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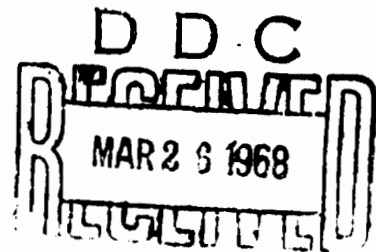
# Atomic Emission Lines Below 2000 Angstroms Hydrogen Through Argon

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## CONTENTS

|                                        |     |
|----------------------------------------|-----|
| Abstract                               | iv  |
| INTRODUCTION                           | 1   |
| ARRANGEMENT OF THE TABLES              | 1   |
| PREPARATION OF THE TABLES              | 3   |
| ACKNOWLEDGMENTS                        | 3   |
| SECTION I – Emission Lines by Spectrum | 5   |
| SECTION II – Finding List              | 265 |
| REFERENCES FOR EACH SPECTRUM           | 347 |
| REFERENCES                             | 349 |



## **ABSTRACT**

A tabulation of observed spectral lines below 2000 Angstroms has been prepared from the published literature up to January 1967. It is intended principally as an aid to the astrophysicist and to the plasma spectroscopist who deals with the spectra of highly stripped atoms. This report includes the first 18 elements, hydrogen through argon. The tabulation is divided into two main sections: the emission lines by spectrum, and a finding list. The entries give the element and spectrum, vacuum wavelength, intensity, and classification. A reference list is included.

### **Problem Status**

This is the first of several reports of this nature to be published on this problem. It covers the first 18 elements. Future reports will cover the remainder of the periodic table.

### **Authorization**

NRL Problem H02-24  
RR 002-09-41-5054

# ATOMIC EMISSION LINES BELOW 2000 ÅNGSTROMS

## Hydrogen through Argon

### INTRODUCTION

The tabulation of spectral lines below 2000 angstroms presented in this report has been prepared from information in the literature published up to January 1967. It is intended principally as an aid to the astrophysicist and to the plasma spectroscopist who deals with the spectra of highly stripped atoms. This report includes the first 18 elements, hydrogen through argon. Future reports will cover the remainder of the periodic table.

### ARRANGEMENT OF THE TABLES

The tabulation is divided into two main sections. Section I gives the lines by spectrum, and Section II is the finding list.

The entries in Section I are arranged by element, with subdivision into first spectrum, second spectrum, etc. Within each spectrum, the lines are arranged in order of increasing wavelength. This means, for example, that the several lines in a multiplet may not be listed consecutively.

#### Wavelengths

The vacuum wavelengths are given as reported in the references listed for each line. The accuracy of the wavelength varies somewhat, primarily with the date of publication, but it is not unreasonable to presume an uncertainty of 50 milliangstroms in most cases. In the case of a few quite recent publications in which wavelengths are given to a tenth of a milliangstrom, the uncertainty is probably not greater than 20 milliangstroms. Those lines proposed as wavelength standards by Commission 14 of the Interna-

tional Astronomical Union in 1962 (reference 308) are marked with the symbol ST.

The vacuum wave number has been omitted to conserve space, since it can be obtained by a simple inversion of the wavelength.

#### Intensity

Only a single intensity is given for each line, chosen from that source in which the particular spectrum was reported as most prominent. The intensities listed in the tables have been normalized to a maximum intensity of 1000 for convenience in comparing the different references. The normalization was usually a linear transformation of the intensities reported by the original authors, but a logarithmic calculation was applied in a few cases.

The overlapping of one reference with another presents a difficult problem. In the majority of the publications, the intensities are visual estimates of emulsion blackening. They are significant only over a limited range of wavelengths, because of the properties of the spectrographic equipment employed, and for a particular source operated in some particular way. For this reason, intensities given by two observers are seldom compatible. The intensity numbers have the following meaning: when two lines in a narrow wavelength region are reported with different intensities, the one with the larger number is generally the more intense.

There is a real need for a single intensity scale. The use of a maximum of 1000 in this report was adopted as an intermediate between the old scales with a maximum of 10 (or 35) and some later publications with a linear scale and a maximum of 100,000.

A few descriptive symbols are used with the intensity. These are given below with their meanings.

- b Blend of two lines
- d Diffuse
- f Forbidden
- h Hazy
- P Predicted wavelength
- r Reversed
- w Wide

### Multiplet Numbers

The multiplet numbers which have been assigned by Charlotte Moore (Refs. 488 and 504) are given in a separate column following the wavelength. Some lines missing from the multiplet tables have been included, but overlapping lines with the same wavelength in a multiplet have not been listed twice.

### Classification

The classifications of the transitions are given in the usual form, with the lower state first. They are divided into columns showing configuration, term, and J-value.

**Configuration**—The configurations are given in enough detail to be self-explanatory. In general, those parts of the configuration which are given represent electrons outside the next lower closed shell.

**Term**—The symbol *g* is used to denote the ground term. Otherwise, the term description is given in notation which follows that of Cowan and Andrew.\* It is presented below in symbolic form for the two-electron case.

| Type of Coupling | Description                          | Notation      |
|------------------|--------------------------------------|---------------|
| LS               | $[(\ell_1 \ell_2)L, (s_1 s_2)S]J$    | $2S+1L_J$     |
| LK               | $[(\ell_1 \ell_2)L, s_1]K, s_2]J$    | $L[K]_J$      |
| jK               | $[(\ell_1 s_1)j_1, \ell_2]K, s_2]J$  | $j_1[K]_J$    |
| jj               | $(\ell_1 s_1)j_1, (\ell_2 s_2)j_2]J$ | $(j_1 j_2)_J$ |

**J-Value**—The J-values are given in separate columns to avoid the use of subscripts.

\*R. D. Cowan and K. L. Andrew, J. Opt. Soc. Am. 55, 502-516 (1965).

### Classification Reference

In general, the primary reference for the notation and classification of the observed lines is AEL, Charlotte Moore's Atomic Energy Levels (Ref. 487). It has been superseded, however, by more recent publications in several cases. Wherever there are three references listed, the third is the one from which the classification was taken. In all cases, the transition was compared with the published energy levels to verify the classification. A few questionable transitions were retained; these are indicated by a question mark following the spectrum number.

We have departed from the notation in AEL in not using primes, double primes, etc., to indicate those configurations which have as parent terms excited states of the next higher ion. Instead, the parent terms are given where they are known.

### References

Reference numbers, referring to the list of references at the end of the report are given with each spectral line to allow the reader to refer to the original publication. In every case, the first reference is the one from which the wavelength was taken. The second reference most commonly relates to the intensity, while the third relates to the classification.

The references in this volume are selected from a list which covers the entire periodic table. The complete list will appear in future NRL reports. The letters CL in a reference refer to the fact that it gives classified lines of the species in parentheses.

### Ionization Potentials

Most of the ionization potentials listed have been taken from AEL (Ref. 487), corrected by using the more recent conversion factor  $1.23981 \times 10^{-4}$  eV/cm<sup>-1</sup>. A few values were taken from the recent paper by Lotz.† Recently derived results for Ne II, O IV and O V were made available through the kindness of Prof. L. Minnhagen of the Lund Institute of Technology.

†W. Lotz, L. Opt. Soc. Am. 57, 873-8 (1967).

## PREPARATION OF THE TABLES

The data were assembled from the literature and punched onto cards. Duplications were removed and disagreements were resolved by comparing the observed spectra with the spectra predicted from the atomic energy levels. In most cases, only those lines which have been observed are listed in the tables. Notable exceptions are the lines of the hydrogenic atoms, for which the spectra had not been reported for elements beyond oxygen. Further, even in the case of some observed lines, the wavelengths given are those predicted from a comprehensive analysis of the spectrum rather than the measured values (Ar II is an example). Some unobserved weak lines in multiplets have also been included for completeness. Such predicted values of wavelength are marked by the symbol P following the intensity.

The wavelengths and classifications retained were then read onto magnetic tape for convenience in handling. The tables were set in print by the Government Printing Office's Linofilm,\* an automatic phototypesetting machine which produces photographic copy

for making printing plates almost directly from magnetic tape.

The advantages of automatic phototypesetting are speed and accuracy. Once the input data are correct, the machine output should also be correct. In fact, however, machine-produced errors do exist. These occur as missing characters. It is hoped that all such errors have been found and corrected.

## ACKNOWLEDGMENTS

Many spectroscopists have graciously contributed preprints of their work for inclusion in these tables. Among these are K. Bockasten, R. D. Cowan, R. C. Elton, B. C. Fawcett, U. Feldman, and V. Kaufman. All the programming for the calculations and the edit code for the Linofilm were written by Mr. Warren Rauscher, who was invaluable. It is a pleasure to acknowledge the support of Dr. A. C. Kolb and Dr. R. C. Elton of the Naval Research Laboratory.

This is a joint undertaking of the Naval Postgraduate School and the Naval Research Laboratory.

\*The Linofilm system has been described by M. E. Stevens and J. L. Little in NBS Monograph 99, Automatic Typographic Quality Typesetting Techniques: A State-of-the-Art Review (April 7, 1967).

PERIODIC CHART OF THE ELEMENTS

| I A      | II A     | III B    | IV B     | V B      | VI B     | VII B    | VIII     |          |          | I B      | II B     | III B    | IV A     | V A      | VI A     | VII A    | INERT GASES |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|
| H<br>1   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          | He<br>2     |
| Li<br>3  | Be<br>4  |          |          |          |          |          |          |          |          |          |          | B<br>5   | C<br>6   | N<br>7   | O<br>8   | F<br>9   | Ne<br>10    |
| Na<br>11 | Mg<br>12 |          |          |          |          |          |          |          |          |          |          | Al<br>13 | Si<br>14 | P<br>15  | S<br>16  | Cl<br>17 | Ar<br>18    |
| K<br>19  | Ca<br>20 | Sc<br>21 | Ti<br>22 | V<br>23  | Cr<br>24 | Mn<br>25 | Fe<br>26 | Co<br>27 | Ni<br>28 | Cu<br>29 | Zn<br>30 | Ga<br>31 | Ge<br>32 | As<br>33 | Se<br>34 | Br<br>35 | Kr<br>36    |
| Rb<br>37 | Sr<br>38 | Y<br>39  | Zr<br>40 | Nb<br>41 | Mo<br>42 | Tc<br>43 | Ru<br>44 | Rh<br>45 | Pd<br>46 | Ag<br>47 | Cd<br>48 | In<br>49 | Sn<br>50 | Sb<br>51 | Te<br>52 | I<br>53  | Xe<br>54    |
| Cs<br>55 | Ba<br>56 | La<br>57 | Hf<br>72 | Ta<br>73 | W<br>74  | Re<br>75 | Os<br>76 | Ir<br>77 | Pt<br>78 | Au<br>79 | Hg<br>80 | Tl<br>81 | Pb<br>82 | Bi<br>83 | Po<br>84 | At<br>85 | Rn<br>86    |
| Fr<br>87 | Ra<br>88 | Ac<br>89 |          |          |          |          |          |          |          |          |          |          |          |          |          |          |             |

Lanthanum Series

|          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Ce<br>58 | Pr<br>59 | Nd<br>60 | Pm<br>61 | Sm<br>62 | Eu<br>63 | Gd<br>64 | Tb<br>65 | Dy<br>66 | Ho<br>67 | Er<br>68 | Tm<br>69 | Yb<br>70 | Lu<br>71 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

Actinium Series

|          |          |         |          |          |          |          |          |          |
|----------|----------|---------|----------|----------|----------|----------|----------|----------|
| Th<br>90 | Pa<br>91 | U<br>92 | Np<br>93 | Pu<br>94 | Am<br>95 | Cm<br>96 | Bk<br>97 | Cf<br>98 |
|----------|----------|---------|----------|----------|----------|----------|----------|----------|

## **SECTION I**

### **Emission Lines by Spectrum**

# CONTENTS

|                                |    |                                 |     |                                 |     |
|--------------------------------|----|---------------------------------|-----|---------------------------------|-----|
| H I . . . . .                  | 7  | Ne VIII . . . . .               | 95  | P I . . . . .                   | 190 |
| D I . . . . .                  | 8  | Ne IX . . . . .                 | 96  | P II . . . . .                  | 194 |
| He I . . . . .                 | 9  | Ne X . . . . .                  | 97  | P III . . . . .                 | 197 |
| He II . . . . .                | 10 | Na Unclassified lines . . . . . | 98  | P IV . . . . .                  | 199 |
| Li II . . . . .                | 11 | Na II . . . . .                 | 99  | P V . . . . .                   | 201 |
| Li III . . . . .               | 12 | Na III . . . . .                | 100 | P VI . . . . .                  | 202 |
| Be I . . . . .                 | 13 | Na IV . . . . .                 | 103 | P VII . . . . .                 | 203 |
| Be II . . . . .                | 14 | Na V . . . . .                  | 105 | P VIII . . . . .                | 204 |
| Be III . . . . .               | 15 | Na VI . . . . .                 | 107 | P IX . . . . .                  | 205 |
| Be IV . . . . .                | 16 | Na VII . . . . .                | 110 | P X . . . . .                   | 206 |
| B I . . . . .                  | 17 | Na VIII . . . . .               | 113 | P XI . . . . .                  | 207 |
| B II . . . . .                 | 18 | Na IX . . . . .                 | 115 | P XII . . . . .                 | 208 |
| B III . . . . .                | 19 | Na XI . . . . .                 | 116 | P XIII . . . . .                | 209 |
| B IV . . . . .                 | 20 | Mg Unclassified lines . . . . . | 117 | P XV . . . . .                  | 210 |
| B V . . . . .                  | 21 | Mg I . . . . .                  | 119 | S Unclassified lines . . . . .  | 211 |
| C Unclassified lines . . . . . | 22 | Mg II . . . . .                 | 120 | S I . . . . .                   | 212 |
| C I . . . . .                  | 23 | Mg III . . . . .                | 121 | S II . . . . .                  | 214 |
| C II . . . . .                 | 27 | Mg IV . . . . .                 | 123 | S III . . . . .                 | 216 |
| C III . . . . .                | 30 | Mg V . . . . .                  | 125 | S IV . . . . .                  | 218 |
| C IV . . . . .                 | 33 | Mg VI . . . . .                 | 128 | S V . . . . .                   | 219 |
| C V . . . . .                  | 34 | Mg VII . . . . .                | 131 | S VI . . . . .                  | 220 |
| C VI . . . . .                 | 35 | Mg VIII . . . . .               | 133 | S VII . . . . .                 | 221 |
| N I . . . . .                  | 36 | Mg IX . . . . .                 | 136 | S VIII . . . . .                | 222 |
| N II . . . . .                 | 40 | Mg X . . . . .                  | 138 | S IX . . . . .                  | 223 |
| N III . . . . .                | 43 | Mg XI . . . . .                 | 139 | S X . . . . .                   | 224 |
| N IV . . . . .                 | 46 | Mg XII . . . . .                | 140 | S XVI . . . . .                 | 225 |
| N V . . . . .                  | 48 | Al Unclassified lines . . . . . | 141 | Cl Unclassified lines . . . . . | 226 |
| N VI . . . . .                 | 50 | Al I . . . . .                  | 145 | Cl I . . . . .                  | 227 |
| N VII . . . . .                | 51 | Al II . . . . .                 | 146 | Cl II . . . . .                 | 228 |
| O I . . . . .                  | 52 | Al III . . . . .                | 148 | Cl III . . . . .                | 231 |
| O II . . . . .                 | 54 | Al IV . . . . .                 | 149 | Cl IV . . . . .                 | 233 |
| O III . . . . .                | 56 | Al V . . . . .                  | 151 | Cl V . . . . .                  | 235 |
| O IV . . . . .                 | 60 | Al VI . . . . .                 | 153 | Cl VI . . . . .                 | 236 |
| O V . . . . .                  | 64 | Al VII . . . . .                | 155 | Cl VII . . . . .                | 237 |
| O VI . . . . .                 | 67 | Al VIII . . . . .               | 157 | Cl VIII . . . . .               | 238 |
| O VII . . . . .                | 68 | Al IX . . . . .                 | 159 | Cl IX . . . . .                 | 239 |
| O VIII . . . . .               | 69 | Al X . . . . .                  | 161 | Cl X . . . . .                  | 240 |
| F Unclassified lines . . . . . | 70 | Al XI . . . . .                 | 162 | Cl XI . . . . .                 | 241 |
| F I . . . . .                  | 71 | Al XII . . . . .                | 163 | Cl XVII . . . . .               | 242 |
| F II . . . . .                 | 73 | Al XIII . . . . .               | 164 | Ar Unclassified lines . . . . . | 243 |
| F III . . . . .                | 74 | Si Unclassified lines . . . . . | 165 | Ar I . . . . .                  | 246 |
| F IV . . . . .                 | 76 | Si I . . . . .                  | 166 | Ar II . . . . .                 | 247 |
| F V . . . . .                  | 79 | Si II . . . . .                 | 170 | Ar III . . . . .                | 252 |
| F VI . . . . .                 | 82 | Si III . . . . .                | 173 | Ar IV . . . . .                 | 254 |
| F VII . . . . .                | 83 | Si VI . . . . .                 | 177 | Ar V . . . . .                  | 255 |
| F VIII . . . . .               | 84 | Si V . . . . .                  | 178 | Ar VI . . . . .                 | 256 |
| F IX . . . . .                 | 85 | Si VI . . . . .                 | 179 | Ar VII . . . . .                | 257 |
| Ne I . . . . .                 | 86 | Si VII . . . . .                | 181 | Ar VIII . . . . .               | 258 |
| Ne II . . . . .                | 87 | Si VIII . . . . .               | 183 | Ar IX . . . . .                 | 259 |
| Ne III . . . . .               | 88 | Si IX . . . . .                 | 185 | Ar X . . . . .                  | 260 |
| Ne IV . . . . .                | 89 | Si X . . . . .                  | 186 | Ar XI . . . . .                 | 261 |
| Ne V . . . . .                 | 92 | Si XI . . . . .                 | 187 | Ar XII . . . . .                | 262 |
| Ne VI . . . . .                | 93 | Si XII . . . . .                | 188 | Ar XVIII . . . . .              | 263 |
| Ne VII . . . . .               | 94 | Si XIV . . . . .                | 189 |                                 |     |

H I

## HYDROGEN, Z = 1

H I

Ground state  $1s\ ^1S_{1/2}$ Ionization potential  $109\,678.764\text{ cm}^{-1}$ ;  $13.598\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------------------|-----------|
| H I     | 914.576    | 2P        | 17        | $1s - 18p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 914.919    | 2P        | 16        | $1s - 17p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 915.329    | 2P        | 15        | $1s - 16p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 915.824    | 3P        | 14        | $1s - 15p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 916.429    | 3P        | 13        | $1s - 14p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 917.181    | 4P        | 12        | $1s - 13p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 918.129    | 5P        | 11        | $1s - 12p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 919.351    | 7P        | 10        | $1s - 11p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 920.963    | 9P        | 9         | $1s - 10p$    | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 923.150    | 10P       | 8         | $1s - 9p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 926.226    | 20P       | 7         | $1s - 8p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 930.748    | 30P       | 6         | $1s - 7p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 937.803    | 40P       | 5         | $1s - 6p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 949.743    | 70P       | 4         | $1s - 5p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 972.537    | 130P      | 3         | $1s - 4p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 1025.722   | 300P      | 2         | $1s - 3p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 1215.668   | 670P      | 1         | $1s - 2p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,488   |
| H I     | 1215.674   | 330P      | 1         | $1s - 2p$     | $K^1S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |



DI

DEUTERIUM,  $Z = 1$ 

DI

Ground state  $1s^2S_{1/2}$ Ionization potential  $109\,708.608\text{ cm}^{-1}$ ;  $13.602\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------------------|-----------|
| D I     | 925.974    | P         | 7         | $1s - 8p$     | $2^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309       |
| D I     | 930.495    | P         | 6         | $1s - 7p$     | $2^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309       |
| D I     | 937.548    | 40P       | 5         | $1s - 6p$     | $2^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,487   |
| D I     | 949.485    | 70P       | 4         | $1s - 5p$     | $2^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,487   |
| D I     | 972.272    | 140P      | 3         | $1s - 4p$     | $2^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,487   |
| D I     | 1025.443   | 320P      | 2         | $1s - 3p$     | $2^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,487   |
| D I     | 1215.339   | 1000P     | 1         | $1s - 2p$     | $2^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,487   |

He I

HELIUM, Z = 2

He I

Ground state  $1s^2\ ^1S_0$

Ionization potential  $198\,310.81\text{ cm}^{-1}$ ;  $24.587\text{ eV}$

| Element | Wavelength | Intensity | Multiplet | Configuration  | Term           | J - J | Reference |
|---------|------------|-----------|-----------|----------------|----------------|-------|-----------|
| He I    | 320.392    | 20        |           | $1s2p - 2p^2$  | $^3P^o - ^3P$  |       | 497       |
| He I    | 505.5001   | 4         |           | $1s^2 - 1s15p$ | $g^1S - ^1P^o$ | 0-1   | 497       |
| He I    | 505.6840   | 6         |           | $1s^2 - 1s14p$ | $g^1S - ^1P^o$ | 0-1   | 497       |
| He I    | 505.9122   | 8         |           | $1s^2 - 1s13p$ | $g^1S - ^1P^o$ | 0-1   | 497       |
| He I    | 506.2000   | 10        |           | $1s^2 - 1s12p$ | $g^1S - ^1P^o$ | 0-1   | 497       |
| He I    | 506.5702   | 15        |           | $1s^2 - 1s11p$ | $g^1S - ^1P^o$ | 0-1   | 497       |
| He I    | 507.0576   | 20        | 10        | $1s^2 - 1s10p$ | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 507.7178   | 30        | 9         | $1s^2 - 1s9p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 508.6431   | 40        | 8         | $1s^2 - 1s8p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 509.9979   | 50        | 7         | $1s^2 - 1s7p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 510.2586   | f         |           | $1s^2 - 1s7s$  | $g^1S - ^1S$   | 0-0   | 497       |
| He I    | 512.0982   | 70        | 6         | $1s^2 - 1s6p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 512.5183   | f         |           | $1s^2 - 1s6s$  | $g^1S - ^1S$   | 0-0   | 497       |
| He I    | 515.6165   | 100       | 5         | $1s^2 - 1s5p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 516.3592   | f         |           | $1s^2 - 1s5s$  | $g^1S - ^1S$   | 0-0   | 497       |
| He I    | 522.2128   | 160       | 4         | $1s^2 - 1s4p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 523.7238   | f         |           | $1s^2 - 1s4s$  | $g^1S - ^1S$   | 0-0   | 497       |
| He I    | 537.0296   | 400       | 3         | $1s^2 - 1s3p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 537.3309   | f         |           | $1s^2 - 1s3d$  | $g^1S - ^1D$   | 0-2   | 497       |
| He I    | 538.8956   | f         |           | $1s^2 - 1s3p$  | $g^1S - ^3P^o$ | 0-1   | 497       |
| He I    | 540.9354   | f         |           | $1s^2 - 1s3s$  | $g^1S - ^1S$   | 0-0   | 497       |
| He I    | 584.3340   | 1000      | 2         | $1s^2 - 1s2p$  | $g^1S - ^1P^o$ | 0-1   | 497,488   |
| He I    | 591.4117   | 40f       | 1         | $1s^2 - 1s2p$  | $g^1S - ^3P^o$ | 0-1   | 497,488   |
| He I    | 601.4041   | f         |           | $1s^2 - 1s2s$  | $g^1S - ^1S$   | 0-0   | 497       |

He II

## HELIUM, Z = 2

He II

Ground state  $1s^2S_{1/2}$ Ionization potential  $\text{He}^+ 438\,908.854\text{ cm}^{-1}; 54.416\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------------------|-----------|
| He II   | 229.431    | P         | 11        | $1s - 12p$    | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 229.736    | P         | 10        | $1s - 11p$    | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 230.139    | P         | 9         | $1s - 10p$    | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 230.686    | P         | 8         | $1s - 9p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 231.454    | P         | 7         | $1s - 8p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 232.584    | 30P       | 6         | $1s - 7p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 234.347    | 40P       | 5         | $1s - 6p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 237.331    | 70P       | 4         | $1s - 5p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 243.027    | 130P      | 3         | $1s - 4p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 256.317    | 320P      | 2         | $1s - 3p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 303.781    | 665       | 1         | $1s - 2p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 303.786    | 335       | 1         | $1s - 2p$     | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 949.301    | 9P        | 19        | $2p - 10d$    | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 949.354    | 17P       | 19        | $2p - 10d$    | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 958.670    | 13P       | 18        | $2p - 9d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 958.724    | 22P       | 18        | $2p - 9d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 972.083    | 18P       | 17        | $2p - 8d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 972.138    | 32P       | 17        | $2p - 8d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 992.334    | 27P       | 16        | $2p - 7d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 992.391    | 48P       | 16        | $2p - 7d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1025.241   | 42P       | 15        | $2p - 6d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1025.302   | 77P       | 15        | $2p - 6d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1084.908   | 73P       | 14        | $2p - 5d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1084.975   | 132P      | 14        | $2p - 5d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1215.088   | 143P      | 13        | $2p - 4d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1215.171   | 260P      | 13        | $2p - 4d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1215.175   | 30P       | 13        | $2p - 4d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1640.332   | 333P      | 12        | $2p - 3d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1640.474   | 600P      | 12        | $2p - 3d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |
| He II   | 1640.490   | 70P       | 12        | $2p - 3d$     | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 309,488   |

Li II

## LITHIUM, Z = 3

Li II

Ground state  $1s^2\ ^1S_0$ Ionization potential  $610\,080\text{ cm}^{-1}$ ;  $75.638\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J | Reference   |
|---------|------------|-----------|-----------|---------------|----------------|-------|-------------|
| Li II   | 171.582    | 100       | 3         | $1s^2 - 1s4p$ | $g^1S - ^1P^o$ | 0-1   | 168,488,596 |
| Li II   | 178.015    | 100       | 2         | $1s^2 - 1s3p$ | $g^1S - ^1P^o$ | 0-1   | 168,488,596 |
| Li II   | 199.282    | 300       | 1         | $1s^2 - 1s2p$ | $g^1S - ^1P^o$ | 0-1   | 168,488,596 |
| Li II   | 1132.1     | 150       |           | $1s2p - 1s4d$ | $^3P^o - ^3D$  |       | 788         |
| Li II   | 1166.4     | 200       |           | $1s2p - 1s4s$ | $^3P^o - ^3S$  | -1    | 788         |
| Li II   | 1198.092   | 10        |           | $1s2s - 1s3p$ | $^3S - ^3P^o$  | 1-    | 307         |
| Li II   | 1253.3     | 100       |           | $1s2p - 1s4s$ | $^1P^o - ^1S$  | 1-0   | 788         |
| Li II   | 1420.89    | 100       |           | $1s2s - 1s3p$ | $^1S - ^1P^o$  | 0-1   | 775,788     |
| Li II   | 1492.931   | 60        |           | $1s2p - 1s3d$ | $^3P^o - ^3D$  | 1-    | 307         |
| Li II   | 1492.973   | 100       |           | $1s2p - 1s3d$ | $^3P^o - ^3D$  | 2-    | 307         |
| Li II   | 1493.036   | 20        |           | $1s2p - 1s3d$ | $^3P^o - ^3D$  | 0-    | 307         |
| Li II   | 1653.076   | 60        |           | $1s2p - 1s3s$ | $^3P^o - ^3S$  | 1-1   | 307         |
| Li II   | 1653.132   | 100       |           | $1s2p - 1s3s$ | $^3P^o - ^3S$  | 2-1   | 307         |
| Li II   | 1653.212   | 20        |           | $1s2p - 1s3s$ | $^3P^o - ^3S$  | 0-1   | 307         |
| Li II   | 1681.660   | 10        |           | $1s2p - 1s3d$ | $^1P^o - ^1D$  | 1-2   | 307         |
| Li II   | 1755.331   | 10        |           | $1s2p - 1s3s$ | $^1P^o - ^1S$  | 1-0   | 307         |

Li III

LITHIUM, Z = 3

Li III

Ground state  $1s^2S_{1/2}$   
Ionization potential  $\text{Li}^+ 987\,660.94\text{ cm}^{-1}$ ; 122.451 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------------------|-----------|
| Li III  | 102.856    | P         |           | $1s - 8p$     | $8^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,253   |
| Li III  | 103.359    | P         |           | $1s - 7p$     | $7^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,253   |
| Li III  | 104.142    | P         |           | $1s - 6p$     | $6^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309       |
| Li III  | 105.468    | P         |           | $1s - 5p$     | $5^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,253   |
| Li III  | 107.999    | P         |           | $1s - 4p$     | $4^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,185   |
| Li III  | 113.905    | 10P       |           | $1s - 3p$     | $3^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,185   |
| Li III  | 134.998    | 200P      |           | $1s - 2p$     | $2^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 309,185   |
| Li III  | 441.00     | P         |           | $2 - 7$       |                |                             | 309       |
| Li III  | 455.63     | P         |           | $2 - 6$       |                |                             | 309       |
| Li III  | 482.14     | P         |           | $2 - 5$       |                |                             | 309       |
| Li III  | 540.00     | P         |           | $2 - 4$       |                |                             | 309       |
| Li III  | 728.98     | P         |           | $2 - 3$       |                |                             | 309       |
| Li III  | 1060.41    | P         |           | $3 - 8$       |                |                             | 309       |
| Li III  | 1116.33    | P         |           | $3 - 7$       |                |                             | 309       |
| Li III  | 1215.05    | P         |           | $3 - 6$       |                |                             | 309       |
| Li III  | 1423.88    | P         |           | $3 - 5$       |                |                             | 309       |

Be I

## BERYLLIUM, Z = 4

Be I

Ground state  $1s^2 2s^2 \ ^1S_0$ Ionization potential 75 192.29 cm<sup>-1</sup>; 9.322 eV

| Element | Wavelength | Intensity | Multiplet | Configuration  | Term           | J - J | Reference   |
|---------|------------|-----------|-----------|----------------|----------------|-------|-------------|
| Be I    | 1426.117   | 125       |           | $2s^2 - 2s5p$  | $g^1S - ^1P^o$ | 0-1   | 333         |
| Be I    | 1491.765   | 250       |           | $2s^2 - 2s4p$  | $g^1S - ^1P^o$ | 0-1   | 197,333     |
| Be I    | 1661.478   | 1000      |           | $2s^2 - 2s3p$  | $g^1S - ^1P^o$ | 0-1   | 197,333,541 |
| Be I    | 1907.12    | 100       |           | $2s2p - 2s12d$ | $^3P^o - ^1D$  |       | 541         |
| Be I    | 1912.49    | 100       |           | $2s2p - 2s11d$ | $^3P^o - ^3D$  |       | 541,658     |
| Be I    | 1919.76    | 200       |           | $2s2p - 2s10d$ | $^3P^o - ^3D$  |       | 541,658     |
| Be I    | 1929.67    | 300       |           | $2s2p - 2s9d$  | $^3P^o - ^3D$  |       | 541,658     |
| Be I    | 1943.68    | 500       |           | $2s2p - 2s8d$  | $^3P^o - ^3D$  |       | 541,658     |
| Be I    | 1956.63    | 100       |           | $2s2p - 2s8s$  | $^3P^o - ^3S$  | -1    | 541,658     |
| Be I    | 1964.55    | 900       |           | $2s2p - 2s7d$  | $^3P^o - ^3D$  |       | 541,658     |
| Be I    | 1985.13    | 300       |           | $2s2p - 2s7s$  | $^3P^o - ^3S$  | -1    | 541,658     |
| Be I    | 1998.01    | 1000      |           | $2s2p - 2s6d$  | $^3P^o - ^3D$  |       | 541,658     |

Be II

## BERYLLIUM, Z = 4

Be II

Ground state  $1s^2s^2S_{1/2}$ Ionization potential  $146\,881.7\text{ cm}^{-1}$ ; 18.211 eV

| Element | Wavelength | Intensity | Multiplet | Configuration   | Term           | J - J       | Reference   |
|---------|------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Be II   | 725.71     | 100       |           | $1s^2s - 1s^2p$ | $g^2S - ^1P^o$ | $1/2 - 3/2$ | 541         |
| Be II   | 743.579    | 300       |           | $1s^2s - 1s^2p$ | $g^2S - ^1P^o$ | $1/2 - 3/2$ | 541         |
| Be II   | 775.362    | 400       |           | $1s^2s - 1s^2p$ | $g^2S - ^1P^o$ | $1/2 - 3/2$ | 332,541     |
| Be II   | 842.025    | 500       | 2         | $1s^2s - 1s^2p$ | $g^2S - ^1P^o$ | $1/2 - 3/2$ | 332,541     |
| Be II   | 842.031    | 250       | 2         | $1s^2s - 1s^2p$ | $g^2S - ^1P^o$ | $1/2 - 1/2$ | 332,541     |
| Be II   | 925.246    | 100       |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $3/2 -$     | 541         |
| Be II   | 943.481    | 30        |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $1/2 -$     | 332,541     |
| Be II   | 943.540    | 70        |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $3/2 -$     | 332,541     |
| Be II   | 949.746    | 100       |           | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 541         |
| Be II   | 973.213    | 150       |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $1/2 -$     | 332,541     |
| Be II   | 973.276    | 350       |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $3/2 -$     | 332,541     |
| Be II   | 983.984    | 50        |           | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 332,541     |
| Be II   | 984.048    | 150       |           | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 332,541     |
| Be II   | 1026.890   | 200       |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 332,541     |
| Be II   | 1026.959   | 400       |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 332,541     |
| Be II   | 1036.299   | 550       | 1         | $1s^2s - 1s^2p$ | $g^2S - ^1P^o$ | $1/2 - 3/2$ | 197,332,541 |
| Be II   | 1036.319   | 250       | 1         | $1s^2s - 1s^2p$ | $g^2S - ^1P^o$ | $1/2 - 1/2$ | 197,332,541 |
| Be II   | 1048.147   | 200       |           | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 332,541     |
| Be II   | 1048.220   | 400       |           | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 332,541     |
| Be II   | 1142.956   | 250       |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 332,541     |
| Be II   | 1143.039   | 500       |           | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 332,541     |
| Be II   | 1197.094   | 330       | 5         | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 332,541     |
| Be II   | 1197.188   | 670       | 5         | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 332,488     |
| Be II   | 1512.269   | 555       | 4         | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 197,332,488 |
| Be II   | 1512.407   | 1000      | 4         | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 197,332,488 |
| Be II   | 1512.419   | 110       | 4         | $1s^2p - 1s^2d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 197,332,488 |
| Be II   | 1776.100   | 500       | 3         | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 197,332,488 |
| Be II   | 1776.307   | 1000      | 3         | $1s^2p - 1s^2s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 197,332,488 |

Be III

BERYLLIUM, Z = 4

Be III

Ground state  $1s^2\ ^1S_0$   
Ionization potential  $1\ 241\ 225\ \text{cm}^{-1}$ ; 153.89 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-------|-----------|
| Be III  | 81.891     |           |           | $1s^2 - 1s7p$ | $K^1S - ^1P^o$ | 0-1   | 596       |
| Be III  | 82.377     |           |           | $1s^2 - 1s6p$ | $K^1S - ^1P^o$ | 0-1   | 596       |
| Be III  | 83.202     |           |           | $1s^2 - 1s5p$ | $K^1S - ^1P^o$ | 0-1   | 596       |
| Be III  | 84.758     | 100       |           | $1s^2 - 1s4p$ | $K^1S - ^1P^o$ | 0-1   | 197,596   |
| Be III  | 88.314     | 330       |           | $1s^2 - 1s3p$ | $K^1S - ^1P^o$ | 0-1   | 197,596   |
| Be III  | 100.254    | 1000      |           | $1s^2 - 1s2p$ | $K^1S - ^1P^o$ | 0-1   | 197,596   |



Be IV

## BERYLLIUM, Z = 4

Be IV

Ground state  $1s^2S_{1/2}$ Ionization potential 1 756 018.7 cm<sup>-1</sup>; 217.713 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J          | Reference   |
|---------|------------|-----------|-----------|---------------|----------------|----------------|-------------|
| Be IV   | 58.574     | P         |           | 1s - 6p       | $g^1S - ^1P^o$ | $\frac{1}{2}-$ | 309,595     |
| Be IV   | 59.320     | P         |           | 1s - 5p       | $g^1S - ^1P^o$ | $\frac{1}{2}-$ | 309,595     |
| Be IV   | 60.743     | P         |           | 1s - 4p       | $g^1S - ^1P^o$ | $\frac{1}{2}-$ | 309,595,765 |
| Be IV   | 64.065     | P         |           | 1s - 3p       | $g^1S - ^1P^o$ | $\frac{1}{2}-$ | 309,765     |
| Be IV   | 75.928     | 1000P     |           | 1s - 2p       | $g^1S - ^1P^o$ | $\frac{1}{2}-$ | 309,197,765 |
| Be IV   | 248.04     | P         |           | 2 - 7         |                |                | 309         |
| Be IV   | 256.27     | P         |           | 2 - 6         |                |                | 309         |
| Be IV   | 271.18     | P         |           | 2 - 5         |                |                | 309         |
| Be IV   | 303.72     | P         |           | 2 - 4         |                |                | 309         |
| Be IV   | 410.01     | P         |           | 2 - 3         |                |                | 309         |
| Be IV   | 596.44     | P         |           | 3 - 8         |                |                | 309         |
| Be IV   | 627.90     | P         |           | 3 - 7         |                |                | 309         |
| Be IV   | 683.42     | P         |           | 3 - 6         |                |                | 309         |
| Be IV   | 800.88     | P         |           | 3 - 5         |                |                | 309         |
| Be IV   | 1171.56    | P         |           | 3 - 4         |                |                | 309         |

B I

## BORON, Z = 5

B I

Ground state  $1s^2 2s^2 p^1 \ ^2P_{1/2}$ Ionization potential  $66\,930\text{ cm}^{-1}$ ;  $8.298\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                  | J-J                         | Reference   |
|---------|------------|-----------|-----------|------------------------|-----------------------|-----------------------------|-------------|
| B I     | 1378.43    | 300       |           | $2s^2 2p - 2s^2 p^2$   | $g^2 P^{\circ} - ^2P$ | $\frac{1}{2} - \frac{3}{2}$ | 134         |
| B I     | 1378.69    | 500b      |           | $2s^2 2p - 2s^2 p^2$   | $g^2 P^{\circ} - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 134         |
| B I     | 1378.95    | 300       |           | $2s^2 2p - 2s^2 p^2$   | $g^2 P^{\circ} - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 134         |
| B I     | 1465.59    | 100d      |           | $2s^2 p^2 - 1s^2 2p^2$ | $^4P - ^4S^{\circ}$   | $\frac{1}{2} - \frac{3}{2}$ | 134         |
| B I     | 1465.69    | 200d      |           | $2s^2 p^2 - 1s^2 2p^2$ | $^4P - ^4S^{\circ}$   | $\frac{3}{2} - \frac{3}{2}$ | 134         |
| B I     | 1465.82    | 200d      |           | $2s^2 p^2 - 1s^2 2p^2$ | $^4P - ^4S^{\circ}$   | $\frac{5}{2} - \frac{3}{2}$ | 134         |
| B I     | 1525.50    | 1         |           | $2s^2 2p - 2s^2 9s$    | $g^2 P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 134         |
| B I     | 1525.84    | 1         |           | $2s^2 2p - 2s^2 9s$    | $g^2 P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 134         |
| B I     | 1533.81    | 10d       |           | $2s^2 2p - 2s^2 8d$    | $g^2 P^{\circ} - ^2D$ | $\frac{1}{2} -$             | 134         |
| B I     | 1534.29    | 10d       |           | $2s^2 2p - 2s^2 8d$    | $g^2 P^{\circ} - ^2D$ | $\frac{3}{2} -$             | 134         |
| B I     | 1546.44    | 100d      |           | $2s^2 2p - 2s^2 7d$    | $g^2 P^{\circ} - ^2D$ | $\frac{1}{2} -$             | 134         |
| B I     | 1546.85    | 200d      |           | $2s^2 2p - 2s^2 7d$    | $g^2 P^{\circ} - ^2D$ | $\frac{3}{2} -$             | 134         |
| B I     | 1558.71    | 200       |           | $2s^2 2p - 2s^2 7s$    | $g^2 P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 134,658     |
| B I     | 1559.11    | 300       |           | $2s^2 2p - 2s^2 7s$    | $g^2 P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 134         |
| B I     | 1566.32    | 200d      |           | $2s^2 2p - 2s^2 6d$    | $g^2 P^{\circ} - ^2D$ | $\frac{1}{2} -$             | 134         |
| B I     | 1566.70    | 300d      |           | $2s^2 2p - 2s^2 6d$    | $g^2 P^{\circ} - ^2D$ | $\frac{3}{2} -$             | 134,658     |
| B I     | 1573.31    | 300       |           | $2s^2 2p - 2s^2 p^2$   | $g^2 P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 134,658     |
| B I     | 1573.67    | 500       |           | $2s^2 2p - 2s^2 p^2$   | $g^2 P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 134         |
| B I     | 1600.41    | 500d      |           | $2s^2 2p - 2s^2 5d$    | $g^2 P^{\circ} - ^2D$ | $\frac{1}{2} -$             | 134,658     |
| B I     | 1600.83    | 800d      |           | $2s^2 2p - 2s^2 5d$    | $g^2 P^{\circ} - ^2D$ | $\frac{3}{2} -$             | 134,658     |
| B I     | 1602.99    | 200d      |           |                        |                       |                             | 134         |
| B I     | 1610.40    | 10        |           | $2s^2 2p - 2s^2 6s$    | $g^2 P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 134         |
| B I     | 1610.72    | 10        |           | $2s^2 2p - 2s^2 6s$    | $g^2 P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 134         |
| B I     | 1662.62    | 200       |           | $2s^2 2p - 2s^2 5s$    | $g^2 P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 134,658     |
| B I     | 1663.05    | 300       |           | $2s^2 2p - 2s^2 5s$    | $g^2 P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 134,658     |
| B I     | 1664.25    | 200d      |           |                        |                       |                             | 134         |
| B I     | 1664.76    | 200d      |           |                        |                       |                             | 134         |
| B I     | 1666.87    | 800d      |           | $2s^2 2p - 2s^2 4d$    | $g^2 P^{\circ} - ^2D$ | $\frac{1}{2} -$             | 134,658     |
| B I     | 1667.30    | 1000d     |           | $2s^2 2p - 2s^2 4d$    | $g^2 P^{\circ} - ^2D$ | $\frac{3}{2} -$             | 134,658     |
| Ti I    | 1817.849   | 400       |           | $2s^2 2p - 2s^2 4s$    | $g^2 P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 197,134     |
| B I     | 1818.349   | 500       |           | $2s^2 2p - 2s^2 4s$    | $g^2 P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 197,134     |
| B I     | 1825.899   | 750d      | 3         | $2s^2 2p - 2s^2 3d$    | $g^2 P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 197,134,488 |
| B I     | 1826.400   | 1000d     | 3         | $2s^2 2p - 2s^2 3d$    | $g^2 P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 197,134,488 |

B II

## BORON, Z = 5

B II

Ground state  $1s^2 2s^1 \ ^1S_0$ Ionization potential 202 895 cm<sup>-1</sup>; 25.155 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J - J | Reference   |
|---------|------------|-----------|-----------|--------------------------------|---------------|-------|-------------|
| B II    | 693.952    | 200       | 2         | $2s^2 - 2s3p$                  | $^1S - ^1P^o$ | 0-1   | 197,168,488 |
| B II    | 731.357    | 100       |           | $2s2p - 2s4d$                  | $^3P^o - ^3D$ | 1-    | 168         |
| B II    | 731.442    | 100       |           | $2s2p - 2s4d$                  | $^3P^o - ^3D$ | 2-    | 168,195     |
| B II    | 864.08     | 10        |           | $2s(^1S)2p - 1s^2 2p(^3P^o)3p$ | $^1P^o - ^1P$ | 1-1   | 168         |
| B II    | 882.536    | 200       |           | $2s2p - 2s3d$                  | $^3P^o - ^3D$ | 1-    | 168         |
| B II    | 882.670    | 200       |           | $2s2p - 2s$                    | $^3P^o - ^3D$ | 2-    | 168,195     |
| B II    | 984.65     | 100       |           | $1s^2 2p^2 - 1s^2 2p3d$        | $^3P - ^3D^o$ |       | 168         |
| B II    | 1048.67    | 10        |           | $1s^2 2p^2 - 1s^2 2p3d$        | $^1D - ^1D^o$ | 2-2   | 168         |
| B II    | 1081.85    | 200       |           | $2s2p - 2s3s$                  | $^3P^o - ^3S$ | 1-1   | 168,195     |
| B II    | 1082.06    | 200       |           | $2s2p - 2s3s$                  | $^3P^o - ^3S$ | 2-1   | 168,195     |
| B II    | 1230.160   | 200       | 1         | $2s(^1S)2p - 2s(^1S)3d$        | $^1P^o - ^1D$ | 1-2   | 168         |
| B II    | 1362.460   | 500       |           | $2s^2 - 2s2p$                  | $^1S - ^1P^o$ | 0-1   | 197,168,488 |
| B II    | 1623.57    | 400       |           | $2s2p - 1s^2 2p^2$             | $^3P^o - ^3P$ | 1-2   | 197,168,488 |
| B II    | 1623.77    | 400       |           | $2s2p - 1s^2 2p^2$             | $^3P^o - ^3P$ | 0-1   | 197,168     |
| B II    | 1623.99    | 500       |           | $2s2p - 1s^2 2p^2$             | $^3P^o - ^3P$ | 2-2   | 197,168,488 |
| B II    | 1624.16    | 400       | 3         | $2s2p - 1s^2 2p^2$             | $^3P^o - ^3P$ | 1-0   | 197,168     |
| B II    | 1624.37    | 400       |           | $2s2p - 1s^2 2p^2$             | $^3P^o - ^3P$ | 2-1   | 197,168,488 |
| B II    | 1842.80    | 300       |           | $2s2p - 1s^2 2p^2$             | $^1P^o - ^1S$ | 1-0   | 168,658     |

B III

## BORON, Z = 5

B III

Ground state  $1s^2 2s^2 S_{1/2}$ Ionization potential  $305\,931.1\text{ cm}^{-1}$ ; 37.930 eV

| Element | Wavelength | Intensity | Multiplet | Configuration       | Term          | J - J       | Reference |
|---------|------------|-----------|-----------|---------------------|---------------|-------------|-----------|
| B III   | 376.372    | 100       |           | $1s^2 2s - 1s^2 5p$ | $^2S - ^2P^o$ | $1/2 - 3/2$ | 195       |
| B III   | 411.810    | 300       |           | $1s^2 2s - 1s^2 4p$ | $^2S - ^2P^o$ | $1/2 - 3/2$ | 168, 195  |
| B III   | 434.627    | 100       |           | $1s^2 2p - 1s^2 6d$ | $^2P^o - ^2D$ | $3/2 - 3/2$ | 195       |
| B III   | 458.700    | 100       |           | $1s^2 2p - 1s^2 5d$ | $^2P^o - ^2D$ | $3/2 - 3/2$ | 195       |
| B III   | 510.777    | 200       |           | $1s^2 2p - 1s^2 4d$ | $^2P^o - ^2D$ | $1/2 - 3/2$ | 168       |
| B III   | 510.865    | 300       |           | $1s^2 2p - 1s^2 4d$ | $^2P^o - ^2D$ | $3/2 - 3/2$ | 168, 195  |
| B III   | 518.244    | 460       |           | $1s^2 2s - 1s^2 3p$ | $^2S - ^2P^o$ | $1/2 - 3/2$ | 197, 168  |
| B III   | 518.271    | 230       |           | $1s^2 2s - 1s^2 3p$ | $^2S - ^2P^o$ | $1/2 - 1/2$ | 197, 168  |
| B III   | 528.219    | 10        |           | $1s^2 2p - 1s^2 4s$ | $^2P^o - ^2S$ | $3/2 - 1/2$ | 195       |
| B III   | 677.004    | 500       |           | $1s^2 2p - 1s^2 3d$ | $^2P^o - ^2D$ | $1/2 - 3/2$ | 195, 168  |
| B III   | 677.147    | 600       |           | $1s^2 2p - 1s^2 3d$ | $^2P^o - ^2D$ | $3/2 - 3/2$ | 197, 168  |
| B III   | 758.476    | 100       |           | $1s^2 2p - 1s^2 3s$ | $^2P^o - ^2S$ | $1/2 - 1/2$ | 195, 168  |
| B III   | 758.673    | 200       |           | $1s^2 2p - 1s^2 3s$ | $^2P^o - ^2S$ | $3/2 - 1/2$ | 195, 168  |

B IV

BORON, Z = 5

B IV

Ground state  $1s^2\ ^1S_0$

Ionization potential 2 091 960  $\text{cm}^{-1}$ ; 259.36 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term          | J - J | Reference   |
|---------|------------|-----------|-----------|---------------|---------------|-------|-------------|
| B IV    | 48.939     |           |           | $1s^2 - 1s6p$ | $^2P^{\circ}$ | 0-1   | 764         |
| B IV    | 49.456     |           |           | $1s^2 - 1s5p$ | $^2P^{\circ}$ | 0-1   | 764,765     |
| B IV    | 50.435     | 100       |           | $1s^2 - 1s4p$ | $^2P^{\circ}$ | 0-1   | 197,764,765 |
| B IV    | 52.682     | 330       |           | $1s^2 - 1s3p$ | $^2P^{\circ}$ | 0-1   | 197,168,764 |
| B IV    | 60.313     | 1000      |           | $1s^2 - 1s2p$ | $^2P^{\circ}$ | 0-1   | 197,168,764 |
| B IV    | 61.088     |           |           | $1s^2 - 1s2p$ | $^2P^{\circ}$ | 0-1   | 764         |

B V

## BORON, Z = 5

B V

Ground state  $1s^2 S_{1/2}$ Ionization potential  $2\,744\,107.6\text{ cm}^{-1}$ ;  $340.217\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J   | Reference |
|---------|------------|-----------|-----------|---------------|----------------|---------|-----------|
| B V     | 37.483     | P         |           | $1s - 6p$     | $R^2S - ^2P^o$ | $1/2 -$ | 309       |
| B V     | 37.960     | P         |           | $1s - 5p$     | $R^2S - ^2P^o$ | $1/2 -$ | 309       |
| B V     | 38.871     | P         |           | $1s - 4p$     | $R^2S - ^2P^o$ | $1/2 -$ | 309,168   |
| B V     | 40.996     | P         |           | $1s - 3p$     | $R^2S - ^2P^o$ | $1/2 -$ | 309,168   |
| B V     | 48.587     | 1000P     |           | $1s - 2p$     | $R^2S - ^2P^o$ | $1/2 -$ | 309,197   |
| B V     | 158.73     | P         |           | $2 - 7$       |                |         | 309       |
| B V     | 163.99     | P         |           | $2 - 6$       |                |         | 309       |
| B V     | 173.54     | P         |           | $2 - 5$       |                |         | 309       |
| B V     | 194.36     | P         |           | $2 - 4$       |                |         | 309       |
| B V     | 262.37     | P         |           | $2 - 3$       |                |         | 309       |
| B V     | 381.70     | P         |           | $3 - 8$       |                |         | 309       |
| B V     | 401.83     | P         |           | $3 - 7$       |                |         | 309       |
| B V     | 437.36     | P         |           | $3 - 6$       |                |         | 309       |
| B V     | 512.53     | P         |           | $3 - 5$       |                |         | 309       |
| B V     | 726.73     | P         |           | $4 - 9$       |                |         | 309       |
| B V     | 749.74     | P         |           | $3 - 4$       |                |         | 309       |
| B V     | 777.57     | P         |           | $4 - 8$       |                |         | 309       |
| B V     | 865.93     | P         |           | $4 - 7$       |                |         | 309       |
| B V     | 1049.72    | P         |           | $4 - 6$       |                |         | 309       |
| B V     | 1214.99    | P         |           | $5 - 10$      |                |         | 309       |
| B V     | 1318.05    | P         |           | $5 - 9$       |                |         | 309       |
| B V     | 1495.38    | P         |           | $5 - 8$       |                |         | 309       |
| B V     | 1619.92    | P         |           | $4 - 5$       |                |         | 309       |
| B V     | 1860.46    | P         |           | $5 - 7$       |                |         | 309       |

C

## CARBON, Z = 6

C

Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| C?      | 289.048    | 300       |           |               |      |       | 170       |
| C?      | 414.592    | 10        |           |               |      |       | 170       |
| C?      | 1121.19    | 20        |           |               |      |       | 816       |
| C?      | 1298.14    | 100       |           |               |      |       | 816       |
| C?      | 1324.14    | 150       |           |               |      |       | 816       |
| C?      | 1324.22    | 200       |           |               |      |       | 816       |
| C?      | 1324.60    | 10        |           |               |      |       | 816       |
| C?      | 1422.57    | 10        |           |               |      |       | 816       |
| C?      | 1721.3     | 5         |           |               |      |       | 816       |
| C?      | 1722.0     | 5         |           |               |      |       | 816       |
| C?      | 1761.2     | 100       |           |               |      |       | 816       |
| C?      | 1829.85    | 1         |           |               |      |       | 816       |
| C?      | 1833.26    | 1         |           |               |      |       | 816       |
| C?      | 1853.2     | 1         |           |               |      |       | 816       |
| C?      | 1911.83    | 10        |           |               |      |       | 816       |
| C?      | 1912.75    | 10        |           |               |      |       | 816       |
| C?      | 1931.15    | 100       |           |               |      |       | 816       |
| C?      | 1990.53    | 10        |           |               |      |       | 816       |
| C?      | 1991.14    | 5         |           |               |      |       | 816       |

C I

## CARBON, Z = 6

C I

Ground state  $1s^2 2s^2 2p^2 \ ^3P_0$ Ionization potential 90 820.42 cm<sup>-1</sup>; 11.260 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term           | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------------|----------------|-------|-----------|
| C I     | 945.191    | 20        | 31        | $2s^2 2p^2 - 2s 2p^3$           | $R^3P - ^3S^o$ | 0-1   | 821.168   |
| C I     | 945.338    | 50        | 31        | $2s^2 2p^2 - 2s 2p^3$           | $R^3P - ^3S^o$ | 1-1   | 821.168   |
| C I     | 945.579    | 75        | 31        | $2s^2 2p^2 - 2s 2p^3$           | $R^3P - ^3S^o$ | 2-1   | 821.168   |
| C I     | 1112.058   | 10        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)11d$ | $R^3P - ^3D^o$ | 2-3   | 821.168   |
| C I     | 1114.457   | 50        | 30        | $2s^2 2p^2 - 2s^2 2p(^3P^o)10d$ | $R^3P - ^3D^o$ | 2-3   | 821.168   |
| C I     | 1117.581   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)9d$  | $R^3P - ^3P^o$ | 2-2   | 821.816   |
| C I     | 1117.724   | 50        | 29        | $2s^2 2p^2 - 2s^2 2p(^3P^o)9d$  | $R^3P - ^3D^o$ | 2-3   | 821.816   |
| C I     | 1118.180   | 50        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)9d$  | $R^3P - ^3F^o$ | 1-2   | 821.168   |
| C I     | 1122.098   | 20        | 28        | $2s^2 2p^2 - 2s^2 2p(^3P^o)8d$  | $R^3P - ^3P^o$ | 2-2   | 821.168   |
| C I     | 1122.260   | 50        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)9s$  | $R^3P - ^1P^o$ | 2-1   | 821.816   |
| C I     | 1122.328   | 100       | 27        | $2s^2 2p^2 - 2s^2 2p(^3P^o)8d$  | $R^3P - ^3D^o$ | 2-3   | 821.816   |
| C I     | 1122.447   | 20        | 27        | $2s^2 2p^2 - 2s^2 2p(^3P^o)8d$  | $R^3P - ^3D^o$ | 0-1   | 821.816   |
| C I     | 1122.725   | 50        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7s$  | $R^3P - ^3P^o$ | 1-1   | 821.816   |
| C I     | 1122.794   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)8d$  | $R^3P - ^3F^o$ | 1-2   | 821.168   |
| C I     | 1123.107   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)8d$  | $R^3P - ^3F^o$ | 2-3   | 821.816   |
| C I     | 1128.252   | 50        | 26        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3P^o$ | 1-0   | 821.816   |
| C I     | 1128.686   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)8s$  | $R^3P - ^1P^o$ | 1-1   | 821.816   |
| C I     | 1128.752   | 100       | 26        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3P^o$ | 2-2   | 821.816   |
| C I     | 1128.903   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^1F^o$ | 2-3   | 821.816   |
| C I     | 1129.030   | 100       |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)8s$  | $R^3P - ^1P^o$ | 2-1   | 821.816   |
| C I     | 1129.135   | 200       | 25        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3D^o$ | 2-3   | 821.816   |
| C I     | 1129.161   | P         | 25        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3D^o$ | 2-2   | 821       |
| C I     | 1129.196   | P         | 25        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3D^o$ | 0-1   | 821       |
| C I     | 1129.405   | 20        | 25        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3D^o$ | 1-1   | 821.816   |
| C I     | 1129.624   | 50        | 24        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3F^o$ | 1-2   | 821.816   |
| C I     | 1129.749   | 20        | 25        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3D^o$ | 2-1   | 821.816   |
| C I     | 1129.924   | 50        | 24        | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^3F^o$ | 2-3   | 821.816   |
| C I     | 1130.171   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7d$  | $R^3P - ^1D^o$ | 1-2   | 821.816   |
| C I     | 1138.383   | 20        | 23        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3P^o$ | 0-1   | 821.816   |
| C I     | 1138.557   | 30        | 23        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3P^o$ | 1-0   | 821.816   |
| C I     | 1138.595   | 20        | 23        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3P^o$ | 1-1   | 821.816   |
| C I     | 1138.946   | 50        | 23        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3P^o$ | 2-1   | 821.816   |
| C I     | 1139.093   | 100       | 23        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3P^o$ | 2-2   | 821.816   |
| C I     | 1139.300   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7s$  | $R^3P - ^1P^o$ | 1-1   | 821.816   |
| C I     | 1139.426   | 50        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^1F^o$ | 2-3   | 821.816   |
| C I     | 1139.514   | 20        | 22        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3D^o$ | 1-2   | 821.816   |
| C I     | 1139.650   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7s$  | $R^3P - ^1P^o$ | 2-1   | 821.816   |
| C I     | 1139.766   | 150       |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7s$  | $R^3P - ^3P^o$ | 1-2   | 821.816   |
| C I     | 1139.812   | 150       | 22        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3D^o$ | 2-3   | 821.816   |
| C I     | 1139.865   | 50        | 22        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3D^o$ | 2-2   | 821.816   |
| C I     | 1140.005   | 50        | 22        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3D^o$ | 1-1   | 821.816   |
| C I     | 1140.223   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7s$  | $R^3P - ^3P^o$ | 1-1   | 821.816   |
| C I     | 1140.357   | 100       | 21        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3F^o$ | 1-2   | 821.816   |
| C I     | 1140.574   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)7s$  | $R^3P - ^3P^o$ | 2-1   | 821.816   |
| C I     | 1140.641   | 150       | 21        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^3F^o$ | 2-3   | 821.816   |
| C I     | 1141.327   | 20        | 20        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^1D^o$ | 1-2   | 821.816   |
| C I     | 1141.678   | 20        | 20        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6d$  | $R^3P - ^1D^o$ | 2-2   | 821.816   |
| C I     | 1155.809   | 50        | 19        | $2s^2 2p^2 - 2s^2 2p(^3P^o)5d$  | $R^3P - ^3P^o$ | 0-1   | 821.816   |
| C I     | 1156.028   | 150       | 19        | $2s^2 2p^2 - 2s^2 2p(^3P^o)5d$  | $R^3P - ^3P^o$ | 1-1   | 821.816   |
| C I     | 1156.199   | 20        | 19        | $2s^2 2p^2 - 2s^2 2p(^3P^o)5d$  | $R^3P - ^3P^o$ | 1-2   | 821.816   |
| C I     | 1156.389   | 100       | 19        | $2s^2 2p^2 - 2s^2 2p(^3P^o)5d$  | $R^3P - ^3P^o$ | 2-1   | 821.816   |
| C I     | 1156.560   | 200       | 19        | $2s^2 2p^2 - 2s^2 2p(^3P^o)5d$  | $R^3P - ^3P^o$ | 2-2   | 821.816   |
| C I     | 1156.765   | 20        |           | $2s^2 2p^2 - 2s^2 2p(^3P^o)5d$  | $R^3P - ^1P^o$ | 2-1   | 821.816   |
| C I     | 1157.186   | 20        | 17        | $2s^2 2p^2 - 2s^2 2p(^3P^o)6s$  | $R^3P - ^1P^o$ | 0-1   | 821.816   |
| C I     | 1157.330   | 50        | 18        | $2s^2 2p^2 - 2s^2 2p(^3P^o)5d$  | $R^3P - ^1F^o$ | 2-3   | 821.816   |



| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term          | J-J | Reference |
|---------|------------|-----------|-----------|-------------------------------|---------------|-----|-----------|
| C I     | 1157.405   | 150       | 17        | $2s^2 2p^2 - 2s^2 p(1P^o)6s$  | $g^3P - 1P^o$ | 1-1 | 821.816   |
| C I     | 1157.770   | 350       | 16        | $2s^2 2p^2 - 2s^2 p(1P^o)5d$  | $g^3P - 1D^o$ | 1-2 | 821.816   |
| C I     | 1157.910   | 730       | 16        | $2s^2 2p^2 - 2s^2 p(1P^o)5d$  | $g^3P - 1D^o$ | 0-1 | 821.816   |
| C I     | 1158.019   | 750       | 16        | $2s^2 2p^2 - 2s^2 p(1P^o)5d$  | $g^3P - 1D^o$ | 2-3 | 821.816   |
| C I     | 1158.132   | 400       | 16        | $2s^2 2p^2 - 2s^2 p(1P^o)5d$  | $g^3P - 1D^o$ | 2-2 | 821.816   |
| C I     | 1158.324   | 100       |           | $2s^2 2p^2 - 2s^2 p(1P^o)6s$  | $g^3P - 1P^o$ | 0-1 | 821.816   |
| C I     | 1158.397   | 100       |           | $2s^2 2p^2 - 2s^2 p(1P^o)6s$  | $g^3P - 1P^o$ | 2-2 | 821.816   |
| C I     | 1158.492   | 20        | 16        | $2s^2 2p^2 - 2s^2 p(1P^o)5d$  | $g^3P - 1D^o$ | 2-1 | 821.816   |
| C I     | 1158.674   | 100       |           | $2s^2 2p^2 - 2s^2 p(1P^o)6s$  | $g^3P - 1P^o$ | 1-0 | 821.816   |
| C I     | 1158.732   | 100       | 15        | $2s^2 2p^2 - 2s^2 p(1P^o)5d$  | $g^3P - 1F^o$ | 1-2 | 821.816   |
| C I     | 1158.907   | 50        |           | $2s^2 2p^2 - 2s^2 p(1P^o)6s$  | $g^3P - 1P^o$ | 2-1 | 821.816   |
| C I     | 1158.967   | 200       | 15        | $2s^2 2p^2 - 2s^2 p(1P^o)5d$  | $g^3P - 1F^o$ | 2-3 | 821.816   |
| C I     | 1188.833   | 200       | 14        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 0-1 | 821.816   |
| C I     | 1188.992   | 500       | 14        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 1-0 | 821.816   |
| C I     | 1189.065   | 200       | 14        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 1-1 | 821.816   |
| C I     | 1189.249   | 250       | 14        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 1-2 | 821.816   |
| C I     | 1189.447   | 500       | 14        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 2-1 | 821.816   |
| C I     | 1189.631   | 700       | 14        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 2-2 | 821.816   |
| C I     | 1190.021   | 35        |           | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 0-1 | 821.816   |
| C I     | 1190.253   | 35        |           | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1P^o$ | 1-1 | 821.816   |
| C I     | 1191.838   | 120       | 13        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1F^o$ | 2-3 | 821.816   |
| C I     | 1192.218   | 70        | 12        | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 0-1 | 821.816   |
| C I     | 1192.451   | 120       | 12        | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 1-1 | 821.816   |
| C I     | 1193.009   | 700       | 11        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1D^o$ | 1-2 | 821.816   |
| C I     | 1193.031   | 300       | 11        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1D^o$ | 0-1 | 821.816   |
| C I     | 1193.240   | 850       | 11        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1D^o$ | 2-3 | 821.816   |
| C I     | 1193.264   | 150       | 11        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1D^o$ | 1-1 | 821.816   |
| C I     | 1193.393   | 350       | 11        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1D^o$ | 2-2 | 821.816   |
| C I     | 1193.679   | 500       |           | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 1-2 | 821.816   |
| C I     | 1193.996   | 120       |           | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 0-1 | 821.816   |
| C I     | 1194.064   | 350       |           | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 2-2 | 821.816   |
| C I     | 1194.229   | 120       |           | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 1-1 | 821.816   |
| C I     | 1194.301   | 120       | 10        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1F^o$ | 1-2 | 821.816   |
| C I     | 1194.406   | 200       |           | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 1-0 | 821.816   |
| C I     | 1194.488   | 350       | 10        | $2s^2 2p^2 - 2s^2 p(1P^o)4d$  | $g^3P - 1F^o$ | 2-3 | 821.816   |
| C I     | 1194.615   | 250       |           | $2s^2 2p^2 - 2s^2 p(1P^o)5s$  | $g^3P - 1P^o$ | 2-1 | 821.816   |
| C I     | 1253.467   | 50        |           | $2s^2 2p^2 - 2s^2 p(1P^o)11d$ | $1D - 1F^o$   | 2-3 | 821.168   |
| C I     | 1253.541   | 100       |           | $2s^2 2p^2 - 2s^2 p(1P^o)11d$ | $1D - 1D^o$   | 2-2 | 821.168   |
| C I     | 1256.498   | 200       |           | $2s^2 2p^2 - 2s^2 p(1P^o)10d$ | $1D - 1F^o$   | 2-3 | 821.168   |
| C I     | 1260.613   | 200       | 59        | $2s^2 2p^2 - 2s^2 p(1P^o)9d$  | $1D - 1F^o$   | 2-3 | 821.168   |
| C I     | 1260.736   | 250       | 9         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1P^o$ | 0-1 | 821.816   |
| C I     | 1260.927   | 200       | 9         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1P^o$ | 1-0 | 821.816   |
| C I     | 1260.996   | 150       | 9         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1P^o$ | 1-1 | 821.816   |
| C I     | 1261.122   | 250       | 9         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1P^o$ | 1-2 | 821.816   |
| C I     | 1261.426   | 250       | 9         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1P^o$ | 2-1 | 821.816   |
| C I     | 1261.552   | 500       | 9         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1P^o$ | 2-2 | 821.816   |
| C I     | 1266.270   | 20        |           | $2s^2 2p^2 - 2s^2 p(1P^o)8d$  | $1D - 1P^o$   | 2-1 | 821.816   |
| C I     | 1266.419   | 100       | 58        | $2s^2 2p^2 - 2s^2 p(1P^o)8d$  | $1D - 1F^o$   | 2-3 | 821.816   |
| C I     | 1267.596   | 50        | 57        | $2s^2 2p^2 - 2s^2 p(1P^o)8d$  | $1D - 1F^o$   | 2-3 | 821.816   |
| C I     | 1274.109   | 50        | 8         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1F^o$ | 2-3 | 821.816   |
| C I     | 1274.756   | 20        | 56        | $2s^2 2p^2 - 2s^2 p(1P^o)7d$  | $1D - 1P^o$   | 2-1 | 821.816   |
| C I     | 1274.984   | 150       | 55        | $2s^2 2p^2 - 2s^2 p(1P^o)7d$  | $1D - 1F^o$   | 2-3 | 821.816   |
| C I     | 1276.287   | 50        |           | $2s^2 2p^2 - 2s^2 p(1P^o)7d$  | $1D - 1F^o$   | 2-3 | 821.816   |
| C I     | 1276.483   | 100       |           | $2s^2 2p^2 - 2s^2 p(1P^o)4s$  | $g^3P - 1P^o$ | 0-1 | 821.816   |
| C I     | 1276.750   | 200       |           | $2s^2 2p^2 - 2s^2 p(1P^o)4s$  | $g^3P - 1P^o$ | 1-1 | 821.816   |
| C I     | 1277.245   | 300       | 7         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1D^o$ | 0-1 | 821.816   |
| C I     | 1277.282   | 700       | 7         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1D^o$ | 1-2 | 821.816   |
| C I     | 1277.513   | 100       | 7         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1D^o$ | 1-1 | 821.816   |
| C I     | 1277.550   | 1000      | 7         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1D^o$ | 2-3 | 821.816   |
| C I     | 1277.723   | 250       | 7         | $2s^2 2p^2 - 2s^2 p(1P^o)3d$  | $g^3P - 1D^o$ | 2-2 | 821.816   |

| Element | Wavelength | Intensity | Multiplet | Configuration                        | Term              | J - J | Reference   |
|---------|------------|-----------|-----------|--------------------------------------|-------------------|-------|-------------|
| C I     | 1277.954   | 70        | 7         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^4P - {}^3D^o$ | 2-1   | 821.816     |
| C I     | 1279.056   | 100       | 6         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^4P - {}^3F^o$ | 1-2   | 821.816     |
| C I     | 1279.229   | 150       | 6         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^4P - {}^3F^o$ | 2-3   | 821.816     |
| C I     | 1279.498   | 70        | 6         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^4P - {}^3F^o$ | 2-2   | 821.816     |
| C I     | 1279.890   | 250       | 5         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^4P - {}^3P^o$ | 1-2   | 821.816     |
| C I     | 1280.135   | 200       | 5         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^4P - {}^3P^o$ | 0-1   | 821.816     |
| C I     | 1280.333   | 700       | 5         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^4P - {}^3P^o$ | 2-2   | 821.816     |
| C I     | 1280.404   | 75        | 5         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^4P - {}^3P^o$ | 1-1   | 821.816     |
| C I     | 1280.597   | 200       | 5         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^4P - {}^3P^o$ | 1-0   | 821.816     |
| C I     | 1280.847   | 250       | 5         | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^4P - {}^3P^o$ | 2-1   | 821.816     |
| C I     | 1288.037   | 200       | 54        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1D - {}^1P^o$ | 2-1   | 821.816     |
| C I     | 1288.422   | 500       | 53        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1D - {}^1F^o$ | 2-3   | 821.816     |
| C I     | 1288.710   | 100       | 52        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 7s$ | ${}^1D - {}^1P^o$ | 2-1   | 821.816     |
| C I     | 1288.917   | 100       |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1D - {}^3D^o$ | 2-3   | 821.816     |
| C I     | 1289.891   | 50        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 7s$ | ${}^1D - {}^3P^o$ | 2-1   | 821.816     |
| C I     | 1289.977   | 300       | 51        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1D - {}^3F^o$ | 2-3   | 821.816     |
| C I     | 1291.304   | 100       | 50        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1D - {}^1D^o$ | 2-2   | 821.816     |
| C I     | 1310.637   | 200       | 49        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1D - {}^1P^o$ | 2-1   | 821.816     |
| C I     | 1311.363   | 1000      | 48        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1D - {}^1F^o$ | 2-3   | 821.816     |
| C I     | 1311.924   | 200       | 47        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6s$ | ${}^1D - {}^1P^o$ | 2-1   | 821.816     |
| C I     | 1312.247   | 100       | 46        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1D - {}^3D^o$ | 2-3   | 821.816     |
| C I     | 1313.387   | 100       |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6s$ | ${}^1D - {}^3P^o$ | 2-1   | 821.816     |
| C I     | 1313.464   | 300       | 45        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1D - {}^3F^o$ | 2-3   | 821.816     |
| C I     | 1315.918   | 200       | 44        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1D - {}^1D^o$ | 2-2   | 821.816     |
| C I     | 1328.8332  | ST        | 4         | $2s^2 2p^2 - 2s^2 2p^2$              | ${}^4P - {}^3P^o$ | 0-1   | 308.816.821 |
| C I     | 1329.0863  | ST        | 4         | $2s^2 2p^2 - 2s^2 2p^2$              | ${}^4P - {}^3P^o$ | 1-0   | 308.816.821 |
| C I     | 1329.1001  | ST        | 4         | $2s^2 2p^2 - 2s^2 2p^2$              | ${}^4P - {}^3P^o$ | 1-2   | 308.816.821 |
| C I     | 1329.1230  | ST        | 4         | $2s^2 2p^2 - 2s^2 2p^2$              | ${}^4P - {}^3P^o$ | 1-1   | 308.816.821 |
| C I     | 1329.5775  | ST        | 4         | $2s^2 2p^2 - 2s^2 2p^2$              | ${}^4P - {}^3P^o$ | 2-2   | 308.816.821 |
| C I     | 1329.6005  | ST        | 4         | $2s^2 2p^2 - 2s^2 2p^2$              | ${}^4P - {}^3P^o$ | 2-1   | 308.816.821 |
| C I     | 1354.288   | 500       | 43        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4d$ | ${}^1D - {}^1P^o$ | 2-1   | 821.816     |
| C I     | 1355.844   | 750       | 42        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4d$ | ${}^1D - {}^1F^o$ | 2-3   | 821.816     |
| C I     | 1357.134   | 300       | 41        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5s$ | ${}^1D - {}^1P^o$ | 2-1   | 821.816     |
| C I     | 1357.659   | 100       |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4d$ | ${}^1D - {}^3D^o$ | 2-3   | 821.816     |
| C I     | 1359.275   | 200       | 40        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4d$ | ${}^1D - {}^3F^o$ | 2-3   | 821.816     |
| C I     | 1359.438   | 50        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5s$ | ${}^1D - {}^3P^o$ | 2-1   | 821.816     |
| C I     | 1364.164   | 600       | 39        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4d$ | ${}^1D - {}^1D^o$ | 2-2   | 821.816     |
| C I     | 1431.597   | 100       | 65        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3s$ | ${}^3S^o - {}^3P$ | 2-3   | 821.816     |
| C I     | 1432.105   | 75        | 65        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3s$ | ${}^3S^o - {}^3P$ | 2-2   | 821.668     |
| C I     | 1432.530   | 50        | 65        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3s$ | ${}^3S^o - {}^3P$ | 2-1   | 821.668     |
| C I     | 1459.0317  | 300       | 38        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^1D - {}^1P^o$ | 2-1   | 371.816.821 |
| C I     | 1463.3360  | 600       | 37        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^1D - {}^1F^o$ | 2-3   | 371.816.821 |
| C I     | 1467.402   | 350       | 36        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^1D - {}^1P^o$ | 2-1   | 821.816     |
| C I     | 1467.877   | 30        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^1D - {}^3D^o$ | 2-3   | 821.816     |
| C I     | 1468.410   | 100       |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^1D - {}^3D^o$ | 2-1   | 821.816     |
| C I     | 1470.094   | 100       | 35        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^1D - {}^3F^o$ | 2-3   | 821.816     |
| C I     | 1472.231   | 60        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 4s$ | ${}^1D - {}^3P^o$ | 2-1   | 821.816     |
| C I     | 1481.7635  | 450       | 34        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 3d$ | ${}^1D - {}^1D^o$ | 2-2   | 371.816.821 |
| C I     | 1492.738   | 60        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 7$  | ${}^1S - {}^1P^o$ | 0-1   | 821.816     |
| C I     | 1493.273   | 10        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 8s$ | ${}^1S - {}^1P^o$ | 0-1   | 821.816     |
| C I     | 1494.532   | 25        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 7d$ | ${}^1S - {}^3D^o$ | 0-1   | 821.816     |
| C I     | 1510.668   | 25        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1S - {}^3P^o$ | 0-1   | 821.816     |
| C I     | 1510.981   | 100       |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1S - {}^1P^o$ | 0-1   | 821.816     |
| C I     | 1511.907   | 25        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 7s$ | ${}^1S - {}^1P^o$ | 0-1   | 821.816     |
| C I     | 1513.150   | 50        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6d$ | ${}^1S - {}^3D^o$ | 0-1   | 821.816     |
| C I     | 1541.510   | 40        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1S - {}^3P^o$ | 0-1   | 821.816     |
| C I     | 1542.1766  | 160       | 64        | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1S - {}^1P^o$ | 0-1   | 371.816.821 |
| C I     | 1543.960   | 60        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 6s$ | ${}^1S - {}^1P^o$ | 0-1   | 821.816     |
| C I     | 1545.249   | 40        |           | $2s^2 2p^2 - 2s^2 2p^2 ({}^1P^o) 5d$ | ${}^1S - {}^3D^o$ | 0-1   | 821.816     |
| C I     | 1560.3095  | 250       | 3         | $2s^2 2p^2 - 2s^2 2p^2$              | ${}^4P - {}^3D^o$ | 0-1   | 371.796.821 |

C I

C I

| Element | Wavelength | Intensity | Multiplet | Configuration                        | Term                 | J - J | Reference   |
|---------|------------|-----------|-----------|--------------------------------------|----------------------|-------|-------------|
| C I     | 1560.6832  | 500       | 3         | $2s^2 2p^2 - 2s 2p^3$                | $g^3 P - ^4 D^\circ$ | 1-2   | 371.796.821 |
| C I     | 1560.7079  | 200       | 3         | $2s^2 2p^2 - 2s 2p^3$                | $g^3 P - ^3 D^\circ$ | 1-1   | 371.796.821 |
| C I     | 1561.3407  | 200       | 3         | $2s^2 2p^2 - 2s 2p^3$                | $g^3 P - ^4 D^\circ$ | 2-2   | 371.796.821 |
| C I     | 1561.367   | P         | 3         | $2s^2 2p^2 - 2s 2p^3$                | $g^3 P - ^3 D^\circ$ | 2-1   | 821         |
| C I     | 1561.4382  | 1000      | 3         | $2s^2 2p^2 - 2s 2p^3$                | $g^3 P - ^3 D^\circ$ | 2-3   | 371.796.821 |
| C I     | 1602.9715  | 200       | 63        | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 4d$ | $^1 S - ^1 P^\circ$  | 0-1   | 371.816.821 |
| C I     | 1606.960   | 50        |           | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 5s$ | $^1 S - ^1 P^\circ$  | 0-1   | 821.816     |
| C I     | 1608.438   | 70        |           | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 4d$ | $^1 S - ^3 D^\circ$  | 0-1   | 821.816     |
| C I     | 1656.2665  | 350       | 2         | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $g^3 P - ^3 P^\circ$ | 1-2   | 371.816.821 |
| C I     | 1656.9282  | 300       | 2         | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $g^3 P - ^1 P^\circ$ | 0-1   | 371.816.821 |
| C I     | 1657.0078  | 1000      | 2         | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $g^3 P - ^3 P^\circ$ | 2-2   | 371.816.821 |
| C I     | 1657.3797  | 300       | 2         | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $g^3 P - ^1 P^\circ$ | 1-1   | 371.816.821 |
| C I     | 1657.9070  | 300       | 2         | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $g^3 P - ^3 P^\circ$ | 1-0   | 371.816.821 |
| C I     | 1658.1222  | 350       | 2         | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $g^3 P - ^3 P^\circ$ | 2-1   | 371.816.821 |
| C I     | 1751.8277  | 800       | 62        | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3d$ | $^1 S - ^1 P^\circ$  | 0-1   | 371.816.821 |
| C I     | 1763.909   | 120       |           | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 4s$ | $^1 S - ^1 P^\circ$  | 0-1   | 816.821     |
| C I     | 1765.366   | 50        |           | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3d$ | $^1 S - ^3 D^\circ$  | 0-1   | 816.821     |
| C I     | 1930.9054  | 1000      | 33        | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $^1 D - ^1 P^\circ$  | 2-1   | 371.816.821 |
| C I     | 1993.620   | 50        | 32        | $2s^2 2p^2 - 2s^2 2p(^3 P^\circ) 3s$ | $^1 D - ^3 P^\circ$  | 2-1   | 821.816     |

C II

## CARBON, Z = 6

C II

Ground state  $1s^2 2s^2 2p^2 \ ^3P^o_{1,1}$ Ionization potential  $196\,659.0\text{ cm}^{-1}$ ;  $24.382\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term           | J - J                     | Reference   |
|---------|------------|-----------|-----------|-------------------------------|----------------|---------------------------|-------------|
| C II    | 425.326    | 10        |           |                               |                |                           | 168         |
| C II    | 437.102    | 100d      |           |                               |                |                           | 168         |
| C II    | 438.824    | P         |           | $2s^2(^1S)2p - 2s2p(^1P^o)5p$ | $R^1P^o - ^1P$ | $\frac{1}{2}-\frac{1}{2}$ | 287         |
| C II    | 438.897    | 100P      |           | $2s^2(^1S)2p - 2s2p(^1P^o)5p$ | $R^1P^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 461.120    | 100d      |           | $2s^2(^1S)2p - 2s2p(^1P^o)4p$ | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 466.352    | 10P       |           | $2s^2(^1S)2p - 2s2p(^1P^o)4p$ | $R^1P^o - ^1P$ | $\frac{1}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 466.407    | 100P      |           | $2s^2(^1S)2p - 2s2p(^1P^o)4p$ | $R^1P^o - ^1P$ | $\frac{1}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 466.491    | 200P      |           | $2s^2(^1S)2p - 2s2p(^1P^o)4p$ | $R^1P^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 466.547    | 10P       |           | $2s^2(^1S)2p - 2s2p(^1P^o)4p$ | $R^1P^o - ^1P$ | $\frac{3}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 516.652    | 10d       |           | $2s2p^2 - 2s2p(^1P^o)6d$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 168,287     |
| C II    | 517.069    | 100d      |           | $2s2p^2 - 2s2p(^1P^o)6d$      | $^1P - ^1D^o$  | $\frac{3}{2}-\frac{3}{2}$ | 168,287     |
| C II    | 530.274    | 300P      |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$ | $R^1P^o - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 530.359    | 400P      |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$ | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 530.454    | P         |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$ | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 287         |
| C II    | 531.721    | 5P        |           | $2s2p^2 - 2s2p(^1P^o)5d$      | $^1P - ^1D^o$  | $\frac{1}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 531.742    | 5P        |           | $2s2p^2 - 2s2p(^1P^o)5d$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 531.917    | 100d      |           | $2s2p^2 - 2s2p(^1P^o)5d$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 532.659    | 100P      |           | $2s2p^2 - 2s2p(^1P^o)5d$      | $^1P - ^1D^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 532.705    | 200P      |           | $2s2p^2 - 2s2p(^1P^o)5d$      | $^1P - ^1D^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II?   | 533.935    | 100d      |           |                               |                |                           | 168         |
| C II    | 543.257    | 200d      |           | $2s^2 2p - 2s^2 6d$           | $R^1P^o - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 543.444    | 300d      |           | $2s^2 2p - 2s^2 6d$           | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 543.446    | 30P       |           | $2s^2 2p - 2s^2 6d$           | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 287         |
| C II    | 547.140    | P         |           | $2s2p^2 - 2s2p(^1P^o)5s$      | $^1P - ^1P^o$  | $\frac{1}{2}-\frac{3}{2}$ | 287         |
| C II    | 547.153    | 10        |           | $2s2p^2 - 2s2p(^1P^o)5s$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 547.277    | 5         |           | $2s2p^2 - 2s2p(^1P^o)5s$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 547.291    | 5         |           | $2s2p^2 - 2s2p(^1P^o)5s$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 549.3195   | ST        | 300       | $2s^2(^1S)2p - 2s2p(^1P^o)3p$ | $R^1P^o - ^1P$ | $\frac{1}{2}-\frac{3}{2}$ | 308,168,287 |
| C II    | 549.3785   | ST        | 400       | $2s^2(^1S)2p - 2s2p(^1P^o)3p$ | $R^1P^o - ^1P$ | $\frac{1}{2}-\frac{1}{2}$ | 308,168,287 |
| C II    | 549.5110   | ST        | 500       | $2s^2(^1S)2p - 2s2p(^1P^o)3p$ | $R^1P^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 308,168,287 |
| C II    | 549.5700   | ST        | 300       | $2s^2(^1S)2p - 2s2p(^1P^o)3p$ | $R^1P^o - ^1P$ | $\frac{3}{2}-\frac{1}{2}$ | 308,168,287 |
| C II    | 551.874    | 10        |           | $2s^2 2p - 2s^2 6s$           | $R^1P^o - ^1S$ | $\frac{3}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 560.2394   | ST        | 400       | $2s^2 2p - 2s^2 5d$           | $R^1P^o - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 308,168,287 |
| C II    | 560.4367   | ST        | 500       | $2s^2 2p - 2s^2 5d$           | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 308,306,287 |
| C II    | 560.4386   | ST        | 40        | $2s^2 2p - 2s^2 5d$           | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 308,287     |
| C II    | 562.338    | 150       |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1P^o$  | $\frac{1}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 562.367    | 150       |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 562.473    | 150       |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 562.497    | 150       |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 562.562    | 300       |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 564.565    | 40        |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1D^o$  | $\frac{1}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 564.582    | 40        |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1D^o$  | $\frac{1}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 564.608    | 100       |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1D^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 564.635    | 50        |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1D^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 564.663    | 200       |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1D^o$  | $\frac{3}{2}-\frac{1}{2}$ | 287,168     |
| C II    | 564.698    | 40        |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^1P - ^1D^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 576.8748   | 100       |           | $2s^2 2p - 2s^2 5s$           | $R^1P^o - ^1S$ | $\frac{1}{2}-\frac{1}{2}$ | 306,168,287 |
| C II    | 577.0859   | 200       |           | $2s^2 2p - 2s^2 5s$           | $R^1P^o - ^1S$ | $\frac{3}{2}-\frac{1}{2}$ | 306,168,287 |
| C II    | 594.8000   | ST        | 600       | $2s^2 2p - 2s^2 4d$           | $R^1P^o - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 308,197,287 |
| C II    | 595.0219   | ST        | 700       | $2s^2 2p - 2s^2 4d$           | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 308,197,287 |
| C II    | 595.0745   | ST        | 70        | $2s^2 2p - 2s^2 4d$           | $R^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 308,197,287 |
| C II    | 600.251    | 100       |           | $2s2p^2 - 2s2p(^1P^o)4s$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 600.337    | 100P      |           | $2s2p^2 - 2s2p(^1P^o)4s$      | $^1P - ^1P^o$  | $\frac{1}{2}-\frac{3}{2}$ | 287         |
| C II    | 600.353    | 300       |           | $2s2p^2 - 2s2p(^1P^o)4s$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{3}{2}$ | 287,168     |
| C II    | 600.503    | 100       |           | $2s2p^2 - 2s2p(^1P^o)4s$      | $^1P - ^1P^o$  | $\frac{3}{2}-\frac{1}{2}$ | 287,168     |

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term          | J - J                       | Reference   |
|---------|------------|-----------|-----------|-------------------------------|---------------|-----------------------------|-------------|
| C II    | 601.518    | 100       |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 635.9945   | 300       |           | $2s^22p - 2s^24s$             | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 308,168,287 |
| C II    | 636.2511   | 400       |           | $2s^22p - 2s^24s$             | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{3}{2}$ | 308,168,287 |
| C II    | 641.593    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 641.627    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 641.771    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 641.800    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 641.888    | 630       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 651.211    | 300       | 9         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 287,168,488 |
| C II    | 651.234    | 300       | 9         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{1}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 651.269    | 700       | 9         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168,488 |
| C II    | 651.304    | 300P      | 9         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287         |
| C II    | 651.345    | 800       | 9         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168,488 |
| C II    | 651.389    | 300P      | 9         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287         |
| C II    | 686.416    | 120       |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 686.488    | 80        |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 687.0526   | 560       | 5         | $2s^22p - 2s^23d$             | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 687.3453   | 1000      | 5         | $2s^22p - 2s^23d$             | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 687.3521   | 110       | 5         | $2s^22p - 2s^23d$             | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 794.964    | 10        |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| C II    | 795.134    | 110       |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| C II    | 799.660    | 509       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 799.928    | 25P       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287         |
| C II    | 799.944    | 350       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 806.384    | 500       | 8         | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168,488 |
| C II    | 806.533    | 200       | 8         | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 287,168,488 |
| C II    | 806.568    | 500       | 8         | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 806.676    | 250       | 8         | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168,488 |
| C II    | 806.686    | 150       | 8         | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 806.830    | 300       | 8         | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 287,168,488 |
| C II    | 806.860    | 300       | 8         | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168,488 |
| C II    | 809.677    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 809.693    | 30P       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 809.747    | 30P       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 809.764    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 858.0918   | 500       | 4         | $2s^22p - 2s^23s$             | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 308,197,287 |
| C II    | 858.5590   | 900       | 4         | $2s^22p - 2s^23s$             | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 308,197,287 |
| C II    | 903.6235   | 200       | 3         | $2s^22p - 2s2p^2$             | $^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 903.9616   | 400       | 3         | $2s^22p - 2s2p^2$             | $^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,197,287 |
| C II    | 904.1416   | 1000      | 3         | $2s^22p - 2s2p^2$             | $^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 904.4801   | 200       | 3         | $2s^22p - 2s2p^2$             | $^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 308,197,287 |
| C II    | 945.977    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 946.198    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 1009.862   | 400       | 7         | $2s2p^2 - 1s^22p^2$           | $^1P - ^1S^o$ | $\frac{1}{2} - \frac{3}{2}$ | 197,287,488 |
| C II    | 1010.092   | 600       | 7         | $2s2p^2 - 1s^22p^2$           | $^1P - ^1S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 197,287,488 |
| C II    | 1010.374   | 1000      | 7         | $2s2p^2 - 1s^22p^2$           | $^1P - ^1S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 197,287,488 |
| C II    | 1036.3367  | 500       | 2         | $2s^22p - 2s2p^2$             | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 308,197,287 |
| C II    | 1037.0182  | 1000      | 2         | $2s^22p - 2s2p^2$             | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 308,197,287 |
| C II    | 1063.285   | 5         |           | $2s2p^2 - 2s^24f$             | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 1063.313   | 5         |           | $2s2p^2 - 2s^24f$             | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 1065.8913  | 700       | 12        | $2s2p^2 - 1s^22p^2$           | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 1065.9199  | 100       | 12        | $2s2p^2 - 1s^22p^2$           | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 1066.1332  | 500       | 12        | $2s2p^2 - 1s^22p^2$           | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 308,197,287 |
| C II    | 1091.937   | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 1092.232   | 10        |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 1092.431   | 10        |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 1092.726   | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II?   | 1134.08    | 50        |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 816,375     |
| C II?   | 1134.52    | 20        |           | $2s^2(^1S)3d - 2s2p(^3P^o)6s$ | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 816,375     |
| C II    | 1138.9358  | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 308,168,287 |

C II

C II

| Element | Wavelength   | Intensity | Multiplet | Configuration                 | Term          | J - J                       | Reference   |
|---------|--------------|-----------|-----------|-------------------------------|---------------|-----------------------------|-------------|
| C II    | 1139.3317 ST | 300       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,168,287 |
| C II    | 1139.4730 ST | 10        |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^3P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,168,287 |
| C II    | 1141.6246 ST | 300       |           | $2s2p^2 - 2s^24p$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,168,287 |
| C II    | 1141.6574 ST | 30P       |           | $2s2p^2 - 2s^24p$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,287     |
| C II    | 1141.7445 ST | 200       |           | $2s2p^2 - 2s^24p$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,168,287 |
| C II    | 1323.8617 ST | 30        | 11        | $2s2p^2 - 1s^22p^3$           | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,287,197 |
| C II    | 1323.9059 ST | 300       | 11        | $2s2p^2 - 1s^22p^3$           | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,287,197 |
| C II    | 1323.9513 ST | 450       | 11        | $2s2p^2 - 1s^22p^3$           | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,287,197 |
| C II    | 1323.9955 ST | 30        | 11        | $2s2p^2 - 1s^22p^3$           | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,287,197 |
| C II    | 1334.5323 ST | 600       | 1         | $2s^22p - 2s2p^2$             | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 308,488,287 |
| C II    | 1335.6627 ST | 100       | 1         | $2s^22p - 2s2p^2$             | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,488,287 |
| C II    | 1335.7077 ST | 1000      | 1         | $2s^22p - 2s2p^2$             | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,488,287 |
| C II    | 1720.456     | 10        |           | $2s2p^2 - 1s^22p^3$           | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 1721.012     | 100       |           | $2s2p^2 - 1s^22p^3$           | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 1721.682     | 200       |           | $2s2p^2 - 1s^22p^3$           | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 287,168     |
| C II    | 1722.238     | 10        |           | $2s2p^2 - 1s^22p^3$           | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 1760.3954 ST | 450       | 10        | $2s2p^2 - 2s^23p$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,488,287 |
| C II    | 1760.4735 ST | 100       | 10        | $2s2p^2 - 2s^23p$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 308,197,287 |
| C II    | 1760.8191 ST | 300       | 10        | $2s2p^2 - 2s^23p$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 308,488,287 |
| C II?   | 1928.30      | 10        |           | $2s2p^2 - 2s^24p$             | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 816,375     |
| C II    | 1987.33      | 40        |           | $2s^2(^1S)3p - 2s2p(^1P^o)3p$ | $^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 287         |
| C II    | 1987.76      | 120       |           | $2s^2(^1S)3p - 2s2p(^1P^o)3p$ | $^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 287         |
| C II    | 1988.09      | 80        |           | $2s^2(^1S)3p - 2s2p(^1P^o)3p$ | $^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 287,168     |
| C II    | 1988.51      | 40        |           | $2s^2(^1S)3p - 2s2p(^1P^o)3p$ | $^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 287         |

C III

CARBON, Z = 6

C III

Ground state  $1s^2 2s^1 2p^1 {}^1S_0$ Ionization potential  $386\,213.9\text{ cm}^{-1}$ ;  $47.883\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term          | J-J | Reference   |
|---------|------------|-----------|-----------|-------------------------------|---------------|-----|-------------|
| C III   | 265.029    | 10d       |           | $2s(2S)2p - 1s^2 2p(2P^o)7p$  | $3P^o - 1P$   | 2-2 | 168.034     |
| C III   | 265.287    | 10d       |           | $2s(2S)2p - 1s^2 2p(2P^o)7p$  | $3P^o - 3D$   | 2-3 | 168.034     |
| C III   | 270.324    | 10d       |           | $2s^2 - 2s8p$                 | $g^1S - 1P^o$ | 0-1 | 168.034     |
| C III   | 270.583    | 100d      |           | $2s(2S)2p - 1s^2 2p(2P^o)6p$  | $3P^o - 1P$   | 2-2 | 168.034     |
| C III   | 271.014    | 100d      |           | $2s(2S)2p - 1s^2 2p(2P^o)6p$  | $3P^o - 3D$   | 2-3 | 168.034     |
| C III   | 274.051    | 200d      |           | $2s^2 - 2s7p$                 | $g^1S - 1P^o$ | 0-1 | 168.034     |
| C III   | 280.043    | 300       |           | $2s^2 - 2s6p$                 | $g^1S - 1P^o$ | 0-1 | 168.034     |
| C III   | 280.522    | 200d      |           | $2s(2S)2p - 1s^2 2p(2P^o)5p$  | $3P^o - 1P$   | 2-2 | 168.034     |
| C III   | 281.390    | 200       |           | $2s(2S)2p - 1s^2 2p(2P^o)5p$  | $3P^o - 3D$   | 2-3 | 168.034     |
| C III   | 288.415    | 10        |           | $2s^2 - 1s^2 2p(2P^o)3d$      | $g^1S - 1P^o$ | 0-1 | 170.034     |
| C III   | 291.3261   | 500       |           | $2s^2 - 2s5p$                 | $g^1S - 1P^o$ | 0-1 | 197.168.034 |
| C III   | 301.206    | 200       |           | $2s(2S)2p - 1s^2 2p(2P^o)4p$  | $3P^o - 1P$   | 0-1 | 168.034     |
| C III   | 301.243    | 300       |           | $2s(2S)2p - 1s^2 2p(2P^o)4p$  | $3P^o - 3P$   | 2-2 | 168.034     |
| C III   | 301.279    | 100       |           | $2s(2S)2p - 1s^2 2p(2P^o)4p$  | $3P^o - 1P$   | 2-1 | 168.034     |
| C III   | 303.432    | 400d      |           | $2s(2S)2p - 1s^2 2p(2P^o)4p$  | $3P^o - 3D$   | 2-3 | 168.034     |
| C III   | 303.468    | 100       |           | $2s(2S)2p - 1s^2 2p(2P^o)4p$  | $3P^o - 3D$   | 2-2 | 168.034     |
| C III   | 310.1697   | 700       | 3         | $2s^2 - 2s4p$                 | $g^1S - 1P^o$ | 0-1 | 197.168.034 |
| C III   | 311.157    | 10d       |           | $2s2p - 2s9d$                 | $3P^o - 3D$   | 2-  | 168.034     |
| C III   | 314.395    | 100d      |           | $2s2p - 2s8d$                 | $3P^o - 3D$   |     | 168.034     |
| C III   | 319.266    | 300d      |           | $2s2p - 2s7d$                 | $3P^o - 3D$   |     | 168.034     |
| C III   | 321.372    | 10d       |           | $2s2p - 2s7s$                 | $3P^o - 3S$   | 2-1 | 168.034     |
| C III   | 322.5741   | 800       |           | $2s^2 - 1s^2 2p(2P^o)3s$      | $g^1S - 1P^o$ | 0-1 | 197.168.034 |
| C III   | 325.570    | 100d      |           | $2s(2S)2p - 1s^2 2p(2P^o)5p$  | $1P^o - 1D$   | 1-2 | 168.034     |
| C III   | 327.112    | 400d      |           | $2s2p - 2s6d$                 | $3P^o - 3D$   | 1-2 | 168         |
| C III   | 327.176    | 400d      |           | $2s2p - 2s6d$                 | $3P^o - 3D$   | 2-3 | 168.034     |
| C III   | 327.784    | 100       |           | $2s(2S)2p - 1s^2 2p(2P^o)5p$  | $1P^o - 1P$   | 1-1 | 168.034     |
| C III   | 330.637    | 100       |           | $2s2p - 2s6s$                 | $3P^o - 3S$   | 1-1 | 168.034     |
| C III   | 330.687    | 100       |           | $2s2p - 2s6s$                 | $3P^o - 3S$   | 2-1 | 168.034     |
| C III?  | 339.773    | 100       |           |                               |               |     | 168         |
| C III   | 341.143    | 500       |           | $2s2p - 2s5d$                 | $3P^o - 3D$   | 0-1 | 168.034     |
| C III   | 341.179    | 600       |           | $2s^2 p - 2s5d$               | $3P^o - 3D$   | 1-2 | 168.034     |
| C III   | 341.242    | 700       |           | $2s2p - 2s5d$                 | $3P^o - 3D$   | 2-3 | 168.034     |
| C III   | 347.777    | 300       |           | $2s2p - 2s5s$                 | $3P^o - 3S$   | 1-1 | 168.034     |
| C III   | 347.854    | 300       |           | $2s2p - 2s5s$                 | $3P^o - 3S$   | 2-1 | 168.034     |
| C III   | 350.132    | 10d       |           | $1s^2 2p^2 - 1s^2 2p(2P^o)6d$ | $3P - 3P^o$   | 2-2 | 168.034     |
| C III   | 350.330    | 200d      |           | $1s^2 2p^2 - 1s^2 2p(2P^o)6d$ | $3P - 3D^o$   | 2-3 | 168.034     |
| C III   | 353.000    | 300d      |           | $2s(2S)2p - 1s^2 2p(2P^o)4p$  | $1P^o - 1D$   | 1-2 | 168.034     |
| C III   | 358.740    | 400       |           | $2s(2S)2p - 1s^2 2p(2P^o)4p$  | $1P^o - 1P$   | 1-1 | 168.034     |
| C III   | 360.557    | 600       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 3P$   | 1-2 | 168.034     |
| C III   | 360.623    | 700       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 3P$   | 2-2 | 168.034     |
| C III   | 360.675    | 500       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 3P$   | 2-1 | 168.034     |
| C III   | 363.7538   | 400       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 3S$   | 0-1 | 034.168     |
| C III   | 363.7852   | 500       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 3S$   | 1-1 | 034.168     |
| C III   | 363.8598   | 600       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 3S$   | 2-1 | 034.168     |
| C III   | 365.778    | 100d      |           | $1s^2 2p^2 - 1s^2 2p(2P^o)5d$ | $3P - 3P^o$   | 2-2 | 168.034     |
| C III   | 366.169    | 400d      |           | $1s^2 2p^2 - 1s^2 2p(2P^o)5d$ | $3P - 3D^o$   | 2-3 | 168.034     |
| C III   | 369.415    | 500       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 1D$   | 2-3 | 168.034     |
| C III   | 369.472    | 200       |           | $2s(2S)2p - 1s^2 2p(2P^o)3p$  | $3P^o - 3D$   | 2-2 | 168.034     |
| C III?  | 370.951    | 10d       |           |                               |               |     | 168         |
| C III   | 371.694    | 1000      | 7         | $2s2p - 2s4d$                 | $3P^o - 3D$   | 1-2 | 168.034     |
| C III   | 371.747    | 1000      | 7         | $2s2p - 2s4d$                 | $3P^o - 3D$   | 2-3 | 168.034     |
| C III   | 371.784    | 800       | 7         | $2s2p - 2s4d$                 | $3P^o - 3D$   | 2-2 | 168.034     |
| C III   | 379.065    | 100       |           | $1s^2 2p^2 - 1s^2 2p(2P^o)5d$ | $1D - 1D^o$   | 2-2 | 168.034     |
| C III   | 379.254    | 10d       |           | $2s2p - 2s7d$                 | $1P^o - 1D$   | 1-2 | 168.034     |
| C III   | 386.2028   | 850       | 2         | $2s^2 - 2s3p$                 | $g^1S - 1P^o$ | 0-1 | 197.168.034 |

| Element | Wavelength | Intensity | Multiplet | Configuration                                                                         | Term          | J - J | Reference   |
|---------|------------|-----------|-----------|---------------------------------------------------------------------------------------|---------------|-------|-------------|
| C III   | 388.9687   | 500       |           | 2s2p - 2s4s                                                                           | $^3P^o - ^3S$ | 0-1   | 197,168,034 |
| C III   | 389.0045   | 600       |           | 2s2p - 2s4s                                                                           | $^3P^o - ^3S$ | 1-1   | 197,168,034 |
| C III   | 389.0898   | 700       |           | 2s2p - 2s4s                                                                           | $^3P^o - ^3S$ | 2-1   | 197,168,034 |
| C III   | 390.055    | 300       |           | 2s2p - 2s6d                                                                           | $^1P^o - ^1D$ | 1-2   | 168,034     |
| C III?  | 398.168    | 10        |           |                                                                                       |               |       | 170         |
| C III?  | 398.551    | 10        |           |                                                                                       |               |       | 170         |
| C III   | 399.637    | 600d      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )4d | $^3P - ^3D^o$ | 1-2   | 168         |
| C III   | 399.688    | 600d      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )4d | $^3P - ^3D^o$ | 2-3   | 168,034     |
| C III?  | 409.204    | 10        |           |                                                                                       |               |       | 168         |
| C III   | 409.325    | 600       |           | 2s2p - 2s5d                                                                           | $^1P^o - ^1D$ | 1-2   | 168,034     |
| C III   | 411.697    | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )4d | $^1D - ^1F^o$ | 2-3   | 168,034     |
| C III   | 411.9577   | 300       |           | 2s( <sup>1</sup> S)2p - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3p           | $^1P^o - ^1S$ | 1-0   | 034,168     |
| C III   | 416.769    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )4d | $^1D - ^1D^o$ | 2-2   | 168,034     |
| C III   | 418.609    | 200d      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )4s | $^3P - ^3P^o$ | 2-2   | 168,034     |
| C III   | 433.3391   | 800       |           | 2s( <sup>1</sup> S)2p - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3p           | $^1P^o - ^1D$ | 1-2   | 034,168     |
| C III   | 450.7338   | 800       |           | 2s2p - 2s4d                                                                           | $^1P^o - ^1D$ | 1-2   | 197,168,034 |
| C III   | 459.462    | 900       | 6         | 2s2p - 2s3d                                                                           | $^3P^o - ^3D$ | 0-1   | 197,168,034 |
| C III   | 459.521    | 950       | 6         | 2s2p - 2s3d                                                                           | $^3P^o - ^3D$ | 1-2   | 197,168,034 |
| C III   | 459.633    | 1000      | 6         | 2s2p - 2s3d                                                                           | $^3P^o - ^3D$ | 2-3   | 197,168,034 |
| C III   | 460.0487   | 800       |           | 2s( <sup>1</sup> S)2p - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3p           | $^1P^o - ^1P$ | 1-1   | 197,168,034 |
| C III   | 468.931    | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s( <sup>1</sup> S)6f                               | $^1D - ^1F^o$ | 2-3   | 168,034     |
| C III   | 477.6246   | 300       |           | 2s2p - 2s4s                                                                           | $^1P^o - ^1S$ | 1-0   | 034,168     |
| C III   | 483.567    | 300       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s( <sup>1</sup> S)5p                               | $^3P - ^3P^o$ | 0-1   | 168,034     |
| C III   | 483.618    | 400       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s( <sup>1</sup> S)5p                               | $^3P - ^3P^o$ | 1-2   | 168,034     |
| C III   | 483.733    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s( <sup>1</sup> S)5p                               | $^3P - ^3P^o$ | 2-2   | 168,034     |
| C III   | 492.6500   | 700       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s( <sup>1</sup> S)5f                               | $^1D - ^1F^o$ | 2-3   | 197,168,034 |
| C III   | 493.341    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$ | 0-1   | 168,034     |
| C III   | 493.364    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$ | 1-0   | 168,034     |
| C III   | 493.396    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$ | 1-1   | 168,034     |
| C III   | 493.464    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$ | 1-2   | 168,034     |
| C III   | 493.519    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$ | 2-1   | 168,034     |
| C III   | 493.587    | 700       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$ | 2-2   | 168,034     |
| C III   | 497.910    | 100       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^1D - ^1P^o$ | 2-1   | 168,034     |
| C III   | 499.425    | 700       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$ | 0-1   | 168,034     |
| C III   | 499.462    | 800       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$ | 1-2   | 168,034     |
| C III   | 499.530    | 900       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$ | 2-3   | 168,034     |
| C III   | 499.583    | 700       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$ | 2-2   | 168,034     |
| C III   | 506.658    | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s5p                                                | $^1D - ^1P^o$ | 2-1   | 168,034     |
| C III   | 511.5225   | 1000      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^1D - ^1F^o$ | 2-3   | 197,168,034 |
| C III   | 535.2885   | 850       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^1D - ^1D^o$ | 2-2   | 197,168,034 |
| C III   | 538.0801   | 900       | 5         | 2s2p - 2s3s                                                                           | $^3P^o - ^3S$ | 0-1   | 197,168,034 |
| C III   | 538.1487   | 950       | 5         | 2s2p - 2s3s                                                                           | $^3P^o - ^3S$ | 1-1   | 197,168,034 |
| C III   | 538.3120   | 1000      | 5         | 2s2p - 2s3s                                                                           | $^3P^o - ^3S$ | 2-1   | 197,168,034 |
| C III   | 554.655    | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4p                                                | $^3P - ^3P^o$ | 2-2   | 168,034     |
| C III   | 565.5280   | 700       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4f                                                | $^1D - ^1F^o$ | 2-3   | 197,168,034 |
| C III   | 566.490    | 400       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4p                                                | $^1D - ^1P^o$ | 2-1   | 168,034     |
| C III   | 574.2809   | 1000      | 11        | 2s2p - 2s3d                                                                           | $^1P^o - ^1D$ | 1-2   | 197,168,034 |
| C III   | 585.261    | 600       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$ | 1-2   | 168,034     |
| C III   | 585.417    | 800       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$ | 2-2   | 168,034     |
| C III   | 585.496    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$ | 1-1   | 168,034     |
| C III   | 585.608    | 600       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$ | 1-0   | 168,034     |
| C III   | 585.666    | 600       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$ | 2-1   | 168,034     |
| C III   | 609.025    | 400       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3d | $^1S - ^1P^o$ | 0-1   | 168,034     |
| C III   | 609.275    | 600       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3s | $^1D - ^1P^o$ | 2-1   | 168,034     |
| C III   | 622.144    | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s5p                                                | $^1S - ^1P^o$ | 0-1   | 168,034     |
| C III   | 690.526    | 700       | 10        | 2s2p - 2s3s                                                                           | $^1P^o - ^1S$ | 1-0   | 168,034     |
| C III   | 714.879    | 100       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4p                                                | $^1S - ^1P^o$ | 0-1   | 168,034     |
| C III   | 784.393    | 300       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )3s | $^1S - ^1P^o$ | 0-1   | 168,034     |
| C III   | 884.516    | 800       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s3p                                                | $^1D - ^1P^o$ | 2-1   | 168,034     |
| C III   | 977.020    | 1000      | 1         | 2s <sup>2</sup> - 2s2p                                                                | $^3S - ^1P^o$ | 0-1   | 197,168,034 |



C III

C III

| Element | Wavelength | Intensity | Multiplet | Configuration                                                                                             | Term                | J - J | Reference   |
|---------|------------|-----------|-----------|-----------------------------------------------------------------------------------------------------------|---------------------|-------|-------------|
| C III   | 1165.698   | 10P       |           | 2s3p - 2s5d                                                                                               | $^3P^{\circ} - ^4D$ | 1-2   | 168.034     |
| C III   | 1165.870   | 100P      |           | 2s3p - 2s5d                                                                                               | $^3P^{\circ} - ^4D$ | 2-3   | 168.034     |
| C III   | 1174.933   | 350       | 4         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                                    | $^3P^{\circ} - ^3P$ | 1-2   | 197.034     |
| C III   | 1175.263   | 300       | 4         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                                    | $^3P^{\circ} - ^3P$ | 0-1   | 197.034     |
| C III   | 1175.590   | 200       | 4         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                                    | $^3P^{\circ} - ^3P$ | 1-1   | 197.034     |
| C III   | 1175.711   | 1000      | 4         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                                    | $^3P^{\circ} - ^3P$ | 2-2   | 197.034     |
| C III   | 1175.987   | 300       | 4         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                                    | $^3P^{\circ} - ^3P$ | 1-0   | 197.034     |
| C III   | 1176.370   | 350       | 4         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                                    | $^3P^{\circ} - ^3P$ | 2-1   | 197.034     |
| C III   | 1247.383   | 800       | 9         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                                    | $^1P^{\circ} - ^1S$ | 1-0   | 197.168.034 |
| C III   | 1255.52    | 100d      |           | 2s3s - 2s4p                                                                                               | $^3S - ^3P^{\circ}$ | 1-    | 168.034     |
| C III   | 1296.30    | 200d      |           | 2s3d - 2s5f                                                                                               | $^3D - ^3F^{\circ}$ |       | 168.034     |
| C III   | 1308.73    | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s3p                                                                    | $^1S - ^1P^{\circ}$ | 0-1   | 168         |
| C III   | 1426.16    | 10        |           | 2s3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                                                | $^3D - ^3P^{\circ}$ | -1    | 168         |
| C III   | 1426.45    | 400       |           | 2s( <sup>2</sup> S)3s - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s                               | $^3S - ^3P^{\circ}$ | 1-2   | 168.034     |
| C III   | 1426.78    | 100       |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^3D - ^3P^{\circ}$ | 3-2   | 168.034     |
| C III   | 1427.85    | 300       |           | 2s( <sup>2</sup> S)3s - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s                               | $^3S - ^3P^{\circ}$ | 1-1   | 168.034     |
| C III   | 1428.17    | 200       |           | 2s( <sup>2</sup> S)3p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p                               | $^3P^{\circ} - ^3P$ | 2-2   | 168.034     |
| C III   | 1428.53    | 200       |           | 2s( <sup>2</sup> S)3s - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s                               | $^3S - ^3P^{\circ}$ | 1-0   | 168.034     |
| C III   | 1428.66    | 10        |           | 2s( <sup>2</sup> S)3p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p                               | $^3P^{\circ} - ^3P$ | 1-1   | 168.034     |
| C III   | 1428.95    | 100       |           | 2s( <sup>2</sup> S)3p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p                               | $^3P^{\circ} - ^3P$ | 2-1   | 168.034     |
| C III   | 1429.08    | 10        |           | 2s( <sup>2</sup> S)3p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p                               | $^3P^{\circ} - ^3P$ | 1-0   | 168.034     |
| C III   | 1477.68    | 300       |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^3D - ^3D^{\circ}$ | 3-3   | 168.034     |
| C III   | 1478.05    | 200       |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^3D - ^3D^{\circ}$ | 2-2   | 168.034     |
| C III   | 1478.30    | 100       |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^3D - ^3D^{\circ}$ | 1-1   | 168.034     |
| C III   | 1531.85    | 200       |           | 2s3p - 2s4d                                                                                               | $^1P^{\circ} - ^1D$ | 1-2   | 168.034     |
| C III   | 1576.49    | 300       |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^3D - ^3F^{\circ}$ | 3-4   | 168.034     |
| C III   | 1577.32    | 200       |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^3D - ^3F^{\circ}$ | -3    | 168.034     |
| C III   | 1577.89    | 200       |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^3D - ^3F^{\circ}$ | -2    | 168.034     |
| C III   | 1591.48    | 200       |           | 2s( <sup>2</sup> S)3s - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s                               | $^1S - ^1P^{\circ}$ | 0-1   | 168.034     |
| C III   | 1620.05    | 300       |           | 2s3p - 2s4d                                                                                               | $^3P^{\circ} - ^3D$ | 2-3   | 168.034     |
| C III   | 1620.33    | 200       |           | 2s3p - 2s4d                                                                                               | $^3P^{\circ} - ^3D$ | 1-2   | 168.034     |
| C III   | 1620.59    | 10        |           | 2s3p - 2s4d                                                                                               | $^3P^{\circ} - ^3D$ | 0-1   | 168.034     |
| C III   | 1620.68    | 100       |           | 2s3p - 2s4d                                                                                               | $^3P^{\circ} - ^3D$ | 2-2   | 168.034     |
| C III   | 1645.06    | 100       |           | 2s( <sup>2</sup> S)3p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p                               | $^1P^{\circ} - ^1P$ | 1-1   | 168.034     |
| C III   | 1779.12    | 10        |           | 2s( <sup>2</sup> S)3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d                               | $^1D - ^1D^{\circ}$ | 2-2   | 168.034     |
| C III?  | 1894.49    | 200       |           |                                                                                                           |                     |       | 168         |
| C III   | 1922.93    | 300       |           | 2s3d - 2s4f                                                                                               | $^3D - ^3F^{\circ}$ | 3-4   | 034.168     |
| C III   | 1923.14    | 200       |           | 2s3d - 2s4f                                                                                               | $^3D - ^3F^{\circ}$ | 2-3   | 034.168     |
| C III   | 1923.31    | 200       |           | 2s3d - 2s4f                                                                                               | $^3D - ^3F^{\circ}$ | 1-2   | 034.168     |
| C III   | 1979.16    | 100       |           | 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )4f | $^3D^{\circ} - ^3F$ | 3-4   | 034         |
| C III   | 1979.62    | 50        |           | 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )4f | $^3D^{\circ} - ^3F$ |       | 034         |

C IV

## CARBON, Z = 6

C IV

Ground state  $1s^2 2s^1 2p^1$ Ionization potential  $520\,177.8\text{ cm}^{-1}$ ;  $64.492\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration        | Term           | J - J                     | Reference   |
|---------|------------|-----------|-----------|----------------------|----------------|---------------------------|-------------|
| C IV    | 197.82     | 10        |           | $1s^2 2s - 1s^2 11p$ | $K^2S - ^2P^o$ | $\frac{1}{2}-$            | 168         |
| C IV    | 199.04     | 10        |           | $1s^2 2s - 1s^2 10p$ | $K^2S - ^2P^o$ | $\frac{1}{2}-$            | 168         |
| C IV    | 200.68     | 10d       |           | $1s^2 2s - 1s^2 9p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-$            | 168         |
| C IV    | 203.057    | 100d      |           | $1s^2 2s - 1s^2 8p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-$            | 168         |
| C IV    | 206.641    | 300d      |           | $1s^2 2s - 1s^2 7p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-$            | 168         |
| C IV    | 212.421    | 500       | 5         | $1s^2 2s - 1s^2 6p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-$            | 168,488     |
| C IV    | 222.791    | 700       | 4         | $1s^2 2s - 1s^2 5p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-$            | 168,488     |
| C IV    | 228.27     | 10d       |           | $1s^2 2p - 1s^2 10d$ | $^2P^o - ^2D$  |                           | 168         |
| C IV    | 230.43     | 100d      |           | $1s^2 2p - 1s^2 9d$  | $^2P^o - ^2D$  |                           | 168         |
| C IV    | 233.53     | 200d      |           | $1s^2 2p - 1s^2 8d$  | $^2P^o - ^2D$  |                           | 168         |
| C IV    | 238.200    | 200d      |           | $1s^2 2p - 1s^2 7d$  | $^2P^o - ^2D$  | $\frac{1}{2}-\frac{3}{2}$ | 168         |
| C IV    | 238.250    | 300d      |           | $1s^2 2p - 1s^2 7d$  | $^2P^o - ^2D$  | $\frac{3}{2}-\frac{5}{2}$ | 168         |
| C IV    | 239.196    | 10        |           | $1s^2 2p - 1s^2 7s$  | $^2P^o - ^2S$  | $\frac{3}{2}-\frac{1}{2}$ | 168         |
| C IV    | 244.907    | 1000      | 3         | $1s^2 2s - 1s^2 4p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-\frac{3}{2}$ | 168,488     |
| C IV    | 245.775    | 400d      | 11        | $1s^2 2p - 1s^2 6d$  | $^2P^o - ^2D$  | $\frac{1}{2}-\frac{3}{2}$ | 168,488     |
| C IV    | 245.830    | 500d      | 11        | $1s^2 2p - 1s^2 6d$  | $^2P^o - ^2D$  | $\frac{3}{2}-\frac{5}{2}$ | 168,488     |
| C IV    | 247.357    | 10        |           | $1s^2 2p - 1s^2 6s$  | $^2P^o - ^2S$  | $\frac{1}{2}-\frac{1}{2}$ | 168         |
| C IV    | 247.415    | 100       |           | $1s^2 2p - 1s^2 6s$  | $^2P^o - ^2S$  | $\frac{3}{2}-\frac{1}{2}$ | 168         |
| C IV    | 259.471    | 600       | 10        | $1s^2 2p - 1s^2 5d$  | $^2P^o - ^2D$  | $\frac{1}{2}-\frac{3}{2}$ | 168,488     |
| C IV    | 259.542    | 700       | 10        | $1s^2 2p - 1s^2 5d$  | $^2P^o - ^2D$  | $\frac{3}{2}-\frac{5}{2}$ | 168,488     |
| C IV    | 262.553    | 300       |           | $1s^2 2p - 1s^2 5s$  | $^2P^o - ^2S$  | $\frac{1}{2}-\frac{1}{2}$ | 168         |
| C IV    | 262.624    | 400       |           | $1s^2 2p - 1s^2 5s$  | $^2P^o - ^2S$  | $\frac{3}{2}-\frac{1}{2}$ | 168         |
| C IV    | 289.143    | 900       | 9         | $1s^2 2p - 1s^2 4d$  | $^2P^o - ^2D$  | $\frac{1}{2}-\frac{3}{2}$ | 168,488     |
| C IV    | 289.230    | 1000      | 9         | $1s^2 2p - 1s^2 4d$  | $^2P^o - ^2D$  | $\frac{3}{2}-\frac{5}{2}$ | 168,488     |
| C IV    | 296.857    | 600       | 8         | $1s^2 2p - 1s^2 4s$  | $^2P^o - ^2S$  | $\frac{1}{2}-\frac{1}{2}$ | 168,488     |
| C IV    | 296.951    | 700       | 8         | $1s^2 2p - 1s^2 4s$  | $^2P^o - ^2S$  | $\frac{3}{2}-\frac{1}{2}$ | 168,488     |
| C IV    | 307.806    | 100f      |           | $1s^2 2s - 1s^2 3d$  | $K^2S - ^2D$   | $\frac{1}{2}-\frac{3}{2}$ | 168         |
| C IV    | 312.422    | 1000      | 2         | $1s^2 2s - 1s^2 3p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-\frac{3}{2}$ | 197,168,488 |
| C IV    | 312.453    | 950       | 2         | $1s^2 2s - 1s^2 3p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-\frac{1}{2}$ | 197,168,488 |
| C IV    | 384.032    | 950       | 7         | $1s^2 2p - 1s^2 3d$  | $^2P^o - ^2D$  | $\frac{1}{2}-\frac{3}{2}$ | 197,168,488 |
| C IV    | 384.178    | 1000      | 7         | $1s^2 2p - 1s^2 3d$  | $^2P^o - ^2D$  | $\frac{3}{2}-\frac{5}{2}$ | 197,168,488 |
| C IV    | 419.525    | 950       | 6         | $1s^2 2p - 1s^2 3s$  | $^2P^o - ^2S$  | $\frac{1}{2}-\frac{1}{2}$ | 197,168,488 |
| C IV    | 419.714    | 1000      | 6         | $1s^2 2p - 1s^2 3s$  | $^2P^o - ^2S$  | $\frac{3}{2}-\frac{1}{2}$ | 197,168,488 |
| C IV    | 770.379    | 10d       |           | $1s^2 3p - 1s^2 5d$  | $^2P^o - ^2D$  | $\frac{3}{2}-\frac{5}{2}$ | 168         |
| C IV    | 948.098    | 200       |           | $1s^2 3s - 1s^2 4p$  | $^2S - ^2P^o$  | $\frac{1}{2}-\frac{3}{2}$ | 168         |
| C IV    | 948.214    | 100       |           | $1s^2 3s - 1s^2 4p$  | $^2S - ^2P^o$  | $\frac{1}{2}-\frac{1}{2}$ | 168         |
| C IV    | 1107.600   | 300       |           | $1s^2 3p - 1s^2 4d$  | $^2P^o - ^2D$  | $\frac{1}{2}-\frac{3}{2}$ | 168         |
| C IV    | 1107.933   | 400       |           | $1s^2 3p - 1s^2 4d$  | $^2P^o - ^2D$  | $\frac{3}{2}-\frac{5}{2}$ | 168         |
| C IV    | 1168.873   | 300       |           | $1s^2 3d - 1s^2 4f$  | $^2D - ^2F^o$  | $\frac{3}{2}-\frac{5}{2}$ | 168         |
| C IV    | 1168.990   | 400       |           | $1s^2 3d - 1s^2 4f$  | $^2D - ^2F^o$  | $\frac{5}{2}-\frac{7}{2}$ | 168         |
| C IV    | 1198.58    | 100d      |           | $1s^2 3d - 1s^2 4p$  | $^2D - ^2P^o$  | $\frac{3}{2}-\frac{5}{2}$ | 168         |
| C IV    | 1230.046   | 200       |           | $1s^2 3p - 1s^2 4s$  | $^2P^o - ^2S$  | $\frac{1}{2}-\frac{1}{2}$ | 168         |
| C IV    | 1230.511   | 300       |           | $1s^2 3p - 1s^2 4s$  | $^2P^o - ^2S$  | $\frac{3}{2}-\frac{1}{2}$ | 168         |
| C IV    | 1548.195   | 1000      | 1         | $1s^2 2s - 1s^2 2p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-\frac{3}{2}$ | 168,488     |
| C IV    | 1550.768   | 950       | 1         | $1s^2 2s - 1s^2 2p$  | $K^2S - ^2P^o$ | $\frac{1}{2}-\frac{1}{2}$ | 168,488     |

CV

## CARBON, Z = 6

CV

Ground state  $1s^2 1S_0$ Ionization potential 3 162 450 cm<sup>-1</sup>; 392.08 eV

| Element | Wavelength | Intensity | Multiplet | Configuration  | Term          | J - J | Reference   |
|---------|------------|-----------|-----------|----------------|---------------|-------|-------------|
| C V     | 32.064     |           |           | $1s^2 - 1s8p$  | $g^1S - 1P^o$ | 0-1   | 765         |
| C V     | 32.188     |           |           | $1s^2 - 1s7p$  | $g^1S - 1P^o$ | 0-1   | 765         |
| C V     | 32.400     |           |           | $1s^2 - 1s6p$  | $g^1S - 1P^o$ | 0-1   | 764,765     |
| C V     | 32.754     |           |           | $1s^2 - 1s5p$  | $g^1S - 1P^o$ | 0-1   | 596,764,765 |
| C V     | 33.426     | 30        |           | $1s^2 - 1s4p$  | $g^1S - 1P^o$ | 0-1   | 197,764,765 |
| C V     | 34.973     | 100       |           | $1s^2 - 1s3p$  | $g^1S - 1P^o$ | 0-1   | 197,764,765 |
| C V     | 40.270     | 300       |           | $1s^2 - 1s2p$  | $g^1S - 1P^o$ | 0-1   | 197,764     |
| C V     | 40.731     | 15        |           | $1s^2 - 1s2p$  | $g^1S - 3P^o$ | 0-1   | 764         |
| C V     | 138.2      | P         |           | $1s2s - 1s10p$ | $3S - 3P^o$   |       | 262         |
| C V     | 139.5      | P         |           | $1s2s - 1s9p$  | $3S - 3P^o$   |       | 262         |
| C V     | 141.27     | P         |           | $1s2s - 1s8p$  | $3S - 3P^o$   |       | 262         |
| C V     | 143.94     |           |           | $1s2s - 1s7p$  | $3S - 3P^o$   |       | 262         |
| C V     | 147.1      | P         |           | $1s2p - 1s10d$ | $3P^o - 3D$   |       | 262         |
| C V     | 148.35     |           |           | $1s2s - 1s6p$  | $3S - 3P^o$   |       | 262         |
| C V     | 148.5      | P         |           | $1s2p - 1s9d$  | $3P^o - 3D$   |       | 262         |
| C V     | 150.51     | P         |           | $1s2p - 1s8d$  | $3P^o - 3D$   |       | 262         |
| C V     | 153.53     |           |           | $1s2p - 1s7d$  | $3P^o - 3D$   |       | 262         |
| C V     | 156.23     | b         |           | $1s2s - 1s5p$  | $3S - 3P^o$   |       | 262         |
| C V     | 157.2      | P         |           | $1s2p - 1s8d$  | $3P^o - 3D$   |       | 262         |
| C V     | 158.47     |           |           | $1s2p - 1s6d$  | $3P^o - 3D$   |       | 262         |
| C V     | 160.53     | P         |           | $1s2p - 1s7d$  | $3P^o - 3D$   |       | 262         |
| C V     | 165.91     | P         |           | $1s2p - 1s6d$  | $3P^o - 3D$   |       | 262         |
| C V     | 167.39     |           |           | $1s2p - 1s5d$  | $3P^o - 3D$   |       | 262         |
| C V     | 173.27     |           |           | $1s2s - 1s4p$  | $3S - 3P^o$   |       | 262         |
| C V     | 175.67     |           |           | $1s2p - 1s5d$  | $3P^o - 3D$   |       | 262         |
| C V     | 186.72     |           |           | $1s2p - 1s4d$  | $3P^o - 3D$   |       | 262         |
| C V     | 197.02     |           |           | $1s2p - 1s4d$  | $3P^o - 3D$   |       | 262         |
| C V     | 227.22     |           |           | $1s2s - 1s3p$  | $3S - 3P^o$   |       | 262         |
| C V     | 248.668    | 10        |           | $1s2p - 1s3d$  | $3P^o - 3D$   |       | 168,812     |
| C V     | 248.744    | 10        |           | $1s2p - 1s3d$  | $3P^o - 3D$   |       | 168,812     |
| C V     | 267.26     |           |           | $1s2p - 1s3d$  | $3P^o - 3D$   |       | 262         |

C VI

## CARBON, Z = 6

C VI

Ground state  $1s^2 S_{1/2}$ Ionization potential  $3\,952\,061\text{ cm}^{-1}$ ; 489.98 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J       | Reference   |
|---------|------------|-----------|-----------|---------------|----------------|-------------|-------------|
| C VI    | 26.026     | P         |           | $1s - 6p$     | $g^2S - ^4P^o$ | $1/2 -$     | 309         |
| C VI    | 26.357     | P         |           | $1s - 5p$     | $g^2S - ^4P^o$ | $1/2 -$     | 309         |
| C VI    | 26.990     | P         |           | $1s - 4p$     | $g^2S - ^4P^o$ | $1/2 -$     | 309,765     |
| C VI    | 28.466     | P         |           | $1s - 3p$     | $g^2S - ^4P^o$ | $1/2 -$     | 309,765     |
| C VI    | 33.736     | 1000P     |           | $1s - 2p$     | $g^2S - ^4P^o$ | $1/2 -$     | 309,197,765 |
| C VI    | 110.22     | P         |           | $2 - 7$       |                |             | 309         |
| C VI    | 113.87     | P         |           | $2 - 6$       |                |             | 309         |
| C VI    | 120.50     | P         |           | $2 - 5$       |                |             | 309         |
| C VI    | 134.95     | P         |           | $2 - 4$       |                |             | 309         |
| C VI    | 182.09     | P         |           | $2p - 3d$     | $^3P^o - ^3D$  | $1/2 - 3/2$ | 309         |
| C VI    | 182.23     | P         |           | $2p - 3d$     | $^3P^o - ^3D$  | $3/2 - 5/2$ | 309         |
| C VI    | 265.05     | P         |           | $3 - 8$       |                |             | 309         |
| C VI    | 279.02     | P         |           | $3 - 7$       |                |             | 309         |
| C VI    | 303.70     | P         |           | $3 - 6$       |                |             | 309         |
| C VI    | 355.89     | P         |           | $3 - 5$       |                |             | 309         |
| C VI    | 504.65     | P         |           | $4 - 9$       |                |             | 309         |
| C VI    | 520.6      | P         |           | $3 - 4$       |                |             | 309         |
| C VI    | 539.95     | P         |           | $4 - 8$       |                |             | 309         |
| C VI    | 601.31     | P         |           | $4 - 7$       |                |             | 309         |
| C VI    | 728.93     | P         |           | $4 - 6$       |                |             | 309         |
| C VI    | 843.72     | P         |           | $5 - 10$      |                |             | 309         |
| C VI    | 915.30     | P         |           | $5 - 9$       |                |             | 309         |
| C VI    | 1038.42    | P         |           | $5 - 8$       |                |             | 309         |
| C VI    | 1124.9     | P         |           | $4 - 5$       |                |             | 309         |
| C VI    | 1291.94    | P         |           | $5 - 7$       |                |             | 309         |

N I

## NITROGEN, Z = 7

N I

Ground state  $1s^2 2s^2 2p^3 \ ^4S_{3/2}$ Ionization potential 117 214 cm<sup>-1</sup>; 14.53 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term                 | J - J                       | Reference   |
|---------|------------|-----------|-----------|--------------------------------|----------------------|-----------------------------|-------------|
| N I     | 875.092    | 65        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)6d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 794.334.487 |
| N I     | 888.019    | 35        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)6s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 794.334.137 |
| N I     | 888.363    | 35        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)6s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 794.334.137 |
| N I     | 905.829    | 150       |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 794.334.137 |
| N I     | 906.202    | 35        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 794.334.137 |
| N I     | 906.426    | 35        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 794.334.137 |
| N I     | 906.722    | 35        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 794.334.487 |
| N I     | 906.824    | 35P       |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 487.334     |
| N I     | 907.268    | 35P       |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 487.334     |
| N I     | 908.2332   | 3         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)5s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 908.7958   | 1         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)5s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 909.6976   | 9         | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)5s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 306.376     |
| N I     | 910.2785   | 6         | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)5s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 306.376     |
| N I     | 910.6456   | 5         | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)5s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 306.376     |
| N I     | 951.0791   | 5         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 951.2947   | 3         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 952.3037   | 18        | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 306.376     |
| N I     | 952.4151   | 14        | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 306.376     |
| N I     | 952.5231   | 10        | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 306.376     |
| N I     | 953.4150   | 25        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 953.6548   | 27        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 953.9698   | 30        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 954.1040   | 30        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 955.2647   | 4         | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 306.334     |
| N I     | 955.4376   | 4         | ST        | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 306.334     |
| N I     | 955.5292   | 3         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 955.8814   | 5         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)3d$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 959.4936   | 5         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376         |
| N I     | 960.2017   | P         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 197.487     |
| N I     | 963.9904   | 25        | 3         | $2s^2 2p^3 - 2s^2 2p^3(^3P)4s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 308.376     |
| N I     | 964.6258   | 23        | 3         | $2s^2 2p^3 - 2s^2 2p^3(^3P)4s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 308.376     |
| N I     | 965.0415   | 23        | 3         | $2s^2 2p^3 - 2s^2 2p^3(^3P)4s$ | $K^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 308.376     |
| N I?    | 1008.875   | 5         |           |                                |                      |                             | 191         |
| N I?    | 1032.958   | 10        |           |                                |                      |                             | 191         |
| N I?    | 1033.453   | 10        |           |                                |                      |                             | 191.334     |
| N I?    | 1043.092   | 65        |           |                                |                      |                             | 191.334     |
| N I?    | 1044.094   | 65        |           |                                |                      |                             | 191.334     |
| N I?    | 1044.724   | 35        |           |                                |                      |                             | 191.334     |
| N I?    | 1063.351   | 5         |           |                                |                      |                             | 191         |
| N I?    | 1066.126   | 5         |           |                                |                      |                             | 191         |
| N I?    | 1066.641   | 20        |           |                                |                      |                             | 191.334     |
| N I?    | 1067.399   | 35        |           |                                |                      |                             | 191.334     |
| N I?    | 1067.607   | 5         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)5d$ | $^1D^{\circ} - ^4D$  | $\frac{3}{2} - \frac{3}{2}$ | 794.191.487 |
| N I     | 1068.476   | 20        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)5d$ | $^1D^{\circ} - ^4D$  | $\frac{3}{2} - \frac{3}{2}$ | 794.191.487 |
| N I     | 1069.198   | 10        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)5d$ | $^1D^{\circ} - ^4F$  | $\frac{3}{2} - \frac{3}{2}$ | 191.487     |
| N I     | 1069.984   | 15        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)6s$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 794.191.334 |
| N I     | 1070.821   | 1         |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)6s$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 794.191     |
| N I?    | 1071.656   | 5         |           |                                |                      |                             | 191         |
| N I?    | 1093.275   | 1         |           |                                |                      |                             | 191         |
| N I?    | 1094.688   | 1         |           |                                |                      |                             | 191         |
| N I?    | 1095.279   | 40        |           |                                |                      |                             | 191         |
| N I     | 1095.940   | 40        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $^1D^{\circ} - ^4D$  | $\frac{3}{2} - \frac{3}{2}$ | 794.191     |
| N I     | 1096.322   | 10        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $^1D^{\circ} - ^4D$  | $\frac{3}{2} - \frac{3}{2}$ | 794.191     |
| N I     | 1096.749   | 10        |           | $2s^2 2p^3 - 2s^2 2p^3(^3P)4d$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 794.191     |
| N I?    | 1097.245   | 40        |           |                                |                      |                             | 794.191     |

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| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J - J                       | Reference     |
|---------|------------|-----------|-----------|--------------------------------|---------------|-----------------------------|---------------|
| ZZ 1    | 1097.990   | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 794.487       |
| ZZ 1    | 1098.103   | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 794.191, 487  |
| ZZ 1    | 1098.264   | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 794.191, 487  |
| ZZ 1    | 1099.153   | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 794.191       |
| ZZ 1    | 1100.3593  | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)5s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1100.4649  | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)5s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1101.2910  | 45        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)5s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1134.1651  | 560       | 2         | $2s^2 2p^3 - 2s^2 2p^4$        | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1134.4147  | 550       | 2         | $2s^2 2p^3 - 2s^2 2p^4$        | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1134.9801  | 780       | 2         | $2s^2 2p^3 - 2s^2 2p^4$        | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 12   | 1139.818   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1143.606   | 90        |           |                                |               |                             | 191           |
| ZZ 1    | 1143.6458  | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3s$ | $^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1143.6508  | 30        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3s$ | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 12   | 1152.139   | 20        |           |                                |               |                             | 191           |
| ZZ 12   | 1154.993   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1156.593   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1158.051   | 10        |           |                                |               |                             | 191           |
| ZZ 1    | 1159.285   | 8         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)7d$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 191, 334      |
| ZZ 1    | 1159.8172  | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^4S^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 197, 487      |
| ZZ 1    | 1159.858   | 5         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)7d$ | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 191, 334      |
| ZZ 12   | 1160.480   | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)7d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 191, 334, 487 |
| ZZ 1    | 1160.9370  | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^4S^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 197, 487      |
| ZZ 1    | 1163.8835  | 150       | 7         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1164.0016  | 30        | 7         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1164.2064  | 60        | 7         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1164.3246  | 95        | 7         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1165.5943  | 40        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1165.8358  | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 12   | 1166.950   | 1         |           |                                |               |                             | 191           |
| ZZ 1    | 1167.4484  | 350       | 6         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1168.2154  | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1168.3344  | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1168.4167  | 60        | 6         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1168.5358  | 300       | 6         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1169.6933  | 80        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1170.1572  | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1170.2766  | 80        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1170.4165  | 5         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1170.6743  | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1171.0834  | 60        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)6d$ | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1176.5097  | 350       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1176.6304  | 180       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1177.6948  | 320       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 12   | 1180.428   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1183.998   | 20        |           |                                |               |                             | 191           |
| ZZ 1    | 1188.972   | 40        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)5d$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 794, 191      |
| ZZ 1    | 1189.244   | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)5d$ | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 794, 191      |
| ZZ 12   | 1189.628   | 90        |           |                                |               |                             | 794           |
| ZZ 1    | 1199.5490  | ST        | 1         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 308, 376      |
| ZZ 1    | 1200.2238  | ST        | 1         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 308, 376      |
| ZZ 1    | 1200.7113  | ST        | 1         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 308, 376      |
| ZZ 1    | 1225.028   | 40        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 794, 191, 334 |
| ZZ 1    | 1225.372   | 40        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 794, 191, 334 |
| ZZ 1    | 1226.831   | 5         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 191, 334      |
| ZZ 1    | 1227.226   | 5         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 191, 334      |
| ZZ 1    | 1227.788   | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3P^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 191, 334      |
| ZZ 1    | 1228.410   | 40        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 794, 191, 334 |
| ZZ 1    | 1228.790   | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 794, 191, 334 |
| ZZ 12   | 1229.172   | 20        |           |                                |               |                             | 794, 191, 334 |

Z 1

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| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J - J                       | Reference     |
|---------|------------|-----------|-----------|--------------------------------|---------------|-----------------------------|---------------|
| ZZ 1    | 1230.288   | 1         |           | $2s^2 2p^1 - 2s^2 2p^2(^3P)5s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 191, 334      |
| ZZ 1    | 1231.588   | 5         |           | $2s^2 2p^1 - 2s^2 2p^2(^3P)5s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 191, 334      |
| ZZ 1    | 1243.1796  | 550       | 5         | $2s^2 2p^1 - 2s^2 2p^2(^1D)3s$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1243.3066  | 400       | 5         | $2s^2 2p^1 - 2s^2 2p^2(^1D)3s$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 12   | 1269.761   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1279.223   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1279.995   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1280.362   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1301.681   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1310.057   | 5         |           |                                |               |                             | 191           |
| ZZ 1    | 1310.5401  | 200       | 13        | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1310.9429  | 150       | 13        | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1310.9495  | 25        | 13        | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 12   | 1313.129   | 20        |           |                                |               |                             | 191, 334      |
| ZZ 1    | 1315.484   | 35        |           | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3P$ | $\frac{1}{2}$               | 191, 334, 487 |
| ZZ 1    | 1316.2906  | 2         |           | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1318.8224  | 5         |           | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3F$ | $\frac{1}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1318.9981  | 150       | 12        | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1319.0048  | 80        | 12        | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1319.6693  | 50        | 12        | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1319.6760  | 250       | 12        | $2s^2 2p^1 - 2s^2 2p^2(^3P)3d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1326.5639  | 10        | 11        | $2s^2 2p^1 - 2s^2 2p^2(^3P)4s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1326.5707  | 50        | 11        | $2s^2 2p^1 - 2s^2 2p^2(^3P)4s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1327.9170  | 25        | 11        | $2s^2 2p^1 - 2s^2 2p^2(^3P)4s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 376           |
| ZZ 1    | 1327.9238  | 15        | 11        | $2s^2 2p^1 - 2s^2 2p^2(^3P)4s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 12   | 1355.887   | 150       |           |                                |               |                             | 191           |
| ZZ 12   | 1357.359   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1360.566   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1377.787   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1379.003   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1411.510   | 5         |           |                                |               |                             | 191           |
| ZZ 1    | 1411.9318  | 150       | 10        | $2s^2 2p^1 - 2s^2 2p^2(^1D)3s$ | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1411.9395  | P         | 10        | $2s^2 2p^1 - 2s^2 2p^2(^1D)3s$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1411.9494  | 300       | 10        | $2s^2 2p^1 - 2s^2 2p^2(^1D)3s$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 12   | 1462.822   | 10        |           |                                |               |                             | 191           |
| ZZ 12   | 1466.723   | 1         |           |                                |               |                             | 794, 191      |
| ZZ 12   | 1467.384   | 20        |           |                                |               |                             | 191           |
| ZZ 12   | 1481.750   | 40        |           |                                |               |                             | 191           |
| ZZ 1    | 1492.6254  | 620       | 4         | $2s^2 2p^1 - 2s^2 2p^2(^3P)3s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1492.8195  | 100       | 4         | $2s^2 2p^1 - 2s^2 2p^2(^3P)3s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1494.6751  | 400       | 4         | $2s^2 2p^1 - 2s^2 2p^2(^3P)3s$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 12   | 1496.707   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1527.495   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1542.499   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1552.995   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1558.834   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1559.751   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1572.976   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1577.131   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1592.867   | 20        |           |                                |               |                             | 191           |
| ZZ 12   | 1597.181   | 10        |           |                                |               |                             | 191           |
| ZZ 12   | 1599.202   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1602.973   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1627.366   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1640.437   | 10        |           |                                |               |                             | 191           |
| ZZ 12   | 1647.493   | 20        |           |                                |               |                             | 191           |
| ZZ 12   | 1653.148   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1669.598   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1671.020   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1677.906   | 40        |           |                                |               |                             | 191           |

N1

N1

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J - J                       | Reference     |
|---------|------------|-----------|-----------|--------------------------------|---------------|-----------------------------|---------------|
| Z 12    | 1721.014   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1721.746   | 20        |           |                                |               |                             | 191           |
| ZZ 12   | 1728.170   | 20        |           |                                |               |                             | 191           |
| ZZ 12   | 1729.481   | 5         |           |                                |               |                             | 191           |
| Z 12    | 1730.734   | 5         |           |                                |               |                             | 191           |
| Z 12    | 1738.502   | 1         |           |                                |               |                             | 191           |
| ZZ 1    | 1742.7189  | 50        | 9         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1742.7306  | 350       | 9         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 376           |
| ZZ 1    | 1745.2482  | 150       | 9         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 376           |
| Z 1     | 1745.2600  | 50        | 9         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 376           |
| ZZ 12   | 1750.079   | 10        |           |                                |               |                             | 191           |
| ZZ 12   | 1757.223   | 5         |           |                                |               |                             | 191           |
| ZZ 12   | 1759.789   | 1         |           |                                |               |                             | 191           |
| ZZ 12   | 1807.328   | 1         |           |                                |               |                             | 191           |
| Z 1     | 1836.752   | 10        | 8         | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 796, 191, 488 |
| Z 12    | 1844.042   | 90        |           |                                |               |                             | 191           |
| ZZ 12   | 1846.399   | 150       |           |                                |               |                             | 191           |
| ZZ 12   | 1873.217   | 5         |           |                                |               |                             | 191           |
| Z 12    | 1889.056   | 10        |           |                                |               |                             | 191           |



N II

## NITROGEN, Z = 7

N II

Ground state  $1s^2 2s^2 2p^3 \ ^4P_{3/2}$ Ionization potential  $238\,750.5\text{ cm}^{-1}$ , 29.600 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term              | J - J | Reference   |
|---------|------------|-----------|-----------|--------------------------------|-------------------|-------|-------------|
| N II    | 453.257    | 20        |           | $2s^2 2p^2 - 2s^2 2p^5 d$      | $^4P - ^4D^\circ$ | 1-2   | 168,200     |
| N II    | 453.340    | 100       |           | $2s^2 2p^2 - 2s^2 2p^5 d$      | $^4P - ^4D^\circ$ | 2-3   | 168,200     |
| N II    | 474.493    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3P^\circ$ | 0-1   | 200,168     |
| N II    | 474.546    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3P^\circ$ | 1-0   | 200,168     |
| N II    | 474.602    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3P^\circ$ | 1-1   | 200,168     |
| N II    | 474.706    | 20P       |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3P^\circ$ | 1-2   | 200,168     |
| N II    | 474.787    | 20P       |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3P^\circ$ | 2-1   | 200,168     |
| N II    | 474.891    | 200P      |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3P^\circ$ | 2-2   | 200,168     |
| N II    | 475.647    | 100P      |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3D^\circ$ | 0-1   | 200,168     |
| N II    | 475.698    | 200P      |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3D^\circ$ | 1-2   | 200,168     |
| N II    | 475.757    | P         |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3D^\circ$ | 1-1   | 200         |
| N II    | 475.803    | 250P      |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3D^\circ$ | 2-3   | 200,168     |
| N II    | 475.884    | 100P      |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^4P - ^3D^\circ$ | 2-2   | 200,168     |
| N II    | 485.849    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^5 d$      | $^1D - ^1F^\circ$ | 2-3   | 200,168     |
| N II    | 505.986    | 100P      |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3d$ | $^3S^\circ - ^3P$ | 2-1   | 200,168     |
| N II    | 506.054    | 200P      |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3d$ | $^3S^\circ - ^3P$ | 2-2   | 200,168     |
| N II    | 506.153    | 300P      |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3d$ | $^3S^\circ - ^3P$ | 2-3   | 200,168     |
| N II    | 508.484    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^4 s$      | $^4P - ^3P^\circ$ | 1-2   | 200,168     |
| N II    | 508.668    | P         |           | $2s^2 2p^2 - 2s^2 2p^4 s$      | $^4P - ^3P^\circ$ | 0-1   | 200         |
| N II    | 508.697    | 150P      |           | $2s^2 2p^2 - 2s^2 2p^4 s$      | $^4P - ^3P^\circ$ | 2-2   | 200,168     |
| N II    | 508.928    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^4 s$      | $^4P - ^3P^\circ$ | 1-0   | 200,168     |
| N II    | 509.006    | 15P       |           | $2s^2 2p^2 - 2s^2 2p^4 s$      | $^4P - ^3P^\circ$ | 2-1   | 200,168     |
| N II    | 510.758    | 250P      |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^1D - ^1F^\circ$ | 2-3   | 200,168     |
| N II    | 513.849    | P         |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^1D - ^1D^\circ$ | 2-2   | 200,168     |
| N II    | 529.355    | 250       | 6         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3P^\circ$ | 0-1   | 197,168,488 |
| N II    | 529.413    | 250       | 6         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3P^\circ$ | 1-0   | 197,168,488 |
| N II    | 529.491    | 250       | 6         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3P^\circ$ | 1-1   | 197,168,488 |
| N II    | 529.637    | 250       | 6         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3P^\circ$ | 1-2   | 197,168,488 |
| N II    | 529.722    | 250       | 6         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3P^\circ$ | 2-1   | 197,168,488 |
| N II    | 529.867    | 400       | 6         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3P^\circ$ | 2-2   | 197,168,488 |
| N II    | 533.511    | 350       | 5         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3D^\circ$ | 0-1   | 197,168,488 |
| N II    | 533.581    | 400       | 5         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3D^\circ$ | 1-2   | 197,168,488 |
| N II    | 533.650    | 350       | 5         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3D^\circ$ | 1-1   | 197,168,488 |
| N II    | 533.729    | 500       | 5         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3D^\circ$ | 2-3   | 197,168,488 |
| N II    | 533.815    | 350       | 5         | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^4P - ^3D^\circ$ | 2-2   | 197,168,488 |
| N II    | 547.818    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^4 s$      | $^1D - ^1P^\circ$ | 2-1   | 200,168     |
| N II    | 559.762    | 10P       |           | $2s^2 2p^2 - 2s^2 2p^4 d$      | $^1S - ^1P^\circ$ | 0-1   | 200,168     |
| N II    | 572.069    | P         |           | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^1D - ^1P^\circ$ | 2-1   | 200         |
| N II    | 574.650    | 500       | 11        | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^1D - ^1F^\circ$ | 2-3   | 197,168,488 |
| N II    | 582.156    | 400       | 10        | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^1D - ^1D^\circ$ | 2-2   | 197,168,488 |
| N II    | 629.167    | 300P      |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3S^\circ - ^3P$ | 2-3   | 200,168     |
| N II    | 629.447    | 200P      |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3S^\circ - ^3P$ | 2-2   | 200,168     |
| N II    | 629.670    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3S^\circ - ^3P$ | 2-1   | 200         |
| N II    | 635.197    | 400       | 13        | $2s^2 2p^2 - 2s^2 2p^3 d$      | $^1S - ^1P^\circ$ | 0-1   | 197,168,488 |
| N II    | 644.634    | 650       | 4         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3S^\circ$ | 0-1   | 197,168,488 |
| N II    | 644.837    | 750       | 4         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3S^\circ$ | 1-1   | 197,168,488 |
| N II    | 645.178    | 850       | 4         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3S^\circ$ | 2-1   | 197,168,488 |
| N II    | 657.327    | 50        |           |                                |                   |       | 170         |
| N II    | 659.538    | 10        |           |                                |                   |       | 170         |
| N II    | 660.286    | 750       | 9         | $2s^2 2p^2 - 2s^2 2p^3$        | $^1D - ^1P^\circ$ | 2-1   | 197,168,488 |
| N II    | 670.296    | 220P      |           | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^1P^\circ$ | 0-1   | 200,168     |
| N II    | 670.515    | 120P      |           | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^1P^\circ$ | 1-1   | 200,168     |
| N II    | 670.884    | 100P      |           | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^1P^\circ$ | 2-1   | 200,168     |
| N II    | 671.016    | 500       | 3         | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^3P^\circ$ | 1-2   | 197,168,488 |
| N II    | 671.386    | 500       | 3         | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^3P^\circ$ | 2-2   | 197,168,488 |

N II

N II

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J-J | Reference   |
|---------|------------|-----------|-----------|--------------------------------|---------------|-----|-------------|
| N II    | 671.411    | 650       | 3         | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^2P - ^3P^o$ | 0-1 | 197,168,488 |
| N II    | 671.630    | 500       | 3         | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^3P^o$ | 1-1 | 197,168,488 |
| N II    | 671.773    | 500       | 3         | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^3P^o$ | 1-0 | 197,168,488 |
| N II    | 672.001    | 500       | 3         | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^4P - ^3P^o$ | 2-1 | 197,168,488 |
| N II    | 745.841    | 500       | 12        | $2s^2 2p^2 - 2s^2 2p^3$        | $^1S - ^1P^o$ | 0-1 | 197,168,488 |
| N II    | 746.984    | 650       | 8         | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^1D - ^1P^o$ | 2-1 | 197,168,488 |
| N II    | 748.369    | P         |           | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^1D - ^1P^o$ | 2-1 | 197,200     |
| N II    | 775.965    | 1000      | 7         | $2s^2 2p^2 - 2s^2 2p^3$        | $^1D - ^1D^o$ | 2-2 | 197,168,488 |
| N II    | 836.187    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3D^o - ^3P$ | 3-2 | 200         |
| N II    | 836.279    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3D^o - ^3P$ | 2-2 | 200         |
| N II    | 836.289    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3D^o - ^3P$ | 1-2 | 200         |
| N II    | 836.616    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3D^o - ^3P$ | 2-1 | 200         |
| N II    | 836.627    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3D^o - ^3P$ | 1-1 | 200         |
| N II    | 836.837    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3D^o - ^3P$ | 1-0 | 200         |
| N II    | 858.376    | 100P      |           | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^1S - ^1P^o$ | 0-1 | 200,168     |
| N II    | 860.205    | P         |           | $2s^2 2p^2 - 2s^2 2p^3 s$      | $^1S - ^3P^o$ | 0-1 | 200         |
| N II    | 915.612    | 700       | 2         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3P^o$ | 0-1 | 197,168,488 |
| N II    | 915.962    | 700       | 2         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3P^o$ | 1-0 | 197,168,488 |
| N II    | 916.012    | 800       | 2         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3P^o$ | 1-2 | 197,168,488 |
| N II    | 916.020    | 600       | 2         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3P^o$ | 1-1 | 197,168,488 |
| N II    | 916.701    | 1000      | 2         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3P^o$ | 2-2 | 197,168,488 |
| N II    | 916.710    | 800       | 2         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3P^o$ | 2-1 | 197,168,488 |
| N II    | 1083.990   | 400       | 1         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3D^o$ | 0-1 | 197,168,488 |
| N II    | 1084.562   | 150       | 1         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3D^o$ | 1-1 | 197,168,488 |
| N II    | 1084.580   | 750       | 1         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3D^o$ | 1-2 | 197,168,488 |
| N II    | 1085.529   | P         | 1         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3D^o$ | 2-1 | 197,200     |
| N II    | 1085.546   | 400       | 1         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3D^o$ | 2-2 | 197,168,488 |
| N II    | 1085.701   | 1000      | 1         | $2s^2 2p^2 - 2s^2 2p^3$        | $^4P - ^3D^o$ | 2-3 | 197,168,488 |
| N II    | 1275.038   | 300P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3P$ | 3-2 | 200,168     |
| N II    | 1275.251   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3P$ | 2-2 | 200         |
| N II    | 1275.275   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3P$ | 1-2 | 200         |
| N II    | 1276.201   | 200P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3P$ | 2-1 | 200,168     |
| N II    | 1276.225   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3P$ | 1-1 | 200         |
| N II    | 1276.800   | 100P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3P$ | 1-0 | 200,168     |
| N II    | 1343.338   | 200P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3D$ | 3-3 | 200,168     |
| N II    | 1343.574   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3D$ | 2-3 | 200         |
| N II    | 1345.076   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3D$ | 3-2 | 200         |
| N II    | 1345.313   | 100P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3D$ | 2-2 | 200,168     |
| N II    | 1345.340   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3D$ | 1-2 | 200         |
| N II    | 1346.413   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3D$ | 2-1 | 200         |
| N II    | 1346.441   | 10P       |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3D^o - ^3D$ | 1-1 | 200,168     |
| N II    | 1627.349   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3P$ | 1-2 | 200         |
| N II    | 1627.376   | 100P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3P$ | 2-2 | 200,168     |
| N II    | 1628.896   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3P$ | 1-1 | 200         |
| N II    | 1628.922   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3P$ | 2-1 | 200         |
| N II    | 1629.079   | 100P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3P$ | 0-1 | 200,168     |
| N II    | 1629.832   | 10P       |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3P$ | 1-0 | 200,168     |
| N II    | 1675.726   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3S$ | 1-1 | 200         |
| N II    | 1675.755   | 400P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3S$ | 2-1 | 200,168     |
| N II    | 1675.920   | 100P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3S$ | 0-1 | 200,243     |
| N II    | 1725.028   | P         |           | $2s^2 2p^3 s - 2s^2 2p^4 p$    | $^3P^o - ^1S$ | 1-0 | 200         |
| N II    | 1732.428   | P         |           | $2s^2 2p^3 s - 2s^2 2p^4 p$    | $^1P^o - ^1S$ | 1-0 | 200         |
| N II    | 1740.310   | 400P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3D$ | 2-3 | 200,168     |
| N II    | 1743.197   | 200P      |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3D$ | 1-2 | 200,168     |
| N II    | 1743.228   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3D$ | 2-2 | 200         |
| N II    | 1745.046   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3D$ | 1-1 | 200         |
| N II    | 1745.076   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3D$ | 2-1 | 200         |
| N II    | 1745.256   | P         |           | $2s^2 2p^3 - 2s^2 2p^3 p$      | $^3P^o - ^3D$ | 0-1 | 200         |
| N II    | 1763.639   | 100P      |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3S^o - ^3P$ | 1-2 | 200,243     |
| N II    | 1765.140   | 50P       |           | $2s^2 2p^3 - 2s^2 2p^2(^4P)3s$ | $^3S^o - ^3P$ | 1-1 | 200,243     |

N II

N II

| Element | Wavelength | Intensity | Multiplet | Configuration              | Term                        | J - J | Reference    |
|---------|------------|-----------|-----------|----------------------------|-----------------------------|-------|--------------|
| N II    | 1766.079   | 100P      |           | $2s^2p^3 - 2s^2p^2(^4P)3s$ | $^4S^{\circ} - ^3P$         | 1-0   | 200.243      |
| N II    | 1772.735   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^1D$         | 1-2   | 200          |
| N II    | 1780.551   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^1D$         | 1-2   | 200          |
| N II    | 1830.527   | 1P        |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3S$         | 0-1   | 200.243      |
| N II    | 1831.586   | 10P       |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3S$         | 1-1   | 200.243      |
| N II    | 1836.172   | 100P      |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3S$         | 2-1   | 200.243      |
| N II    | 1839.931   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3S$         | 1-1   | 200          |
| N II    | 1840.983   | 100P      |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3P$         | 1-2   | 200.247      |
| N II    | 1842.284   | 10P       |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3P$         | 0-1   | 200.247      |
| N II    | 1843.357   | 10P       |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3P$         | 1-1   | 200.247      |
| N II    | 1844.259   | 10P       |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3P$         | 1-0   | 200.247      |
| N II    | 1845.616   | 100P      |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3P$         | 2-2   | 200.247      |
| N II    | 1848.002   | 10P       |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3P$         | 2-1   | 200.247      |
| N II    | 1849.414   | 100P      |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3P$         | 1-2   | 200.168      |
| N II    | 1851.810   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3P$         | 1-1   | 200          |
| N II    | 1852.721   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3P$         | 1-0   | 200          |
| N II    | 1857.870   | 300P      |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3D$         | 1-2   | 200.243      |
| N II    | 1858.545   | 200P      |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3D$         | 0-1   | 200.243      |
| N II    | 1859.260   | 500P      |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3D$         | 2-3   | 200.243      |
| N II    | 1859.636   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3D$         | 1-1   | 200          |
| N II    | 1862.588   | 200P      |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3D$         | 2-2   | 200.243      |
| N II    | 1864.364   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^3D$         | 2-1   | 200          |
| N II    | 1866.457   | P         |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3D$         | 1-2   | 200          |
| N II    | 1868.240   | 10P       |           | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^3D$         | 1-1   | 200.168      |
| N II    | 1878.624   | 200P      |           | $2s^2p^3s - 2s^2p^4p$      | $^3P^{\circ} - ^1P$         | 1-1   | 200.168      |
| N II    | 1887.404   | 350P      | 14        | $2s^2p^3s - 2s^2p^4p$      | $^1P^{\circ} - ^1P$         | 1-1   | 200.168, 488 |
| N II    | 1991.301   | 10P       |           | $2s^2p^3p - 2s^2p^3s$      | $^1P^{\circ} - ^1P^{\circ}$ | 1-1   | 200.168      |

N III

## NITROGEN, Z = 7

N III

Ground state  $1s^2 2s^2 2p^3 P^{\circ}_1$ Ionization potential  $382\,625.5\text{ cm}^{-1}$ ,  $47.438\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                       | Term                 | J - J                       | Reference   |
|---------|------------|-----------|-----------|-------------------------------------|----------------------|-----------------------------|-------------|
| N III   | 264.837    | 100       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| N III   | 264.948    | 200       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 267.851    | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 267.952    | 100       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 282.093    | 100d      |           | $2s^22p - 2s^26d$                   | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 282.213    | 300d      |           | $2s^22p - 2s^26d$                   | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 284.296    | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})5d$      | $^4P - ^4D$          | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 284.346    | 200       |           | $2s2p^2 - 2s2p(^1P^{\circ})5d$      | $^4P - ^4D$          | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 292.447    | 300       |           | $2s^22p - 2s^25d$                   | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 292.595    | 400       |           | $2s^22p - 2s^25d$                   | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 299.670    | 10        |           | $2s^22p - 2s^25s$                   | $g^2P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| N III   | 299.820    | 100       |           | $2s^22p - 2s^25s$                   | $g^2P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| N III   | 303.891    | 200       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4P^{\circ}$  |                             | 168         |
| N III   | 303.981    | 200       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 304.032    | 200       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4P^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 304.818    | 400d      |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 304.874    | 300d      |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4D^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 304.912    | 300d      |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4D$          | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 305.918    | 100d      |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| N III   | 311.739    | 200       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 311.628    | 300       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 314.715    | 800       | 7         | $2s^22p - 2s^24d$                   | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 314.850    | 900       | 7         | $2s^22p - 2s^24d$                   | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 314.877    | 600       | 7         | $2s^22p - 2s^24d$                   | $g^2P^{\circ} - ^2D$ | $\frac{5}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 321.071    | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})4s$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 321.161    | 250       |           | $2s2p^2 - 2s2p(^1P^{\circ})4s$      | $^4P - ^4P^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 321.270    | 100d      |           | $2s2p^2 - 2s2p(^1P^{\circ})4s$      | $^4P - ^4P^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 323.431    | 400       | 6         | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 323.488    | 500       | 6         | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 323.615    | 600       | 6         | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2P$ | $\frac{5}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 323.671    | 400       | 6         | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 332.133    | 200       |           | $2s^22p - 2s^24s$                   | $g^2P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| N III   | 332.327    | 300       |           | $2s^22p - 2s^24s$                   | $g^2P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| N III   | 338.345    | 200       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4D - ^4D^{\circ}$  |                             | 168         |
| N III   | 348.690    | 10d       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4D - ^4F^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 348.800    | 10d       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4D - ^4F^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 351.979    | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4D - ^4D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 358.278    | 250       | 11        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 358.327    | 400       | 11        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 358.356    | 400       | 11        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 358.401    | 250       | 11        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 358.469    | 400       | 11        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 358.509    | 400       | 11        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 358.578    | 500       | 11        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 362.833    | 600       | 10        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4D^{\circ}$  | $\frac{1}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 362.881    | 650       | 10        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 362.946    | 650       | 10        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4D^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 362.985    | 500       | 10        | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 374.204    | 900       | 5         | $2s^22p - 2s^23d$                   | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 374.441    | 1000      | 5         | $2s^22p - 2s^23d$                   | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 398.885    | 250       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4D^{\circ}$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 399.045    | 350       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 399.084    | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4D^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168         |
| N III   | 413.681    | 10        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4D - ^4P^{\circ}$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| N III   | 413.797    | 10        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4D - ^4P^{\circ}$  | $\frac{5}{2} - \frac{3}{2}$ | 168         |

N III

N III

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term          | J - J                       | Reference   |
|---------|------------|-----------|-----------|---------------------------------|---------------|-----------------------------|-------------|
| N III   | 418.705    | 600       | 16        | $2s2p^2 - 2s2p(^3P^o)3d$        | $^1D - ^2F^o$ | $\frac{3}{2} - \frac{7}{2}$ | 168,488     |
| N III   | 418.910    | 500       | 16        | $2s2p^2 - 2s2p(^3P^o)3d$        | $^3D - ^2F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 428.180    | 500       | 15        | $2s2p^2 - 2s2p(^3P^o)3d$        | $^3D - ^2D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 428.244    | 400       | 15        | $2s2p^2 - 2s2p(^3P^o)3d$        | $^3D - ^2D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 433.911    | 500       | 9         | $2s2p^2 - 2s2p(^3P^o)3s$        | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 434.014    | 500       | 9         | $2s2p^2 - 2s2p(^3P^o)3s$        | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 434.066    | 600       | 9         | $2s2p^2 - 2s2p(^3P^o)3s$        | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 434.129    | 450       | 9         | $2s2p^2 - 2s2p(^3P^o)3s$        | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 434.246    | 500       | 9         | $2s2p^2 - 2s2p(^3P^o)3s$        | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 434.280    | 500       | 9         | $2s2p^2 - 2s2p(^3P^o)3s$        | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 451.869    | 850       | 4         | $2s^22p - 2s^23s$               | $^3P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 452.226    | 900       | 4         | $2s^22p - 2s^23s$               | $^3P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 456.078    | 100       |           | $2s2p^2 - 2s^24f$               | $^2D - ^2F^o$ | $\frac{3}{2} - \frac{7}{2}$ | 168         |
| N III   | 472.232    | 350       | 18        | $2s2p^2 - 2s2p(^3P^o)3d$        | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 472.392    | 400       | 18        | $2s2p^2 - 2s2p(^3P^o)3d$        | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 509.586    | 400       | 14        | $2s2p^2 - 2s2p(^3P^o)3s$        | $^2D - ^2P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 509.897    | 350       | 14        | $2s2p^2 - 2s2p(^3P^o)3s$        | $^2D - ^2P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 530.037    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$        | $^1P - ^2D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 530.268    | 250       |           | $2s2p^2 - 2s2p(^3P^o)3d$        | $^1P - ^2D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 601.468    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3s$        | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 601.878    | 10        |           | $2s2p^2 - 2s2p(^3P^o)3s$        | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| N III   | 684.996    | 700       | 3         | $2s^22p - 2s2p^2$               | $^3P^o - ^2P$ | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 685.513    | 750       | 3         | $2s^22p - 2s2p^2$               | $^3P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 197,168,488 |
| N III   | 685.816    | 800       | 3         | $2s^22p - 2s2p^2$               | $^3P^o - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 686.335    | 700       | 3         | $2s^22p - 2s2p^2$               | $^3P^o - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| N III   | 691.187    | 100       |           | $2s2p^2 - 2s^23p$               | $^2D - ^2P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| N III   | 691.388    | 50        |           | $2s2p^2 - 2s^23p$               | $^2D - ^2P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| N III   | 763.340    | 700       | 2         | $2s^22p - 2s2p^2$               | $^3P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 197,168,488 |
| N III   | 764.357    | 750       | 2         | $2s^22p - 2s2p^2$               | $^3P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| N III   | 771.544    | 500       | 8         | $2s2p^2 - 1s^22p^3$             | $^1P - ^1S^o$ | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 771.901    | 550       | 8         | $2s2p^2 - 1s^22p^3$             | $^1P - ^1S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 772.385    | 600       | 8         | $2s2p^2 - 1s^22p^3$             | $^1P - ^1S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 772.891    | 450       | 13        | $2s2p^2 - 1s^22p^3$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 772.975    | 400       | 13        | $2s2p^2 - 1s^22p^3$             | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 871.850    | 10        |           | $2s2p^2 - 2s^23p$               | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| N III   | 979.842    | 400       | 12        | $2s2p^2 - 1s^22p^3$             | $^2D - ^2D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 979.919    | 450       | 12        | $2s2p^2 - 1s^22p^3$             | $^2D - ^2D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| N III   | 989.790    | 800       | 1         | $2s^22p - 2s^22p^2$             | $^3P^o - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 991.514    | 600       | 1         | $2s^22p - 2s^22p^2$             | $^3P^o - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 991.579    | 900       | 1         | $2s^22p - 2s^22p^2$             | $^3P^o - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| N III   | 1006.015   | 300       | 17        | $2s2p^2 - 1s^22p^3$             | $^2S - ^2P^o$ | $\frac{1}{2} -$             | 168,488     |
| N III   | 1183.030   | 350       | 20        | $2s2p^2 - 1s^22p^3$             | $^2P - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 168,488     |
| N III   | 1184.544   | 400       | 20        | $2s2p^2 - 1s^22p^3$             | $^2P - ^2P^o$ | $\frac{3}{2} -$             | 168,488     |
| N III   | 1324.40    | 150       |           | $2s^23d - 2s^25f$               | $^2D - ^2F^o$ | $\frac{3}{2} - \frac{7}{2}$ | 246,487     |
| N III   | 1345.69    | 200       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4d$ | $^1D - ^1F^o$ |                             | 246         |
| N III   | 1346.27    | 200       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4d$ | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246         |
| N III   | 1347.56    | 10        |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4d$ | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{7}{2}$ | 246         |
| N III   | 1387.31    | 200       |           | $2s^23p - 2s^24d$               | $^2P^o - ^2D$ |                             | 168,246     |
| N III   | 1470.68    | 10        |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4d$ | $^1P - ^1D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 246         |
| N III   | 1471.02    | 50        |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4d$ | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246         |
| N III   | 1471.69    | 100       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4d$ | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{7}{2}$ | 246         |
| N III   | 1694.79    | 10        |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4s$ | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246         |
| N III   | 1696.54    | 150       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4s$ | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246         |
| N III   | 1697.19    | 10        |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4s$ | $^1D - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 246         |
| N III   | 1698.16    | 100       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4s$ | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246         |
| N III   | 1699.00    | 100       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4s$ | $^1D - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 246         |
| N III   | 1699.32    | 250       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4s$ | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246         |
| N III   | 1699.95    | 200       |           | $2s2p(^3P^o)3p - 2s2p(^3P^o)4s$ | $^1D - ^1P^o$ |                             | 246         |
| N III   | 1730.04    | 400       |           | $2s2p(^3P^o)3d - 2s2p(^3P^o)4f$ | $^1F^o - ^1G$ |                             | 168         |
| N III   | 1747.86    | 450       | 19        | $2s2p^2 - 1s^22p^3$             | $^2P - ^2D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168,488     |

N III

N III

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------------------------|---------------|-----------------------------|-----------|
| N III   | 1751.24    | 300       | 19        | $2s2p^2 - 1s^22p^3$             | $^2P - ^2D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| N III   | 1751.75    | 500       | 19        | $2s2p^2 - 1s^22p^3$             | $^2P - ^2D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| N III   | 1804.3     | 300       | 22        | $2s^23p - 2s^24s$               | $^1P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 168,488   |
| N III   | 1805.5     | 350       | 22        | $2s^23p - 2s^24s$               | $^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488   |
| N III   | 1835.578   | 150       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1S - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 191,246   |
| N III   | 1839.59    | 100       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1S - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246       |
| N III   | 1841.68    | 50        |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1S - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 246       |
| N III   | 1845.64    | 250       |           | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{7}{2} - \frac{9}{2}$ | 168       |
| N III   | 1845.80    | 200       |           | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{5}{2} - \frac{7}{2}$ | 168       |
| N III   | 1885.25    | 500       | 24        | $2s^23d - 2s^24f$               | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{7}{2}$ | 168,488   |
| N III   | 1906.22    | 100       |           | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{5}{2}$ | 177       |
| N III   | 1906.89    | 100       |           | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{5}{2} - \frac{7}{2}$ | 177       |
| N III   | 1907.28    | 400       |           | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 177       |
| N III   | 1907.99    | 300P      | 27        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{5}{2}$ | 177,488   |
| N III   | 1908.21    | 400P      | 27        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{5}{2} - \frac{7}{2}$ | 177,488   |
| N III   | 1908.96    | 100       | 27        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1D^o - ^1F$ | $\frac{5}{2} - \frac{5}{2}$ | 177,246   |
| N III   | 1918.69    | 10        | 29        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{1}{2}$ | 177       |
| N III   | 1919.06    | 10        |           | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 177       |
| N III   | 1919.44    | 50        | 29        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 177       |
| N III   | 1919.71    | 100       | 29        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 177       |
| N III   | 1919.99    | 100       | 29        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 177       |
| N III   | 1920.86    | 400       | 29        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{7}{2}$ | 177,488   |
| N III   | 1921.49    | 200       | 29        | $2s2p(^1P^o)3d - 2s2p(^1P^o)4f$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{5}{2}$ | 177,488   |
| N III?  | 1923.11    | 100       |           |                                 |               |                             | 246       |
| N III?  | 1923.86    | 100       |           |                                 |               |                             | 246       |
| N III   | 1946.99    | 250       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246       |
| N III   | 1949.22    | 300       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246       |
| N III   | 1949.81    | 200       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 246       |
| N III   | 1951.43    | 100       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246       |
| N III   | 1952.20    | 50        |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 246       |
| N III   | 1953.66    | 150       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 246       |
| N III   | 1953.80    | 150       |           | $2s2p(^1P^o)3p - 2s2p(^1P^o)4s$ | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 246       |

N IV

## NITROGEN, Z = 7

N IV

Ground state  $1s^2 2s^2 1S_0$ Ionization potential 624 864.7 cm<sup>-1</sup>, 77.471 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J-J | Reference   |
|---------|------------|-----------|-----------|--------------------------------|---------------|-----|-------------|
| N IV    | 181.746    | 100       |           | $2s^2 - 2s5p$                  | $^1S - ^1P^o$ | 0-1 | 168         |
| N IV    | 196.954    | 20d       |           | $2s2p - 2s^o d$                | $^3P^o - ^3D$ |     | 168         |
| N IV    | 197.007    | 100d      |           | $2s2p - 2s6d$                  | $^3P^o - ^3D$ | 2-3 | 168         |
| N IV    | 197.230    | 300       |           | $2s^2 - 2s4p$                  | $^1S - ^1P^o$ | 0-1 | 168         |
| N IV    | 205.960    | 200d      |           | $2s2p - 2s5d$                  | $^3P^o - ^3D$ |     | 168         |
| N IV    | 206.021    | 220d      |           | $2s2p - 2s5d$                  | $^3P^o - ^3D$ | 2-3 | 168         |
| N IV    | 211.396    | 10        |           | $2s^2 - 1s^2 2p(^3P^o)3s$      | $^1S - ^1P^o$ | 0-1 | 168         |
| N IV    | 217.227    | 100       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)4p$ | $^1P^o - ^1D$ | 1-2 | 168         |
| N IV    | 218.085    | 100d      |           | $1s^2 2p^2 - 1s^2 2p(^3P^o)5d$ | $^3P - ^3D^o$ | 2-3 | 168         |
| N IV    | 225.098    | 300       | 6         | $2s2p - 2s4d$                  | $^3P^o - ^3D$ | 0-1 | 168,488     |
| N IV    | 225.136    | 400       | 6         | $2s2p - 2s4d$                  | $^3P^o - ^3D$ | 1-2 | 168,488     |
| N IV    | 225.205    | 500       | 6         | $2s2p - 2s4d$                  | $^3P^o - ^3D$ | 2-3 | 168,488     |
| N IV    | 234.124    | 300       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3P$ |     | 168         |
| N IV    | 234.195    | 400       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3P$ | 2-2 | 168         |
| N IV    | 234.249    | 200       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3P$ | 2-1 | 168         |
| N IV    | 237.860    | 100       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3S$ | 0-1 | 168         |
| N IV    | 237.903    | 200       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3S$ | 1-1 | 168         |
| N IV    | 237.983    | 300       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3S$ | 2-1 | 168         |
| N IV    | 239.161    | 120       |           | $1s^2 2p^2 - 1s^2 2p(^3P^o)4d$ | $^3P - ^3D^o$ | 1-  | 168         |
| N IV    | 239.210    | 200       |           | $1s^2 2p^2 - 1s^2 2p(^3P^o)4d$ | $^3P - ^3D^o$ | 2-3 | 168         |
| N IV    | 239.618    | 400       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3D$ |     | 168         |
| N IV    | 239.693    | 100       |           | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^3P^o - ^3D$ | 2-3 | 168         |
| N IV    | 247.205    | 900       | 2         | $2s^2 - 2s3p$                  | $^1S - ^1P^o$ | 0-1 | 197,168,488 |
| N IV    | 260.455    | 200       |           | $2s2p - 2s4d$                  | $^1P^o - ^1D$ | 1-2 | 168         |
| N IV    | 270.995    | 600       | 12        | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^1P^o - ^1D$ | 1-2 | 168,488     |
| N IV    | 283.420    | 900       | 5         | $2s2p - 2s3d$                  | $^3P^o - ^3D$ | 0-1 | 197,168,488 |
| N IV    | 283.470    | 950       | 5         | $2s2p - 2s3d$                  | $^3P^o - ^3D$ | 1-2 | 197,168,488 |
| N IV    | 283.579    | 1000      | 5         | $2s2p - 2s3d$                  | $^3P^o - ^3D$ | 2-3 | 197,168,488 |
| N IV    | 285.563    | 500       | 11        | $2s(^3S)2p - 1s^2 2p(^3P^o)3p$ | $^1P^o - ^1P$ | 1-1 | 168,488     |
| N IV    | 297.595    | 250       | 15        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 0-1 | 168         |
| N IV    | 297.644    | 350       | 15        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 1-1 | 168,488     |
| N IV    | 297.712    | 250       | 15        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 1-2 | 168         |
| N IV    | 297.768    | 250       | 15        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 2-1 | 168         |
| N IV    | 297.815    | 400       | 15        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 2-2 | 168,488     |
| N IV    | 300.316    | 300       |           | $1s^2 2p^2 - 2s4f$             | $^1D - ^1F^o$ | 2-3 | 168,824     |
| N IV    | 303.009    | 350       | 14        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3D^o$ | 0-1 | 168,824     |
| N IV    | 303.048    | 400       | 14        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3D^o$ | 1-2 | 168,824     |
| N IV    | 303.079    | 350       | 14        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3D^o$ | 1-1 | 168,824     |
| N IV    | 303.123    | 500       | 14        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3D^o$ | 2-3 | 168,824     |
| N IV    | 303.163    | 350       | 14        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^3P - ^3D^o$ | 2-2 | 168,824     |
| N IV    | 315.053    | 800       | 18        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^1D - ^1F^o$ | 2-3 | 168,824     |
| N IV    | 322.503    | 600       | 4         | $2s2p - 2s3s$                  | $^3P^o - ^3S$ | 0-1 | 168,824     |
| N IV    | 322.570    | 650       | 4         | $2s2p - 2s3s$                  | $^3P^o - ^3S$ | 1-1 | 168,824     |
| N IV    | 322.724    | 750       | 4         | $2s2p - 2s3s$                  | $^3P^o - ^3S$ | 2-1 | 168,824     |
| N IV    | 323.175    | 700       | 17        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^1D - ^1D$   | 2-2 | 168,824     |
| N IV    | 335.050    | 1000      | 10        | $2s2p - 2s3d$                  | $^1P^o - ^1D$ | 1-2 | 197,168,824 |
| N IV    | 344.915    | 250       | 13        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3s$ | $^3P - ^3P^o$ | 1-2 | 168,824     |
| N IV    | 345.023    | 250       | 13        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3s$ | $^3P - ^3P^o$ | 0-1 | 168,824     |
| N IV    | 345.063    | 400       | 13        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3s$ | $^3P - ^3P^o$ | 2-2 | 168,824     |
| N IV    | 345.107    | 250       | 13        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3s$ | $^3P - ^3P^o$ | 1-1 | 168,824     |
| N IV    | 345.201    | 250       | 13        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3s$ | $^3P - ^3P^o$ | 1-0 | 168,824     |
| N IV    | 351.931    | 500       | 16        | $1s^2 2p^2 - 1s^2 2p(^3P^o)3s$ | $^1D - ^1P^o$ | 2-1 | 168,824     |
| N IV    | 352.058    | 400       |           | $1s^2 2p^2 - 1s^2 2p(^3P^o)3d$ | $^1S - ^1P^o$ | 0-1 | 168,824     |
| N IV    | 387.353    | 400       | 9         | $2s2p - 2s3s$                  | $^1P^o - ^1S$ | 1-0 | 168,824     |
| N IV    | 420.769    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^3P^o)3s$ | $^1S - ^1P^o$ | 0-1 | 824         |

N IV

N IV

| Element | Wavelength | Intensity | Multiplet | Configuration        | Term          | J - J | Reference |
|---------|------------|-----------|-----------|----------------------|---------------|-------|-----------|
| N IV    | 463.737    | 300       |           | $1s^2 2p^2 - 2s 3p$  | $^1D - ^1P^o$ | 2-1   | 824       |
| ZZ IV   | 765.148    | 850       | 1         | $2s^2 - 2s 2p$       | $^3S - ^1P^o$ | 0-1   | 824       |
| ZZ IV   | 921.992    | 850       | 3         | $2s 2p - 1s^2 2p^2$  | $^3P^o - ^3P$ | 1-2   | 824       |
| ZZ IV   | 922.519    | 800       | 3         | $2s 2p - 1s^2 2p^2$  | $^3P^o - ^3P$ | 0-1   | 824       |
| ZZ IV   | 923.057    | 700       | 3         | $2s 2p - 1s^2 2p^2$  | $^3P^o - ^3P$ | 1-1   | 824       |
| ZZ IV   | 923.220    | 1000      | 3         | $2s 2p - 1s^2 2p^2$  | $^3P^o - ^3P$ | 2-2   | 824       |
| ZZ IV   | 923.675    | 800       | 3         | $2s 2p - 1s^2 2p^2$  | $^3P^o - ^3P$ | 1-0   | 824       |
| ZZ IV   | 924.283    | 850       | 3         | $2s 2p - 1s^2 2p^2$  | $^3P^o - ^3P$ | 2-1   | 824       |
| ZZ IV   | 948.155    | 100       |           | $2s 3p - 2s 4d$      | $^3P^o - ^3D$ | 0-1   | 824       |
| ZZ IV   | 948.244    | 200       |           | $2s 3p - 2s 4d$      | $^3P^o - ^3D$ | 1-2   | 824       |
| ZZ IV   | 948.540    | 250       |           | $2s 3p - 2s 4d$      | $^3P^o - ^3D$ | 2-3   | 824       |
| ZZ IV   | 955.335    | 1000      | 8         | $2s 2p - 1s^2 2p^2$  | $^1P^o - ^1S$ | 1-0   | 824       |
| ZZ IV   | 1036.16    | 400w      |           | $2s 3d - 2s 4f$      | $^3D - ^3F^o$ |       | 824       |
| ZZ IV   | 1078.708   | 300       |           | $2s 3d - 2s 4f$      | $^1D - ^1F^o$ | 2-3   | 824       |
| ZZ IV   | 1086.084   | b         |           | $2s 3p - 2s 4s$      | $^3P^o - ^3S$ | 0-1   | 824       |
| ZZ IV   | 1086.269   | 50        |           | $2s 3p - 2s 4s$      | $^3P^o - ^3S$ | 1-1   | 824       |
| ZZ IV   | 1086.691   | 100       |           | $2s 3p - 2s 4s$      | $^3P^o - ^3S$ | 2-1   | 824       |
| ZZ IV   | 1133.117   | 200       |           | $2s 3s - 1s^2 2p 3s$ | $^3S - ^3P^o$ | 1-2   | 824       |
| ZZ IV   | 1135.244   | 150       |           | $2s 3s - 1s^2 2p 3s$ | $^3S - ^3P^o$ | 1-1   | 824       |
| ZZ IV   | 1136.241   | 100       |           | $2s 3s - 1s^2 2p 3s$ | $^3S - ^3P^o$ | 1-0   | 824       |
| ZZ IV   | 1168.599   | 150       |           | $2s 3d - 1s^2 2p 3d$ | $^3D - ^3D^o$ | 3-3   | 824       |
| ZZ IV   | 1169.063   | 100       |           | $2s 3d - 1s^2 2p 3d$ | $^3D - ^3D^o$ | 2-2   | 824       |
| ZZ IV   | 1169.478   | 50        |           | $2s 3d - 1s^2 2p 3d$ | $^3D - ^3D^o$ | 1-1   | 824       |
| ZZ IV   | 1188.006   | 300       |           | $2s 3s - 1s^2 2p 3s$ | $^1S - ^1P^o$ | 0-1   | 824       |
| ZZ IV   | 1224.960   | 50        |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3S$ | 0-1   | 824       |
| ZZ IV   | 1225.192   | 150       |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3S$ | 1-1   | 824       |
| ZZ IV   | 1225.719   | 200       |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3S$ | 2-1   | 824       |
| ZZ IV   | 1243.73    | b         |           | $1s^2 2p 3d - 2s 6g$ | $^3F^o - ^3G$ | 2-    | 824       |
| ZZ IV   | 1244.92    | 50        |           | $1s^2 2p 3d - 2s 6g$ | $^3F^o - ^3G$ | 3-    | 824       |
| ZZ IV   | 1246.51    | 100       |           | $1s^2 2p 3d - 2s 6g$ | $^3F^o - ^3G$ | 4-    | 824       |
| ZZ IV   | 1270.280   | 250       |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3D$ | 2-3   | 824       |
| ZZ IV   | 1272.160   | 200       |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3D$ | 1-2   | 824       |
| ZZ IV   | 1272.74    | 100       |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3D$ | 2-2   | 824       |
| ZZ IV   | 1273.47    | 150       |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3D$ | 0-1   | 824       |
| ZZ IV   | 1273.716   | 100       |           | $2s 3p - 1s^2 2p 3p$ | $^3P^o - ^3D$ | 1-1   | 824       |
| ZZ IV   | 1284.218   | 150       |           | $2s 3d - 2s 4p$      | $^1D - ^1P^o$ | 2-1   | 824       |
| ZZ IV   | 1296.600   | 250       |           | $2s 3d - 1s^2 2p 3d$ | $^1D - ^1F^o$ | 2-3   | 824       |
| ZZ IV   | 1309.557   | 200       |           | $2s 3p - 1s^2 2p 3p$ | $^1P^o - ^1P$ | 1-1   | 824       |
| ZZ IV   | 1323.98    | 100b      |           | $2s 3d - 1s^2 2p 3d$ | $^3D - ^3F^o$ | 3-4   | 824       |
| ZZ IV   | 1325.685   | 50        |           | $2s 3d - 1s^2 2p 3d$ | $^3D - ^3F^o$ | 2-3   | 824       |
| ZZ IV   | 1326.964   | 20        |           | $2s 3d - 1s^2 2p 3d$ | $^3D - ^3F^o$ | 1-2   | 824       |
| ZZ IV   | 1438.37    | 150       |           | $1s^2 2p 3d - 2s 6g$ | $^1F^o - ^1G$ | 3-4   | 824       |
| ZZ IV   | 1446.114   | 250       |           | $2s 3d - 1s^2 2p 3d$ | $^1D - ^1D^o$ | 2-2   | 824       |
| ZZ IV   | 1486.496   | 100       |           | $2s^2 - 2s 2p$       | $^3S - ^3P^o$ | 0-1   | 824       |
| ZZ IV   | 1687.60    | 50        |           | $2s 4f - 2s 6g$      | $^3F^o - ^3G$ | 2-    | 824       |
| ZZ IV   | 1687.82    | 100       |           | $2s 4f - 2s 6g$      | $^3F^o - ^3G$ | 3-    | 824       |
| ZZ IV   | 1688.11    | 150       |           | $2s 4f - 2s 6g$      | $^3F^o - ^3G$ | 4-    | 824       |
| ZZ IV   | 1696.86    | 150       |           | $1s^2 2p 3d - 2s 5g$ | $^3F^o - ^3G$ | 2-3   | 824       |
| ZZ IV   | 1699.03    | 200       |           | $1s^2 2p 3d - 2s 5g$ | $^3F^o - ^3G$ | 3-4   | 824       |
| ZZ IV   | 1702.006   | 250       |           | $1s^2 2p 3d - 2s 5g$ | $^3F^o - ^3G$ | 4-5   | 824       |
| N IV    | 1718.551   | 1000      | 7         | $2s 2p - 1s^2 2p^2$  | $^1P^o - ^1D$ | 1-2   | 824       |



N V

# NITROGEN, Z = 7

N V

Ground state  $1s^2s \ ^1S_{1/2}$

Ionization potential 789 537.2 cm<sup>-1</sup>; 97.888 eV

| Element | Wavelength | Intensity | Multiplet | Configuration     | Term           | J - J       | Reference |
|---------|------------|-----------|-----------|-------------------|----------------|-------------|-----------|
| Z Z V   | 128.229    | 1         |           | $1s^2s - 1s^217p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 128.430    | 1         |           | $1s^2s - 1s^216p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 128.662    | 10        |           | $1s^2s - 1s^215p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 128.954    | 10        |           | $1s^2s - 1s^214p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 129.337    | 20        |           | $1s^2s - 1s^213p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
| Z Z V   | 129.811    | 30        |           | $1s^2s - 1s^212p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 130.431    | 40        |           | $1s^2s - 1s^211p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 131.254    | 50        |           | $1s^2s - 1s^210p$ | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 132.383    | 60        |           | $1s^2s - 1s^29p$  | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 133.994    | 70        |           | $1s^2s - 1s^28p$  | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
| Z Z V   | 136.429    | 80        |           | $1s^2s - 1s^27p$  | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 770       |
|         | 140.356    | 160P      |           | $1s^2s - 1s^26p$  | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 313,770   |
|         | 140.358    | P         |           | $1s^2s - 1s^26p$  | $g^2S - ^2P^o$ | $1/2 - 1/2$ | 313       |
|         | 142.797    | 1         |           | $1s^2p - 1s^218d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 142.981    | 1         |           | $1s^2p - 1s^217d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
| Z Z V   | 143.241    | 10        |           | $1s^2p - 1s^216d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 143.520    | 10        |           | $1s^2p - 1s^215d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 143.914    | 20        |           | $1s^2p - 1s^214d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 144.392    | 30        |           | $1s^2p - 1s^213d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 144.978    | 40        |           | $1s^2p - 1s^212d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
| Z Z V   | 145.742    | 50        |           | $1s^2p - 1s^211d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 146.716    | 30        |           | $1s^2p - 1s^210d$ | $^2P^o - ^2D$  | $1/2 - 3/2$ | 770       |
|         | 146.767    | 60        |           | $1s^2p - 1s^210d$ | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 146.921    | 30        |           | $1s^2p - 1s^210s$ | $^2P^o - ^2S$  | $3/2 - 1/2$ | 770       |
|         | 147.424    | 240P      |           | $1s^2s - 1s^25p$  | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 313,770   |
| Z Z V   | 147.427    | P         |           | $1s^2s - 1s^25p$  | $g^2S - ^2P^o$ | $1/2 - 1/2$ | 313       |
|         | 148.116    | 40        |           | $1s^2p - 1s^29d$  | $^2P^o - ^2D$  | $1/2 - 3/2$ | 770       |
|         | 148.168    | 70        |           | $1s^2p - 1s^29d$  | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 148.328    | 10        |           | $1s^2p - 1s^29s$  | $^2P^o - ^2S$  | $1/2 - 1/2$ | 770       |
|         | 148.387    | 40        |           | $1s^2p - 1s^29s$  | $^2P^o - ^2S$  | $3/2 - 1/2$ | 770       |
| Z Z V   | 150.116    | 70        |           | $1s^2p - 1s^28d$  | $^2P^o - ^2D$  | $1/2 - 3/2$ | 770       |
|         | 150.171    | 140       |           | $1s^2p - 1s^28d$  | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 150.429    | 20        |           | $1s^2p - 1s^28s$  | $^2P^o - ^2S$  | $1/2 - 1/2$ | 770       |
|         | 150.488    | 50        |           | $1s^2p - 1s^28s$  | $^2P^o - ^2S$  | $3/2 - 1/2$ | 770       |
|         | 153.136    | 180       |           | $1s^2p - 1s^27d$  | $^2P^o - ^2D$  | $1/2 - 3/2$ | 770       |
| Z Z V   | 153.192    | 280       |           | $1s^2p - 1s^27d$  | $^2P^o - ^2D$  | $3/2 - 5/2$ | 770       |
|         | 153.624    | 30        |           | $1s^2p - 1s^27s$  | $^2P^o - ^2S$  | $1/2 - 1/2$ | 770       |
|         | 153.683    | 60        |           | $1s^2p - 1s^27s$  | $^2P^o - ^2S$  | $3/2 - 1/2$ | 770       |
|         | 158.024    | 240P      |           | $1s^2p - 1s^26d$  | $^2P^o - ^2D$  | $1/2 - 3/2$ | 313,770   |
|         | 158.088    | 360P      |           | $1s^2p - 1s^26d$  | $^2P^o - ^2D$  | $3/2 - 5/2$ | 313,770   |
| Z Z V   | 158.862    | 40P       |           | $1s^2p - 1s^26s$  | $^2P^o - ^2S$  | $1/2 - 1/2$ | 313,770   |
|         | 158.928    | 70P       |           | $1s^2p - 1s^26s$  | $^2P^o - ^2S$  | $3/2 - 1/2$ | 313,770   |
|         | 162.556    | 480P      | 3         | $1s^2s - 1s^24p$  | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 313,770   |
|         | 162.564    | P         | 3         | $1s^2s - 1s^24p$  | $g^2S - ^2P^o$ | $1/2 - 1/2$ | 313       |
|         | 166.875    | 440P      |           | $1s^2p - 1s^25d$  | $^2P^o - ^2D$  | $1/2 - 3/2$ | 313,770   |
| Z Z V   | 166.946    | 520P      |           | $1s^2p - 1s^25d$  | $^2P^o - ^2D$  | $3/2 - 5/2$ | 313,770   |
|         | 168.514    | 50P       |           | $1s^2p - 1s^25s$  | $^2P^o - ^2S$  | $1/2 - 1/2$ | 313,770   |
|         | 168.587    | 120P      |           | $1s^2p - 1s^25s$  | $^2P^o - ^2S$  | $3/2 - 1/2$ | 313,770   |
|         | 186.063    | 520P      | 6         | $1s^2p - 1s^24d$  | $^2P^o - ^2D$  | $1/2 - 3/2$ | 313,770   |
|         | 186.149    | 620P      | 6         | $1s^2p - 1s^24d$  | $^2P^o - ^2D$  | $3/2 - 5/2$ | 313,770   |
| Z Z V   | 190.155    | 200P      |           | $1s^2p - 1s^24s$  | $^2P^o - ^2S$  | $1/2 - 1/2$ | 313,770   |
|         | 190.249    | 320P      |           | $1s^2p - 1s^24s$  | $^2P^o - ^2S$  | $3/2 - 1/2$ | 313,770   |
|         | 209.274    | 800P      | 2         | $1s^2s - 1s^23p$  | $g^2S - ^2P^o$ | $1/2 - 3/2$ | 313,770   |
|         | 209.308    | 800P      | 2         | $1s^2s - 1s^23p$  | $g^2S - ^2P^o$ | $1/2 - 1/2$ | 313,770   |
|         | 247.561    | 85        | 5         | $1s^2p - 1s^23d$  | $^2P^o - ^2D$  | $1/2 - 3/2$ | 313       |

Z V

N V

| Element | Wavelength | Intensity | Multiplet | Configuration       | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------------|---------------|-----------------------------|-----------|
| Z V     | 247.706    | 100       | 5         | $1s^2 2p - 1s^2 3d$ | $^2P^o - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 313       |
| Z V     | 266.196    | 120       | 4         | $1s^2 2p - 1s^2 3s$ | $^2P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 313       |
| Z V     | 266.379    | 150       | 4         | $1s^2 2p - 1s^2 3s$ | $^2P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 313       |
| Z V     | 424.61     | 35        |           | $1s^2 3p - 1s^2 6d$ | $^2P^o - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 313       |
| Z V     | 424.75     | 40        |           | $1s^2 3p - 1s^2 6d$ | $^2P^o - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 313       |
| Z V     | 436.85     | 60        |           | $1s^2 3d - 1s^2 6f$ | $^2D - ^2F^o$ |                             | 313       |
| Z V     | 450.08     | 50        |           | $1s^2 3s - 1s^2 5p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 313       |
| Z V     | 511.834    | 70        |           | $1s^2 3d - 1s^2 5f$ | $^2D - ^2F^o$ |                             | 313       |
| Z V     | 628.744    | 70        |           | $1s^2 3s - 1s^2 4p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 313       |
| Z V     | 628.874    | 50        |           | $1s^2 3s - 1s^2 4p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 313       |
| Z V     | 713.518    | 85        |           | $1s^2 3p - 1s^2 4d$ | $^2P^o - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 313       |
| Z V     | 713.860    | 120       |           | $1s^2 3p - 1s^2 4d$ | $^2P^o - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 313       |
| Z V     | 748.195    | 120       |           | $1s^2 3d - 1s^2 4f$ | $^2D - ^2F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 313       |
| Z V     | 748.291    | 150       |           | $1s^2 3d - 1s^2 4f$ | $^2D - ^2F^o$ | $\frac{5}{2} - \frac{3}{2}$ | 313       |
| Z V     | 777.712    | 35        |           | $1s^2 3p - 1s^2 4s$ | $^2P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 313       |
| Z V     | 778.172    | 40        |           | $1s^2 3p - 1s^2 4s$ | $^2P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 313       |
| Z V     | 1048.20    | 40        |           | $1s^2 4d - 1s^2 6f$ | $^2D - ^2F^o$ |                             | 313       |
| Z V     | 1049.65    | 50        |           | $1s^2 4f - 1s^2 6g$ | $^2F^o - ^2G$ |                             | 313       |
| Z V     | 1238.821   | 1000      | 1         | $1s^2 2s - 1s^2 2p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 313       |
| Z V     | 1242.804   | 800       | 1         | $1s^2 2s - 1s^2 2p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 313       |
| Z V     | 1389.514   | 50        |           | $1s^2 4s - 1s^2 5p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 313       |
| Z V     | 1389.822   | 40        |           | $1s^2 4s - 1s^2 5p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 313       |
| Z V     | 1495.5     | 40        |           | $1s^2 5g - 1s^2 8f$ | $^2G - ^2F^o$ |                             | 313       |
| Z V     | 1548.67    | P         |           | $1s^2 4p - 1s^2 5d$ | $^2P^o - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 313       |
| Z V     | 1549.336   | 85        |           | $1s^2 4p - 1s^2 5d$ | $^2P^o - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 313       |
| Z V     | 1616.328   | 150       |           | $1s^2 4d - 1s^2 5f$ | $^2D - ^2F^o$ |                             | 313       |
| Z V     | 1619.688   | 250       |           | $1s^2 4f - 1s^2 5g$ | $^2F^o - ^2G$ |                             | 313       |
| Z V     | 1621.966   | 35        |           | $1s^2 4f - 1s^2 5d$ | $^2F^o - ^2D$ |                             | 313       |
| Z V     | 1655.922   | 40        |           | $1s^2 4d - 1s^2 5p$ | $^2D - ^2P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 313       |
| Z V     | 1702.25    | 50P       |           | $1s^2 4p - 1s^2 5s$ | $^2P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 313       |
| Z V     | 1703.218   | 60        |           | $1s^2 4p - 1s^2 5s$ | $^2P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 313       |
| Z V     | 1811.08    | 30        |           | $1s^2 5p - 1s^2 7d$ | $^2P^o - ^2D$ | $\frac{1}{2} -$             | 313       |
| Z V     | 1811.62    | 35        |           | $1s^2 5p - 1s^2 7d$ | $^2P^o - ^2D$ | $\frac{3}{2} -$             | 313       |
| Z V     | 1857.69    | 50        |           | $1s^2 5d - 1s^2 7f$ | $^2D - ^2F^o$ | $\frac{3}{2} -$             | 313       |
| Z V     | 1857.88    | 50        |           | $1s^2 5d - 1s^2 7f$ | $^2D - ^2F^o$ | $\frac{5}{2} -$             | 313       |
| Z V     | 1860.37    | 85        |           | $1s^2 5f - 1s^2 7g$ | $^2F^o - ^2G$ |                             | 313       |
| Z V     | 1882.36    | 30        |           | $1s^2 5p - 1s^2 7s$ | $^2P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 313       |
| Z V     | 1882.92    | 35        |           | $1s^2 5p - 1s^2 7s$ | $^2P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 313       |

N VI

## NITROGEN, Z = 7

N VI

Ground state  $1s^2\ ^1S_0$ Ionization potential  $4\ 452\ 800\ \text{cm}^{-1}$ ; 552.06 eV

| Element | Wavelength | Intensity | Multiplet | Configuration  | Term          | J - J | Reference |
|---------|------------|-----------|-----------|----------------|---------------|-------|-----------|
| N VI    | 23.771     | 10        |           | $1s^2 - 1s4p$  | $^1S - ^1P^o$ | 0-1   | 197,764   |
| N VI    | 24.898     | 30        |           | $1s^2 - 1s3p$  | $^1S - ^1P^o$ | 0-1   | 197,764   |
| N VI    | 28.787     | 100       |           | $1s^2 - 1s2p$  | $^1S - ^1P^o$ | 0-1   | 764       |
| N VI    | 29.084     |           |           | $1s^2 - 1s2p$  | $^1S - ^1P^o$ | 0-1   | 764       |
| N VI    | 97.4       | P         |           | $1s2s - 1s10p$ | $^1S - ^1P^o$ |       | 262       |
| N VI    | 98.3       | P         |           | $1s2s - 1s9p$  | $^1S - ^1P^o$ |       | 262       |
| N VI    | 99.5       | P         |           | $1s2s - 1s8p$  | $^1S - ^1P^o$ |       | 262       |
| N VI    | 101.46     | P         |           | $1s2s - 1s7p$  | $^1S - ^1P^o$ |       | 262       |
| N VI    | 102.6      | P         |           | $1s2p - 1s10d$ | $^1P^o - ^1D$ |       | 262       |
| N VI    | 103.6      | P         |           | $1s2p - 1s9d$  | $^1P^o - ^1D$ |       | 262       |
| N VI    | 104.58     | P         |           | $1s2s - 1s6p$  | $^1S - ^1P^o$ |       | 262       |
| N VI    | 105.0      | P         |           | $1s2p - 1s8d$  | $^1P^o - ^1D$ |       | 262       |
| N VI    | 107.15     | P         |           | $1s2p - 1s7d$  | $^1P^o - ^1D$ |       | 262       |
| N VI    | 110.23     |           |           | $1s2s - 1s5p$  | $^1S - ^1P^o$ |       | 262       |
| N VI    | 110.59     | P         |           | $1s2p - 1s6d$  | $^1P^o - ^1D$ |       | 262       |
| N VI    | 116.81     |           |           | $1s2p - 1s5d$  | $^1P^o - ^1D$ |       | 262       |
| N VI    | 122.44     |           |           | $1s2s - 1s4p$  | $^1S - ^1P^o$ |       | 262       |
| N VI    | 130.32     |           |           | $1s2p - 1s4d$  | $^1P^o - ^1D$ |       | 262       |
| N VI    | 161.22     |           |           | $1s2s - 1s3p$  | $^1S - ^1P^o$ |       | 262       |
| N VI    | 173.92     |           |           | $1s2p - 1s3d$  | $^1P^o - ^1D$ |       | 262       |
| N VI    | 1896.82    | 300       |           | $1s2s - 1s2p$  | $^1S - ^1P^o$ | 1-2   | 072       |
| N VI    | 1907.34    | 200       |           | $1s2s - 1s2p$  | $^1S - ^1P^o$ | 1-1   | 072       |
| N VI    | 1907.87    | 200       |           | $1s2s - 1s2p$  | $^1S - ^1P^o$ | 1-0   | 072       |

N VII

## NITROGEN, Z = 7

N VII

Ground state  $1s^2S_{1/2}$ Ionization potential  $5\,380\,089\text{ cm}^{-1}$ , 667.03 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term         | J - J   | Reference   |
|---------|------------|-----------|-----------|---------------|--------------|---------|-------------|
| Z VII   | 19.118     | P         |           | $1s-6p$       | $k^2S-^4P^o$ | $^1_2-$ | 309         |
| Z VII   | 19.361     | P         |           | $1s-5p$       | $k^2S-^4P^o$ | $^1_2-$ | 309         |
| Z VII   | 19.826     | P         |           | $1s-4p$       | $k^2S-^4P^o$ | $^1_2-$ | 309         |
| Z VII   | 20.910     | P         |           | $1s-3p$       | $k^2S-^4P^o$ | $^1_2-$ | 309         |
| Z VII   | 24.781     | 100P      |           | $1s-2p$       | $k^2S-^4P^o$ | $^1_2-$ | 309,197,764 |
| Z VII   | 80.25      | P         |           | 2-7           |              |         | 309         |
| Z VII   | 83.65      | P         |           | 2-6           |              |         | 309         |
| Z VII   | 88.51      | P         |           | 2-5           |              |         | 309         |
| Z VII   | 99.13      | P         |           | 2-4           |              |         | 309         |
| Z VII   | 133.82     | P         |           | 2-3           |              |         | 309         |
| Z VII   | 194.71     | P         |           | 3-8           |              |         | 309         |
| Z VII   | 204.98     | P         |           | 3-7           |              |         | 309         |
| Z VII   | 223.12     | P         |           | 3-6           |              |         | 309         |
| Z VII   | 261.45     | P         |           | 3-5           |              |         | 309         |
| Z VII   | 370.74     | P         |           | 4-9           |              |         | 309         |
| Z VII   | 382.45     | P         |           | 3-4           |              |         | 309         |
| Z VII   | 396.68     | P         |           | 4-8           |              |         | 309         |
| Z VII   | 441.75     | P         |           | 4-7           |              |         | 309         |
| Z VII   | 535.51     | P         |           | 4-6           |              |         | 309         |
| Z VII   | 619.84     | P         |           | 5-10          |              |         | 309         |
| Z VII   | 672.42     | P         |           | 5-9           |              |         | 309         |
| Z VII   | 762.88     | P         |           | 5-8           |              |         | 309         |
| Z VII   | 826.4      | P         |           | 4-5           |              |         | 309         |
| Z VII   | 949.1      | P         |           | 5-7           |              |         | 309         |
| Z VII   | 952.99     | P         |           | 6-11          |              |         | 309         |
| Z VII   | 1046.02    | P         |           | 6-10          |              |         | 309         |
| Z VII   | 1205.0     | P         |           | 6-9           |              |         | 309         |
| Z VII   | 1521.4     | P         |           | 5-6           |              |         | 309         |
| Z VII   | 1530.2     | P         |           | 6-8           |              |         | 309         |

OI

## OXYGEN, Z = 8

OI

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ Ionization potential 109 836.7 cm<sup>-1</sup>; 13.618 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term           | J - J | Reference   |
|---------|------------|-----------|-----------|------------------------------------|----------------|-------|-------------|
| O I     | 748.4      | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 6d$ | $K^3P - ^3P^o$ | 2-    | 165,250     |
| O I     | 749.3      | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 6d$ | $K^3P - ^3P^o$ | 1-    | 165,250     |
| O I     | 755.8      | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 5d$ | $K^3P - ^3P^o$ | 2-    | 165,250     |
| O I     | 756.7      | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 5d$ | $K^3P - ^3P^o$ | 1-    | 165,250     |
| O I     | 769.355    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 4d$ | $K^3P - ^3P^o$ | 2-1   | 165,250     |
| O I     | 769.411    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 4d$ | $K^3P - ^3P^o$ | 2-2   | 165,250     |
| O I     | 770.264    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 4d$ | $K^3P - ^3P^o$ | 1-0   | 165,250     |
| O I     | 770.294    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 4d$ | $K^3P - ^3P^o$ | 1-1   | 165,250     |
| O I     | 770.350    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 4d$ | $K^3P - ^3P^o$ | 1-2   | 165,250     |
| O I     | 770.698    | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 4d$ | $K^3P - ^3P^o$ | 0-1   | 165,250     |
| O I     | 791.514    | 50        |           | $2s^2 2p^4 - 2s^2 p^5$             | $K^3P - ^3P^o$ | 2-1   | 197,250,165 |
| O I     | 791.974    | 150       |           | $2s^2 2p^4 - 2s^2 p^5$             | $K^3P - ^3P^o$ | 2-2   | 197,250,165 |
| O I     | 792.233    | 50        |           | $2s^2 2p^4 - 2s^2 p^5$             | $K^3P - ^3P^o$ | 1-0   | 197,250,165 |
| O I     | 792.507    | 50        |           | $2s^2 2p^4 - 2s^2 p^5$             | $K^3P - ^3P^o$ | 1-1   | 197,250,165 |
| O I     | 792.938    | 150       |           | $2s^2 2p^4 - 2s^2 p^5$             | $K^3P - ^3P^o$ | 0-1   | 197,250,165 |
| O I     | 792.968    | 200       |           | $2s^2 2p^4 - 2s^2 p^5$             | $K^3P - ^3P^o$ | 1-2   | 197,165     |
| O I     | 810.667    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3d$ | $K^3P - ^3P^o$ | 2-1   | 165,250     |
| O I     | 811.052    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3d$ | $K^3P - ^3P^o$ | 2-2   | 165,250     |
| O I     | 811.501    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3d$ | $K^3P - ^3P^o$ | 1-0   | 165,250     |
| O I     | 811.710    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3d$ | $K^3P - ^3P^o$ | 1-1   | 165,250     |
| O I     | 812.096    | 75        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3d$ | $K^3P - ^3P^o$ | 1-2   | 165,250     |
| O I     | 812.158    | 75        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3d$ | $K^3P - ^3P^o$ | 0-1   | 165,250     |
| O I     | 850.74     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 7s$ | $^1D - ^1D^o$  | 2-2   | 165,250     |
| O I     | 861.63     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 6s$ | $^1D - ^1D^o$  | 2-2   | 165,250     |
| O I     | 877.802    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4P^o) 3s$ | $K^3P - ^3P^o$ | 2-1   | 197,250,165 |
| O I     | 877.882    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4P^o) 3s$ | $K^3P - ^3P^o$ | 2-2   | 197,250,165 |
| O I     | 878.976    | 75        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4P^o) 3s$ | $K^3P - ^3P^o$ | 1-0   | 197,165     |
| O I     | 879.023    | 70        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4P^o) 3s$ | $K^3P - ^3P^o$ | 1-1   | 197,165     |
| O I     | 879.104    | 80        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4P^o) 3s$ | $K^3P - ^3P^o$ | 1-2   | 197,165     |
| O I     | 879.554    | 75        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4P^o) 3s$ | $K^3P - ^3P^o$ | 0-1   | 197,165     |
| O I     | 882.88     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 5s$ | $^1D - ^1D^o$  | 2-2   | 165,250     |
| O I     | 922.011    | P         | 8         | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3d$ | $^1D - ^1F^o$  | 2-3   | 165,488     |
| O I     | 929.517    | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 7d$ | $K^3P - ^3D^o$ | 2-    | 165         |
| O I     | 930.889    | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 7d$ | $K^3P - ^3D^o$ | 1-    | 165         |
| O I     | 931.479    | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 7d$ | $K^3P - ^3D^o$ | 0-    | 165         |
| O I     | 935.183    | 400       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 4s$ | $^1D - ^1D^o$  | 2-2   | 063,165     |
| O I     | 936.630    | 150       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 6d$ | $K^3P - ^3D$   | 2-    | 165,335     |
| O I     | 937.841    | 150       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 7s$ | $K^3P - ^3S^o$ | 2-1   | 165,335     |
| O I     | 938.022    | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 6d$ | $K^3P - ^3D^o$ | 1-    | 165         |
| O I     | 938.621    | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 6d$ | $K^3P - ^3D$   | 0-    | 165         |
| O I     | 939.237    | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 7s$ | $K^3P - ^3S^o$ | 1-1   | 165         |
| O I     | 939.837    | P         |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 7s$ | $K^3P - ^3S^o$ | 0-1   | 165         |
| O I     | 948.6867   | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 5d$ | $K^3P - ^3D^o$ | 2-    | 197,335,165 |
| O I     | 950.1134   | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 5d$ | $K^3P - ^3D^o$ | 1-    | 197,335,165 |
| O I     | 950.7340   | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 5d$ | $K^3P - ^3D^o$ | 0-    | 197,165     |
| O I     | 950.8845   | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 6s$ | $K^3P - ^3S^o$ | 2-1   | 197,335,165 |
| O I     | 952.3179   | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 6s$ | $K^3P - ^3S^o$ | 1-1   | 197,335,165 |
| O I     | 952.9414   | 80        |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 6s$ | $K^3P - ^3S^o$ | 0-1   | 197,335,165 |
| O I     | 971.7376   | 400       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 4d$ | $K^3P - ^3D^o$ | 2-    | 197,335,165 |
| O I     | 973.2346   | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 4d$ | $K^3P - ^3D^o$ | 1-    | 197,335,165 |
| O I     | 973.8857   | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 4d$ | $K^3P - ^3D^o$ | 0-    | 197,335,165 |
| O I     | 976.4480   | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 5s$ | $K^3P - ^3S^o$ | 2-1   | 197,335,165 |
| O I     | 977.9595   | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 5s$ | $K^3P - ^3S^o$ | 1-1   | 197,335,165 |
| O I     | 978.6170   | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 (^4S^o) 5s$ | $K^3P - ^3S^o$ | 0-1   | 197,335,165 |
| O I     | 988.581    | 100       | 5         | $2s^2 2p^4 - 2s^2 2p^4 (^4D^o) 3s$ | $K^3P - ^3D^o$ | 2-1   | 165,250     |

O I

O I

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J - J | Reference   |
|---------|------------|-----------|-----------|----------------------------------|----------------|-------|-------------|
| O I     | 988.6548   | 300       | 5         | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $K^1P - ^3D^o$ | 2-2   | 197,250,165 |
| O I     | 988.7733   | 400       | 5         | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $K^1P - ^3D^o$ | 2-3   | 197,250,165 |
| O I     | 990.1270   | 300       | 5         | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $K^1P - ^3D^o$ | 1-1   | 197,250,165 |
| O I     | 990.2044   | 300       | 5         | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $K^1P - ^3D^o$ | 1-2   | 197,250,165 |
| O I     | 990.8010   | 100       | 5         | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $K^1P - ^3D^o$ | 0-1   | 197,250,165 |
| O I     | 999.493    | 200       | 7         | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3s$ | $^1D - ^1P^o$  | 2-1   | 165,488     |
| O I     | 1025.7616  | 450       | 4         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$ | $K^1P - ^3D^o$ | 2-    | 197,488     |
| O I     | 1027.4309  | 400       | 4         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$ | $K^1P - ^3D^o$ | 1-    | 197,488     |
| O I     | 1028.1571  | 350       | 4         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$ | $K^1P - ^3D^o$ | 0-1   | 197,488     |
| O I     | 1039.2303  | 400       | 3         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4s$ | $K^1P - ^3S^o$ | 2-1   | 197,488     |
| O I     | 1040.9427  | 400       | 3         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4s$ | $K^1P - ^3S^o$ | 1-1   | 197,488     |
| O I     | 1041.6476  | 400       | 3         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4s$ | $K^1P - ^3S^o$ | 0-1   | 197,488     |
| O I     | 1152.152   | 250       | 6         | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $^1D - ^1D^o$  | 2-2   | 197,488     |
| O I     | 1217.643   | 100       | 9         | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3s$ | $^1S - ^1P^o$  | 0-1   | 197,488     |
| O I     | 1302.1686  | 500       | 2         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$ | $K^1P - ^3S^o$ | 2-1   | 308,488     |
| O I     | 1304.8575  | 500       | 2         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$ | $K^1P - ^3S^o$ | 1-1   | 308,488     |
| O I     | 1306.0286  | 450       | 2         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$ | $K^1P - ^3S^o$ | 0-1   | 308,488     |
| O I     | 1355.5975  | 400       | 1         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$ | $K^1P - ^3S^o$ | 2-2   | 197,488     |
| O I     | 1358.5125  | 250       | 1         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$ | $K^1P - ^3S^o$ | 1-2   | 197,488     |

O II

## OXYGEN, Z = 8

O II

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ Ionization potential 283 244  $\text{cm}^{-1}$ ; 35.117 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term                 | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------------|-----------------------------|-----------|
| O II    | 376.693    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)5d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 376.745    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)5d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 377.045    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)5d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 391.912    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O II    | 391.943    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 392.002    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $g^4S^{\circ} - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 392.322    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $g^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 403.035    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 403.087    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 403.273    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 403.372    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 418.598    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 418.812    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)5d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 424.577    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4d$ | $^1P^{\circ} - ^1S$  | $-\frac{1}{2}$              | 168       |
| O II    | 425.273    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4d$ | $^1P^{\circ} - ^1P$  | $-\frac{1}{2}$              | 168       |
| O II    | 426.526    | 50d       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4d$ | $^1P^{\circ} - ^1D$  |                             | 168       |
| O II    | 429.557    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $g^4S^{\circ} - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 429.647    | 250       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 429.716    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O II    | 429.918    | 250       | 3         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488   |
| O II    | 430.041    | 300       | 3         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O II    | 430.177    | 300       | 3         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O II    | 436.510    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 436.649    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 437.332    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 437.683    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 440.552    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 440.598    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O II    | 442.001    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 442.048    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 443.681    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)5d$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 445.601    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 445.638    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 456.997    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)4s$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 458.422    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)5s$ | $^1P^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 464.194    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 464.310    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1P^{\circ} - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O II    | 464.785    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1P^{\circ} - ^1S$  | $-\frac{1}{2}$              | 168       |
| O II    | 465.529    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1P^{\circ} - ^1P$  | $-\frac{1}{2}$              | 168       |
| O II    | 465.760    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4d$ | $^1P^{\circ} - ^1P$  | $-\frac{3}{2}$              | 168       |
| O II    | 467.926    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)4s$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 468.766    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1P^{\circ} - ^1P$  |                             | 168       |
| O II    | 470.408    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3d$ | $^1P^{\circ} - ^1D$  |                             | 168       |
| O II    | 481.587    | 200b      | 10        | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O II    | 481.635    | 10        | 10        | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 481.704    | 50        | 10        | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 481.755    | 150       | 10        | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O II    | 483.752    | 200       | 9         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 168,488   |
| O II    | 483.976    | 250       | 9         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O II    | 484.025    | 100       | 9         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 485.086    | 300       | 8         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O II    | 485.465    | 10        | 8         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 485.515    | 250       | 8         | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O II    | 485.572    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O II    | 485.631    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term               | J - J                       | Reference   |
|---------|------------|-----------|-----------|---------------------------------------|--------------------|-----------------------------|-------------|
| O II    | 499.871    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^1P)4s$        | $^1P^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O II    | 500.343    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^1P)4s$        | $^1P^\circ - ^1P$  | $-\frac{1}{2}$              | 168         |
| O II    | 515.498    | 250       | 17        | $2s^2 2p^3 - 2s^2 2p^4(^1P)3d$        | $^1P^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 515.640    | 200       | 17        | $2s^2 2p^3 - 2s^2 2p^4(^1P)3d$        | $^1P^\circ - ^1D$  | $-\frac{3}{2}$              | 168,488     |
| O II    | 517.937    | 200       | 16        | $2s^2 2p^3 - 2s^2 2p^4(^1P)3d$        | $^1P^\circ - ^1P$  | $-\frac{1}{2}$              | 168,488     |
| O II    | 518.242    | 250       | 16        | $2s^2 2p^3 - 2s^2 2p^4(^1P)3d$        | $^1P^\circ - ^1P$  | $-\frac{3}{2}$              | 168,488     |
| O II    | 537.830    | 450       | 7         | $2s^2 2p^3 - 2s^2 2p^4$               | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| O II    | 538.256    | 500       | 7         | $2s^2 2p^3 - 2s^2 2p^4$               | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 538.318    | 350       | 7         | $2s^2 2p^3 - 2s^2 2p^4$               | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 539.086    | 400       | 2         | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $g^4S^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 539.547    | 400       | 2         | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $g^4S^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 539.853    | 350       | 2         | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $g^4S^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| O II    | 555.056    | 250       | 6         | $2s^2 2p^3 - 2s^2 2p^4(^1D)3s$        | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 555.121    | 250       | 6         | $2s^2 2p^3 - 2s^2 2p^4(^1D)3s$        | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 580.400    | 300       | 15        | $2s^2 2p^3 - 2s^2 2p^4$               | $^1P^\circ - ^1P$  | $-\frac{1}{2}$              | 168,488     |
| O II    | 580.967    | 350       | 15        | $2s^2 2p^3 - 2s^2 2p^4$               | $^1P^\circ - ^1P$  | $-\frac{3}{2}$              | 168,488     |
| O II    | 600.585    | 300       | 14        | $2s^2 2p^3 - 2s^2 2p^4(^1D)3s$        | $^1P^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 616.291    | 350       | 5         | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 616.363    | 200       | 5         | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 617.051    | 300       | 5         | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| O II    | 644.148    | 600       | 13        | $2s^2 2p^3 - 2s^2 2p^4$               | $^1P^\circ - ^1S$  | $-\frac{1}{2}$              | 197,168,488 |
| O II    | 672.948    | 400       | 12        | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $^1P^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O II    | 673.768    | 350       | 12        | $2s^2 2p^3 - 2s^2 2p^4(^1P)3s$        | $^1P^\circ - ^1P$  | $-\frac{1}{2}$              | 168,488     |
| O II    | 718.484    | 850       | 4         | $2s^2 2p^3 - 2s^2 2p^4$               | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O II    | 718.562    | 800       | 4         | $2s^2 2p^3 - 2s^2 2p^4$               | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O II    | 739.949    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S)3s$        | $^1P - ^1S^\circ$  | $\frac{3}{2} - \frac{3}{2}$ | 175         |
| O II    | 740.838    | 10        |           | $2s^2 2p^4 - 2s^2 2p^4(^1S)3s$        | $^1P - ^1S^\circ$  | $\frac{3}{2} - \frac{3}{2}$ | 175         |
| O II    | 741.293    | 1         |           | $2s^2 2p^4 - 2s^2 2p^4(^1S)3s$        | $^1P - ^1S^\circ$  | $\frac{1}{2} - \frac{3}{2}$ | 175         |
| O II    | 796.661    | 500       | 11        | $2s^2 2p^3 - 2s^2 2p^4$               | $^1P^\circ - ^1D$  |                             | 197,168,488 |
| O II    | 832.762    | 700       | 1         | $2s^2 2p^3 - 2s^2 2p^4$               | $g^4S^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| O II    | 833.332    | 750       | 1         | $2s^2 2p^3 - 2s^2 2p^4$               | $g^4S^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O II    | 834.467    | 750       | 1         | $2s^2 2p^3 - 2s^2 2p^4$               | $g^4S^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O II    | 1957.42    | 10        |           | $2s^2 2p^3(^1P)3p - 2s^2 2p^3(^1P)5s$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 036,487     |
| O II    | 1960.34    | 100       |           | $2s^2 2p^3(^1P)3p - 2s^2 2p^3(^1P)5s$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 036,487     |
| O II    | 1962.24    | 300       |           | $2s^2 2p^3(^1P)3p - 2s^2 2p^3(^1P)5s$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 036,487     |
| O II    | 1963.84    | 200       |           | $2s^2 2p^3(^1P)3p - 2s^2 2p^3(^1P)5s$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 036,487     |
| O II    | 1964.35    | 10        |           | $2s^2 2p^3(^1P)3p - 2s^2 2p^3(^1P)5s$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 036,487     |



Ground state  $1s^2 2s^2 2p^4 \ ^3P_0$ Ionization potential  $442\,807\text{ cm}^{-1}$ ;  $54.900\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J - J | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-------|-----------|
| O III   | 226.038    | 50d       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4p$   | $K^3P - ^3D^0$ | 2-3   | 168,771   |
| O III   | 228.893    | 10        |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4p$   | $K^3P - ^3S^0$ | 1-1   | 168       |
| O III   | 228.988    | 10        |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4p$   | $K^3P - ^3S^0$ | 2-1   | 168       |
| C III   | 236.710    | 50d       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4p$   | $^1D - ^3D^0$  | 2-3   | 168,487   |
| O III   | 240.979    | 100d      |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 6d$ | $K^3P - ^3D^0$ | 1-2   | 168       |
| O III   | 241.037    | 100d      |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 6d$ | $K^3P - ^3D^0$ | 2-3   | 168       |
| O III   | 241.819    | 50        |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 5d$   | $^3S^0 - ^3P$  | 2-2   | 168       |
| O III   | 241.875    | 50        |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 5d$   | $^3S^0 - ^3P$  | 2-3   | 168       |
| O III   | 244.049    | 100d      |           | $2s^2 2p^2 - 2s 2p^3 (^3D) 3p$   | $^1D - ^1P^0$  | 2-1   | 168       |
| O III   | 246.265    | 150       |           | $2s^2 2p^2 - 2s 2p^3 (^3D) 3p$   | $^1D - ^1D^0$  | 2-2   | 168       |
| O III   | 247.080    | 50        |           | $2s^2 2p^2 - 2s 2p^3 (^3D) 3p$   | $^1D - ^1F^0$  | 2-3   | 168       |
| O III   | 248.320    | 50d       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 7d$ | $^1D - ^1F^0$  | 2-3   | 168       |
| O III   | 248.538    | 50        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5d$ | $K^3P - ^3D^0$ | 0     | 168       |
| O III   | 248.574    | 60        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5d$ | $K^3P - ^3D^0$ | 1-2   | 168       |
| O III   | 248.618    | 100       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5d$ | $K^3P - ^3D^0$ | 2-3   | 168       |
| O III   | 253.548    | 10        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 6d$ | $^1D - ^1D^0$  | 2-2   | 168       |
| O III   | 255.044    | 10        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5s$ | $K^3P - ^3P^0$ | 1-2   | 168       |
| O III   | 255.158    | 50        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5s$ | $K^3P - ^3P^0$ | 2-2   | 168       |
| O III   | 255.302    | 10        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5s$ | $K^3P - ^3P^0$ | 2-1   | 168       |
| O III   | 256.425    | 100       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4d$   | $^3S^0 - ^3P$  | 2-1   | 168       |
| O III   | 256.460    | 150       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4d$   | $^3S^0 - ^3P$  | 2-2   | 168       |
| O III   | 256.506    | 150       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4d$   | $^3S^0 - ^3P$  | 2-3   | 168       |
| O III   | 261.027    | 200d      |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5d$ | $^1D - ^1F^0$  | 2-3   | 168       |
| O III   | 262.113    | 100       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5d$ | $^1D - ^1D^0$  | 2-2   | 168       |
| O III   | 262.289    | 10        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5d$ | $^1D - ^1F^0$  | 2-2   | 168       |
| O III   | 262.729    | 10        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3P^0$ | 1-2   | 168       |
| O III   | 262.882    | 50        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3P^0$ | 2-2   | 168       |
| O III   | 263.692    | 150       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3D^0$ | 0-1   | 168       |
| O III   | 263.728    | 200       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3D^0$ | 1-2   | 168       |
| O III   | 263.768    | 150       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3D^0$ | 1-1   | 168       |
| O III   | 263.818    | 250       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3D^0$ | 2-3   | 168       |
| O III   | 263.861    | 150       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3D^0$ | 2-2   | 168       |
| O III   | 263.903    | 10        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $K^3P - ^3D^0$ | 2-1   | 168       |
| O III   | 264.257    | 200       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3P^0$ | 0-1   | 168       |
| O III   | 264.338    | 250d      |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3P^0$ | 1-1   | 168       |
| O III   | 264.480    | 300       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3P^0$ | 2-2   | 168       |
| O III   | 266.967    | 250b      |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3D^0$ | 0-1   | 168       |
| O III   | 266.985    | 350       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3D^0$ | 1-2   | 168       |
| O III   | 267.030    | 350       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3D^0$ | 2-3   | 168       |
| O III   | 267.050    | 150       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3D^0$ | 1-1   | 168       |
| O III   | 267.121    | 200       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3D^0$ | 2-2   | 168       |
| O III   | 268.451    | 50d       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5s$ | $^1D - ^1P^0$  | 2-1   | 168       |
| O III   | 271.403    | 50        |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4s$   | $^3S^0 - ^3P$  | 2-3   | 168       |
| O III   | 271.523    | 50        |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4s$   | $^3S^0 - ^3P$  | 2-2   | 168       |
| O III   | 271.611    | 10        |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 4s$   | $^3S^0 - ^3P$  | 2-1   | 168       |
| O III   | 275.281    | 100       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3S^0$ | 0-1   | 168       |
| O III   | 275.366    | 150       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3S^0$ | 1-1   | 168       |
| O III   | 275.513    | 200       |           | $2s^2 2p^2 - 2s 2p^3 (^4P) 3p$   | $K^3P - ^3S^0$ | 2-1   | 168       |
| O III   | 277.385    | 350       | 12        | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $^1D - ^1F^0$  | 2-3   | 168,488   |
| O III   | 277.514    | 50        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 5d$ | $^1S - ^1P^0$  | 0-1   | 168       |
| O III   | 279.787    | 150       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $^1D - ^1D^0$  | 2-2   | 168       |
| O III   | 280.030    | 100       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4d$ | $^1D - ^1F^0$  | 2-2   | 168       |
| O III   | 280.116    | 50        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4s$ | $K^3P - ^3P^0$ | 1-2   | 168       |
| O III   | 280.234    | 50        |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4s$ | $K^3P - ^3P^0$ | 0-1   | 168       |
| O III   | 280.265    | 150       |           | $2s^2 2p^2 - 2s^2 2p (^4P^0) 4s$ | $K^3P - ^3P^0$ | 2-2   | 168       |

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term           | J-J | Reference   |
|---------|------------|-----------|-----------|--------------------------------|----------------|-----|-------------|
| O III   | 280.328    | 50        |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)4s$ | $g^3P - ^1P^o$ | 1-1 | 168         |
| O III   | 280.412    | 50        |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)4s$ | $g^3P - ^1P^o$ | 1-0 | 168         |
| O III   | 280.483    | 50        |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)4s$ | $g^3P - ^1P^o$ | 2-1 | 168         |
| O III   | 286.038    | 10        |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)5s$ | $^1S - ^1P^o$  | 0-1 | 168         |
| O III   | 295.511    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)4s$ | $^1D - ^1P^o$  | 2-1 | 168         |
| O III   | 295.619    | 250       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1S^o - ^1P$  | 2-1 | 168         |
| O III   | 295.657    | 300       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1S^o - ^1P$  | 2-2 | 168         |
| O III   | 295.716    | 300       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1S^o - ^1P$  | 2-3 | 168         |
| O III   | 295.944    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)4d$ | $^1S - ^1P^o$  | 0-1 | 168         |
| O III   | 296.012    | 200       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1S^o - ^1D$  | 2-3 | 168         |
| O III   | 296.270    | 50d       |           | $2s^2 2p^2 - 2s^2 2p(^1D)3d$   | $^1D^o - ^1P$  |     | 168         |
| O III   | 299.275    | 100d      |           | $2s^2 2p^2 - 2s^2 2p(^1D)3d$   | $^1D^o - ^1D$  |     | 168         |
| O III   | 300.455    | 150d      |           | $2s^2 2p^2 - 2s^2 2p(^1D)3d$   | $^1D^o - ^1F$  |     | 168         |
| O III   | 303.411    | 350       | 6         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1P^o$ | 0-1 | 168,488     |
| O III   | 303.460    | 350       | 6         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1P^o$ | 1-0 | 168,488     |
| O III   | 303.515    | 350       | 6         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1P^o$ | 1-1 | 168,488     |
| O III   | 303.621    | 350       | 6         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1P^o$ | 1-2 | 168,488     |
| O III   | 303.693    | 350       | 6         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1P^o$ | 2-1 | 168,488     |
| O III   | 303.799    | 450       | 6         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1P^o$ | 2-2 | 168,488     |
| O III   | 305.596    | 400       | 5         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1D^o$ | 0-1 | 168,488     |
| O III   | 305.656    | 450       | 5         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1D^o$ | 1-2 | 168,488     |
| O III   | 305.703    | 400       | 5         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1D^o$ | 1-1 | 168,488     |
| O III   | 305.769    | 500       | 5         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1D^o$ | 2-3 | 168,488     |
| O III   | 305.836    | 400       | 5         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1D^o$ | 2-2 | 168,488     |
| O III   | 305.879    | 200       | 5         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1D^o$ | 2-1 | 168,488     |
| O III   | 308.051    | 50        |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1D^o$ | 1-2 | 168         |
| O III   | 308.306    | 100       |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $g^3P - ^1F^o$ | 2-3 | 168         |
| O III   | 316.967    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)4s$ | $^1S - ^1P^o$  | 0-1 | 168         |
| O III   | 317.265    | 50d       |           | $2s^2 2p^2 - 2s^2 2p(^1D)3d$   | $^1P^o - ^1P$  |     | 168         |
| O III   | 319.996    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $^1D - ^1P^o$  | 2-1 | 168         |
| O III   | 320.720    | 100d      |           | $2s^2 2p^2 - 2s^2 2p(^1D)3d$   | $^1P^o - ^1D$  |     | 168         |
| O III   | 320.979    | 600       | 11        | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $^1D - ^1F^o$  | 2-3 | 197,168,488 |
| O III   | 328.448    | 500       | 10        | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $^1D - ^1D^o$  | 2-2 | 168,488     |
| O III   | 328.742    | 450       |           | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $^1D - ^1F^o$  | 2-2 | 168         |
| O III   | 345.309    | 500       | 15        | $2s^2 2p^2 - 2s^2 2p(^1P^o)3d$ | $^1S - ^1P^o$  | 0-1 | 168,488     |
| O III   | 349.825    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1D$  | 3-3 | 168         |
| O III   | 349.918    | 100       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1D$  | 2-2 | 168         |
| O III   | 349.961    | 50        |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1D$  | 1-1 | 168         |
| O III   | 355.137    | 300       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1F$  | 3-4 | 168         |
| O III   | 355.293    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1F$  | 3-3 | 168         |
| O III   | 355.333    | 250       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1F$  | 2-3 | 168         |
| O III   | 355.469    | 250       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1F$  | 1-2 | 168         |
| O III   | 356.558    | 10        |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1P$  | 1-0 | 168         |
| O III   | 356.625    | 50        |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1P$  | 2-1 | 168         |
| O III   | 356.725    | 100       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1P$  | 3-2 | 168         |
| O III   | 356.768    | 10        |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1D^o - ^1P$  | 2-2 | 168         |
| O III   | 359.016    | 400       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3s$   | $^1S^o - ^1P$  | 2-3 | 168         |
| O III   | 359.223    | 400       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3s$   | $^1S^o - ^1P$  | 2-2 | 168         |
| O III   | 359.384    | 350       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3s$   | $^1S^o - ^1P$  | 2-1 | 168         |
| O III   | 364.739    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1D)3s$   | $^1D^o - ^1D$  | 3-3 | 168         |
| O III   | 364.867    | 100       |           | $2s^2 2p^2 - 2s^2 2p(^1D)3s$   | $^1D^o - ^1D$  | 2-2 | 168         |
| O III   | 364.940    | 50        |           | $2s^2 2p^2 - 2s^2 2p(^1D)3s$   | $^1D^o - ^1D$  | 1-1 | 168         |
| O III   | 373.805    | 400       | 4         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3s$ | $g^3P - ^1P^o$ | 1-2 | 168,488     |
| O III   | 374.005    | 400       | 4         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3s$ | $g^3P - ^1P^o$ | 0-1 | 168,488     |
| O III   | 374.075    | 500       | 4         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3s$ | $g^3P - ^1P^o$ | 2-2 | 168,488     |
| O III   | 374.165    | 400       | 4         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3s$ | $g^3P - ^1P^o$ | 1-1 | 168,488     |
| O III   | 374.331    | 400       | 4         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3s$ | $g^3P - ^1P^o$ | 1-0 | 168,488     |
| O III   | 374.436    | 400       | 4         | $2s^2 2p^2 - 2s^2 2p(^1P^o)3s$ | $g^3P - ^1P^o$ | 2-1 | 168,488     |
| O III   | 379.505    | 200       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1P^o - ^1D$  | 2-3 | 168         |
| O III   | 379.575    | 150       |           | $2s^2 2p^2 - 2s^2 2p(^1P)3d$   | $^1P^o - ^1D$  | -2  | 168         |

## O III

## O III

| Element | Wavelength | Intensity | Multiplet | Configuration              | Term             | J-J | Reference   |
|---------|------------|-----------|-----------|----------------------------|------------------|-----|-------------|
| O III   | 379.631    | 100       |           | $2s2p^3 - 2s2p^2(^4P)3d$   | $^4P^o - ^4D$    | -1  | 168         |
| O III   | 382.214    | 50d       |           |                            |                  |     | 168         |
| O III   | 382.903    | 50d       |           |                            |                  |     | 168         |
| O III   | 387.398    | 100       |           | $2s2p^3 - 2s2p^2(^4P)3d$   | $^4P^o - ^4P$    | 1-0 | 168         |
| O III   | 387.482    | 150       |           | $2s2p^3 - 2s2p^2(^4P)3d$   | $^4P^o - ^4P$    | -1  | 168         |
| O III   | 387.639    | 200       |           | $2s2p^3 - 2s2p^2(^4P)3d$   | $^4P^o - ^4P$    | 2-2 | 168         |
| O III   | 395.558    | 600       | 9         | $2s2p^3 - 2s^22p(^4P^o)3s$ | $^1D - ^1P^o$    | 2-1 | 197,168,488 |
| O III   | 397.120    | 100       |           | $2s2p^3 - 2s2p^2(^4D)3s$   | $^4P^o - ^4D$    | 2-3 | 168         |
| O III   | 397.231    | 50        |           | $2s2p^3 - 2s2p^2(^4D)3s$   | $^4P^o - ^4D$    | 1-2 | 168         |
| O III   | 397.310    | 10        |           | $2s2p^3 - 2s2p^2(^4D)3s$   | $^4P^o - ^4D$    | 0-1 | 168         |
| O III   | 434.256    | 200       |           | $2s2p^3 - 2s2p^2(^4P)3s$   | $^3D^o - ^3P$    | 3-2 | 168         |
| O III   | 434.646    | 150       |           | $2s2p^3 - 2s2p^2(^4P)3s$   | $^3D^o - ^3P$    | 2-1 | 168         |
| O III   | 434.840    | 100       |           | $2s2p^3 - 2s2p^2(^4P)3s$   | $^3D^o - ^3P$    | 1-0 | 168         |
| O III   | 434.975    | 500       | 14        | $2s2p^3 - 2s^22p(^4P^o)3s$ | $^1S - ^1P^o$    | 0-1 | 168,488     |
| O III   | 480.955    | 200       |           | $2s2p^3 - 2s2p^2(^4P)3s$   | $^4P^o - ^4P$    | 2-2 | 168         |
| O III   | 481.354    | 150       |           | $2s2p^3 - 2s2p^2(^4P)3s$   | $^4P^o - ^4P$    | -1  | 168         |
| O III   | 481.381    | 100       |           | $2s2p^3 - 2s2p^2(^4P)3s$   | $^4P^o - ^4P$    | 0-1 | 168         |
| O III   | 481.587    | 200b      |           | $2s2p^3 - 2s2p^2(^4P)3s$   | $^4P^o - ^4P$    | 1-0 | 168         |
| O III   | 491.714    | 10        |           | $2s2p^3 - 2s2p^2(^4P)3d$   | $^4S^o - ^4P$    | 1-1 | 168         |
| O III   | 491.980    | 50        |           | $2s2p^3 - 2s2p^2(^4P)3d$   | $^4S^o - ^4P$    | 1-2 | 168         |
| O III   | 507.391    | 800       | 3         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4S^o$   | 0-1 | 197,168,488 |
| O III   | 507.683    | 850       | 3         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4S^o$   | 1-1 | 197,168,488 |
| O III   | 508.182    | 900       | 3         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4S^o$   | 2-1 | 197,168,488 |
| O III   | 525.795    | 900       | 8         | $2s^22p^3 - 2s2p^3$        | $^1D - ^1P^o$    | 2-1 | 197,168,488 |
| O III   | 554.275    | 10        |           | $2s2p^3 - 2s^22p(^4P^o)3p$ | $^3D^o - ^3P$    | 3-2 | 175         |
| O III   | 574.065    | 1         |           | $2s2p^3 - 2s^22p(^4P^o)3p$ | $^3D^o - ^3D$    | 3-3 | 175         |
| O III   | 597.818    | 750       | 13        | $2s^22p^3 - 2s2p^3$        | $^1S - ^1P^o$    | 0-1 | 197,168,488 |
| O III   | 599.598    | 900       | 7         | $2s^22p^3 - 2s2p^3$        | $^1D - ^1D^o$    | 2-2 | 197,168,488 |
| O III   | 609.705    | 300       | 16        | $2s2p^3 - 1s^22p^4$        | $^3D^o - ^3P$    | 1-0 | 168,488     |
| O III   | 610.043    | 350       | 16        | $2s2p^3 - 1s^22p^4$        | $^3D^o - ^3P$    | 2-1 | 168,488     |
| O III   | 610.746    | 400       | 16        | $2s2p^3 - 1s^22p^4$        | $^3D^o - ^3P$    | 3-2 | 168,488     |
| O III   | 610.850    | 300       | 16        | $2s2p^3 - 1s^22p^4$        | $^3D^o - ^3P$    | 2-2 | 168,488     |
| O III   | 658.578    | 50        |           | $2s2p^3 - 2s^22p(^4P^o)3p$ | $^4P^o - ^4D$    | 2-3 | 175         |
| O III   | 659.538    | 10        |           | $2s2p^3 - 2s^22p(^4P^o)3p$ | $^4P^o - ^4D$    | 1-2 | 175         |
| O III   | 702.332    | 800       | 2         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4P^o$   | 0-1 | 197,168,488 |
| O III   | 702.822    | 800       | 2         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4P^o$   | 1-0 | 197,168,488 |
| O III   | 702.899    | 850       | 2         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4P^o$   | 1-  | 197,168,488 |
| O III   | 703.850    | 900       | 2         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4P^o$   | 2-  | 197,168,488 |
| O III   | 705.762    | 100       |           | $2s2p^3 - 1s^22p^4$        | $^4P^o - ^4P$    | 1-0 | 168         |
| O III   | 706.224    | 150       |           | $2s2p^3 - 1s^22p^4$        | $^4P^o - ^4P$    | -1  | 168         |
| O III   | 706.298    | 100       |           | $2s2p^3 - 1s^22p^4$        | $^4P^o - ^4P$    | 0-1 | 168         |
| O III   | 707.315    | 200       |           | $2s2p^3 - 1s^22p^4$        | $^4P^o - ^4P$    | -2  | 168         |
| O III   | 752.762    | 200       |           | $2s2p^3 - 1s^22p^4$        | $^4P^o - ^4S$    | 1-0 | 168         |
| O III   | 832.927    | 700       | 1         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4D^o$   | 0-1 | 197,168,488 |
| O III   | 833.742    | 800       | 1         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4D^o$   | 1-2 | 197,168,488 |
| O III   | 835.096    | 700       | 1         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4D^o$   | 2-2 | 197,168,488 |
| O III   | 835.292    | 800       | 1         | $2s^22p^3 - 2s2p^3$        | $g^4P - ^4D^o$   | 2-3 | 197,168,488 |
| O III   | 898.957    | 400       | 17        | $2s2p^3 - 1s^22p^4$        | $^1D^o - ^1D$    | 2-2 | 168,488     |
| O III   | 1138.545   | 100       |           | $2s2p^3 - 1s^22p^4$        | $^1P^o - ^1D$    | 1-2 | 168         |
| O III   | 1149.603   | 50        |           | $2s2p^3 - 1s^22p^4$        | $^4S^o - ^4P$    | 1-0 | 168         |
| O III   | 1150.882   | 100       |           | $2s2p^3 - 1s^22p^4$        | $^4S^o - ^4P$    | 1-1 | 168         |
| O III   | 1153.773   | 150       |           | $2s2p^3 - 1s^22p^4$        | $^4S^o - ^4P$    | 1-2 | 168         |
| O III   | 1476.89    | 600       |           | $2s^22p3p - 2s^22p4s$      | $^1P - ^1P^o$    | 1-1 | 072         |
| O III   | 1584.45    | 400       |           | $2s^22p3p - 2s^22p4s$      | $^3D - ^3P^o$    | 2-2 | 072         |
| O III   | 1587.87    | 400       |           | $2s^22p3p - 2s^22p4s$      | $^3D - ^3P^o$    | 1-1 | 072         |
| O III   | 1590.01    | 800       |           | $2s^22p3p - 2s^22p4s$      | $^3D - ^3P^o$    | 3-2 | 072         |
| O III   | 1590.61    | 400       |           | $2s^22p3p - 2s^22p4s$      | $^3D - ^3P^o$    | 1-0 | 072         |
| O III   | 1591.33    | 600       |           | $2s^22p3p - 2s^22p4s$      | $^3D - ^3P^o$    | 2-1 | 072         |
| O III   | 1679.06    | 400       |           | $2s^22p3p - 2s^22p4s$      | $^4S - ^4P^o$    | 1-2 | 072         |
| O III   | 1760.12    | 700       |           | $2s^22p3d - 2s^22p4f$      | $^4F^o - G[7/2]$ | 3-4 | 072         |

O III

O III

| Element | Wavelength | Intensity | Multiplet | Configuration               | Term                     | J - J | Reference |
|---------|------------|-----------|-----------|-----------------------------|--------------------------|-------|-----------|
| O III   | 1760.42    | 500       |           | $2s^2 2p^3 p - 2s^2 2p^4 s$ | $^3P - ^3P^o$            | 1-2   | 072       |
| O III   | 1763.22    | 700       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - G[\frac{7}{2}]$ | 2-3   | 072       |
| O III   | 1764.48    | 700       |           | $2s^2 2p^3 p - 2s^2 2p^4 s$ | $^3P - ^3P^o$            | 2-2   | 072       |
| O III   | 1766.34    | 400       |           | $2s^2 2p^3 p - 2s^2 2p^4 s$ | $^3P - ^3P^o$            | 0-1   | 072       |
| O III   | 1767.78    | 1000      |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - G[\frac{7}{2}]$ | 4-5   | 072       |
| O III   | 1768.24    | 900       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - G[\frac{7}{2}]$ | 3-4   | 072       |
| O III   | 1769.32    | 400       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - G[\frac{7}{2}]$ | 3-3   | 072       |
| O III   | 1771.67    | 900       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^1D^o - G[\frac{7}{2}]$ | 2-3   | 072       |
| O III   | 1772.31    | 400       |           | $2s^2 2p^3 p - 2s^2 2p^4 s$ | $^3P - ^3P^o$            | 1-0   | 072       |
| O III   | 1773.00    | 500       |           | $2s^2 2p^3 p - 2s^2 2p^4 s$ | $^3P - ^3P^o$            | 2-1   | 072       |
| O III   | 1773.85    | 500       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - G[\frac{7}{2}]$ | 4-4   | 072       |
| O III   | 1779.16    | 700       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - F[\frac{7}{2}]$ | 2-3   | 072       |
| O III   | 1781.03    | 600       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - F[\frac{7}{2}]$ | 2-3   | 072       |
| O III   | 1784.85    | 600       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3F^o - F[\frac{7}{2}]$ | 3-4   | 072       |
| O III   | 1789.66    | 700       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^1D^o - F[\frac{9}{2}]$ | 2-3   | 072       |
| O III   | 1848.26    | 500       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^1D^o - D[\frac{3}{2}]$ | 3-3   | 072       |
| O III   | 1856.62    | 500       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^1D^o - G[\frac{7}{2}]$ | 3-4   | 072       |
| O III   | 1872.78    | 800       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3D^o - F[\frac{7}{2}]$ | 2-3   | 072       |
| O III   | 1872.87    | 800       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3D^o - F[\frac{7}{2}]$ | 1-2   | 072       |
| O III   | 1874.94    | 800       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3D^o - F[\frac{7}{2}]$ | 3-4   | 072       |
| O III   | 1920.04    | 600       |           | $2s^2 2p^3 p - 2s^2 2p^4 s$ | $^1D - ^1P^o$            | 2-1   | 072       |
| O III   | 1920.75    | 500       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3P^o - D[\frac{3}{2}]$ | 1-2   | 072       |
| O III   | 1921.52    | 500       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3P^o - D[\frac{3}{2}]$ | 1-1   | 072       |
| O III   | 1923.49    | 700       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3P^o - D[\frac{3}{2}]$ | 2-3   | 072       |
| O III   | 1923.82    | 500       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3P^o - D[\frac{3}{2}]$ | 0-1   | 072       |
| O III   | 1926.94    | 500       |           | $2s^2 2p^3 d - 2s^2 2p^4 f$ | $^3P^o - D[\frac{3}{2}]$ | 1-2   | 072       |

Ground state  $1s^2 2s^2 2p^4 \ ^3P_1$ Ionization potential 624 383.8  $\text{cm}^{-1}$ ; 77.412 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-----------------------------|-----------|
| O IV    | 152.264    | 10        |           | $2s^2 2p - 2s2p(^1P^o)4p$        | $g^1P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 152.355    | 10        |           | $2s^4(^1S)2p - 2s2p(^1P^o)4p$    | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 153.162    | 10        |           | $2s^4(^1S)2p - 1s^2 2p^4(^1D)3d$ | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 170,487   |
| O IV    | 158.553    | 10        |           | $2s^4(^1S)2p - 2s2p(^3P^o)5p$    | $g^1P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 158.606    | 50        |           | $2s^4(^1S)2p - 2s2p(^3P^o)5p$    | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV?   | 160.141    | 10        |           |                                  |                |                             |           |
| O IV    | 167.145    | 10d       |           | $2s2p^2 - 2s2p(^3P^o)7d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 170.940    | 10        |           | $2s2p^2 - 2s2p(^3P^o)6d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 170.988    | 10        |           | $2s2p^2 - 2s2p(^3P^o)6d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 171.071    | 100       |           | $2s^4(^1S)2p - 2s2p(^3P^o)4p$    | $g^1P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 171.121    | 100       |           | $2s^4(^1S)2p - 2s2p(^3P^o)4p$    | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 171.191    | 10        |           | $2s^4(^1S)2p - 2s2p(^3P^o)4p$    | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 173.803    | 10        |           | $2s^4(^1S)2p - 2s2p(^3P^o)4p$    | $g^1P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 173.851    | 50        |           | $2s^4(^1S)2p - 2s2p(^3P^o)4p$    | $g^1P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 168       |
| O IV    | 173.917    | 100       |           | $2s^4(^1S)2p - 2s2p(^3P^o)4p$    | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 173.968    | 10        |           | $2s^4(^1S)2p - 2s2p(^3P^o)4p$    | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 174.105    | 100       |           | $2s^2 2p - 2s^2 6d$              | $g^1P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 174.220    | 150       |           | $2s^2 2p - 2s^2 6d$              | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 177.598    | 10        |           | $2s2p^2 - 2s2p(^3P^o)5d$         | $^1P - ^1P^o$  |                             | 168       |
| O IV    | 177.659    | 10        |           | $2s2p^2 - 2s2p(^3P^o)5d$         | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 177.698    | 50        |           | $2s2p^2 - 2s2p(^3P^o)5d$         | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 177.761    | 100       |           | $2s2p^2 - 2s2p(^3P^o)5d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 177.808    | 100       |           | $2s2p^2 - 2s2p(^3P^o)5d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 180.351    | 50        |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$    | $g^1P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 168       |
| O IV    | 180.481    | 100       |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$    | $g^1P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 181.150    | 200       |           | $2s^2 2p - 2s^2 5d$              | $g^1P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 181.275    | 250       |           | $2s^2 2p - 2s^2 5d$              | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 181.876    | 150       |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$    | $g^1P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 168       |
| O IV    | 181.995    | 200       |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$    | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 182.711    | 150       |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$    | $g^1P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 182.832    | 200       |           | $2s^2(^1S)2p - 2s2p(^1P^o)3p$    | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV?   | 183.139    | 10        |           |                                  |                |                             | 168       |
| O IV    | 183.353    | 10        |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1S^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 183.395    | 50        |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 183.454    | 50        |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 185.384    | 10        |           | $2s^2 2p - 2s^2 5s$              | $g^1P^o - ^3S$ | $-\frac{1}{2}$              | 168,487   |
| O IV    | 186.872    | 50        |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 186.936    | 100       |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 186.982    | 10        |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 188.152    | 100       |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1D$    | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 188.190    | 10        |           | $2s2p^2 - 1s^2 2p^4(^3P)3p$      | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 191.609    | 100d      |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 191.640    | 10        |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 191.695    | 100       |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 191.752    | 150       |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 192.139    | 200       |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 192.169    | 200       |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 192.206    | 250       |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 192.244    | 150       |           | $2s2p^2 - 2s2p(^3P^o)4d$         | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 195.863    | 350       |           | $2s^2 2p - 2s^2 4d$              | $g^1P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 196.009    | 400       |           | $2s^2 2p - 2s^2 4d$              | $g^1P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 196.348    | 10d       |           | $2s2p^2 - 2s2p(^3P^o)5d$         | $^1D - ^3F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 196.435    | 10d       |           | $2s2p^2 - 2s2p(^3P^o)5d$         | $^1D - ^3F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 200.827    | 50        |           | $2s2p^2 - 1s^2 2p^4(^1D)3p$      | $^1D - ^3F^o$  |                             | 170,175   |
| O IV    | 200.915    | 50        |           | $2s2p^2 - 2s2p(^3P^o)4s$         | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168       |

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term           | J - J                       | Reference   |
|---------|------------|-----------|-----------|-------------------------------|----------------|-----------------------------|-------------|
| O IV    | 200.966    | 50        |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^4P - ^4P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 200.995    | 100       |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 201.022    | 10        |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 201.073    | 50        |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 201.098    | 50        |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{5}{2}$ | 166         |
| O IV    | 202.891    | 200       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 168,487     |
| O IV    | 203.048    | 250       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 168,487     |
| O IV    | 204.708    | 10d       |           | $2s2p^2 - 1s^22p^2(^3P)3p$    | $^1D - ^1D^o$  |                             | 168         |
| O IV    | 204.905    | 10        |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^3P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 204.996    | 10        |           | $2s2p^2 - 2s2p(^1P^o)4d$      | $^3P - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 205.842    | 10        |           | $2s^22p - 2s^24s$             | $g^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 206.002    | 50        |           | $2s^22p - 2s^24s$             | $g^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 207.183    | 300       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 207.239    | 350       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3D$ | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 207.348    | 200       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3D$ | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 211.808    | 10d       |           | $2s2p^2 - 2s2p(^3P^o)5d$      | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 212.578    | 100d      |           | $2s2p^2 - 2s^2(^1S)8f$        | $^1D - ^3F^o$  |                             | 168         |
| O IV    | 212.974    | 150d      |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1D - ^3F^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 213.061    | 150d      |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1D - ^3F^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 213.978    | 200       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 214.032    | 250       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 214.155    | 300       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3P$ | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 214.209    | 200       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $g^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 214.249    | 50        |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 214.290    | 50        |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 216.960    | 10        |           | $2s2p^2 - 2s^2(^1S)7f$        | $^1D - ^3F^o$  |                             | 168         |
| O IV    | 221.515    | 10        |           |                               |                |                             | 168         |
| O IV    | 221.648    | 200       |           |                               |                |                             | 168         |
| O IV    | 222.763    | 250       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 222.777    | 200       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 223.728    | 10        |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^1D - ^3P^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 223.841    | 10        |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^1D - ^3P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 225.299    | 250       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^3F^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 229.896    | 10        |           | $2s2p^2 - 1s^22p^2(^3P)3p$    | $^3P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 230.040    | 10        |           | $2s2p^2 - 1s^22p^2(^3P)3p$    | $^3P - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 230.682    | 50        |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 230.755    | 100       |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 231.031    | 150       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^4P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 231.070    | 500b      |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^4P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 231.101    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 231.144    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 231.200    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 231.240    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 231.302    | 350       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^4P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 233.457    | 350       | 7         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168,488     |
| O IV    | 233.495    | 350       | 7         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O IV    | 233.521    | 300       | 7         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O IV    | 233.561    | 400       | 7         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O IV    | 233.596    | 300       | 7         | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^1D$    | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O IV    | 234.988    | 150       |           | $2s2p^2 - 2s^25f$             | $^1D - ^3F^o$  |                             | 168         |
| O IV    | 236.071    | 50d       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^4P - ^3F^o$  |                             | 168         |
| O IV    | 238.361    | 700       | 5         | $2s^22p - 2s^23d$             | $g^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| O IV    | 238.573    | 750       | 5         | $2s^22p - 2s^23d$             | $g^3P^o - ^3D$ | $\frac{3}{2} - \frac{5}{2}$ | 197,168,488 |
| O IV    | 239.592    | 150       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 239.935    | 10        |           | $2s2p^2 - 1s^22p^2(^3P)3p$    | $^3P - ^3S^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 240.079    | 50        |           | $2s2p^2 - 1s^22p^2(^3P)3p$    | $^3P - ^3S^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 242.045    | 100       |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^3P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 242.140    | 150       |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^3P - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 242.183    | 10        |           | $2s2p^2 - 2s2p(^3P^o)4d$      | $^3P - ^1D^o$  | $\frac{3}{2} - \frac{5}{2}$ | 168         |
| O IV    | 245.720    | 50d       |           |                               |                |                             | 168         |

## O IV

## O IV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term              | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------------------------|-------------------|-----------------------------|-----------|
| O IV    | 246.465    | 100       |           | $1s^2 2p^2 - 1s^2 2p^2(^4P)3d$  | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 246.503    | 150       |           | $1s^2 2p^2 - 1s^2 2p^2(^4P)3d$  | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 246.563    | 200       |           | $1s^2 2p^2 - 1s^2 2p^2(^4P)3d$  | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{5}{2}$ | 168       |
| O IV    | 249.223    | 150       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 168       |
| O IV    | 249.365    | 200       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 251.114    | 50        |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3d$  | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 170,175   |
| O IV    | 251.148    | 50        |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3d$  | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 170,175   |
| O IV    | 252.564    | 300d      |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3d$  | $^1D^\circ - ^1F$ |                             | 168,175   |
| O IV    | 252.948    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 253.082    | 350       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 255.252    | 250       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1D - ^1P^\circ$ | $-\frac{3}{2}$              | 168       |
| O IV    | 255.302    | 10        |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3d$  | $^1D^\circ - ^1D$ |                             | 175       |
| O IV    | 258.116    | 100       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 258.207    | 150       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 260.389    | 550       | 9         | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1D - ^1F^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O IV    | 260.556    | 500       | 9         | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1D - ^1F^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168,488   |
| O IV    | 265.062    | 10        |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$  | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 266.690    | 10        |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$  | $^1D^\circ - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 158       |
| O IV?   | 266.729    | 10        |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$  | $^1D^\circ - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 266.932    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1D - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 266.967    | 250b      |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1D - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 269.559    | 50d       |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3d$  | $^1P^\circ - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 168,175   |
| O IV    | 271.989    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 272.076    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 272.125    | 350       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 272.174    | 250       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 272.270    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 272.311    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 279.456    | 100       |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3d$  | $^1P^\circ - ^1D$ |                             | 170,175   |
| O IV    | 279.633    | 500       | 4         | $2s^2 2p - 2s^2 3s$             | $^4P^\circ - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 168,488   |
| O IV    | 279.937    | 550       | 4         | $2s^2 2p - 2s^2 3s$             | $^4P^\circ - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 168,488   |
| O IV    | 282.213    | 50        |           | $2s2p^2 - 2s2p(^1P)3s$          | $^1S - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 285.714    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1S - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 168       |
| O IV    | 285.838    | 350       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1S - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 289.292    | 150       |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3s$  | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 289.469    | 100       |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3s$  | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 289.590    | 50        |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3s$  | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 289.898    | 100       |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3s$  | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 289.933    | 50        |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3s$  | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 291.054    | 50        |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$  | $^1P^\circ - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 291.203    | 50        |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$  | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 294.650    | 50        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)4f$ | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 294.853    | 50        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)4f$ | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 295.051    | 50        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)4f$ | $^1D^\circ - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 295.140    | 50        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)4f$ | $^1D^\circ - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 295.874    | 100       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 299.495    | 150       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 168       |
| O IV    | 299.620    | 100       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 299.710    | 100       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 299.850    | 200       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 306.621    | 400       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 306.882    | 350       |           | $2s2p^2 - 2s2p(^1P^\circ)3s$    | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |
| O IV    | 311.490    | 250       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 311.679    | 300       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 311.726    | 150       |           | $2s2p^2 - 2s2p(^1P^\circ)3d$    | $^1P - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 321.457    | 50        |           | $1s^2 2p^2 - 1s^2 2p^2(^1D)3s$  | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 327.320    | 50        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)4f$ | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 327.519    | 10        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)4f$ | $^1P^\circ - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 168       |
| O IV    | 339.330    | 50        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)3p$ | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 168       |
| O IV    | 339.436    | 10        |           | $1s^2 2p^2 - 2s2p(^1P^\circ)3p$ | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 168       |

| Element | Wavelength | Intensity | Multiplet | Configuration              | Term           | J-J                         | Reference   |
|---------|------------|-----------|-----------|----------------------------|----------------|-----------------------------|-------------|
| O IV    | 346.372    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3s$   | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 346.688    | 150       |           | $2s2p^2 - 2s2p(^3P^o)3s$   | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 367.192    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3s$   | $^3P - ^3P^o$  |                             | 168         |
| O IV    | 379.775    | 200       |           | $2s2p^2 - 2s^23p$          | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 379.919    | 150       |           | $2s2p^2 - 2s^23p$          | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 442.705    | 50        |           | $2s2p^2 - 2s^23p$          | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 442.873    | 10        |           | $2s2p^2 - 2s^23p$          | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 471.273    | 50        |           | $1s^22p^2 - 2s2p(^3P^o)3p$ | $^1D^o - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 471.603    | 10        |           | $1s^22p^2 - 2s2p(^3P^o)3p$ | $^1D^o - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 553.328    | 800       | 3         | $2s^22p - 2s2p^2$          | $K^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| O IV    | 554.074    | 850       | 3         | $2s^22p - 2s2p^2$          | $K^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 197,168,488 |
| O IV    | 554.514    | 900       | 3         | $2s^22p - 2s2p^2$          | $K^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O IV    | 555.262    | 800       | 3         | $2s^22p - 2s2p^2$          | $K^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| O IV    | 608.395    | 700       | 2         | $2s^22p - 2s2p^2$          | $K^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 197,168,488 |
| O IV    | 609.829    | 750       | 2         | $2s^22p - 2s2p^2$          | $K^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| O IV    | 616.933    | 400       |           | $2s2p^2 - 1s^22p^2$        | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 617.033    | 350       |           | $2s2p^2 - 1s^22p^2$        | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |
| O IV    | 624.617    | 650       | 6         | $2s2p^2 - 1s^22p^2$        | $^1P - ^1S^o$  | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| O IV    | 625.130    | 700       | 6         | $2s2p^2 - 1s^22p^2$        | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O IV    | 625.852    | 700       | 6         | $2s2p^2 - 1s^22p^2$        | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| O IV    | 779.821    | 450       | 8         | $2s2p^2 - 1s^22p^2$        | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168,488     |
| O IV    | 779.905    | 500       | 8         | $2s2p^2 - 1s^22p^2$        | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168,488     |
| O IV    | 787.710    | 750       | 1         | $2s^22p - 2s2p^2$          | $K^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| O IV    | 790.103    | 650       | 1         | $2s^22p - 2s2p^2$          | $K^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O IV    | 790.203    | 800       | 1         | $2s^22p - 2s2p^2$          | $K^3P^o - ^1D$ | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| O IV    | 802.198    | 300       |           | $2s2p^2 - 1s^22p^2$        | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 802.250    | 250       |           | $2s2p^2 - 1s^22p^2$        | $^3S - ^3P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 921.301    | 200       |           | $2s2p^2 - 1s^22p^2$        | $^3P - ^3P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 921.364    | 250       |           | $2s2p^2 - 1s^22p^2$        | $^3P - ^3P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O IV    | 923.353    | 300       |           | $2s2p^2 - 1s^22p^2$        | $^3P - ^3P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 1338.603   | 300       |           | $2s2p^2 - 1s^22p^2$        | $^1P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O IV    | 1342.995   | 200       |           | $2s2p^2 - 1s^22p^2$        | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O IV    | 1343.507   | 350       |           | $2s2p^2 - 1s^22p^2$        | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{1}{2}$ | 168         |



OV

## OXYGEN, Z = 8

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Ground state  $1s^2 2s^2 2p^4$ Ionization potential 918 657  $\text{cm}^{-1}$ ; 113.896 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term           | J - J | Reference   |
|---------|------------|-----------|-----------|--------------------------------|----------------|-------|-------------|
| O V     | 122.128    | 10        |           | $2s(^4S)2p - 1s^2 2p(^4P^o)5p$ | $^4P^o - ^4P$  | 2-2   | 168         |
| O V     | 122.372    | 10        |           | $2s(^4S)2p - 1s^2 2p(^4P^o)5p$ | $^4P^o - ^4D$  | 2-3   | 168         |
| O V     | 124.598    | 250       |           | $2s^2 - 2s5p$                  | $g^1S - ^1P^o$ | 0-1   | 168         |
| O V     | 128.235    | 10        |           | $2s2p - 2s7d$                  | $^4P^o - ^4D$  | 1-2   | 168         |
| O V     | 128.297    | 10        |           | $2s2p - 2s7d$                  | $^4P^o - ^4D$  | 2-3   | 168         |
| O V     | 131.750    | 100       |           | $2s2p - 2s6d$                  | $^4P^o - ^4D$  |       | 168         |
| O V     | 131.807    | 100       |           | $2s2p - 2s6d$                  | $^4P^o - ^4D$  | 2-3   | 168         |
| O V     | 132.800    | 100       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4P$  |       | 168         |
| O V     | 132.851    | 200       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4P$  | 2-2   | 168         |
| O V     | 132.885    | 10        |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4P$  | 2-1   | 168         |
| O V     | 133.328    | 10        |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4S$  | 1-1   | 168         |
| O V     | 133.395    | 10        |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4S$  | 2-1   | 168         |
| O V     | 133.521    | 300       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4D$  | 2-3   | 168         |
| O V     | 135.523    | 350       |           | $2s^2 - 2s4p$                  | $g^1S - ^1P^o$ | 0-1   | 168         |
| O V     | 138.030    | 200       |           | $2s2p - 2s$                    | $^4P^o - ^4D$  | 0-1   | 168         |
| O V     | 138.054    | 300       |           | $2s2p - 2s5d$                  | $^4P^o - ^4D$  | 1-2   | 168         |
| O V     | 138.108    | 400       |           | $2s2p - 2s5d$                  | $^4P^o - ^4D$  | 2-3   | 168         |
| O V     | 139.025    | 350       |           | $2s^2 - 1s^2 2p(^4P^o)3d$      | $g^1S - ^1P^o$ | 0-1   | 168         |
| O V     | 140.045    | 10        |           | $2s2p - 2s5s$                  | $^4P^o - ^4S$  | 1-1   | 168         |
| O V     | 140.109    | 10        |           | $2s2p - 2s5s$                  | $^4P^o - ^4S$  | 2-1   | 168         |
| O V?    | 142.119    | 10        |           |                                |                |       | 129         |
| O V     | 144.802    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)5d$ | $^4P - ^4D^o$  | 1-2   | 168         |
| O V     | 144.837    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)5d$ | $^4P - ^4D^o$  | 2-3   | 168         |
| O V     | 146.345    | 100       |           | $2s2p - 2s6d$                  | $^4P^o - ^4D$  | 1-2   | 168         |
| O V     | 147.261    | 250       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4D$  | 1-2   | 168         |
| O V     | 149.034    | 10        |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)5d$ | $^4D - ^4D^o$  | 2-2   | 168         |
| O V     | 149.078    | 200       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)4p$ | $^4P^o - ^4P$  | 1-1   | 168         |
| O V     | 151.449    | 400       |           | $2s2p - 2s4d$                  | $^4P^o - ^4D$  | 0-1   | 168         |
| O V     | 151.481    | 500       |           | $2s2p - 2s4d$                  | $^4P^o - ^4D$  | 1-2   | 168.362     |
| O V     | 151.548    | 600       |           | $2s2p - 2s4d$                  | $^4P^o - ^4D$  | 2-3   | 168.362     |
| O V     | 153.948    | 250       |           | $2s2p - 2s5d$                  | $^4P^o - ^4D$  | 1-2   | 168         |
| O V     | 156.126    | 100       |           | $2s2p - 2s4s$                  | $^4P^o - ^4S$  | 0-1   | 168         |
| O V     | 156.158    | 200       |           | $2s2p - 2s4s$                  | $^4P^o - ^4S$  | 1-1   | 168         |
| O V     | 156.225    | 300       |           | $2s2p - 2s4s$                  | $^4P^o - ^4S$  | 2-1   | 168         |
| O V     | 158.813    | 1000      |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)4d$ | $^4P - ^4P^o$  |       | 168         |
| O V     | 158.926    | 200       |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)4d$ | $^4P - ^4P^o$  | 2-2   | 168         |
| O V     | 159.343    | 400       |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)4d$ | $^4P - ^4D$    | 1-2   | 168         |
| O V     | 159.380    | 400       |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)4d$ | $^4P - ^4D^o$  | 2-3   | 168         |
| O V     | 162.494    | 300       |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)4d$ | $^4D - ^4F^o$  | 2-3   | 168.487     |
| O V     | 164.178    | 200       |           | $1s^2 2p^2 - 2s6f$             | $^4D - ^4F^o$  | 2-3   | 168.487     |
| O V     | 164.578    | 500       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4P$  |       | 168         |
| O V     | 164.628    | 400       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4P$  | 1-1   | 168         |
| O V     | 164.656    | 600       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4P$  | 2-2   | 168         |
| O V     | 164.710    | 400       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4P$  | 2-1   | 168         |
| O V     | 164.986    | 200       |           | $1s^2 2p^2 - 1s^2 2p(^4P^o)4d$ | $^4D - ^4D^o$  | 2-2   | 168         |
| O V     | 166.113    | 300       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4S$  | 0-1   | 168         |
| O V     | 166.152    | 400       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4S$  | 1-1   | 168         |
| O V     | 166.234    | 500       |           | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4S$  | 2-1   | 168         |
| O V     | 167.991    | 800       | 6         | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4D$  | 2-3   | 168.488     |
| O V     | 168.042    | 400       | 6         | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4D$  | 1-1   | 168.488     |
| O V     | 168.077    | 400       | 6         | $2s(^4S)2p - 1s^2 2p(^4P^o)3p$ | $^4P^o - ^4D$  | 2-2   | 168.488     |
| O V     | 169.478    | 10        |           | $1s^2 2p^2 - 2s5p$             | $^4P - ^4P^o$  | 1-    | 168         |
| O V     | 169.586    | 10        |           | $1s^2 2p^2 - 2s3p$             | $^4P - ^4P^o$  | 2-    | 168         |
| O V     | 170.218    | 400       |           | $2s2p - 2s4d$                  | $^4P^o - ^4D$  | 1-2   | 168         |
| O V     | 172.169    | 800       | 2         | $2s^2 - 2s3p$                  | $g^1S - ^1P^o$ | 0-1   | 197.168.488 |

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| Element | Wavelength | Intensity | Multiplet | Configuration                                                                         | Term           | J-J | Reference   |
|---------|------------|-----------|-----------|---------------------------------------------------------------------------------------|----------------|-----|-------------|
| O V     | 174.558    | 200       |           | 2s2p - 2s4s                                                                           | $^1P^o - ^1S$  | 1-0 | 168         |
| O V     | 178.713    | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>1</sup> P <sup>o</sup> )4d | $^1S - ^1P^o$  | 0-1 | 168         |
| O V     | 182.205    | 200       |           | 2s( <sup>2</sup> S)2p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p           | $^1P^o - ^1S$  | 1-0 | 168         |
| O V?    | 185.455    | 200       |           |                                                                                       |                |     | 168         |
| O V     | 185.747    | 600       | 12        | 2s( <sup>2</sup> S)2p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p           | $^1P^o - ^1D$  | 1-2 | 168,488     |
| O V     | 191.397    | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4p                                                | $^3P - ^3P^o$  | 0-1 | 168         |
| O V     | 191.458    | 100       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4p                                                | $^3P - ^3P^o$  | 1-1 | 168         |
| O V     | 191.556    | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4p                                                | $^3P - ^3P^o$  | 2-2 | 168         |
| O V     | 192.751    | 850       | 5         | 2s2p - 2s3d                                                                           | $^3P^o - ^3D$  | 0-1 | 197,168,488 |
| O V     | 192.799    | 900       | 5         | 2s2p - 2s3d                                                                           | $^3P^o - ^3D$  | 1-2 | 197,168,488 |
| O V     | 192.906    | 950       | 5         | 2s2p - 2s3d                                                                           | $^3P^o - ^3D$  | 2-3 | 197,168,488 |
| O V     | 194.593    | 530       | 11        | 2s( <sup>2</sup> S)2p - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3p           | $^1P^o - ^1P$  | 1-1 | 168,488     |
| O V?    | 198.031    | 250       |           |                                                                                       |                |     | 168         |
| O V     | 202.158    | 350       | 14        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$  | 0-1 | 168         |
| O V     | 202.191    | 350       | 14        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$  | 1-0 | 168         |
| O V     | 202.226    | 350       | 14        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$  | 1-1 | 168,488     |
| O V     | 202.282    | 350       | 14        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$  | 1-2 | 168,488     |
| O V     | 202.335    | 350       | 14        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$  | 2-1 | 168,488     |
| O V     | 202.393    | 450       | 14        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3P^o$  | 2-2 | 168,488     |
| O V     | 203.783    | 400       | 13        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$  | 0-1 | 168,488     |
| O V     | 203.821    | 500       | 13        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$  | 1-2 | 168,488     |
| O V     | 203.851    | 400       | 13        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$  | 1-1 | 168         |
| O V     | 203.890    | 550       | 13        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$  | 2-3 | 168,488     |
| O V     | 203.935    | 400       | 13        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^3P - ^3D^o$  | 2-2 | 168         |
| O V     | 205.102    | 250       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^1D - ^1P^o$  | 2-1 | 168         |
| O V     | 207.794    | 670       | 16        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^1D - ^1F^o$  | 2-3 | 168,488     |
| O V     | 215.034    | 500       | 4         | 2s2p - 2s3s                                                                           | $^3P^o - ^3S$  | 0-1 | 168,488     |
| O V     | 215.104    | 550       | 4         | 2s2p - 2s3s                                                                           | $^3P^o - ^3S$  | 1-1 | 168,488     |
| O V     | 215.245    | 600       | 4         | 2s2p - 2s3s                                                                           | $^3P^o - ^3S$  | 2-1 | 168,488     |
| O V     | 216.018    | 530       | 15        | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^1D - ^1D^o$  | 2-2 | 168,488     |
| O V     | 220.352    | 870       | 10        | 2s2p - 2s3d                                                                           | $^1P^o - ^1D$  | 1-2 | 197,168,489 |
| O V     | 222.235    | 250       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s4p                                                | $^1S - ^1P^o$  | 0-1 | 168         |
| O V     | 227.374    | 350       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$  | 1-2 | 168         |
| O V     | 227.468    | 350       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$  | 0-1 | 168         |
| O V     | 227.510    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$  | 2-2 | 168         |
| O V     | 227.549    | 350       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$  | 1-1 | 168         |
| O V     | 227.636    | 350       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$  | 1-0 | 168         |
| O V     | 227.688    | 350       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^3P - ^3P^o$  | 2-1 | 168         |
| O V     | 231.070    | 500b      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^1D - ^1P^o$  | 2-1 | 168         |
| O V     | 231.823    | 500       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3d | $^1S - ^1P^o$  | 0-1 | 168         |
| O V     | 248.459    | 400       | 9         | 2s2p - 2s3s                                                                           | $^1P^o - ^1S$  | 1-0 | 168,488     |
| O V     | 265.550    | 300       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p( <sup>2</sup> P <sup>o</sup> )3s | $^1S - ^1P^o$  | 0-1 | 168         |
| O V     | 270.982    | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s3p                                                | $^3P - ^3P^o$  | 2-2 | 168         |
| O V     | 286.448    | 400       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s3p                                                | $^1D - ^1P^o$  | 2-1 | 168         |
| O V     | 341.391    | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s3p                                                | $^1S - ^1P^o$  | 0-1 | 168         |
| O V     | 481.12     | 700       |           | 2s3d - 2s4f                                                                           | $^3D - ^3F^o$  |     | 072         |
| O V     | 529.20     | 500       |           | 2s3s - 2s4p                                                                           | $^3S - ^3P^o$  | 1-  | 072         |
| O V     | 604.41     | 500       |           | 2s3p - 2s4d                                                                           | $^1P^o - ^1D$  | 1-2 | 072         |
| O V     | 627.36     | 500       |           | 2s3p - 2s4d                                                                           | $^3P^o - ^3D$  | 1-2 | 072         |
| O V     | 627.63     | 700       |           | 2s3p - 2s4d                                                                           | $^3P^o - ^3D$  | 2-3 | 072         |
| O V     | 629.732    | 1000      | 1         | 2s <sup>2</sup> - 2s2p                                                                | $g^1S - ^1P^o$ | 0-1 | 197,168,488 |
| O V     | 681.25     | 800       |           | 2s3d - 2s4f                                                                           | $^3D - ^3F^o$  |     | 072         |
| O V     | 716.55     | 500       |           | 2s3p - 2s4s                                                                           | $^3P^o - ^3S$  | 2-1 | 072         |
| O V     | 728.74     | 700       |           | 2s3d - 2s4f                                                                           | $^1D - ^1F^o$  | 2-3 | 072         |
| O V     | 758.677    | 700       | 3         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                | $^3P^o - ^3P$  | 1-2 | 197,168,488 |
| O V     | 759.440    | 700       | 3         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                | $^3P^o - ^3P$  | 0-1 | 197,168,488 |
| O V     | 760.229    | 700       | 3         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                | $^3P^o - ^3P$  | 1-1 | 197,168,488 |
| O V     | 760.445    | 800       | 3         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                | $^3P^o - ^3P$  | 2-2 | 197,168,488 |
| O V     | 761.130    | 700       | 3         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                | $^3P^o - ^3P$  | 1-0 | 197,168,488 |
| O V     | 762.001    | 700       | 3         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup>                                                | $^3P^o - ^3P$  | 2-1 | 197,168,488 |

OV

OV

| Element | Wavelength | Intensity | Multiplet | Configuration                          | Term                             | J - J | Reference |
|---------|------------|-----------|-----------|----------------------------------------|----------------------------------|-------|-----------|
| O V     | 774.522    | 500       | 8         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup> | <sup>1</sup> P° - <sup>1</sup> S | 1-0   | 168.488   |
| O V     | 1371.287   | 670       | 7         | 2s2p - 1s <sup>2</sup> 2p <sup>2</sup> | <sup>1</sup> P° - <sup>1</sup> D | 1-2   | 168.488   |
| O V     | 1418.41    | 500       |           | 2s4p - 2s5d                            | <sup>3</sup> P° - <sup>3</sup> D | 2-3   | 072       |
| O V     | 1506.71    | 800       |           | 2s4d - 2s5f                            | <sup>3</sup> D - <sup>3</sup> F° |       | 072       |
| O V     | 1596.37    | 500       |           | 2s4d - 2s5f                            | <sup>1</sup> D - <sup>1</sup> F° | 2-3   | 072       |
| O V     | 1643.66    | 1000      |           | 2s4f - 2s5g                            | <sup>3</sup> F° - <sup>3</sup> G |       | 072       |
| O V     | 1708.01    | 700       |           | 2s4f - 2s5g                            | <sup>1</sup> F° - <sup>1</sup> G | 3-4   | 072       |

O VI

## OXYGEN, Z = 8

O VI

Ground state  $1s^2s^2S_{1/2}$ Ionization potential 1 113 999.5  $\text{cm}^{-1}$ ; 138.115 eV

| Element | Wavelength | Intensity | Multiplet | Configuration      | Term           | J - J                       | Reference   |
|---------|------------|-----------|-----------|--------------------|----------------|-----------------------------|-------------|
| O VI    | 93.03      | 100       |           | $1s^22s - 1s^210p$ | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 555         |
| O VI    | 93.84      | 150       |           | $1s^22s - 1s^29p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 555         |
| O VI    | 95.02      | 200       |           | $1s^22s - 1s^28p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 555         |
| O VI    | 96.78      | 250       |           | $1s^22s - 1s^27p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 555         |
| O VI    | 99.68      | 250       |           | $1s^22s - 1s^26p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 555         |
| O VI    | 101.57     | 100       |           | $1s^22p - 1s^211d$ | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 555         |
| O VI    | 102.30     | 150       |           | $1s^22p - 1s^210d$ | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 555         |
| O VI    | 103.26     | 200       |           | $1s^22p - 1s^29d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 555         |
| O VI    | 104.67     | 250       |           | $1s^22p - 1s^28d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 555         |
| O VI    | 104.811    | 350       |           | $1s^22s - 1s^25p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 168,555     |
| O VI    | 106.79     | 300       |           | $1s^22p - 1s^27d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 555         |
| O VI    | 110.148    | 120       |           | $1s^22p - 1s^26d$  | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 168,555     |
| O VI    | 110.220    | 250       |           | $1s^22p - 1s^26d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,555     |
| O VI    | 110.69     | 150       |           | $1s^22p - 1s^26s$  | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 555         |
| O VI    | 115.824    | 350       |           | $1s^22s - 1s^24p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 168,555     |
| O VI    | 116.347    | 120       |           | $1s^22p - 1s^25d$  | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 168,555     |
| O VI    | 116.419    | 250       |           | $1s^22p - 1s^25d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,555     |
| O VI    | 117.40     | 300       |           | $1s^22p - 1s^25s$  | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 555         |
| O VI    | 129.786    | 150       | 5         | $1s^22p - 1s^24d$  | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 168,555,488 |
| O VI    | 129.872    | 250       | 5         | $1s^22p - 1s^24d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168,555,488 |
| O VI    | 132.219    | 100       |           | $1s^22p - 1s^24s$  | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 168,555     |
| O VI    | 132.312    | 200       |           | $1s^22p - 1s^24s$  | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 168,555     |
| O VI    | 150.089    | 500       | 2         | $1s^22s - 1s^23p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 197,555,168 |
| O VI    | 150.124    | 250       | 2         | $1s^22s - 1s^23p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 197,555,168 |
| O VI    | 172.935    | 950       | 4         | $1s^22p - 1s^23d$  | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 197,168,488 |
| O VI    | 173.082    | 1000      | 4         | $1s^22p - 1s^23d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 197,168,488 |
| O VI    | 183.937    | 650       | 3         | $1s^22p - 1s^23s$  | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 197,168,488 |
| O VI    | 184.117    | 850       | 3         | $1s^22p - 1s^23s$  | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 197,168,488 |
| O VI    | 447.712    | 10        |           | $1s^23s - 1s^24p$  | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O VI    | 447.840    | 10        |           | $1s^23s - 1s^24p$  | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 168         |
| O VI    | 495.090    | 10d       |           | $1s^23p - 1s^24d$  | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O VI    | 498.431    | 100d      |           | $1s^23p - 1s^24d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O VI    | 519.610    | 200d      |           | $1s^23d - 1s^24f$  | $^1D - ^1F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 168         |
| O VI    | 519.723    | 200d      |           | $1s^23d - 1s^24f$  | $^1D - ^1F^o$  | $\frac{1}{2} - \frac{3}{2}$ | 168         |
| O VI    | 1031.912   | 850       | 1         | $1s^22s - 1s^22p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 168,488     |
| O VI    | 1037.613   | 750       | 1         | $1s^22s - 1s^22p$  | $g^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 168,488     |

O VII

## OXYGEN, Z = 8

O VII

Ground state  $1s^2 \ ^1S_0$ Ionization potential  $5\,963\,000\text{ cm}^{-1}$ ; 739.30 eV

| Element | Wavelength | Intensity | Multiplet | Configuration  | Term          | J - J | Reference |
|---------|------------|-----------|-----------|----------------|---------------|-------|-----------|
| O VII   | 17.200     | 50        |           | $1s^2 - 1s6p$  | $^1S - ^1P^o$ | 0-1   | 764       |
| O VII   | 17.396     | 100       |           | $1s^2 - 1s5p$  | $^1S - ^1P^o$ | 0-1   | 764       |
| O VII   | 17.768     | 200       |           | $1s^2 - 1s4p$  | $^1S - ^1P^o$ | 0-1   | 197,764   |
| O VII   | 18.627     | 500       |           | $1s^2 - 1s3p$  | $^1S - ^1P^o$ | 0-1   | 197,764   |
| O VII   | 21.602     | 1000      |           | $1s^2 - 1s2p$  | $^1S - ^1P^o$ | 0-1   | 197,764   |
| O VII   | 21.804     | 300       |           | $1s^2 - 1s2p$  | $^1S - ^1P^o$ | 0-1   | 764       |
| O VII   | 72.3       | P         |           | $1s2s - 1s10p$ | $^3S - ^3P^o$ |       | 262       |
| O VII   | 73.0       | P         |           | $1s2s - 1s9p$  | $^3S - ^3P^o$ |       | 262       |
| O VII   | 73.9       | P         |           | $1s2s - 1s8p$  | $^3S - ^3P^o$ |       | 262       |
| O VII   | 75.35      | P         |           | $1s2s - 1s7p$  | $^3S - ^3P^o$ |       | 262       |
| O VII   | 75.5       | P         |           | $1s2p - 1s10d$ | $^1P^o - ^1D$ |       | 262       |
| O VII   | 76.3       | P         |           | $1s2p - 1s9d$  | $^1P^o - ^1D$ |       | 262       |
| O VII   | 77.31      | P         |           | $1s2p - 1s8d$  | $^1P^o - ^1D$ |       | 262       |
| O VII   | 77.68      | P         |           | $1s2s - 1s6p$  | $^3S - ^3P^o$ |       | 262       |
| O VII   | 78.94      | 50        |           | $1s2p - 1s7d$  | $^1P^o - ^1D$ | 2-3   | 555       |
| O VII   | 81.50      | 100       |           | $1s2p - 1s6d$  | $^1P^o - ^1D$ | 2-3   | 555       |
| O VII   | 81.89      | 150       |           | $1s2s - 1s5p$  | $^3S - ^3P^o$ | 1-    | 555       |
| O VII   | 86.07      | 200       |           | $1s2p - 1s5d$  | $^1P^o - ^1D$ | 2-3   | 555       |
| O VII   | 91.02      | 250       |           | $1s2s - 1s4p$  | $^3S - ^3P^o$ | 1-    | 555       |
| O VII   | 96.12      | 300       |           | $1s2p - 1s4d$  | $^1P^o - ^1D$ | 2-3   | 555       |
| O VII   | 120.331    | 350       |           | $1s2s - 1s3p$  | $^3S - ^3P^o$ | 1-    | 164,555   |
| O VII   | 128.412    | 150       |           | $1s2p - 1s3d$  | $^1P^o - ^1D$ | 1-    | 164,555   |
| O VII   | 128.500    | 200       |           | $1s2p - 1s3d$  | $^1P^o - ^1D$ | 2-3   | 164,555   |
| O VII   | 133.31     | 250       |           | $1s2p - 1s3s$  | $^1P^o - ^3S$ | 2-1   | 555       |
| O VII   | 1623.29    |           |           | $1s2s - 1s2p$  | $^3S - ^1P^o$ | 1-2   | 202       |
| O VII   | 1637.96    |           |           | $1s2s - 1s2p$  | $^3S - ^3P^o$ | 1-1   | 202       |
| O VII   | 1639.58    |           |           | $1s2s - 1s2p$  | $^3S - ^3P^o$ | 1-0   | 202       |

O VIII

## OXYGEN, Z = 8

O VIII

Ground state  $1s^2S_{1/2}$ Ionization potential 7 028 394 cm<sup>-1</sup>; 871.39 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J          | Reference |
|---------|------------|-----------|-----------|---------------|----------------|----------------|-----------|
| O VIII  | 14.453     | 2         |           | 1s - 8p       | $R^2S - ^2P^o$ | $\frac{1}{2}-$ | 309,817   |
| O VIII  | 14.524     | 3         |           | 1s - 7p       | $R^2S - ^2P^o$ | $\frac{1}{2}-$ | 309,817   |
| O VIII  | 14.634     | 8         |           | 1s - 6p       | $R^2S - ^2P^o$ | $\frac{1}{2}-$ | 309,817   |
| O VIII  | 14.821     | 25        |           | 1s - 5p       | $R^2S - ^2P^o$ | $\frac{1}{2}-$ | 309,817   |
| O VIII  | 15.176     | 80        |           | 1s - 4p       | $R^2S - ^2P^o$ | $\frac{1}{2}-$ | 309,817   |
| O VIII  | 16.006     | 308       |           | 1s - 3p       | $R^2S - ^2P^o$ | $\frac{1}{2}-$ | 309,817   |
| O VIII  | 18.969     | 1000      |           | 1s - 2p       | $R^2S - ^2P^o$ | $\frac{1}{2}-$ | 309,817   |
| O VIII  | 61.977     | P         |           | 2 - 7         |                |                | 309       |
| O VIII  | 64.03      | P         |           | 2 - 6         |                |                | 309       |
| O VIII  | 67.76      | P         |           | 2 - 5         |                |                | 309       |
| O VIII  | 75.89      | P         |           | 2 - 4         |                |                | 309       |
| O VIII  | 102.43     | P         |           | 2 - 3         |                |                | 309       |
| O VIII  | 149.06     | P         |           | 3 - 8         |                |                | 309       |
| O VIII  | 156.92     | P         |           | 3 - 7         |                |                | 309       |
| O VIII  | 170.80     | P         |           | 3 - 6         |                |                | 309       |
| O VIII  | 200.15     | P         |           | 3 - 5         |                |                | 309       |
| O VIII  | 283.83     | P         |           | 4 - 9         |                |                | 309       |
| O VIII  | 292.8      | P         |           | 3 - 4         |                |                | 309       |
| O VIII  | 303.69     | P         |           | 4 - 8         |                |                | 309       |
| O VIII  | 338.19     | P         |           | 4 - 7         |                |                | 309       |
| O VIII  | 409.97     | P         |           | 4 - 6         |                |                | 309       |
| O VIII  | 474.54     | P         |           | 5 - 10        |                |                | 309       |
| O VIII  | 514.80     | P         |           | 5 - 9         |                |                | 309       |
| O VIII  | 584.05     | P         |           | 5 - 8         |                |                | 309       |
| O VIII  | 632.7      | P         |           | 4 - 5         |                |                | 309       |
| O VIII  | 726.6      | P         |           | 5 - 7         |                |                | 309       |
| O VIII  | 729.61     | P         |           | 6 - 11        |                |                | 309       |
| O VIII  | 800.8      | P         |           | 6 - 10        |                |                | 309       |
| O VIII  | 922.6      | P         |           | 6 - 9         |                |                | 309       |
| O VIII  | 1164.8     | P         |           | 5 - 6         |                |                | 309       |
| O VIII  | 1171.5     | P         |           | 6 - 8         |                |                | 309       |
| O VIII  | 1931.8     | P         |           | 6 - 7         |                |                | 309       |

F

FLUORINE,  $Z = 9$ 

F

Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| F       | 132.389    | 10d       |           |               |      |       | 176       |
| F       | 154.968    | 10        |           |               |      |       | 176       |
| F       | 194.655    | 10        |           |               |      |       | 176       |
| F       | 197.298    | 100d      |           |               |      |       | 176       |
| F       | 206.548    | 10        |           |               |      |       | 176       |
| F       | 213.684    | 10d       |           |               |      |       | 176       |
| F       | 225.114    | 10d       |           |               |      |       | 176       |
| F       | 225.627    | 10d       |           |               |      |       | 176       |

F I

## FLUORINE, Z = 9

F I

Ground state  $1s^2 2s^2 2p^5 \ ^2P_{3/2}$ Ionization potential  $140\,524.5\text{ cm}^{-1}$ ;  $17.422\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term                 | J - J                     | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------------|---------------------------|-----------|
| F I     | 680.709    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4s$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 682.581    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4s$ | $g^4P^{\circ} - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 732.960    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5d$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 734.642    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5d$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |
| F I     | 734.795    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5d$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 735.154    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5d$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 735.469    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)6s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 736.987    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)6s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 745.767    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 746.400    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3F$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 746.627    | 3         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3F$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 747.999    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 748.134    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |
| F I     | 748.338    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 748.580    | 4         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 748.709    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3F$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 748.946    | 3         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 750.418    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{1}{2}$ | 420       |
| F I     | 750.610    | 3         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |
| F I     | 750.885    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$ | $g^4P^{\circ} - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 751.861    | 4         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 752.884    | 4         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5s$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{1}{2}$ | 420       |
| F I     | 753.303    | 4         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 754.148    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 755.603    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)5s$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 776.926    | 4         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 777.010    | 5         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3F$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 777.531    | 4         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3F$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 778.059    | 6         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 779.192    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |
| F I     | 779.365    | 6         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 779.910    | 5         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 779.972    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3F$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 780.134    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |
| F I     | 780.390    | 15        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 780.519    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 780.713    | 5         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 781.654    | 3         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{1}{2}$ | 420       |
| F I     | 782.378    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 782.575    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^1D$ | $\frac{1}{2}-\frac{1}{2}$ | 420       |
| F I     | 782.976    | 5         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$ | $g^4P^{\circ} - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 790.006    | 7         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |
| F I     | 791.875    | 12        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 792.536    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4s$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{1}{2}$ | 420       |
| F I     | 793.237    | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |
| F I     | 794.417    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420       |
| F I     | 795.774    | 2         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4s$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{1}{2}$ | 420       |
| F I     | 796.982    | 3         |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4s$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420       |
| F I     | 806.964    | 150       | 2         | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$ | $g^4P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 420,488   |
| F I     | 809.599    | 125       | 2         | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$ | $g^4P^{\circ} - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 420,488   |
| F I     | 951.871    | 500       | 1         | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420,488   |
| F I     | 954.825    | 1000      | 1         | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{3}{2}$ | 420,488   |
| F I     | 955.545    | 750       | 1         | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{1}{2}$ | 420,488   |
| F I     | 958.524    | 500       | 1         | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$ | $g^4P^{\circ} - ^3P$ | $\frac{1}{2}-\frac{3}{2}$ | 420,488   |
| F I     | 972.401    | 20        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$ | $g^4P^{\circ} - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 420       |



F I

F I

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------|-----------------------------|-----------|
| F I     | 973.895    | 350       |           | $2s^2 2p^4 - 2s^2 2p^4(^3P)3s$ | $g^3P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 420       |
| F I     | 976.217    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^3P)3s$ | $g^3P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 420       |
| F I     | 976.505    | 40        |           | $2s^2 2p^4 - 2s^2 2p^4(^3P)3s$ | $g^3P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 420       |
| F I     | 977.745    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^3P)3s$ | $g^3P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 420       |

F II

## FLUORINE, Z = 9

F II

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ Ionization potential 282 056.5  $\text{cm}^{-1}$ ; 34.970 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term           | J - J | Reference |
|---------|------------|-----------|-----------|-------------------------------------------|----------------|-------|-----------|
| F II    | 348.800    | 10        |           |                                           |                |       | 176       |
| F II    | 353.421    | 15        |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3d$          | $g^3P - ^3P^o$ | 2-2   | 176,042   |
| F II    | 375.300    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $g^3P - ^3P^o$ | 2-2   | 176,042   |
| F II    | 375.434    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $g^3P - ^3S^o$ | 2-1   | 176,042   |
| F II    | 375.718    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $g^3P - ^3P^o$ | 1-1   | 176,042   |
| F II    | 375.793    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $g^3P - ^3P^o$ | 1-2   | 176,042   |
| F II    | 375.928    | 100d      |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $g^3P - ^3P^o$ | 0-1   | 176,042   |
| F II    | 376.686    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $g^3P - ^3D^o$ | 2-3   | 176,042   |
| F II    | 377.140    | 10        |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $g^3P - ^3D^o$ | 1-2   | 176,042   |
| F II    | 380.903    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3d$          | $^1D - ^1F^o$  | 2-3   | 176,487   |
| F II    | 393.676    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)4d$          | $g^3P - ^3D^o$ | 2-3   | 176,042   |
| F II    | 394.204    | 10        |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)4d$          | $g^3P - ^3D^o$ | 1-    | 176,042   |
| F II    | 400.575    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)4s$          | $^1D - ^1D^o$  | 2-2   | 176,042   |
| F II    | 405.640    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $^1D - ^1P^o$  | 2-1   | 176,487   |
| F II    | 407.046    | 400       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $^1D - ^1F^o$  | 2-3   | 176,487   |
| F II    | 407.505    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$          | $^1D - ^1D^o$  | 2-2   | 176,042   |
| F II    | 417.874    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3d$          | $^1S - ^1P^o$  | 0-1   | 176,042   |
| F II    | 422.012    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)4s$          | $g^3P - ^3S^o$ | 2-1   | 176,042   |
| F II    | 422.618    | 650       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)4s$          | $g^3P - ^3S^o$ | 1-1   | 176,042   |
| F II    | 430.909    | 250       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3d$          | $g^3P - ^3D^o$ | 2-3   | 176,042   |
| F II    | 431.545    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3d$          | $g^3P - ^3D^o$ | 1-2   | 176,042   |
| F II    | 431.826    | 150       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3d$          | $g^3P - ^3D^o$ | 0-1   | 176,042   |
| F II    | 435.634    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$          | $g^3P - ^3P^o$ | 2-    | 176,042   |
| F II    | 436.279    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$          | $g^3P - ^3P^o$ | 1-    | 176,042   |
| F II    | 436.563    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$          | $g^3P - ^3P^o$ | 0-1   | 176,042   |
| F II    | 457.177    | 500       |           | $2s^2 2p^4 - 2s^2 2p^4$                   | $^1D - ^1P^o$  | 2-1   | 176,042   |
| F II    | 471.949    | 200       |           |                                           |                |       | 176       |
| F II    | 471.990    | 400       | 3         | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$          | $g^3P - ^3D^o$ | 2-3   | 176,488   |
| F II    | 472.710    | 350       | 3         | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$          | $g^3P - ^3D^o$ | 1-2   | 176,488   |
| F II    | 473.016    | 300       | 3         | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$          | $g^3P - ^3D^o$ | 0-1   | 176,488   |
| F II    | 484.600    | 550       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$          | $^1D - ^1P^o$  | 2-1   | 176,042   |
| F II    | 513.649    | 400       |           | $2s^2 2p^4 - 2s^2 2p^4$                   | $^1S - ^1P^o$  | 0-1   | 176,042   |
| F II    | 514.945    | 600       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$          | $^1D - ^1D^o$  | 2-2   | 176,042   |
| F II    | 546.851    | 1000      | 2         | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3s$          | $g^3P - ^3S^o$ | 2-1   | 176,488   |
| F II    | 547.875    | 400       | 2         | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3s$          | $g^3P - ^3S^o$ | 1-1   | 176,488   |
| F II    | 548.322    | 300       | 2         | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3s$          | $g^3P - ^3S^o$ | 0-1   | 176,488   |
| F II    | 548.517    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$          | $^1S - ^1P^o$  | 0-1   | 176,042   |
| F II    | 605.668    | 700       | 1         | $2s^2 2p^4 - 2s^2 2p^4$                   | $g^3P - ^3P^o$ | 2-1   | 176,488   |
| F II    | 606.284    | 600       | 1         | $2s^2 2p^4 - 2s^2 2p^4$                   | $g^3P - ^3P^o$ | 1-0   | 176,488   |
| F II    | 606.805    | 800       | 1         | $2s^2 2p^4 - 2s^2 2p^4$                   | $g^3P - ^3P^o$ | 2-2   | 176,488   |
| F II    | 606.925    | 500       | 1         | $2s^2 2p^4 - 2s^2 2p^4$                   | $g^3P - ^3P^o$ | 1-1   | 176,488   |
| F II    | 607.472    | 600       | 1         | $2s^2 2p^4 - 2s^2 2p^4$                   | $g^3P - ^3P^o$ | 0-1   | 176,488   |
| F II    | 608.065    | 700       | 1         | $2s^2 2p^4 - 2s^2 2p^4$                   | $g^3P - ^3P^o$ | 1-2   | 176,488   |
| F II    | 1702.16    | 10        |           | $2s^2 2p^4(^1S^o)3p - 2s^2 2p^4(^1D^o)3d$ | $^3P - ^3P^o$  | 2-2   | 157       |
| F II    | 1704.90    | 100       |           | $2s^2 2p^4(^1S^o)3p - 2s^2 2p^4(^1D^o)3d$ | $^3P - ^3S^o$  | 2-1   | 157       |
| F II    | 1744.86    | 100       |           | $2s^2 2p^4(^1S^o)3s - 2s^2 2p^4(^1D^o)3p$ | $^3S^o - ^3P$  | 1-0   | 157       |
| F II    | 1745.57    | 200       |           | $2s^2 2p^4(^1S^o)3s - 2s^2 2p^4(^1D^o)3p$ | $^3S^o - ^3P$  | 1-1   | 157       |
| F II    | 1747.40    | 300       |           | $2s^2 2p^4(^1S^o)3s - 2s^2 2p^4(^1D^o)3p$ | $^3S^o - ^3P$  | 1-2   | 157       |

F III

## FLUORINE, Z = 9

F III

Ground state  $1s^2 2s^2 2p^3 \ ^4S_{3/2}$ Ionization potential 505 410  $\text{cm}^{-1}$ ; 62.66 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                          | Term                | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------------|---------------------|-----------------------------|-----------|
| F III   | 214.804    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)5d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 214.865    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)5d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 219.277    | 10d       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5d$         | $^3D^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 219.588    | 1d        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5d$         | $^3D^{\circ} - ^3F$ |                             | 174,176   |
| F III   | 226.051    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 174,176   |
| F III   | 226.091    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 226.166    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 230.117    | 500       |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^{\circ})3p$ | $^4S^{\circ} - ^4P$ | $\frac{3}{2} -$             | 174,176   |
| F III   | 230.573    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$         | $^3D^{\circ} - ^3P$ |                             | 174,176   |
| F III   | 231.015    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$         | $^3D^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 231.100    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$         | $^3D^{\circ} - ^3F$ |                             | 174,176   |
| F III   | 231.371    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)5d$         | $^3D^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 240.233    | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$         | $^3P^{\circ} - ^3P$ |                             | 174,176   |
| F III   | 240.550    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 240.730    | 200d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$         | $^3P^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 240.855    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 174,176   |
| F III   | 241.118    | 10d       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)5d$         | $^3P^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 243.364    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^3D^{\circ} - ^3D$ | $-\frac{3}{2}$              | 174,176   |
| F III   | 244.698    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3d$         | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 244.768    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^3D^{\circ} - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 245.002    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^3D^{\circ} - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 245.860    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4s$         | $^3D^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 254.162    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^3P^{\circ} - ^3D$ | $-\frac{3}{2}$              | 174,176   |
| F III   | 254.193    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^3P^{\circ} - ^3D$ | $-\frac{3}{2}$              | 174,176   |
| F III   | 255.624    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3d$         | $^3P^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 255.725    | 500       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 174,176   |
| F III   | 255.772    | 600       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 255.865    | 700       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 256.360    | 500       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^4S^{\circ} - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 256.525    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^3P^{\circ} - ^3P$ | $-\frac{1}{2}$              | 174,176   |
| F III   | 256.673    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$         | $^3P^{\circ} - ^3P$ | $-\frac{3}{2}$              | 174,176   |
| F III   | 256.723    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 256.890    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4s$         | $^3P^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 260.313    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 260.375    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 174,176   |
| F III   | 260.498    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$         | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 260.782    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$         | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 174,176   |
| F III   | 261.716    | 700       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 261.751    | 600       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 263.807    | 800       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3D^{\circ} - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 270.675    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3P^{\circ} - ^3S$ | $-\frac{1}{2}$              | 174,176   |
| F III   | 272.710    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3P^{\circ} - ^3P$ | $-\frac{3}{2}$              | 174,176   |
| F III   | 272.758    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3P^{\circ} - ^3P$ | $-\frac{1}{2}$              | 174,176   |
| F III   | 272.915    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$         | $^3P^{\circ} - ^3P$ | $-\frac{3}{2}$              | 174,176   |
| F III   | 273.207    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$         | $^3P^{\circ} - ^3P$ | $-\frac{3}{2}$              | 174,176   |
| F III   | 274.260    | 600       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$         | $^3P^{\circ} - ^3D$ |                             | 174,176   |
| F III   | 276.786    | 500       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 276.895    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 279.692    | 700       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 280.010    | 600       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 280.811    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 280.905    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 281.207    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 281.350    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 174,176   |
| F III   | 290.848    | 600       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^3P^{\circ} - ^3D$ | $-\frac{3}{2}$              | 174,176   |

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term          | J - J                     | Reference |
|---------|------------|-----------|-----------|---------------------------------------|---------------|---------------------------|-----------|
| F III   | 290.947    | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3d$        | $^1P^o - ^1D$ | $-\frac{3}{2}$            | 174,176   |
| F III   | 295.365    | 200       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3d$        | $^1P^o - ^1D$ | $-\frac{1}{2}$            | 174,176   |
| F III   | 295.405    | 100       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3d$        | $^1P^o - ^1D$ | $-\frac{3}{2}$            | 174,176   |
| F III   | 295.710    | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3d$        | $^1P^o - ^1P$ | $-\frac{1}{2}$            | 174,176   |
| F III   | 295.886    | 600       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3d$        | $^1P^o - ^1P$ | $-\frac{3}{2}$            | 174,176   |
| F III   | 311.415    | 400       |           | $2s^2 2p^2 - 2s^2 2p^2(^1S)3s$        | $^1P^o - ^1S$ | $\frac{1}{2}$             | 174,176   |
| F III   | 315.221    | 800       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^3S^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 315.539    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^3S^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 315.748    | 600       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^3S^o - ^1P$ | $\frac{3}{2}-\frac{1}{2}$ | 174,176   |
| F III   | 316.488    | 400       |           | $2s^2 2p^2 - 2s^2 2p^2(^1S^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 316.823    | 300       |           | $2s^2 2p^2 - 2s^2 2p^2(^1S^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 316.998    | 200       |           | $2s^2 2p^2 - 2s^2 2p^2(^1S^o)3d$      | $^1P - ^1D^o$ | $\frac{1}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 322.650    | 800       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3s$        | $^1D^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 322.685    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3s$        | $^1D^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 341.924    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3s$        | $^1P^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 343.892    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^1D^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 343.931    | 400       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^1D^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 344.388    | 600       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^1D^o - ^1P$ | $\frac{3}{2}-\frac{1}{2}$ | 174,176   |
| F III   | 365.874    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^1P^o - ^1P$ | $-\frac{3}{2}$            | 174,176   |
| F III   | 366.391    | 600       |           | $2s^2 2p^2 - 2s^2 2p^2(^1P)3s$        | $^1P^o - ^1P$ | $-\frac{1}{2}$            | 174,176   |
| F III   | 378.563    | 100       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D^o)3s$      | $^1D - ^1D^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 378.603    | 200       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D^o)3s$      | $^1D - ^1D^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 395.442    | 300       |           | $2s^2 2p^2 - 2s^2 2p^2(^1S^o)3s$      | $^1P - ^1S^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 395.968    | 200       |           | $2s^2 2p^2 - 2s^2 2p^2(^1S^o)3s$      | $^1P - ^1S^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 396.247    | 100       |           | $2s^2 2p^2 - 2s^2 2p^2(^1S^o)3s$      | $^1P - ^1S^o$ | $\frac{1}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 429.511    | 650       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1D^o - ^1P$ | $\frac{3}{2}-\frac{1}{2}$ | 174,176   |
| F III   | 430.154    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1D^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 430.218    | 500       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1D^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 464.284    | 600       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1P^o - ^1P$ | $-\frac{1}{2}$            | 174,176   |
| F III   | 465.113    | 650       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1P^o - ^1P$ | $-\frac{3}{2}$            | 174,176   |
| F III   | 508.384    | 900       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1P^o - ^1S$ | $-\frac{1}{2}$            | 174,176   |
| F III   | 522.288    | 300       |           | $2s^2 2p^2 - 1s^2 2p^2$               | $^1D - ^1P$   | $\frac{3}{2}-\frac{1}{2}$ | 174,176   |
| F III   | 523.661    | 400       |           | $2s^2 2p^2 - 1s^2 2p^2$               | $^1D - ^1P^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 567.629    | 500       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1D^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 567.676    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1D^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 567.737    | 650       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1D^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 567.794    | 500       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1D^o - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 630.131    | 600       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1P^o - ^1D$ | $-\frac{3}{2}$            | 174,176   |
| F III   | 630.194    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^1P^o - ^1D$ | $-\frac{3}{2}$            | 174,176   |
| F III   | 656.125    | 700       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^3S^o - ^1P$ | $\frac{3}{2}-\frac{1}{2}$ | 174,176   |
| F III   | 656.878    | 750       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^3S^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 658.337    | 800       |           | $2s^2 2p^2 - 2s^2 2p^2$               | $^3S^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 742.69     | 100       |           | $2s^2 2p^2 - 1s^2 2p^2$               | $^1P - ^1P^o$ | $\frac{3}{2}-\frac{3}{2}$ | 174,176   |
| F III   | 1071.66    | 10        |           | $2s^2 2p^2(^1P)3p - 2s^2 2p^2(^1P)4d$ | $^1D^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 042       |
| F III   | 1099.10    | 10        |           | $2s^2 2p^2(^1P)3p - 2s^2 2p^2(^1P)4d$ | $^1P^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 042       |
| F III   | 1101.55    | 10        |           | $2s^2 2p^2(^1P)3p - 2s^2 2p^2(^1P)4d$ | $^1P^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 042       |
| F III   | 1103.64    | 10        |           | $2s^2 2p^2(^1P)3p - 2s^2 2p^2(^1P)4d$ | $^1P^o - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 042       |

F IV

FLUORINE, Z = 9

F IV

Ground state  $1s^2 2s^2 2p^5 \ ^3P_0$ Ionization potential 703 020  $\text{cm}^{-1}$ ; 87.16 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term           | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------------|----------------|-------|-----------|
| F IV    | 140.781    | 1         |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 5p$     | $g^3P - ^3D^o$ |       | 173,176   |
| F IV    | 140.816    | 1         |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 5p$     | $g^3P - ^3D^o$ | 2-3   | 173,176   |
| F IV    | 150.335    | 10        |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 4p$     | $g^3P - ^3P^o$ |       | 173,176   |
| F IV    | 150.422    | 10        |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 4p$     | $g^3P - ^3P^o$ | 2-2   | 173,176   |
| F IV    | 150.977    | 100       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 4p$     | $g^3P - ^3D^o$ |       | 173,176   |
| F IV    | 151.005    | 100       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 4p$     | $g^3P - ^3D^o$ | 2-3   | 173,176   |
| F IV    | 151.079    | 1         |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 4p$     | $g^3P - ^3D^o$ | 2-2   | 173,176   |
| F IV    | 152.997    | 1         |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 6d$ | $g^3P - ^3P^o$ | 1-    | 173,176   |
| F IV    | 153.102    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 6d$ | $g^3P - ^3P^o$ | 2-2   | 173,176   |
| F IV    | 153.141    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 6d$ | $g^3P - ^3D^o$ | 2-3   | 173,176   |
| F IV    | 155.624    | 10        |           | $2s 2p^3 - 2s 2p^4 (^4P) 5d$       | $^1S^o - ^1P$  | 2-    | 173,176   |
| F IV    | 155.673    | 10        |           | $2s 2p^3 - 2s 2p^4 (^4P) 5d$       | $^1S^o - ^1P$  | 2-3   | 173,176   |
| F IV    | 158.398    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 5d$ | $g^3P - ^1P^o$ | 1-    | 173,176   |
| F IV    | 158.601    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 5d$ | $g^3P - ^3D^o$ | 2-3   | 173,176   |
| F IV    | 158.925    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 6d$ | $^1D - ^1F^o$  | 2-3   | 173,176   |
| F IV    | 164.612    | 200       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 5d$ | $^1D - ^1F^o$  | 2-3   | 173,176   |
| F IV    | 165.350    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 5d$ | $^1D - ^1D^o$  | 2-2   | 173,176   |
| F IV    | 165.479    | 1         |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 5d$ | $^1D - ^1F^o$  | 2-2   | 173,176   |
| F IV    | 166.444    | 200       |           | $2s 2p^3 - 2s 2p^4 (^4P) 4d$       | $^1S^o - ^1P$  | 2-2   | 173,176   |
| F IV    | 166.499    | 200       |           | $2s 2p^3 - 2s 2p^4 (^4P) 4d$       | $^1S^o - ^1P$  | 2-3   | 173,176   |
| F IV    | 168.450    | 200       |           | $2s^2 2p^3 - 2s 2p^4 (^4D) 3p$     | $^1D - ^1P^o$  | 2-1   | 173,176   |
| F IV    | 169.166    | 200       |           | $2s 2p^3 - 2s 2p^4 (^4D) 4d$       | $^3D^o - ^1F$  |       | 173,176   |
| F IV    | 169.481    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $g^3P - ^1P^o$ | 1-0   | 173,176   |
| F IV    | 169.502    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $g^3P - ^1P^o$ | 1-1   | 173,176   |
| F IV    | 169.610    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $g^3P - ^3P^o$ | 2-1   | 173,176   |
| F IV    | 169.661    | 200       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $g^3P - ^3P^o$ | 2-2   | 173,176   |
| F IV    | 169.748    | 200       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $g^3P - ^3D^o$ | 0-1   | 173,176   |
| F IV    | 169.790    | 300       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $g^3P - ^3D^o$ | 1-2   | 173,176   |
| F IV    | 169.839    | 300       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $g^3P - ^3D^o$ | 2-3   | 173,176   |
| F IV    | 170.187    | 200       |           | $2s^2 2p^3 - 2s 2p^4 (^4D) 3p$     | $^1D - ^1D^o$  | 2-2   | 173,176   |
| F IV    | 171.066    | 300       |           | $2s^2 2p^3 - 2s 2p^4 (^4D) 3p$     | $^1D - ^1F^o$  | 2-3   | 173,176   |
| F IV    | 172.653    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 5d$ | $^1S - ^1P^o$  | 0-1   | 173,176   |
| F IV    | 175.033    | 10        |           | $2s 2p^3 - 2s 2p^4 (^4P) 4s$       | $^1S^o - ^1P$  | 2-3   | 173,176   |
| F IV    | 175.132    | 1         |           | $2s 2p^3 - 2s 2p^4 (^4P) 4s$       | $^1S^o - ^1P$  | 2-2   | 173,176   |
| F IV    | 176.110    | 10        |           |                                    |                |       | 173,176   |
| F IV    | 176.367    | 400       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $^1D - ^1F^o$  | 2-3   | 173,176   |
| F IV    | 177.971    | 200       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $^1D - ^1D^o$  | 2-2   | 173,176   |
| F IV    | 178.126    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $^1D - ^1F^o$  | 2-2   | 173,176   |
| F IV    | 178.540    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4s$ | $g^3P - ^1P^o$ | 1-2   | 173,176   |
| F IV    | 178.670    | 300       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4s$ | $g^3P - ^1P^o$ | 2-2   | 173,176   |
| F IV    | 178.724    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4s$ | $g^3P - ^1P^o$ | 1-0   | 173,176   |
| F IV    | 178.805    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4s$ | $g^3P - ^1P^o$ | 2-1   | 173,176   |
| F IV    | 179.827    | 100       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^1P^o$ | 1-2   | 173,176   |
| F IV    | 179.907    | 1         |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^1P^o$ | 1-1   | 173,176   |
| F IV    | 179.943    | 200       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^1P^o$ | 2-2   | 173,176   |
| F IV    | 180.029    | 10        |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^1P^o$ | 2-1   | 173,176   |
| F IV    | 181.521    | 400       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^3D^o$ | 1-2   | 173,176   |
| F IV    | 181.571    | 400       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^3D^o$ | 2-3   | 173,176   |
| F IV    | 181.655    | 200       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^3D^o$ | 2-2   | 173,176   |
| F IV    | 185.484    | 300       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4d$ | $^1S - ^1P^o$  | 0-1   | 173,176   |
| F IV    | 186.558    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P^o) 4s$ | $^1D - ^1P^o$  | 2-1   | 173,176   |
| F IV    | 187.105    | 200       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^1S^o$ | 1-1   | 173,176   |
| F IV    | 187.240    | 300       |           | $2s^2 2p^3 - 2s 2p^4 (^4P) 3p$     | $g^3P - ^1S^o$ | 2-1   | 173,176   |
| F IV    | 187.916    | 100       |           | $2s 2p^3 - 2s 2p^4 (^4P) 4d$       | $^3D^o - ^1D$  | 3-3   | 173,176   |
| F IV    | 188.004    | 10        |           | $2s 2p^3 - 2s 2p^4 (^4P) 4d$       | $^3D^o - ^3D$  |       | 173,176   |

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term               | J - J | Reference |
|---------|------------|-----------|-----------|--------------------------------|--------------------|-------|-----------|
| F IV    | 188.656    | 200       |           | $2s2p^3 - 2s2p^3(^4P)4d$       | $^3D^\circ - ^3F$  | 3-4   | 173,176   |
| F IV    | 188.758    | 100       |           | $2s2p^3 - 2s2p^3(^4P)4d$       | $^3D^\circ - ^3F$  | 2-3   | 173,176   |
| F IV    | 188.834    | 10        |           | $2s2p^3 - 2s2p^3(^4P)4d$       | $^3D^\circ - ^3F$  | 1-2   | 173,176   |
| F IV    | 196.351    | 400       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3S^\circ - ^3P$  | 2-1   | 173,176   |
| F IV    | 196.390    | 500       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3S^\circ - ^3P$  | 2-2   | 173,176   |
| F IV    | 196.448    | 600       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3S^\circ - ^3P$  | 2-3   | 173,176   |
| F IV    | 196.968    | 100       |           | $2s^22p^3 - 2s^22p^3(^4P^o)4s$ | $^1S - ^1P^o$      | 0-1   | 173,176   |
| F IV    | 197.108    | 200       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3S^\circ - ^3D$  | 2-3   | 173,176   |
| F IV    | 199.004    | 300       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3D^\circ - ^3D$  | 3-3   | 173,176   |
| F IV    | 199.086    | 300       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3D^\circ - ^3D$  |       | 173,176   |
| F IV    | 199.607    | 100       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3D^\circ - ^3P$  | 3-2   | 173,176   |
| F IV    | 199.761    | 500       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3P^o$     | 0-1   | 173,176   |
| F IV    | 199.804    | 500       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3P^o$     | 1-0   | 173,176   |
| F IV    | 199.849    | 500       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3P^o$     | 1-1   | 173,176   |
| F IV    | 199.934    | 500       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3P^o$     | 1-2   | 173,176   |
| F IV    | 200.001    | 500       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3P^o$     | 2-1   | 173,176   |
| F IV    | 200.089    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3P^o$     | 2-2   | 173,176   |
| F IV    | 201.011    | 600       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3D^\circ$ | 0-1   | 173,176   |
| F IV    | 201.063    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3D^\circ$ | 1-2   | 173,176   |
| F IV    | 201.101    | 600       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3D^\circ$ | 1-1   | 173,176   |
| F IV    | 201.160    | 800       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3D^\circ$ | 2-3   | 173,176   |
| F IV    | 201.222    | 600       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3D^\circ$ | 2-2   | 173,176   |
| F IV    | 201.465    | 400       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3D^\circ - ^3F$  |       | 173,176   |
| F IV    | 202.989    | 10        |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^1D^\circ$ | 1-2   | 173,176   |
| F IV    | 203.152    | 100       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $g^3P - ^3F^\circ$ | 2-3   | 173,176   |
| F IV    | 208.254    | 900       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $^1D - ^1F^\circ$  | 2-3   | 173,176   |
| F IV    | 208.549    | 200       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3P^\circ - ^3S$  | -1    | 173,176   |
| F IV    | 210.480    | 100       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3P^\circ - ^3D$  | 2-3   | 173,176   |
| F IV    | 210.545    | 100       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3P^\circ - ^3D$  |       | 173,176   |
| F IV    | 211.152    | 10        |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^3P^\circ - ^3P$  | 2-2   | 173,176   |
| F IV    | 213.848    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $^1D - ^1D^\circ$  | 2-2   | 173,176   |
| F IV    | 214.062    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $^1D - ^3F^\circ$  | 2-2   | 173,176   |
| F IV    | 220.765    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3d$ | $^1S - ^1P^\circ$  | 0-1   | 173,176   |
| F IV    | 223.394    | 300       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3D$  | 3-3   | 173,176   |
| F IV    | 223.456    | 200       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3D$  | 2-2   | 173,176   |
| F IV    | 223.497    | 100       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3D$  | -1    | 173,176   |
| F IV    | 226.944    | 600       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3F$  | 3-4   | 173,176   |
| F IV    | 227.079    | 300       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3F$  | 3-3   | 173,176   |
| F IV    | 227.101    | 500       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3F$  | 2-3   | 173,176   |
| F IV    | 227.211    | 400       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3F$  | 1-2   | 173,176   |
| F IV    | 228.496    | 1         |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3P$  | 1-0   | 173,176   |
| F IV    | 228.552    | 10        |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3P$  | 2-1   | 173,176   |
| F IV    | 228.645    | 100       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3D^\circ - ^3P$  | 3-2   | 173,176   |
| F IV    | 229.261    | 200       |           |                                |                    |       | 173,176   |
| F IV    | 233.159    | 200       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^1D^\circ - ^1D$  | 2-2   | 173,176   |
| F IV    | 233.222    | 600       |           | $2s2p^3 - 2s2p^3(^4P)3s$       | $^3S^\circ - ^3P$  | 2-3   | 173,176   |
| F IV    | 233.297    | 200       |           | $2s2p^3 - 2s2p^3(^4D)3d$       | $^1D^\circ - ^1F$  | 2-3   | 173,176   |
| F IV    | 233.393    | 500       |           | $2s2p^3 - 2s^3p^3(^4P)3s$      | $^3S^\circ - ^3P$  | 2-2   | 173,176   |
| F IV    | 233.526    | 400       |           | $2s2p^3 - 2s2p^3(^4P)3s$       | $^3S^\circ - ^3P$  | 2-1   | 173,176   |
| F IV    | 237.913    | 300       |           | $2s2p^3 - 2s2p^3(^4D)3s$       | $^3D^\circ - ^3D$  | 3-3   | 173,176   |
| F IV    | 237.955    | 400       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3P^\circ - ^3D$  | 2-3   | 173,176   |
| F IV    | 238.012    | 300       |           | $2s2p^3 - 2s2p^3(^4D)3s$       | $^3D^\circ - ^3D$  | -2    | 173,176   |
| F IV    | 238.042    | 200       |           | $2s2p^3 - 2s2p^3(^4P)3d$       | $^3P^\circ - ^3D$  | -1    | 173,176   |
| F IV    | 238.099    | 100       |           | $2s2p^3 - 2s2p^3(^4D)3s$       | $^3D^\circ - ^3D$  | -1    | 173,176   |
| F IV    | 239.856    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3s$ | $g^3P - ^3P^\circ$ | 1-2   | 173,176   |
| F IV    | 240.017    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3s$ | $g^3P - ^3P^\circ$ | 0-1   | 173,176   |
| F IV    | 240.079    | 900       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3s$ | $g^3P - ^3P^\circ$ | 2-2   | 173,176   |
| F IV    | 240.146    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3s$ | $g^3P - ^3P^\circ$ | 1-1   | 173,176   |
| F IV    | 240.275    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3s$ | $g^3P - ^3P^\circ$ | 1-0   | 173,176   |
| F IV    | 240.371    | 700       |           | $2s^22p^3 - 2s^22p^3(^4P^o)3s$ | $g^3P - ^3P^\circ$ | 2-1   | 173,176   |

F IV

F IV

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term                    | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------------|-------------------------|-------|-----------|
| F IV    | 243.736    | 200       |           | $2s2p^3 - 2s2p^3(^4P)3d$           | $^3P^\circ - ^3P$       | 1-0   | 173,176   |
| F IV    | 243.796    | 300       |           | $2s2p^3 - 2s2p^3(^4P)3d$           | $^3P^\circ - ^3P$       | 1-1   | 173,176   |
| F IV    | 243.922    | 400       |           | $2s2p^3 - 2s2p^3(^4P)3d$           | $^3P^\circ - ^3P$       | 2-2   | 173,176   |
| F IV    | 249.228    | 100       |           | $2s2p^3 - 2s2p^3(^3D)3d$           | $^1P^\circ - ^1P$       | 1-1   | 173,176   |
| F IV    | 249.744    | 10        |           | $2s2p^3 - 2s2p^3(^3D)3d$           | $^1P^\circ - ^1D$       | 1-2   | 173,176   |
| F IV    | 251.026    | 1000      |           | $2s^22p^3 - 2s^22p^3(^3P^\circ)3s$ | $^1D^\circ - ^1P^\circ$ | 2-1   | 173,176   |
| F IV    | 254.491    | 200       |           | $2s2p^3 - 2s2p^3(^3D)3s$           | $^3P^\circ - ^3D$       | 2-3   | 173,176   |
| F IV    | 254.595    | 100       |           | $2s2p^3 - 2s2p^3(^3D)3s$           | $^3P^\circ - ^3D$       | 1-2   | 173,176   |
| F IV    | 254.681    | 10        |           | $2s2p^3 - 2s2p^3(^3D)3s$           | $^3P^\circ - ^3D$       | 0-1   | 173,176   |
| F IV    | 268.785    | 400       |           | $2s2p^3 - 2s^2p^3(^4P)3s$          | $^3D^\circ - ^3P$       | 3-2   | 173,176   |
| F IV    | 268.817    | 100       |           | $2s2p^3 - 2s2p^3(^4P)3s$           | $^3D^\circ - ^3P$       | 2-2   | 173,176   |
| F IV    | 269.076    | 300       |           | $2s2p^3 - 2s2p^3(^4P)3s$           | $^3D^\circ - ^3P$       | 2-1   | 173,176   |
| F IV    | 269.225    | 200       |           | $2s2p^3 - 2s2p^3(^4P)3s$           | $^3D^\circ - ^3P$       | 1-0   | 173,176   |
| F IV    | 270.225    | 600       |           | $2s^22p^3 - 2s^22p^3(^3P^\circ)3s$ | $^1S^\circ - ^1P^\circ$ | 0-1   | 173,176   |
| F IV    | 279.834    | 300       |           | $2s2p^3 - 2s2p^3(^3D)3s$           | $^1D^\circ - ^1D$       | 2-2   | 173,176   |
| F IV    | 287.994    | 1         |           | $2s2p^3 - 2s2p^3(^4P)3d$           | $^3S^\circ - ^3P$       | 1-0   | 173,176   |
| F IV    | 288.078    | 10        |           | $2s2p^3 - 2s2p^3(^4P)3d$           | $^3S^\circ - ^3P$       | 1-1   | 173,176   |
| F IV    | 288.267    | 100       |           | $2s2p^3 - 2s2p^3(^4P)3d$           | $^3S^\circ - ^3P$       | 1-2   | 173,176   |
| F IV    | 290.147    | 400       |           | $2s2p^3 - 2s2p^3(^4P)3s$           | $^3P^\circ - ^3P$       | 2-2   | 173,176   |
| F IV    | 290.440    | 300       |           | $2s2p^3 - 2s2p^3(^4P)3s$           | $^3P^\circ - ^3P$       | -1    | 173,176   |
| F IV    | 290.461    | 200       |           | $2s2p^3 - 2s2p^3(^4P)3s$           | $^3P^\circ - ^3P$       | 0-1   | 173,176   |
| F IV    | 290.608    | 200       |           | $2s2p^3 - 2s2p^3(^4P)3s$           | $^3P^\circ - ^3P$       | 1-0   | 173,176   |
| F IV    | 319.695    | 300       |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3D^\circ - ^3P$       | 3-2   | 173,176   |
| F IV    | 319.740    | 10        |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3D^\circ - ^3P$       | 2-2   | 173,176   |
| F IV    | 320.004    | 200       |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3D^\circ - ^3P$       | -1    | 173,176   |
| F IV    | 320.192    | 100       |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3D^\circ - ^3P$       | 1-0   | 173,176   |
| F IV    | 328.213    | 10        |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3D^\circ - ^3D$       | 3-3   | 173,176   |
| F IV    | 355.045    | 200       |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3P^\circ - ^3S$       | 2-1   | 173,176   |
| F IV    | 360.635    | 100       |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3P^\circ - ^3D$       | 2-3   | 173,176   |
| F IV    | 361.208    | 10        |           | $2s2p^3 - 2s^22p^3(^3P^\circ)3p$   | $^3P^\circ - ^3D$       | 1-2   | 173,176   |
| F IV    | 419.644    | 900       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3S^\circ$      | 0-1   | 173,176   |
| F IV    | 420.041    | 950       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3S^\circ$      | 1-1   | 173,176   |
| F IV    | 420.727    | 1000      |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3S^\circ$      | 2-1   | 173,176   |
| F IV    | 430.758    | 950       |           | $2s^22p^3 - 2s2p^3$                | $^1D^\circ - ^1P^\circ$ | 2-1   | 173,176   |
| F IV    | 490.566    | 800       |           | $2s^22p^3 - 2s2p^3$                | $^1S^\circ - ^1P^\circ$ | 0-1   | 173,176   |
| F IV    | 490.997    | 1000      |           | $2s^22p^3 - 2s2p^3$                | $^1D^\circ - ^1D^\circ$ | 2-2   | 173,176   |
| F IV    | 497.363    | 500       |           | $2s2p^3 - 1s^22p^4$                | $^3D^\circ - ^3P$       | 1-0   | 173,176   |
| F IV    | 497.802    | 600       |           | $2s2p^3 - 1s^22p^4$                | $^3D^\circ - ^3P$       | 2-1   | 173,176   |
| F IV    | 497.842    | 400       |           | $2s2p^3 - 1s^22p^4$                | $^3D^\circ - ^3P$       | 1-1   | 173,176   |
| F IV    | 498.790    | 700       |           | $2s2p^3 - 1s^22p^4$                | $^3D^\circ - ^3P$       | 3-2   | 173,176   |
| F IV    | 498.911    | 400       |           | $2s2p^3 - 1s^22p^4$                | $^3D^\circ - ^3P$       | 2-2   | 173,176   |
| F IV    | 570.636    | 900       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3P^\circ$      | 0-1   | 173,176   |
| F IV    | 571.302    | 900       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3P^\circ$      | 1-0   | 173,176   |
| F IV    | 571.384    | 950       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3P^\circ$      | 1-    | 173,176   |
| F IV    | 572.657    | 1000      |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3P^\circ$      | 2-2   | 173,176   |
| F IV    | 575.633    | 200       |           | $2s2p^3 - 1s^22p^4$                | $^3P^\circ - ^3P$       | 1-0   | 173,176   |
| F IV    | 576.266    | 300       |           | $2s2p^3 - 1s^22p^4$                | $^3P^\circ - ^3P$       | -1    | 173,176   |
| F IV    | 576.349    | 200       |           | $2s2p^3 - 1s^22p^4$                | $^3P^\circ - ^3P$       | 0-1   | 173,176   |
| F IV    | 577.737    | 400       |           | $2s2p^3 - 1s^22p^4$                | $^3P^\circ - ^3P$       | 2-2   | 173,176   |
| F IV    | 676.130    | 850       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3D^\circ$      | 0-1   | 173,176   |
| F IV    | 677.154    | 800       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3D^\circ$      | 1-1   | 173,176   |
| F IV    | 677.224    | 950       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3D^\circ$      | 1-2   | 173,176   |
| F IV    | 679.003    | 800       |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3D^\circ$      | 2-2   | 173,176   |
| F IV    | 679.217    | 1000      |           | $2s^22p^3 - 2s2p^3$                | $g^3P - ^3D^\circ$      | 2-3   | 173,176   |

F V

## FLUORINE, Z = 9

F V

Ground state  $1s^2 2s^2 2p^4 \text{ } ^2\text{P}_{1/2}$ Ionization potential 921 450 cm<sup>-1</sup>; 114.24 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                               | Term                         | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------------------------------------|------------------------------|-----------------------------|-----------|
| F V     | 119.986    | 10        |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)4p$ | $g^2\text{P}^o - ^1\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 120.032    | 15        |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)4p$ | $g^2\text{P}^o - ^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 122.042    | 10        |           | $2s2p^2 - 2s2p(^1\text{P}^o)5d$             | $^4\text{P} - ^1\text{D}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 176       |
| F V     | 123.665    | 10        |           | $2s^2(^1\text{S})2p - 2s^2(^1\text{S})5d$   | $g^2\text{P}^o - ^2\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 123.774    | 100       |           | $2s^2(^1\text{S})2p - 2s^2(^1\text{S})5d$   | $g^2\text{P}^o - ^2\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 131.516    | 10        |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{S}$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 131.638    | 10        |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{S}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 132.207    | 10        |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^4\text{P} - ^1\text{P}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 132.310    | 100       |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^4\text{P} - ^1\text{P}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 132.453    | 200       |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^4\text{P} - ^1\text{D}^o$  | $\frac{1}{2} -$             | 172.176   |
| F V     | 132.484    | 300       |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^4\text{P} - ^1\text{D}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 132.511    | 300       |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^4\text{P} - ^1\text{D}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 132.699    | 100d      |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{P}$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 132.819    | 200       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 133.082    | 10        |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 133.208    | 100       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 133.599    | 110       |           | $2s2p^2 - 1s^2 2p^4(^1\text{P})3p$          | $^4\text{P} - ^4\text{S}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 133.662    | 100       |           | $2s2p^2 - 1s^2 2p^4(^1\text{P})3p$          | $^4\text{P} - ^4\text{S}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 134.407    | 400       |           | $2s^2 2p^2 - 2s^2 4d$                       | $g^2\text{P}^o - ^1\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 134.539    | 500       |           | $2s^2 2p^2 - 2s^2 4d$                       | $g^2\text{P}^o - ^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 135.621    | 1         |           | $2s2p^2 - 1s^2 2p^4(^1\text{P})3p$          | $^4\text{P} - ^4\text{P}^o$  |                             | 172.176   |
| F V     | 135.692    | 10        |           | $2s2p^2 - 1s^2 2p^4(^1\text{P})3p$          | $^4\text{P} - ^4\text{P}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 136.902    | 300       |           | $2s2p^2 - 1s^2 2p^4(^1\text{P})3p$          | $^4\text{P} - ^1\text{D}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 136.955    | 10        |           | $2s2p^2 - 1s^2 2p^4(^1\text{P})3p$          | $^4\text{P} - ^1\text{D}$    | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 138.181    | 100d      |           | $2s2p^2 - 2s2p(^1\text{P}^o)4s$             | $^4\text{P} - ^4\text{P}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 176       |
| F V     | 138.256    | 10d       |           | $2s2p^2 - 2s2p(^1\text{P}^o)4s$             | $^4\text{P} - ^4\text{P}^o$  |                             | 176       |
| F V     | 140.266    | 10        |           | $2s^2 2p - 2s^2 4s$                         | $g^2\text{P}^o - ^2\text{S}$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 140.414    | 100       |           | $2s^2 2p - 2s^2 4s$                         | $g^2\text{P}^o - ^2\text{S}$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V?    | 142.422    | 100       |           |                                             |                              |                             | 176       |
| F V?    | 143.794    | 10        |           |                                             |                              |                             | 176       |
| F V     | 143.897    | 100       |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^2\text{D} - ^1\text{F}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 143.965    | 15        |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^2\text{D} - ^1\text{F}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V?    | 144.445    | 10        |           |                                             |                              |                             | 176       |
| F V?    | 144.478    | 1         |           |                                             |                              |                             | 176       |
| F V     | 144.637    | 100       |           | $2s2p^2 - 1s^2 2p^4(^1\text{D})3p$          | $^2\text{D} - ^1\text{F}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 176       |
| F V     | 144.673    | 90        |           | $2s2p^2 - 1s^2 2p^4(^1\text{D})3p$          | $^2\text{D} - ^1\text{F}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 176       |
| F V     | 145.177    | 100d      |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^2\text{D} - ^1\text{D}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 145.392    | 200       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{S}$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 145.547    | 300       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{S}$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 147.946    | 400       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^1\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 148.002    | 500       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 148.108    | 100       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 152.339    | 200       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{P}$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 152.391    | 300       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{P}$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 152.511    | 400       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 152.563    | 200       |           | $2s^2(^1\text{S})2p - 2s2p(^1\text{P}^o)3p$ | $g^2\text{P}^o - ^2\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 157.515    | 100d      |           | $2s2p^2 - 2s2p(^1\text{P}^o)3d$             | $^2\text{D} - ^1\text{D}^o$  |                             | 172.176   |
| F V     | 158.537    | 400       |           | $2s2p^2 - 2s2p(^1\text{P}^o)3d$             | $^2\text{D} - ^1\text{F}^o$  |                             | 172.176   |
| F V     | 159.558    | 1         |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^2\text{P} - ^1\text{D}^o$  | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 159.658    | 10        |           | $2s2p^2 - 2s2p(^1\text{P}^o)4d$             | $^2\text{P} - ^1\text{D}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 162.013    | 200       |           | $2s2p^2 - 2s2p(^1\text{P}^o)3d$             | $^4\text{P} - ^4\text{P}^o$  | $\frac{1}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 162.053    | 300       |           | $2s2p^2 - 2s2p(^1\text{P}^o)3d$             | $^4\text{P} - ^4\text{P}^o$  | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 162.082    | 300       |           | $2s2p^2 - 2s2p(^1\text{P}^o)3d$             | $^4\text{P} - ^4\text{P}^o$  | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 162.121    | 200       |           | $2s2p^2 - 2s2p(^1\text{P}^o)3d$             | $^4\text{P} - ^4\text{P}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 162.172    | 300       |           | $2s2p^2 - 2s2p(^1\text{P}^o)3d$             | $^4\text{P} - ^4\text{P}^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |



F V

F V

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J - J                       | Reference    |
|---------|------------|-----------|-----------|------------------------------|---------------|-----------------------------|--------------|
| F V     | 162.215    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 162.270    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 163.456    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 163.501    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 163.558    | 500       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 163.596    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D$   | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 165.983    | 900       |           | $2s^22p - 2s^23d$            | $^4P^o - ^4D$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 166.177    | 1000      |           | $2s^22p - 2s^23d$            | $^4P^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 167.858    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4S - ^4P^o$ | $\frac{1}{2} -$             | 172.176      |
| F V     | 171.214    | 10        |           | $1s^22p^3 - 1s^22p^2(^3P)3d$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 171.241    | 100       |           | $1s^22p^3 - 1s^22p^2(^3P)3d$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 171.302    | 200       |           | $1s^22p^3 - 1s^22p^2(^3P)3d$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 173.020    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4P^o$ | $\frac{3}{2} -$             | 172.176      |
| F V     | 173.656    | 10        |           | $1s^22p^3 - 1s^22p^2(^1D)3d$ | $^4D^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 176          |
| F V     | 173.714    | 10        |           | $1s^22p^3 - 1s^22p^2(^1D)3d$ | $^4D^o - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 176          |
| F V     | 174.490    | 300       |           | $1s^22p^3 - 1s^22p^2(^1D)3d$ | $^4D^o - ^4F$ | $\frac{3}{2} -$             | 172.176      |
| F V     | 174.513    | 300       |           | $1s^22p^3 - 1s^22p^2(^1D)3d$ | $^4D^o - ^4F$ | $\frac{3}{2} -$             | 172.176      |
| F V     | 174.568    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 174.698    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 176.472    | 10        |           | $1s^22p^3 - 1s^22p^2(^1D)3d$ | $^4D^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 178.434    | 500       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4D - ^4F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 178.590    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4D - ^4F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 178.612    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4D - ^4P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 182.979    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4D - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 183.016    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4D - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 183.208    | 10        |           | $1s^22p^3 - 1s^22p^2(^3P)3d$ | $^4D^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V?    | 184.232    | 10        |           |                              |               |                             | 176          |
| F V?    | 184.282    | 1         |           |                              |               |                             | 176          |
| F V     | 186.715    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 186.788    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 186.842    | 500       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 186.879    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 186.968    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 187.008    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 189.943    | 200       |           | $1s^22p^3 - 1s^22p^2(^1D)3d$ | $^4P^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 190.571    | 600       |           | $2s^22p - 2s^23s$            | $^4P^o - ^4S$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 190.839    | 700       |           | $2s^22p - 2s^23s$            | $^4P^o - ^4S$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 191.892    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4S - ^4P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 191.973    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4S - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 194.108    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4S - ^4P^o$ | $\frac{1}{2} -$             | 172.176      |
| F V     | 196.713    | 200       |           | $1s^22p^3 - 1s^22p^2(^3P)3s$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 176          |
| F V     | 196.870    | 100       |           | $1s^22p^3 - 1s^22p^2(^3P)3s$ | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 176          |
| F V     | 197.615    | 1         |           | $1s^22p^3 - 1s^22p^2(^3P)3d$ | $^4P^o - ^4P$ | $\frac{1}{2} -$             | 172.176, 487 |
| F V     | 197.780    | 10        |           | $1s^22p^3 - 1s^22p^2(^3P)3d$ | $^4P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176, 487 |
| F V     | 198.476    | 100       |           | $1s^22p^3 - 1s^22p^2(^1D)3s$ | $^4D^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 198.765    | 1         |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V?    | 200.335    | 10        |           |                              |               |                             | 172.176      |
| F V     | 200.861    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{1}{2} -$             | 172.176      |
| F V     | 205.552    | 400       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4D - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 205.778    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4D - ^4P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 206.430    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 206.594    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$     | $^4P - ^4D$   | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 215.676    | 10        |           | $1s^22p^3 - 1s^22p^2(^1D)3s$ | $^4P^o - ^4D$ |                             | 172.176      |
| F V?    | 217.893    | 10        |           |                              |               |                             | 172.176      |
| F V?    | 218.052    | 1         |           |                              |               |                             | 172.176      |
| F V     | 223.999    | 1         |           | $1s^22p^2 - 2s2p(^3P^o)3p$   | $^4D^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 226.341    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4S - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 226.608    | 90        |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4S - ^4P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176      |
| F V     | 235.840    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3s$     | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |
| F V     | 242.324    | 300       |           | $2s2p^2 - 2s^2(^1S)3p$       | $^4D - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176      |

F V

F V

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|------------------------|----------------|-----------------------------|-----------|
| F V     | 242.439    | 200       |           | $2s2p^2 - 2s^2(^1S)3p$ | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 464.370    | 650       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 465.374    | 700       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 465.978    | 750       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 466.995    | 650       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 506.163    | 850       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 508.079    | 900       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 513.975    | 700       |           | $2s2p^2 - 1s^22p^3$    | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 514.087    | 600       |           | $2s2p^2 - 1s^22p^3$    | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 172.176   |
| F V     | 524.597    | 600       |           | $2s2p^2 - 1s^22p^3$    | $^1P - ^1S^o$  | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 525.292    | 650       |           | $2s2p^2 - 1s^22p^3$    | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 526.298    | 700       |           | $2s2p^2 - 1s^22p^3$    | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 647.771    | 500       |           | $2s2p^2 - 1s^22p^3$    | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 647.879    | 600       |           | $2s2p^2 - 1s^22p^3$    | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 654.034    | 600       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 657.220    | 200       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 657.335    | 400       |           | $2s^22p - 2s2p^2$      | $K^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 667.23     | 300       |           | $2s2p^2 - 1s^22p^3$    | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 757.08     | 400       |           | $2s2p^2 - 1s^22p^3$    | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |
| F V     | 1088.41    | 100       |           | $2s2p^2 - 1s^22p^3$    | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 172.176   |

F VI

## FLUORINE, Z = 9

F VI

Ground state  $1s^2 2s^2 2p^5$   $^2P^{\circ}_1$ Ionization potential 1 267 581  $\text{cm}^{-1}$ ; 157.156 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                        | Term                | J - J | Reference |
|---------|------------|-----------|-----------|--------------------------------------|---------------------|-------|-----------|
| F VI    | 99.044     | 10        |           | $2s2p - 2s5d$                        | $^3P^{\circ} - ^3D$ |       | 171.176   |
| F VI    | 99.105     | 15        |           | $2s2p - 2s5d$                        | $^3P^{\circ} - ^3D$ | 2-3   | 171.176   |
| F VI    | 99.203     | 10        |           | $2s^2 - 2s4p$                        | $^3S - ^1P^{\circ}$ | 0-1   | 171.176   |
| F VI    | 108.975    | 100       |           | $2s2p - 2s4d$                        | $^3P^{\circ} - ^3D$ |       | 171.176   |
| F VI    | 109.040    | 150       |           | $2s2p - 2s4d$                        | $^3P^{\circ} - ^3D$ | 2-3   | 171.176   |
| F VI    | 113.840    | 10d       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})4d$ | $^3P - ^3D^{\circ}$ | 2-3   | 171.176   |
| F VI    | 116.094    | 10        |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})4d$ | $^1D - ^1F^{\circ}$ | 2-3   | 171.176   |
| F VI    | 120.116    | 100       |           | $2s2p - 2s4d$                        | $^1P^{\circ} - ^1D$ | 1-2   | 171.176   |
| F VI    | 122.122    | 100       |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3P$ |       | 171.176   |
| F VI    | 122.169    | 10        |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3P$ | 1-1   | 171.176   |
| F VI    | 122.200    | 200       |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3P$ | 2-2   | 171.176   |
| F VI    | 122.251    | 15        |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3P$ | 2-1   | 171.176   |
| F VI    | 123.051    | 10        |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3S$ | 0-1   | 171.176   |
| F VI    | 123.090    | 10        |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3S$ | 1-1   | 171.176   |
| F VI    | 123.175    | 100       |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3S$ | 2-1   | 171.176   |
| F VI    | 124.387    | 300d      |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3D$ |       | 171.176   |
| F VI    | 124.440    | 10        |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3D$ | 1-1   | 171.176   |
| F VI    | 124.474    | 10        |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^3P^{\circ} - ^3D$ | 2-2   | 171.176   |
| F VI    | 126.923    | 500       |           | $2s^2 - 2s3p$                        | $^3S - ^1P^{\circ}$ | 0-1   | 171.176   |
| F VI    | 135.397    | 300       |           | $2s(^3S)2p - 2p(^1P^{\circ})3p$      | $^1P^{\circ} - ^1D$ | 1-2   | 171.176   |
| F VI    | 139.758    | 500       |           | $2s2p - 2s3d$                        | $^3P^{\circ} - ^3D$ | 0-1   | 171.176   |
| F VI    | 139.800    | 600       |           | $2s2p - 2s3d$                        | $^3P^{\circ} - ^3D$ | 1-2   | 171.176   |
| F VI    | 139.900    | 700       |           | $2s2p - 2s3d$                        | $^3P^{\circ} - ^3D$ | 2-3   | 171.176   |
| F VI    | 141.154    | 200       |           | $2s(^3S)2p - 1s^2 2p(^3P^{\circ})3p$ | $^1P^{\circ} - ^1P$ | 1-1   | 171.176   |
| F VI    | 145.462    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 0-1   | 171.176   |
| F VI    | 145.489    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 1-0   | 171.176   |
| F VI    | 145.585    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 1-2   | 171.176   |
| F VI    | 145.630    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 2-1   | 171.176   |
| F VI    | 145.691    | 300       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 2-2   | 171.176   |
| F VI    | 146.576    | 200       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3D^{\circ}$ | 0-1   | 171.176   |
| F VI    | 146.613    | 300       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3D^{\circ}$ | 1-2   | 171.176   |
| F VI    | 146.676    | 400       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3D^{\circ}$ | 2-3   | 171.176   |
| F VI    | 146.718    | 200       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^3P - ^3D^{\circ}$ | 2-2   | 171.176   |
| F VI    | 148.653    | 400       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^1D - ^1F^{\circ}$ | 2-3   | 171.176   |
| F VI    | 153.678    | 200       |           | $2s2p - 2s3s$                        | $^3P^{\circ} - ^3S$ | 0-1   | 171.176   |
| F VI    | 153.741    | 300       |           | $2s2p - 2s3s$                        | $^3P^{\circ} - ^3S$ | 1-1   | 171.176   |
| F VI    | 153.880    | 400       |           | $2s2p - 2s3s$                        | $^3P^{\circ} - ^3S$ | 2-1   | 171.176   |
| F VI    | 154.506    | 300       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3d$ | $^1D - ^1D^{\circ}$ | 2-2   | 171.176   |
| F VI    | 156.247    | 600       |           | $2s2p - 2s3d$                        | $^1P^{\circ} - ^1D$ | 1-2   | 171.176   |
| F VI    | 161.174    | 120       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3s$ | $^3P - ^3P^{\circ}$ | 1-2   | 171.176   |
| F VI    | 161.257    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3s$ | $^3P - ^3P^{\circ}$ | 0-1   | 171.176   |
| F VI    | 161.308    | 300       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3s$ | $^3P - ^3P^{\circ}$ | 2-2   | 171.176   |
| F VI    | 161.341    | 90        |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3s$ | $^3P - ^3P^{\circ}$ | 1-1   | 171.176   |
| F VI    | 161.414    | 100       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3s$ | $^3P - ^3P^{\circ}$ | 1-0   | 171.176   |
| F VI    | 161.477    | 120       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3s$ | $^3P - ^3P^{\circ}$ | 2-1   | 171.176   |
| F VI    | 163.138    | 200       |           |                                      |                     |       | 171.176   |
| F VI    | 164.015    | 10d       |           | $1s^2 2p^2 - 1s^2 2p(^3P^{\circ})3s$ | $^1D - ^1P^{\circ}$ | 2-1   | 171.176   |
| F VI    | 173.145    | 100       |           | $2s2p - 2s3s$                        | $^1P^{\circ} - ^1S$ | 1-0   | 171.176   |
| F VI    | 194.840    | 100       |           | $1s^2 2p^2 - 2s3p$                   | $^1D - ^1P^{\circ}$ | 2-1   | 171.176   |
| F VI    | 535.204    | 1000      |           | $2s^2 - 2s2p$                        | $^3S - ^1P^{\circ}$ | 0-1   | 171.176   |
| F VI    | 643.98     | 700       |           | $2s2p - 1s^2 2p^2$                   | $^3P^{\circ} - ^3P$ | 1-2   | 171.176   |
| F VI    | 645.02     | 600       |           | $2s2p - 1s^2 2p^2$                   | $^3P^{\circ} - ^3P$ | 0-1   | 171.176   |
| F VI    | 646.10     | 500       |           | $2s2p - 1s^2 2p^2$                   | $^3P^{\circ} - ^3P$ | 1-1   | 171.176   |
| F VI    | 646.36     | 800       |           | $2s2p - 1s^2 2p^2$                   | $^3P^{\circ} - ^3P$ | 2-2   | 171.176   |
| F VI    | 647.31     | 600       |           | $2s2p - 1s^2 2p^2$                   | $^3P^{\circ} - ^3P$ | 1-0   | 171.176   |
| F VI    | 648.50     | 700       |           | $2s2p - 1s^2 2p^2$                   | $^3P^{\circ} - ^3P$ | 2-1   | 171.176   |
| F VI    | 1139.60    | 200       |           | $2s2p - 1s^2 2p^2$                   | $^1P^{\circ} - ^1D$ | 1-2   | 171.176   |

F VII

FLUORINE,  $Z = 9$ 

F VII

Ground state  $1s^2 2s^2 S_{1/2}$ Ionization potential  $1\,493\,656\text{ cm}^{-1}$ ;  $185.185\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration       | Term          | J - J       | Reference |
|---------|------------|-----------|-----------|---------------------|---------------|-------------|-----------|
| F VII   | 86.728     | 10        |           | $1s^2 2s - 1s^2 4p$ | $^4S - ^2P^o$ | $1/2 -$     | 171.176   |
| F VII   | 95.697     | 10        |           | $1s^2 2p - 1s^2 4d$ | $^2P^o - ^2D$ | $1/2 - 3/2$ | 171.176   |
| F VII   | 95.775     | 100       |           | $1s^2 2p - 1s^2 4d$ | $^2P^o - ^2D$ | $3/2 - 5/2$ | 171.176   |
| F VII   | 112.935    | 400       |           | $1s^2 2s - 1s^2 3p$ | $^4S - ^2P^o$ | $1/2 - 3/2$ | 171.176   |
| F VII   | 112.976    | 300       |           | $1s^2 2s - 1s^2 3p$ | $^4S - ^2P^o$ | $1/2 - 1/2$ | 171.176   |
| F VII   | 127.653    | 400       |           | $1s^2 2p - 1s^2 3d$ | $^2P^o - ^2D$ | $1/2 - 3/2$ | 171.176   |
| F VII   | 127.796    | 500       |           | $1s^2 2p - 1s^2 3d$ | $^2P^o - ^2D$ | $3/2 - 5/2$ | 171.176   |
| F VII   | 134.703    | 100       |           | $1s^2 2p - 1s^2 3s$ | $^2P^o - ^2S$ | $1/2 - 1/2$ | 171.176   |
| F VII   | 134.882    | 200       |           | $1s^2 2p - 1s^2 3s$ | $^2P^o - ^2S$ | $3/2 - 1/2$ | 171.176   |
| F VII   | 883.097    |           |           | $1s^2 2s - 1s^2 2p$ | $^4S - ^2P^o$ | $1/2 - 3/2$ | 071       |
| F VII   | 890.762    |           |           | $1s^2 2s - 1s^2 2p$ | $^4S - ^2P^o$ | $1/2 - 1/2$ | 071       |

F VIII

FLUORINE,  $Z = 9$ 

F VIII

Ground state  $1s^2 1S_0$ Ionization potential  $7\,693\,400\text{ cm}^{-1}$ ;  $953.84\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term            | J - J | Reference |
|---------|------------|-----------|-----------|---------------|-----------------|-------|-----------|
| F VIII  | 13.780     |           |           | $1s^2 - 1s4p$ | $2^1S - 1^1P^o$ | 0-1   | 236       |
| F VIII  | 14.458     |           |           | $1s^2 - 1s3p$ | $2^1S - 1^1P^o$ | 0-1   | 236,764   |
| F VIII  | 16.807     |           |           | $1s^2 - 1s2p$ | $2^1S - 1^1P^o$ | 0-1   | 236,764   |
| F VIII  | 16.951     |           |           | $1s^2 - 1s2p$ | $2^1S - 3^1P^o$ | 0-1   | 764       |
| F VIII  | 98.707     | 10        |           | $1s2p - 1s3d$ | $3^1P^o - 3^1D$ |       | 164       |
| F VIII  | 98.799     | 10        |           | $1s2p - 1s3d$ | $3^1P^o - 3^1D$ | 2-3   | 164       |

FIX

## FLUORINE, Z = 9

FIX

Ground state  $1s^2S_{1/2}$ Ionization potential 8 897 241  $\text{cm}^{-1}$ ; 1103.09 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J         | Reference |
|---------|------------|-----------|-----------|---------------|----------------|---------------|-----------|
| F IX    | 11.560     | P         |           | $1s - 6p$     | $h^1S - ^1P^o$ | $\frac{1}{2}$ | 309       |
| F IX    | 11.707     | P         |           | $1s - 5p$     | $h^1S - ^1P^o$ | $\frac{1}{2}$ | 309       |
| F IX    | 11.988     | P         |           | $1s - 4p$     | $h^1S - ^1P^o$ | $\frac{1}{2}$ | 309       |
| F IX    | 12.644     | P         |           | $1s - 3p$     | $h^1S - ^1P^o$ | $\frac{1}{2}$ | 309       |
| F IX    | 14.984     | P         |           | $1s - 2p$     | $h^1S - ^1P^o$ | $\frac{1}{2}$ | 309       |
| F IX    | 48.96      | P         |           | $2 - 7$       |                |               | 309       |
| F IX    | 50.58      | P         |           | $2 - 6$       |                |               | 309       |
| F IX    | 53.53      | P         |           | $2 - 5$       |                |               | 309       |
| F IX    | 59.95      | P         |           | $2 - 4$       |                |               | 309       |
| F IX    | 80.91      | P         |           | $2 - 3$       |                |               | 309       |
| F IX    | 123.97     | P         |           | $3 - 7$       |                |               | 309       |
| F IX    | 134.94     | P         |           | $3 - 6$       |                |               | 309       |
| F IX    | 158.12     | P         |           | $3 - 5$       |                |               | 309       |
| F IX    | 231.3      | P         |           | $3 - 4$       |                |               | 309       |
| F IX    | 267.19     | P         |           | $4 - 7$       |                |               | 309       |
| F IX    | 323.9      | P         |           | $4 - 6$       |                |               | 309       |
| F IX    | 499.8      | P         |           | $4 - 5$       |                |               | 309       |
| F IX    | 574.1      | P         |           | $5 - 7$       |                |               | 309       |
| F IX    | 920.3      | P         |           | $5 - 6$       |                |               | 309       |
| F IX    | 1526.3     | P         |           | $6 - 7$       |                |               | 309       |

Ne I

NEON, Z = 10

Ne I

Ground state  $1s^2 2s^2 2p^6 1S$ .Ionization potential  $173\,931.7\text{ cm}^{-1}$ ; 21.564 eV

| Element | Wavelength | Intensity | Multiplet | Configuration           | Term                                | J - J | Reference   |
|---------|------------|-----------|-----------|-------------------------|-------------------------------------|-------|-------------|
| Ne I    | 578.82     |           |           | $2p^6 - 2p^5(^1P^o)11s$ | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 703.487     |
| Ne I    | 579.75     |           |           | $2p^6 - 2p^5(^1P^o)10s$ | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 703.487     |
| Ne I    | 580.57     |           |           | $2p^6 - 2p^5(^1P^o)8s$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 703.487     |
| Ne I    | 581.14     |           |           | $2p^6 - 2p^5(^1P^o)9s$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 703.487     |
| Ne I    | 582.46     |           |           | $2p^6 - 2p^5(^1P^o)7d$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 703.487     |
| Ne I    | 585.25     |           |           | $2p^6 - 2p^5(^1P^o)6d$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 703.487     |
| Ne I    | 586.30     |           |           | $2p^6 - 2p^5(^1P^o)7s$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 703.487     |
| Ne I    | 587.20     | 35        |           | $2p^6 - 2p^5(^1P^o)5d$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 057.487     |
| Ne I    | 589.16     | 35        |           | $2p^6 - 2p^5(^1P^o)6s$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 057.487     |
| Ne I    | 589.92     | 35b       |           | $2p^6 - 2p^5(^1P^o)5d$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 057.487     |
| Ne I    | 591.82     | 70        |           | $2p^6 - 2p^5(^1P^o)6s$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 057.487     |
| Ne I    | 595.919    | 100       |           | $2p^6 - 2p^5(^1P^o)4d$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197.057.487 |
| Ne I    | 598.705    | 75        |           | $2p^6 - 2p^5(^1P^o)4d$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 197.057.487 |
| Ne I    | 598.890    | 35b       |           | $2p^6 - 2p^5(^1P^o)4d$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197.057.487 |
| Ne I    | 600.036    | 70        |           | $2p^6 - 2p^5(^1P^o)5s$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197.057.487 |
| Ne I    | 602.725    | 170       |           | $2p^6 - 2p^5(^1P^o)5s$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 197.057.487 |
| Ne I    | 615.627    | 170       | 7         | $2p^6 - 2p^5(^1P^o)3d$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197.057.488 |
| Ne I    | 618.671    | 170       | 6         | $2p^6 - 2p^5(^1P^o)3d$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 197.057.488 |
| Ne I    | 619.101    | 120       | 5         | $2p^6 - 2p^5(^1P^o)3d$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 197.057.488 |
| Ne I    | 626.822    | 200       | 4         | $2p^6 - 2p^5(^1P^o)4s$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197.057.488 |
| Ne I    | 629.738    | 200       | 3         | $2p^6 - 2p^5(^1P^o)4s$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 197.057.488 |
| Ne I    | 735.895    | 1000      | 2         | $2p^6 - 2p^5(^1P^o)3s$  | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197.057.488 |
| Ne I    | 743.718    | 400       | 1         | $2p^6 - 2p^5(^1P^o)3s$  | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 197.057.488 |

Ne II

NEON, Z = 10

Ne II

Ground state  $1s^2 2s^2 2p^6 \ ^1P_1$ Ionization potential 330 391.0 cm<sup>-1</sup>; 40.962 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term           | J - J                       | Reference   |
|---------|------------|-----------|-----------|---------------------------------------|----------------|-----------------------------|-------------|
| Ne II   | 324.56     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $g^1P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 326.54     | 350       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 326.77     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4s$        | $g^1P^o - ^1D$ | $\frac{3}{2} -$             | 057         |
| Ne II   | 327.25     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $g^1P^o - ^1P$ | $\frac{3}{2} -$             | 057         |
| Ne II   | 327.33     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $g^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 327.63     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4s$        | $g^1P^o - ^1D$ | $\frac{1}{2} -$             | 057         |
| Ne II   | 328.08     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 057         |
| Ne II   | 330.20     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 330.62     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$        | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 330.77     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$        | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 331.06     | 65        |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$        | $g^1P^o - ^1P$ | $\frac{1}{2} -$             | 057         |
| Ne II   | 331.50     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$        | $g^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 352.237    | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 057         |
| Ne II   | 352.946    | 250       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 353.206    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 057         |
| Ne II   | 353.922    | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 354.954    | 250       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 355.450    | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 057         |
| Ne II   | 355.647    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 355.848    | 65        |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 355.946    | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 356.131    | 250       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 057         |
| Ne II   | 356.436    | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 057         |
| Ne II   | 356.534    | 200       | 6         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 488,074     |
| Ne II   | 356.795    | 350d      | 6         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 488,074     |
| Ne II   | 357.534    | 350       | 6         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$        | $g^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 488,074     |
| Ne II   | 361.427    | 350       | 5         | $2s^2 2p^5 - 2s^2 2p^4(^1S)3s$        | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 057,488,074 |
| Ne II   | 362.456    | 250       | 5         | $2s^2 2p^5 - 2s^2 2p^4(^1S)3s$        | $g^1P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 057,488,074 |
| Ne II   | 405.852    | 600       | 4         | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$        | $g^1P^o - ^1D$ | $\frac{3}{2} -$             | 197,488,074 |
| Ne II   | 407.136    | 550       | 4         | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$        | $g^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 197,488,074 |
| Ne II   | 445.032    | 450       | 3         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 197,488,074 |
| Ne II   | 446.252    | 550       | 3         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,488,074 |
| Ne II   | 446.591    | 450       | 3         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 197,488,074 |
| Ne II   | 447.813    | 550       | 3         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 197,488,074 |
| Ne II   | 454.648    | 350       | 2         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 488,074     |
| Ne II   | 455.270    | 450       | 2         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,488,074 |
| Ne II   | 456.344    | 250       | 2         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 488,074     |
| Ne II   | 456.895    | 350       | 2         | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$        | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 488,074     |
| Ne II   | 460.725    | 1000      | 1         | $2s^2 2p^5 - 2s^2 p^5$                | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 197,488,074 |
| Ne II   | 462.388    | 930       | 1         | $2s^2 2p^5 - 2s^2 p^5$                | $g^1P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 197,488,074 |
| Ne II   | 1681.683   | 200       | 7         | $2s^2 2p^5 - 2s^2 2p^4(^1D)3p$        | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 796,057,488 |
| Ne II   | 1688.356   | 250       | 7         | $2s^2 2p^5 - 2s^2 2p^4(^1D)3p$        | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 796,057,488 |
| Ne II?  | 1732.69    | 200       |           |                                       |                |                             | 251         |
| Ne II?  | 1853.22    | 65        |           |                                       |                |                             | 251         |
| Ne II?  | 1854.11    | 65        |           |                                       |                |                             | 251         |
| Ne II?  | 1880.21    | 200       |           |                                       |                |                             | 251         |
| Ne II?  | 1883.82    | 65        |           |                                       |                |                             | 251         |
| Ne II?  | 1888.15    | 65        |           |                                       |                |                             | 251         |
| Ne II?  | 1889.77    | 65        |           |                                       |                |                             | 251         |
| Ne II   | 1907.49    | 350       | 9         | $2s^2 2p^4(^1P)3s - 2s^2 2p^4(^1D)3p$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 057,488     |
| Ne II   | 1916.09    | 550       | 9         | $2s^2 2p^4(^1P)3s - 2s^2 2p^4(^1D)3p$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 057,488     |
| Ne II   | 1930.02    | 450       | 9         | $2s^2 2p^4(^1P)3s - 2s^2 2p^4(^1D)3p$ | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 057,488     |
| Ne II   | 1938.82    | 350       | 9         | $2s^2 2p^4(^1P)3s - 2s^2 2p^4(^1D)3p$ | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 057,488     |



Ne III

NEON, Z = 10

Ne III

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ Ionization potential  $514\,148\text{ cm}^{-1}$ , 63.74 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term          | J-J | Reference   |
|---------|------------|-----------|-----------|-------------------------------------------|---------------|-----|-------------|
| Ne III  | 251.145    | 200b      | 5         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 2-  | 338.488     |
| Ne III  | 251.558    | 200       | 5         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 1-  | 338.488     |
| Ne III  | 251.726    | 200       | 5         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 0-1 | 338.488     |
| Ne III  | 267.059    | 300b      | 4         | $2s^2 2p^4 - 2s^2 2p^3(^2P^o)3s$          | $^4P - ^4P^o$ | 2-2 | 338.488     |
| Ne III  | 267.516    | 300b      | 4         | $2s^2 2p^4 - 2s^2 2p^3(^2P^o)3s$          | $^4P - ^4P^o$ | 1-  | 338.488     |
| Ne III  | 267.709    | 200       | 4         | $2s^2 2p^4 - 2s^2 2p^3(^2P^o)3s$          | $^4P - ^4P^o$ | 0-1 | 338.488     |
| Ne III  | 282.50     | 10        | 8         | $2s^2 2p^4 - 2s^2 2p^3(^2P^o)3s$          | $^1D - ^1P^o$ | 2-1 | 057.488     |
| Ne III  | 283.178    | 300b      | 3         | $2s^2 2p^4 - 2s^2 2p^3(^2D^o)3s$          | $^4P - ^4D^o$ | 2-2 | 338.488     |
| Ne III  | 283.206    | 600       | 3         | $2s^2 2p^4 - 2s^2 2p^3(^2D^o)3s$          | $^4P - ^4D^o$ | 2-3 | 338.488     |
| Ne III  | 283.690    | 500b      | 3         | $2s^2 2p^4 - 2s^2 2p^3(^2D^o)3s$          | $^4P - ^4D^o$ | 1-2 | 338.488     |
| Ne III  | 283.894    | 300       | 3         | $2s^2 2p^4 - 2s^2 2p^3(^2D^o)3s$          | $^4P - ^4D^o$ | 0-1 | 338.488     |
| Ne III  | 301.124    | 400       | 7         | $2s^2 2p^4 - 2s^2 2p^3(^2D^o)3s$          | $^1D - ^1D^o$ | 2-2 | 057.488     |
| Ne III  | 308.559    | 100       | 10        | $2s^2 2p^4 - 2s^2 2p^3(^2P^o)3s$          | $^1S - ^1P^o$ | 0-1 | 057.488     |
| Ne III  | 313.048    | 400       | 2         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$          | $^4P - ^4S^o$ | 2-1 | 057.488     |
| Ne III  | 313.677    | 300       | 2         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$          | $^4P - ^4S^o$ | 1-1 | 057.488     |
| Ne III  | 313.92     | 100       | 2         | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3s$          | $^4P - ^4S^o$ | 0-1 | 057.488     |
| Ne III  | 379.308    | 700       | 6         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^1D - ^1P^o$ | 2-1 | 197.488     |
| Ne III  | 427.840    | 300       | 9         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^1S - ^1P^o$ | 0-1 | 057.488     |
| Ne III  | 488.103    | 800       | 1         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^4P - ^4P^o$ | 2-1 | 197.488.074 |
| Ne III  | 488.868    | 700       | 1         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^4P - ^4P^o$ | 1-0 | 197.488.074 |
| Ne III  | 489.501    | 1000      | 1         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^4P - ^4P^o$ | 2-2 | 197.488.074 |
| Ne III  | 489.641    | 400       | 1         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^4P - ^4P^o$ | 1-1 | 197.488.074 |
| Ne III  | 490.310    | 700       | 1         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^4P - ^4P^o$ | 0-1 | 197.488.074 |
| Ne III  | 491.050    | 900       | 1         | $2s^2 2p^4 - 2s^2 2p^3$                   | $^4P - ^4P^o$ | 1-2 | 197.488.074 |
| Ne III  | 1255.026   | 200       | 13        | $2s^2 2p^4(^4S^o)3s - 2s^2 2p^3(^2D^o)3p$ | $^4S^o - ^4P$ | 1-0 | 057.488     |
| Ne III  | 1255.685   | 500       | 13        | $2s^2 2p^4(^4S^o)3s - 2s^2 2p^3(^2D^o)3p$ | $^4S^o - ^4P$ | 1-1 | 057.488     |
| Ne III  | 1257.190   | 600       | 13        | $2s^2 2p^4(^4S^o)3s - 2s^2 2p^3(^2D^o)3p$ | $^4S^o - ^4P$ | 1-2 | 057.488     |

Ne IV

NEON, Z = 10

Ne IV

Ground state  $1s^2 2s^2 2p^2 \ ^3P_2$ Ionization potential 782 768  $\text{cm}^{-1}$ ; 97.05 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term              | J - J                     | Reference |
|---------|------------|-----------|-----------|--------------------------------|-------------------|---------------------------|-----------|
| Ne IV   | 140.127    | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)6s$ | $^3D^\circ - ^3D$ |                           | 544       |
| Ne IV   | 142.929    | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5d$ | $^3D^\circ - ^3F$ | $\frac{3}{2}$             | 544       |
| Ne IV   | 144.019    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)5s$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 144.151    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)5s$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 144.288    | 5         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)5s$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{1}{2}$ | 544       |
| Ne IV   | 146.262    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5s$ | $^3D^\circ - ^3D$ |                           | 544       |
| Ne IV   | 148.660    | 5         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)4d$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{1}{2}$ | 544       |
| Ne IV   | 148.787    | 15b       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)4d$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 148.942    | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)4d$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 149.589    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)4d$ | $^1D^\circ - ^1D$ |                           | 544       |
| Ne IV   | 150.931    | 5         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5s$ | $^1P^\circ - ^3D$ |                           | 544       |
| Ne IV   | 151.456    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$ | $^1D^\circ - ^3P$ |                           | 544       |
| Ne IV   | 151.817    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$ | $^1D^\circ - ^1D$ |                           | 544       |
| Ne IV   | 152.231    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$ | $^1D^\circ - ^3F$ |                           | 544       |
| Ne IV   | 154.488    | 25        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)4d$ | $^1P^\circ - ^1D$ |                           | 544       |
| Ne IV   | 156.480    | 25d       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$ | $^1P^\circ - ^3P$ |                           | 544       |
| Ne IV   | 156.873    | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$ | $^1P^\circ - ^1D$ |                           | 544       |
| Ne IV   | 157.626    | 25        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 157.781    | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 157.862    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{1}{2}$ | 544       |
| Ne IV   | 158.063    | 25        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)4d$ | $^1D^\circ - ^1D$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 158.105    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)4d$ | $^1D^\circ - ^1D$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 158.646    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)4d$ | $^1D^\circ - ^3F$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 158.822    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)4d$ | $^1D^\circ - ^3F$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 160.471    | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4s$ | $^1D^\circ - ^1D$ |                           | 544       |
| Ne IV   | 163.562    | 60        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^1P^\circ - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 163.602    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$ | $^1P^\circ - ^1D$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 166.113    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4s$ | $^1P^\circ - ^1D$ |                           | 544       |
| Ne IV   | 167.921    | 25b       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^1D^\circ - ^3P$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 168.101    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^1D^\circ - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 544       |
| Ne IV   | 172.492    | 200       | 3         | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{1}{2}$ | 488,544   |
| Ne IV   | 172.525    | 250       | 3         | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 488,544   |
| Ne IV   | 172.620    | 400       | 3         | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^4S^\circ - ^4P$ | $\frac{3}{2}-\frac{3}{2}$ | 488,544   |
| Ne IV   | 174.120    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^1P^\circ - ^3P$ | $-\frac{3}{2}$            | 544,487   |
| Ne IV   | 174.303    | 15        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$ | $^1P^\circ - ^3P$ | $-\frac{1}{2}$            | 544       |
| Ne IV   | 174.880    | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^3P$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 174.920    | 40        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 544       |
| Ne IV   | 176.007    | 250       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^1D$ |                           | 544       |
| Ne IV   | 177.161    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^3F$ |                           | 544       |
| Ne IV   | 180.402    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^3S$ | $-\frac{1}{2}$            | 544       |
| Ne IV   | 181.614    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^3P$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 181.691    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^3P$ | $-\frac{1}{2}$            | 544       |
| Ne IV   | 182.829    | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^1D$ |                           | 544       |
| Ne IV   | 183.165    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^1D^\circ - ^1D$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 183.247    | 60        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^1D^\circ - ^1D$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 185.479    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^1D^\circ - ^3F$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 186.575    | 750       | 7         | $2s^2 2p^3 - 2s^2 2p^2(^1S)3d$ | $^1D^\circ - ^1D$ |                           | 488,544   |
| Ne IV   | 186.787    | 25        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^1D^\circ - ^3P$ | $\frac{3}{2}-\frac{1}{2}$ | 544       |
| Ne IV   | 186.915    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^1D^\circ - ^3P$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 190.565    | 125       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^1P^\circ - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 544       |
| Ne IV   | 190.645    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$ | $^1P^\circ - ^1D$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 194.276    | 500       | 11        | $2s^2 2p^3 - 2s^2 2p^2(^1S)3d$ | $^1P^\circ - ^1D$ |                           | 488,544   |
| Ne IV   | 194.477    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^1P^\circ - ^3P$ | $-\frac{1}{2}$            | 544       |
| Ne IV   | 194.623    | 250b      |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$ | $^1P^\circ - ^3P$ | $-\frac{3}{2}$            | 544       |
| Ne IV   | 204.270    | 75        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3s$ | $^1P^\circ - ^3S$ | $-\frac{1}{2}$            | 544       |

## Ne IV

## Ne IV

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J - J         | Reference     |
|---------|------------|-----------|-----------|------------------------------|---------------|---------------|---------------|
| Ne IV   | 204.531    | 125       |           | $2s2p^4 - 2s2p^3(^1S^o)3d$   | $^1P - ^4D^o$ | $^3_2 -$      | 544           |
| Ne IV   | 204.786    | 75        |           | $2s2p^4 - 2s2p^3(^1S^o)3d$   | $^1P - ^4D^o$ | $^3_2 -$      | 544           |
| Ne IV   | 204.908    | 25        |           | $2s2p^4 - 2s2p^3(^1S^o)3d$   | $^1P - ^4D^o$ | $^1_2 -$      | 544           |
| Ne IV   | 208.485    | 500       | 2         | $2s^22p^3 - 2s^22p^2(^1P)3s$ | $^4S^o - ^4P$ | $^3_2 - ^3_2$ | 488, 544      |
| Ne IV   | 208.734    | 500       | 2         | $2s^22p^3 - 2s^22p^2(^1P)3s$ | $^4S^o - ^4P$ | $^3_2 - ^3_2$ | 488, 544      |
| Ne IV   | 208.899    | 400       | 2         | $2s^22p^3 - 2s^22p^2(^1P)3s$ | $^4S^o - ^4P$ | $^3_2 - ^1_2$ | 488, 544      |
| Ne IV   | 212.556    | 750       | 6         | $2s^22p^3 - 2s^22p^2(^1D)3s$ | $^3D^o - ^3D$ | $^5_2 -$      | 488, 544      |
| Ne IV   | 215.396    | 25        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4S^o$ | $^5_2 - ^3_2$ | 544           |
| Ne IV   | 215.711    | 15        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4S^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 215.843    | 75        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4S^o$ | $^1_2 - ^3_2$ | 544           |
| Ne IV   | 17.337     | 75        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4P$   | $^5_2 - ^3_2$ | 544           |
| Ne IV   | 17.640     | 75        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4P$   | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 17.777     | 75        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4P$   | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 217.830    | 125       |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4D^o$ | $^5_2 - ^7_2$ | 544           |
| Ne IV   | 218.131    | 100       |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4P$   | $^1_2 - ^1_2$ | 544           |
| Ne IV   | 218.184    | 50        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4D^o$ | $^5_2 - ^3_2$ | 544           |
| Ne IV   | 218.343    | 75        |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4D^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 218.483    | 100d      |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4D^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 218.643    | 125       |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4D^o$ | $^1_2 - ^3_2$ | 544           |
| Ne IV   | 218.766    | 250       |           | $2s2p^4 - 2s^22p^3(^1P)4p$   | $^1P - ^4D^o$ | $^1_2 - ^1_2$ | 544           |
| Ne IV   | 222.600    | 200       |           | $2s^22p^3 - 2s^22p^2(^1D)3s$ | $^3P^o - ^3D$ |               | 544           |
| Ne IV   | 223.235    | 125       |           | $2s^22p^3 - 2s^22p^2(^1P)3s$ | $^3D^o - ^3P$ | $^5_2 - ^3_2$ | 773, 544      |
| Ne IV   | 223.601    | 125       |           | $2s^22p^3 - 2s^22p^2(^1P)3s$ | $^3D^o - ^3P$ | $^3_2 - ^1_2$ | 773, 544      |
| Ne IV   | 234.319    | 125       |           | $2s^22p^3 - 2s^22p^2(^1P)3s$ | $^3P^o - ^3P$ | $^3_2$        | 773, 544      |
| Ne IV   | 234.704    | 125       |           | $2s^22p^3 - 2s^22p^2(^1P)3s$ | $^3P^o - ^3P$ | $^1_2$        | 773, 544      |
| Ne IV   | 247.422    | 50        |           | $2s2p^4 - 2s2p^3(^1S^o)3s$   | $^1P - ^4S^o$ | $^5_2 - ^3_2$ | 544           |
| Ne IV   | 247.807    | 40        |           | $2s2p^4 - 2s2p^3(^1S^o)3s$   | $^1P - ^4S^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 248.004    | 40        |           | $2s2p^4 - 2s2p^3(^1S^o)3s$   | $^1P - ^4S^o$ | $^1_2 - ^3_2$ | 544           |
| Ne IV   | 286.448    | 75        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4S^o$ | $^5_2 - ^3_2$ | 544           |
| Ne IV   | 286.934    | 75        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4S^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 287.206    | 50        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4S^o$ | $^1_2 - ^3_2$ | 544           |
| Ne IV   | 293.123    | 75        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4P^o$ | $^5_2 - ^3_2$ | 544           |
| Ne IV   | 293.429    | 50        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4P^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 293.649    | 25        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4P^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 293.947    | 5         |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4P^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 294.100    | 15        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4P^o$ | $^3_2 - ^1_2$ | 544           |
| Ne IV   | 294.390    | 15        |           | $2s2p^4 - 2s^22p^3(^1P)3p$   | $^1P - ^4P^o$ | $^1_2 - ^1_2$ | 544           |
| Ne IV   | 357.831    | 250       | 5         | $2s^22p^3 - 2s2p^4$          | $^3D^o - ^3P$ | $^3_2 - ^1_2$ | 197, 544, 488 |
| Ne IV   | 358.721    | 1000d     | 5         | $2s^22p^3 - 2s2p^4$          | $^3D^o - ^3P$ | $^3_2$        | 488, 544      |
| Ne IV   | 387.141    | 700       | 10        | $2s^22p^3 - 2s2p^4$          | $^3P^o - ^3P$ | $^1_2$        | 197, 544, 488 |
| Ne IV   | 388.218    | 500       | 10        | $2s^22p^3 - 2s2p^4$          | $^3P^o - ^3P$ | $^3_2$        | 197, 544, 488 |
| Ne IV   | 421.609    | 750       | 9         | $2s^22p^3 - 2s2p^4$          | $^3P^o - ^3S$ | $^1_2$        | 197, 544, 488 |
| Ne IV   | 431.472    | 125       |           | $2s2p^4 - 1s^22p^3$          | $^3D - ^3P^o$ | $^3_2 - ^1_2$ | 544           |
| Ne IV   | 433.237    | 250       |           | $2s2p^4 - 1s^22p^3$          | $^3D - ^3P^o$ | $^3_2$        | 544           |
| Ne IV   | 469.773    | 700       | 4         | $2s^22p^3 - 2s2p^4$          | $^3D^o - ^3D$ | $^5_2 - ^3_2$ | 773, 488      |
| Ne IV   | 469.820    | 1000      | 4         | $2s^22p^3 - 2s2p^4$          | $^3D^o - ^3D$ | $^5_2 - ^3_2$ | 773, 488      |
| Ne IV   | 469.866    | 900       | 4         | $2s^22p^3 - 2s2p^4$          | $^3D^o - ^3D$ | $^3_2 - ^3_2$ | 773, 488      |
| Ne IV   | 469.921    | 700       | 4         | $2s^22p^3 - 2s2p^4$          | $^3D^o - ^3D$ | $^3_2 - ^3_2$ | 773, 488      |
| Ne IV   | 521.741    | 125       | 8         | $2s^22p^3 - 2s2p^4$          | $^3P^o - ^3D$ | $^1_2 - ^3_2$ | 773, 544, 488 |
| Ne IV   | 521.820    | 125       | 8         | $2s^22p^3 - 2s2p^4$          | $^3P^o - ^3D$ | $^3_2 - ^3_2$ | 773, 544, 488 |
| Ne IV   | 536.965    | 5         |           | $2s2p^4 - 1s^22p^3$          | $^3S - ^3P^o$ | $^1_2 - ^1_2$ | 544           |
| Ne IV   | 539.731    | 15        |           | $2s2p^4 - 1s^22p^3$          | $^3S - ^3P^o$ | $^1_2 - ^3_2$ | 544           |
| Ne IV   | 541.127    | 400       | 1         | $2s^22p^3 - 2s2p^4$          | $^4S^o - ^4P$ | $^3_2 - ^1_2$ | 197, 544, 488 |
| Ne IV   | 542.073    | 500       | 1         | $2s^22p^3 - 2s2p^4$          | $^4S^o - ^4P$ | $^3_2 - ^3_2$ | 197, 544, 488 |
| Ne IV   | 543.891    | 750       | 1         | $2s^22p^3 - 2s2p^4$          | $^4S^o - ^4P$ | $^3_2 - ^3_2$ | 197, 544, 488 |
| Ne IV   | 602.999    | 10        |           | $2s2p^4 - 1s^22p^3$          | $^3P - ^3P^o$ | $^3_2 - ^1_2$ | 544           |
| Ne IV   | 605.595    | 10        |           | $2s2p^4 - 1s^22p^3$          | $^3P - ^3P^o$ | $^1_2 - ^1_2$ | 544           |
| Ne IV   | 606.527    | 25        |           | $2s2p^4 - 1s^22p^3$          | $^3P - ^3P^o$ | $^3_2 - ^3_2$ | 544           |
| Ne IV   | 609.168    | 5         |           | $2s2p^4 - 1s^22p^3$          | $^3P - ^3P^o$ | $^1_2 - ^3_2$ | 544           |
| Ne IV   | 758.317    | 15d       |           | $1s^22p^3 - 2s^22p^2(^1D)3d$ | $^3P^o - ^3S$ | $^3_2 - ^1_2$ | 544           |

Ne IV

Ne IV

| Element | Wavelength | Intensity | Multiplet | Configuration                                                                         | Term                                         | J - J     | Reference |
|---------|------------|-----------|-----------|---------------------------------------------------------------------------------------|----------------------------------------------|-----------|-----------|
| Ne IV   | 763.959    | P         |           | 1s <sup>2</sup> 2p <sup>5</sup> - 2s <sup>2</sup> 2p <sup>4</sup> ( <sup>1</sup> D)3d | <sup>2</sup> P <sup>o</sup> - <sup>2</sup> S | 1/2 - 1/2 | 544       |
| Ne IV   | 780.250    | 15d       |           | 1s <sup>2</sup> 2p <sup>5</sup> - 2s <sup>2</sup> 2p <sup>4</sup> ( <sup>1</sup> D)3d | <sup>2</sup> P <sup>o</sup> - <sup>2</sup> P | 3/2 - 3/2 | 544       |
| Ne IV   | 786.141    | S         |           | 1s <sup>2</sup> 2p <sup>5</sup> - 2s <sup>2</sup> 2p <sup>4</sup> ( <sup>1</sup> D)3d | <sup>2</sup> P <sup>o</sup> - <sup>2</sup> P | 1/2 - 3/2 | 544       |

Ne V

NEON, Z = 10

Ne V

Ground state  $1s^2 2s^2 2p^6 \ ^1P_0$ Ionization potential  $1\ 018\ 634\ \text{cm}^{-1}$ ;  $126.29\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term             | J - J | Reference   |
|---------|------------|-----------|-----------|----------------------------------|------------------|-------|-------------|
| Ne V    | 118.715    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4 d$        | $g^3 P - ^3 P^o$ |       | 544         |
| Ne V    | 118.841    | 10        |           | $2s^2 2p^3 - 2s^2 2p^4 d$        | $g^3 P - ^1 D^o$ |       | 544         |
| Ne V    | 122.520    | 200b      |           | $2s^2 2p^3 - 2s^2 2p^4 d$        | $^1 D - ^1 F^o$  | 2-3   | 544         |
| Ne V    | 123.712    | 30        |           | $2s^2 2p^3 - 2s^2 2p^4 d$        | $^1 D - ^1 D^o$  | 2-2   | 544         |
| Ne V    | 125.830    | 20        |           | $2s^2 2p^3 - 2s^2 2p^4 s$        | $g^3 P - ^3 P^o$ | 1-    | 544         |
| Ne V    | 128.793    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 4d$ | $^1 S^o - ^1 P$  | 2-    | 544         |
| Ne V    | 129.034    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4 s$        | $^1 D - ^1 P^o$  | 2-1   | 544         |
| Ne V    | 136.215    | 20        |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 4s$ | $^1 S^o - ^1 P$  | 2-    | 544         |
| Ne V    | 140.716    | 50        |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3d$ | $^1 S^o - ^1 P$  | 2-1   | 544         |
| Ne V    | 140.757    | 150       |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3d$ | $^1 S^o - ^1 P$  | 2-2   | 544         |
| Ne V    | 140.791    | 150       |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3d$ | $^1 S^o - ^1 P$  | 2-3   | 544         |
| Ne V    | 142.441    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $g^3 P - ^3 P^o$ | 1-0   | 544         |
| Ne V    | 142.503    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $g^3 P - ^3 P^o$ | 1-1   | 544         |
| Ne V    | 142.661    | 40        |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $g^3 P - ^3 P^o$ | 2-1   | 544         |
| Ne V    | 142.724    | 150       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $g^3 P - ^3 P^o$ | 2-2   | 544         |
| Ne V    | 143.219    | 50        |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $g^3 P - ^3 D^o$ | 0-1   | 544         |
| Ne V    | 143.273    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $g^3 P - ^3 D^o$ | 1-2   | 544         |
| Ne V    | 143.344    | 150       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $g^3 P - ^3 D^o$ | 2-3   | 544         |
| Ne V    | 147.132    | 150       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $^1 D - ^1 F^o$  | 2-3   | 544         |
| Ne V    | 148.787    | 15b       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $^1 D - ^1 P^o$  | 2-1   | 544         |
| Ne V    | 151.424    | 120       |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $^1 D - ^1 D^o$  | 2-2   | 544         |
| Ne V    | 156.610    | 20        |           | $2s^2 2p^3 - 2s^2 2p^3 d$        | $^1 S - ^1 P^o$  | 0-1   | 544         |
| Ne V    | 164.023    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3s$ | $^1 S^o - ^1 P$  | 2-3   | 544         |
| Ne V    | 164.145    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3s$ | $^1 S^o - ^1 P$  | 2-2   | 544         |
| Ne V    | 164.294    | 80        |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3s$ | $^1 S^o - ^1 P$  | 2-1   | 544         |
| Ne V    | 167.483    | 150       |           | $2s^2 2p^3 - 2s^2 2p^3 s$        | $g^3 P - ^3 P^o$ | 1-2   | 544         |
| Ne V    | 167.610    | 30        |           | $2s^2 2p^3 - 2s^2 2p^3 s$        | $g^3 P - ^3 P^o$ | 0-1   | 544         |
| Ne V    | 167.670    | 250       |           | $2s^2 2p^3 - 2s^2 2p^3 s$        | $g^3 P - ^3 P^o$ | 2-2   | 544         |
| Ne V    | 167.837    | 25        |           | $2s^2 2p^3 - 2s^2 2p^3 s$        | $g^3 P - ^3 P^o$ | 1-0   | 544         |
| Ne V    | 167.921    | 25b       |           | $2s^2 2p^3 - 2s^2 2p^3 s$        | $g^3 P - ^3 P^o$ | 2-1   | 544         |
| Ne V    | 173.932    | 500       | 6         | $2s^2 2p^3 - 2s^2 2p^3 s$        | $^1 D - ^1 P^o$  | 2-1   | 488,544     |
| Ne V    | 184.730    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3 s$        | $^1 S - ^1 P^o$  | 0-1   | 544         |
| Ne V    | 195.368    | 50        |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3s$ | $^3 P^o - ^3 P$  | -2    | 544         |
| Ne V    | 195.553    | 30        |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3s$ | $^3 P^o - ^3 P$  | -1    | 544         |
| Ne V    | 195.621    | 20        |           | $2s^2 2p^3 - 2s^2 2p^3 (^1P) 3s$ | $^3 P^o - ^3 P$  | 1-0   | 544         |
| Ne V    | 357.955    | 400       | 3         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 S^o$ | 0-1   | 197,544,488 |
| Ne V    | 358.472    | 500       | 3         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 S^o$ | 1-1   | 197,544,488 |
| Ne V    | 359.385    | 500       | 3         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 S^o$ | 2-1   | 197,544,488 |
| Ne V    | 365.594    | 1000      | 5         | $2s^2 2p^3 - 2s^2 2p^3$          | $^1 D - ^1 P^o$  | 2-1   | 197,488     |
| Ne V    | 416.198    | 800       | 4         | $2s^2 2p^3 - 2s^2 2p^3$          | $^1 D - ^1 D^o$  | 2-2   | 197,544,488 |
| Ne V    | 416.834    | 250       |           | $2s^2 2p^3 - 2s^2 2p^3$          | $^1 S - ^1 P^o$  | 0-1   | 544         |
| Ne V    | 420.386    | 100       |           | $2s^2 2p^3 - 1s^2 2p^4$          | $^3 D^o - ^3 P$  | 1-0   | 544         |
| Ne V    | 420.951    | 150       |           | $2s^2 2p^3 - 1s^2 2p^4$          | $^3 D^o - ^3 P$  | 2-1   | 544         |
| Ne V    | 422.214    | 150       |           | $2s^2 2p^3 - 1s^2 2p^4$          | $^3 D^o - ^3 P$  | 3-2   | 544         |
| Ne V    | 422.347    | 50        |           | $2s^2 2p^3 - 1s^2 2p^4$          | $^3 D^o - ^3 P$  | 2-2   | 544         |
| Ne V    | 480.406    | 250       | 2         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 P^o$ | 0-1   | 197,544,488 |
| Ne V    | 481.281    | 150       | 2         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 P^o$ | 1-0   | 197,544,488 |
| Ne V    | 481.361    | 250       | 2         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 P^o$ | 1-1   | 197,544,488 |
| Ne V    | 482.987    | 500       | 2         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 P^o$ | 2-2   | 197,544,488 |
| Ne V    | 487.070    | 30d       |           | $2s^2 2p^3 - 1s^2 2p^4$          | $^3 P^o - ^3 P$  | 2-1   | 544         |
| Ne V    | 488.940    | P         |           | $2s^2 2p^3 - 1s^2 2p^4$          | $^3 P^o - ^3 P$  | 2-2   | 544         |
| Ne V    | 568.418    | 400       | 1         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 D^o$ | 0-1   | 197,544,488 |
| Ne V    | 569.759    | 250       | 1         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 D^o$ | 1-1   | 197,544,488 |
| Ne V    | 569.830    | 500       | 1         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 D^o$ | 1-2   | 197,544,488 |
| Ne V    | 572.106    | 250       | 1         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 D^o$ | 2-2   | 197,544,488 |
| Ne V    | 572.336    | 800       | 1         | $2s^2 2p^3 - 2s^2 2p^3$          | $g^3 P - ^3 D^o$ | 2-3   | 197,544,488 |

Ne VI

NEON, Z = 10

Ne VI

Ground state  $1s^2 2s^2 2p^1 P^{\circ}_2$ Ionization potential  $1\ 274\ 000\ \text{cm}^{-1}$ ; 157.9 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                       | Term                 | J - J                     | Reference   |
|---------|------------|-----------|-----------|-------------------------------------|----------------------|---------------------------|-------------|
| Ne VI   | 110.410    | 20        |           | $2s^2 2p - 2s 2p(^1P^{\circ}) 3p$   | $K^1P^{\circ} - ^1D$ |                           | 544         |
| Ne VI   | 111.142    | 10        |           | $2s^2 2p - 2s 2p(^1P^{\circ}) 3p$   | $K^1P^{\circ} - ^1S$ | $-\frac{1}{2}$            | 544         |
| Ne VI   | 113.870    | 10        |           | $2s^2 2p - 2s 2p(^1P^{\circ}) 3p$   | $K^1P^{\circ} - ^1P$ |                           | 544         |
| Ne VI   | 121.140    | 50d       |           | $2s 2p^2 - 2s 2p(^1P^{\circ}) 3d$   | $^4P - ^4D^{\circ}$  |                           | 544         |
| Ne VI   | 122.520    | 200b      |           | $2s^2 2p - 2s^2 3d$                 | $K^1P^{\circ} - ^1D$ | $\frac{1}{2}-$            | 544         |
| Ne VI   | 122.686    | 100       |           | $2s^2 2p - 2s^2 3d$                 | $K^1P^{\circ} - ^1D$ | $\frac{3}{2}-$            | 544         |
| Ne VI   | 136.089    | 40        |           | $2s^2 2p^2 - 2s 2p(^1P^{\circ}) 3s$ | $^4P - ^4P^{\circ}$  |                           | 544         |
| Ne VI   | 138.397    | 30        |           | $2s^2 2p - 2s^2 3s$                 | $K^1P^{\circ} - ^1S$ | $\frac{1}{2}-\frac{1}{2}$ | 544         |
| Ne VI   | 138.630    | 30        |           | $2s^2 2p - 2s^2 3s$                 | $K^1P^{\circ} - ^1S$ | $\frac{3}{2}-\frac{1}{2}$ | 544         |
| Ne VI?  | 171.114    | 50        |           |                                     |                      |                           | 544         |
| Ne VI?  | 171.212    | 20        |           |                                     |                      |                           | 544         |
| Ne VI?  | 188.424    | 30        |           |                                     |                      |                           | 544         |
| Ne VI?  | 194.839    | 20        |           |                                     |                      |                           | 544         |
| Ne VI?  | 194.936    | 20        |           |                                     |                      |                           | 544         |
| Ne VI   | 399.820    | 50        |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1P$ | $\frac{1}{2}-\frac{3}{2}$ | 197,544,074 |
| Ne VI   | 401.138    | 150       |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1P$ | $\frac{1}{2}-\frac{1}{2}$ | 197,544,074 |
| Ne VI   | 401.939    | 250       |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1P$ | $\frac{3}{2}-\frac{3}{2}$ | 197,544,074 |
| Ne VI   | 403.262    | 100       |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1P$ | $\frac{3}{2}-\frac{1}{2}$ | 197,544,074 |
| Ne VI?  | 432.393    | 50        |           |                                     |                      |                           | 544         |
| Ne VI   | 433.176    | 400       |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1S$ | $\frac{1}{2}-\frac{1}{2}$ | 197,071     |
| Ne VI   | 435.649    | 400       |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1S$ | $\frac{3}{2}-\frac{1}{2}$ | 197,071     |
| Ne VI   | 440.404    | 100       |           | $2s 2p^2 - 1s^2 2p^3$               | $^1D - ^1P^{\circ}$  | $\frac{3}{2}-\frac{3}{2}$ | 071         |
| Ne VI   | 440.60     | 10        |           | $2s 2p^2 - 1s^2 2p^3$               | $^1D - ^1P^{\circ}$  | $\frac{3}{2}-\frac{1}{2}$ | 071         |
| Ne VI   | 451.843    | 200       |           | $2s 2p^2 - 1s^2 2p^3$               | $^4P - ^4S^{\circ}$  | $\frac{1}{2}-\frac{3}{2}$ | 197,071     |
| Ne VI   | 452.745    | 300       |           | $2s 2p^2 - 1s^2 2p^3$               | $^4P - ^4S^{\circ}$  | $\frac{3}{2}-\frac{3}{2}$ | 197,071     |
| Ne VI   | 454.072    | 300       |           | $2s 2p^2 - 1s^2 2p^3$               | $^4P - ^4S^{\circ}$  | $\frac{3}{2}-\frac{3}{2}$ | 197,071     |
| Ne VI   | 558.595    | 50        |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1D$ | $\frac{1}{2}-\frac{3}{2}$ | 197,544,074 |
| Ne VI   | 562.735    | 10        |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 197,544,074 |
| Ne VI   | 562.805    | 150       |           | $2s^2 2p - 2s 2p^2$                 | $K^1P^{\circ} - ^1D$ | $\frac{3}{2}-\frac{3}{2}$ | 197,544,074 |

Ne VII

NEON, Z = 10

Ne VII

Ground state  $1s^2 2s^2 \ ^1S_0$ 

Ionization potential 207.3 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term                    | J-J | Reference   |
|---------|------------|-----------|-----------|------------------------------------|-------------------------|-----|-------------|
| Ne VII  | 74.97      | 300       |           | $2s2p - 2p4p$                      | $^1P^\circ - ^1D^\circ$ | 2-3 | 255         |
| Ne VII  | 75.78      | 300       |           | $2s^2 - 2s4p$                      | $^3S^\circ - ^1P^\circ$ | 0-1 | 255,316     |
| Ne VII  | 76.58      | 200       |           | $2s2p - 2s6d$                      | $^1P^\circ - ^1D^\circ$ | 1-2 | 255         |
| Ne VII  | 80.62      | 300       |           | $2s2p - 2s5d$                      | $^1P^\circ - ^1D^\circ$ | 1-2 | 255         |
| Ne VII  | 82.26      | 600       |           | $2s2p - 2s4d$                      | $^1P^\circ - ^1D^\circ$ | 2-3 | 255,316     |
| Ne VII  | 84.34      | 200       |           | $2s2p - 2s4s$                      | $^1P^\circ - ^1S^\circ$ | 2-1 | 255         |
| Ne VII  | 89.41      | 400       |           | $2s2p - 2s4d$                      | $^1P^\circ - ^1D^\circ$ | 1-2 | 255,316     |
| Ne VII  | 94.33      | 600       |           | $2s(^3S)2p - 1s^2 2p(^2P^\circ)3p$ | $^1P^\circ - ^1P^\circ$ | 2-2 | 255         |
| Ne VII  | 94.99      | 400       |           | $2s(^3S)2p - 1s^2 2p(^2P^\circ)3p$ | $^1P^\circ - ^1S^\circ$ | 2-1 | 255         |
| Ne VII  | 95.86      | 700       |           | $2s(^3S)2p - 1s^2 2p(^2P^\circ)3p$ | $^1P^\circ - ^1D^\circ$ | 2-3 | 255         |
| Ne VII  | 97.54      | 700       |           | $2s^2 - 2s3p$                      | $^3S^\circ - ^1P^\circ$ | 0-1 | 255,316     |
| Ne VII  | 106.07     | 900       |           | $2s2p - 2s3d$                      | $^1P^\circ - ^1D^\circ$ | 1-2 | 255,316     |
| Ne VII  | 106.19     | 900       |           | $2s2p - 2s3d$                      | $^1P^\circ - ^1D^\circ$ | 2-3 | 255,316     |
| Ne VII  | 107.07     | 400       |           | $2s(^3S)2p - 1s^2 2p(^2P^\circ)3p$ | $^1P^\circ - ^1P^\circ$ | 1-1 | 255         |
| Ne VII  | 110.60     | 700       |           | $1s^2 2p^2 - 1s^2 2p(^2P^\circ)3d$ | $^1P^\circ - ^1D^\circ$ | 2-3 | 255         |
| Ne VII  | 111.78     | 600       |           | $1s^2 2p^2 - 1s^2 2p(^2P^\circ)3d$ | $^1D^\circ - ^1F^\circ$ | 2-3 | 255         |
| Ne VII  | 115.36     | 700       |           | $2s2p - 2s3s$                      | $^1P^\circ - ^1S^\circ$ | -1  | 255,316     |
| Ne VII  | 115.52     | 700       |           | $2s2p - 2s3s$                      | $^1P^\circ - ^1S^\circ$ | 2-1 | 255,316     |
| Ne VII  | 115.97     | 600       |           | $1s^2 2p^2 - 1s^2 2p(^2P^\circ)3d$ | $^1D^\circ - ^1D^\circ$ | 2-2 | 255         |
| Ne VII  | 116.66     | 700       |           | $2s2p - 2s3d$                      | $^1P^\circ - ^1D^\circ$ | 1-2 | 255,316     |
| Ne VII  | 120.32     | 500       |           | $1s^2 2p^2 - 1s^2 2p(^2P^\circ)3s$ | $^1P^\circ - ^1P^\circ$ | 2-2 | 255         |
| Ne VII  | 121.68     | 700       |           | $1s^2 2p^2 - 1s^2 2p(^2P^\circ)3d$ | $^1S^\circ - ^1P^\circ$ | 0-1 | 255         |
| Ne VII  | 127.65     | 500       |           | $2s2p - 2s3s$                      | $^1P^\circ - ^1S^\circ$ | 1-0 | 255,316     |
| Ne VII  | 134.82     | 200       |           | $1s^2 2p^2 - 1s^2 2p(^2P^\circ)3s$ | $^1S^\circ - ^1P^\circ$ | 0-1 | 255         |
| Ne VII  | 465.221    | 700       |           | $2s^2 - 2s2p$                      | $^3S^\circ - ^1P^\circ$ | 0-1 | 197,071,074 |
| Ne VII  | 558.61     | 400b      |           | $2s2p - 1s^2 2p^2$                 | $^1P^\circ - ^1P^\circ$ | 1-2 | 197,071     |
| Ne VII  | 559.947    | 300       |           | $2s2p - 1s^2 2p^2$                 | $^1P^\circ - ^1P^\circ$ | 0-1 | 197,071     |
| Ne VII  | 561.378    | 200       |           | $2s2p - 1s^2 2p^2$                 | $^1P^\circ - ^1P^\circ$ | 1-1 | 197,071     |
| Ne VII  | 561.728    | 400       |           | $2s2p - 1s^2 2p^2$                 | $^1P^\circ - ^1P^\circ$ | 2-2 | 197,071     |
| Ne VII  | 562.992    | 200       |           | $2s2p - 1s^2 2p^2$                 | $^1P^\circ - ^1P^\circ$ | 1-0 | 197,071     |
| Ne VII  | 564.529    | 200       |           | $2s2p - 1s^2 2p^2$                 | $^1P^\circ - ^1P^\circ$ | 2-1 | 197,071,252 |
| Ne VII  | 1981.974   | 600       |           | $2s3s - 2s3p$                      | $^1S^\circ - ^1P^\circ$ | 1-2 | 071         |
| Ne VII  | 1992.060   | 300       |           | $2s3s - 2s3p$                      | $^1S^\circ - ^1P^\circ$ | 1-1 | 071         |
| Ne VII  | 1997.345   | 100       |           | $2s3s - 2s3p$                      | $^1S^\circ - ^1P^\circ$ | 1-0 | 071         |

Ne VIII

NEON, Z = 10

Ne VIII

Ground state  $1s^2s\ ^2S_{1/2}$ 

Ionization potential 239.1 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration    | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|------------------|---------------|-----------------------------|-----------|
| Ne VIII | 56.10      | 100       |           | $1s^2s - 1s^2p$  | $^2S - ^2P^o$ | $\frac{1}{2} -$             | 255       |
| Ne VIII | 57.79      | 100       |           | $1s^2s - 1s^26p$ | $^2S - ^2P^o$ | $\frac{1}{2} -$             | 255       |
| Ne VIII | 60.45      | 100       |           | $1s^2p - 1s^27d$ | $^2P^o - ^2D$ |                             | 255,316   |
| Ne VIII | 60.81      | 200       |           | $1s^2s - 1s^25p$ | $^2S - ^2P^o$ | $\frac{1}{2} -$             | 255,316   |
| Ne VIII | 62.36      | 100       |           | $1s^2p - 1s^26d$ | $^2P^o - ^2D$ |                             | 255,316   |
| Ne VIII | 65.89      | 200       |           | $1s^2p - 1s^25d$ | $^2P^o - ^2D$ |                             | 255,316   |
| Ne VIII | 67.39      | 300       |           | $1s^2s - 1s^24p$ | $^2S - ^2P^o$ | $\frac{1}{2} -$             | 255,316   |
| Ne VIII | 73.55      | 400       |           | $1s^2p - 1s^24d$ | $^2P^o - ^2D$ |                             | 255,316   |
| Ne VIII | 74.64      | 300       |           | $1s^2p - 1s^24s$ | $^2P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 255,316   |
| Ne VIII | 88.11      | 700       |           | $1s^2s - 1s^23p$ | $^2S - ^2P^o$ | $\frac{1}{2} -$             | 255,316   |
| Ne VIII | 98.11      | 700       |           | $1s^2p - 1s^23d$ | $^2P^o - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 255,316   |
| Ne VIII | 98.27      | 700       |           | $1s^2p - 1s^23d$ | $^2P^o - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 255,316   |
| Ne VIII | 102.89     | 500       |           | $1s^2p - 1s^23s$ | $^2P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 255,316   |
| Ne VIII | 103.10     | 600       |           | $1s^2p - 1s^23s$ | $^2P^o - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 255,316   |
| Ne VIII | 770.409    | 1000      |           | $1s^2s - 1s^22p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 071,197   |
| Ne VIII | 780.324    | 500       |           | $1s^2s - 1s^22p$ | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 071,197   |



Ne IX

NEON, Z = 10

Ne IX

Ground state  $1s^2\ ^1S_0$ Ionization potential 9 644 900 cm<sup>-1</sup>; 1196 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration | Term          | J - J | Reference |
|---------|------------|-----------|-----------|---------------|---------------|-------|-----------|
| Ne IX   | 13.44      |           |           | $1s^2 - 1s2p$ | $^1S - ^1P^o$ | 0-1   | 255,164   |
| Ne IX   | 13.55      |           |           | $1s^2 - 1s2p$ | $^1S - ^3P^o$ | 0-    | 255,164   |
| Ne IX   | 46.3       | P         |           | $1s2s - 1s7p$ | $^3S - ^3P^o$ |       | 262       |
| Ne IX   | 47.7       | P         |           | $1s2s - 1s6p$ | $^3S - ^3P^o$ |       | 262       |
| Ne IX   | 48.0       | P         |           | $1s2p - 1s7d$ | $^3P^o - ^3D$ |       | 262       |
| Ne IX   | 49.5       | P         |           | $1s2p - 1s6d$ | $^3P^o - ^3D$ |       | 262       |
| Ne IX   | 50.3       | P         |           | $1s2s - 1s5p$ | $^3S - ^3P^o$ |       | 262       |
| Ne IX   | 52.4       | P         |           | $1s2p - 1s5d$ | $^3P^o - ^3D$ |       | 262       |
| Ne IX   | 56.1       | P         |           | $1s2s - 1s4p$ | $^3S - ^3P^o$ |       | 262       |
| Ne IX   | 58.5       | P         |           | $1s2p - 1s4d$ | $^3P^o - ^3D$ |       | 262       |
| Ne IX   | 74.4       | P         |           | $1s2s - 1s3p$ | $^3S - ^3P^o$ |       | 262       |
| Ne IX   | 78.38      |           |           | $1s2p - 1s3d$ | $^3P^o - ^3D$ |       | 262       |

Ne X

NEON,  $Z = 0$ 

Ne X

Ground state  $1s^2S_{1/2}$ Ionization potential  $10\,986\,875\text{ cm}^{-1}$ ;  $1362.16\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term            | J - J   | Reference |
|---------|------------|-----------|-----------|---------------|-----------------|---------|-----------|
| Ne X    | 9.362      | P         |           | $1s - 6p$     | $2^2S - 2^2P^o$ | $1/2 -$ | 309       |
| Ne X    | 9.481      | P         |           | $1s - 5p$     | $2^2S - 2^2P^o$ | $1/2 -$ | 309       |
| Ne X    | 9.708      | P         |           | $1s - 4p$     | $2^2S - 2^2P^o$ | $1/2 -$ | 309       |
| Ne X    | 10.239     | P         |           | $1s - 3p$     | $2^2S - 2^2P^o$ | $1/2 -$ | 309       |
| Ne X    | 12.134     | P         |           | $1s - 2p$     | $2^2S - 2^2P^o$ | $1/2 -$ | 309       |
| Ne X    | 39.65      | P         |           | $2 - 7$       |                 |         | 309       |
| Ne X    | 40.96      | P         |           | $2 - 6$       |                 |         | 309       |
| Ne X    | 43.35      | P         |           | $2 - 5$       |                 |         | 309       |
| Ne X    | 48.55      | P         |           | $2 - 4$       |                 |         | 309       |
| Ne X    | 65.52      | P         |           | $2 - 3$       |                 |         | 309       |
| Ne X    | 100.41     | P         |           | $3 - 7$       |                 |         | 309       |
| Ne X    | 109.28     | P         |           | $3 - 6$       |                 |         | 309       |
| Ne X    | 128.06     | P         |           | $3 - 5$       |                 |         | 309       |
| Ne X    | 187.3      | P         |           | $3 - 4$       |                 |         | 309       |
| Ne X    | 216.41     | P         |           | $4 - 7$       |                 |         | 309       |
| Ne X    | 262.3      | P         |           | $4 - 6$       |                 |         | 309       |
| Ne X    | 404.8      | P         |           | $4 - 5$       |                 |         | 309       |
| Ne X    | 465.0      | P         |           | $5 - 7$       |                 |         | 309       |
| Ne X    | 745.4      | P         |           | $5 - 6$       |                 |         | 309       |
| Ne X    | 1236.3     | P         |           | $6 - 7$       |                 |         | 309       |

Z<sub>a</sub>

## SODIUM, Z = 11

Na

Unclassified lines

| Element        | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|----------------|------------|-----------|-----------|---------------|------|-------|-----------|
| Z <sub>a</sub> | 67.027     | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 67.461     | 100d      |           |               |      |       | 692       |
| Z <sub>a</sub> | 70.320     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 71.386     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 73.128     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 77.076     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 77.558     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 78.023     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 79.620     | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 82.516     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 83.180     | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 86.890     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 87.524     | 200       |           |               |      |       | 692       |
| Z <sub>a</sub> | 88.583     | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 92.608     | 10d       |           |               |      |       | 692       |
| Z <sub>a</sub> | 93.070     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 95.551     | 200       |           |               |      |       | 692       |
| Z <sub>a</sub> | 95.796     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 96.018     | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 96.572     | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 98.271     | 10d       |           |               |      |       | 692       |
| Z <sub>a</sub> | 100.337    | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 101.201    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 101.348    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 104.314    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 104.440    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 106.345    | 200       |           |               |      |       | 692       |
| Z <sub>a</sub> | 106.703    | 10d       |           |               |      |       | 692       |
| Z <sub>a</sub> | 108.159    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 110.085    | 200       |           |               |      |       | 692       |
| Z <sub>a</sub> | 110.474    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 110.577    | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 112.526    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 112.641    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 113.061    | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 113.952    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 120.040    | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 120.220    | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 120.298    | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 120.355    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 120.430    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 122.330    | 10        |           |               |      |       | 692       |
| Z <sub>a</sub> | 127.953    | 100       |           |               |      |       | 692       |
| Z <sub>a</sub> | 128.112    | 300       |           |               |      |       | 692       |
| Z <sub>a</sub> | 138.628    | 200       |           |               |      |       | 692       |
| Z <sub>a</sub> | 191.205    | 10        |           |               |      |       | 693       |
| Z <sub>a</sub> | 193.807    | 10        |           |               |      |       | 693       |
| Z <sub>a</sub> | 215.870    | 100       |           |               |      |       | 693       |
| Z <sub>a</sub> | 217.385    | 10        |           |               |      |       | 693       |
| Z <sub>a</sub> | 425.245    | 10        |           |               |      |       | 693       |
| Z <sub>a</sub> | 425.493    | 100       |           |               |      |       | 693       |
| Z <sub>a</sub> | 436.946    | 10        |           |               |      |       | 693       |
| Z <sub>a</sub> | 515.952    | 100       |           |               |      |       | 693       |

Na II

SODIUM, Z = 11

Na II

Ground state  $1s^2 2s^2 2p^6 \ ^1S_0$   
Ionization potential  $381\,528\text{ cm}^{-1}$ ; 47.302 eV

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                                | J - J | Reference   |
|---------|------------|-----------|-----------|------------------------|-------------------------------------|-------|-------------|
| Na II   | 282.827    | 10        |           | $2p^6 - 2p^5(^1P^o)4d$ | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 693.487     |
| Na II   | 300.151    | 100       | 4         | $2p^6 - 2p^5(^1P^o)3d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 488.693     |
| Na II   | 301.311    | 10        |           | $2p^6 - 2p^5(^1P^o)4s$ | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 693.487     |
| Na II   | 301.432    | 100       | 3         | $2p^6 - 2p^5(^1P^o)3d$ | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 488.693     |
| Na II   | 372.069    | 600       | 2         | $2p^6 - 2p^5(^1P^o)3s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 197.693,488 |
| Na II   | 376.375    | 300       | 1         | $2p^6 - 2p^5(^1P^o)3s$ | $g^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 197.693,488 |

Na III

SODIUM, Z = 11

Na III

Ground state  $1s^2 2s^2 2p^6 \ ^3P_1$ Ionization potential  $578\,033\text{ cm}^{-1}$ ;  $71.665\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term          | J-J                       | Reference |
|---------|------------|-----------|-----------|---------------------------------------|---------------|---------------------------|-----------|
| Na III  | 183.575    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 183.747    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$        | $^2P^o - ^2P$ | $\frac{3}{2}-$            | 693       |
| Na III  | 184.218    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$        | $^2P^o - ^2P$ | $\frac{1}{2}-$            | 693       |
| Na III  | 188.870    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3d$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 189.346    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3d$        | $^2P^o - ^2D$ | $\frac{1}{2}-\frac{3}{2}$ | 693       |
| Na III  | 194.032    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{1}{2}$ | 693       |
| Na III  | 194.166    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{1}{2}$ | 693       |
| Na III  | 194.306    | 100d      |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)4d$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 195.538    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4s$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 202.184    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 202.490    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 202.720    | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{1}{2}$ | 693       |
| Na III  | 202.760    | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $^2P^o - ^2P$ | $\frac{1}{2}-\frac{1}{2}$ | 693       |
| Na III  | 203.050    | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $^2P^o - ^2D$ | $\frac{1}{2}-\frac{3}{2}$ | 693       |
| Na III  | 203.282    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $^2P^o - ^2P$ | $\frac{1}{2}-\frac{3}{2}$ | 693       |
| Na III  | 203.324    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$        | $^2P^o - ^2P$ | $\frac{1}{2}-\frac{1}{2}$ | 693       |
| Na III  | 206.871    | 10        |           |                                       |               |                           | 693       |
| Na III  | 207.355    | 10        |           |                                       |               |                           | 693       |
| Na III  | 207.458    | 10        |           |                                       |               |                           | 693       |
| Na III  | 214.235    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 214.576    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{1}{2}$ | 693       |
| Na III  | 214.868    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$        | $^2P^o - ^2P$ | $\frac{1}{2}-\frac{3}{2}$ | 693       |
| Na III  | 215.042    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 215.230    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$        | $^2P^o - ^2P$ | $\frac{1}{2}-\frac{1}{2}$ | 693       |
| Na III  | 215.340    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 215.498    | 10        |           |                                       |               |                           | 693       |
| Na III  | 215.671    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3d$        | $^2P^o - ^2D$ | $\frac{1}{2}-\frac{3}{2}$ | 693       |
| Na III  | 216.120    | 100       |           |                                       |               |                           | 693       |
| Na III  | 229.868    | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3s$        | $^2P^o - ^2S$ | $\frac{3}{2}-\frac{1}{2}$ | 693       |
| Na III  | 230.593    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3s$        | $^2P^o - ^2S$ | $\frac{1}{2}-\frac{1}{2}$ | 693       |
| Na III  | 250.515    | 800       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$        | $^2P^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 251.371    | 600       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$        | $^2P^o - ^2D$ | $\frac{1}{2}-\frac{3}{2}$ | 693       |
| Na III  | 266.893    | 500       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{1}{2}$ | 693       |
| Na III  | 267.642    | 800       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 267.868    | 600       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$        | $^2P^o - ^2P$ | $\frac{1}{2}-\frac{1}{2}$ | 693       |
| Na III  | 268.623    | 500       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$        | $^2P^o - ^2P$ | $\frac{1}{2}-\frac{3}{2}$ | 693       |
| Na III  | 272.441    | 10d       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P)3s$        | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{3}{2}$ | 693       |
| Na III  | 378.143    | 1000      |           | $2s^2 2p^5 - 2s^2 2p^4$               | $^2P^o - ^2S$ | $\frac{3}{2}-\frac{1}{2}$ | 197,693   |
| Na III  | 380.107    | 800       |           | $2s^2 2p^5 - 2s^2 2p^4$               | $^2P^o - ^2S$ | $\frac{1}{2}-\frac{1}{2}$ | 197,693   |
| Na III  | 1100.49    | 100       |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4P^o - ^2S$ | $\frac{1}{2}-\frac{1}{2}$ | 758       |
| Na III  | 1122.30    | 10        |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4P^o - ^2F$ | $\frac{3}{2}-\frac{3}{2}$ | 758       |
| Na III  | 1153.04    | 40        |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4P^o - ^2P$ | $\frac{3}{2}-\frac{3}{2}$ | 758       |
| Na III  | 1180.40    | 160       |           | $2s^2 2p^4(^1D)3p - 2s^2 2p^4(^1S)3d$ | $^4D^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 758       |
| Na III  | 1221.12    | 100       |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4D^o - ^2D$ | $\frac{3}{2}-\frac{3}{2}$ | 758       |
| Na III  | 1223.44    | 80d       |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4D^o - ^2P$ | $\frac{3}{2}-\frac{3}{2}$ | 758       |
| Na III  | 1224.73    | 80        |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4D^o - ^2D$ | $\frac{1}{2}-\frac{1}{2}$ | 758       |
| Na III  | 1235.40    | 80d       |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4D^o - ^2G$ | $\frac{7}{2}-\frac{7}{2}$ | 758       |
| Na III  | 1256.68    | 20        |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4D^o - ^2D$ | $\frac{5}{2}-\frac{3}{2}$ | 758       |
| Na III  | 1265.66    | 40        |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^4D^o - ^2P$ | $\frac{5}{2}-\frac{3}{2}$ | 758       |
| Na III  | 1337.39    | 120d      |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^1D)3d$ | $^2P^o - ^2P$ | $\frac{3}{2}-\frac{1}{2}$ | 758       |
| Na III  | 1427.27    | 10        |           | $2s^2 2p^4(^3P)3s - 2s^2 2p^4(^1D)3p$ | $^2P - ^2D^o$ | $\frac{1}{2}-\frac{1}{2}$ | 758       |
| Na III  | 1436.21    | 240       |           | $2s^2 2p^4(^3P)3s - 2s^2 2p^4(^1D)3p$ | $^2P - ^2P^o$ | $\frac{3}{2}-\frac{1}{2}$ | 758       |
| Na III  | 1458.15    | 60        |           | $2s^2 2p^4(^3P)3s - 2s^2 2p^4(^1D)3p$ | $^2P - ^2P^o$ | $\frac{1}{2}-\frac{1}{2}$ | 758       |
| Na III  | 1529.67    | 20        |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^3P)4s$ | $^4P^o - ^2P$ | $\frac{1}{2}-\frac{1}{2}$ | 758       |
| Na III  | 1541.19    | 20        |           | $2s^2 2p^4(^3P)3p - 2s^2 2p^4(^3P)4s$ | $^4P^o - ^2P$ | $\frac{3}{2}-\frac{3}{2}$ | 758       |

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term              | J - J                       | Reference |
|---------|------------|-----------|-----------|-------------------------------------------|-------------------|-----------------------------|-----------|
| Na III  | 1548.68    | 160       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1602.91    | 100       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1604.47    | 120       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1610.97    | 80        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1613.77    | 160       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1621.94    | 100       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1624.07    | 240       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1633.64    | 80        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1650.91    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1658.71    | 40        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1669.52    | 60d       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1669.52    | 60d       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1678.74    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1691.70    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1718.48    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1719.60    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1731.08    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1741.33    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1746.39    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1752.06    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1752.65    | 60        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1754.97    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1761.05    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1762.13    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1763.84    | 60        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1767.21    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4F$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1773.00    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1775.32    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1782.92    | 240       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1791.23    | 200       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1791.80    | 160       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1801.27    | 140       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1810.74    | 80        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1811.70    | 100       |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4F^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1814.35    | 60        |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4F^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1816.83    | 40        |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4P^\circ - ^4S$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1819.01    | 40        |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4F^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1821.68    | 240       |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4F^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1824.52    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1825.44    | 200       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4D^\circ - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1835.22    | 300       |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4P^\circ - ^4S$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1838.11    | 120       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1843.43    | 40        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1844.36    | 400       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1845.10    | 240       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1847.54    | 200       |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4F^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1849.58    | 700       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1850.24    | 400       |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4F^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1850.39    | 360       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1855.91    | 300       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1856.73    | 400       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1857.57    | 100       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1859.20    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4D^\circ - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1859.61    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1861.19    | 300       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4P^\circ - ^4D$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1862.40    | 120       |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4P^\circ - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1869.43    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1872.45    | 20        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 3d$ | $^4D^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1873.32    | 80        |           | $2s^2 2p^4 (^3D) 3p - 2s^2 2p^4 (^3D) 3d$ | $^4F^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1874.22    | 10        |           | $2s^2 2p^4 (^3P) 3p - 2s^2 2p^4 (^3P) 4s$ | $^4D^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |

## Na III

## Na III

| Element | Wavelength | Intensity | Multiplet | Configuration                     | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|-----------------------------------|---------------|-----------------------------|-----------|
| Na III  | 1885.75    | 80        |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)4s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1887.48    | 300       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{7}{2} - \frac{7}{2}$ | 758       |
| Na III  | 1890.75    | 240       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)4s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1899.70    | 60        |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{7}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1913.17    | 160       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3P$ | $\frac{7}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1918.46    | 120       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{7}{2} - \frac{7}{2}$ | 758       |
| Na III  | 1920.12    | 120       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1926.27    | 900       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1927       | 300       |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1933.87    | 600       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1935.54    | 10        |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1939.32    | 10        |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{7}{2}$ | 758       |
| Na III  | 1941.61    | 10        |           | $2s^2p^4(^3P)3s - 2s^2p^4(^3P)3p$ | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1941.77    | 10        |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1942.19    | 120       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1943.40    | 120       |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1F^o - ^1G$ | $\frac{3}{2} - \frac{7}{2}$ | 758       |
| Na III  | 1944.99    | 60d       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1946.43    | 400d      |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1F^o - ^1G$ | $\frac{7}{2} - \frac{7}{2}$ | 758       |
| Na III  | 1946.70    | 10        |           | $2s^2p^4(^3P)3s - 2s^2p^4(^3P)3p$ | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1950.79    | 300       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1951.21    | 800       |           | $2s^2p^4(^3P)3s - 2s^2p^4(^3P)3p$ | $^3P - ^3S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1955.31    | 160       |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1956.48    | 10        |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)4s$ | $^3S^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1960.76    | 400       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1965.04    | 360       |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3F$ | $\frac{7}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1975.58    | 10        |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{7}{2}$ | 758       |
| Na III  | 1976.62    | 20        |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1977.14    | 20        |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1980.95    | 10        |           | $2s^2p^4(^1D)3p - 2s^2p^4(^1D)3d$ | $^1P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 758       |
| Na III  | 1985.58    | 600       |           | $2s^2p^4(^3P)3s - 2s^2p^4(^3P)3p$ | $^3P - ^3S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |
| Na III  | 1995.62    | 60        |           | $2s^2p^4(^3P)3p - 2s^2p^4(^3P)3d$ | $^3D^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 758       |

Na IV

## SODIUM, Z = 11

Na IV

Ground state  $1s^2 2s^2 2p^4 P_1$ Ionization potential 797 741 cm<sup>-1</sup>; 98.905 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J - J | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-------|-----------|
| Na IV   | 129.464    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)5d$ | $g^3P - ^3D^o$ | 2-    | 693       |
| Na IV   | 132.211    | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)4d$ | $g^3P - ^3D^o$ | 2-    | 692,693   |
| Na IV   | 132.465    | 10d       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)4d$ | $g^3P - ^3D^o$ | 0-    | 692,693   |
| Na IV   | 132.740    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)5s$ | $g^3P - ^3D^o$ | 2-    | 692,693   |
| Na IV   | 136.435    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $g^3P - ^3S^o$ | 2-1   | 692,693   |
| Na IV   | 136.550    | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $g^3P - ^3P^o$ | 2-    | 692,693   |
| Na IV   | 136.645    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $g^3P - ^3S^o$ | 1-1   | 692,693   |
| Na IV   | 136.748    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $g^3P - ^3P^o$ | 1-    | 692,693   |
| Na IV   | 136.854    | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $g^3P - ^3D^o$ | 2-    | 692,693   |
| Na IV   | 137.062    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $g^3P - ^3D^o$ | 1-    | 692,693   |
| Na IV   | 137.144    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $g^3P - ^3D^o$ | 0-    | 693       |
| Na IV   | 137.714    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)4d$ | $^1D - ^1F^o$  | 2-3   | 692,693   |
| Na IV   | 137.945    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)4d$ | $^1D - ^1D^o$  | 2-2   | 692,693   |
| Na IV   | 139.867    | 200b      |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)4s$ | $g^3P - ^3P^o$ | 2-    | 692,693   |
| Na IV   | 142.232    | 200b      |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $^1D - ^1F^o$  | 2-3   | 693       |
| Na IV   | 142.363    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $^1D - ^1D^o$  | 2-2   | 692,693   |
| Na IV   | 142.688    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4d$ | $^1D - ^1P^o$  | 2-1   | 692,693   |
| Na IV   | 144.979    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4s$ | $g^3P - ^3D^o$ | 2-    | 692,693   |
| Na IV   | 145.846    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)4s$ | $^1D - ^1P^o$  | 2-1   | 692,693   |
| Na IV   | 146.060    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4d$ | $g^3P - ^3D^o$ | 2-    | 692,693   |
| Na IV   | 146.298    | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4d$ | $g^3P - ^3D^o$ | 1-    | 692,693   |
| Na IV   | 146.398    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4d$ | $g^3P - ^3D^o$ | 0-    | 692,693   |
| Na IV   | 150.297    | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $g^3P - ^3D^o$ | 2-    | 693       |
| Na IV   | 150.545    | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $g^3P - ^3D^o$ | 1-    | 693       |
| Na IV   | 150.647    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $g^3P - ^3D^o$ | 0-    | 693       |
| Na IV   | 150.695    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $g^3P - ^3P^o$ | 2-    | 693       |
| Na IV   | 150.968    | 200b      |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $g^3P - ^3P^o$ | 1-    | 693       |
| Na IV   | 151.048    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $g^3P - ^3P^o$ | 0-    | 693       |
| Na IV   | 151.303    | 100b      |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)4s$ | $^1D - ^1D^o$  | 2-2   | 693       |
| Na IV   | 155.090    | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4s$ | $g^3P - ^3S^o$ | 2-1   | 693       |
| Na IV   | 155.248    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3S^o$ | 2-1   | 693       |
| Na IV   | 155.354    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)4s$ | $g^3P - ^3S^o$ | 1-1   | 693       |
| Na IV   | 155.445    | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3P^o$ | 2-1   | 693       |
| Na IV   | 155.515    | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3P^o$ | 2-2   | 693       |
| Na IV   | 155.622    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3S^o$ | 0-1   | 693       |
| Na IV   | 155.693    | 200d      |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3P^o$ | 1-0   | 693       |
| Na IV   | 155.781    | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3P^o$ | 1-2   | 693       |
| Na IV   | 155.832    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3P^o$ | 0-1   | 693       |
| Na IV   | 156.536    | 800       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3D^o$ | 2-3   | 693       |
| Na IV   | 156.780    | 500       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3D^o$ | 1-    | 693       |
| Na IV   | 156.887    | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $g^3P - ^3D^o$ | 0-1   | 693       |
| Na IV   | 157.090    | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $^1D - ^1F^o$  | 2-3   | 693       |
| Na IV   | 157.599    | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $^1D - ^1P^o$  | 2-1   | 693       |
| Na IV   | 157.782    | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3d$ | $^1D - ^1D^o$  | 2-2   | 693       |
| Na IV   | 162.445    | 800       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $^1D - ^1F^o$  | 2-3   | 693       |
| Na IV   | 163.187    | 600       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $^1D - ^1D^o$  | 2-2   | 693       |
| Na IV   | 163.840    | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $^1D - ^1P^o$  | 2-1   | 693       |
| Na IV?  | 164.841    | 400       |           |                                  |                |       | 693       |
| Na IV   | 168.084    | 1000      |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$ | $g^3P - ^3D^o$ | 2-    | 693       |
| Na IV   | 168.409    | 800       |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$ | $g^3P - ^3D^o$ | 1-    | 693       |
| Na IV   | 168.544    | 500       |           | $2s^2 2p^4 - 2s^2 2p^3(^4S^o)3d$ | $g^3P - ^3D^o$ | 0-1   | 693       |
| Na IV   | 174.008    | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^4D^o)3d$ | $^1S - ^1P^o$  | 0-1   | 693       |
| Na IV   | 181.758    | 800       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3s$ | $g^3P - ^3P^o$ | 2-    | 693       |
| Na IV   | 182.128    | 600       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3s$ | $g^3P - ^3P^o$ | 1-    | 693       |
| Na IV   | 182.282    | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^4P^o)3s$ | $g^3P - ^3P^o$ | 0-    | 693       |



## Na IV

## Na IV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term          | J - J | Reference |
|---------|------------|-----------|-----------|----------------------------------|---------------|-------|-----------|
| Na IV   | 190.126    | 600       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3s$ | $^1D - ^1P^o$ | 2-1   | 693       |
| Na IV   | 190.440    | 1000      |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $^3P - ^3D^o$ | 2-    | 693       |
| Na IV   | 190.835    | 800       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $^3P - ^3D^o$ | 1-    | 693       |
| Na IV   | 191.000    | 600       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $^3P - ^3D^o$ | 0-    | 693       |
| Na IV   | 199.769    | 600       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3s$ | $^1D - ^1D^o$ | 2-2   | 693       |
| Na IV   | 203.959    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3s$ | $^1S - ^1P^o$ | 0-1   | 693       |
| Na IV   | 205.487    | 600       |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)3s$ | $^3P - ^3S^o$ | 2-1   | 693       |
| Na IV   | 205.956    | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)3s$ | $^3P - ^3S^o$ | 1-1   | 693       |
| Na IV   | 206.155    | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)3s$ | $^3P - ^3S^o$ | 0-1   | 693       |
| Na IV   | 319.638    | 1000      |           | $2s^2 2p^4 - 2s 2p^3$            | $^1D - ^1P^o$ | 2-1   | 197,693   |
| Na IV   | 360.761    | 600       |           | $2s^2 2p^4 - 2s 2p^3$            | $^1S - ^1P^o$ | 0-1   | 693       |
| Na IV   | 408.682    | 800       |           | $2s^2 2p^4 - 2s 2p^3$            | $^3P - ^3P^o$ | 2-1   | 197,693   |
| Na IV   | 409.615    | 800       |           | $2s^2 2p^4 - 2s 2p^3$            | $^3P - ^3P^o$ | 1-0   | 197,693   |
| Na IV   | 410.371    | 1000      |           | $2s^2 2p^4 - 2s 2p^3$            | $^3P - ^3P^o$ | 2-2   | 197,693   |
| Na IV   | 410.540    | 600       |           | $2s^2 2p^4 - 2s 2p^3$            | $^3P - ^3P^o$ | 1-1   | 197,693   |
| Na IV   | 411.333    | 700       |           | $2s^2 2p^4 - 2s 2p^3$            | $^3P - ^3P^o$ | 0-1   | 197,693   |
| Na IV   | 412.240    | 800       |           | $2s^2 2p^4 - 2s 2p^3$            | $^3P - ^3P^o$ | 1-2   | 197,693   |

Na V

## SODIUM, Z = 11

Na V

Ground state  $1s^2 2s^2 2p^3 \ ^4S_{3/2}$ Ionization potential 1116 312 cm<sup>-1</sup>; 138.40 eV

| Element       | Wavelength | Intensity | Multiplet | Configuration                        | Term              | J - J                       | Reference |
|---------------|------------|-----------|-----------|--------------------------------------|-------------------|-----------------------------|-----------|
| $Z_{Na} \vee$ | 100.851    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5d$       | $^3D^\circ - ^3D$ |                             | 692       |
| $Z_{Na} \vee$ | 100.945    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5d$       | $^3D^\circ - ^3F$ |                             | 692       |
| $Z_{Na} \vee$ | 103.482    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)5d$       | $^3P^\circ - ^3D$ |                             | 692       |
| $Z_{Na} \vee$ | 106.278    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 106.302    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 106.399    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \vee$ | 106.490    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 107.934    | 200b      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$       | $^3D^\circ - ^3D$ |                             | 692       |
| $Z_{Na} \vee$ | 108.017    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$       | $^3D^\circ - ^3F$ |                             | 692       |
| $Z_{Na} \vee$ | 110.817    | 200b      |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3p$ | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 110.878    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3p$ | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 110.921    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$       | $^3P^\circ - ^3D$ |                             | 692       |
| $Z_{Na} \vee$ | 111.512    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 111.552    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 111.879    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 112.009    | 300b      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 112.077    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \vee$ | 112.186    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^4D$ |                             | 692       |
| $Z_{Na} \vee$ | 112.347    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 113.574    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4s$       | $^3D^\circ - ^3D$ |                             | 692       |
| $Z_{Na} \vee$ | 114.700    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3P^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 114.738    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3P^\circ - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 117.703    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| $Z_{Na} \vee$ | 117.876    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| $Z_{Na} \vee$ | 117.990    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^\circ)3p$ | $^4S^\circ - ^4P$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \vee$ | 121.263    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$       | $^3P^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 125.178    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \vee$ | 125.216    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 125.286    | 500       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 125.428    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \vee$ | 125.461    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4D$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \vee$ | 125.899    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3d$       | $^3P^\circ - ^3D$ |                             | 692       |
| $Z_{Na} \vee$ | 126.090    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 126.210    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4D^\circ$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \vee$ | 126.368    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4D^\circ$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \vee$ | 126.458    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4D^\circ$ | $\frac{1}{2} -$             | 692       |
| $Z_{Na} \vee$ | 126.557    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 126.608    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \vee$ | 126.779    | 10b       |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 126.814    | 100b      |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 126.920    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \vee$ | 126.985    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 127.036    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3D^\circ)3d$ | $^4P - ^4P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 127.444    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 127.473    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 128.025    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 128.051    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 129.942    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \vee$ | 130.680    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3P$ | $- \frac{3}{2}$             | 692       |
| $Z_{Na} \vee$ | 130.723    | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3P$ | $- \frac{1}{2}$             | 692       |
| $Z_{Na} \vee$ | 131.345    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 131.413    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 131.635    | 300d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3D$ |                             | 692       |
| $Z_{Na} \vee$ | 133.162    | 500       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \vee$ | 133.388    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |

Na V

Na V

| Element             | Wavelength | Intensity | Multiplet | Configuration                    | Term              | J - J                       | Reference |
|---------------------|------------|-----------|-----------|----------------------------------|-------------------|-----------------------------|-----------|
| $Z_{Na} \checkmark$ | 134.183    | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$   | $^1D^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 134.272    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$   | $^1D^\circ - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 135.791    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$   | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 135.854    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$   | $^1P^\circ - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 138.812    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$   | $^1P^\circ - ^2P$ | $-\frac{1}{2}$              | 692, 693  |
| $Z_{Na} \checkmark$ | 138.917    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$   | $^1P^\circ - ^4P$ | $-\frac{3}{2}$              | 692       |
| $Z_{Na} \checkmark$ | 140.171    | 10        |           | $2s 2p^4 - 2s 2p^3(^1D^\circ)3d$ | $^1D - ^4F^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 140.258    | 10        |           | $2s 2p^4 - 2s 2p^3(^1D^\circ)3d$ | $^1D - ^4F^\circ$ | $\frac{3}{2} - \frac{7}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 142.232    | 200b      |           | $2s 2p^4 - 2s 2p^3(^1P^\circ)3s$ | $^1P - ^1P^\circ$ | $\frac{3}{2} -$             | 692, 693  |
| $Z_{Na} \checkmark$ | 142.415    | 10        |           | $2s 2p^4 - 2s 2p^3(^1P^\circ)3s$ | $^1P - ^1P^\circ$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \checkmark$ | 144.330    | 200       |           | $2s 2p^4 - 2s 2p^3(^1S^\circ)3d$ | $^1P - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 144.546    | 200       |           | $2s 2p^4 - 2s 2p^3(^1S^\circ)3d$ | $^1P - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 144.661    | 100       |           | $2s 2p^4 - 2s 2p^3(^1S^\circ)3d$ | $^1P - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 692, 693  |
| $Z_{Na} \checkmark$ | 147.897    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3s$   | $^1P^\circ - ^2S$ | $-\frac{1}{2}$              | 692       |
| $Z_{Na} \checkmark$ | 148.642    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$   | $^1S^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 148.856    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$   | $^1S^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 149.001    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$   | $^1S^\circ - ^1P$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \checkmark$ | 150.968    | 200b      |           | $2s 2p^4 - 2s 2p^3(^1D^\circ)3s$ | $^1P - ^1D^\circ$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \checkmark$ | 151.127    | 400       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$   | $^1D^\circ - ^1D$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \checkmark$ | 151.188    | 100       |           | $2s 2p^4 - 2s 2p^3(^1D^\circ)3s$ | $^1P - ^1D^\circ$ | $\frac{3}{2} -$             | 692       |
| $Z_{Na} \checkmark$ | 151.303    | 100b      |           | $2s 2p^4 - 2s 2p^3(^1D^\circ)3s$ | $^1P - ^1D^\circ$ | $\frac{1}{2} -$             | 692       |
| $Z_{Na} \checkmark$ | 157.036    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$   | $^1P^\circ - ^1D$ | $-\frac{1}{2}$              | 692       |
| $Z_{Na} \checkmark$ | 157.209    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$   | $^1D^\circ - ^1P$ | $-\frac{3}{2}$              | 692       |
| $Z_{Na} \checkmark$ | 157.511    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$   | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 163.616    | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$   | $^1P^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 163.930    | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$   | $^1P^\circ - ^1P$ | $-\frac{1}{2}$              | 692       |
| $Z_{Na} \checkmark$ | 167.510    | 100       |           | $2s 2p^4 - 2s 2p^3(^1D^\circ)3s$ | $^1D - ^1D^\circ$ | $-\frac{3}{2}$              | 692       |
| $Z_{Na} \checkmark$ | 170.631    | 100       |           | $2s 2p^4 - 2s 2p^3(^1S^\circ)3s$ | $^1P - ^1S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 170.923    | 100       |           | $2s 2p^4 - 2s 2p^3(^1S^\circ)3s$ | $^1P - ^1S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 171.076    | 100d      |           | $2s 2p^4 - 2s 2p^3(^1S^\circ)3s$ | $^1P - ^1S^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 307.152    | 800       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 197, 692  |
| $Z_{Na} \checkmark$ | 308.264    | 1000      |           | $2s^2 2p^3 - 2s 2p^4$            | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197, 692  |
| $Z_{Na} \checkmark$ | 330.718    | 10        |           | $2s^2 2p^3 - 2s 2p^4$            | $^1D^\circ - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 332.550    | 800       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^\circ - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 333.910    | 900       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 360.319    | 800       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^\circ - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 360.367    | 800       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^\circ - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 367.557    | 200       |           | $2s 2p^4 - 1s^2 2p^3$            | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 369.743    | 300       |           | $2s 2p^4 - 1s^2 2p^3$            | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 400.722    | 1000      |           | $2s^2 2p^3 - 2s 2p^4$            | $^1D^\circ - ^1D$ | $-\frac{3}{2}$              | 197, 692  |
| $Z_{Na} \checkmark$ | 445.046    | 500       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^\circ - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 445.190    | 600       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 459.897    | 600       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1S^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 197, 692  |
| $Z_{Na} \checkmark$ | 461.051    | 850       |           | $2s^2 2p^3 - 2s 2p^4$            | $^1S^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197, 692  |
| $Z_{Na} \checkmark$ | 463.263    | 1000      |           | $2s^2 2p^3 - 2s 2p^4$            | $^1S^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197, 692  |
| $Z_{Na} \checkmark$ | 510.102    | 10        |           | $2s 2p^4 - 1s^2 2p^3$            | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 511.193    | 100       |           | $2s 2p^4 - 1s^2 2p^3$            | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| $Z_{Na} \checkmark$ | 514.350    | 10        |           | $2s 2p^4 - 1s^2 2p^3$            | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 692       |

Na VI

## SODIUM, Z = 11

Na VI

Ground state  $1s^2 2s^2 2p^4 \ ^3P_0$ Ionization potential  $1\ 388\ 419\ \text{cm}^{-1}; 172.14\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J - J | Reference |
|---------|------------|-----------|-----------|--------------------------------|---------------|-------|-----------|
| Na VI   | 80.345     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)6d$ | $^1D - ^1F^o$ | 2-3   | 692       |
| Na VI   | 80.645     | 10d       |           | $2s^2 2p^3 - 2s^2 2p(^4P)5d$   | $^3S^o - ^3P$ | 2-3   | 692       |
| Na VI   | 81.498     | 200b      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)5d$ | $^3P - ^3P^o$ | 2-2   | 692       |
| Na VI   | 81.543     | 100d      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)5d$ | $^3P - ^3D^o$ | 2-3   | 692       |
| Na VI   | 81.584     | 100d      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)5d$ | $^3P - ^3D^o$ | 2-2   | 692       |
| Na VI   | 83.639     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)5d$ | $^1D - ^1F^o$ | 2-3   | 692       |
| Na VI   | 87.141     | 100b      |           | $2s^2 2p^3 - 2s^2 2p(^4P)4d$   | $^3S^o - ^3P$ | 2-2   | 692       |
| Na VI   | 87.211     | 700b      |           | $2s^2 2p^3 - 2s^2 2p(^4P)4d$   | $^3S^o - ^3P$ | 2-3   | 692       |
| Na VI   | 88.038     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^3P - ^3P^o$ | 1-2   | 692       |
| Na VI   | 88.143     | 200d      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^3P - ^3P^o$ | 2-2   | 692       |
| Na VI   | 88.223     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^3P - ^3D^o$ | 0-1   | 692       |
| Na VI   | 88.246     | 200       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^3P - ^3D^o$ | 1-2   | 692       |
| Na VI   | 88.270     | 300d      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^3P - ^3D^o$ | 2-3   | 692       |
| Na VI   | 88.340     | 100d      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^3P - ^3D^o$ | 2-2   | 692       |
| Na VI   | 88.387     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^3D)4d$   | $^3D^o - ^3P$ |       | 692       |
| Na VI   | 88.460     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^3D)4d$   | $^3D^o - ^3F$ |       | 692       |
| Na VI   | 90.468     | 300       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^1D - ^1F^o$ | 2-3   | 692       |
| Na VI   | 90.746     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^4P)4s$   | $^3S^o - ^3P$ | 2-3   | 692       |
| Na VI   | 91.268     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^1D - ^1D^o$ | 2-2   | 692       |
| Na VI   | 91.414     | 10d       |           | $2s^2 2p^3 - 2s^2 2p(^3D)4d$   | $^3P^o - ^3P$ |       | 692       |
| Na VI   | 91.475     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4d$ | $^1D - ^3F^o$ | 2-2   | 692       |
| Na VI   | 91.737     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4s$ | $^3P - ^3P^o$ | 1-2   | 692       |
| Na VI   | 91.836     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)4s$ | $^3P - ^3P^o$ | 2-2   | 692       |
| Na VI   | 94.208     | 100       |           | $2s^2 2p^3 - 1s^2 2p(^4S^o)3p$ | $^3D^o - ^3P$ | 3-    | 692       |
| Na VI   | 94.827     | 10d       |           | $2s^2 2p^3 - 2s^2 2p(^4P)4d$   | $^3D^o - ^3D$ |       | 692       |
| Na VI   | 95.182     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^4P)4d$   | $^3D^o - ^3F$ | 3-4   | 692       |
| Na VI   | 95.263     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^4P)4d$   | $^3D^o - ^3F$ | 2-3   | 692       |
| Na VI   | 95.319     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^4P)4d$   | $^3D^o - ^3F$ | 1-2   | 692       |
| Na VI   | 95.933     | 300       |           | $2s^2 2p^3 - 2s^2 2p(^3D)3p$   | $^1D - ^1D^o$ | 2-2   | 692       |
| Na VI   | 96.124     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^3D)3p$   | $^3P - ^3D^o$ | 0-    | 692       |
| Na VI   | 96.196     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^3D)3p$   | $^3P - ^3D^o$ | 1-    | 692       |
| Na VI   | 96.307     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^3D)3p$   | $^3P - ^3D^o$ | 2-    | 692       |
| Na VI   | 96.475     | 300       |           | $2s^2 2p^3 - 2s^2 2p(^3D)3p$   | $^1D - ^1F^o$ | 2-3   | 692       |
| Na VI   | 97.636     | 10        |           | $2s^2 2p^3 - 1s^2 2p(^4S^o)3p$ | $^3P^o - ^3P$ |       | 692       |
| Na VI   | 98.309     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^4P)4d$   | $^3P^o - ^3D$ | 2-    | 692       |
| Na VI   | 99.004     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^4P)4s$   | $^3D^o - ^3P$ | 3-2   | 692       |
| Na VI   | 99.500     | 10        |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3P^o$ | 1-2   | 692       |
| Na VI   | 99.617     | 100       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3P^o$ | 2-2   | 692       |
| Na VI   | 99.680     | 100b      |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3P^o$ | 2-1   | 692       |
| Na VI   | 100.469    | 200       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3D^o$ | 1-2   | 692       |
| Na VI   | 100.519    | 300       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3D^o$ | 2-3   | 692       |
| Na VI   | 100.590    | 100       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3D^o$ | 2-2   | 692       |
| Na VI   | 103.002    | 10        |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3S^o$ | 0-1   | 692       |
| Na VI   | 103.078    | 100       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3S^o$ | 1-1   | 692       |
| Na VI   | 103.210    | 200       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3p$   | $^3P - ^3S^o$ | 2-1   | 692       |
| Na VI   | 106.040    | 300       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3d$   | $^3S^o - ^3P$ | 2-1   | 692       |
| Na VI   | 106.077    | 300       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3d$   | $^3S^o - ^3P$ | 2-2   | 692       |
| Na VI   | 106.125    | 400       |           | $2s^2 2p^3 - 2s^2 2p(^4P)3d$   | $^3S^o - ^3P$ | 2-3   | 692       |
| Na VI   | 106.580    | 10        |           | $2s^2 2p^3 - 2s^2 2p(^4P)3d$   | $^3S^o - ^3D$ | 2-3   | 692       |
| Na VI   | 107.014    | 200       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 0-1   | 692       |
| Na VI   | 107.061    | 300b      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 1-0   | 692       |
| Na VI   | 107.093    | 300b      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 1-1   | 692       |
| Na VI   | 107.158    | 100b      |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 1-2   | 692       |
| Na VI   | 107.227    | 300       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 2-1   | 692       |
| Na VI   | 107.288    | 400       |           | $2s^2 2p^3 - 2s^2 2p(^3P^o)3d$ | $^3P - ^3P^o$ | 2-2   | 692       |

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J-J | Reference |
|---------|------------|-----------|-----------|------------------------------|---------------|-----|-----------|
| Na VI   | 107.535    | 300       |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^3D^o - ^3D$ | -   | 692       |
| Na VI   | 107.553    | 300       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^3P - ^3D^o$ | 0-1 | 692       |
| Na VI   | 107.608    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^3P - ^3D^o$ | 1-2 | 692       |
| Na VI   | 107.683    | 500       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^3P - ^3D^o$ | 2-3 | 692       |
| Na VI   | 107.742    | 200       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^3P - ^3D^o$ | 2-2 | 692       |
| Na VI   | 107.934    | 200b      |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^3D^o - ^3P$ | -   | 692       |
| Na VI   | 108.555    | 400       |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^3D^o - ^3F$ | -   | 692       |
| Na VI   | 108.678    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^3P - ^1D^o$ | 1-2 | 692       |
| Na VI   | 109.763    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^1D - ^1P^o$ | 2-1 | 692       |
| Na VI   | 109.896    | 500       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^1D - ^1F^o$ | 2-3 | 692       |
| Na VI   | 110.750    | 200       |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^3P^o - ^3S$ | -1  | 692       |
| Na VI   | 111.725    | 100       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^1D - ^3D^o$ | 2-3 | 692       |
| Na VI   | 111.793    | 100       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^1D - ^3D^o$ | 2-2 | 692       |
| Na VI   | 112.009    | 300b      |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^3P^o - ^3D$ | 2-3 | 692       |
| Na VI   | 112.448    | 300d      |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^3P^o - ^3P$ | -   | 692       |
| Na VI   | 112.950    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^1D - ^1D^o$ | 2-2 | 692       |
| Na VI   | 113.125    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^1D - ^3F^o$ | 2-2 | 692       |
| Na VI   | 114.666    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3d$ | $^1S - ^1P^o$ | 0-1 | 692       |
| Na VI   | 115.729    | 200       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3D^o - ^3D$ | 1-3 | 692       |
| Na VI   | 115.780    | 10d       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3D^o - ^3D$ | 2-2 | 692       |
| Na VI   | 117.491    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3D^o - ^3F$ | 3-4 | 692       |
| Na VI   | 117.609    | 300       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3D^o - ^3F$ | 2-3 | 692       |
| Na VI   | 117.699    | 300       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3D^o - ^3F$ | 1-2 | 692       |
| Na VI   | 118.500    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3D^o - ^3P$ | 2-1 | 692       |
| Na VI   | 118.585    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3D^o - ^3P$ | 3-2 | 692       |
| Na VI   | 119.204    | 10b       |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^1D^o - ^1P$ | 2-1 | 692       |
| Na VI   | 119.684    | 300       |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^1D^o - ^1D$ | 2-2 | 692       |
| Na VI   | 120.931    | 300       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3P^o - ^3D$ | 2-3 | 692       |
| Na VI   | 120.973    | 200       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3P^o - ^3D$ | 1-2 | 692       |
| Na VI   | 121.004    | 100       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3P^o - ^3D$ | 0-1 | 692       |
| Na VI   | 121.773    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3S^o - ^3P$ | 2-3 | 692       |
| Na VI   | 121.913    | 320       |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3S^o - ^3P$ | 2-2 | 692       |
| Na VI   | 122.018    | 300b      |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3S^o - ^3P$ | 2-1 | 692       |
| Na VI   | 123.134    | 400       |           | $2s^2p^3 - 2s^2p^2(^4D)3s$   | $^3D^o - ^3D$ | -   | 692       |
| Na VI   | 123.744    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3s$ | $^3P - ^3P^o$ | 1-2 | 692       |
| Na VI   | 123.868    | 300       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3s$ | $^3P - ^3P^o$ | 0-1 | 692       |
| Na VI   | 123.929    | 500       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3s$ | $^3P - ^3P^o$ | 2-2 | 692       |
| Na VI   | 123.970    | 200       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3s$ | $^3P - ^3P^o$ | 1-1 | 692       |
| Na VI   | 124.059    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3P^o - ^3P$ | 2-2 | 692, 487  |
| Na VI   | 124.153    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3s$ | $^3P - ^3P^o$ | 2-1 | 692       |
| Na VI   | 124.850    | 10        |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^1P^o - ^1P$ | 1-1 | 692       |
| Na VI   | 125.383    | 10        |           | $2s^2p^3 - 2s^2p^2(^4D)3d$   | $^1P^o - ^1D$ | 1-2 | 692       |
| Na VI   | 127.837    | 400       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3s$ | $^1D - ^1P^o$ | 2-1 | 692       |
| Na VI   | 129.040    | 200       |           | $2s^2p^3 - 2s^2p^2(^4D)3s$   | $^3P^o - ^3D$ | -   | 692       |
| Na VI   | 133.825    | 200       |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3D^o - ^3P$ | 3-2 | 692       |
| Na VI   | 134.021    | 100d      |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3D^o - ^3P$ | 2-1 | 692       |
| Na VI   | 134.135    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3D^o - ^3P$ | 1-0 | 692       |
| Na VI   | 134.532    | 300       |           | $2s^2p^3 - 2s^2p^2(^4P^o)3s$ | $^1S - ^1P^o$ | 0-1 | 692       |
| Na VI   | 137.589    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P)3d$   | $^3S^o - ^3P$ | 1-2 | 692       |
| Na VI   | 138.693    | 200       |           | $2s^2p^3 - 2s^2p^2(^4D)3s$   | $^1D^o - ^1D$ | 2-2 | 692       |
| Na VI   | 140.833    | 200       |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3P^o - ^3P$ | -2  | 692       |
| Na VI   | 141.040    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P)3s$   | $^3P^o - ^3P$ | -1  | 692       |
| Na VI   | 146.398    | 10        |           | $2s^2p^3 - 2s^2p^2(^4D)3s$   | $^1P^o - ^1D$ | 1-2 | 692       |
| Na VI   | 149.442    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P^o)3p$ | $^3D^o - ^3P$ | 3-2 | 692       |
| Na VI   | 149.621    | 10        |           | $2s^2p^3 - 2s^2p^2(^4P^o)3p$ | $^3D^o - ^3P$ | 2-1 | 692       |
| Na VI   | 311.921    | 400       |           | $2s^2p^3 - 2s^2p^3$          | $^3P - ^3S^o$ | 0-1 | 692       |
| Na VI   | 312.608    | 300       |           | $2s^2p^3 - 2s^2p^3$          | $^3P - ^3S^o$ | 1-1 | 692       |
| Na VI   | 313.748    | 500       |           | $2s^2p^3 - 2s^2p^3$          | $^3P - ^3S^o$ | 2-1 | 692       |
| Na VI   | 317.641    | 600       |           | $2s^2p^3 - 2s^2p^3$          | $^1D - ^1P^o$ | 2-1 | 197, 692  |
| Na VI   | 361.250    | 800d      |           | $2s^2p^3 - 2s^2p^3$          | $^1D - ^1D^o$ | 2-2 | 197, 692  |

Na VI

Na VI

| Element | Wavelength | Intensity | Multiplet | Configuration         | Term           | J - J | Reference |
|---------|------------|-----------|-----------|-----------------------|----------------|-------|-----------|
| Na VI   | 362.444    | 400       |           | $2s^2 2p^2 - 2s 2p^3$ | $^1S - ^1P^o$  | 0-1   | 692       |
| Na VI   | 363.774    | 200       |           | $2s 2p^3 - 1s^2 2p^4$ | $^3D^o - ^3P$  | 1-0   | 692       |
| Na VI   | 364.477    | 300       |           | $2s 2p^3 - 1s^2 2p^4$ | $^3D^o - ^3P$  | 2-1   | 692       |
| Na VI   | 366.110    | 400       |           | $2s 2p^3 - 1s^2 2p^4$ | $^3D^o - ^3P$  | 3-2   | 692       |
| Na VI   | 366.240    | 10        |           | $2s 2p^3 - 1s^2 2p^4$ | $^3D^o - ^3P$  | 2-2   | 692       |
| Na VI   | 414.370    | 200       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3P^o$ | 0-    | 692       |
| Na VI   | 415.505    | 400       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3P^o$ | 1-    | 692       |
| Na VI   | 417.595    | 600       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3P^o$ | 2-    | 692       |
| Na VI   | 421.465    | 100       |           | $2s 2p^3 - 1s^2 2p^4$ | $^3P^o - ^3P$  | -1    | 692       |
| Na VI   | 423.821    | 200       |           | $2s 2p^3 - 1s^2 2p^4$ | $^3P^o - ^3P$  | -2    | 692       |
| Na VI   | 440.266    | 300       |           | $2s 2p^3 - 1s^2 2p^4$ | $^1D^o - ^1D$  | 2-2   | 692       |
| Na VI   | 489.580    | 500       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3D^o$ | 0-1   | 197,692   |
| Na VI   | 491.240    | 300       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3D^o$ | 1-1   | 197,692   |
| Na VI   | 491.340    | 600       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3D^o$ | 1-2   | 197,692   |
| Na VI   | 494.160    | 300       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3D^o$ | 2-2   | 197,692   |
| Na VI   | 494.382    | 700       |           | $2s^2 2p^2 - 2s 2p^3$ | $K^3P - ^3D^o$ | 2-3   | 197,692   |
| Na VI   | 528.730    | 10        |           | $2s 2p^3 - 1s^2 2p^4$ | $^1P^o - ^1D$  | 1-2   | 692       |
| Na VI   | 632.90     | 10        |           | $2s 2p^3 - 1s^2 2p^4$ | $^3S^o - ^3P$  | 1-1   | 692       |
| Na VI   | 638.21     | 10        |           | $2s 2p^3 - 1s^2 2p^4$ | $^3S^o - ^3P$  | 1-2   | 692       |

Na VII

SODIUM, Z = 11

Na VII

Ground state  $1s^2 2s^2 2p^1 P^{\circ}_1$ Ionization potential 1 681 679  $\text{cm}^{-1}$ ; 208.50 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                       | Term                 | J - J                       | Reference |
|---------|------------|-----------|-----------|-------------------------------------|----------------------|-----------------------------|-----------|
| Na VII  | 62.725     | 10d       |           | $2s^2(^1S)2p - 2s^2(^1S)8d$         | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 63.185     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})5p$ | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 692, 691  |
| Na VII  | 63.227     | 10        |           | $2s^2(^1S)2p - 2s2p(^3P^{\circ})5p$ | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 63.361     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})5p$ | $g^2P^{\circ} - ^1P$ | $\frac{1}{2} -$             | 691       |
| Na VII  | 63.442     | 10        |           | $2s^2(^1S)2p - 2s2p(^3P^{\circ})5p$ | $g^2P^{\circ} - ^1P$ | $\frac{3}{2} -$             | 691       |
| Na VII  | 63.778     | 10        |           | $2s^2(^1S)2p - 2s^2(^1S)7d$         | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 64.113     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})4p$ | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} -$             | 691       |
| Na VII  | 64.904     | 10        |           | $2s2p^2 - 2s2p(^3P^{\circ})6d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} -$             | 691       |
| Na VII  | 65.388     | 100       |           | $2s^2(^1S)2p - 2s^2(^1S)6d$         | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 65.474     | 100       |           | $2s^2(^1S)2p - 2s^2(^1S)6d$         | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 67.826     | 100d      |           | $2s2p^2 - 2s2p(^3P^{\circ})5d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} -$             | 691       |
| Na VII  | 67.877     | 100d      |           | $2s2p^2 - 2s2p(^3P^{\circ})5d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} -$             | 691       |
| Na VII  | 67.912     | 200d      |           | $2s2p^2 - 2s2p(^3P^{\circ})5d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} -$             | 691       |
| Na VII  | 68.422     | 10d       |           | $2s^2(^1S)2p - 2s^2(^1S)5d$         | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 68.519     | 100d      |           | $2s^2(^1S)2p - 2s^2(^1S)5d$         | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 68.866     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})4p$ | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 68.908     | 100       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})4p$ | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 69.314     | 10        |           | $2s^2(^1S)2p - 2s2p(^3P^{\circ})4p$ | $g^2P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 69.395     | 10d       |           | $2s^2(^1S)2p - 2s2p(^3P^{\circ})4p$ | $g^2P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 72.020     | 100       |           | $2s2p^2 - 2s2p(^3P^{\circ})5d$      | $^2D - ^2F^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 72.079     | 100       |           | $2s2p^2 - 2s2p(^3P^{\circ})5d$      | $^2D - ^2F^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 72.865     | 200       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^2D - ^2F^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 74.097     | 100       |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 74.180     | 200       |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 74.217     | 200       |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^4P - ^4D^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 74.255     | 300       |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 74.268     | 300       |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^4P - ^4D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 74.861     | 300       |           | $2s^2(^1S)2p - 2s^2(^1S)4d$         | $g^2P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 74.980     | 300b      |           | $2s^2(^1S)2p - 2s^2(^1S)4d$         | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 76.501     | 10        |           | $2s2p^2 - 2s2p(^3P^{\circ})4s$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 76.565     | 10        |           | $2s2p^2 - 2s2p(^3P^{\circ})4s$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 76.626     | 10d       |           | $2s2p^2 - 2s2p(^3P^{\circ})4s$      | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 76.827     | 10        |           | $1s^2 2p^2 - 1s^2 2p^2(^3P)4d$      | $^4S^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 76.862     | 10        |           | $1s^2 2p^2 - 1s^2 2p^2(^3P)4d$      | $^4S^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 77.353     | 100       |           | $2s^2(^1S)2p - 2s^2(^1S)4s$         | $g^2P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 78.459     | 10        |           | $2s2p^2 - 2s2p(^1P^{\circ})4s$      | $^2S - ^2P^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 78.771     | 10        |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^2D - ^2P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 78.907     | 300       |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^2D - ^2F^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 78.982     | 200       |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^2D - ^2F^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 79.477     | 200       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 79.571     | 100       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 79.761     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 79.786     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 79.893     | 300d      |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 80.008     | 300       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $g^2P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 80.133     | 10        |           | $2s2p^2 - 1s^2 2p^2(^3P)3p$         | $^4P - ^4S^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 80.174     | 10        |           | $2s2p^2 - 1s^2 2p^2(^3P)3p$         | $^4P - ^4S^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 80.245     | 100       |           | $2s2p^2 - 1s^2 2p^2(^3P)3p$         | $^4P - ^4S^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 81.430     | 100       |           | $2s2p^2 - 1s^2 2p^2(^3P)3p$         | $^4P - ^4P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 81.498     | 200b      |           | $2s2p^2 - 2s2p(^3P^{\circ})4s$      | $^2D - ^2P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 81.855     | 400       |           | $2s2p^2 - 1s^2 2p^2(^3P)3p$         | $^4P - ^4D^{\circ}$  | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 82.636     | 10        |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^2S - ^2P^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 82.685     | 10        |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^2S - ^2P^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 84.221     | 400       |           | $2s2p^2 - 1s^2 2p^2(^1D)3p$         | $^2D - ^2D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 84.832     | 10        |           | $2s2p^2 - 2s2p(^3P^{\circ})4d$      | $^2P - ^2D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 691       |

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|-------------------------------|---------------|-----------------------------|-----------|
| Na VII  | 85.260     | 300       |           | $2s2p^2 - 1s^22p^4(^1D)3p$    | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 85.297     | 300       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 85.458     | 400       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 86.596     | 400       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 86.652     | 500       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 86.758     | 300b      |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 87.141     | 100b      |           | $2s2p^2 - 2s2p(^3P^o)4s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 87.471     | 10        |           | $2s2p^2 - 1s^22p^4(^1P)3p$    | $^1D - ^1D^o$ |                             | 691       |
| Na VII  | 88.698     | 200       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 88.747     | 300       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 88.865     | 400       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 88.914     | 200       |           | $2s^2(^1S)2p - 2s2p(^3P^o)3p$ | $^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 90.173     | 100       |           | $2s2p^2 - 1s^22p^4(^1D)3p$    | $^1P - ^1D^o$ | $\frac{1}{2} -$             | 691       |
| Na VII  | 90.252     | 400b      |           | $2s2p^2 - 1s^22p^4(^1D)3p$    | $^1P - ^1D^o$ | $\frac{3}{2} -$             | 691       |
| Na VII  | 90.830     | 10        |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^1P^o$ |                             | 691       |
| Na VII  | 91.064     | 200       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^1D^o$ |                             | 691       |
| Na VII  | 92.003     | 500       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^1F^o$ |                             | 691       |
| Na VII  | 92.774     | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 92.809     | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 92.843     | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 92.883     | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 92.930     | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 92.976     | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 93.393     | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 93.434     | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 93.486     | 500       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 93.528     | 100       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 94.020     | 10        |           | $2s2p^2 - 1s^22p^4(^1P)3p$    | $^1P - ^1D^o$ |                             | 691       |
| Na VII  | 94.288     | 600       |           | $2s^2(^1S)2p - 2s^2(^1S)3d$   | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 94.468     | 700       |           | $2s^2(^1S)2p - 2s^2(^1S)3d$   | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 96.845     | 100       |           | $1s^22p^2 - 1s^22p^4(^1P)3d$  | $^1S^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 96.872     | 200       |           | $1s^22p^2 - 1s^22p^4(^1P)3d$  | $^1S^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 96.922     | 300       |           | $1s^22p^2 - 1s^22p^4(^1P)3d$  | $^1S^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 97.790     | 100       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1P - ^1P^o$ | $\frac{1}{2} -$             | 691       |
| Na VII  | 97.907     | 200       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1P - ^1P^o$ | $\frac{3}{2} -$             | 691       |
| Na VII  | 98.016     | 100       |           | $1s^22p^2 - 1s^22p^4(^1D)3d$  | $^1D^o - ^1P$ | $- \frac{3}{2}$             | 691       |
| Na VII  | 98.080     | 300b      |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1P - ^1D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 98.188     | 300       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 98.378     | 300       |           | $1s^22p^2 - 1s^22p^4(^1D)3d$  | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 98.394     | 300       |           | $1s^22p^2 - 1s^22p^4(^1D)3d$  | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 99.421     | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 99.556     | 400       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1D - ^1F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 99.680     | 100b      |           | $1s^22p^2 - 1s^22p^4(^1D)3d$  | $^1D^o - ^1D$ |                             | 691       |
| Na VII  | 100.718    | 200       |           | $2s2p^2 - 2s2p(^1P^o)3s$      | $^1D - ^1P^o$ |                             | 691       |
| Na VII  | 101.785    | 300       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 101.816    | 300       |           | $2s2p^2 - 2s2p(^1P^o)3d$      | $^1D - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 102.226    | 100       |           | $1s^22p^2 - 1s^22p^4(^1P)3d$  | $^1D^o - ^1D$ |                             | 691       |
| Na VII  | 102.390    | 100       |           | $1s^22p^2 - 1s^22p^4(^1P)3d$  | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 102.448    | 10        |           | $1s^22p^2 - 1s^22p^4(^1P)3d$  | $^1D^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 103.354    | 100       |           | $1s^22p^2 - 1s^22p^4(^1D)3d$  | $^1P^o - ^1P$ | $- \frac{3}{2}$             | 691       |
| Na VII  | 103.400    | 10        |           | $1s^22p^2 - 1s^22p^4(^1D)3d$  | $^1P^o - ^1P$ | $- \frac{1}{2}$             | 691       |
| Na VII  | 103.779    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 103.842    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 103.891    | 400d      |           | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 104.000    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 104.036    | 220       |           | $2s2p^2 - 2s2p(^3P^o)3s$      | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 104.871    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 104.955    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$      | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Na VII  | 105.111    | 300       |           | $2s^2(^1S)2p - 2s^2(^1S)3s$   | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Na VII  | 105.205    | 200       |           | $1s^22p^2 - 1s^22p^4(^1D)3d$  | $^1P^o - ^1D$ |                             | 691       |



## Na VII

## Na VII

| Element | Wavelength | Intensity | Multiplet | Configuration               | Term           | J - J                       | Reference   |
|---------|------------|-----------|-----------|-----------------------------|----------------|-----------------------------|-------------|
| Na VII  | 105.354    | 400       |           | $2s^2(^1S)2p - 2s^2(^1S)3s$ | $g^2P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 691         |
| Na VII  | 107.061    | 300b      |           | $2s2p^2 - 2s2p(^3P^o)3d$    | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 691         |
| Na VII  | 107.093    | 300b      |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1S - ^1P^o$  | $\frac{1}{2} -$             | 691         |
| Na VII  | 108.079    | 10        |           | $1s^22p^2 - 1s^22p(^3P)3d$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 108.193    | 200       |           | $1s^22p^2 - 1s^22p(^3P)3s$  | $^1S^o - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 108.373    | 100       |           | $1s^22p^2 - 1s^22p(^3P)3s$  | $^1S^o - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 108.733    | 200       |           | $1s^22p^2 - 1s^22p(^1D)3s$  | $^1D^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 108.829    | 100       |           | $1s^22p^2 - 1s^22p(^1D)3s$  | $^1D^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 109.362    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3s$    | $^1P - ^1P^o$  | $\frac{1}{2} -$             | 691         |
| Na VII  | 109.519    | 200       |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1P - ^1P^o$  | $\frac{3}{2} -$             | 691         |
| Na VII  | 110.647    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$    | $^1P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 110.778    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3d$    | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 110.817    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3d$    | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 111.211    | 300       |           | $2s2p^2 - 2s2p(^3P^o)3s$    | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 111.390    | 200       |           | $2s2p^2 - 2s2p(^3P^o)3s$    | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 691         |
| Na VII  | 115.361    | 10        |           | $1s^22p^2 - 1s^22p(^1D)3s$  | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 115.475    | 10        |           | $1s^22p^2 - 1s^22p(^1D)3s$  | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 118.840    | 10        |           | $1s^22p^2 - 2s2p(^1P^o)3p$  | $^1D^o - ^1P$  | $- \frac{3}{2}$             | 691         |
| Na VII  | 118.902    | 10        |           | $1s^22p^2 - 2s2p(^1P^o)3p$  | $^1D^o - ^1P$  | $- \frac{1}{2}$             | 691         |
| Na VII  | 119.014    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3s$    | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 119.100    | 10        |           | $1s^22p^2 - 2s2p(^1P^o)3p$  | $^1D^o - ^1D$  |                             | 691         |
| Na VII  | 119.204    | 10b       |           | $2s2p^2 - 2s2p(^3P^o)3s$    | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 691         |
| Na VII  | 122.018    | 300b      |           | $2s2p^2 - 2s2p(^3P^o)3s$    | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 122.252    | 100       |           | $2s2p^2 - 2s2p(^3P^o)3s$    | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 691         |
| Na VII  | 124.532    | 10        |           | $2s2p^2 - 2s^2(^1S)3p$      | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 126.779    | 10        |           | $1s^22p^2 - 2s2p(^1P^o)3p$  | $^1P^o - ^1P$  | $\frac{1}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 126.814    | 100       |           | $1s^22p^2 - 2s2p(^1P^o)3p$  | $^1P^o - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 139.867    | 200b      |           | $1s^22p^2 - 2s2p(^3P^o)3p$  | $^1D^o - ^1P$  |                             | 691,692,693 |
| Na VII  | 350.645    | 500       |           | $2s^2(^1S)2p - 2s2p^2$      | $g^2P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 197,691     |
| Na VII  | 352.275    | 600       |           | $2s^2(^1S)2p - 2s2p^2$      | $g^2P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 197,691     |
| Na VII  | 353.294    | 800       |           | $2s^2(^1S)2p - 2s2p^2$      | $g^2P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,691     |
| Na VII  | 354.950    | 400       |           | $2s^2(^1S)2p - 2s2p^2$      | $g^2P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 197,691     |
| Na VII  | 381.300    | 300       |           | $2s^2(^1S)2p - 2s2p^2$      | $g^2P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 691         |
| Na VII  | 385.061    | 10        |           | $2s2p^2 - 1s^22p^2$         | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 385.254    | 10        |           | $2s2p^2 - 1s^22p^2$         | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 691         |
| Na VII  | 396.335    | 200       |           | $2s2p^2 - 1s^22p^2$         | $^1P - ^1S^o$  | $\frac{1}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 397.490    | 300       |           | $2s2p^2 - 1s^22p^2$         | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 399.182    | 400       |           | $2s2p^2 - 1s^22p^2$         | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 483.216    | 200       |           | $2s2p^2 - 1s^22p^2$         | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 483.328    | 300       |           | $2s2p^2 - 1s^22p^2$         | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 691         |
| Na VII  | 486.740    | 400       |           | $2s^2(^1S)2p - 2s2p^2$      | $g^2P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 197,691     |
| Na VII  | 491.950    | 400d      |           | $2s^2(^1S)2p - 2s2p^2$      | $g^2P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 197,691     |

Ground state  $1s^2 2s^2 1S_0$ Ionization potential  $2\ 131\ 139\ \text{cm}^{-1}$ , 264.22 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                       | Term          | J - J | Reference |
|---------|------------|-----------|-----------|-------------------------------------|---------------|-------|-----------|
| Na VIII | 51.316     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)6p$ | $^3P^o - ^1D$ | 2-    | 691       |
| Na VIII | 51.789     | 10        |           | $1s^2 2s^2 - 1s^2 2s(^2S)6p$        | $^3S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 53.750     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)5p$ | $^3P^o - ^3P$ | 2-2   | 691       |
| Na VIII | 54.380     | 100       |           | $1s^2 2s^2 - 1s^2 2s(^2S)5p$        | $^3S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 55.345     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)6d$   | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 55.396     | 100       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)6d$   | $^3P^o - ^1D$ | 2-3   | 691       |
| Na VIII | 57.096     | 10        |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)6d$      | $^3P - ^1P^o$ | 2-2   | 691       |
| Na VIII | 57.119     | 10        |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)6d$      | $^3P - ^1D^o$ | 2-3   | 691       |
| Na VIII | 57.230     | 10d       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)5p$ | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 58.070     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)5d$   | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 58.201     | 500b      |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)5d$   | $^3P^o - ^1D$ | 2-3   | 691       |
| Na VIII | 59.009     | 100       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)4p$ | $^3P^o - ^3P$ | 2-2   | 691       |
| Na VIII | 59.101     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)6d$   | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 59.204     | 300       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)4p$ | $^3P^o - ^1D$ | 2-3   | 691       |
| Na VIII | 59.249     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)4p$ | $^3F^o - ^1D$ | 2-3   | 691       |
| Na VIII | 59.759     | 200       |           | $1s^2 2s^2 - 1s^2 2s(^2S)4p$        | $^3S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 59.992     | 10        |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)5d$      | $^3P - ^3P^o$ | 1-1   | 691       |
| Na VIII | 60.053     | 100       |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)5d$      | $^3P - ^3P^o$ | 2-2   | 691       |
| Na VIII | 60.073     | 100       |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)5d$      | $^3P - ^3D^o$ | 2-3   | 691       |
| Na VIII | 61.088     | 200       |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)5d$      | $^1D - ^1F^o$ | 2-3   | 691       |
| Na VIII | 61.347     | 1         |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)5d$      | $^1D - ^1D$   | 2-2   | 691       |
| Na VIII | 62.276     | 100       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)5d$   | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 63.114     | 100       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)4p$ | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 63.695     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)4p$ | $^3P^o - ^1P$ | 1-1   | 691       |
| Na VIII | 64.205     | 200       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)4d$   | $^3P^o - ^1D$ | 0-1   | 691       |
| Na VIII | 64.237     | 400       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)4d$   | $^3P^o - ^3D$ | 1-2   | 691       |
| Na VIII | 64.302     | 500       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)4d$   | $^3P^o - ^3D$ | 2-3   | 691       |
| Na VIII | 65.672     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)4s$   | $^3P^o - ^3S$ | 1-1   | 691       |
| Na VIII | 65.730     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)4s$   | $^3P^o - ^3S$ | 2-1   | 691       |
| Na VIII | 66.059     | 200       |           | $1s^2 2s^2 - 1s^2 2p(^2P^o)3d$      | $^3S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 66.358     | 10        |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)4d$      | $^3P - ^3P^o$ | 1-1   | 691       |
| Na VIII | 66.433     | 200d      |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)4d$      | $^3P - ^3P^o$ | 2-2   | 691       |
| Na VIII | 66.498     | 400       |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)4d$      | $^3P - ^3D^o$ | 2-3   | 691       |
| Na VIII | 67.478     | 100       |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)4d$      | $^1D - ^1P^o$ | 2-1   | 691       |
| Na VIII | 67.672     | 400       |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)4d$      | $^1D - ^1F^o$ | 2-3   | 691       |
| Na VIII | 68.193     | 100       |           | $1s^2 2p^2 - 1s^2 2p(^2P^o)4d$      | $^1D - ^1D^o$ | 2-2   | 691       |
| Na VIII | 69.120     | 300       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)4d$   | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 70.741     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)4s$   | $^3P^o - ^1S$ | 1-0   | 691       |
| Na VIII | 74.956     | 300       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3P$ | 1-2   | 691       |
| Na VIII | 74.980     | 300b      |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3P$ | 1-1   | 691       |
| Na VIII | 75.043     | 400       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3P$ | 2-2   | 691       |
| Na VIII | 75.096     | 300       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3P$ | 2-1   | 691       |
| Na VIII | 75.385     | 100       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3S$ | 0-1   | 691       |
| Na VIII | 75.428     | 200       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3S$ | 1-1   | 691       |
| Na VIII | 75.518     | 300       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3S$ | 2-1   | 691       |
| Na VIII | 76.123     | 500       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3D$ | 2-3   | 691       |
| Na VIII | 76.173     | 100       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3D$ | 1-1   | 691       |
| Na VIII | 76.217     | 200       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^3D$ | 2-2   | 691       |
| Na VIII | 77.267     | 600       |           | $1s^2 2s^2 - 1s^2 2s(^2S)3p$        | $^3S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 80.756     | 10        |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^1S$ | 1-0   | 691       |
| Na VIII | 81.210     | 500       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 83.240     | 700       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)3d$   | $^3P^o - ^3D$ | 0-1   | 691       |
| Na VIII | 83.288     | 800       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)3d$   | $^3P^o - ^3D$ | 1-2   | 691       |
| Na VIII | 83.391     | 900       |           | $1s^2 2s(^2S)2p - 1s^2 2s(^2S)3d$   | $^3P^o - ^3D$ | 2-3   | 691       |
| Na VIII | 84.050     | 500       |           | $1s^2 2s(^2S)2p - 1s^2 2p(^2P^o)3p$ | $^3P^o - ^1P$ | 1-1   | 691       |

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term          | J - J | Reference |
|---------|------------|-----------|-----------|-------------------------------|---------------|-------|-----------|
| Na VIII | 85.826     | 200       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3P^o$ | 0-1   | 691       |
| Na VIII | 85.861     | 300       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3P^o$ | 1-0   | 691       |
| Na VIII | 85.887     | 300       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3P^o$ | 1-1   | 691       |
| Na VIII | 85.936     | 100       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3P^o$ | 1-2   | 691       |
| Na VIII | 85.992     | 300       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3P^o$ | 2-1   | 691       |
| Na VIII | 86.039     | 500       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3P^o$ | 2-2   | 691       |
| Na VIII | 86.381     | 400       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3D^o$ | 0-1   | 691       |
| Na VIII | 86.417     | 500       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3D^o$ | 1-2   | 691       |
| Na VIII | 86.479     | 600       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3D^o$ | 2-3   | 691       |
| Na VIII | 86.530     | 100       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^3P - ^3D^o$ | 2-2   | 691       |
| Na VIII | 86.758     | 300b      |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^1D - ^1P^o$ | 2-1   | 691       |
| Na VIII | 87.211     | 700b      |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^1D - ^1F^o$ | 2-3   | 691       |
| Na VIII | 89.759     | 200       |           | $1s^2s(^2S)2p - 1s^2s(^2S)3s$ | $^3P^o - ^3S$ | 0-1   | 691       |
| Na VIII | 89.818     | 300       |           | $1s^2s(^2S)2p - 1s^2s(^2S)3s$ | $^3P^o - ^3S$ | 1-1   | 691       |
| Na VIII | 89.948     | 400       |           | $1s^2s(^2S)2p - 1s^2s(^2S)3s$ | $^3P^o - ^3S$ | 2-1   | 691       |
| Na VIII | 90.252     | 400b      |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^1D - ^1D^o$ | 2-2   | 691       |
| Na VIII | 90.536     | 500       |           | $1s^2s(^2S)2p - 1s^2s(^2S)3d$ | $^1P^o - ^1D$ | 1-2   | 691       |
| Na VIII | 93.120     | 100       |           | $1s^2p^2 - 1s^2p(^2P^o)3s$    | $^3P - ^3P^o$ | 1-2   | 691       |
| Na VIII | 93.197     | 10        |           | $1s^2p^2 - 1s^2p(^2P^o)3s$    | $^3P - ^3P^o$ | 0-1   | 691       |
| Na VIII | 93.242     | 200       |           | $1s^2p^2 - 1s^2p(^2P^o)3s$    | $^3P - ^3P^o$ | 2-2   | 591       |
| Na VIII | 93.339     | 10        |           | $1s^2p^2 - 1s^2p(^2P^o)3s$    | $^3P - ^3P^o$ | 1-0   | 691       |
| Na VIII | 93.670     | 400       |           | $1s^2p^2 - 1s^2p(^2P^o)3d$    | $^1S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 93.898     | 200       |           | $1s^2p^2 - 1s^2p(^2P^o)3s$    | $^1D - ^1P^o$ | 2-1   | 691       |
| Na VIII | 98.080     | 300b      |           | $1s^2s(^2S)2p - 1s^2s(^2S)3s$ | $^1P^o - ^1S$ | 1-0   | 691       |
| Na VIII | 102.043    | 10        |           | $1s^2p^2 - 1s^2p(^2P^o)3s$    | $^1S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 107.158    | 100b      |           | $1s^2p^2 - 1s^2s(^2S)3p$      | $^1D - ^1P^o$ | 2-1   | 691       |
| Na VIII | 117.909    | 10        |           | $1s^2p^2 - 1s^2s(^2S)3p$      | $^1S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 411.145    | 100       |           | $1s^2s^2 - 1s^2s(^2S)2p$      | $^3S - ^1P^o$ | 0-1   | 691       |
| Na VIII | 492.329    | 10        |           | $1s^2s(^2S)2p - 1s^2p^2$      | $^3P^o - ^3P$ | 1-2   | 691       |
| Na VIII | 496.249    | 100       |           | $1s^2s(^2S)2p - 1s^2p^2$      | $^3P^o - ^3P$ | 2-2   | 691       |

Ground state  $1s^2 2s^2 S_{1/2}$ Ionization potential 2 418 520 cm<sup>-1</sup>; 299.85 eV

| Element | Wavelength | Intensity | Multiplet | Configuration       | Term               | J - J       | Reference |
|---------|------------|-----------|-----------|---------------------|--------------------|-------------|-----------|
| Na IX   | 44.723     | 10        |           | $1s^2 2s - 1s^2 7p$ | $K^2S - ^2P^\circ$ | $1/2 -$     | 691       |
| Na IX   | 46.090     | 100       |           | $1s^2 2s - 1s^2 6p$ | $K^2S - ^2P^\circ$ | $1/2 -$     | 691       |
| Na IX   | 47.776     | 10        |           | $1s^2 2p - 1s^2 7d$ | $^2P^\circ - ^2D$  | $1/2 - 3/2$ | 691       |
| Na IX   | 47.836     | 100       |           | $1s^2 2p - 1s^2 7d$ | $^2P^\circ - ^2D$  | $3/2 - 3/2$ | 691       |
| Na IX   | 48.553     | 200       |           | $1s^2 2s - 1s^2 5p$ | $K^2S - ^2P^\circ$ | $1/2 -$     | 691       |
| Na IX   | 49.326     | 100       |           | $1s^2 2p - 1s^2 6d$ | $^2P^\circ - ^2D$  | $1/2 - 3/2$ | 691       |
| Na IX   | 49.386     | 200       |           | $1s^2 2p - 1s^2 6d$ | $^2P^\circ - ^2D$  | $3/2 - 3/2$ | 691       |
| Na IX   | 52.116     | 100       |           | $1s^2 2p - 1s^2 5d$ | $^2P^\circ - ^2D$  | $1/2 - 3/2$ | 691       |
| Na IX   | 52.186     | 200       |           | $1s^2 2p - 1s^2 5d$ | $^2P^\circ - ^2D$  | $3/2 - 3/2$ | 691       |
| Na IX   | 52.487     | 1         |           | $1s^2 2p - 1s^2 5s$ | $^2P^\circ - ^2S$  | $3/2 - 1/2$ | 691       |
| Na IX   | 53.860     | 300       |           | $1s^2 2s - 1s^2 4p$ | $K^2S - ^2P^\circ$ | $1/2 -$     | 691       |
| Na IX   | 58.201     | 500b      |           | $1s^2 2p - 1s^2 4d$ | $^2P^\circ - ^2D$  | $1/2 - 3/2$ | 691       |
| Na IX   | 58.279     | 600       |           | $1s^2 2p - 1s^2 4d$ | $^2P^\circ - ^2D$  | $3/2 - 3/2$ | 691       |
| Na IX   | 58.954     | 100       |           | $1s^2 2p - 1s^2 4s$ | $^2P^\circ - ^2S$  | $1/2 - 1/2$ | 691       |
| Na IX   | 59.042     | 200       |           | $1s^2 2p - 1s^2 4s$ | $^2P^\circ - ^2S$  | $3/2 - 1/2$ | 691       |
| Na IX   | 70.615     | 700       |           | $1s^2 2s - 1s^2 3p$ | $K^2S - ^2P^\circ$ | $1/2 - 3/2$ | 691       |
| Na IX   | 70.653     | 600       |           | $1s^2 2s - 1s^2 3p$ | $K^2S - ^2P^\circ$ | $1/2 - 1/2$ | 691       |
| Na IX   | 77.764     | 700       |           | $1s^2 2p - 1s^2 3d$ | $^2P^\circ - ^2D$  | $1/2 - 3/2$ | 691       |
| Na IX   | 77.911     | 800       |           | $1s^2 2p - 1s^2 3d$ | $^2P^\circ - ^2D$  | $3/2 - 3/2$ | 691       |
| Na IX   | 81.175     | 500       |           | $1s^2 2p - 1s^2 3s$ | $^2P^\circ - ^2S$  | $1/2 - 1/2$ | 691       |
| Na IX   | 81.350     | 500       |           | $1s^2 2p - 1s^2 3s$ | $^2P^\circ - ^2S$  | $3/2 - 1/2$ | 691       |
| Na IX   | 681.72     | 10        |           | $1s^2 2s - 1s^2 2p$ | $K^2S - ^2P^\circ$ | $1/2 - 3/2$ | 487, 691  |
| Na IX   | 694.26     | P         |           | $1s^2 2s - 1s^2 2p$ | $K^2S - ^2P^\circ$ | $1/2 - 1/2$ | 487       |

Na XI

## SODIUM, Z = 11

Na XI

Ground state  $1s^2S_{1/2}$ Ionization potential 13 297 676  $\text{cm}^{-1}$ ; 1648.66 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J           | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------|-----------|
| Na XI   | 7.735      | P         |           | $1s - 6p$     | $K^2S - ^2P^o$ | $\frac{1}{2} -$ | 309       |
| Na XI   | 7.833      | P         |           | $1s - 5p$     | $K^2S - ^2P^o$ | $\frac{1}{2} -$ | 309       |
| Na XI   | 8.021      | P         |           | $1s - 4p$     | $K^2S - ^2P^o$ | $\frac{1}{2} -$ | 309       |
| Na XI   | 8.459      | P         |           | $1s - 3p$     | $K^2S - ^2P^o$ | $\frac{1}{2} -$ | 309       |
| Na XI   | 10.025     | P         |           | $1s - 2p$     | $K^2S - ^2P^o$ | $\frac{1}{2} -$ | 309       |
| Na XI   | 32.76      | P         |           | $2 - 7$       |                |                 | 309       |
| Na XI   | 33.85      | P         |           | $2 - 6$       |                |                 | 309       |
| Na XI   | 35.82      | P         |           | $2 - 5$       |                |                 | 309       |
| Na XI   | 40.11      | P         |           | $2 - 4$       |                |                 | 309       |
| Na XI   | 54.14      | P         |           | $2 - 3$       |                |                 | 309       |
| Na XI   | 82.97      | P         |           | $3 - 7$       |                |                 | 309       |
| Na XI   | 90.31      | P         |           | $3 - 6$       |                |                 | 309       |
| Na XI   | 105.82     | P         |           | $3 - 5$       |                |                 | 309       |
| Na XI   | 154.8      | P         |           | $3 - 4$       |                |                 | 309       |
| Na XI   | 178.83     | P         |           | $4 - 7$       |                |                 | 309       |
| Na XI   | 216.8      | P         |           | $4 - 6$       |                |                 | 309       |
| Na XI   | 334.5      | P         |           | $4 - 5$       |                |                 | 309       |
| Na XI   | 384.3      | P         |           | $5 - 7$       |                |                 | 309       |
| Na XI   | 616.0      | P         |           | $5 - 6$       |                |                 | 309       |
| Na XI   | 1021.6     | P         |           | $6 - 7$       |                |                 | 309       |

Mg

## MAGNESIUM, Z = 12

Mg

Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Mg      | 54.17      | 10        |           |               |      |       | 692       |
| Mg      | 62.615     | 10        |           |               |      |       | 692       |
| Mg      | 69.327     | 10        |           |               |      |       | 692       |
| Mg      | 70.512     | 10        |           |               |      |       | 692       |
| Mg      | 70.563     | 10        |           |               |      |       | 692       |
| Mg      | 70.762     | 100d      |           |               |      |       | 692       |
| Mg      | 70.787     | 100d      |           |               |      |       | 692       |
| Mg      | 70.878     | 10d       |           |               |      |       | 692       |
| Mg      | 71.454     | 100       |           |               |      |       | 692       |
| Mg      | 71.621     | 10d       |           |               |      |       | 692       |
| Mg      | 71.724     | 10d       |           |               |      |       | 692       |
| Mg      | 73.112     | 10        |           |               |      |       | 692       |
| Mg      | 73.710     | 10        |           |               |      |       | 692       |
| Mg      | 73.773     | 10        |           |               |      |       | 692       |
| Mg      | 74.676     | 100       |           |               |      |       | 692       |
| Mg      | 75.112     | 100       |           |               |      |       | 692       |
| Mg      | 75.528     | 10d       |           |               |      |       | 692       |
| Mg      | 75.666     | 300       |           |               |      |       | 692       |
| Mg      | 76.169     | 100       |           |               |      |       | 692       |
| Mg      | 76.459     | 100       |           |               |      |       | 692       |
| Mg      | 77.301     | 10        |           |               |      |       | 692       |
| Mg      | 78.376     | 10        |           |               |      |       | 692       |
| Mg      | 78.643     | 100d      |           |               |      |       | 692       |
| Mg      | 78.668     | 100d      |           |               |      |       | 692       |
| Mg      | 79.880     | 200       |           |               |      |       | 692       |
| Mg      | 80.563     | 100       |           |               |      |       | 692       |
| Mg      | 82.111     | 10        |           |               |      |       | 692       |
| Mg      | 85.091     | 10        |           |               |      |       | 692       |
| Mg      | 86.147     | 10        |           |               |      |       | 692       |
| Mg      | 86.417     | 200d      |           |               |      |       | 692       |
| Mg      | 86.440     | 200d      |           |               |      |       | 692       |
| Mg      | 86.762     | 100       |           |               |      |       | 692       |
| Mg      | 87.660     | 10        |           |               |      |       | 692       |
| Mg      | 88.016     | 200       |           |               |      |       | 692       |
| Mg      | 89.256     | 100       |           |               |      |       | 692       |
| Mg      | 89.556     | 10        |           |               |      |       | 692       |
| Mg      | 90.165     | 10        |           |               |      |       | 692       |
| Mg      | 90.338     | 100       |           |               |      |       | 692       |
| Mg      | 90.463     | 10        |           |               |      |       | 692       |
| Mg      | 91.013     | 10        |           |               |      |       | 692       |
| Mg      | 91.129     | 10d       |           |               |      |       | 692       |
| Mg      | 91.302     | 10d       |           |               |      |       | 692       |
| Mg      | 92.503     | 10        |           |               |      |       | 692       |
| Mg      | 92.685     | 10        |           |               |      |       | 692       |
| Mg      | 93.650     | 200d      |           |               |      |       | 692       |
| Mg      | 93.720     | 100d      |           |               |      |       | 692       |
| Mg      | 93.972     | 10        |           |               |      |       | 692       |
| Mg      | 94.721     | 100       |           |               |      |       | 692       |
| Mg      | 99.535     | 100       |           |               |      |       | 692       |
| Mg      | 99.610     | 200       |           |               |      |       | 692       |
| Mg      | 100.196    | 100       |           |               |      |       | 692       |
| Mg      | 100.374    | 100       |           |               |      |       | 692       |
| Mg      | 100.421    | 100       |           |               |      |       | 692       |
| Mg      | 100.519    | 10        |           |               |      |       | 692       |
| Mg      | 100.545    | 200       |           |               |      |       | 692       |

Mg

Mg

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Mg      | 100.597    | 200       |           |               |      |       | 692       |
| Mg      | 101.322    | 100       |           |               |      |       | 692       |
| Mg      | 101.398    | 10        |           |               |      |       | 692       |
| Mg      | 101.845    | 100       |           |               |      |       | 692       |
| Mg      | 102.053    | 10        |           |               |      |       | 692       |
| Mg      | 102.906    | 300       |           |               |      |       | 692       |
| Mg      | 104.342    | 300       |           |               |      |       | 692       |
| Mg      | 105.066    | 500       |           |               |      |       | 692       |
| Mg      | 105.778    | 100       |           |               |      |       | 692       |
| Mg      | 105.830    | 100       |           |               |      |       | 692       |
| Mg      | 106.453    | 200       |           |               |      |       | 692       |
| Mg      | 109.420    | 100       |           |               |      |       | 692       |
| Mg      | 113.279    | 10        |           |               |      |       | 692       |
| Mg      | 114.498    | 10        |           |               |      |       | 692       |
| Mg      | 117.880    | 10        |           |               |      |       | 692       |
| Mg      | 126.961    | 10        |           |               |      |       | 692       |
| Mg      | 127.013    | 10        |           |               |      |       | 692       |
| Mg      | 137.509    | 10        |           |               |      |       | 692       |
| Mg      | 139.705    | 10        |           |               |      |       | 692       |
| Mg      | 151.808    | 10        |           |               |      |       | 693       |
| Mg      | 152.153    | 100       |           |               |      |       | 693       |
| Mg      | 251.600    | 100       |           |               |      |       | 693       |
| Mg      | 269.295    | 10        |           |               |      |       | 693       |
| Mg      | 295.393    | 10        |           |               |      |       | 693       |
| Mg      | 341.790    | 10        |           |               |      |       | 693       |
| Mg      | 376.665    | 100       |           |               |      |       | 693       |
| Mg      | 430.767    | 10        |           |               |      |       | 693       |
| Mg      | 465.972    | 10        |           |               |      |       | 693       |
| Mg      | 491.045    | 10        |           |               |      |       | 693       |
| Mg      | 880.16     | 200       |           |               |      |       | 692       |
| Mg      | 1579.05    | 10d       |           |               |      |       | 693       |
| Mg      | 1607.13    | 10        |           |               |      |       | 693       |
| Mg      | 1699.75    | 10        |           |               |      |       | 693       |
| Mg      | 1800.28    | 100       |           |               |      |       | 693       |
| Mg      | 1844.18    | 100       |           |               |      |       | 693       |
| Mg      | 1865.64    | 10        |           |               |      |       | 693       |
| Mg      | 1900.04    | 100       |           |               |      |       | 693       |
| Mg      | 1924.48    | 10        |           |               |      |       | 693       |
| Mg      | 1928.43    | 10        |           |               |      |       | 693       |
| Mg      | 1974.75    | 10        |           |               |      |       | 693       |

**Mg I**

**MAGNESIUM,  $Z = 12$**

**Mg I**

Ground state  $1s^2 2s^2 2p^6 3s^2 \ ^1S_0$

**Ionization potential 61 669.14 cm<sup>-1</sup>; 7.646 eV**

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                                 | J - J | Reference |
|---------|------------|-----------|-----------|------------------------|--------------------------------------|-------|-----------|
| Mg I    | 1827.94    | P         |           | 3s <sup>2</sup> - 3s5p | 4 <sup>1</sup> S - 1 <sup>1</sup> P° | 0-1   | 708       |



Mg II

## MAGNESIUM, Z = 12

Mg II

Ground state  $1s^2s^2p^3s^1S_{1/2}$ Ionization potential  $121\,267.41\text{ cm}^{-1}$ ; 15.035 eV

| Element | Wavelength | Intensity | Multiplet | Configuration   | Term           | J - J       | Reference |
|---------|------------|-----------|-----------|-----------------|----------------|-------------|-----------|
| Mg II   | 884.6967   | P         |           | $2p^3s - 2p^8p$ | $R^2S - ^1P^o$ | $1/2 - 3/2$ | 592       |
| Mg II   | 884.7189   | P         |           | $2p^3s - 2p^8p$ | $R^2S - ^1P^o$ | $1/2 - 1/2$ | 592       |
| Mg II   | 907.3752   | P         |           | $2p^3s - 2p^7p$ | $R^2S - ^1P^o$ | $1/2 - 3/2$ | 592       |
| Mg II   | 907.4115   | P         |           | $2p^3s - 2p^7p$ | $R^2S - ^1P^o$ | $1/2 - 1/2$ | 592       |
| Mg II   | 946.7032   | P         |           | $2p^3s - 2p^6p$ | $R^2S - ^1P^o$ | $1/2 - 3/2$ | 592       |
| Mg II   | 946.7094   | P         |           | $2p^3s - 2p^6p$ | $R^2S - ^1P^o$ | $1/2 - 1/2$ | 592       |
| Mg II   | 1025.9681  | P         |           | $2p^3s - 2p^5p$ | $R^2S - ^1P^o$ | $1/2 - 3/2$ | 592       |
| Mg II   | 1026.1133  | P         |           | $2p^3s - 2p^5p$ | $R^2S - ^1P^o$ | $1/2 - 1/2$ | 592       |
| Mg II   | 1239.9252  | P         |           | $2p^3s - 2p^4p$ | $R^2S - ^1P^o$ | $1/2 - 3/2$ | 592       |
| Mg II   | 1240.3947  | P         |           | $2p^3s - 2p^4p$ | $R^2S - ^1P^o$ | $1/2 - 1/2$ | 592       |
| Mg II   | 1271.2388  | P         |           | $2p^3p - 2p^8d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 592       |
| Mg II   | 1271.9402  | P         |           | $2p^3p - 2p^9s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 592       |
| Mg II   | 1272.7202  | P         |           | $2p^3p - 2p^8d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1272.7212  | P         |           | $2p^3p - 2p^8d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1273.4232  | P         |           | $2p^3p - 2p^9s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 592       |
| Mg II   | 1306.7139  | P         |           | $2p^3p - 2p^7d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 592       |
| Mg II   | 1307.8754  | P         |           | $2p^3p - 2p^8s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 592       |
| Mg II   | 1308.2792  | P         |           | $2p^3p - 2p^7d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1308.2809  | P         |           | $2p^3p - 2p^7d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1309.4434  | P         |           | $2p^3p - 2p^8s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 592       |
| Mg II   | 1365.5442  | P         |           | $2p^3p - 2p^6d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 592       |
| Mg II   | 1367.2537  | P         |           | $2p^3p - 2p^6d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1367.2568  | P         |           | $2p^3p - 2p^6d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1367.7082  | P         |           | $2p^3p - 2p^7s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 592       |
| Mg II   | 1369.4231  | P         |           | $2p^3p - 2p^7s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 592       |
| Mg II   | 1475.9998  | P         |           | $2p^3p - 2p^5d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 592       |
| Mg II   | 1477.9972  | P         |           | $2p^3p - 2p^5d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1478.0037  | P         |           | $2p^3p - 2p^5d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1480.8797  | P         |           | $2p^3p - 2p^6s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 592       |
| Mg II   | 1482.8903  | P         |           | $2p^3p - 2p^6s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 592       |
| Mg II   | 1734.8523  | P         |           | $2p^3p - 2p^4d$ | $^1P^o - ^1D$  | $1/2 - 3/2$ | 592       |
| Mg II   | 1737.6124  | P         |           | $2p^3p - 2p^4d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1737.6283  | P         |           | $2p^3p - 2p^4d$ | $^1P^o - ^1D$  | $3/2 - 3/2$ | 592       |
| Mg II   | 1750.6637  | P         |           | $2p^3p - 2p^5s$ | $^1P^o - ^1S$  | $1/2 - 1/2$ | 592       |
| Mg II   | 1753.4744  | P         |           | $2p^3p - 2p^5s$ | $^1P^o - ^1S$  | $3/2 - 1/2$ | 592       |

Mg III

## MAGNESIUM, Z = 12

Mg III

Ground state  $1s^2s^2p^6\ ^1S_0$ Ionization potential 646 364 cm<sup>-1</sup>; 80.137 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term                                                    | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------------|---------------------------------------------------------|-------|-----------|
| Mg III  | 158.530    | 10d       |           | $2p^6 - 2p^4(^1P^o)8d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 159.209    | 10d       |           | $2p^6 - 2p^4(^1P^o)7d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 159.755    | 10d       |           | $2p^6 - 2p^4(^1P^o)7d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 161.135    | 10        |           | $2p^6 - 2p^4(^1P^o)6d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 161.686    | 10d       |           | $2p^6 - 2p^4(^1P^o)6d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 163.586    | 10        |           | $2p^6 - 2p^4(^1P^o)6s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 164.159    | 10        |           | $2p^6 - 2p^4(^1P^o)6s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 164.384    | 200       |           | $2p^6 - 2p^4(^1P^o)5d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 164.954    | 200       |           | $2p^6 - 2p^4(^1P^o)5d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 165.197    | 10        |           | $2p^6 - 2p^4(^1P^o)5d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 169.150    | 100       |           | $2p^6 - 2p^4(^1P^o)5s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 169.746    | 100       |           | $2p^6 - 2p^4(^1P^o)5s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 170.802    | 500       |           | $2p^6 - 2p^4(^1P^o)4d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 171.395    | 400       |           | $2p^6 - 2p^4(^1P^o)4d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 171.896    | 10        |           | $2p^6 - 2p^4(^1P^o)4d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 182.240    | 300       |           | $2p^6 - 2p^4(^1P^o)4s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 182.973    | 200       |           | $2p^6 - 2p^4(^1P^o)4s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 186.510    | 900       | 4         | $2p^6 - 2p^4(^1P^o)3d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 187.194    | 800       | 3         | $2p^6 - 2p^4(^1P^o)3d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 188.526    | 300       |           | $2p^6 - 2p^4(^1P^o)3d$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 231.730    | 1000      | 2         | $2p^6 - 2p^4(^1P^o)3s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 234.258    | 850       | 1         | $2p^6 - 2p^4(^1P^o)3s$          | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$                     | 0-1   | 693,487   |
| Mg III  | 1572.72    | 400       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-2   | 693,487   |
| Mg III  | 1586.26    | 300       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-1   | 693,487   |
| Mg III  | 1592.39    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-0   | 693,487   |
| Mg III  | 1642.86    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 3-3   | 693,487   |
| Mg III  | 1648.88    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-1   | 693,487   |
| Mg III  | 1652.26    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-2   | 693,487   |
| Mg III  | 1659.28    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-3   | 693,487   |
| Mg III  | 1675.76    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-2   | 693,487   |
| Mg III  | 1679.56    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-1   | 693,487   |
| Mg III  | 1697.32    | 200       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 3-3   | 693,487   |
| Mg III  | 1703.43    | 10d       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-1   | 693,487   |
| Mg III  | 1703.78    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-1   | 693,487   |
| Mg III  | 1714.85    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-3   | 693,487   |
| Mg III  | 1722.10    | 200       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-2   | 693,487   |
| Mg III  | 1730.81    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 3-3   | 693,487   |
| Mg III  | 1731.88    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-2   | 693,487   |
| Mg III  | 1738.91    | 600       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 3-4   | 693,487   |
| Mg III  | 1739.56    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-3   | 693,487   |
| Mg III  | 1744.08    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-2   | 693,487   |
| Mg III  | 1747.64    | 400       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-2   | 693,487   |
| Mg III  | 1749.02    | 500       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-3   | 693,487   |
| Mg III  | 1758.01    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 693,487   |
| Mg III  | 1763.93    | 200       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-1   | 693,487   |
| Mg III  | 1773.09    | 300       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-2   | 693,487   |
| Mg III  | 1783.36    | 400       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-3   | 693,487   |
| Mg III  | 1788.05    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-2   | 693,487   |
| Mg III  | 1791.50    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-1   | 693,487   |
| Mg III  | 1794.68    | 300       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-2   | 693,487   |
| Mg III  | 1800.75    | 400       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-3   | 693,487   |
| Mg III  | 1820.47    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 693,487   |
| Mg III  | 1838.32    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-3   | 693,487   |
| Mg III  | 1858.19    | 200d      |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | ?     | 693,487   |
| Mg III  | 1868.23    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-2   | 693,487   |

## Mg III

## Mg III

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term                                                    | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------------|---------------------------------------------------------|-------|-----------|
| Mg III  | 1879.46    | 400d      |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{1}{2}[\frac{3}{2}]$ | 2-2   | 693,487   |
| Mg III  | 1887.31    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-1   | 693,487   |
| Mg III  | 1890.35    | 200       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{1}{2}[\frac{1}{2}]^o - \frac{1}{2}[\frac{1}{2}]$ | 1-0   | 693,487   |
| Mg III  | 1896.26    | 10        |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{1}{2}[\frac{3}{2}]$ | 2-1   | 693,487   |
| Mg III  | 1901.55    | 100       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{1}{2}[\frac{1}{2}]$ | 1-1   | 693,487   |
| Mg III  | 1908.46    | 300       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{1}{2}[\frac{1}{2}]$ | 1-0   | 693,487   |
| Mg III  | 1918.76    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-2   | 693,487   |
| Mg III  | 1923.87    | 300       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{1}{2}[\frac{3}{2}]$ | 1-2   | 693,487   |
| Mg III  | 1930.64    | 300       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 2-2   | 693,487   |
| Mg III  | 1933.59    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 693,487   |
| Mg III  | 1937.80    | 200       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{1}{2}[\frac{1}{2}]^o - \frac{1}{2}[\frac{1}{2}]$ | 0-1   | 693,487   |
| Mg III  | 1938.95    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 2-1   | 693,487   |
| Mg III  | 1941.50    | 10        |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{1}{2}[\frac{3}{2}]$ | 1-1   | 693,487   |
| Mg III  | 1954.87    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{3}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 693,487   |
| Mg III  | 1962.18    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-1   | 693,487   |
| Mg III  | 1971.57    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{3}{2}[\frac{3}{2}]^o$ | 1-0   | 693,487   |
| Mg III  | 1977.56    | 100       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 1-2   | 693,487   |
| Mg III  | 1979.31    | 100       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{1}{2}[\frac{1}{2}]^o - \frac{1}{2}[\frac{3}{2}]$ | 0-1   | 693,487   |

Mg IV

## MAGNESIUM, Z = 12

Mg IV

Ground state:  $1s^2 2s^2 2p^6 \ ^1P_1$ Ionization potential 881 759 cm<sup>-1</sup>, 109.32 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term           | J-J                         | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------|-----------------------------|-----------|
| Mg IV?  | 112.914    | 10        |           |                                |                |                             | 692       |
| Mg IV?  | 118.158    | 10d       |           |                                |                |                             | 692       |
| Mg IV?  | 118.420    | 10        |           |                                |                |                             | 692       |
| Mg IV?  | 118.603    | 100       |           |                                |                |                             | 692       |
| Mg IV?  | 118.740    | 10        |           |                                |                |                             | 692       |
| Mg IV?  | 118.914    | 10        |           |                                |                |                             | 692       |
| Mg IV?  | 119.978    | 10        |           |                                |                |                             | 692       |
| Mg IV?  | 120.086    | 10d       |           |                                |                |                             | 692       |
| Mg IV?  | 120.283    | 100d      |           |                                |                |                             | 692       |
| Mg IV?  | 120.415    | 10d       |           |                                |                |                             | 692       |
| Mg IV?  | 121.543    | 10        |           |                                |                |                             | 692       |
| Mg IV?  | 123.184    | 10        |           |                                |                |                             | 692       |
| Mg IV   | 123.273    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)5d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692,693   |
| Mg IV   | 123.377    | 100d      |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)5d$ | $g^1P^o - ^1P$ | $\frac{3}{2}$               | 692,693   |
| Mg IV?  | 123.418    | 10        |           |                                |                |                             | 692       |
| Mg IV   | 123.500    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)5d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 123.590    | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)5d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 123.722    | 10d       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)5d$ | $g^1P^o - ^1P$ | $\frac{3}{2}$               | 692,693   |
| Mg IV   | 123.770    | 10        |           |                                |                |                             | 692       |
| Mg IV   | 124.414    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$ | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 692,693   |
| Mg IV   | 124.538    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692,693   |
| Mg IV   | 124.649    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 124.759    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$ | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 692,693   |
| Mg IV   | 124.870    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692,693   |
| Mg IV   | 124.990    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692,693   |
| Mg IV   | 125.459    | 300b      |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)4s$ | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 125.811    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)4s$ | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 692,693   |
| Mg IV   | 129.730    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692,487   |
| Mg IV   | 129.855    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693,487   |
| Mg IV   | 129.969    | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693,487   |
| Mg IV   | 130.085    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692,487   |
| Mg IV   | 130.118    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692,487   |
| Mg IV   | 130.243    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692,487   |
| Mg IV   | 130.294    | 200b      |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 692,487   |
| Mg IV   | 130.352    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693,487   |
| Mg IV?  | 130.541    | 10        |           |                                |                |                             | 692       |
| Mg IV   | 130.630    | 100b      |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693,487   |
| Mg IV   | 132.815    | 500       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 133.202    | 600       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 137.966    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692,693   |
| Mg IV   | 138.262    | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692,693   |
| Mg IV   | 138.394    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692,693   |
| Mg IV   | 138.693    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)4s$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 692,693   |
| Mg IV   | 139.995    | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 692,487   |
| Mg IV   | 140.120    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 693,487   |
| Mg IV   | 140.176    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 140.425    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 140.475    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 140.523    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV?  | 140.564    | 200       |           |                                |                |                             | 693       |
| Mg IV   | 140.867    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 140.918    | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 140.966    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 146.526    | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 146.836    | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$ | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term        | J - J                       | Reference |
|---------|------------|-----------|-----------|-------------------------------------------|-------------|-----------------------------|-----------|
| Mg IV   | 146.949    | 400       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 693, 487  |
| Mg IV   | 147.006    | 400       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 147.052    | 400       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV?  | 147.252    | 300       |           |                                           |             |                             | 693       |
| Mg IV   | 147.321    | 400       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 147.405    | 500       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 147.535    | 500       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4D$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 147.632    | 10        |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 693, 487  |
| Mg IV   | 147.746    | 400       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693, 487  |
| Mg IV?  | 147.887    | 100       |           |                                           |             |                             | 693       |
| Mg IV   | 148.121    | 200       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3d$          | $^4P - ^4F$ | $\frac{1}{2} - \frac{3}{2}$ | 693, 487  |
| Mg IV   | 160.230    | 600       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4S) 3s$          | $^4P - ^4S$ | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 160.804    | 400       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4S) 3s$          | $^4P - ^4S$ | $\frac{1}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 171.653    | 800       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4D) 3s$          | $^4P - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 172.306    | 700       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4D) 3s$          | $^4P - ^4D$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 180.070    | 800       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3s$          | $^4P - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 180.617    | 1000      |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3s$          | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 180.796    | 900       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3s$          | $^4P - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 181.345    | 800       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3s$          | $^4P - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 183.439    | 400       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3s$          | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 183.915    | 100       |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3s$          | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 184.189    | 10        |           | $2s^2 2p^2 - 2s^2 2p^4 (^4P) 3s$          | $^4P - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 320.999    | 1000      |           | $2s^2 2p^2 - 2s^2 2p^2$                   | $^4P - ^4S$ | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 323.310    | 900       |           | $2s^2 2p^2 - 2s^2 2p^2$                   | $^4P - ^4S$ | $\frac{1}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 1459.52    | 100       |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4S$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1490.41    | 10        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4S$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1508.82    | 10        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4S$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1658.92    | 10        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1680.02    | 10        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1683.04    | 300       |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4D$ | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 1698.83    | 200d      |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1874.59    | 10d       |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1893.87    | 100       |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1906.71    | 10        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Mg IV   | 1925.99    | 11        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1946.20    | 10        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Mg IV   | 1956.58    | 10        |           | $2s^2 2p^4 (^4P) 3s - 2s^2 2p^4 (^4P) 3p$ | $^4P - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |

Ground state  $1s^2 2s^2 2p^4 \ ^3P_1$ Ionization potential 1 139 421  $\text{cm}^{-1}$ , 141.27 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term          | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------------|---------------|-------|-----------|
| Mg V    | 92.409     | 10d       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 5d$ | $^3P - ^3P^o$ | 2-1   | 692       |
| Mg V    | 92.428     | 10d       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 5d$ | $^3P - ^3P^o$ | 2-2   | 692       |
| Mg V    | 92.534     | 10        |           |                                    |               |       | 692       |
| Mg V    | 92.588     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 5d$ | $^3P - ^3P^o$ | 1-2   | 692       |
| Mg V    | 92.641     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 5d$ | $^3P - ^3D^o$ | 2-    | 692       |
| Mg V    | 93.109     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 5d$ | $^1D - ^1D^o$ | 2-2   | 692       |
| Mg V    | 94.793     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 5d$ | $^3P - ^3D^o$ | 2-    | 692       |
| Mg V    | 95.556     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 5d$ | $^1D - ^1F^o$ | 2-3   | 692       |
| Mg V    | 95.592     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 5d$ | $^1D - ^1D^o$ | 2-2   | 692       |
| Mg V    | 95.803     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^3P - ^3D^o$ | 2-    | 692       |
| Mg V    | 95.909     | 100d      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^3P - ^3P^o$ | 2-2   | 692       |
| Mg V    | 95.965     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^3P - ^3D^o$ | 1-    | 692       |
| Mg V    | 96.019     | 200b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^3P - ^3D^o$ | 0-    | 692       |
| Mg V    | 96.085     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^3P - ^3P^o$ | 1-1   | 692       |
| Mg V    | 96.159     | 10b       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^3P - ^3P^o$ | 0-1   | 692       |
| Mg V    | 97.391     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 5d$ | $^3P - ^3D^o$ | 2-    | 692       |
| Mg V    | 97.439     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3p$ | $^3P - ^3D^o$ | 2-    | 692       |
| Mg V    | 97.563     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 5d$ | $^3P - ^3D^o$ | 1-    | 692       |
| Mg V    | 97.606     | 200b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3p$ | $^3P - ^3D^o$ | 1-    | 692       |
| Mg V    | 97.686     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3p$ | $^3P - ^3D^o$ | 0-    | 692       |
| Mg V    | 98.235     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^3P - ^3P^o$ | 2-1   | 692       |
| Mg V    | 98.271     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^3P - ^3P^o$ | 2-2   | 692       |
| Mg V    | 98.406     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^3P - ^3P^o$ | 1-1   | 692       |
| Mg V    | 98.444     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^3P - ^3P^o$ | 1-2   | 692       |
| Mg V    | 98.636     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^3P - ^3D^o$ | 2-    | 692       |
| Mg V    | 98.805     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^3P - ^3D^o$ | 1-    | 692       |
| Mg V    | 98.872     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^3P - ^3D^o$ | 0-    | 692       |
| Mg V    | 98.983     | 400b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^1D - ^1F^o$ | 2-3   | 692       |
| Mg V    | 99.025     | 200b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^1D - ^1P^o$ | 2-1   | 692       |
| Mg V    | 99.067     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4d$ | $^1D - ^1D^o$ | 2-2   | 692       |
| Mg V    | 99.149     | 10        |           |                                    |               |       | 692       |
| Mg V    | 99.205     | 1         |           |                                    |               |       | 692       |
| Mg V    | 99.788     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 5s$ | $^3P - ^3S^o$ | 2-1   | 692       |
| Mg V    | 100.949    | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4s$ | $^3P - ^3P^o$ | 2-    | 692       |
| Mg V    | 101.671    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^1D - ^1F^o$ | 2-3   | 692       |
| Mg V    | 101.782    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^1D - ^1D^o$ | 2-2   | 692       |
| Mg V    | 102.079    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4d$ | $^1D - ^1P^o$ | 2-1   | 692       |
| Mg V    | 103.333    | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 5s$ | $^3P - ^3P^o$ | 2-2   | 692       |
| Mg V    | 103.904    | 400       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 4d$ | $^3P - ^3D^o$ | 2-3   | 692       |
| Mg V    | 103.947    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4s$ | $^3P - ^3D^o$ | 2-    | 692       |
| Mg V    | 104.100    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 4d$ | $^3P - ^3D^o$ | 1-2   | 692       |
| Mg V    | 104.140    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4s$ | $^3P - ^3D^o$ | 1-    | 692       |
| Mg V    | 104.182    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 4d$ | $^3P - ^3D^o$ | 0-1   | 692       |
| Mg V    | 104.214    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4s$ | $^3P - ^3D^o$ | 0-    | 692       |
| Mg V    | 104.432    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4s$ | $^1D - ^1P^o$ | 2-1   | 692       |
| Mg V    | 107.661    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^o 4s$ | $^1D - ^1D^o$ | 2-2   | 692       |
| Mg V    | 109.174    | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 4s$ | $^3S - ^3P^o$ | 0-1   | 692       |
| Mg V    | 109.812    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 4s$ | $^3P - ^3S^o$ | 2-1   | 692       |
| Mg V    | 110.029    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 4s$ | $^3P - ^3S^o$ | 1-1   | 692       |
| Mg V    | 110.121    | 10b       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^o 4s$ | $^3P - ^3S^o$ | 0-1   | 692       |
| Mg V    | 110.809    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3d$ | $^3P - ^3D^o$ | 2-2   | 692       |
| Mg V    | 110.859    | 400       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3d$ | $^3P - ^3D^o$ | 2-3   | 692       |
| Mg V    | 110.939    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3d$ | $^3P - ^3P^o$ | 1-1   | 692       |
| Mg V    | 111.031    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3d$ | $^3P - ^3D^o$ | 1-2   | 692       |
| Mg V    | 111.091    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^o 3d$ | $^3P - ^3D^o$ | 0-1   | 692       |

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term        | J-J | Reference |
|---------|------------|-----------|-----------|-------------------------------|-------------|-----|-----------|
| Mg V    | 111.199    | 400b      |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4P$ | 2-2 | 692       |
| Mg V    | 111.247    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4P$ | 2-1 | 692       |
| Mg V    | 111.419    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4P$ | 1-2 | 692       |
| Mg V    | 111.467    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4P$ | 1-1 | 692       |
| Mg V    | 111.496    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4P$ | 1-0 | 692       |
| Mg V    | 113.217    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4D$ | 2-3 | 692       |
| Mg V    | 113.314    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4D$ | 1-2 | 692       |
| Mg V    | 113.518    | 100       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4D$ | 0-1 | 692       |
| Mg V    | 113.703    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4S$ | 2-1 | 692       |
| Mg V    | 113.823    | 100       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 2-2 | 692       |
| Mg V    | 113.934    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4S$ | 1-1 | 692       |
| Mg V    | 113.990    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4P$ | 2-1 | 692       |
| Mg V    | 114.029    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4S$ | 0-1 | 692       |
| Mg V    | 114.059    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4P$ | 2-2 | 692       |
| Mg V    | 114.199    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4P$ | 1-0 | 692       |
| Mg V    | 114.226    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4P$ | 1-1 | 692       |
| Mg V    | 114.285    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4P$ | 1-2 | 692       |
| Mg V    | 114.324    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4P$ | 0-1 | 692       |
| Mg V    | 114.785    | 600d      |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4D$ | 2-  | 692       |
| Mg V    | 115.013    | 600d      |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4P - ^4D$ | 1-  | 692       |
| Mg V    | 115.093    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4D - ^4F$ | 2-3 | 692       |
| Mg V    | 115.399    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4D - ^4P$ | 2-1 | 692       |
| Mg V    | 115.537    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4D - ^4D$ | 2-2 | 692       |
| Mg V    | 118.083    | 500       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4D - ^4F$ | 2-3 | 692       |
| Mg V    | 118.810    | 500       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4D - ^4D$ | 2-2 | 692       |
| Mg V    | 119.401    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4D - ^4P$ | 2-1 | 692       |
| Mg V    | 119.447    | 400       |           |                               |             |     | 692       |
| Mg V    | 121.644    | 600       |           | $2s^2 2p^4 - 2s^2 p^4 (S) 3d$ | $^4P - ^4D$ | 2-3 | 692       |
| Mg V    | 121.922    | 500       |           | $2s^2 2p^4 - 2s^2 p^4 (S) 3d$ | $^4P - ^4D$ | 1-2 | 692       |
| Mg V    | 122.034    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (S) 3d$ | $^4P - ^4D$ | 0-1 | 692       |
| Mg V    | 125.600    | 400b      |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3d$ | $^4S - ^4P$ | 0-1 | 692       |
| Mg V    | 126.280    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4D$ | 2-  | 692       |
| Mg V    | 126.544    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4D$ | 1-  | 692       |
| Mg V    | 126.677    | 10b       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3d$ | $^4P - ^4D$ | 0-  | 692       |
| Mg V    | 132.171    | 600       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 2-  | 692       |
| Mg V    | 132.485    | 500       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 1-  | 692       |
| Mg V    | 132.623    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 0-1 | 692       |
| Mg V    | 135.638    | 200       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3s$ | $^4P - ^4D$ | 2-3 | 692       |
| Mg V    | 135.953    | 100       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3s$ | $^4P - ^4D$ | 1-2 | 692       |
| Mg V    | 136.128    | 10        |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3s$ | $^4P - ^4D$ | 0-1 | 692       |
| Mg V    | 137.234    | 600       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4D - ^4P$ | 2-1 | 692       |
| Mg V    | 137.414    | 800       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3s$ | $^4P - ^4D$ | 2-3 | 692       |
| Mg V    | 137.748    | 700       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3s$ | $^4P - ^4D$ | 1-2 | 692       |
| Mg V    | 137.880    | 600       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3s$ | $^4P - ^4D$ | 0-1 | 692       |
| Mg V    | 142.933    | 600       |           | $2s^2 2p^4 - 2s^2 p^4 (D) 3s$ | $^4D - ^4D$ | 2-2 | 692       |
| Mg V    | 145.485    | 500       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4S - ^4P$ | 0-1 | 692       |
| Mg V    | 146.083    | 600       |           | $2s^2 2p^4 - 2s^2 p^4 (S) 3s$ | $^4P - ^4S$ | 2-1 | 692       |
| Mg V    | 146.464    | 500       |           | $2s^2 2p^4 - 2s^2 p^4 (S) 3s$ | $^4P - ^4S$ | 1-1 | 692       |
| Mg V    | 146.621    | 400       |           | $2s^2 2p^4 - 2s^2 p^4 (S) 3s$ | $^4P - ^4S$ | 0-1 | 692       |
| Mg V    | 152.019    | 10        |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 2-1 | 692       |
| Mg V    | 152.149    | 300       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 2-2 | 692       |
| Mg V    | 152.384    | 100       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 1-1 | 692       |
| Mg V    | 152.527    | 100       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 1-2 | 692       |
| Mg V    | 152.591    | 10d       |           | $2s^2 2p^4 - 2s^2 p^4 (P) 3s$ | $^4P - ^4P$ | 0-1 | 692       |
| Mg V    | 276.581    | 1000      |           | $2s^2 2p^4 - 2s^2 p^4$        | $^4D - ^4P$ | 2-1 | 692       |
| Mg V    | 312.311    | 1000      |           | $2s^2 2p^4 - 2s^2 p^4$        | $^4S - ^4P$ | 0-1 | 692       |
| Mg V    | 351.089    | 850       |           | $2s^2 2p^4 - 2s^2 p^4$        | $^4P - ^4P$ | 2-1 | 692       |
| Mg V    | 352.202    | 700       |           | $2s^2 2p^4 - 2s^2 p^4$        | $^4P - ^4P$ | 1-0 | 692       |
| Mg V    | 353.094    | 1000      |           | $2s^2 2p^4 - 2s^2 p^4$        | $^4P - ^4P$ | 2-2 | 692       |
| Mg V    | 353.300    | 650       |           | $2s^2 2p^4 - 2s^2 p^4$        | $^4P - ^4P$ | 1-1 | 692       |

Mg V

| Element | Wavelength | Intensity | Multiplet | Configuration         | Term          | J - J | Reference |
|---------|------------|-----------|-----------|-----------------------|---------------|-------|-----------|
| Mg V    | 354 223    | 700       |           | $2s^2 2p^4 - 2s 2p^5$ | $^4P - ^4P^o$ | 0-1   | 692       |
| Mg V    | 355 326    | 850       |           | $2s^2 2p^4 - 2s 2p^5$ | $^4P - ^4P^o$ | 1-2   | 692       |



Ground state  $1s^2 2s^2 2p^6 {}^4S_{3/2}$ Ionization potential  $1\ 504\ 581\ \text{cm}^{-1}$ ;  $186.54\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term                            | J - J                       | Reference |
|---------|------------|-----------|-----------|------------------------------------|---------------------------------|-----------------------------|-----------|
| Mg VI   | 72.430     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 6s$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 74.319     | 300b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 5d$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 74.461     | 10b       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 5d$ | $g^4S^{\circ} - {}^4D$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 74.574     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 4p$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2}$               | 692       |
| Mg VI   | 75.248     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 5d$ | ${}^1D^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 75.334     | 100d      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 5d$ | ${}^1D^{\circ} - {}^1F$         |                             | 692       |
| Mg VI   | 75.834     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 5s$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 75.890     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 5s$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 76.908     | 1         |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 5d$ | ${}^1P^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 77.405     | 200b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 5d$ | ${}^1D^{\circ} - {}^1F$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 77.511     | 100b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 5d$ | ${}^1D^{\circ} - {}^1F$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 77.639     | 10        |           |                                    |                                 |                             | 692       |
| Mg VI   | 78.239     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1S) 4d$ | ${}^1D^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 79.059     | 10d       |           |                                    |                                 |                             | 692       |
| Mg VI   | 79.817     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 79.830     | 400       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 79.857     | 400       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 80.032     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | $g^4S^{\circ} - {}^4D$          | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 80.075     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | $g^4S^{\circ} - {}^4D$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 80.724     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 4d$ | ${}^1D^{\circ} - {}^1P$         |                             | 692       |
| Mg VI   | 80.930     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 4d$ | ${}^1D^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 81.106     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 4d$ | ${}^1D^{\circ} - {}^1F$         |                             | 692       |
| Mg VI   | 82.238     | 200b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 5d$ | ${}^1P^{\circ} - {}^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 82.475     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 4d$ | ${}^1P^{\circ} - {}^1S$         | $\frac{1}{2}$               | 692       |
| Mg VI   | 82.853     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 4d$ | ${}^1P^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 83.403     | 400b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 83.519     | 300b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 83.560     | 200b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4s$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 84.745     | 200d      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 4s$ | ${}^1D^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 85.153     | 10b       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4d$ | ${}^1P^{\circ} - {}^1D$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 85.577     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3p$ | ${}^1D^{\circ} - {}^1F$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 85.622     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3p$ | ${}^1D^{\circ} - {}^1F$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 86.807     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 4s$ | ${}^1P^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 87.406     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4s$ | ${}^1D^{\circ} - {}^1P$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 88.827     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 4d$ | ${}^1P^{\circ} - {}^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 88.952     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 4d$ | ${}^1P^{\circ} - {}^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 89.021     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 4d$ | ${}^1P^{\circ} - {}^1D^{\circ}$ | $\frac{1}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 89.649     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 4s$ | ${}^1P^{\circ} - {}^1P$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 90.897     | 600b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 3p$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2}$               | 692       |
| Mg VI   | 92.964     | 100b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 4s$ | ${}^1P^{\circ} - {}^1S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 93.109     | 100b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^3S) 4s$ | ${}^1P^{\circ} - {}^1S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 93.493     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1S) 3d$ | ${}^1D^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 93.385     | 400b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 3d$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 93.421     | 400b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 3d$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 93.483     | 500b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 3d$ | $g^4S^{\circ} - {}^4P$          | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 95.637     | 100b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 3d$ | $g^4S^{\circ} - {}^4D$          | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 95.675     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1P) 3d$ | $g^4S^{\circ} - {}^4D$          | $\frac{3}{2}$               | 692       |
| Mg VI   | 95.803     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1D^{\circ} - {}^1S$         | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 96.085     | 100b      |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1S) 3d$ | ${}^1P^{\circ} - {}^1D$         |                             | 692       |
| Mg VI   | 96.159     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1P^{\circ} - {}^1S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 96.240     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1P^{\circ} - {}^1D^{\circ}$ | $\frac{3}{2}$               | 692       |
| Mg VI   | 96.256     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1D^{\circ} - {}^1P$         | $\frac{3}{2} - \frac{3}{2}$ | 692       |
| Mg VI   | 96.303     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1D^{\circ} - {}^1P$         | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 96.388     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1P^{\circ} - {}^1D^{\circ}$ | $\frac{3}{2}$               | 692       |
| Mg VI   | 96.467     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1P^{\circ} - {}^1D^{\circ}$ | $\frac{1}{2}$               | 692       |

## Mg VI

## Mg VI

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J-J       | Reference |
|---------|------------|-----------|-----------|------------------------------|---------------|-----------|-----------|
| Mg VI   | 96.670     | 200       |           | $2s2p^4 - 2s2p^4(^3D^o)3d$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 96.704     | 200       |           | $2s2p^4 - 2s2p^4(^3D^o)3d$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 96.797     | 100       |           | $2s2p^4 - 2s2p^4(^3D^o)3d$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 96.857     | 100       |           | $2s2p^4 - 2s2p^4(^3D^o)3d$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 96.903     | 10        |           | $2s2p^4 - 2s2p^4(^3D^o)3d$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 96.939     | 400       |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1D^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 96.973     | 400       |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1D^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 97.251     | 500       |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1D^o - ^1F$ | $3/2-3/2$ | 692       |
| Mg VI   | 97.278     | 500       |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1D^o - ^1F$ | $3/2-3/2$ | 692       |
| Mg VI   | 98.508     | 300       |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1P^o - ^3S$ | $3/2-3/2$ | 692       |
| Mg VI   | 98.983     | 400b      |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1P^o - ^1P$ | $-3/2$    | 692       |
| Mg VI   | 99.025     | 200b      |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1P^o - ^1P$ | $-3/2$    | 692       |
| Mg VI   | 99.279     | 400       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1D^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 99.313     | 400       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1D^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 99.713     | 300       |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1P^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 99.738     | 300       |           | $2s^22p^3 - 2s^22p^3(^1D)3d$ | $^1P^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 100.702    | 500       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1D^o - ^1F$ | $3/2-3/2$ | 692       |
| Mg VI   | 100.904    | 400       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1D^o - ^1F$ | $3/2-3/2$ | 692       |
| Mg VI   | 101.508    | 200J      |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1D^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 101.556    | 30J       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1D^o - ^1P$ | $-3/2$    | 692       |
| Mg VI   | 102.189    | 500       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1P^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 102.239    | 500       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1P^o - ^1D$ | $3/2-3/2$ | 692       |
| Mg VI   | 104.519    | 300       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1P^o - ^1P$ | $-3/2$    | 692       |
| Mg VI   | 104.597    | 500       |           | $2s^22p^3 - 2s^22p^3(^3P)3d$ | $^1P^o - ^1P$ | $-3/2$    | 692       |
| Mg VI   | 105.410    | 200       |           | $2s2p^4 - 2s2p^4(^1D^o)3d$   | $^1D - ^1F^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 105.502    | 300       |           | $2s2p^4 - 2s2p^4(^3D^o)3d$   | $^1D - ^1F^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 107.820    | 400       |           | $2s2p^4 - 2s2p^4(^3S^o)3d$   | $^3P - ^3D$   | $3/2-3/2$ | 692       |
| Mg VI   | 108.015    | 300       |           | $2s2p^4 - 2s2p^4(^3S^o)3d$   | $^3P - ^3D^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 108.114    | 200       |           | $2s2p^4 - 2s2p^4(^3S^o)3d$   | $^3P - ^3D^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 108.148    | 100       |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3P - ^3P^o$ | $3/2$     | 692       |
| Mg VI   | 108.338    | 100       |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3P - ^3P^o$ | $3/2$     | 692       |
| Mg VI   | 108.441    | 10        |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3P - ^3P^o$ | $3/2$     | 692       |
| Mg VI   | 111.160    | 300       |           | $2s^22p^3 - 2s^22p^3(^1S)3s$ | $^1P^o - ^3S$ | $3/2-3/2$ | 692       |
| Mg VI   | 111.199    | 400b      |           | $2s^22p^3 - 2s^22p^3(^1S)3s$ | $^1P^o - ^3S$ | $3/2-3/2$ | 692       |
| Mg VI   | 111.552    | 500       |           | $2s^22p^3 - 2s^22p^3(^3P)3s$ | $^3S^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 111.746    | 400       |           | $2s^22p^3 - 2s^22p^3(^3P)3s$ | $^3S^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 111.864    | 400       |           | $2s^22p^3 - 2s^22p^3(^3P)3s$ | $^3S^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 113.189    | 500       |           | $2s^22p^3 - 2s^22p^3(^1D)3s$ | $^1D^o - ^1D$ | $3/2$     | 692       |
| Mg VI   | 114.412    | 10        |           | $2s2p^4 - 2s2p^4(^1D^o)3s$   | $^3P - ^3D^o$ | $3/2$     | 692       |
| Mg VI   | 114.624    | 10        |           | $2s2p^4 - 2s2p^4(^1D^o)3s$   | $^3P - ^3D^o$ | $3/2$     | 692       |
| Mg VI   | 114.725    | 10        |           | $2s2p^4 - 2s2p^4(^1D^o)3s$   | $^3P - ^3D^o$ | $3/2$     | 692       |
| Mg VI   | 116.968    | 500       |           | $2s^22p^3 - 2s^22p^3(^1D)3s$ | $^1P^o - ^1D$ | $3/2$     | 692       |
| Mg VI   | 116.968    | 500       |           | $2s^22p^3 - 2s^22p^3(^3P)3s$ | $^1D^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 117.226    | 300       |           | $2s^22p^3 - 2s^22p^3(^3P)3s$ | $^1D^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 117.527    | 100       |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^1D - ^1P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 121.025    | 500       |           | $2s^22p^3 - 2s^22p^3(^3P)3s$ | $^1P^o - ^1P$ | $-3/2$    | 692       |
| Mg VI   | 121.290    | 300       |           | $2s^22p^3 - 2s^22p^3(^3P)3s$ | $^1P^o - ^1P$ | $-3/2$    | 692       |
| Mg VI   | 123.590    | 100d      |           | $2s2p^4 - 2s2p^4(^1D^o)3s$   | $^1D - ^1D^o$ | $3/2$     | 692       |
| Mg VI   | 125.204    | 300       |           | $2s2p^4 - 2s2p^4(^3S^o)3s$   | $^3P - ^3S^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 125.459    | 300b      |           | $2s2p^4 - 2s2p^4(^3S^o)3s$   | $^3P - ^3S^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 125.600    | 400b      |           | $2s2p^4 - 2s2p^4(^3S^o)3s$   | $^3P - ^3S^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 126.450    | 100       |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3S - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 126.488    | 100       |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3S - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 130.294    | 200b      |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 130.630    | 100b      |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 130.701    | 10        |           | $2s2p^4 - 2s2p^4(^3P^o)3s$   | $^3P - ^3P^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 137.814    | 10        |           | $2s2p^4 - 2s2p^4(^1D^o)3s$   | $^3P - ^3D^o$ | $3/2-3/2$ | 692       |
| Mg VI   | 268.986    | 650       |           | $2s^22p^3 - 2s2p^4$          | $^1D^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 270.394    | 750       |           | $2s^22p^3 - 2s2p^4$          | $^1D^o - ^1P$ | $3/2-3/2$ | 692       |
| Mg VI   | 288.652    | 10        |           | $2s^22p^3 - 2s2p^4$          | $^1D^o - ^3S$ | $3/2-3/2$ | 692       |

Mg VI

Mg VI

| Element | Wavelength | Intensity | Multiplet | Configuration         | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|-----------------------|---------------|-----------------------------|-----------|
| Mg VI   | 291.348    | 300       |           | $2s^2 2p^3 - 2s 2p^4$ | $^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 291.458    | 200       |           | $2s^2 2p^3 - 2s 2p^4$ | $^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 293.026    | 200       |           | $2s^2 2p^3 - 2s 2p^4$ | $^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 293.124    | 400d      |           | $2s^2 2p^3 - 2s 2p^4$ | $^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 314.554    | 300       |           | $2s^2 2p^3 - 2s 2p^4$ | $^1P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 314.676    | 400       |           | $2s^2 2p^3 - 2s 2p^4$ | $^1P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 349.155    | 700d      |           | $2s^2 2p^3 - 2s 2p^4$ | $^1D^o - ^1D$ |                             | 692       |
| Mg VI   | 387.787    | 200d      |           | $2s^2 2p^3 - 2s 2p^4$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 388.020    | 300d      |           | $2s^2 2p^3 - 2s 2p^4$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 399.289    | 600       |           | $2s^2 2p^3 - 2s 2p^4$ | $^3S^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 400.676    | 700       |           | $2s^2 2p^3 - 2s 2p^4$ | $^3S^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |
| Mg VI   | 403.315    | 800       |           | $2s^2 2p^3 - 2s 2p^4$ | $^3S^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 692       |

Ground state  $1s^2s^2p^3\ ^4P$ .Ionization potential 1 814 430  $\text{cm}^{-1}$ ; 224.95 eV

| Element | Wavelength | Intensity | Multiplet | Configuration              | Term        | J-J | Reference |
|---------|------------|-----------|-----------|----------------------------|-------------|-----|-----------|
| Mg VII  | 58.316     | 10        |           | $2s^2p^3 - 2s2p^4(^4P)5p$  | $^4P - ^4D$ | 2-3 | 692       |
| Mg VII  | 59.640     | 1         |           | $2s2p^3 - 2s2p^4(^4P)6d$   | $^4S - ^4P$ | 2-3 | 692       |
| Mg VII  | 60.138     | 10        |           | $2s^2p^3 - 2s^2p^4(^4P)6d$ | $^4P - ^4P$ |     | 692       |
| Mg VII  | 62.166     | 10d       |           | $2s2p^3 - 2s2p^4(^4P)5d$   | $^4S - ^4P$ | 2-3 | 692       |
| Mg VII  | 62.696     | 100       |           | $2s^2p^3 - 2s^2p^4(^4P)5d$ | $^4P - ^4P$ | 2-2 | 692       |
| Mg VII  | 63.396     | 100d      |           | $2s^2p^3 - 2s2p^4(^4P)4p$  | $^4P - ^4D$ | 2-3 | 692       |
| Mg VII  | 64.122     | 200       |           | $2s^2p^3 - 2s^2p^4(^4P)5d$ | $^4D - ^4F$ | 2-3 | 692       |
| Mg VII  | 64.377     | 100b      |           | $2s^2p^3 - 2s^2p^4(^4P)5d$ | $^4D - ^4D$ | 2-2 | 692       |
| Mg VII  | 66.788     | 10        |           | $2s2p^3 - 2s2p^4(^4P)5d$   | $^4D - ^4F$ | 3-4 | 692       |
| Mg VII  | 67.453     | 10        |           | $2s2p^3 - 2s2p^4(^4P)4d$   | $^4S - ^4P$ | 2-1 | 692       |
| Mg VII  | 67.470     | 100d      |           | $2s2p^3 - 2s2p^4(^4P)4d$   | $^4S - ^4P$ | 2-2 | 692       |
| Mg VII  | 67.497     | 200       |           | $2s2p^3 - 2s2p^4(^4P)4d$   | $^4S - ^4P$ | 2-3 | 692       |
| Mg VII  | 67.993     | 100d      |           | $2s^2p^3 - 2s^2p^4(^4P)4d$ | $^4P - ^4P$ | 1-2 | 692       |
| Mg VII  | 68.064     | 200       |           | $2s^2p^3 - 2s^2p^4(^4P)4d$ | $^4P - ^4P$ | 2-2 | 692       |
| Mg VII  | 68.100     | 200       |           | $2s^2p^3 - 2s^2p^4(^4P)4d$ | $^4P - ^4D$ | 1-2 | 692       |
| Mg VII  | 68.144     | 300d      |           | $2s^2p^3 - 2s^2p^4(^4P)4d$ | $^4P - ^4D$ | 2-3 | 692       |
| Mg VII  | 68.352     | 200       |           | $2s2p^3 - 2s2p^4(^4D)4d$   | $^4D - ^4F$ |     | 692       |
| Mg VII  | 69.615     | 300b      |           | $2s^2p^3 - 2s^2p^4(^4P)4d$ | $^4D - ^4F$ | 2-3 | 692       |
| Mg VII  | 69.900     | 10        |           | $2s2p^3 - 2s2p^4(^4P)4s$   | $^4S - ^4P$ | 2-3 | 692       |
| Mg VII  | 70.193     | 100       |           | $2s^2p^3 - 2s^2p^4(^4P)4d$ | $^4D - ^4D$ | 2-2 | 692       |
| Mg VII  | 71.786     | 100       |           | $2s^2p^3 - 2s^2p^4(^4P)4d$ | $^4S - ^4P$ | 0-1 | 692       |
| Mg VII  | 72.546     | 10b       |           | $2s2p^3 - 2s2p^4(^4P)4d$   | $^4D - ^4D$ |     | 692       |
| Mg VII  | 72.787     | 100       |           | $2s2p^3 - 2s2p^4(^4P)4d$   | $^4D - ^4F$ | 3-4 | 692       |
| Mg VII  | 72.852     | 10        |           | $2s2p^3 - 2s2p^4(^4P)4d$   | $^4D - ^4F$ | 2-3 | 692       |
| Mg VII  | 72.896     | 1d        |           | $2s2p^3 - 2s2p^4(^4P)4d$   | $^4D - ^4F$ | 1-2 | 692       |
| Mg VII  | 75.975     | 400       |           | $2s^2p^3 - 2s2p^4(^4D)3p$  | $^4D - ^4D$ | 2-2 | 692       |
| Mg VII  | 76.392     | 300       |           | $2s^2p^3 - 2s^2p^4(^4D)3p$ | $^4D - ^4F$ | 2-3 | 692       |
| Mg VII  | 77.033     | 100       |           | $2s^2p^3 - 2s2p^4(^4D)3p$  | $^4P - ^4D$ | 1-  | 692       |
| Mg VII  | 77.144     | 200       |           | $2s^2p^3 - 2s2p^4(^4D)3p$  | $^4P - ^4D$ | 2-  | 692       |
| Mg VII  | 78.405     | 10        |           | $2s^2p^3 - 2s2p^4(^4P)3p$  | $^4P - ^4P$ | 1-2 | 692       |
| Mg VII  | 78.521     | 200       |           | $2s^2p^3 - 2s2p^4(^4P)3p$  | $^4P - ^4P$ | 2-2 | 692       |
| Mg VII  | 79.131     | 500       |           | $2s^2p^3 - 2s2p^4(^4P)3p$  | $^4P - ^4D$ | 1-2 | 692       |
| Mg VII  | 79.168     | 500       |           | $2s^2p^3 - 2s2p^4(^4P)3p$  | $^4P - ^4D$ | 2-3 | 692       |
| Mg VII  | 79.248     | 100       |           | $2s^2p^3 - 2s2p^4(^4P)3p$  | $^4P - ^4D$ | 2-2 | 692       |
| Mg VII  | 81.024     | 100       |           | $2s^2p^3 - 2s2p^4(^4P)3p$  | $^4P - ^4S$ | 1-1 | 692       |
| Mg VII  | 81.133     | 300       |           | $2s^2p^3 - 2s2p^4(^4P)3p$  | $^4P - ^4S$ | 2-1 | 692       |
| Mg VII  | 82.940     | 400       |           | $2s2p^3 - 2s2p^4(^4P)3d$   | $^4S - ^4P$ | 2-1 | 692       |
| Mg VII  | 82.969     | 400       |           | $2s2p^3 - 2s2p^4(^4P)3d$   | $^4S - ^4P$ | 2-2 | 692       |
| Mg VII  | 83.015     | 500d      |           | $2s2p^3 - 2s2p^4(^4P)3d$   | $^4S - ^4P$ | 2-3 | 692       |
| Mg VII  | 83.403     | 400b      |           | $2s2p^3 - 2s2p^4(^4P)3d$   | $^4S - ^4D$ | 2-  | 692       |
| Mg VII  | 83.519     | 300b      |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4P$ | 0-1 | 692       |
| Mg VII  | 83.560     | 200b      |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4P$ | 1-0 | 692       |
| Mg VII  | 83.587     | 200       |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4P$ | 1-1 | 692       |
| Mg VII  | 83.635     | 10        |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4P$ | 1-2 | 692       |
| Mg VII  | 83.716     | 300       |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4P$ | 2-1 | 692       |
| Mg VII  | 83.766     | 500       |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4P$ | 2-2 | 692       |
| Mg VII  | 83.910     | 300       |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4D$ | 0-1 | 692       |
| Mg VII  | 83.959     | 400d      |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4D$ | 1-2 | 692       |
| Mg VII  | 84.025     | 500       |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4D$ | 2-3 | 692       |
| Mg VII  | 84.087     | 300b      |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4P - ^4D$ | 2-2 | 692       |
| Mg VII  | 84.189     | 10        |           | $2s2p^3 - 2s2p^4(^4D)3d$   | $^4D - ^4P$ |     | 692       |
| Mg VII  | 84.642     | 500       |           | $2s2p^3 - 2s2p^4(^4D)3d$   | $^4D - ^4F$ |     | 692       |
| Mg VII  | 85.336     | 10        |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4D - ^4P$ | 2-1 | 692       |
| Mg VII  | 85.407     | 700       |           | $2s^2p^3 - 2s^2p^4(^4P)3d$ | $^4D - ^4F$ | 2-3 | 692       |
| Mg VII  | 86.032     | 200d      |           | $2s2p^3 - 2s2p^4(^4D)3d$   | $^4P - ^4S$ | -1  | 692       |

## Mg VII

## Mg VII

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term            | J-J | Reference |
|---------|------------|-----------|-----------|------------------------------|-----------------|-----|-----------|
| Mg VII  | 87.131     | 500d      |           | $2s^2p^4 - 2s^2p^4(^1D)3d$   | $^1P^o - ^1D$   | 2-3 | 692       |
| Mg VII  | 87.175     | 400d      |           | $2s^2p^4 - 2s^2p^4(^1D)3d$   | $^1P^o - ^1D$   | 1-2 | 692       |
| Mg VII  | 87.722     | 600       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D - ^1D^o$   | 2-2 | 692       |
| Mg VII  | 87.767     | 400       |           | $2s^2p^4 - 2s^2p^4(^1D)3d$   | $^1P^o - ^1F$   |     | 692       |
| Mg VII  | 87.889     | 500       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D - ^1F^o$   | 2-2 | 692       |
| Mg VII  | 88.680     | 600       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1S - ^1P^o$   | 0-1 | 692       |
| Mg VII  | 89.407     | 200       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1D$   | 3-3 | 692       |
| Mg VII  | 89.448     | 200       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1D$   | 2-2 | 692       |
| Mg VII  | 89.476     | 10        |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1D$   | 1-1 | 692       |
| Mg VII  | 90.706     | 400       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1F$   | 3-4 | 692       |
| Mg VII  | 90.815     | 300       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1F$   | 2-3 | 692       |
| Mg VII  | 90.897     | 600b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1F$   | 1-2 | 692       |
| Mg VII  | 91.460     | 10d       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1P$   | 2-1 | 692       |
| Mg VII  | 91.573     | 100       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1D^o - ^1P$   | 3-2 | 692       |
| Mg VII  | 92.256     | 300       |           | $2s^2p^4 - 2s^2p^4(^1D)3d$   | $^1D^o - ^1F$   | 2-3 | 692       |
| Mg VII  | 92.898     | 200       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1P^o - ^1D$   | 2-3 | 692       |
| Mg VII  | 92.934     | 200       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1P^o - ^1D$   | 1-2 | 692       |
| Mg VII  | 92.964     | 100b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1P^o - ^1D$   | 0-1 | 692       |
| Mg VII  | 94.043     | 400b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1S^o - ^1P$   | 2-3 | 692       |
| Mg VII  | 94.174     | 300       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1S^o - ^1P$   | 2-2 | 692       |
| Mg VII  | 94.276     | 200b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1S^o - ^1P$   | 2-1 | 692       |
| Mg VII  | 95.027     | 400       |           | $2s^2p^4 - 2s^2p^4(^1D)3s$   | $^1D^o - ^1D$   |     | 692       |
| Mg VII  | 95.089     | 10        |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1P^o - ^1P$   | -0  | 692       |
| Mg VII  | 95.139     | 100       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1P^o - ^1P$   | -1  | 692       |
| Mg VII  | 95.233     | 100       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1P^o - ^1P$   | -2  | 692       |
| Mg VII  | 95.259     | 200       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P^o$ | 1-2 | 692       |
| Mg VII  | 95.385     | 400b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P^o$ | 0-1 | 692       |
| Mg VII  | 95.421     | 400b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P^o$ | 2-2 | 692       |
| Mg VII  | 95.483     | 500b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P^o$ | 1-1 | 692       |
| Mg VII  | 95.556     | 100b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P^o$ | 1-0 | 692       |
| Mg VII  | 95.637     | 300b      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P^o$ | 2-1 | 692       |
| Mg VII  | 96.019     | 200b      |           | $2s^2p^4 - 2s^2p^4(^1D)3d$   | $^1P^o - ^1D$   | 1-2 | 692       |
| Mg VII  | 98.322     | 300       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1D - ^1P^o$   | 2-1 | 692       |
| Mg VII  | 98.983     | 400b      |           | $2s^2p^4 - 2s^2p^4(^1D)3s$   | $^1P^o - ^1D$   |     | 692       |
| Mg VII  | 101.956    | 200       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1D^o - ^1P$   | 3-2 | 692       |
| Mg VII  | 102.138    | 100       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1D^o - ^1P$   | 2-1 | 692       |
| Mg VII  | 102.471    | 300       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1S - ^1P^o$   | 0-1 | 692       |
| Mg VII  | 103.743    | 10        |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1S^o - ^1P$   | 1-1 | 692       |
| Mg VII  | 103.859    | 10        |           | $2s^2p^4 - 2s^2p^4(^1P^o)3d$ | $^1S^o - ^1P$   | 1-2 | 692       |
| Mg VII  | 105.159    | 100       |           | $2s^2p^4 - 2s^2p^4(^1D)3s$   | $^1D^o - ^1D$   | 2-2 | 692       |
| Mg VII  | 106.524    | 200d      |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P$   | -2  | 692       |
| Mg VII  | 106.707    | 100       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P$   | -1  | 692       |
| Mg VII  | 106.809    | 10        |           | $2s^2p^4 - 2s^2p^4(^1P^o)3s$ | $^1P^o - ^1P$   | 1-0 | 692       |
| Mg VII  | 110.121    | 10b       |           | $2s^2p^4 - 2s^2p^4(^1D)3s$   | $^1P^o - ^1D$   | 1-2 | 692       |
| Mg VII  | 111.984    | 10d       |           | $2s^2p^4 - 2s^2p^4(^1P^o)3p$ | $^1D^o - ^1P$   | -2  | 692       |
| Mg VII  | 112.135    | 10        |           | $2s^2p^4 - 2s^2p^4(^1P^o)3p$ | $^1D^o - ^1P$   | -1  | 692       |
| Mg VII  | 112.269    | 1         |           | $2s^2p^4 - 2s^2p^4(^1P^o)3p$ | $^1D^o - ^1P$   | -0  | 692       |
| Mg VII  | 276.145    | 200       |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1S^o$ | 0-1 | 692       |
| Mg VII  | 277.007    | 300       |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1S^o$ | 1-1 | 692       |
| Mg VII  | 278.406    | 400       |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1S^o$ | 2-1 | 692       |
| Mg VII  | 280.744    | 300       |           | $2s^2p^4 - 2s^2p^4$          | $^1D - ^1P^o$   | 2-1 | 692       |
| Mg VII  | 319.016    | 400d      |           | $2s^2p^4 - 2s^2p^4$          | $^1D - ^1D^o$   | 2-2 | 692       |
| Mg VII  | 363.770    | 10        |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1P^o$ | 0-1 | 692       |
| Mg VII  | 365.230    | 200d      |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1P^o$ | 1-  | 692       |
| Mg VII  | 367.679    | 400d      |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1P^o$ | 2-  | 692       |
| Mg VII  | 429.134    | 100d      |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1D^o$ | 0-1 | 692       |
| Mg VII  | 431.318    | 200d      |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1D^o$ | 1-2 | 692       |
| Mg VII  | 434.710    | 10d       |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1D^o$ | 2-2 | 692       |
| Mg VII  | 434.923    | 200d      |           | $2s^2p^4 - 2s^2p^4$          | $^1P^o - ^1D^o$ | 2-3 | 692       |

Ground state  $1s^2 2s^2 2p^6 {}^1P_1$ Ionization potential 2 145 679  $\text{cm}^{-1}$ , 266.02 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term            | J-J                         | Reference |
|---------|------------|-----------|-----------|--------------------------------|-----------------|-----------------------------|-----------|
| Mg VIII | 52.395     | 10        |           | $2s2p^5 - 1s^2 2p^4 ({}^1P)4p$ | ${}^1P - {}^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 53.484     | 10d       |           | $2s2p^5 - 2s2p^4 ({}^1P)5d$    | ${}^1P - {}^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 53.512     | 100d      |           | $2s2p^5 - 2s2p^4 ({}^1P)5d$    | ${}^1P - {}^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 53.812     | 10        |           | $2s^2 2p - 2s^2 5d$            | ${}^3P - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 53.905     | 100       |           | $2s^2 2p - 2s^2 5d$            | ${}^3P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 54.886     | 100       |           | $2s^2 2p - 2s2p^4 ({}^1P)4p$   | ${}^3P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 55.222     | 10d       |           | $2s^2 2p - 2s2p^4 ({}^1P)4p$   | ${}^3P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 56.358     | 10d       |           | $2s2p^5 - 2s2p^4 ({}^1P)5d$    | ${}^1D - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 56.403     | 10d       |           | $2s2p^5 - 2s2p^4 ({}^1P)5d$    | ${}^1D - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 57.590     | 10        |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1D - {}^1D$ |                             | 691       |
| Mg VIII | 57.736     | 100       |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1D - {}^1F$ |                             | 691       |
| Mg VIII | 58.537     | 10d       |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1P - {}^1P$ | $\frac{3}{2}$               | 691       |
| Mg VIII | 58.614     | 200d      |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 58.667     | 300d      |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 59.038     | 200       |           | $2s^2 2p - 2s^2 4d$            | ${}^3P - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 59.153     | 300       |           | $2s^2 2p - 2s^2 4d$            | ${}^3P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 60.384     | 10        |           | $2s^2 2p - 2s2p^4 ({}^1P)4s$   | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 60.806     | 10        |           | $2s^2 2p - 2s^2 4s$            | ${}^3P - {}^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 61.891     | 200       |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1D - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 61.964     | 100b      |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1D - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 62.291     | 10        |           | $2s2p^5 - 2s2p^4 ({}^1P)4d$    | ${}^1D - {}^1D$ |                             | 691       |
| Mg VIII | 64.246     | 10        |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 64.377     | 100b      |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 64.488     | 100d      |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 64.518     | 100d      |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 64.635     | 200       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 64.635     | 200       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 64.702     | 200       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 64.811     | 10        |           | $2s2p^5 - 1s^2 2p^4 ({}^1P)3p$ | ${}^1P - {}^1S$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 64.878     | 100       |           | $2s2p^5 - 1s^2 2p^4 ({}^1P)3p$ | ${}^1P - {}^1S$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 65.735     | 100       |           | $2s2p^5 - 1s^2 2p^4 ({}^1P)3p$ | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 65.806     | 200       |           | $2s2p^5 - 1s^2 2p^4 ({}^1P)3p$ | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 66.069     | 300       |           | $2s2p^5 - 1s^2 2p^4 ({}^1P)3p$ | ${}^1P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 67.731     | 400b      |           | $2s2p^5 - 1s^2 2p^4 ({}^1D)3p$ | ${}^1D - {}^1D$ |                             | 691       |
| Mg VIII | 68.450     | 100       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 68.550     | 100       |           | $2s2p^5 - 1s^2 2p^4 ({}^1D)3p$ | ${}^1D - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 68.580     | 10        |           | $2s2p^5 - 1s^2 2p^4 ({}^1D)3p$ | ${}^1D - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 68.606     | 200       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 69.413     | 400b      |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 69.467     | 500b      |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 69.577     | 100       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 70.953     | 100       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 71.007     | 200d      |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 71.118     | 300       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 71.162     | 100       |           | $2s^2 2p - 2s2p^4 ({}^1P)3p$   | ${}^3P - {}^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 72.027     | 300b      |           | $2s2p^5 - 1s^2 2p^4 ({}^1D)3p$ | ${}^1P - {}^1D$ | $\frac{3}{2}$               | 691       |
| Mg VIII | 72.546     | 10b       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1D - {}^1P$ |                             | 692, 691  |
| Mg VIII | 72.684     | 100d      |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1D - {}^1D$ |                             | 691       |
| Mg VIII | 73.250     | 400       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1D - {}^1F$ |                             | 691       |
| Mg VIII | 73.825     | 100       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1P - {}^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 73.862     | 200       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 73.890     | 100       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 73.927     | 100       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 73.981     | 200       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 74.021     | 300       |           | $2s2p^5 - 2s2p^4 ({}^1P)3d$    | ${}^1P - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |

## Mg VIII

## Mg VIII

| Element  | Wavelength | Intensity | Multiplet | Configuration                                              | Term      | J - J   | Reference |
|----------|------------|-----------|-----------|------------------------------------------------------------|-----------|---------|-----------|
| Mg VIII  | 74.274     | 200b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 1/2-3/2 | 691       |
| Mg VIII  | 74.319     | 300b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 3/2-3/2 | 692,691   |
| Mg VIII  | 74.366     | 400b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 3/2-3/2 | 691       |
| Mg VIII  | 74.411     | 100b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 3/2-3/2 | 691       |
| Mg VIII  | 74.858     | 600       |           | 2s <sup>2</sup> 2p - 2s <sup>2</sup> 3d                    | 3P° - 1D  | 1/2-3/2 | 691       |
| Mg VIII  | 75.034     | 700       |           | 2s <sup>2</sup> 2p - 2s <sup>2</sup> 3d                    | 3P° - 1D  | 3/2-3/2 | 691       |
| Mg VIII  | 76.199     | 100       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1S° - 1P° | 1/2-    | 691       |
| Mg VIII  | 76.714     | 100       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3d | 1S° - 1P  | 3/2-1/2 | 691       |
| Mg VIII  | 76.740     | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3d | 1S° - 1P  | 3/2-3/2 | 691       |
| Mg VIII  | 76.788     | 300       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3d | 1S° - 1P  | 3/2-3/2 | 691       |
| Mg VIII  | 77.405     | 200b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1P° | 1/2-    | 691       |
| Mg VIII  | 77.511     | 100b      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1D)3d | 1D° - 1P  |         | 691       |
| Mg VIII  | 77.572     | 500       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 1/2-3/2 | 691       |
| Mg VIII  | 77.671     | 500       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 3/2-3/2 | 691       |
| Mg VIII  | 77.737     | 600b      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1D)3d | 1D° - 1F  |         | 691       |
| Mg VIII  | 78.446     | 600d      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1D° - 1F° | 3/2-3/2 | 691       |
| Mg VIII  | 78.574     | 600d      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1D° - 1F° | 3/2-3/2 | 691       |
| Mg VIII  | 79.695     | 200       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1D° - 1P° |         | 691       |
| Mg VIII  | 80.229     | 400d      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1D° - 1D  | 3/2-3/2 | 691       |
| Mg VIII  | 80.255     | 400d      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1D° - 1D° | 3/2-3/2 | 691       |
| Mg VIII  | 80.806     | 10d       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3d | 1D° - 1D  | 3/2-3/2 | 691       |
| Mg VIII  | 80.889     | 100       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3d | 1D° - 1F  | 3/2-3/2 | 691       |
| Mg VIII? | 81.304     | 100       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1D)3d | 1P° - 1P  |         | 691       |
| Mg VIII? | 81.368     | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1D)3d | 1P° - 1P  |         | 691       |
| Mg VIII  | 81.732     | 300       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 3/2-3/2 | 691       |
| Mg VIII  | 81.790     | 200       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 1/2-3/2 | 691       |
| Mg VIII  | 81.844     | 400       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 3/2-3/2 | 691       |
| Mg VIII  | 81.943     | 200       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 3/2-1/2 | 691       |
| Mg VIII  | 81.979     | 200       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 3/2-3/2 | 691       |
| Mg VIII  | 82.238     | 200b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1S° - 1P° | 1/2-1/2 | 691       |
| Mg VIII  | 82.317     | 300       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1S° - 1P° | 1/2-3/2 | 691       |
| Mg VIII  | 82.598     | 200       |           | 2s <sup>2</sup> 2p - 2s <sup>2</sup> 3s                    | 3P° - 1S  | 1/2-1/2 | 691       |
| Mg VIII  | 82.709     | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1D)3d | 1P° - 1D  |         | 691       |
| Mg VIII  | 82.822     | 300       |           | 2s <sup>2</sup> 2p - 2s <sup>2</sup> 3s                    | 3P° - 1S  | 3/2-1/2 | 691       |
| Mg VIII  | 84.087     | 300b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1S° - 1P° | 1/2-    | 691       |
| Mg VIII  | 84.827     | 10d       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3d | 1P° - 1D  | 3/2-3/2 | 691       |
| Mg VIII  | 84.919     | 100       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3s | 1S° - 1P  | 3/2-3/2 | 691       |
| Mg VIII  | 85.064     | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3s | 1S° - 1P  | 3/2-3/2 | 691       |
| Mg VIII  | 85.153     | 10b       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1P)3s | 1S° - 1P  | 3/2-1/2 | 691       |
| Mg VIII  | 85.248     | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 1s <sup>2</sup> 2p(1D)3s | 1D° - 1D  |         | 691       |
| Mg VIII  | 85.599     | 300       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 1/2-    | 691       |
| Mg VIII  | 85.749     | 400       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 3/2-    | 691       |
| Mg VIII  | 86.234     | 100       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 1/2-3/2 | 691       |
| Mg VIII  | 86.359     | 100       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3d                            | 1P° - 1D° | 3/2-3/2 | 691       |
| Mg VIII  | 86.847     | 200       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1D° - 1P° | 3/2-3/2 | 691       |
| Mg VIII  | 87.017     | 100       |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1D° - 1P° | 3/2-1/2 | 691       |
| Mg VIII  | 92.123     | 100d      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1S° - 1P° | 1/2-3/2 | 691       |
| Mg VIII  | 92.324     | 10        |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1S° - 1P° | 1/2-1/2 | 691       |
| Mg VIII  | 93.911     | 10        |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 1/2-3/2 | 691       |
| Mg VIII  | 94.043     | 400b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 3/2-3/2 | 691       |
| Mg VIII  | 94.276     | 200b      |           | 2s2p <sup>2</sup> - 2s2p(1P°)3s                            | 1P° - 1P° | 3/2-1/2 | 691       |
| Mg VIII  | 97.465     | 200       |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s2p(1P°)3p              | 1P° - 1P  | 3/2-3/2 | 691       |
| Mg VIII  | 97.525     | 10        |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s2p(1P°)3p              | 1P° - 1P  | -1/2    | 691       |
| Mg VIII  | 97.606     | 200b      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s2p(1P°)3p              | 1P° - 1D  | 3/2-3/2 | 691       |
| Mg VIII  | 97.686     | 100b      |           | 1s <sup>2</sup> 2p <sup>2</sup> - 2s2p(1P°)3p              | 1P° - 1D  | 1/2-3/2 | 691       |
| Mg VIII  | 311.806    | 10d       |           | 2s <sup>2</sup> 2p - 2s2p <sup>2</sup>                     | 3P° - 1P  | 1/2-3/2 | 691       |
| Mg VIII  | 313.743    | 100d      |           | 2s <sup>2</sup> 2p - 2s2p <sup>2</sup>                     | 3P° - 1P  | 1/2-1/2 | 691       |
| Mg VIII  | 315.022    | 200d      |           | 2s <sup>2</sup> 2p - 2s2p <sup>2</sup>                     | 3P° - 1P  | 3/2-3/2 | 691       |
| Mg VIII  | 317.029    | 100d      |           | 2s <sup>2</sup> 2p - 2s2p <sup>2</sup>                     | 3P° - 1P  | 3/2-3/2 | 691       |
| Mg VIII  | 335.230    | 10d       |           | 2s <sup>2</sup> 2p - 2s2p <sup>2</sup>                     | 3P° - 1S  | 1/2-1/2 | 691       |

Mg VIII

Mg VIII

| Element | Wavelength | Intensity | Multiplet | Configuration         | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|-----------------------|---------------|-----------------------------|-----------|
| Mg VIII | 339 007    | 100d      |           | $2s^2 2p - 2s 2p^2$   | $^4P^o - ^4S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg VIII | 356 000    | 10        |           | $2s 2p^2 - 1s^2 2p^2$ | $^4P - ^4S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 430 467    | 10d       |           | $2s^2 2p - 2s 2p^2$   | $^4P^o - ^4D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg VIII | 436 726    | 100d      |           | $2s^2 2p - 2s 2p^2$   | $^4P^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |



Mg IX

## MAGNESIUM, Z = 12

Mg IX

Ground state  $1s^2 2s^1 \ ^1S_0$ Ionization potential  $2\ 645\ 444\ \text{cm}^{-1}$ ,  $327.98\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term          | J-J | Reference |
|---------|------------|-----------|-----------|------------------------------------|---------------|-----|-----------|
| Mg IX   | 46.711     | 10        |           | $2s2p - 2s5d$                      | $^3P^o - ^3D$ | 2-3 | 691       |
| Mg IX   | 47.818     | 10d       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 4p$      | $^3P^o - ^3P$ | 2-2 | 691       |
| Mg IX   | 47.947     | 100d      |           | $2s2p - 1s^2 2p^3 \ ^1P^o 4p$      | $^3P^o - ^3D$ |     | 691       |
| Mg IX   | 48.024     | 10d       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 5d$ | $^3P - ^3P^o$ | 2-  | 691       |
| Mg IX   | 48.340     | 100       |           | $2s^2 - 2s4p$                      | $^3S - ^1P^o$ | 0-1 | 691       |
| Mg IX   | 48.794     | 10        |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 5d$ | $^1D - ^1F^o$ | 2-3 | 691       |
| Mg IX   | 49.586     | 1         |           | $2s2p - 2s5d$                      | $^1P^o - ^1D$ | 1-2 | 691       |
| Mg IX   | 50.777     | 10        |           | $2s2p - 1s^2 2p^3 \ ^1P^o 4p$      | $^1P^o - ^1D$ | 1-2 | 691       |
| Mg IX   | 51.560     | 10        |           | $2s2p - 2s4d$                      | $^3P^o - ^3D$ | 0-1 | 691       |
| Mg IX   | 51.591     | 300       |           | $2s2p - 2s4d$                      | $^3P^o - ^3D$ | 1-2 | 691       |
| Mg IX   | 51.654     | 400       |           | $2s2p - 2s4d$                      | $^3P^o - ^3D$ | 2-3 | 691       |
| Mg IX   | 53.112     | 10        |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 4d$ | $^3P - ^3P^o$ |     | 691       |
| Mg IX   | 53.188     | 200d      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 4d$ | $^3P - ^3P^o$ | 2-2 | 691       |
| Mg IX   | 53.222     | 200d      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 4d$ | $^3P - ^3D^o$ | 2-3 | 691       |
| Mg IX   | 54.011     | 200       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 4d$ | $^1D - ^1F^o$ | 2-3 | 691       |
| Mg IX   | 54.463     | 10        |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 4d$ | $^1D - ^1D^o$ | 2-2 | 691       |
| Mg IX   | 55.060     | 200       |           | $2s2p - 2s4d$                      | $^1P^o - ^1D$ | 1-2 | 691       |
| Mg IX   | 56.861     | 10        |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 4d$ | $^1S - ^1P^o$ | 0-1 | 691       |
| Mg IX   | 61.038     | 200       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3P$ | 1-2 | 691       |
| Mg IX   | 61.088     | 100       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3P$ | 1-1 | 691       |
| Mg IX   | 61.127     | 300       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3P$ | 2-2 | 691       |
| Mg IX   | 61.175     | 200       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3P$ | 2-1 | 691       |
| Mg IX   | 61.359     | 10        |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3S$ | 0-1 | 691       |
| Mg IX   | 61.393     | 100       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3S$ | 1-1 | 691       |
| Mg IX   | 61.489     | 200       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3S$ | 2-1 | 691       |
| Mg IX   | 61.924     | 400       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3D$ |     | 691       |
| Mg IX   | 61.964     | 100b      |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3D$ | 1-1 | 691       |
| Mg IX   | 62.020     | 10        |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3D$ | 2-2 | 691       |
| Mg IX   | 62.751     | 500       |           | $2s^2 - 2s3p$                      | $^3S - ^1P^o$ | 0-1 | 691       |
| Mg IX   | 65.609     | 400       |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^1P^o - ^1D$ | 1-2 | 691       |
| Mg IX   | 67.090     | 500       |           | $2s2p - 2s3d$                      | $^3P^o - ^3D$ | 0-1 | 691       |
| Mg IX   | 67.135     | 600       |           | $2s2p - 2s3d$                      | $^3P^o - ^3D$ | 1-2 | 691       |
| Mg IX   | 67.239     | 700       |           | $2s2p - 2s3d$                      | $^3P^o - ^3D$ | 2-3 | 691       |
| Mg IX   | 67.731     | 400b      |           | $2s2p - 1s^2 2p^3 \ ^1P^o 3p$      | $^3P^o - ^3P$ | 1-1 | 691       |
| Mg IX   | 68.949     | 10        |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3P^o$ | 0-1 | 691       |
| Mg IX   | 68.986     | 100       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3P^o$ | 1-0 | 691       |
| Mg IX   | 69.009     | 100       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3P^o$ | 1-1 | 691       |
| Mg IX   | 69.058     | 10        |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3P^o$ | 1-2 | 691       |
| Mg IX   | 69.116     | 100       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3P^o$ | 2-1 | 691       |
| Mg IX   | 69.161     | 300       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3P^o$ | 2-2 | 691       |
| Mg IX   | 69.374     | 200       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3D^o$ | 0-1 | 691       |
| Mg IX   | 69.413     | 400b      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3D^o$ | 1-2 | 691       |
| Mg IX   | 69.467     | 500b      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3D^o$ | 2-3 | 691       |
| Mg IX   | 69.513     | 100       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^3P - ^3D$   | 2-2 | 691       |
| Mg IX   | 69.615     | 300b      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^1D - ^1P^o$ | 2-1 | 691       |
| Mg IX   | 69.950     | 600       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^1D - ^1F^o$ | 2-3 | 691       |
| Mg IX   | 71.841     | 100       |           | $2s2p - 2s3s$                      | $^3P^o - ^3S$ | 0-1 | 691       |
| Mg IX   | 71.901     | 200       |           | $2s2p - 2s3s$                      | $^3P^o - ^3S$ | 1-1 | 691       |
| Mg IX   | 72.027     | 300b      |           | $2s2p - 2s3s$                      | $^3P^o - ^3S$ | 2-1 | 691       |
| Mg IX   | 72.226     | 300       |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3d$ | $^1D - ^1D^o$ | 2-2 | 691       |
| Mg IX   | 72.312     | 400       |           | $2s2p - 2s(^3S)3d$                 | $^3P^o - ^1D$ | 1-2 | 691       |
| Mg IX   | 74.274     | 200b      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3s$ | $^3P - ^3P^o$ | 1-2 | 691       |
| Mg IX   | 74.319     | 300b      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3s$ | $^3P - ^3P^o$ | 0-1 | 691       |
| Mg IX   | 74.366     | 400b      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3s$ | $^3P - ^3P^o$ | 2-2 | 691       |
| Mg IX   | 74.411     | 100b      |           | $1s^2 2p^2 - 1s^2 2p^3 \ ^1P^o 3s$ | $^3P - ^3P^o$ | 1-1 | 691       |

Mg IX

Mg IX

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term          | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------------|---------------|-------|-----------|
| Mg IX   | 74 461     | 10b       |           | $1s^2 2p^2 - 1s^2 2p(^1P^o) 3s$ | $^1P - ^1P^o$ | 1-0   | 691       |
| Mg IX   | 74 520     | 100       |           | $1s^2 2p^2 - 1s^2 2p(^1P^o) 3s$ | $^3P - ^1P^o$ | 2-1   | 691       |
| Mg IX   | 74 738     | 100       |           | $1s^2 2p^2 - 1s^2 2p(^1P^o) 3s$ | $^1D - ^1P^o$ | 2-1   | 691       |
| Mg IX   | 77 737     | 600b      |           | $2s 2p - 2s 3s$                 | $^1P^o - ^1S$ | 1-0   | 691       |
| Mg IX   | 80 428     | 100       |           | $1s^2 2p^2 - 1s^2 2p(^1P^o) 3s$ | $^1S - ^1P^o$ | 0-1   | 691       |
| Mg IX   | 91 385     | 10d       |           | $1s^2 2p^2 - 2s 3p$             | $^1S - ^1P^o$ | 0-1   | 691       |
| Mg IX   | 368 071    | 100d      |           | $2s^2 - 2s 2p$                  | $^3S - ^1P^o$ | 0-1   | 691       |
| Mg IX   | 439 180    | 10        |           | $2s 2p - 1s^2 2p^2$             | $^1P^o - ^1P$ | 1-2   | 691       |
| Mg IX   | 443 981    | 10d       |           | $2s 2p - 1s^2 2p^2$             | $^3P^o - ^1P$ | 2-2   | 691       |

Mg X

MAGNESIUM,  $Z = 12$ 

Mg X

Ground state  $1s^2 2s^2 2p^6$ Ionization potential  $2\,963\,810\text{ cm}^{-1}$ ,  $367.46\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|---------------|-----------------------------|-----------|
| Mg X    | 44.050     | 100       |           | $2s - 4p$     | $^4S - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg X    | 47.231     | 300       |           | $2p - 4d$     | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg X    | 47.310     | 500       |           | $2p - 4d$     | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg X    | 57.876     | 600       |           | $2s - 3p$     | $^4S - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg X    | 57.920     | 400       |           | $2s - 3p$     | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg X    | 63.152     | 700       |           | $2p - 3d$     | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 691       |
| Mg X    | 63.295     | 900       |           | $2p - 3d$     | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 691       |
| Mg X    | 65.672     | 200       |           | $2p - 3s$     | $^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 691       |
| Mg X    | 65.847     | 300       |           | $2p - 3s$     | $^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 691       |
| Mg X    | 170.21     | P         |           | $3s - 4p$     | $^1S - ^1P^o$ | $\frac{1}{2} -$             | 487       |
| Mg X    | 609.85     | P         |           | $2s - 2p$     | $^4S - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| Mg X    | 625.28     | P         |           | $2s - 2p$     | $^2S - ^2P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |

Mg XI

MAGNESIUM, Z = 12

Mg XI

Ground state  $1s^2 1S_0$

Ionization potential  $14\,209\,200\text{ cm}^{-1}$ ,  $1761.67\text{ eV}$

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-------|-----------|
| Mg XI   | 7 310      |           |           | $1s^2 - 1s5p$ | $R^1S - ^1P^o$ | 0-1   | 236       |
| Mg XI   | 7 473      |           |           | $1s^2 - 1s4p$ | $R^1S - ^1P^o$ | 0-1   | 236       |
| Mg XI   | 7 850      |           |           | $1s^2 - 1s3p$ | $R^1S - ^1P^o$ | 0-1   | 236       |
| Mg XI   | 9 168      |           |           | $1s^2 - 1s2p$ | $R^1S - ^1P^o$ | 0-1   | 236       |

Mg XII

## MAGNESIUM, Z = 12

Mg XII

Ground state  $1s^2S_{1/2}$ Ionization potential  $15\ 829\ 946\ \text{cm}^{-1}$ ,  $1962.61\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J           | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------|-----------|
| Mg XII  | 6.497      | P         |           | $1s - 6p$     | $h^2S - ^1P^o$ | $\frac{1}{2} -$ | 309       |
| Mg XII  | 6.580      | P         |           | $1s - 5p$     | $h^2S - ^1P^o$ | $\frac{1}{2} -$ | 309       |
| Mg XII  | 6.738      | P         |           | $1s - 4p$     | $h^2S - ^1P^o$ | $\frac{1}{2} -$ | 309       |
| Mg XII  | 7.106      | P         |           | $1s - 3p$     | $h^2S - ^1P^o$ | $\frac{1}{2} -$ | 309       |
| Mg XII  | 8.421      | P         |           | $1s - 2p$     | $h^2S - ^1P^o$ | $\frac{1}{2} -$ | 309       |
| Mg XII  | 27.52      | P         |           | 2 - 7         |                |                 | 309       |
| Mg XII  | 28.43      | P         |           | 2 - 6         |                |                 | 309       |
| Mg XII  | 30.09      | P         |           | 2 - 5         |                |                 | 309       |
| Mg XII  | 33.70      | P         |           | 2 - 4         |                |                 | 309       |
| Mg XII  | 45.47      | P         |           | 2 - 3         |                |                 | 309       |
| Mg XII  | 69.71      | P         |           | 3 - 7         |                |                 | 309       |
| Mg XII  | 75.87      | P         |           | 3 - 6         |                |                 | 309       |
| Mg XII  | 88.91      | P         |           | 3 - 5         |                |                 | 309       |
| Mg XII  | 130.0      | P         |           | 3 - 4         |                |                 | 309       |
| Mg XII  | 150.26     | P         |           | 4 - 7         |                |                 | 309       |
| Mg XII  | 182.1      | P         |           | 4 - 6         |                |                 | 309       |
| Mg XII  | 281.1      | P         |           | 4 - 5         |                |                 | 309       |
| Mg XII  | 322.9      | P         |           | 5 - 7         |                |                 | 309       |
| Mg XII  | 517.5      | P         |           | 5 - 6         |                |                 | 309       |
| Mg XII  | 858.4      | P         |           | 6 - 7         |                |                 | 309       |

Al

## ALUMINUM, Z = 13

Al

Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Al      | 46.896     | 10        |           |               |      |       | 233       |
| Al      | 53.412     | 10        |           |               |      |       | 233       |
| Al      | 53.598     | 10        |           |               |      |       | 233       |
| Al      | 55.143     | 10        |           |               |      |       | 233       |
| Al      | 55.622     | 1         |           |               |      |       | 233       |
| Al      | 56.274     | 30        |           |               |      |       | 233       |
| Al      | 56.545     | 10        |           |               |      |       | 233       |
| Al      | 57.116     | 50        |           |               |      |       | 233       |
| Al      | 57.244     | 50        |           |               |      |       | 233       |
| Al      | 57.271     | 50        |           |               |      |       | 233       |
| Al      | 57.663     | 10        |           |               |      |       | 233       |
| Al      | 58.144     | 50        |           |               |      |       | 233       |
| Al      | 58.441     | 10        |           |               |      |       | 233       |
| Al      | 58.512     | 10        |           |               |      |       | 233       |
| Al      | 59.298     | 10        |           |               |      |       | 233       |
| Al      | 59.481     | 10d       |           |               |      |       | 233       |
| Al      | 60.052     | 50        |           |               |      |       | 233       |
| Al      | 60.788     | 50        |           |               |      |       | 233       |
| Al      | 60.809     | 50        |           |               |      |       | 233       |
| Al      | 61.262     | 10        |           |               |      |       | 233       |
| Al      | 61.373     | 50        |           |               |      |       | 233       |
| Al      | 61.472     | 100       |           |               |      |       | 233       |
| Al      | 61.900     | 10        |           |               |      |       | 233       |
| Al      | 61.933     | 50        |           |               |      |       | 233       |
| Al      | 62.070     | 50        |           |               |      |       | 233       |
| Al      | 63.560     | 10        |           |               |      |       | 233       |
| Al      | 64.269     | 10        |           |               |      |       | 233       |
| Al      | 64.418     | 10        |           |               |      |       | 233       |
| Al      | 65.632     | 50        |           |               |      |       | 233       |
| Al      | 65.821     | 50        |           |               |      |       | 233       |
| Al      | 66.996     | 10d       |           |               |      |       | 233       |
| Al      | 67.873     | 10        |           |               |      |       | 233       |
| Al      | 68.000     | 10        |           |               |      |       | 233       |
| Al      | 68.439     | 50        |           |               |      |       | 233       |
| Al      | 68.458     | 50        |           |               |      |       | 233       |
| Al      | 68.783     | 10        |           |               |      |       | 233       |
| Al      | 68.904     | 10        |           |               |      |       | 233       |
| Al      | 69.165     | 200       |           |               |      |       | 233       |
| Al      | 69.379     | 50        |           |               |      |       | 233       |
| Al      | 69.631     | 200       |           |               |      |       | 233       |
| Al      | 70.040     | 50        |           |               |      |       | 233       |
| Al      | 70.090     | 100       |           |               |      |       | 233       |
| Al      | 70.802     | 50        |           |               |      |       | 233       |
| Al      | 71.077     | 10        |           |               |      |       | 233       |
| Al      | 71.139     | 50        |           |               |      |       | 233       |
| Al      | 71.277     | 50        |           |               |      |       | 233       |
| Al      | 71.590     | 70        |           |               |      |       | 233       |
| Al      | 71.625     | 70        |           |               |      |       | 233       |
| Al      | 71.774     | 10d       |           |               |      |       | 233       |
| Al      | 71.867     | 10d       |           |               |      |       | 233       |
| Al      | 71.987     | 10        |           |               |      |       | 233       |
| Al      | 72.674     | 300       |           |               |      |       | 233       |
| Al      | 73.278     | 100       |           |               |      |       | 233       |
| Al      | 74.016     | 120       |           |               |      |       | 233       |
| Al      | 74.259     | 10        |           |               |      |       | 233       |

Al

Al

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Al      | 74.321     | 50        |           |               |      |       | 233       |
| Al      | 75.164     | 100       |           |               |      |       | 233       |
| Al      | 75.226     | 100d      |           |               |      |       | 233       |
| Al      | 76.794     | 200       |           |               |      |       | 233       |
| Al      | 76.853     | 200       |           |               |      |       | 233       |
| Al      | 76.984     | 100       |           |               |      |       | 233       |
| Al      | 77.052     | 50        |           |               |      |       | 233       |
| Al      | 77.315     | 10        |           |               |      |       | 233       |
| Al      | 78.149     | 100       |           |               |      |       | 233       |
| Al      | 78.256     | 70        |           |               |      |       | 233       |
| Al      | 78.421     | 10        |           |               |      |       | 233       |
| Al      | 78.508     | 150       |           |               |      |       | 233       |
| Al      | 78.573     | 70        |           |               |      |       | 233       |
| Al      | 78.836     | 100       |           |               |      |       | 233       |
| Al      | 78.938     | 300       |           |               |      |       | 233       |
| Al      | 79.557     | 10        |           |               |      |       | 233       |
| Al      | 79.783     | 50        |           |               |      |       | 233       |
| Al      | 80.014     | 10        |           |               |      |       | 233       |
| Al      | 80.403     | 10        |           |               |      |       | 233       |
| Al      | 81.560     | 100       |           |               |      |       | 233       |
| Al      | 81.667     | 100       |           |               |      |       | 233       |
| Al      | 82.105     | 70        |           |               |      |       | 233       |
| Al      | 82.128     | 70        |           |               |      |       | 233       |
| Al      | 82.423     | 50        |           |               |      |       | 233       |
| Al      | 82.582     | 50        |           |               |      |       | 233       |
| Al      | 82.908     | 50d       |           |               |      |       | 233       |
| Al      | 83.102     | 10        |           |               |      |       | 233       |
| Al      | 83.335     | 10        |           |               |      |       | 233       |
| Al      | 84.479     | 10        |           |               |      |       | 233       |
| Al      | 85.046     | 1         |           |               |      |       | 233       |
| Al      | 85.189     | 10        |           |               |      |       | 693       |
| Al      | 86.282     | 50        |           |               |      |       | 233       |
| Al      | 86.360     | 100       |           |               |      |       | 233       |
| Al      | 86.393     | 100       |           |               |      |       | 233       |
| Al      | 86.427     | 100       |           |               |      |       | 233       |
| Al      | 86.540     | 10        |           |               |      |       | 233       |
| Al      | 86.975     | 10        |           |               |      |       | 233       |
| Al      | 87.932     | 100       |           |               |      |       | 233       |
| Al      | 88.108     | 100       |           |               |      |       | 233       |
| Al      | 88.241     | 10        |           |               |      |       | 233       |
| Al      | 91.023     | 500       |           |               |      |       | 233       |
| Al      | 94.970     | 150       |           |               |      |       | 233       |
| Al      | 95.405     | 10        |           |               |      |       | 233       |
| Al      | 95.624     | 100       |           |               |      |       | 233       |
| Al      | 95.720     | 200       |           |               |      |       | 233       |
| Al      | 95.859     | 10        |           |               |      |       | 233       |
| Al      | 96.939     | 10        |           |               |      |       | 233       |
| Al      | 104.227    | 10        |           |               |      |       | 233       |
| Al      | 104.960    | 10        |           |               |      |       | 233       |
| Al      | 106.471    | 10        |           |               |      |       | 233       |
| Al      | 113.140    | 50        |           |               |      |       | 233       |
| Al      | 135.231    | 10        |           |               |      |       | 693       |
| Al      | 135.620    | 50        |           |               |      |       | 693       |
| Al      | 190.560    | 50        |           |               |      |       | 693       |
| Al      | 221.543    | 10        |           |               |      |       | 693       |
| Al      | 228.911    | 10        |           |               |      |       | 693       |
| Al      | 1150.27    | 10        |           |               |      |       | 693       |
| Al      | 1165.38    | 10d       |           |               |      |       | 693       |
| Al      | 1183.62    | 10        |           |               |      |       | 693       |
| Al      | 1220.57    | 10        |           |               |      |       | 693       |

Al

Al

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Al?     | 1271.27    | 10        |           |               |      |       | 816       |
| Al      | 1271.38    | 10        |           |               |      |       | 816       |
| Al      | 1291.81    | 10        |           |               |      |       | 693       |
| Al      | 1294.86    | 40        |           |               |      |       | 816       |
| Al      | 1320.71    | 10        |           |               |      |       | 693       |
| Al      | 1332.57    | 20        |           |               |      |       | 816       |
| Al      | 1333.99    | 20        |           |               |      |       | 816       |
| Al      | 1336.86    | 40        |           |               |      |       | 816       |
| Al      | 1337.86    | 50        |           |               |      |       | 693       |
| Al      | 1364.10    | 10        |           |               |      |       | 816       |
| Al      | 1365.54    | 10        |           |               |      |       | 816       |
| Al      | 1367.02    | 10        |           |               |      |       | 816       |
| Al      | 1367.07    | 20        |           |               |      |       | 816       |
| Al      | 1368.51    | 10        |           |               |      |       | 816       |
| Al      | 1369.20    | 10d       |           |               |      |       | 693       |
| Al      | 1370.00    | 10        |           |               |      |       | 816       |
| Al      | 1414.24    | 40        |           |               |      |       | 816       |
| Al      | 1416.49    | 40        |           |               |      |       | 816       |
| Al      | 1417.14    | 10        |           |               |      |       | 816       |
| Al      | 1420.45    | 10        |           |               |      |       | 816       |
| Al      | 1422.17    | 10        |           |               |      |       | 693       |
| Al      | 1429.57    | 10        |           |               |      |       | 693       |
| Al      | 1437.40    | 20        |           |               |      |       | 816       |
| Al      | 1438.32    | 10        |           |               |      |       | 816       |
| Al      | 1439.96    | 20        |           |               |      |       | 816       |
| Al      | 1443.28    | 40        |           |               |      |       | 816       |
| Al      | 1443.66    | 10        |           |               |      |       | 816       |
| Al      | 1457.92    | 50d       |           |               |      |       | 693       |
| Al      | 1541.71    | 10        |           |               |      |       | 816       |
| Al      | 1542.66    | 20        |           |               |      |       | 816       |
| Al      | 1673.28    | 10        |           |               |      |       | 816       |
| Al      | 1675.75    | 20        |           |               |      |       | 816       |
| Al      | 1699.78    | 10        |           |               |      |       | 816       |
| Al      | 1701.05    | 10        |           |               |      |       | 816       |
| Al      | 1727.11    | 20        |           |               |      |       | 816       |
| Al      | 1730.56    | 20        |           |               |      |       | 816       |
| Al      | 1749.99    | 80        |           |               |      |       | 816       |
| Al      | 1772.78    | 40        |           |               |      |       | 816       |
| Al      | 1773.18    | 40        |           |               |      |       | 816       |
| Al      | 1773.99    | 60        |           |               |      |       | 816       |
| Al      | 1774.76    | 40        |           |               |      |       | 816       |
| Al      | 1776.97    | 80        |           |               |      |       | 816       |
| Al      | 1777.82    | 60        |           |               |      |       | 816       |
| Al      | 1778.25    | 20        |           |               |      |       | 816       |
| Al      | 1778.59    | 20        |           |               |      |       | 816       |
| Al      | 1781.07    | 40        |           |               |      |       | 816       |
| Al      | 1782.65    | 20        |           |               |      |       | 816       |
| Al      | 1783.55    | 40        |           |               |      |       | 816       |
| Al      | 1785.29    | 20        |           |               |      |       | 816       |
| Al      | 1786.78    | 20        |           |               |      |       | 816       |
| Al      | 1786.93    | 20        |           |               |      |       | 816       |
| Al      | 1787.41    | 40        |           |               |      |       | 816       |
| Al      | 1788.15    | 60        |           |               |      |       | 816       |
| Al      | 1791.21    | 20        |           |               |      |       | 816       |
| Al      | 1792.04    | 60        |           |               |      |       | 816       |
| Al      | 1793.54    | 40        |           |               |      |       | 816       |
| Al?     | 1793.92    | 10        |           |               |      |       | 816       |
| Al      | 1797.18    | 20        |           |               |      |       | 816       |
| Al      | 1797.45    | 60        |           |               |      |       | 816       |
| Al      | 1798.45    | 20        |           |               |      |       | 816       |



Al

Al

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Al      | 1799.89    | 10        |           |               |      |       | 816       |
| Al      | 1801.90    | 20        |           |               |      |       | 816       |
| Al      | 1802.00    | 20        |           |               |      |       | 816       |
| Al      | 1805.94    | 40        |           |               |      |       | 816       |
| Al      | 1807.58    | 20        |           |               |      |       | 816       |
| Al      | 1807.64    | 20        |           |               |      |       | 816,653   |
| Al      | 1811.09    | 10        |           |               |      |       | 816       |
| Al      | 1813.15    | 20        |           |               |      |       | 816       |
| Al      | 1817.15    | 20        |           |               |      |       | 816       |
| Al      | 1817.35    | 20        |           |               |      |       | 816       |
| Al      | 1818.37    | 100       |           |               |      |       | 816       |
| Al      | 1819.28    | 80        |           |               |      |       | 816       |
| Al      | 1820.11    | 60        |           |               |      |       | 816       |
| Al      | 1822.32    | 10        |           |               |      |       | 816       |
| Al      | 1823.63    | 10        |           |               |      |       | 816       |
| Al      | 1823.71    | 10        |           |               |      |       | 816       |
| Al      | 1827.56    | 20        |           |               |      |       | 816       |
| Al      | 1829.28    | 40        |           |               |      |       | 816       |
| Al      | 1831.62    | 40        |           |               |      |       | 816       |
| Al      | 1833.26    | 20        |           |               |      |       | 816       |
| Al      | 1834.13    | 60        |           |               |      |       | 816       |
| Al      | 1839.39    | 10        |           |               |      |       | 816       |
| Al      | 1840.62    | 10        |           |               |      |       | 816       |
| Al      | 1844.29    | 20        |           |               |      |       | 816       |
| Al      | 1846.42    | 40        |           |               |      |       | 816       |
| Al      | 1848.69    | 40        |           |               |      |       | 816       |
| Al      | 1849.15    | 40        |           |               |      |       | 816       |
| Al      | 1850.56    | 40        |           |               |      |       | 816       |
| Al      | 1856.10    | 20        |           |               |      |       | 816       |
| Al      | 1856.27    | 40        |           |               |      |       | 816       |
| Al      | 1869.56    | 20        |           |               |      |       | 816       |
| Al      | 1870.75    | 10        |           |               |      |       | 816       |
| Al      | 1871.74    | 60        |           |               |      |       | 816       |
| Al      | 1875.63    | 20        |           |               |      |       | 816       |
| Al      | 1875.98    | 40        |           |               |      |       | 816       |
| Al      | 1895.51    | 20        |           |               |      |       | 816       |
| Al      | 1904.69    | 10        |           |               |      |       | 816       |
| Al      | 1921.94    | 20        |           |               |      |       | 816       |
| Al      | 1922.16    | 20        |           |               |      |       | 816       |
| Al      | 1922.26    | 10        |           |               |      |       | 816       |
| Al      | 1927.09    | 40        |           |               |      |       | 816       |
| Al      | 1927.13    | 10        |           |               |      |       | 816       |
| Al      | 1959.10    | 10        |           |               |      |       | 816       |
| Al      | 1964.99    | 60        |           |               |      |       | 816,653   |
| Al      | 1966.38    | 10        |           |               |      |       | 816       |
| Al      | 1980.82    | 20        |           |               |      |       | 816       |
| Al      | 1996.30    | 20        |           |               |      |       | 816       |

Al I

## ALUMINUM, Z = 13

Al I

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^1 {}^2P_{1/2}$ Ionization potential 48 278 37  $\text{cm}^{-1}$ , 5.986 eV

| Element | Wavelength | Intensity | Multiplet | Configuration       | Term                    | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------------|-------------------------|-----------------------------|-----------|
| Al I    | 1762.892   | 100       |           | $3s^2 3p - 3s 3p^2$ | $g^2 P^{\circ} - {}^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 197,198   |
| Al I    | 1765.632   | 200       |           | $3s^2 3p - 3s 3p^2$ | $g^2 P^{\circ} - {}^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 197,198   |
| Al I    | 1766.381   | 200       |           | $3s^2 3p - 3s 3p^2$ | $g^2 P^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 197,198   |
| Al I    | 1769.133   | 200       |           | $3s^2 3p - 3s 3p^2$ | $g^2 P^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 197,198   |

Al II

## ALUMINUM, Z = 13

Al II

Ground state  $1s^2 2s^2 2p^6 3s^1 \ ^2S_{1/2}$ Ionization potential  $151\,860\text{ cm}^{-1}$ ,  $18\,828\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration              | Term        | J-J | Reference   |
|---------|------------|-----------|-----------|----------------------------|-------------|-----|-------------|
| Al II   | 933.06     | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-  | 653,487     |
| Al II   | 933.95     | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 2-  | 653,487     |
| Al II   | 935.20     | 50        |           | $3s^2 - 3s^2 3s 3d$        | $^2S - ^1P$ | 0-1 | 653,487     |
| Al II   | 952.43     | 1         |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 0-  | 653,487     |
| Al II   | 953.18     | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-  | 653,487     |
| Al II   | 954.35     | 20        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 2-  | 653,487     |
| Al II   | 954.87     | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-1 | 653,487     |
| Al II   | 955.99     | 50        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 2-1 | 653,487     |
| Al II   | 986.55     | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-  | 653,487     |
| Al II   | 987.80     | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 2-  | 653,487     |
| Al II   | 989.70     | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-1 | 653,487     |
| Al II   | 990.88     | 50        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 2-1 | 653,487     |
| Al II   | 1047.82    | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 0-  | 653,487     |
| Al II   | 1048.53    | 50        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-  | 653,487     |
| Al II   | 1049.93    | 100       |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 2-  | 653,487     |
| Al II   | 1055.28    | 20        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-1 | 653,487     |
| Al II   | 1056.68    | 1         |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 2-1 | 653,487     |
| Al II   | 1142.97    | 100       |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 653,487     |
| Al II   | 1152.14    | 200       |           |                            |             |     | 653         |
| Al II   | 1157.10    | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 816,653,487 |
| Al II   | 1158.14    | 50        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-0 | 653,487     |
| Al II   | 1177.43    | 40        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 816,653,487 |
| Al II   | 1179.34    | 10        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-0 | 816,653,487 |
| Al II   | 1189.18    | 60        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 0-1 | 816,653,487 |
| Al II   | 1190.05    | 80        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 816,653,487 |
| Al II   | 1191.82    | 100       |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 2-  | 816,653,487 |
| Al II   | 1208.35    | 60        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 816,653,487 |
| Al II   | 1209.19    | 40        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 0-1 | 816,653,487 |
| Al II   | 1210.09    | 80        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-1 | 816,653,487 |
| Al II   | 1211.90    | 100       |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 2-1 | 816,487     |
| Al II   | 1258.86    | 60        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 816,653,487 |
| Al II   | 1266.66    | 20        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-0 | 816,653,487 |
| Al II   | 1350.18    | 300       |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 816,653,487 |
| Al II   | 1371.24    | 60        |           | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-0 | 816,487     |
| Al II   | 1539.84    | 300       | 10        | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-2 | 816,488     |
| Al II   | 1555.93    | 20        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1P$ | 2-1 | 816,653,487 |
| Al II   | 1560.35    | 50        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1F$ | 2-3 | 653,487     |
| Al II   | 1563.58    | 20        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1P$ | 2-1 | 816,653,487 |
| Al II   | 1569.37    | 20        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1F$ | 2-3 | 816,653,487 |
| Al II   | 1573.01    | 20        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1P$ | 2-1 | 816,653,487 |
| Al II   | 1580.90    | 20        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1F$ | 2-3 | 816,653,487 |
| Al II   | 1584.72    | 40        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1P$ | 2-1 | 816,487     |
| Al II   | 1596.07    | 80        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1F$ | 2-3 | 816,653,487 |
| Al II   | 1599.44    | 40        |           | $2p^3 3p^2 - 2p^3 3p^2 3d$ | $^1D - ^1P$ | 2-1 | 816,653,487 |
| Al II   | 1616.43    | 120       |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1F$ | 2-3 | 816,653,487 |
| Al II   | 1618.40    | 80        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1P$ | 2-1 | 816,653,487 |
| Al II   | 1625.62    | 120       | 9         | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1S$ | 1-0 | 816,488     |
| Al II   | 1644.22    | 80        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1P$ | 2-1 | 816,653,487 |
| Al II   | 1644.80    | 100       |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1F$ | 2-3 | 816,653,487 |
| Al II   | 1670.786   | 600       | 2         | $2p^3 3s^2 - 3s^2 3s 3p$   | $^2S - ^1P$ | 0-1 | 197,816,488 |
| Al II   | 1681.81    | 60        |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1P$ | 2-1 | 816,653,487 |
| Al II   | 1686.25    | 100       |           | $2p^3 3p^2 - 3s^2 3s 3d$   | $^1D - ^1F$ | 2-3 | 816,653,487 |
| Al II   | 1719.43    | 300       | 6         | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 0-1 | 816,488     |
| Al II   | 1721.26    | 500       | 6         | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 1-1 | 816,488     |
| Al II   | 1724.97    | 600       | 6         | $3s^2 3s 3p - 3s^2 3s 3d$  | $^1P - ^1D$ | 2-1 | 816,488     |

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J - J | Reference   |
|---------|------------|-----------|-----------|--------------------------------|---------------|-------|-------------|
| Al II   | 1739.75    | 40        |           | $2p^3 3p^2 - 3s(^2S)8p$        | $^1D - ^1P^o$ | 2-1   | 816,653,487 |
| Al II   | 1750.52    | 120       |           | $2p^3 3p^2 - 3s(^2S)7f$        | $^1D - ^1F^o$ | 2-3   | 816,653,487 |
| Al II   | 1760.103   | 160       | 5         | $3s(^2S)3p - 2p^3 3p^2$        | $^3P^o - ^3P$ | 1-2   | 197,816,487 |
| Al II   | 1761.979   | 140       | 5         | $3s(^2S)3p - 2p^3 3p^2$        | $^3P^o - ^3P$ | 0-1   | 197,816,487 |
| Al II   | 1763.874   | 60        | 5         | $3s(^2S)3p - 2p^3 3p^2$        | $^3P^o - ^3P$ | 1-1   | 197,816,488 |
| Al II   | 1763.947   | 200       | 5         | $3s(^2S)3p - 2p^3 3p^2$        | $^3P^o - ^3P$ | 2-2   | 197,816,488 |
| Al II   | 1765.811   | 100       | 5         | $3s(^2S)3p - 2p^3 3p^2$        | $^3P^o - ^3P$ | 1-0   | 197,816,487 |
| Al II   | 1767.735   | 160       | 5         | $3s(^2S)3p - 2p^3 3p^2$        | $^3P^o - ^3P$ | 2-1   | 197,816,488 |
| Al II   | 1776.19    | 20        |           | $3s(^2S)4s - 3s(^2S)11p$       | $^1S - ^3P^o$ | 1-    | 816,653,487 |
| Al II?  | 1807.42    | 60        |           |                                |               |       | 816         |
| Al II   | 1828.59    | 500       |           | $3s(^2S)4s - 2p^3 3p(^1P^o)4s$ | $^1S - ^3P^o$ | 1-2   | 816,536,487 |
| Al II   | 1832.85    | 400       |           | $3s(^2S)4s - 2p^3 3p(^1P^o)4s$ | $^1S - ^3P^o$ | 1-1   | 816,536,487 |
| Al II   | 1834.82    | 200       |           | $3s(^2S)4s - 2p^3 3p(^1P^o)4s$ | $^1S - ^3P^o$ | 1-0   | 816,536,487 |
| Al II   | 1836.97    | 80        |           | $2p^3 3p^2 - 3s(^2S)7p$        | $^1D - ^1P^o$ | 2-1   | 816,653,487 |
| Al II   | 1838.21    | 40        |           | $3s(^2S)4s - 3s(^2S)15p$       | $^1S - ^1P^o$ | 0-1   | 816,653,487 |
| Al II?  | 1839.53    | 20        |           |                                |               |       | 816,653,487 |
| Al II?  | 1839.78    | 60        |           |                                |               |       | 816,653,487 |
| Al II   | 1848.90    | 40        |           | $3s(^2S)4s - 3s(^2S)14p$       | $^1S - ^1P^o$ | 0-1   | 816,653,487 |
| Al II   | 1855.928   | 400       | 4         | $3s(^2S)3p - 3s(^2S)4s$        | $^3P^o - ^3S$ | 0-1   | 197,816,488 |
| Al II   | 1858.031   | 800       | 4         | $3s(^2S)3p - 3s(^2S)4s$        | $^3P^o - ^3S$ | 1-1   | 197,816,488 |
| Al II   | 1859.99    | 240       |           | $2p^3 3p^2 - 3s(^2S)6f$        | $^1D - ^1F^o$ | 2-3   | 816,653,487 |
| Al II   | 1862.318   | 800       | 4         | $3s(^2S)3p - 3s(^2S)4s$        | $^3P^o - ^3S$ | 2-1   | 197,816,488 |
| Al II   | 1877.04    | 100       |           | $3s(^2S)3d - 3s(^2S)12f$       | $^1D - ^1F^o$ |       | 816,653,487 |
| Al II   | 1878.50    | 60        |           | $3s(^2S)4s - 3s(^2S)12p$       | $^1S - ^1P^o$ | 0-1   | 816,653,487 |
| Al II   | 1897.44    | 120       |           | $3s(^2S)3d - 3s(^2S)11f$       | $^1D - ^1F^o$ |       | 816,653,487 |
| Al II   | 1899.19    | 80        |           | $3s(^2S)4s - 2p^3 3p(^1P^o)4s$ | $^1S - ^1P^o$ | 0-1   | 816,653,487 |
| Al II   | 1904.32    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3P^o$ | 0-1   | 816,487     |
| Al II   | 1906.40    | 60        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3P^o$ | 1-2   | 816,487     |
| Al II   | 1906.60    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3P^o$ | 1-1   | 816,487     |
| Al II   | 1906.67    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3P^o$ | 1-0   | 816,487     |
| Al II   | 1910.83    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3P^o$ | 2-2   | 816,487     |
| Al II   | 1911.01    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3P^o$ | 2-1   | 816,487     |
| Al II   | 1924.83    | 200       |           | $3s(^2S)3d - 3s(^2S)10f$       | $^1D - ^1F^o$ |       | 816,653,487 |
| Al II   | 1926.05    | 80        |           | $3s(^2S)4s - 3s(^2S)11p$       | $^1S - ^1P^o$ | 0-1   | 816,653,487 |
| Al II?  | 1926.96    | 60        |           | $3s(^2S)4s - 3s(^2S)8p$        | $^1S - ^3P^o$ | 1-    | 816,653,487 |
| Al II   | 1929.99    | 240       |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)4s$ | $^3P - ^3P^o$ | 1-2   | 816,653,487 |
| Al II?  | 1931.06    | 200       |           |                                |               |       | 816         |
| Al II   | 1932.39    | 240       |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)4s$ | $^3P - ^3P^o$ | 0-1   | 816,653,487 |
| Al II   | 1934.52    | 400       |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)4s$ | $^3P - ^3P^o$ | 2-2   | 816,653,487 |
| Al II   | 1934.73    | 300       |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)4s$ | $^3P - ^3P^o$ | 1-1   | 816,653,487 |
| Al II   | 1936.93    | 300       |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)4s$ | $^3P - ^3P^o$ | 1-0   | 816,653,487 |
| Al II   | 1939.27    | 300       |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)4s$ | $^3P - ^3P^o$ | 2-1   | 816,653,487 |
| Al II   | 1958.25    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3D^o$ | 0-1   | 816,487     |
| Al II   | 1958.77    | 20        |           | $3s(^2S)3d - 2p^3 3p(^1P^o)3d$ | $^1D - ^3P^o$ | 3-2   | 816,487     |
| Al II   | 1959.00    | 10        |           | $3s(^2S)3d - 2p^3 3p(^1P^o)3d$ | $^1D - ^3P^o$ |       | 816,487     |
| Al II?  | 1960.32    | 40        |           |                                |               |       | 816         |
| Al II?  | 1960.64    | 40        |           |                                |               |       | 816         |
| Al II?  | 1960.84    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3D^o$ | 1-2   | 816,487     |
| Al II   | 1962.59    | 100       |           | $3s(^2S)3d - 3s(^2S)9f$        | $^1D - ^1F^o$ | 3-4   | 816,653,487 |
| Al II   | 1962.72    | 120       |           | $3s(^2S)4s - 3s(^2S)10p$       | $^1S - ^1P^o$ | 0-1   | 816,653,487 |
| Al II   | 1965.31    | 40        |           | $2p^3 3p^2 - 2p^3 3p(^1P^o)3d$ | $^3P - ^3D^o$ | 2-3   | 816,487     |
| Al II   | 1983.65    | 60        |           | $3s(^2S)3d - 2p^3 3p(^1P^o)4s$ | $^1D - ^3P^o$ | 3-2   | 816,487     |
| Al II   | 1988.71    | 40        |           | $3s(^2S)3d - 2p^3 3p(^1P^o)4s$ | $^1D - ^3P^o$ | 2-1   | 816,487     |
| Al II   | 1990.530   | 800       | 8         | $3s(^2S)3p - 3s(^2S)3d$        | $^1P^o - ^1D$ | 1-2   | 197,816,488 |
| Al II   | 1991.05    | 20        |           | $3s(^2S)3d - 2p^3 3p(^1P^o)4s$ | $^1D - ^3P^o$ | 1-0   | 816,487     |

Al III

## ALUMINUM, Z = 13

Al III

Ground state  $1s^2 2s^2 2p^3 \ ^3S_{1/2}$ Ionization potential  $229\,453.99\text{ cm}^{-1}$ , 28.448 eV

| Element | Wavelength | Intensity | Multiplet | Configuration       | Term          | I-J         | Reference   |
|---------|------------|-----------|-----------|---------------------|---------------|-------------|-------------|
| Al III  | 486.95     | 100       | 3         | $2p^3 3s - 2p^4 7p$ | $^4S - ^4P^o$ | $1/2 - 3/2$ | 190         |
| Al III  | 511.215    | 400       |           | $2p^3 3s - 2p^4 6p$ | $^4S - ^4P^o$ | $1/2 -$     | 190         |
| Al III  | 560.390    | 700       |           | $2p^3 3s - 2p^4 5p$ | $^4S - ^4P^o$ | $1/2 - 3/2$ | 190,488     |
| Al III  | 670.144    | 100       |           | $2p^3 3p - 2p^4 7s$ | $^3P^o - ^3S$ | $1/2 - 1/2$ | 190         |
| Al III  | 671.198    | 200       |           | $2p^3 3p - 2p^4 7s$ | $^3P^o - ^3S$ | $3/2 - 1/2$ | 190         |
| Al III  | 695.817    | 500       | 2         | $2p^3 3s - 2p^4 4p$ | $^4S - ^4P^o$ | $1/2 - 3/2$ | 197,190,488 |
| Al III  | 696.212    | 400       | 2         | $2p^3 3s - 2p^4 4p$ | $^4S - ^4P^o$ | $1/2 - 1/2$ | 197,190,488 |
| Al III  | 725.716    | 200       | 3         | $2p^3 3p - 2p^4 6s$ | $^3P^o - ^3S$ | $1/2 - 1/2$ | 190         |
| Al III  | 726.948    | 300       |           | $2p^3 3p - 2p^4 6s$ | $^3P^o - ^3S$ | $3/2 - 1/2$ | 190         |
| Al III  | 855.040    | 400       |           | $2p^3 3p - 2p^4 5s$ | $^3P^o - ^3S$ | $1/2 - 1/2$ | 190         |
| Al III  | 856.768    | 500       |           | $2p^3 3p - 2p^4 5s$ | $^3P^o - ^3S$ | $3/2 - 1/2$ | 190         |
| Al III  | 892.056    | 400       | 3         | $2p^3 3p - 2p^4 4d$ | $^3P^o - ^3D$ | $1/2 - 3/2$ | 190         |
| Al III  | 893.905    | 500       |           | $2p^3 3p - 2p^4 4d$ | $^3P^o - ^3D$ | $3/2 - 3/2$ | 190         |
| Al III  | 1162.66    | 10        |           | $2p^3 3d - 2p^4 6f$ | $^3D - ^3F^o$ |             | 190         |
| Al III  | 1352.83    | 200       |           | $2p^3 3d - 2p^4 5f$ | $^3D - ^3F^o$ |             | 816,190     |
| Al III  | 1379.670   | 600       | 1         | $2p^3 3p - 2p^4 4s$ | $^3P^o - ^3S$ | $1/2 - 1/2$ | 190         |
| Al III  | 1384.144   | 800       |           | $2p^3 3p - 2p^4 4s$ | $^3P^o - ^3S$ | $3/2 - 1/2$ | 190         |
| Al III  | 1605.75    | 700       |           | $2p^3 3p - 2p^4 3d$ | $^3P^o - ^3D$ | $1/2 - 3/2$ | 197,190     |
| Al III  | 1611.85    | 900       |           | $2p^3 3p - 2p^4 3d$ | $^3P^o - ^3D$ | $3/2 - 3/2$ | 197,190     |
| Al III  | 1854.720   | 1000      |           | $2p^3 3s - 2p^4 3p$ | $^4S - ^4P^o$ | $1/2 - 3/2$ | 197,816,488 |
| Al III  | 1862.795   | 600       |           | $2p^3 3s - 2p^4 3p$ | $^4S - ^4P^o$ | $1/2 - 1/2$ | 197,816,488 |
| Al III  | 1935.88    | 60        |           | $2p^3 3d - 2p^4 4f$ | $^3D - ^3F^o$ |             | 197,816,190 |

Ground state  $1s^2 2s^2 2p^6 \ ^1S_0$ Ionization potential 967 783 cm<sup>-1</sup>, 119.99 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term                                                    | J - J | Reference   |
|---------|------------|-----------|-----------|---------------------------------|---------------------------------------------------------|-------|-------------|
| Al IV   | 108.535    | 50        |           | $2p^6 - 2p^4(^1P^o)6d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 693,487     |
| Al IV   | 108.913    | 50d       |           | $2p^6 - 2p^4(^1P^o)6d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 111.196    | 100       |           | $2p^6 - 2p^4(^1P^o)5d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 111.589    | 150       |           | $2p^6 - 2p^4(^1P^o)5d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 111.781    | 50        |           | $2p^6 - 2p^4(^1P^o)5d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 114.313    | 10        |           | $2p^6 - 2p^4(^1P^o)5s$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 114.737    | 50        |           | $2p^6 - 2p^4(^1P^o)5s$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 116.464    | 250       |           | $2p^6 - 2p^4(^1P^o)4d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 116.921    | 150       |           | $2p^6 - 2p^4(^1P^o)4d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 117.410    | 10        |           | $2p^6 - 2p^4(^1P^o)4d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 233,487     |
| Al IV   | 124.034    | 400       |           | $2p^6 - 2p^4(^1P^o)4s$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 693,487     |
| Al IV   | 124.543    | 300       |           | $2p^6 - 2p^4(^1P^o)4s$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 693,487     |
| Al IV   | 129.729    | 700       |           | $2p^6 - 2p^4(^1P^o)3d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 693,487     |
| Al IV   | 131.652    | 150       |           | $2p^6 - 2p^4(^1P^o)3d$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 693,487     |
| Al IV   | 160.073    | 800       |           | $2p^6 - 2p^4(^1P^o)3s$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 197,693,487 |
| Al IV   | 161.686    | 700       |           | $2p^6 - 2p^4(^1P^o)3s$          | $^4S - \frac{1}{2}[\frac{1}{2}]^o$                      | 0-1   | 197,693,487 |
| Al IV   | 1118.80    | 200d      |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-2   | 693,487     |
| Al IV   | 1136.80    | 150       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-1   | 693,487     |
| Al IV   | 1142.03    | 50d       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-0   | 693,487     |
| Al IV   | 1150.85    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 3-2   | 693,487     |
| Al IV   | 1156.21    | 50        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 3-3   | 693,487     |
| Al IV   | 1161.85    | 10d       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-2   | 693,487     |
| Al IV   | 1167.35    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-3   | 693,487     |
| Al IV   | 1198.47    | 50        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 3-3   | 693,487     |
| Al IV   | 1211.80    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 693,487     |
| Al IV   | 1216.78    | 50        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-1   | 693,487     |
| Al IV   | 1219.19    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-2   | 693,487     |
| Al IV   | 1228.30    | 50        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 3-3   | 693,487     |
| Al IV   | 1229.94    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-1   | 693,487     |
| Al IV   | 1237.14    | 200       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 3-4   | 693,487     |
| Al IV   | 1240.18    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-2   | 693,487     |
| Al IV   | 1240.83    | 150       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 693,487     |
| Al IV   | 1248.76    | 100d      |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-2   | 693,487     |
| Al IV   | 1251.35    | 50        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-2   | 693,487     |
| Al IV   | 1257.58    | 150       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-3   | 693,487     |
| Al IV   | 1262.51    | 50        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-1   | 693,487     |
| Al IV   | 1264.14    | 150d      |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-2   | 693,487     |
| Al IV   | 1272.70    | 150d      |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-3   | 693,487     |
| Al IV   | 1283.48    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-1   | 693,487     |
| Al IV   | 1302.13    | 100       |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 693,487     |
| Al IV   | 1353.73    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 2-1   | 693,487     |
| Al IV   | 1359.49    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-2   | 693,487     |
| Al IV   | 1388.77    | 100       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 2-1   | 693,487     |
| Al IV   | 1404.72    | 100d      |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 2-2   | 693,487     |
| Al IV   | 1409.52    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-1   | 693,487     |
| Al IV   | 1412.24    | 10        |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 2-1   | 693,487     |
| Al IV   | 1417.58    | 10        |           | $2p^4(^1P^o)3p - 2p^4(^1P^o)3d$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]^o$ | 1-0   | 693,487     |
| Al IV   | 1425.00    | 10        |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 1-1   | 693,487     |
| Al IV   | 1431.93    | 100       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 1-0   | 693,487     |
| Al IV   | 1441.81    | 50d       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 1-2   | 693,487     |
| Al IV   | 1447.47    | 100d      |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 2-2   | 693,487     |
| Al IV   | 1449.70    | 10        |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 1-1   | 693,487     |
| Al IV   | 1481.46    | 10        |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 0-1   | 693,487     |
| Al IV   | 1486.87    | 50d       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{3}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 1-2   | 693,487     |
| Al IV   | 1526.15    | 50d       |           | $2p^4(^1P^o)3s - 2p^4(^1P^o)3p$ | $\frac{1}{2}[\frac{1}{2}] - \frac{1}{2}[\frac{1}{2}]$   | 1-0   | 693,487     |

Al IV

Al IV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term                                                    | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------------|---------------------------------------------------------|-------|-----------|
| Al IV   | 1537.52    | 100       |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 2-2   | 693,487   |
| Al IV   | 1553.00    | 50d       |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 1-1   | 693,487   |
| Al IV   | 1557.24    | 250d      |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)p$  | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 2-3   | 693,487   |
| Al IV   | 1564.14    | 50d       |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{1}{2}[\frac{1}{2}]^o - \frac{1}{2}[\frac{1}{2}]$ | 1-1   | 693,487   |
| Al IV   | 1582.04    | 150d      |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 1-2   | 693,487   |
| Al IV   | 1584.45    | 100d      |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{1}{2}[\frac{1}{2}]^o - \frac{1}{2}[\frac{1}{2}]$ | 1-2   | 693,487   |
| Al IV   | 1589.27    | 50d       |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{1}{2}[\frac{1}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 0-1   | 693,487   |
| Al IV   | 1639.00    | 100       |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{1}{2}[\frac{1}{2}]^o - \frac{3}{2}[\frac{3}{2}]$ | 1-2   | 693,487   |
| Al IV   | 1818.55    | 50d       |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{1}{2}]$ | 2-1   | 693,487   |
| Al IV   | 1881.19    | 50        |           | $2p^4(^3P^o)3s - 2p^4(^3P^o)3p$ | $\frac{3}{2}[\frac{3}{2}]^o - \frac{3}{2}[\frac{1}{2}]$ | 1-1   | 693,487   |

Al V

## ALUMINUM, Z = 13

Al V

Ground state  $1s^2 2s^2 2p^1 \ ^2P_{1/2}$ Ionization potential  $1\ 240\ 600\ \text{cm}^{-1}$ ,  $153.8\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------|-----------------------------|-----------|
| Al V    | 85.662     | 50        |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)5d$ | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 85.804     | 350       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)6d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 85.865     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)5d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 85.922     | 10b       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)6d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 87.020     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^1S)4d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 87.279     | 50d       |           | $2s^2 2p^2 - 2s^2 2p^1(^1S)4d$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 88.425     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)5d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 88.539     | 400b      |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)5d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 88.636     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)5d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 88.688     | 200b      |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)5d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 88.817     | 50        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)5d$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 88.945     | 1         |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)5d$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 90.630     | 250b      |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 90.646     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 90.701     | 200       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4d$ | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 90.914     | 200       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 90.982     | 50d       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4d$ | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 91.078     | 10        |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 91.750     | 50        |           | $2s^2 2p^2 - 2s^2 2p^1(^1S)4s$ | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 92.039     | 10        |           | $2s^2 2p^2 - 2s^2 2p^1(^1S)4s$ | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 93.654     | 20        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 93.755     | 350       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 93.855     | 200       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 93.880     | 70        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 93.955     | 300       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 93.981     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 94.089     | 70        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 94.117     | 120       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 94.160     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 94.187     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 94.321     | 10        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 94.394     | 10        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4d$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 95.835     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4s$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 96.150     | 50        |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)4s$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 99.200     | 50        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4s$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 99.290     | 500       |           | $2s^2 2p^2 - 2s^2 2p^1(^1S)3d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 99.427     | 200       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4s$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 99.544     | 100       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4s$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 99.616     | 350       |           | $2s^2 2p^2 - 2s^2 2p^1(^1S)3d$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 99.769     | 20        |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)4s$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 103.805    | 500       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 103.881    | 700       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 103.990    | 200       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 104.073    | 500       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 104.121    | 600       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 104.180    | 700       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 104.363    | 500       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 104.447    | 500       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 104.495    | 400       |           | $2s^2 2p^2 - 2s^2 2p^1(^1D)3d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 107.711    | 300       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)3d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 107.945    | 1000      |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)3d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 108.004    | 250       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)3d$ | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 108.057    | 600       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)3d$ | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 108.112    | 600       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)3d$ | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 108.315    | 200       |           | $2s^2 2p^2 - 2s^2 2p^1(^3P)3d$ | $g^3P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |



Al V

Al V

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-----------------------------|-----------|
| Al V    | 108.385    | 500       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 108.404    | 250       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 108.446    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 108.462    | 500       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4D$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 108.526    | 20        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 108.616    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 108.707    | 300       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 108.851    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 109.021    | 150       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3d$   | $g^3P^o - ^4D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 118.500    | 500       |           | $2s^2 2p^3 - 2s^2 2p^4(^1S)3s$   | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 118.984    | 300       |           | $2s^2 2p^3 - 2s^2 2p^4(^1S)3s$   | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 125.525    | 750       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3s$   | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 126.065    | 750       |           | $2s^2 2p^3 - 2s^2 2p^4(^1D)3s$   | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 130.413    | 1000      |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3s$   | $g^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al V    | 130.848    | 1000      |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3s$   | $g^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 131.003    | 1000      |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3s$   | $g^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 131.441    | 1000      |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3s$   | $g^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 132.630    | 500       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3s$   | $g^3P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 133.013    | 200       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3s$   | $g^3P^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al V    | 133.242    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P)3s$   | $g^3P^o - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 136.249    | 50        |           | $2s^2 2p^3 - 2s^2 2p^4(^3P^o)3s$ | $^1S - ^3P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al V    | 136.668    | 100       |           | $2s^2 2p^3 - 2s^2 2p^4(^3P^o)3s$ | $^1S - ^3P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al V    | 278.699    | 800       |           | $2s^2 2p^3 - 2s^2 p^4$           | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 197,693   |
| Al V    | 281.397    | 700       |           | $2s^2 2p^3 - 2s^2 p^4$           | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 197,693   |

Al VI

## ALUMINUM, Z = 13

Al VI

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ Ionization potential  $1.536 \times 10^6 \text{ cm}^{-1}$ , 190.5 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term          | J-J | Reference |
|---------|------------|-----------|-----------|----------------------------------|---------------|-----|-----------|
| Al VI   | 68.167     | 50d       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)5d$ | $^4P - ^3D^o$ | 2-3 | 233       |
| Al VI   | 68.223     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)5d$ | $^4P - ^1P^o$ | 2-2 | 233       |
| Al VI   | 68.289     | 1         |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)5d$ | $^4P - ^3D^o$ | 1-2 | 233       |
| Al VI   | 72.714     | 1         |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)5d$ | $^4P - ^3D^o$ | 2-3 | 233       |
| Al VI   | 72.810     | 250       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)4d$ | $^4P - ^3D^o$ | 2-3 | 233       |
| Al VI   | 72.865     | 50        |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)4d$ | $^4P - ^1D^o$ | 1-2 | 233       |
| Al VI   | 72.926     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)4d$ | $^4P - ^1P^o$ | 2-2 | 233       |
| Al VI   | 73.076     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)4d$ | $^4P - ^1P^o$ | 1-2 | 233       |
| Al VI   | 73.334     | 1         |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4s$ | $^1D - ^1D^o$ | 2-2 | 233       |
| Al VI   | 74.346     | 50        |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^4P - ^1S^o$ | 2-1 | 233       |
| Al VI   | 74.444     | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^4P - ^1P^o$ | 2-2 | 233       |
| Al VI   | 74.504     | 50d       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^4P - ^1S^o$ | 1-1 | 233       |
| Al VI   | 74.592     | 150       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^4P - ^1P^o$ | 1-2 | 233       |
| Al VI   | 74.656     | 250       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^4P - ^1D^o$ | 2-3 | 233       |
| Al VI   | 74.813     | 50        |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^4P - ^3D^o$ | 1-2 | 233       |
| Al VI   | 74.892     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)4d$ | $^1D - ^1F^o$ | 2-3 | 233       |
| Al VI   | 76.618     | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^1D - ^1F^o$ | 2-3 | 233       |
| Al VI   | 76.697     | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^1D - ^1D^o$ | 2-2 | 233       |
| Al VI   | 76.953     | 50        |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4d$ | $^1D - ^1P^o$ | 2-1 | 233       |
| Al VI   | 77.945     | 500b      |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)4d$ | $^4P - ^3D^o$ | 2-3 | 233       |
| Al VI   | 78.112     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)4d$ | $^4P - ^3D^o$ | 1-2 | 233       |
| Al VI   | 78.178     | 50        |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)4d$ | $^4P - ^3D^o$ | 0-1 | 233       |
| Al VI   | 78.459     | 70        |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4s$ | $^4P - ^3D^o$ | 2-3 | 233       |
| Al VI   | 78.628     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4s$ | $^4P - ^3D^o$ | 1-2 | 233       |
| Al VI   | 78.712     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)4s$ | $^1D - ^1P^o$ | 2-1 | 233       |
| Al VI   | 80.770     | 70        |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)4s$ | $^1D - ^1D^o$ | 2-2 | 233       |
| Al VI?  | 81.176     | 50        |           |                                  |               |     | 233       |
| Al VI?  | 81.339     | 10        |           |                                  |               |     | 233       |
| Al VI   | 81.738     | 50b       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)4s$ | $^1S - ^1P^o$ | 0-1 | 233       |
| Al VI   | 82.082     | 70        |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)4s$ | $^4P - ^3S^o$ | 2-1 | 233       |
| Al VI   | 82.267     | 50        |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)4s$ | $^4P - ^3S^o$ | 1-1 | 233       |
| Al VI   | 82.338     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^o)4s$ | $^4P - ^3S^o$ | 0-1 | 233       |
| Al VI?  | 84.650     | 100       |           |                                  |               |     | 233       |
| Al VI?  | 84.801     | 20        |           |                                  |               |     | 233       |
| Al VI?  | 84.828     | 70        |           |                                  |               |     | 233       |
| Al VI?  | 84.928     | 10        |           |                                  |               |     | 233       |
| Al VI   | 85.423     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3D^o$ | 2-2 | 233       |
| Al VI   | 85.515     | 1000      |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3D^o$ | 2-3 | 233       |
| Al VI   | 85.569     | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3F^o$ | 2-2 | 233       |
| Al VI   | 85.622     | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3D^o$ | 1-2 | 233       |
| Al VI   | 85.724     | 300       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3F^o$ | 2-3 | 233       |
| Al VI   | 85.764     | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3F^o$ | 1-2 | 233       |
| Al VI   | 85.817     | 350       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3P^o$ | 2-2 | 233       |
| Al VI   | 85.865     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3P^o$ | 2-1 | 233       |
| Al VI?  | 85.970     | 10        |           |                                  |               |     | 233       |
| Al VI   | 86.020     | 150       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3P^o$ | 1-2 | 233       |
| Al VI   | 86.070     | 150       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3P^o$ | 1-1 | 233       |
| Al VI   | 86.097     | 150       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3P^o$ | 1-0 | 233       |
| Al VI   | 86.147     | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^1P^o)3d$ | $^4P - ^3P^o$ | 0-1 | 233       |
| Al VI   | 87.334     | 400       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3d$ | $^4P - ^3S^o$ | 2-1 | 233       |
| Al VI   | 87.544     | 350       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3d$ | $^4P - ^3S^o$ | 1-1 | 233       |
| Al VI   | 87.592     | 500       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3d$ | $^4P - ^3P^o$ | 2-1 | 233       |
| Al VI   | 87.629     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3d$ | $^4P - ^3S^o$ | 0-1 | 233       |
| Al VI   | 87.655     | 650       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3d$ | $^4P - ^3P^o$ | 2-2 | 233       |
| Al VI   | 87.783     | 250       |           | $2s^2 2p^4 - 2s^2 2p^3(^1D^o)3d$ | $^4P - ^3P^o$ | 1-0 | 233       |

Al VI

Al VI

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J-J | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-----|-----------|
| Al VI   | 87.802     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $K^2P - ^1P^o$ | 1-1 | 233       |
| Al VI   | 87.866     | 350       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $K^2P - ^1P^o$ | 1-2 | 233       |
| Al VI   | 87.887     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $K^2P - ^1P^o$ | 0-1 | 233       |
| Al VI   | 88.170     | 1000      |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $K^2P - ^1D^o$ | 2-3 | 233       |
| Al VI   | 88.273     | 750       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3d$ | $^1D - ^1F^o$  | 2-3 | 233       |
| Al VI   | 88.325     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $K^2P - ^1F^o$ | 2-3 | 233       |
| Al VI   | 88.376     | 750       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $K^2P - ^1D^o$ | 1-2 | 233       |
| Al VI   | 88.469     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $K^2P - ^1D^o$ | 0-1 | 233       |
| Al VI   | 88.539     | 400b      |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3d$ | $^1D - ^1P^o$  | 2-1 | 233       |
| Al VI   | 88.688     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3d$ | $^1D - ^1D^o$  | 2-2 | 233       |
| Al VI   | 90.200     | 1000      |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $^1D - ^1F^o$  | 2-3 | 233       |
| Al VI   | 90.858     | 600       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $^1D - ^1D^o$  | 2-2 | 233       |
| Al VI   | 91.332     | 500       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $^1D - ^1P^o$  | 2-1 | 233       |
| Al VI   | 92.626     | 750       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3d$ | $K^2P - ^1D^o$ | 2-3 | 233       |
| Al VI   | 92.636     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3d$ | $K^2P - ^1D^o$ | 2-2 | 233       |
| Al VI   | 92.875     | 500       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3d$ | $K^2P - ^1D^o$ | 1-2 | 233       |
| Al VI   | 92.970     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3d$ | $K^2P - ^1D^o$ | 0-1 | 233       |
| Al VI   | 95.436     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3d$ | $^1S - ^1P^o$  | 0-1 | 233       |
| Al VI?  | 96.071     | 10        |           |                                  |                |     | 233       |
| Al VI   | 96.442     | 10        |           | $2s2p^4 - 2s2p^4(^1S)3s$         | $^1P^o - ^1S$  | 2-1 | 233       |
| Al VI   | 96.673     | 50d       |           | $2s2p^4 - 2s2p^4(^1S)3s$         | $^1P^o - ^1S$  | 1-1 | 233       |
| Al VI?  | 98.684     | 10        |           |                                  |                |     | 233       |
| Al VI   | 100.616    | 600       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$ | $K^2P - ^1P^o$ | 2-2 | 233       |
| Al VI   | 100.639    | 100       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$ | $K^2P - ^1P^o$ | 2-1 | 233       |
| Al VI   | 100.894    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$ | $K^2P - ^1P^o$ | 1-2 | 233       |
| Al VI   | 100.919    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$ | $K^2P - ^1P^o$ | 1-1 | 233       |
| Al VI   | 101.027    | 150       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$ | $K^2P - ^1P^o$ | 0-1 | 233       |
| Al VI   | 103.062    | 10        |           | $2s2p^4 - 2s2p^4(^1D)3s$         | $^1P^o - ^1D$  | 2-3 | 233       |
| Al VI   | 103.940    | 300       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$ | $^1D - ^1P^o$  | 2-1 | 233       |
| Al VI   | 104.047    | 1000      |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$ | $K^2P - ^1D^o$ | 2-3 | 233       |
| Al VI   | 104.344    | 800       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$ | $K^2P - ^1D^o$ | 1-2 | 233       |
| Al VI   | 104.466    | 400       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$ | $K^2P - ^1D^o$ | 0-1 | 233       |
| Al VI   | 107.620    | 700       |           | $2s^2 2p^4 - 2s^2 2p^4(^1D^o)3s$ | $^1D - ^1D^o$  | 2-2 | 233       |
| Al VI   | 109.284    | 350       |           | $2s^2 2p^4 - 2s^2 2p^4(^1P^o)3s$ | $^1S - ^1P^o$  | 0-1 | 233       |
| Al VI   | 109.514    | 1000      |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3s$ | $K^2P - ^1S^o$ | 2-1 | 233       |
| Al VI   | 109.843    | 600       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3s$ | $K^2P - ^1S^o$ | 1-1 | 233       |
| Al VI   | 109.974    | 200       |           | $2s^2 2p^4 - 2s^2 2p^4(^1S^o)3s$ | $K^2P - ^1S^o$ | 0-1 | 233       |
| Al VI   | 113.314    | 50        |           | $2s2p^4 - 2s2p^4(^1P)3s$         | $^1P^o - ^1P$  | 2-1 | 233       |
| Al VI   | 113.437    | 150       |           | $2s2p^4 - 2s2p^4(^1P)3s$         | $^1P^o - ^1P$  | 2-2 | 233       |
| Al VI   | 113.623    | 50d       |           | $2s2p^4 - 2s2p^4(^1P)3s$         | $^1P^o - ^1P$  | 1-1 | 233       |
| Al VI   | 113.756    | 50        |           | $2s2p^4 - 2s2p^4(^1P)3s$         | $^1P^o - ^1P$  | 1-2 | 233       |
| Al VI   | 243.760    | 600d      |           | $2s^2 2p^4 - 2s2p^4$             | $^1D - ^1P^o$  | 2-1 | 197,693   |
| Al VI   | 275.350    | 300d      |           | $2s^2 2p^4 - 2s2p^4$             | $^1S - ^1P^o$  | 0-1 | 693       |
| Al VI   | 307.248    | 350d      |           | $2s^2 2p^4 - 2s2p^4$             | $K^2P - ^1P^o$ | 2-1 | 197,693   |
| Al VI   | 308.560    | 300d      |           | $2s^2 2p^4 - 2s2p^4$             | $K^2P - ^1P^o$ | 1-0 | 197,693   |
| Al VI   | 309.596    | 400d      |           | $2s^2 2p^4 - 2s2p^4$             | $K^2P - ^1P^o$ | 2-2 | 197,693   |
| Al VI   | 309.852    | 300d      |           | $2s^2 2p^4 - 2s2p^4$             | $K^2P - ^1P^o$ | 1-1 | 197,693   |
| Al VI   | 310.908    | 300d      |           | $2s^2 2p^4 - 2s2p^4$             | $K^2P - ^1P^o$ | 0-1 | 197,693   |
| Al VI   | 312.241    | 300d      |           | $2s^2 2p^4 - 2s2p^4$             | $K^2P - ^1P^o$ | 1-2 | 197,693   |

Ground state  $1s^2 2s^2 2p^1 \ ^2P_{1/2}$ Ionization potential 1 947 390 cm<sup>-1</sup>, 241.4 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term               | J-J                         | Reference |
|---------|------------|-----------|-----------|--------------------------------|--------------------|-----------------------------|-----------|
| Al VII  | 58 384     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)5d$ | $^1D^\circ - ^1F$  | $\frac{5}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 58 752     | 1         |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)5s$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 59 821     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)5d$ | $^1D^\circ - ^1F$  | $\frac{5}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 59 911     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)5d$ | $^1D^\circ - ^1F$  | $\frac{5}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 62 296     | 200b      |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 62 432     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $g^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 62 474     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $g^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 63 025     | 500b      |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)4d$ | $^1D^\circ - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 64 066     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)4d$ | $^1P^\circ - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 64 325     | 50        |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)4d$ | $^1P^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 64 358     | 50        |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)4d$ | $^1P^\circ - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 64 481     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 64 513     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 64 704     | 150       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $^1D^\circ - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 64 815     | 120       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4s$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 64 904     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4s$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 65 014     | 10d       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 65 865     | 50        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $^1P^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 65 882     | 50        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4d$ | $^1P^\circ - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 67 565     | 150b      |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)4s$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 68 531     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^2(^4S)4d$ | $^4P - ^4D^\circ$  | $\frac{5}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 68 637     | 50b       |           | $2s^2 2p^2 - 2s^2 2p^2(^4S)4d$ | $^4P - ^4D^\circ$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 68 681     | 10b       |           | $2s^2 2p^2 - 2s^2 2p^2(^4S)4d$ | $^4P - ^4D^\circ$  | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 72 270     | 500d      |           | $2s^2 2p^2 - 2s^2 2p^2(^4S)3p$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 74 095     | 100d      |           | $2s^2 2p^2 - 2s^2 2p^2(^1S)3d$ | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 75 270     | 250       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 75 302     | 350       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 75 360     | 600       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $g^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 75 488     | 200b      |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $g^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 75 532     | 200       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $g^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 75 809     | 100       |           | $2s^2 2p^2 - 2s^2 2p^2(^3D)3d$ | $^4P - ^4S^\circ$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 75 850     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 75 894     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 76 010     | 50        |           | $2s^2 2p^2 - 2s^2 2p^2(^3D)3d$ | $^4P - ^4D^\circ$  | $\frac{3}{2} -$             | 233       |
| Al VII  | 76 086     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3D)3d$ | $^4P - ^4D$        | $\frac{1}{2} -$             | 233       |
| Al VII  | 76 221     | 50        |           | $2s^2 2p^2 - 2s^2 2p^2(^3D)3d$ | $^4P - ^4P^\circ$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 76 257     | 100       |           | $2s^2 2p^2 - 2s^2 2p^2(^3D)3d$ | $^4P - ^4P^\circ$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 76 342     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3D)3d$ | $^4P - ^4P^\circ$  | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 76 383     | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 76 422     | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 76 543     | 1000      |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 76 572     | 1000      |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1D^\circ - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 77 448     | 150b      |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 77 770     | 300       |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 77 806     | 70        |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^1P$  | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 77 896     | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 77 945     | 500b      |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1D^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 78 327     | 1000      |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 78 351     | 1000b     |           | $2s^2 2p^2 - 2s^2 2p^2(^1D)3d$ | $^1P^\circ - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 79 012     | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1D^\circ - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 79 197     | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1D^\circ - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 79 635     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 79 690     | 150       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1D^\circ - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 79 919     | 300       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1P^\circ - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 79 952     | 250       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P)3d$ | $^1P^\circ - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 233       |

Al VII

Al VII

| Element | Wavelength | Intensity | Multiplet | Configuration                          | Term                      | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------------|---------------------------|-----------------------------|-----------|
| Al VII  | 81.234     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^1P^\circ - ^4D$         | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 81.738     | 50b       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^1P^\circ - ^1P$         | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 81.806     | 200d      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$         | $^1P^\circ - ^1P$         | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 83.831     | 350       |           | $2s^2 2p^3 - 2s^2 2p^2(^1S^{\circ})3d$ | $^1P^\circ - ^4D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 84.007     | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^1S^{\circ})3d$ | $^1P^\circ - ^4D^{\circ}$ | $\frac{3}{2} - \frac{5}{2}$ | 233       |
| Al VII  | 84.098     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1S^{\circ})3d$ | $^1P^\circ - ^4D^{\circ}$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 86.671     | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3s$         | $^1P^\circ - ^1S$         | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 86.689     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S)3s$         | $^1P^\circ - ^1S$         | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 86.887     | 750       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^3S^{\circ} - ^1P$       | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 87.060     | 600       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^3S^{\circ} - ^1P$       | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 87.176     | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^3S^{\circ} - ^1P$       | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 88.033     | 900       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$         | $^1D^{\circ} - ^1D$       | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 90.550     | 300       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^1D^{\circ} - ^1P$       | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 90.630     | 250b      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$         | $^1P^\circ - ^1D$         | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 90.772     | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^1D^{\circ} - ^1P$       | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 93.269     | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^1P^\circ - ^1P$         | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 93.295     | 120       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^1P^\circ - ^1P$         | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 93.516     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^1P^\circ - ^1P$         | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 93.542     | 1         |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$         | $^1P^\circ - ^1P$         | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al VII  | 95.965     | 200d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1S^{\circ})3s$ | $^1P^\circ - ^1S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 96.198     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S^{\circ})3s$ | $^1P^\circ - ^1S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 96.319     | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^1S^{\circ})3s$ | $^1P^\circ - ^1S^{\circ}$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al VII  | 239.030    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1D^{\circ} - ^1P$       | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Al VII  | 240.770    | 200d      |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1D^{\circ} - ^1P$       | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Al VII  | 259.035    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1P^\circ - ^1P$         | $\frac{1}{2} - \frac{1}{2}$ | 693       |
| Al VII  | 259.219    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1P^\circ - ^1P$         | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Al VII  | 261.053    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1P^\circ - ^1P$         | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Al VII  | 261.219    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1P^\circ - ^1P$         | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Al VII  | 279.256    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1P^\circ - ^1S$         | $\frac{3}{2} - \frac{1}{2}$ | 693       |
| Al VII  | 309.012    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1D^{\circ} - ^1D$       | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Al VII  | 309.122    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1D^{\circ} - ^1D$       | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Al VII  | 343.290    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1P^\circ - ^1D$         | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Al VII  | 343.650    | 10d       |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^1P^\circ - ^1D$         | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Al VII  | 352.160    | 100d      |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^3S^{\circ} - ^1P$       | $\frac{3}{2} - \frac{1}{2}$ | 197,693   |
| Al VII  | 353.776    | 200d      |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^3S^{\circ} - ^1P$       | $\frac{3}{2} - \frac{3}{2}$ | 197,693   |
| Al VII  | 356.885    | 250d      |           | $2s^2 2p^3 - 2s^2 2p^3$                | $^3S^{\circ} - ^1P$       | $\frac{3}{2} - \frac{3}{2}$ | 197,693   |

Ground state  $1s^2 2s^2 p^1 \ ^2P_{1/2}$ Ionization potential  $2.295\ 500\ \text{cm}^{-1}$ , 284.6 eV

| Element  | Wavelength | Intensity | Multiplet | Configuration                          | Term                | J - J | Reference |
|----------|------------|-----------|-----------|----------------------------------------|---------------------|-------|-----------|
| Al VIII  | 53.785     | 10        |           | $2s2p^1 - 2s2p^1(^4P)4d$               | $^1S^{\circ} - ^1P$ | 2-1   | 233       |
| Al VIII  | 53.800     | 10        |           | $2s2p^1 - 2s2p^1(^4P)4d$               | $^1S^{\circ} - ^1P$ | 2-2   | 233       |
| Al VIII  | 53.823     | 10        |           | $2s2p^1 - 2s2p^1(^4P)4d$               | $^1S^{\circ} - ^1P$ | 2-3   | 233       |
| Al VIII  | 54.217     | 200b      |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})4d$ | $^3P - ^1D^{\circ}$ | 1-2   | 233       |
| Al VIII  | 54.258     | 200       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})4d$ | $^3P - ^1D^{\circ}$ | 2-3   | 233       |
| Al VIII  | 56.150     | 50b       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})4s$ | $^3P - ^1P^{\circ}$ | 2-2   | 233       |
| Al VIII  | 57.553     | 10        |           | $2s2p^1 - 2s2p^1(^4P)4d$               | $^1D^{\circ} - ^1F$ | 3-4   | 233       |
| Al VIII  | 57.624     | 10        |           | $2s2p^1 - 2s2p^1(^4P)4d$               | $^1D^{\circ} - ^1F$ | 2-3   | 233       |
| Al VIII  | 61.694     | 150       |           | $2s^2 2p^2 - 2s2p^2(^3D)3p$            | $^1D - ^1D^{\circ}$ | 2-2   | 233       |
| Al VIII  | 62.016     | 100       |           | $2s^2 2p^2 - 2s2p^2(^3D)3p$            | $^1D - ^1F^{\circ}$ | 2-3   | 233       |
| Al VIII  | 63.203     | 10        |           | $2s2p^1 - 2s2p^1(^3P)3d$               | $^1D^{\circ} - ^1P$ | 3-2   | 233       |
| Al VIII  | 63.714     | 100       |           | $2s2p^1 - 2s2p^1(^3P)3d$               | $^1D^{\circ} - ^1F$ | 3-4   | 233       |
| Al VIII  | 63.933     | 10        |           | $2s^2 2p^2 - 2s2p^2(^4P)3p$            | $^3P - ^1D^{\circ}$ | 0-1   | 233       |
| Al VIII  | 63.965     | 150d      |           | $2s^2 2p^2 - 2s2p^2(^4P)3p$            | $^3P - ^1D^{\circ}$ | 1-2   | 233       |
| Al VIII  | 64.004     | 200       |           | $2s^2 2p^2 - 2s2p^2(^4P)3p$            | $^3P - ^1D^{\circ}$ | 2-3   | 233       |
| Al VIII  | 64.086     | 10        |           | $2s^2 2p^2 - 2s2p^2(^4P)3p$            | $^3P - ^1D^{\circ}$ | 2-2   | 233       |
| Al VIII  | 65.128     | 10d       |           | $2s^2 2p^2 - 2s2p^2(^3P)3d$            | $^3P^{\circ} - ^3P$ | 2-2   | 233       |
| Al VIII  | 65.298     | 10        |           | $2s^2 2p^2 - 2s2p^2(^3P)3d$            | $^3P^{\circ} - ^1D$ | 2-3   | 233       |
| Al VIII  | 65.381     | 50        |           | $2s^2 2p^2 - 2s2p^2(^4P)3p$            | $^3P - ^3S^{\circ}$ | 1-1   | 233       |
| Al VIII  | 65.494     | 50        |           | $2s^2 2p^2 - 2s2p^2(^4P)3p$            | $^3P - ^3S^{\circ}$ | 2-1   | 233       |
| Al VIII  | 66.321     | 60b       |           | $2s2p^1 - 2s2p^1(^3S)3d$               | $^1P^{\circ} - ^1D$ | 2-3   | 233       |
| Al VIII  | 66.363     | 10        |           | $2s2p^1 - 2s2p^1(^3S)3d$               | $^1P^{\circ} - ^1D$ | 1-2   | 233       |
| Al VIII  | 66.704     | 150       |           | $2s^2 2p^2 - 2s2p^2(^4P)3d$            | $^1S^{\circ} - ^1P$ | 2-1   | 233       |
| Al VIII  | 66.731     | 200       |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1S^{\circ} - ^1P$ | 2-2   | 233       |
| Al VIII  | 66.771     | 350       |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1S^{\circ} - ^1P$ | 2-3   | 233       |
| Al VIII  | 67.044     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 0-1   | 233       |
| Al VIII  | 67.096     | 100       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 1-0   | 233       |
| Al VIII  | 67.121     | 100       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 1-1   | 233       |
| Al VIII  | 67.166     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 1-2   | 233       |
| Al VIII  | 67.244     | 150       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 2-1   | 233       |
| Al VIII  | 67.288     | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^3P^{\circ}$ | 2-2   | 233       |
| Al VIII  | 67.360     | 250       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^1D^{\circ}$ | 0-1   | 233       |
| Al VIII  | 67.408     | 500       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^1D^{\circ}$ | 1-2   | 233       |
| Al VIII  | 67.437     | 50        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^1D^{\circ}$ | 1-1   | 233       |
| Al VIII  | 67.464     | 600       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^1D^{\circ}$ | 2-3   | 233       |
| Al VIII  | 67.529     | 10        |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^3P - ^1D^{\circ}$ | 2-2   | 233       |
| Al VIII  | 67.565     | 150b      |           | $2s2p^1 - 2s2p^1(^3D)3d$               | $^1D^{\circ} - ^1D$ | 3-3   | 233       |
| Al VIII  | 67.946     | 500       |           | $2s2p^1 - 2s2p^1(^3D)3d$               | $^1D^{\circ} - ^1F$ | 3-4   | 233       |
| Al VIII  | 68.375     | 750       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^1D - ^1F^{\circ}$ | 2-3   | 233       |
| Al VIII  | 68.825     | 50b       |           | $2s2p^1 - 2s2p^1(^3D)3d$               | $^1P^{\circ} - ^3S$ | 2-1   | 233       |
| Al VIII  | 69.420     | 50        |           | $2s2p^1 - 2s2p^1(^3D)3d$               | $^1P^{\circ} - ^3P$ | 1-0   | 233       |
| Al VIII  | 69.502     | 100       |           | $2s2p^1 - 2s2p^1(^3D)3d$               | $^1P^{\circ} - ^3P$ | 0-1   | 233       |
| Al VIII  | 69.611     | 200       |           | $2s2p^1 - 2s2p^1(^3D)3d$               | $^1P^{\circ} - ^3P$ | 2-2   | 233       |
| Al VIII  | 69.773     | 150       |           | $2s2p^1 - 2s2p^1(^3D)3d$               | $^1P^{\circ} - ^1D$ | 2-3   | 233       |
| Al VIII  | 70.161     | 300       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^1D - ^1D$         | 2-2   | 233       |
| Al VIII  | 70.323     | 200       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^1D - ^1F^{\circ}$ | 2-2   | 233       |
| Al VIII? | 70.402     | 1         |           |                                        |                     |       | 233       |
| Al VIII  | 70.727     | 250       |           | $2s^2 2p^2 - 2s^2 2p^2(^3P^{\circ})3d$ | $^1S - ^1P^{\circ}$ | 0-1   | 233       |
| Al VIII  | 72.223     | 200       |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1D^{\circ} - ^1F$ | 3-4   | 233       |
| Al VIII  | 72.324     | 200       |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1D^{\circ} - ^1F$ | 2-3   | 233       |
| Al VIII  | 72.401     | 150       |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1D^{\circ} - ^1F$ | 1-2   | 233       |
| Al VIII  | 73.703     | 150       |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1P^{\circ} - ^1D$ | 2-3   | 233       |
| Al VIII  | 73.733     | 100       |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1P^{\circ} - ^1D$ | 1-2   | 233       |
| Al VIII  | 73.760     | 10        |           | $2s2p^1 - 2s2p^1(^4P)3d$               | $^1P^{\circ} - ^1D$ | 0-1   | 233       |
| Al VIII  | 73.879     | 200       |           | $2s^2 2p^2 - 2s2p^2(^3S)3s$            | $^1P^{\circ} - ^3S$ | 2-1   | 233       |

Al VIII

Al VIII

| Element              | Wavelength | Intensity | Multiplet | Configuration              | Term            | J | J | Reference |
|----------------------|------------|-----------|-----------|----------------------------|-----------------|---|---|-----------|
| Al VIII              | 74 841     | 200       |           | $2s2p^3 - 2s2p^3(^3P)3s$   | $^3S^o - ^3P$   | 2 | 3 | 233       |
| Al VIII              | 74 965     | 150       |           | $2s2p^3 - 2s2p^3(^3P)3s$   | $^3S^o - ^3P$   | 2 | 2 | 233       |
| Al VIII              | 75 058     | 50        |           | $2s2p^3 - 2s2p^3(^3P)3s$   | $^3S^o - ^3P$   | 2 | 1 | 233       |
| Al VIII              | 75 397     | 70        |           | $2s2p^3 - 2s2p^3(^3P)3d$   | $^3P^o - ^3P$   | 2 | 1 | 233       |
| Al VIII              | 75 488     | 200b      |           | $2s2p^3 - 2s2p^3(^3P)3d$   | $^3P^o - ^3P$   | 2 | 2 | 233       |
| Al VIII              | 75 577     | 150       |           | $2s2p^3 - 2s2p^3(^1D)3s$   | $^1D^o - ^1D$   | 3 | 3 | 233       |
| Al VIII              | 75 623     | 100       |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^3P^o - ^3P^o$ | 1 | 2 | 233       |
| Al VIII              | 75 734     | 50        |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^3P^o - ^3P^o$ | 0 | 1 | 233       |
| Al VIII              | 75 778     | 250       |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^3P^o - ^3P^o$ | 2 | 2 | 233       |
| Al VIII              | 75 850     | 100b      |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^3P^o - ^3P^o$ | 1 | 1 | 233       |
| Al VIII              | 75 894     | 100b      |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^3P^o - ^3P^o$ | 1 | 0 | 233       |
| Al VIII              | 75 985     | 50        |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^3P^o - ^3P^o$ | 2 | 1 | 233       |
| Al VIII              | 77 605     | 100       |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^1D^o - ^1P^o$ | 2 | 1 | 233       |
| Al VIII <sup>7</sup> | 78 225     | 1         |           |                            |                 |   |   | 233       |
| Al VIII              | 78 351     | 1000b     |           | $2s2p^3 - 2s2p^3(^1D)3s$   | $^1P^o - ^1D$   | 2 | 3 | 233       |
| Al VIII              | 79 455     | 120       |           | $2s2p^3 - 2s2p^3(^3S)3s$   | $^3S^o - ^3S$   | 1 | 1 | 233       |
| Al VIII              | 80 320     | 10        |           | $2s2p^3 - 2s2p^3(^3P)3s$   | $^1D^o - ^1P$   | 3 | 2 | 233       |
| Al VIII              | 80 483     | 10d       |           | $2s2p^3 - 2s2p^3(^3P)3s$   | $^1D^o - ^1P$   | 2 | 1 | 233       |
| Al VIII              | 80 704     | 100       |           | $2s2p^3 - 2s2p^3(^1P^o)3s$ | $^3S^o - ^3P^o$ | 0 | 1 | 233       |
| Al VIII              | 82 543     | 150       |           | $2s2p^3 - 2s2p^3(^1D)3s$   | $^1D^o - ^1D$   | 2 | 2 | 233       |
| Al VIII              | 83 465     | 50        |           | $2s2p^3 - 2s2p^3(^3P)3s$   | $^3P^o - ^3P$   | 2 | 2 | 233       |
| Al VIII              | 83 635     | 10        |           | $2s2p^3 - 2s2p^3(^3P)3s$   | $^3P^o - ^3P$   | 1 | 1 | 233       |
| Al VIII              | 85 922     | 10b       |           | $2s2p^3 - 2s2p^3(^1D)3s$   | $^1P^o - ^1D$   | 1 | 2 | 233       |
| Al VIII              | 91 487     | 50        |           | $2s2p^3 - 2s2p^3(^1P^o)3p$ | $^3P^o - ^3S$   | 2 | 1 | 233       |
| Al VIII              | 250 139    | 10        |           | $2s2p^3 - 2s2p^3$          | $^3P^o - ^3S^o$ | 2 | 1 | 693       |
| Al VIII              | 251 347    | 10        |           | $2s2p^3 - 2s2p^3$          | $^1D^o - ^1P^o$ | 2 | 1 | 693       |
| Al VIII              | 285 467    | 50d       |           | $2s2p^3 - 2s2p^3$          | $^1D^o - ^1D^o$ | 2 | 2 | 693       |
| Al VIII              | 328 200    | 10d       |           | $2s2p^3 - 2s2p^3$          | $^3P^o - ^3P^o$ | 2 | 2 | 693       |
| Al VIII <sup>7</sup> | 381 689    | 10        |           | $2s2p^3 - 2s2p^3$          | $^3P^o - ^1D^o$ | 0 | 1 | 693       |
| Al VIII              | 383 785    | 50        |           | $2s2p^3 - 2s2p^3$          | $^3P^o - ^1D^o$ | 1 | 2 | 693       |
| Al VIII              | 387 970    | 100       |           | $2s2p^3 - 2s2p^3$          | $^3P^o - ^1D^o$ | 2 | 3 | 693       |

Al IX

## ALUMINUM, Z = 13

Al IX

Ground state  $1s^2 2s^2 2p^1 P^{\circ}_{1/2}$ Ionization potential  $2.663 \times 10^8 \text{ cm}^{-1}$ , 330.2 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                       | Term                | J-J                         | Reference |
|---------|------------|-----------|-----------|-------------------------------------|---------------------|-----------------------------|-----------|
| Al IX   | 43.549     | 10        |           | $2s^2(^1S)2p - 2s^2(^1S)5d$         | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 47.417     | 1         |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 47.489     | 50        |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 47.534     | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^4D$         | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 47.755     | 10        |           | $2s^2(^1S)2p - 2s^2(^1S)4d$         | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 47.856     | 50        |           | $2s^2(^1S)2p - 2s^2(^1S)4d$         | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 49.094     | 1         |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^4P - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 49.854     | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})4d$      | $^2D - ^4F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 53.376     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 53.424     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 53.488     | 1         |           | $2s2p^2 - 1s^2 2p^2(^1P)3p$         | $^4P - ^4S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 53.554     | 10        |           | $2s2p^2 - 1s^2 2p^2(^1P)3p$         | $^4P - ^4S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 54.312     | 10d       |           | $2s2p^2 - 1s^2 2p^2(^1P)3p$         | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 54.457     | 200       |           | $2s2p^2 - 1s^2 2p^2(^1P)3p$         | $^4P - ^4D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 55.667     | 10        |           | $2s2p^2 - 1s^2 2p^2(^1D)3p$         | $^2D - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 56.150     | 50b       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^1S$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 56.304     | 70        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^1S$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 56.899     | 100b      |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 56.945     | 250       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 58.060     | 10        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 58.112     | 50        |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 58.222     | 100       |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 58.276     | 1         |           | $2s^2(^1S)2p - 2s2p(^1P^{\circ})3p$ | $^4P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 59.381     | 10d       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^2D - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 59.761     | 300       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^2D - ^4F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.162     | 10d       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.197     | 50        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.222     | 10        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.262     | 10        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.312     | 50        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.347     | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.504     | 150       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.549     | 200       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.588     | 300       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.645     | 10        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 60.896     | 300       |           | $2s^2(^1S)2p - 2s^2(^1S)3d$         | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 61.069     | 600       |           | $2s^2(^1S)2p - 2s^2(^1S)3d$         | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 61.647     | 10        |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^1S - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 62.296     | 200b      |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$      | $^4S^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 62.327     | 250       |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$      | $^4S^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 62.369     | 150       |           | $1s^2 2p^2 - 1s^2 2p^2(^1P)3d$      | $^4S^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 62.474     | 100b      |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 62.587     | 100       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 62.916     | 150       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 63.025     | 500b      |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^4P - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 63.509     | 500d      |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^2D - ^4F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 63.632     | 300       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^2D - ^4F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 64.625     | 50        |           | $2s2p^2 - 2s2p(^1P^{\circ})3s$      | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 64.885     | 150       |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^2D - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 64.904     | 100b      |           | $2s2p^2 - 2s2p(^1P^{\circ})3d$      | $^2D - ^2D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 66.038     | 50        |           | $2s2p^2 - 2s2p(^1P^{\circ})3s$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 66.092     | 50        |           | $2s2p^2 - 2s2p(^1P^{\circ})3s$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 66.142     | 120       |           | $2s2p^2 - 2s2p(^1P^{\circ})3s$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 66.239     | 60        |           | $2s2p^2 - 2s2p(^1P^{\circ})3s$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 66.275     | 50        |           | $2s2p^2 - 2s2p(^1P^{\circ})3s$      | $^4P - ^4P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |



| Element | Wavelength | Intensity | Multiplet | Configuration               | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|-----------------------------|---------------|-----------------------------|-----------|
| Al IX   | 66 321     | 60b       |           | $2s2p^2 - 2s2p(^3P^o)3d$    | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 66 624     | 10        |           | $2s^4(^1S)2p - 2s^4(^1S)3s$ | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al IX   | 66 836     | 100d      |           | $2s^4(^1S)2p - 2s^4(^1S)3s$ | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al IX   | 67 878     | 10        |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 68 531     | 100b      |           | $1s^22p^2 - 1s^22p(^3P)3s$  | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 68 637     | 50b       |           | $1s^22p^2 - 1s^22p(^3P)3s$  | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 68 681     | 10b       |           | $1s^22p^2 - 1s^22p(^3P)3s$  | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al IX   | 68 825     | 50b       |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1P - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al IX   | 68 958     | 50        |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 69 258     | 50d       |           | $2s2p^2 - 2s2p(^3P^o)3d$    | $^1P - ^1D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 69 716     | 100       |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 69 850     | 50d       |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1D - ^1P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| Al IX   | 73 451     | 1         |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 73 625     | 1         |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al IX   | 74 785     | 50        |           | $2s2p^2 - 2s2p(^1P^o)3s$    | $^1P - ^1P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 77 381     | 150       |           | $1s^22p^2 - 2s2p(^1P^o)3p$  | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 77 448     | 150b      |           | $1s^22p^2 - 2s2p(^1P^o)3p$  | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| Al IX   | 284 042    | 10d       |           | $2s^4(^1S)2p - 2s2p^2$      | $^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |
| Al IX   | 385.030    | 10P       |           | $2s^4(^1S)2p - 2s2p^2$      | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 693       |
| Al IX   | 392.418    | 10P       |           | $2s^4(^1S)2p - 2s2p^2$      | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 693       |

Al X

## ALUMINUM, Z = 13

Al X

Ground state  $1s^2 2s^2 1S_0$ Ionization potential 3 215 340 cm<sup>-1</sup>, 398.6 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term          | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------------|---------------|-------|-----------|
| Al X    | 44.136     | 10        |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 4d$ | $1D - 1F^0$   | 2-3   | 233       |
| Al X    | 44.902     | 10        |           | $2s 2p - 2s 4d$                 | $1P^0 - 1D$   | 1-2   | 233       |
| Al X    | 50.670     | 50        |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1P$   | 1-2   | 233       |
| Al X    | 50.762     | 250       |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1P$   | 2-2   | 233       |
| Al X    | 50.802     | 50        |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1P$   | 2-1   | 233       |
| Al X    | 50.946     | 10        |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1S$   | 1-1   | 233       |
| Al X    | 51.039     | 10        |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1S$   | 2-1   | 233       |
| Al X    | 51.362     | 350       |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1D$   | 2-3   | 233       |
| Al X    | 51.400     | 1         |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1D$   | 1-1   | 233       |
| Al X    | 51.454     | 1         |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1D$   | 2-2   | 233       |
| Al X    | 51.979     | 300       |           | $2s^2 - 2s 3p$                  | $g^1S - 1P^0$ | 0-1   | 233       |
| Al X    | 54.115     | 220       |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1D$   | 1-2   | 233       |
| Al X    | 55.227     | 150       |           | $2s 2p - 2s(1S)3d$              | $1P^0 - 1G$   | 0-1   | 233       |
| Al X    | 55.272     | 500       |           | $2s 2p - 2s(1S)3d$              | $1P^0 - 1D$   | 1-2   | 233       |
| Al X    | 55.376     | 750       |           | $2s 2p - 2s(1S)3d$              | $1P^0 - 1D$   | 2-3   | 233       |
| Al X    | 55.731     | 50        |           | $2s 2p - 1s^2 2p^2 1P^0 3p$     | $1P^0 - 1P$   | 1-1   | 233       |
| Al X    | 56.650     | 10d       |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3d$ | $1P - 1P^0$   | 1-1   | 233       |
| Al X    | 56.762     | 10        |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3d$ | $1P - 1P^0$   | 2-1   | 233       |
| Al X    | 56.802     | 200       |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3d$ | $1P - 1P^0$   | 2-2   | 233       |
| Al X    | 56.964     | 150       |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3d$ | $1P - 1D^0$   | 1-2   | 233       |
| Al X    | 57.024     | 250       |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3d$ | $1P - 1D^0$   | 2-3   | 233       |
| Al X    | 57.072     | 10        |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3d$ | $1P - 1D^0$   | 2-2   | 233       |
| Al X    | 57.368     | 350       |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3d$ | $1D - 1F^0$   | 2-3   | 233       |
| Al X    | 58.808     | 1         |           | $2s 2p - 2s 3s$                 | $1P^0 - 1S$   | 0-1   | 233       |
| Al X    | 58.858     | 100       |           | $2s 2p - 2s 3s$                 | $1P^0 - 1S$   | 1-1   | 233       |
| Al X    | 58.987     | 150       |           | $2s 2p - 2s 3s$                 | $1P^0 - 1S$   | 2-1   | 233       |
| Al X    | 59.107     | 400       |           | $2s 2p - 2s 3d$                 | $1P^0 - 1D$   | 1-2   | 233       |
| Al X    | 60.700     | 10        |           | $1s^2 2p^2 - 1s^2 2p^2 1P^0 3s$ | $1P - 1P^0$   | 2-2   | 233       |
| Al X    | 63.134     | 200       |           | $2s 2p - 2s 3s$                 | $1P^0 - 1S$   | 1-0   | 233       |
| Al X    | 332.891    | 10        |           | $2s^2 - 2s 2p$                  | $g^1S - 1P^0$ | 0-1   | 693       |
| Al X    | 401.183    | 10        |           | $2s 2p - 1s^2 2p^2$             | $1P^0 - 1P$   | 2-2   | 693       |

Al XI

## ALUMINUM, Z = 13

Al XI

Ground state  $1s^2 2s^2 2p^1$ Ionization potential  $3\,564\,900\text{ cm}^{-1}$ , 442.0 eV

| Element | Wavelength | Intensity | Multiplet | Configuration       | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------------|---------------|-----------------------------|-----------|
| Al XI   | 39.180     | 1         |           | $1s^2 2p - 1s^2 4d$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al XI   | 48.297     | 250       |           | $1s^2 2s - 1s^2 3p$ | $^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al XI   | 48.338     | 150       |           | $1s^2 2s - 1s^2 3p$ | $^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al XI   | 52.299     | 500       |           | $1s^2 2p - 1s^2 3d$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al XI   | 52.446     | 600       |           | $1s^2 2p - 1s^2 3d$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al XI   | 54.217     | 200b      |           | $1s^2 2p - 1s^2 3s$ | $^1P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| Al XI   | 54.388     | 70        |           | $1s^2 2p - 1s^2 3s$ | $^1P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |

Al XII

ALUMINUM,  $Z = 13$ 

Al XII

Ground state  $1s^2 1S_0$ Ionization potential  $16\,825\,000\text{ cm}^{-1}$ , 2086.0 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term            | J - J | Reference |
|---------|------------|-----------|-----------|---------------|-----------------|-------|-----------|
| Al XII  | 6 314      |           |           | $1s^2 - 1s4p$ | $1s^2 S - 1P^o$ | 0-1   | 236       |
| Al XII  | 6 635      |           |           | $1s^2 - 1s3p$ | $1s^2 S - 1P^o$ | 0-1   | 236       |
| Al XII  | 7 257      |           |           | $1s^2 - 1s2p$ | $1s^2 S - 1P^o$ | 0-1   | 236       |

Al XIII

## ALUMINUM, Z = 13

Al XIII

Ground state  $1s^2S_{1/2}$ Ionization potential  $18\,584\,139\text{ cm}^{-1}$ ,  $2304.08\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term         | J - J     | Reference |
|---------|------------|-----------|-----------|---------------|--------------|-----------|-----------|
| Al XIII | 5.534      | P         |           | $1s-6p$       | $2^1S-^1P^o$ | $1/2-1/2$ | 309       |
| Al XIII | 5.605      | P         |           | $1s-5p$       | $2^1S-^1P^o$ | $1/2-1/2$ | 309       |
| Al XIII | 5.739      | P         |           | $1s-4p$       | $2^1S-^1P^o$ | $1/2-1/2$ | 309       |
| Al XIII | 6.053      | P         |           | $1s-3p$       | $2^1S-^1P^o$ | $1/2-1/2$ | 309       |
| Al XIII | 7.173      | P         |           | $1s-2p$       | $2^1S-^1P^o$ | $1/2-1/2$ | 309       |
| Al XIII | 23.44      | P         |           | $2-7$         |              |           | 309       |
| Al XIII | 24.22      | P         |           | $2-6$         |              |           | 309       |
| Al XIII | 25.63      | P         |           | $2-5$         |              |           | 309       |
| Al XIII | 28.70      | P         |           | $2-4$         |              |           | 309       |
| Al XIII | 38.73      | P         |           | $2-3$         |              |           | 309       |
| Al XIII | 59.39      | P         |           | $3-7$         |              |           | 309       |
| Al XIII | 64.64      | P         |           | $3-6$         |              |           | 309       |
| Al XIII | 75.74      | P         |           | $3-5$         |              |           | 309       |
| Al XIII | 110.8      | P         |           | $3-4$         |              |           | 309       |
| Al XIII | 128.02     | P         |           | $4-7$         |              |           | 309       |
| Al XIII | 155.2      | P         |           | $4-6$         |              |           | 309       |
| Al XIII | 239.5      | P         |           | $4-5$         |              |           | 309       |
| Al XIII | 275.1      | P         |           | $5-7$         |              |           | 309       |
| Al XIII | 440.9      | P         |           | $5-6$         |              |           | 309       |
| Al XIII | 731.4      | P         |           | $6-7$         |              |           | 309       |

Si

## SILICON, Z = 14

Si

## Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J | J | Reference |
|---------|------------|-----------|-----------|---------------|------|---|---|-----------|
| Si      | 53.025     | 20        |           |               |      |   |   | 231       |
| Si      | 53.063     | 20        |           |               |      |   |   | 231       |
| Si      | 54.403     | 50d       |           |               |      |   |   | 231       |
| Si      | 56.145     | 50        |           |               |      |   |   | 231       |
| Si      | 56.645     | 50d       |           |               |      |   |   | 231       |
| Si      | 58.150     | 50        |           |               |      |   |   | 231       |
| Si      | 60.151     | 20        |           |               |      |   |   | 231       |
| Si      | 60.421     | 20        |           |               |      |   |   | 231       |
| Si      | 60.459     | 20        |           |               |      |   |   | 231       |
| Si      | 60.673     | 100       |           |               |      |   |   | 231       |
| Si      | 62.152     | 50        |           |               |      |   |   | 231       |
| Si      | 62.251     | 100       |           |               |      |   |   | 231       |
| Si      | 62.386     | 50d       |           |               |      |   |   | 231       |
| Si      | 62.454     | 20        |           |               |      |   |   | 231       |
| Si      | 63.183     | 50d       |           |               |      |   |   | 231       |
| Si      | 63.478     | 20        |           |               |      |   |   | 231       |
| Si      | 63.879     | 50        |           |               |      |   |   | 231       |
| Si      | 64.772     | 50d       |           |               |      |   |   | 231       |
| Si      | 65.711     | 50        |           |               |      |   |   | 231       |
| Si      | 66.726     | 100       |           |               |      |   |   | 231       |
| Si      | 66.912     | 100       |           |               |      |   |   | 231       |
| Si      | 66.977     | 20d       |           |               |      |   |   | 231       |
| Si      | 67.574     | 50d       |           |               |      |   |   | 231       |
| Si      | 68.270     | 50d       |           |               |      |   |   | 231       |
| Si      | 68.340     | 50        |           |               |      |   |   | 231       |
| Si      | 68.497     | 50d       |           |               |      |   |   | 231       |
| Si      | 68.522     | 50d       |           |               |      |   |   | 231       |
| Si      | 68.786     | 100       |           |               |      |   |   | 231       |
| Si      | 68.833     | 20        |           |               |      |   |   | 231       |
| Si      | 68.853     | 100       |           |               |      |   |   | 231       |
| Si      | 70.594     | 100       |           |               |      |   |   | 231       |
| Si      | 70.771     | 100d      |           |               |      |   |   | 231       |
| Si      | 71.900     | 200       |           |               |      |   |   | 231       |
| Si      | 81.449     | 50        |           |               |      |   |   | 231       |
| Si      | 82.622     | 50d       |           |               |      |   |   | 231       |
| Si      | 85.614     | 20        |           |               |      |   |   | 231       |
| Si      | 92.957     | 50d       |           |               |      |   |   | 231       |
| Si      | 110.957    | 100       |           |               |      |   |   | 231       |
| Si?     | 1943.42    | 0         |           |               |      |   |   | 816       |
| Si?     | 1949.17    | 0         |           |               |      |   |   | 816       |
| Si?     | 1952.96    | 0         |           |               |      |   |   | 816       |
| Si?     | 1956.75    | 0         |           |               |      |   |   | 816       |
| Si?     | 1960.17    | 0         |           |               |      |   |   | 816       |

Si I

## SILICON, Z = 14

Si I

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^2 \ ^3P_0$ Ionization potential  $65\,743.0\text{ cm}^{-1}$  8.151 eV

| Element | Wavelength | Intensity | Multiplet | Configuration            | Term                   | J   | J | Reference |
|---------|------------|-----------|-----------|--------------------------|------------------------|-----|---|-----------|
| Si I    | 1255.276   | 10        |           | $3s^2 3p^2 - 3s^2 3p^1$  | $R^3P - ^3S^o$         | 0-1 |   | 608       |
| Si I    | 1256.490   | 40        |           | $3s^2 3p^2 - 3s^2 3p^1$  | $R^3P - ^3S^o$         | 1-1 |   | 608       |
| Si I    | 1258.795   | 50        |           | $3s^2 3p^2 - 3s^2 3p^1$  | $R^3P - ^3S^o$         | 2-1 |   | 608       |
| Si I?   | 1543.713   | 1r        |           |                          |                        |     |   | 608       |
| Si I    | 1545.565   | 1r        |           | $3s^2 3p^2 - 3s^2 3p10d$ | $R^3P - ^3D$           | 2-3 |   | 608       |
| Si I    | 1546.559   | 1r        |           | $3s^2 3p^2 - 3s^2 3p10d$ | $R^3P - ^3P^o$         | 2-2 |   | 608       |
| Si I?   | 1547.373   | 1r        |           |                          |                        |     |   | 608       |
| Si I    | 1548.7149  | 2         |           | $3s^2 3p^2 - 3s^2 3p9d$  | $R^3P - ^3D$           | 1-2 |   | 370       |
| Si I?   | 1551.2411  | 2         |           |                          |                        |     |   | 370       |
| Si I    | 1551.8595  | 2         |           | $3s^2 3p^2 - 3s^2 3p9d$  | $R^3P - ^3D^o$         | 2-3 |   | 370       |
| Si I?   | 1551.9323  | 1         |           |                          |                        |     |   | 370       |
| Si I    | 1552.2089  | 1         |           | $3s^2 3p^2 - 3s^2 3p9d$  | $R^3P - ^3D^o$         | 2-2 |   | 370       |
| Si I    | 1552.9498  | 2         |           | $3s^2 3p^2 - 3s^2 3p9d$  | $R^3P - ^3P^o$         | 2-2 |   | 370       |
| Si I?   | 1553.3712  | 1         |           |                          |                        |     |   | 370       |
| Si I?   | 1554.7021  | 2         |           |                          |                        |     |   | 370       |
| Si I    | 1555.5157  | 1         |           | $3s^2 3p^2 - 3s^2 3p10s$ | $R^3P - (^3/2, 1/2)^o$ | 1-2 |   | 370       |
| Si I?   | 1555.6630  | 1         |           |                          |                        |     |   | 370       |
| Si I?   | 1556.1626  | 1         |           |                          |                        |     |   | 370       |
| Si I    | 1556.5273  | 1         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3P^o$         | 1-0 |   | 370       |
| Si I    | 1558.2400  | 2         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3D^o$         | 1-2 |   | 370       |
| Si I    | 1559.3645  | 2         |           | $3s^2 3p^2 - 3s^2 3p10s$ | $R^3P - (^3/2, 1/2)^o$ | 2-1 |   | 370       |
| Si I    | 1560.7425  | 8         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3D^o$         | 2-3 |   | 370       |
| Si I    | 1562.0065  | 4         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3P^o$         | 2-2 |   | 370       |
| Si I    | 1562.0531  | 1         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3P^o$         | 0-1 |   | 370       |
| Si I    | 1563.3641  | 1         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3F^o$         | 2-3 |   | 370       |
| Si I    | 1564.6138  | 8         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3F^o$         | 1-2 |   | 370       |
| Si I    | 1567.7263  | 8         |           | $3s^2 3p^2 - 3s^2 3p9s$  | $R^3P - (^3/2, 1/2)^o$ | 1-2 |   | 370       |
| Si I?   | 1567.8095  | 1         |           |                          |                        |     |   | 370       |
| Si I    | 1568.1963  | 10        |           | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3P^o$         | 1-0 |   | 370       |
| Si I    | 1568.6182  | 3         | 40        | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3D^o$         | 0-1 |   | 370       |
| Si I    | 1569.3185  | 8         |           | $3s^2 3p^2 - 3s^2 3p8d$  | $R^3P - ^3F^o$         | 2-3 |   | 370       |
| Si I?   | 1569.3841  | 1         |           |                          |                        |     |   | 370       |
| Si I    | 1570.0275  | 2         |           | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3P^o$         | 1-1 |   | 370       |
| Si I    | 1570.5175  | 3         | 40        | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3D^o$         | 1-1 |   | 370       |
| Si I    | 1570.8104  | 1         |           | $3s^2 3p^2 - 3s^2 3p9s$  | $R^3P - (^3/2, 1/2)^o$ | 2-1 |   | 370       |
| Si I    | 1571.3226  | 1         |           | $3s^2 3p^2 - 3s^2 3p9s$  | $R^3P - (^3/2, 1/2)^o$ | 2-2 |   | 370       |
| Si I    | 1571.4058  | 10        | 40        | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3D^o$         | 1-2 |   | 370       |
| Si I?   | 1571.7956  | 6         |           |                          |                        |     |   | 370       |
| Si I    | 1572.7173  | 2         |           | $3s^2 3p^2 - 3s^2 3p9s$  | $R^3P - (^3/2, 1/2)^o$ | 0-1 |   | 370       |
| Si I?   | 1572.9245  | 1         |           |                          |                        |     |   | 370       |
| Si I?   | 1573.3483  | 1         |           |                          |                        |     |   | 370       |
| Si I    | 1573.6350  | 10        |           | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3P^o$         | 2-1 |   | 370       |
| Si I    | 1573.8840  | 25        | 40        | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3D^o$         | 2-3 |   | 370       |
| Si I?   | 1574.1275  | 1         |           |                          |                        |     |   | 370       |
| Si I    | 1574.7456  | 1         |           | $3s^2 3p^2 - 3s^2 3p9s$  | $R^3P - (^3/2, 1/2)^o$ | 1-0 |   | 370       |
| Si I    | 1574.8435  | 30        |           | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3P^o$         | 2-2 |   | 370       |
| Si I    | 1575.1268  | 10        |           | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3P^o$         | 0-1 |   | 370       |
| Si I    | 1576.8294  | 12        | 39        | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3F^o$         | 2-3 |   | 370       |
| Si I    | 1577.0439  | 2         |           | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3P^o$         | 1-1 |   | 370       |
| Si I    | 1580.3001  | 12        | 38        | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3F^o$         | 1-2 |   | 370       |
| Si I    | 1584.0216  | 8         |           | $3s^2 3p^2 - 3s^2 3p8s$  | $R^3P - (^3/2, 1/2)^o$ | 0-1 |   | 370       |
| Si I    | 1584.3455  | 12        | 38        | $3s^2 3p^2 - 3s^2 3p7d$  | $R^3P - ^3F^o$         | 2-3 |   | 370       |
| Si I    | 1584.8540  | 2         |           | $3s^2 3p^2 - 3s^2 3p6d$  | $R^3P - ^3P^o$         | 0-1 |   | 370       |
| Si I    | 1585.9580  | 3         |           | $3s^2 3p^2 - 3s^2 3p8s$  | $R^3P - (^3/2, 1/2)^o$ | 1-1 |   | 370       |
| Si I    | 1586.1372  | 15        |           | $3s^2 3p^2 - 3s^2 3p6d$  | $R^3P - ^3P^o$         | 1-0 |   | 370       |

| Element           | Wavelength | Intensity | Multiplet | Configuration                | Term                                 | J - J | Reference |
|-------------------|------------|-----------|-----------|------------------------------|--------------------------------------|-------|-----------|
| Si I              | 1586.7913  | 20        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^2P^o$                        | 1-1   | 370       |
| Si I              | 1586.8920  | 3         |           | $3s^2 3p^2 - 3s^2 3p8s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 1-2   | 370       |
| Si I              | 1587.7612  | 15        |           | $3s^2 3p^2 - 3s^2 3p7d$      | $^4P - ^1D^o$                        | 2-2   | 370       |
| Si I              | 1589.1728  | 15        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1D^o$                        | 0-1   | 370       |
| Si I              | 1589.6389  | 7         |           | $3s^2 3p^2 - 3s^2 3p8s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 2-1   | 370       |
| Si I              | 1590.4768  | 20        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^2P^o$                        | 2-1   | 370       |
| Si I              | 1590.5763  | 15        |           | $3s^2 3p^2 - 3s^2 3p8s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 2-2   | 370       |
| Si I              | 1591.1232  | 20        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1D^o$                        | 1-1   | 370       |
| Si I              | 1592.0200  | 20        |           | $3s^2 3p^2 - 3s^2 3p8s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 0-1   | 370       |
| Si I              | 1592.4234  | 60        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1D^o$                        | 1-2   | 370       |
| Si I              | 1594.1455  | 3         |           | $3s^2 3p^2 - 3s^2 3p8s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 1-0   | 370       |
| Si I              | 1594.5655  | 70        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1D^o$                        | 2-3   | 370       |
| Si I              | 1594.9493  | 70        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^2P^o$                        | 2-2   | 370       |
| Si I              | 1595.7552  | 30        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1P^o$                        | 0-1   | 370       |
| Si I              | 1597.721   | 25        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1P^o$                        | 1-1   | 370       |
| Si I <sup>o</sup> | 1597.7357  | 20        |           |                              |                                      |       | 370       |
| Si I              | 1597.9627  | 60        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1F^o$                        | 2-3   | 370       |
| Si I              | 1605.8374  | 20        | 33        | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^2F^o$                        | 1-2   | 370       |
| Si I              | 1608.9164  | 25        | 33        | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^2F^o$                        | 2-3   | 370       |
| Si I              | 1614.5672  | 30        | 30        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2P^o$                        | 0-1   | 370       |
| Si I              | 1614.6300  | 25        |           | $3s^2 3p^2 - 3s^2 3p6d$      | $^4P - ^1D^o$                        | 2-2   | 370       |
| Si I              | 1615.9488  | 50        | 30        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2P^o$                        | 1-0   | 370       |
| Si I              | 1616.5791  | 70        | 30        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2P^o$                        | 1-1   | 370       |
| Si I              | 1618.0062  | 8         |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 1-1   | 370       |
| Si I              | 1619.0458  | 8         | 30        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2P^o$                        | 1-2   | 370       |
| Si I              | 1619.5264  | 15        |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 1-2   | 370       |
| Si I              | 1620.4043  | 60        | 30        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2P^o$                        | 2-1   | 370       |
| Si I              | 1621.8380  | 2         |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 2-1   | 370       |
| Si I              | 1622.8806  | 90        | 30        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2P^o$                        | 2-2   | 370       |
| Si I              | 1623.3677  | 8         |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 2-2   | 370       |
| Si I              | 1623.4983  | 10        |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 0-1   | 370       |
| Si I              | 1625.5307  | 35        |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 1-1   | 370       |
| Si I              | 1625.7045  | 70        | 27        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1D^o$                        | 0-1   | 370       |
| Si I              | 1627.0498  | 20        |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 1-0   | 370       |
| Si I              | 1627.7451  | 30        | 27        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1D^o$                        | 1-1   | 370       |
| Si I              | 1629.4034  | 20        |           | $3s^2 3p^2 - 3s^2 3p7s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 2-1   | 370       |
| Si I              | 1629.4382  | 100       | 27        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1D^o$                        | 1-2   | 370       |
| Si I              | 1629.9458  | 100       | 27        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1D^o$                        | 2-3   | 370       |
| Si I              | 1631.1676  | 70        | 26        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1P^o$                        | 0-1   | 370       |
| Si I              | 1633.2230  | 45        | 26        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1P^o$                        | 1-1   | 370       |
| Si I              | 1633.3262  | 40        | 27        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1D^o$                        | 2-2   | 370       |
| Si I              | 1633.9829  | 90        |           | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1F^o$                        | 2-3   | 370       |
| Si I              | 1637.0106  | 4         |           | $3s^2 3p^2 - 3s^2 3p^4(P)3d$ | $^4S^o - ^3P$                        | 2-1   | 370       |
| Si I              | 1638.2823  | 2         |           | $3s^2 3p^2 - 3s^2 3p^4(P)3d$ | $^4S^o - ^3P$                        | 2-2   | 370       |
| Si I              | 1640.267   | 1         |           | $3s^2 3p^2 - 3s^2 3p^4(P)3d$ | $^4S^o - ^3P$                        | 2-3   | 370       |
| Si I              | 1651.0280  | 25        | 25        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2F^o$                        | 1-2   | 370       |
| Si I              | 1653.3758  | 40        | 25        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^2F^o$                        | 2-3   | 370       |
| Si I              | 1660.4759  | 15        | 24        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1D^o$                        | 1-2   | 370       |
| Si I              | 1664.5113  | 35        | 24        | $3s^2 3p^2 - 3s^2 3p5d$      | $^4P - ^1D^o$                        | 2-2   | 370       |
| Si I              | 1666.3762  | 60        | 23        | $3s^2 3p^2 - 3s^2 3p4d$      | $^4P - ^2P^o$                        | 0-1   | 370       |
| Si I              | 1667.6288  | 70        | 23        | $3s^2 3p^2 - 3s^2 3p4d$      | $^4P - ^2P^o$                        | 1-0   | 370       |
| Si I              | 1668.5204  | 70        | 23        | $3s^2 3p^2 - 3s^2 3p4d$      | $^4P - ^2P^o$                        | 1-1   | 370       |
| Si I              | 1671.1168  | 40        | 23        | $3s^2 3p^2 - 3s^2 3p4d$      | $^4P - ^2P^o$                        | 1-2   | 370       |
| Si I              | 1672.5961  | 80        | 23        | $3s^2 3p^2 - 3s^2 3p4d$      | $^4P - ^2P^o$                        | 2-1   | 370       |
| Si I              | 1675.2053  | 200       | 23        | $3s^2 3p^2 - 3s^2 3p4d$      | $^4P - ^2P^o$                        | 2-2   | 370       |
| Si I              | 1676.8214  | 15        |           | $3s^2 3p^2 - 3s^2 3p6s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 0-1   | 370       |
| Si I              | 1682.6717  | 70        |           | $3s^2 3p^2 - 3s^2 3p6s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 1-2   | 370       |
| Si I              | 1683.1186  | 3         |           | $3s^2 3p^2 - 3s^2 3p6s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 2-1   | 370       |
| Si I              | 1686.8175  | 100       |           | $3s^2 3p^2 - 3s^2 3p6s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 2-2   | 370       |
| Si I              | 1687.0918  | 20        |           | $3s^2 3p^2 - 3s^2 3p6s$      | $^4P - (\frac{3}{2}, \frac{1}{2})^o$ | 0-1   | 370       |



Si I

Si I

| Element | Wavelength | Intensity | Multiplet | Configuration            | Term                        | J - J | Reference |
|---------|------------|-----------|-----------|--------------------------|-----------------------------|-------|-----------|
| Si I    | 1689.2898  | 60        |           | $3s^2 3p^1 - 3s^2 3p6s$  | $K^2P - (1/2, 1/2)^{\circ}$ | 1-1   | 370       |
| Si I?   | 1689.921   | 1         |           |                          |                             |       | 370       |
| Si I    | 1690.7882  | 60        |           | $3s^2 3p^1 - 3s^2 3p6s$  | $K^2P - (1/2, 1/2)^{\circ}$ | 1-0   | 370       |
| Si I    | 1693.2926  | 125       | 18        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3D^{\circ}$        | 0-1   | 370       |
| Si I    | 1693.4676  | 60        |           | $3s^2 3p^1 - 3s^2 3p6s$  | $K^2P - (1/2, 1/2)^{\circ}$ | 2-1   | 370       |
| Si I    | 1695.5074  | 90        | 18        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3D^{\circ}$        | 1-1   | 370       |
| Si I    | 1696.2065  | 200       | 18        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3D^{\circ}$        | 1-2   | 370       |
| Si I    | 1697.9409  | 250       | 18        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3D^{\circ}$        | 2-3   | 370       |
| Si I    | 1699.7169  | 10        | 18        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3D^{\circ}$        | 2-1   | 370       |
| Si I    | 1700.4193  | 90        | 18        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3D^{\circ}$        | 2-2   | 370       |
| Si I    | 1700.6354  | 80        | 16        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^1P^{\circ}$        | 0-1   | 370       |
| Si I?   | 1702.6978  | 1         |           |                          |                             |       | 370       |
| Si I    | 1702.8685  | 70        | 16        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^1P^{\circ}$        | 1-1   | 370       |
| Si I    | 1704.4416  | 100       | 17        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^1F^{\circ}$        | 2-3   | 370       |
| Si I    | 1707.1148  | 8         | 16        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^1P^{\circ}$        | 2-1   | 370       |
| Si I?   | 1710.744   | 1         |           |                          |                             |       | 370       |
| Si I    | 1722.562   | 4         |           | $3s^2 3p^1 - 3s^2 3p10s$ | $^1D - (1/2, 1/2)^{\circ}$  | 2-1   | 370       |
| Si I    | 1724.242   | 6         |           | $3s^2 3p^1 - 3s^2 3p8d$  | $^1D - ^1D^{\circ}$         | 2-3   | 370       |
| Si I    | 1727.444   | 2         |           | $3s^2 3p^1 - 3s^2 3p8d$  | $^1D - ^1F^{\circ}$         | 2-3   | 370       |
| Si I    | 1733.346   | 1         |           | $3s^2 3p^1 - 3s^2 3p8d$  | $^1D - ^3F^{\circ}$         | 2-2   | 370       |
| Si I    | 1734.718   | 8         |           | $3s^2 3p^1 - 3s^2 3p8d$  | $^1D - ^3F^{\circ}$         | 2-3   | 370       |
| Si I    | 1736.538   | 3         |           | $3s^2 3p^1 - 3s^2 3p9s$  | $^1D - (1/2, 1/2)^{\circ}$  | 2-1   | 370       |
| Si I    | 1740.2988  | 20        | 80        | $3s^2 3p^1 - 3s^2 3p7d$  | $^1D - ^3D^{\circ}$         | 2-3   | 370       |
| Si I    | 1743.8941  | 20        | 79        | $3s^2 3p^1 - 3s^2 3p7d$  | $^1D - ^1F^{\circ}$         | 2-3   | 370       |
| Si I    | 1745.3475  | 25        | 15        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3F^{\circ}$        | 1-2   | 370       |
| Si I    | 1745.647   | 1         |           | $3s^2 3p^1 - 3s^2 3p9s$  | $^1D - (1/2, 1/2)^{\circ}$  | 2-1   | 370       |
| Si I    | 1747.4144  | 40        | 15        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3F^{\circ}$        | 2-3   | 370       |
| Si I    | 1749.808   | 3         | 15        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^3F^{\circ}$        | 2-2   | 370       |
| Si I    | 1752.634   | 3         | 78        | $3s^2 3p^1 - 3s^2 3p7d$  | $^1D - ^3F^{\circ}$         | 2-2   | 370       |
| Si I    | 1753.101   | 15        | 78        | $3s^2 3p^1 - 3s^2 3p7d$  | $^1D - ^3F^{\circ}$         | 2-3   | 370       |
| Si I    | 1757.283   | 3         |           | $3s^2 3p^1 - 3s^2 3p7d$  | $^1D - ^1D^{\circ}$         | 2-2   | 370       |
| Si I    | 1759.5831  | 10        |           | $3s^2 3p^1 - 3s^2 3p8s$  | $^1D - (1/2, 1/2)^{\circ}$  | 2-1   | 370       |
| Si I    | 1763.6612  | 80        |           | $3s^2 3p^1 - 3s^2 3p^1$  | $K^2P - ^3P^{\circ}$        | 0-1   | 370       |
| Si I    | 1765.0296  | 90        |           | $3s^2 3p^1 - 3s^2 3p^1$  | $K^2P - ^3P^{\circ}$        | 1-0   | 370       |
| Si I    | 1765.6215  | 50        | 76        | $3s^2 3p^1 - 3s^2 3p6d$  | $^1D - ^3D^{\circ}$         | 2-3   | 370       |
| Si I    | 1765.9452  | 8         | 76        | $3s^2 3p^1 - 3s^2 3p6d$  | $^1D - ^3D^{\circ}$         | 2-1   | 370       |
| Si I    | 1766.0634  | 100       |           | $3s^2 3p^1 - 3s^2 3p^1$  | $K^2P - ^3P^{\circ}$        | 1-1   | 370       |
| Si I    | 1766.3538  | 50        |           | $3s^2 3p^1 - 3s^2 3p^1$  | $K^2P - ^3P^{\circ}$        | 1-2   | 370       |
| Si I    | 1769.4609  | 2         |           | $3s^2 3p^1 - 3s^2 3p8s$  | $^1D - (1/2, 1/2)^{\circ}$  | 2-1   | 370       |
| Si I    | 1769.7852  | 70        |           | $3s^2 3p^1 - 3s^2 3p6d$  | $^1D - ^1F^{\circ}$         | 2-3   | 370       |
| Si I    | 1770.6298  | 125       |           | $3s^2 3p^1 - 3s^2 3p^1$  | $K^2P - ^3P^{\circ}$        | 2-1   | 370       |
| Si I    | 1770.9216  | 300       |           | $3s^2 3p^1 - 3s^2 3p^1$  | $K^2P - ^3P^{\circ}$        | 2-2   | 370       |
| Si I    | 1772.2263  | 12        | 13        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^1D^{\circ}$        | 1-2   | 370       |
| Si I    | 1776.8245  | 150       | 13        | $3s^2 3p^1 - 3s^2 3p4d$  | $K^2P - ^1D^{\circ}$        | 2-2   | 370       |
| Si I    | 1783.2318  | 25        | 73        | $3s^2 3p^1 - 3s^2 3p6d$  | $^1D - ^3F^{\circ}$         | 2-3   | 370       |
| Si I    | 1784.0884  | 8         | 73        | $3s^2 3p^1 - 3s^2 3p6d$  | $^1D - ^3F^{\circ}$         | 2-2   | 370       |
| Si I    | 1790.2544  | 25        | 72        | $3s^2 3p^1 - 3s^2 3p6d$  | $^1D - ^1D^{\circ}$         | 2-2   | 370       |
| Si I    | 1797.3565  | 6         | 70        | $3s^2 3p^1 - 3s^2 3p5d$  | $^1D - ^3P^{\circ}$         | 2-1   | 370       |
| Si I    | 1799.1177  | 30        |           | $3s^2 3p^1 - 3s^2 3p7s$  | $^1D - (1/2, 1/2)^{\circ}$  | 2-1   | 370       |
| Si I    | 1800.404   | 1         | 70        | $3s^2 3p^1 - 3s^2 3p5d$  | $^1D - ^3P^{\circ}$         | 2-2   | 370       |
| Si I    | 1808.4293  | 20        | 69        | $3s^2 3p^1 - 3s^2 3p7s$  | $^1D - (1/2, 1/2)^{\circ}$  | 2-1   | 370       |
| Si I    | 1809.1042  | 100       | 67        | $3s^2 3p^1 - 3s^2 3p5d$  | $^1D - ^3D^{\circ}$         | 2-3   | 370       |
| Si I    | 1814.0789  | 250       | 68        | $3s^2 3p^1 - 3s^2 3p5d$  | $^1D - ^1F^{\circ}$         | 2-3   | 370       |
| Si I    | 1817.9562  | 10        | 66        | $3s^2 3p^1 - 3s^2 3p5d$  | $^1D - ^1P^{\circ}$         | 2-1   | 370       |
| Si I    | 1822.4549  | 30        | 12        | $3s^2 3p^1 - 3s^2 3p5s$  | $K^2P - ^1P^{\circ}$        | 0-1   | 370       |
| Si I    | 1825.021   | 1         | 12        | $3s^2 3p^1 - 3s^2 3p5s$  | $K^2P - ^1P^{\circ}$        | 1-1   | 370       |
| Si I    | 1829.8971  | 10        | 12        | $3s^2 3p^1 - 3s^2 3p5s$  | $K^2P - ^1P^{\circ}$        | 2-1   | 370       |
| Si I    | 1836.5090  | 200       | 11        | $3s^2 3p^1 - 3s^2 3p5s$  | $K^2P - ^3P^{\circ}$        | 1-2   | 370       |
| Si I    | 1838.0113  | 40        | 65        | $3s^2 3p^1 - 3s^2 3p5d$  | $^1D - ^3F^{\circ}$         | 2-3   | 370       |
| Si I    | 1840.0415  | 8         | 65        | $3s^2 3p^1 - 3s^2 3p5d$  | $^1D - ^3F^{\circ}$         | 2-2   | 370       |

Si I

Si I

| Element | Wavelength | Intensity | Multiplet | Configuration         | Term                       | J-J | Reference |
|---------|------------|-----------|-----------|-----------------------|----------------------------|-----|-----------|
| Si I    | 1841.1515  | 125       | 11        | $3s^23p^2 - 3s^23p5s$ | $g^3P - ^1P^o$             | 0-1 | 370       |
| Si I    | 1841.4486  | 400       | 11        | $3s^23p^2 - 3s^23p5s$ | $g^3P - ^1P^o$             | 2-2 | 370       |
| Si I    | 1843.7695  | 200       | 11        | $3s^23p^2 - 3s^23p5s$ | $g^3P - ^1P^o$             | 1-1 | 370       |
| Si I    | 1845.5203  | 200       | 10        | $3s^23p^2 - 3s^23p^4$ | $g^3P - ^1D^o$             | 0-1 | 370       |
| Si I    | 1846.1115  | 200       | 11        | $3s^23p^2 - 3s^23p5s$ | $g^3P - ^1P^o$             | 1-0 | 370       |
| Si I    | 1847.4733  | 300       | 10        | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1D^o$             | 1-2 | 370       |
| Si I    | 1848.1503  | 200       | 10        | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1D^o$             | 1-1 | 370       |
| Si I    | 1848.7478  | 250       | 11        | $3s^23p^2 - 3s^23p5s$ | $g^3P - ^1P^o$             | 2-1 | 370       |
| Si I    | 1850.6717  | 400       | 10        | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1D^o$             | 2-3 | 370       |
| Si I    | 1851.7823  | 70        | 64        | $3s^23p^2 - 3s^23p5d$ | $^1D - ^1D^o$              | 2-2 | 370       |
| Si I    | 1852.4715  | 250       | 10        | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1D^o$             | 2-2 | 370       |
| Si I    | 1853.1517  | 35        | 10        | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1D^o$             | 2-1 | 370       |
| Si I    | 1861.7949  | 2         | 63        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1P^o$              | 2-1 | 370       |
| Si I    | 1865.0278  | 2         | 63        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1P^o$              | 2-2 | 370       |
| Si I    | 1873.1043  | 25        | 9         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 0-1 | 370       |
| Si I    | 1874.8424  | 175       |           | $3s^23p^2 - 3s^23p6s$ | $^1D - (^{1/2}, ^{1/2})^o$ | 2-1 | 370       |
| Si I    | 1875.8129  | 30        | 9         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 1-1 | 370       |
| Si I    | 1880.9684  | 5         | 9         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 2-1 | 370       |
| Si I    | 1881.8538  | 30        | 8         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1F^o$             | 2-3 | 370       |
| Si I    | 1887.6929  | 45        | 61        | $3s^23p^2 - 3s^23p6s$ | $^1D - (^{1/2}, ^{1/2})^o$ | 2-1 | 370       |
| Si I    | 1893.252   | 175       | 58        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1D^o$              | 2-3 | 370       |
| Si I    | 1895.461   | 1         | 58        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1D^o$              | 2-1 | 370       |
| Si I    | 1896.339   | 1         | 58        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1D^o$              | 2-2 | 370       |
| Si I    | 1901.3370  | 400       | 57        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1F^o$              | 2-3 | 370       |
| Si I    | 1904.6660  | 40        | 56        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1P^o$              | 2-1 | 370       |
| Si I    | 1954.9664  | 50        | 55        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1F^o$              |     | 370       |
| Si I    | 1957.965   | 1         | 55        | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1F^o$              |     | 370       |
| Si I    | 1977.597   | 400       | 7         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 0-1 | 370       |
| Si I    | 1979.206   | 400       | 7         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 1-0 | 370       |
| Si I    | 1980.617   | 300       | 7         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 1-1 | 370       |
| Si I    | 1983.232   | 300       | 7         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 1-2 | 370       |
| Si I    | 1984.0688  | 3         |           | $3s^23p^2 - 3s^23p^2$ | $^1D - ^1P^o$              | 2-1 | 370       |
| Si I    | 1984.4393  | 20        |           | $3s^23p^2 - 3s^23p^2$ | $^1D - ^1P^o$              | 2-2 | 370       |
| Si I    | 1986.363   | 500       | 7         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 2-1 | 370       |
| Si I    | 1988.993   | 1000      | 7         | $3s^23p^2 - 3s^23p3d$ | $g^3P - ^1P^o$             | 2-2 | 370       |
| Si I    | 1991.8522  | 50        |           | $3s^23p^2 - 3s^23p4d$ | $^1D - ^1D^o$              | 2-2 | 370       |

Si II

SILICON, Z = 14

Si II

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^2 \ ^3P_1$ Ionization potential  $131\,838.40\text{ cm}^{-1}$ ,  $16.346\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J-J                         | Reference   |
|---------|------------|-----------|-----------|------------------------------|---------------|-----------------------------|-------------|
| Si II   | 711.34     | 0h        | 6.09      | $3s^2 3p - 3s 3p(^3P^o)4p$   | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 711.83     | 1h        | 6.09      | $3s^2 3p - 3s 3p(^3P^o)4p$   | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 755.362    | 2         | 6.08      | $3s^2 3p - 3s 3p(^3P^o)4p$   | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 803.234    | 3h        | 6.07      | $3s^2 3p - 3s^2 8d$          | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 805.101    | 10h       | 6.07      | $3s^2 3p - 3s^2 8d$          | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 818.590    | 2h        | 6.06      | $3s^2 3p - 3s^2 7d$          | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 819.49     | 0h        | 8.08      | $3s^2 3p^2 - 3s 3p(^3P^o)5d$ | $^4P - ^4P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 820.516    | 20h       | 6.06      | $3s^2 3p - 3s^2 7d$          | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 820.63     | 3h        | 8.08      | $3s^2 3p^2 - 3s 3p(^3P^o)5d$ | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 820.9210   | 3h        | 6.05      | $3s^2 3p^2 - 3s^2 8s$        | $^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 821.450    | 2h        | 8.07      | $3s 3p^2 - 3s 3p(^3P^o)5d$   | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 822.8613   | 5h        | 6.05      | $3s^2 3p - 3s^2 8s$          | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 826.42     | 1h        | 8.06      | $3s 3p^2 - 3s 3p(^3P^o)6s$   | $^4P - ^4P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 843.7192   | 20h       | 6.04      | $3s^2 3p - 3s^2 6d$          | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 845.7684   | 40h       | 6.04      | $3s^2 3p - 3s^2 6d$          | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 371,678,504 |
| Si II   | 848.0700   | 5         | 6.03      | $3s^2 3p - 3s^2 7s$          | $^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 850.1409   | 10        | 6.03      | $3s^2 3p - 3s^2 7s$          | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 889.7228   | 100       | 6.02      | $3s^2 3p - 3s^2 5d$          | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 892.0007   | 200       | 6.02      | $3s^2 3p - 3s^2 5d$          | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 371,678,504 |
| Si II   | 899.4063   | 10        | 6.01      | $3s^2 3p - 3s^2 6s$          | $^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 901.7359   | 20        | 6.01      | $3s^2 3p - 3s^2 6s$          | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 905.71     | 0         | 8.05      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 906.126    | 0         | 8.05      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 906.586    | 1         | 8.05      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 907.033    | 0         | 8.05      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 907.762    | 0         | 8.05      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 908.461    | 1         | 8.05      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 909.209    | 3         | 8.05      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 912.375    | 5         | 8.04      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4D^o$ | $\frac{1}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 912.459    | 5         | 8.04      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4D^o$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 913.012    | 10        | 8.03      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 913.264    | 3         | 8.04      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 913.853    | 20        | 8.04      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 914.476    | 2         | 8.04      | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^4P - ^4D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 928.297    | 5         | 8.03      | $3s 3p^2 - 3s 3p(^3P^o)5s$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 929.206    | 1         | 8.03      | $3s 3p^2 - 3s 3p(^3P^o)5s$   | $^4P - ^4P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 929.810    | 20        | 8.03      | $3s 3p^2 - 3s 3p(^3P^o)5s$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 930.242    | 0         | 8.03      | $3s 3p^2 - 3s 3p(^3P^o)5s$   | $^4P - ^4P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 931.200    | 5         | 8.03      | $3s 3p^2 - 3s 3p(^3P^o)5s$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 931.667    | 5         | 8.03      | $3s 3p^2 - 3s 3p(^3P^o)5s$   | $^4P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 989.8730   | 100       | 6         | $3s^2 3p - 3s^2 4d$          | $^3P^o - ^3D$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 992.6826   | 200       | 6         | $3s^2 3p - 3s^2 4d$          | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 1020.6988  | 25        | 5.01      | $3s^2 3p - 3s^2 5s$          | $^3P^o - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 1023.7002  | 50        | 5.01      | $3s^2 3p - 3s^2 5s$          | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 1034.967   | 0         | 13.08     | $3s 3p^2 - 3s 3p(^3P^o)5s$   | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1056.899   | 2         | 13.07     | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^3D - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1057.050   | 30        | 13.07     | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^3D - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1057.503   | 15        | 13.07     | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^3D - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1057.690   | 2         | 13.07     | $3s 3p^2 - 3s 3p(^3P^o)4d$   | $^3D - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II?  | 1082.400   | 2         |           |                              |               |                             | 504,678     |
| Si II?  | 1084.144   | 3         |           |                              |               |                             | 504,678     |
| Si II   | 1127.442   | 20h       | 13.06     | $3s 3p^2 - 2p^2 3p^2$        | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1127.907   | 40h       | 13.06     | $3s 3p^2 - 2p^2 3p^2$        | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1190.4157  | 100       | 5         | $3s^2 3p - 3s 3p^2$          | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |
| Si II   | 1193.2894  | 200       | 5         | $3s^2 3p - 3s 3p^2$          | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 371,678,504 |

| Element | Wavelength | Intensity | Multiplet | Configuration                        | Term                | J - J                       | Reference   |
|---------|------------|-----------|-----------|--------------------------------------|---------------------|-----------------------------|-------------|
| Si II   | 1194.5001  | 250       | 5         | $3s^2 3p - 3s 3p^2$                  | $^4P^{\circ} - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 371,678,504 |
| Si II   | 1197.3936  | 100       | 5         | $3s^2 3p - 3s 3p^2$                  | $^4P^{\circ} - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 371,678,504 |
| Si II?  | 1216.117   | 10h       |           |                                      |                     |                             | 504,678     |
| Si II   | 1222.288   | 0         | 8.02      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1P^{\circ}$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1222.635   | 5         | 8.02      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1P^{\circ}$ | $\frac{1}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1223.907   | 20        | 8.02      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1224.252   | 20        | 8.02      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1224.972   | 10        | 8.02      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1226.814   | 50        | 8.01      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1D^{\circ}$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1226.887   | 20        | 8.02      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1226.986   | 40        | 8.01      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1D^{\circ}$ | $\frac{1}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1227.604   | 100       | 8.02      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1228.437   | 10        | 8.01      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1D^{\circ}$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1228.617   | 25        | 8.01      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1228.746   | 150       | 8.01      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1229.388   | 200       | 8.01      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1231.406   | 5         | 8.01      | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^1P - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II?  | 1233.354   | 5h        |           |                                      |                     |                             | 504,678     |
| Si II?  | 1235.920   | 10        |           |                                      |                     |                             | 504,678     |
| Si II?  | 1237.36    | 3h        |           |                                      |                     |                             | 504,678     |
| Si II   | 1246.738   | 100       | 8         | $3s 3p^2 - 2p^2 3p^2$                | $^1P - ^1S^{\circ}$ | $\frac{1}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1248.426   | 150       | 8         | $3s 3p^2 - 2p^2 3p^2$                | $^1P - ^1S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1250.089   | 100       | 13.05     | $3s 3p^2 - 2p^2 3p^2$                | $^1D - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1250.433   | 150       | 13.05     | $3s 3p^2 - 2p^2 3p^2$                | $^1D - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1251.164   | 200       | 8         | $3s 3p^2 - 2p^2 3p^2$                | $^1P - ^1S^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1260.4212  | 500       | 4         | $3s^2 3p - 3s^2 3d$                  | $^4P^{\circ} - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 371,678,504 |
| Si II   | 1264.7374  | 1000      | 4         | $3s^2 3p - 3s^2 3d$                  | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 371,678,504 |
| Si II   | 1265.0010  | 100       | 4         | $3s^2 3p - 3s^2 3d$                  | $^4P^{\circ} - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 371,678,504 |
| Si II   | 1274.300   | 3h        |           |                                      |                     |                             | 504,678     |
| Si II   | 1275.662   | 5h        |           |                                      |                     |                             | 504,678     |
| Si II   | 1304.3720  | 100       | 3         | $3s^2 3p - 3s 3p^2$                  | $^4P^{\circ} - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 371,504,678 |
| Si II   | 1305.590   | 50h       | 13.04     | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^2D - ^1F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1309.2769  | 200       | 3         | $3s^2 3p - 3s 3p^2$                  | $^4P^{\circ} - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 371,504,678 |
| Si II   | 1309.458   | 20h       | 13.04     | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^2D - ^1F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1309.77    | 2h        | 13.04     | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^2D - ^1F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1311.265   | 2h        |           |                                      |                     |                             | 504,678     |
| Si II   | 1346.873   | 100       | 7         | $3s 3p^2 - 3s 3p(^3P^{\circ})4s$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1348.543   | 100       | 7         | $3s 3p^2 - 3s 3p(^3P^{\circ})4s$     | $^1P - ^1P^{\circ}$ | $\frac{1}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1350.057   | 150       | 7         | $3s 3p^2 - 3s 3p(^3P^{\circ})4s$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1350.520   | 20        | 7         | $3s 3p^2 - 3s 3p(^3P^{\circ})4s$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1350.658   | 20        | 7         | $3s 3p^2 - 3s 3p(^3P^{\circ})4s$     | $^1P - ^1P^{\circ}$ | $\frac{1}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1352.635   | 100       | 7         | $3s 3p^2 - 3s 3p(^3P^{\circ})4s$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1353.718   | 100       | 7         | $3s 3p^2 - 3s 3p(^3P^{\circ})4s$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1403.783   | 5h        | 13.03     | $3s 3p^2 - 3s^2 10p$                 | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1404.170   | 1h        | 13.03     | $3s 3p^2 - 3s^2 10p$                 | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1404.478   | 6h        | 13.03     | $3s 3p^2 - 3s^2 10p$                 | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1409.073   | 10h       | 13.02     | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1409.90    | 2h        | 13.02     | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1410.219   | 20h       | 13.02     | $3s 3p^2 - 3s 3p(^3P^{\circ})3d$     | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1416.972   | 10h       | 18.06     | $3s^2(^1S)3d - 3s 3p(^3P^{\circ})4d$ | $^2D - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1417.781   | 5         | 18.06     | $3s^2(^1S)3d - 3s 3p(^3P^{\circ})4d$ | $^2D - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1418.110   | 0         | 18.06     | $3s^2(^1S)3d - 3s 3p(^3P^{\circ})4d$ | $^2D - ^1D^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1434.400   | 1h        | 13.01     | $3s 3p^2 - 3s^2 9p$                  | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |
| Si II   | 1434.542   | 2h        | 13.01     | $3s 3p^2 - 3s^2 9p$                  | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1438.576   | 2h        | 13        | $3s 3p^2 - 3s^2 8f$                  | $^2D - ^1F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1438.931   | 4h        | 13        | $3s 3p^2 - 3s^2 8f$                  | $^2D - ^1F^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1471.775   | 2         | 30        | $3s 3p^2 - 3s 3p(^3P^{\circ})5s$     | $^1P - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1474.304   | 1h        | 12.02     | $3s 3p^2 - 3s^2 8p$                  | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1474.649   | 15h       | 12.02     | $3s 3p^2 - 3s^2 8p$                  | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{3}{2}$ | 504,678     |
| Si II   | 1475.188   | 5h        | 12.02     | $3s 3p^2 - 3s^2 8p$                  | $^2D - ^1P^{\circ}$ | $\frac{3}{2} - \frac{1}{2}$ | 504,678     |

Si II

Si II

| Element | Wavelength | Intensity | Multiplet | Configuration                 | Term          | J             | J             | Reference   |
|---------|------------|-----------|-----------|-------------------------------|---------------|---------------|---------------|-------------|
| Si II   | 1476.928   | 1         | 12.01     | $3s3p^2 - 2p^33p^1$           | $^4D - ^4S$   | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1484.873   | 15        | 12        | $3s3p^2 - 3s^27f$             | $^4D - ^4F$   | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1485.024   | 90h       | 15.04     | $3s3p^2 - 2p^33p^1$           | $^4S - ^2P^o$ | $\frac{1}{2}$ | $\frac{1}{2}$ | 504,678     |
| Si II   | 1485.224   | 30        | 12        | $3s3p^2 - 3s^27f$             | $^4D - ^2F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1485.513   | 100h      | 15.04     | $3s3p^2 - 2p^33p^1$           | $^4S - ^2P^o$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1508.741   | 3h        | 11.01     | $3s3p^2 - 3s3p(^1P^o)4s$      | $^4D - ^2P^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1509.101   | 100h      | 11.01     | $3s3p^2 - 3s3p(^1P^o)4s$      | $^4D - ^2P^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1512.072   | 50h       | 11.01     | $3s3p^2 - 3s3p(^1P^o)4s$      | $^4D - ^2P^o$ | $\frac{3}{2}$ | $\frac{1}{2}$ | 504,678     |
| Si II   | 1513.570   | 1         | 29        | $3s3p^2 - 3s3p(^1P^o)4d$      | $^2P - ^4D^o$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1516.910   | 6         | 29        | $3s3p^2 - 3s3p(^1P^o)4d$      | $^2P - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1518.221   | 5         | 29        | $3s3p^2 - 3s3p(^1P^o)4d$      | $^2P - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1526.7076  | 500       | 2         | $3s^23p - 3s^24s$             | $^4P^o - ^2S$ | $\frac{1}{2}$ | $\frac{1}{2}$ | 371,504,678 |
| Si II   | 1533.4320  | 1000      | 2         | $3s^23p - 3s^24s$             | $^4P^o - ^2S$ | $\frac{3}{2}$ | $\frac{1}{2}$ | 371,504,678 |
| Si II   | 1562.451   | 10        | 11        | $3s3p^2 - 3s^26f$             | $^4D - ^4F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1562.845   | 15        | 11        | $3s3p^2 - 3s^26f$             | $^4D - ^4F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1563.765   | 10        | 10.02     | $3s3p^2 - 3s^27p$             | $^2D - ^4P^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1564.066   | 5         | 10.02     | $3s3p^2 - 3s^27p$             | $^2D - ^4P^o$ | $\frac{3}{2}$ | $\frac{1}{2}$ | 504,678     |
| Si II   | 1661.059   | 3h        | 28        | $3s3p^2 - 2p^33p^1$           | $^2P - ^4P^o$ | $\frac{1}{2}$ | $\frac{1}{2}$ | 504,678     |
| Si II   | 1661.633   | 1h        | 28        | $3s3p^2 - 2p^33p^1$           | $^2P - ^4P^o$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1667.267   | 0         | 28        | $3s3p^2 - 2p^33p^1$           | $^2P - ^4P^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1704.967   | 2h        | 10.01     | $3s3p^2 - 3s^26p$             | $^2D - ^2P^o$ |               |               | 504,678     |
| Si II   | 1710.826   | 10h       | 10        | $3s3p^2 - 3s^25f$             | $^4D - ^2F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1711.296   | 20h       | 10        | $3s3p^2 - 3s^25f$             | $^4D - ^2F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1786.817   | 4         | 18.05     | $3s^23d - 2p^33p^1$           | $^4D - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1787.538   | 8         | 18.05     | $3s^23d - 2p^33p^1$           | $^4D - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1808.0117  | 150       | 1         | $3s^23p - 3s3p^2$             | $^4P^o - ^2D$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 370,504,678 |
| Si II   | 1816.9278  | 200       | 1         | $3s^23p - 3s3p^2$             | $^4P^o - ^2D$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 370,504,678 |
| Si II   | 1817.4511  | 10        | 1         | $3s^23p - 3s3p^2$             | $^4P^o - ^2D$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 370,504,678 |
| Si II   | 1868.765   | 1         | 9.02      | $3s3p^2 - 3s3p(^1P^o)3d$      | $^2D - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1869.317   | 20        | 9.02      | $3s3p^2 - 3s3p(^1P^o)3d$      | $^2D - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1870.227   | 15        | 9.02      | $3s3p^2 - 3s3p(^1P^o)3d$      | $^2D - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1870.782   | 3         | 9.02      | $3s3p^2 - 3s3p(^1P^o)3d$      | $^2D - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1902.459   | 100h      | 18.04     | $3s^2(^1S)3d - 3s3p(^1P^o)3d$ | $^2D - ^2F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1904.326   | 5h        | 31        | $3s^2(^1S)4d - 3s3p(^1P^o)4d$ | $^2D - ^2P^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1905.878   | 3h        | 31        | $3s^2(^1S)4d - 3s3p(^1P^o)4d$ | $^2D - ^2P^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1910.621   | 50h       | 18.04     | $3s^2(^1S)3d - 3s3p(^1P^o)3d$ | $^2D - ^2F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1911.265   | 0h        | 18.04     | $3s^2(^1S)3d - 3s3p(^1P^o)3d$ | $^2D - ^2F^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1941.667   | 50        | 27        | $3s3p^2 - 2p^33p^1$           | $^2P - ^2D^o$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1944.586   | 15        | 23        | $3s^2(^1S)4p - 3s3p(^1P^o)4p$ | $^2P^o - ^2P$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1945.504   | 3         | 23        | $3s^2(^1S)4p - 3s3p(^1P^o)4p$ | $^2P^o - ^2P$ | $\frac{1}{2}$ | $\frac{1}{2}$ | 504,678     |
| Si II   | 1947.769   | 1         | 23        | $3s^2(^1S)4p - 3s3p(^1P^o)4p$ | $^2P^o - ^2P$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1949.331   | 10        | 27        | $3s3p^2 - 2p^33p^1$           | $^2P - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |
| Si II   | 1949.564   | 100       | 27        | $3s3p^2 - 2p^33p^1$           | $^2P - ^2D^o$ | $\frac{3}{2}$ | $\frac{3}{2}$ | 504,678     |

Si III

## SILICON, Z = 14

Si III

Ground state  $1s^2 2s^2 2p^6 3s^2 3s_{1/2}$ Ionization potential 270 139.3 cm<sup>-1</sup>, 33.492 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term           | J-J | Reference   |
|---------|------------|-----------|-----------|------------------------------|----------------|-----|-------------|
| Si III  | 423.817    | P         | 3.04      | $3s^2 - 3p(^2P)4s$           | $g^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 426.644    | P         | 3.03      | $3s^2 - 3s(^2S)6p$           | $g^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 437.255    | P         | 3.02      | $3s^2 - 3p(^2P)3d$           | $g^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 466.129    | 80        | 3.01      | $3s^2 - 3s(^2S)5p$           | $g^1S - ^1P^o$ | 0-1 | 197,504,768 |
| Si III  | 510.079    | P         | 6.08      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1S$  | 0-1 | 504,768     |
| Si III  | 510.414    | P         | 6.08      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1S$  | 1-1 | 504,768     |
| Si III  | 511.096    | P         | 6.08      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1S$  | 2-1 | 504,768     |
| Si III  | 511.994    | P         | 6.07      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1P$  | 1-2 | 504,768     |
| Si III  | 512.219    | P         | 6.07      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1P$  | 0-1 | 504,768     |
| Si III  | 512.557    | P         | 6.07      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1P$  | 1-1 | 504,768     |
| Si III  | 512.681    | P         | 6.07      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1P$  | 2-2 | 504,768     |
| Si III  | 512.772    | P         | 6.07      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1P$  | 1-0 | 504,768     |
| Si III  | 513.245    | P         | 6.07      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1P$  | 2-1 | 504,768     |
| Si III  | 520.79     | 10        | 6.06      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1D$  | 1-2 | 504,768     |
| Si III  | 520.92     | 20        | 6.06      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1D$  | 2-3 | 504,768     |
| Si III  | 521.149    | P         | 6.06      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1D$  | 1-1 | 504,768     |
| Si III  | 521.510    | P         | 6.06      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1D$  | 2-2 | 504,768     |
| Si III  | 521.861    | P         | 6.06      | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1D$  | 2-1 | 504,768     |
| Si III  | 533.226    | P         | 6.05      | $3s3p - 3s6d$                | $^1P^o - ^1D$  | 0-1 | 504,768     |
| Si III  | 533.530    | P         | 6.05      | $3s3p - 3s6d$                | $^1P^o - ^1D$  | 1-2 | 504,768     |
| Si III  | 533.592    | P         | 6.05      | $3s3p - 3s6d$                | $^1P^o - ^1D$  | 1-1 | 504,768     |
| Si III  | 534.189    | P         | 6.05      | $3s3p - 3s6d$                | $^1P^o - ^1D$  | 2-3 | 504,768     |
| Si III  | 534.276    | P         | 6.05      | $3s3p - 3s6d$                | $^1P^o - ^1D$  | 2-2 | 504,768     |
| Si III  | 534.339    | P         | 6.05      | $3s3p - 3s6d$                | $^1P^o - ^1D$  | 2-1 | 504,768     |
| Si III  | 565.289    | 20        | 6.04      | $3s3p - 3s6s$                | $^1P^o - ^1S$  | 0-1 | 504,768     |
| Si III  | 565.698    | 40        | 6.04      | $3s3p - 3s6s$                | $^1P^o - ^1S$  | 1-1 | 504,768     |
| Si III  | 566.546    | P         | 6.04      | $3s3p - 3s6s$                | $^1P^o - ^1S$  | 2-1 | 504,768     |
| Si III  | 566.613    | 160       | 3         | $3s^2 - 3s4p$                | $g^1S - ^1P^o$ | 0-1 | 197,504,768 |
| Si III  | 567.878    | P         | 19        | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1S$  | 1-0 | 504,768     |
| Si III  | 573.538    | P         | 6.03      | $3s3p - 3s5d$                | $^1P^o - ^1D$  | 0-1 | 504,768     |
| Si III  | 573.951    | P         | 6.03      | $3s3p - 3s5d$                | $^1P^o - ^1D$  | 1-2 | 504,768     |
| Si III  | 573.961    | P         | 6.03      | $3s3p - 3s5d$                | $^1P^o - ^1D$  | 1-1 | 504,768     |
| Si III  | 574.799    | P         | 6.03      | $3s3p - 3s5d$                | $^1P^o - ^1D$  | 2-3 | 504,768     |
| Si III  | 574.814    | P         | 6.03      | $3s3p - 3s5d$                | $^1P^o - ^1D$  | 2-2 | 504,768     |
| Si III  | 574.824    | P         | 6.03      | $3s3p - 3s5d$                | $^1P^o - ^1D$  | 2-1 | 504,768     |
| Si III  | 605.873    | P         | 18        | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1D$  | 1-2 | 504,768     |
| Si III  | 624.997    | P         | 17        | $3s(^2S)3p - 3p(^2P)4p$      | $^1P^o - ^1P$  | 1-1 | 504,768     |
| Si III  | 634.255    | P         | 16        | $3s3p - 3s6d$                | $^1P^o - ^1D$  | 1-2 | 504,768     |
| Si III  | 651.668    | 80        | 6.02      | $3s3p - 3s5s$                | $^1P^o - ^1S$  | 0-1 | 197,504,768 |
| Si III  | 652.223    | 120       | 6.02      | $3s3p - 3s5s$                | $^1P^o - ^1S$  | 1-1 | 197,504,768 |
| Si III  | 653.332    | 160       | 6.02      | $3s3p - 3s5s$                | $^1P^o - ^1S$  | 2-1 | 197,504,768 |
| Si III  | 671.718    | 40        | 6.01      | $3s3p - 3s4d$                | $^1P^o - ^1D$  | 0-1 | 504,768     |
| Si III  | 672.293    | 80        | 6.01      | $3s3p - 3s4d$                | $^1P^o - ^1D$  | 1-2 | 504,768     |
| Si III  | 673.477    | 100       | 6.01      | $3s3p - 3s4d$                | $^1P^o - ^1D$  | 2-3 | 504,768     |
| Si III  | 678.055    | 40        | 15        | $3s3p - 3s6s$                | $^1P^o - ^1S$  | 1-0 | 504,768     |
| Si III  | 690.689    | 40        | 14        | $3s3p - 3s5d$                | $^1P^o - ^1D$  | 1-2 | 504,768     |
| Si III  | 800.066    | 100       | 13        | $3s3p - 3s5s$                | $^1P^o - ^1S$  | 1-0 | 504,768     |
| Si III  | 822.004    | P         | 29        | $2p^6 3p^2 - 2p^6 3s6f$      | $^1D - ^1F^o$  | 2-3 | 504,768     |
| Si III  | 823.408    | 180       | 12        | $3s3p - 3s4d$                | $^1P^o - ^1D$  | 1-2 | 197,504,768 |
| Si III  | 879.233    | 10        | 28        | $2p^6 3p^2 - 2p^6 3p(^2P)4s$ | $^1D - ^1P^o$  | 2-1 | 504,768     |
| Si III  | 883.398    | 100       | 27        | $2p^6 3p^2 - 2p^6 3p(^2P)3d$ | $^1D - ^1F^o$  | 2-3 | 504,768     |
| Si III  | 891.479    | P         | 26        | $2p^6 3p^2 - 3s6p$           | $^1D - ^1P^o$  | 2-1 | 504,768     |
| Si III  | 936.056    | 25        | 44        | $3s3d - 3s7f$                | $^1D - ^1F^o$  | 3-4 | 504,768     |
| Si III  | 936.058    | 2         | 44        | $3s3d - 3s7f$                | $^1D - ^1F^o$  | 3-3 | 504,768     |
| Si III  | 936.060    | 1         | 44        | $3s3d - 3s7f$                | $^1D - ^1F^o$  | 3-2 | 504,768     |

## Si III

## Si III

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term           | J-J | Reference   |
|---------|------------|-----------|-----------|------------------------------|----------------|-----|-------------|
| Si III  | 936.077    | 18        | 44        | 3s3d - 3s7f                  | $^1D - ^1F$    | 2-3 | 504,768     |
| Si III  | 936.079    | 2         | 44        | 3s3d - 3s7f                  | $^1D - ^1F$    | 2-2 | 504,768     |
| Si III  | 936.100    | 12        | 44        | 3s3d - 3s7f                  | $^1D - ^1F$    | 1-2 | 504,768     |
| Si III  | 939.093    | 140       | 25        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^1D - ^1P^o$  | 2-1 | 197,504,768 |
| Si III  | 967.936    | 180       | 24        | $2p^63p^2 - 3s5f$            | $^1D - ^1F$    | 2-3 | 197,504,768 |
| Si III  | 993.519    | 200       | 6         | 3s3p - 3s4s                  | $^1P^o - ^1S$  | 0-1 | 197,504,768 |
| Si III  | 994.787    | 260       | 6         | 3s3p - 3s4s                  | $^1P^o - ^1S$  | 1-1 | 197,504,768 |
| Si III  | 997.389    | 320       | 6         | 3s3p - 3s4s                  | $^1P^o - ^1S$  | 2-1 | 197,504,768 |
| Si III  | 1005.349   | 60        | 43        | 3s3d - 3s6f                  | $^1D - ^1F$    | 3-4 | 504,768     |
| Si III  | 1005.353   | 5         | 43        | 3s3d - 3s6f                  | $^1D - ^1F$    | 3-3 | 504,768     |
| Si III  | 1005.357   | 1         | 43        | 3s3d - 3s6f                  | $^1D - ^1F$    | 3-2 | 504,768     |
| Si III  | 1005.374   | 40        | 43        | 3s3d - 3s6f                  | $^1D - ^1F$    | 2-3 | 504,768     |
| Si III  | 1005.378   | 5         | 43        | 3s3d - 3s6f                  | $^1D - ^1F$    | 2-2 | 504,768     |
| Si III  | 1005.403   | 30        | 43        | 3s3d - 3s6f                  | $^1D - ^1F$    | 1-2 | 504,768     |
| Si III  | 1031.169   | 140       | 33        | $2p^63p^2 - 2p^63p(^1P^o)4s$ | $^1P - ^1P^o$  | 1-2 | 504,768     |
| Si III  | 1032.851   | 60        | 33        | $2p^63p^2 - 2p^63p(^1P^o)4s$ | $^1P - ^1P^o$  | 0-1 | 504,768     |
| Si III  | 1033.920   | 160       | 33        | $2p^63p^2 - 2p^63p(^1P^o)4s$ | $^1P - ^1P^o$  | 2-2 | 504,768     |
| Si III  | 1034.287   | 80        | 33        | $2p^63p^2 - 2p^63p(^1P^o)4s$ | $^1P - ^1P^o$  | 1-1 | 504,768     |
| Si III  | 1035.657   | 60        | 33        | $2p^63p^2 - 2p^63p(^1P^o)4s$ | $^1P - ^1P^o$  | 1-0 | 504,768     |
| Si III  | 1037.053   | 140       | 33        | $2p^63p^2 - 2p^63p(^1P^o)4s$ | $^1P - ^1P^o$  | 2-1 | 504,768     |
| Si III  | 1083.210   | 120       | 23        | $2p^63p^2 - 3s5p$            | $^1D - ^1P^o$  | 2-1 | 504,768     |
| Si III  | 1092.915   | P         | 42        | 3s3d - 3s6p                  | $^1D - ^1P^o$  | 3-2 | 504,768     |
| Si III  | 1092.940   | P         | 42        | 3s3d - 3s6p                  | $^1D - ^1P^o$  | 2-2 | 504,768     |
| Si III  | 1092.969   | P         | 42        | 3s3d - 3s6p                  | $^1D - ^1P^o$  | 1-2 | 504,768     |
| Si III  | 1093.105   | P         | 42        | 3s3d - 3s6p                  | $^1D - ^1P^o$  | 2-1 | 504,768     |
| Si III  | 1093.133   | P         | 42        | 3s3d - 3s6p                  | $^1D - ^1P^o$  | 1-1 | 504,768     |
| Si III  | 1093.293   | P         | 42        | 3s3d - 3s6p                  | $^1D - ^1P^o$  | 1-0 | 504,768     |
| Si III  | 1108.368   | 280       | 5         | 3s3p - 3s3d                  | $^3P^o - ^1D$  | 0-1 | 197,504,768 |
| Si III  | 1109.965   | 320       | 5         | 3s3p - 3s3d                  | $^3P^o - ^1D$  | 1-2 | 197,504,768 |
| Si III  | 1113.228   | 360       | 5         | 3s3p - 3s3d                  | $^3P^o - ^1D$  | 2-3 | 197,504,768 |
| Si III  | 1140.545   | 120       | 32        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1D^o$  | 0-1 | 504,768     |
| Si III  | 1141.580   | 140       | 32        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1D^o$  | 1-2 | 504,768     |
| Si III  | 1142.282   | 120       | 32        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1D^o$  | 1-1 | 504,768     |
| Si III  | 1144.306   | 160       | 32        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1D^o$  | 2-3 | 504,768     |
| Si III  | 1144.959   | 120       | 32        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1D^o$  | 2-2 | 504,768     |
| Si III  | 1145.122   | 150       | 41        | 3s3d - 3s5f                  | $^3D - ^3F^o$  | 3-4 | 504,768     |
| Si III  | 1145.149   | 13        | 41        | 3s3d - 3s5f                  | $^3D - ^3F^o$  | 3-3 | 504,768     |
| Si III  | 1145.16    | 1         | 41        | 3s3d - 3s5f                  | $^3D - ^3F^o$  | 3-2 | 504,768     |
| Si III  | 1145.177   | 80        | 41        | 3s3d - 3s5f                  | $^3D - ^3F^o$  | 2-3 | 504,768     |
| Si III  | 1145.19    | 10        | 41        | 3s3d - 3s5f                  | $^3D - ^3F^o$  | 2-2 | 504,768     |
| Si III  | 1145.22    | 50        | 41        | 3s3d - 3s5f                  | $^3D - ^3F^o$  | 1-2 | 504,768     |
| Si III  | 1145.669   | P         | 32        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1D^o$  | 2-1 | 504,768     |
| Si III  | 1154.998   | 120       | 31        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1P^o$  | 0-1 | 504,768     |
| Si III  | 1155.957   | 120       | 31        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1P^o$  | 1-0 | 504,768     |
| Si III  | 1156.782   | 80        | 31        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1P^o$  | 1-1 | 504,768     |
| Si III  | 1158.102   | 140       | 31        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1P^o$  | 1-2 | 504,768     |
| Si III  | 1160.255   | 120       | 31        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1P^o$  | 2-1 | 504,768     |
| Si III  | 1161.579   | 160       | 31        | $2p^63p^2 - 2p^63p(^1P^o)3d$ | $^3P - ^1P^o$  | 2-2 | 504,768     |
| Si III  | 1172.529   | 80        | 30        | $2p^63p^2 - 3s5p$            | $^3P - ^3P^o$  | 0-1 | 504,768     |
| Si III  | 1174.369   | 100       | 30        | $2p^63p^2 - 3s5p$            | $^3P - ^3P^o$  | 1-1 | 504,768     |
| Si III  | 1174.432   | 120       | 30        | $2p^63p^2 - 3s5p$            | $^3P - ^3P^o$  | 1-2 | 504,768     |
| Si III  | 1178.004   | 160       | 30        | $2p^63p^2 - 3s5p$            | $^3P - ^3P^o$  | 2-2 | 504,768     |
| Si III  | 1182.018   | 60        | 64        | 3s3d - 3s7f                  | $^1D - ^1F^o$  | 2-3 | 504,768     |
| Si III  | 1192.228   | P         | 40        | $3s(^1S)3d - 3p(^1P^o)4s$    | $^3D - ^1P^o$  | 3-2 | 504,768     |
| Si III  | 1192.258   | P         | 40        | $3s(^1S)3d - 3p(^1P^o)4s$    | $^3D - ^1P^o$  | 2-2 | 504,768     |
| Si III  | 1192.293   | P         | 40        | $3s(^1S)3d - 3p(^1P^o)4s$    | $^3D - ^1P^o$  | 1-2 | 504,768     |
| Si III  | 1196.436   | P         | 40        | $3s(^1S)3d - 3p(^1P^o)4s$    | $^3D - ^1P^o$  | 2-1 | 504,768     |
| Si III  | 1196.470   | P         | 40        | $3s(^1S)3d - 3p(^1P^o)4s$    | $^3D - ^1P^o$  | 1-1 | 504,768     |
| Si III  | 1198.297   | P         | 40        | $3s(^1S)3d - 3p(^1P^o)4s$    | $^3D - ^1P^o$  | 1-0 | 504,768     |
| Si III  | 1206.510   | 600       | 2         | $3s^2 - 3s3p$                | $g^1S - ^1P^o$ | 0-1 | 504,768     |

Si III

Si III

| Element | Wavelength | Intensity | Multiplet | Configuration                                                                       | Term          | J-J | Reference   |
|---------|------------|-----------|-----------|-------------------------------------------------------------------------------------|---------------|-----|-------------|
| Si III  | 1206.533   | 600       | 11        | 3s3p - 3s3d                                                                         | $^1P^o - ^1D$ | 1-2 | 504,768     |
| Si III  | 1207.517   | 180       | 22        | 2p <sup>2</sup> 3p <sup>2</sup> - 2p <sup>2</sup> 3p <sup>2</sup> P <sup>2</sup> 3d | $^1D - ^1D^o$ | 2-2 | 504,768     |
| Si III  | 1210.456   | 200       | 21        | 2p <sup>2</sup> 3p <sup>2</sup> - 3s4f                                              | $^1D - ^1F^o$ | 2-3 | 504,768     |
| Si III  | 1212.011   | 40        | 50        | 2p <sup>2</sup> 3p <sup>2</sup> - 2p <sup>2</sup> 3p <sup>2</sup> P <sup>2</sup> 4s | $^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 1212.247   | P         | 74        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1S$ | 1-0 | 504,768     |
| Si III  | 1235.431   | 140       | 49        | 2p <sup>2</sup> 3p <sup>2</sup> - 3s6p                                              | $^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 1280.354   | 120       | 63        | 3s3d - 3s6f                                                                         | $^1D - ^1F^o$ | 2-3 | 504,768     |
| Si III  | 1294.545   | 340       | 4         | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P - ^1P$   | 1-2 | 197,504,768 |
| Si III  | 1296.726   | 280       | 4         | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P - ^1P$   | 0-1 | 197,504,768 |
| Si III  | 1298.891   | 300       | 4         | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P - ^1P$   | 1-1 | 197,504,768 |
| Si III  | 1298.960   | 360       | 4         | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P - ^1P$   | 2-2 | 504,768     |
| Si III  | 1300.703   | P         | 54        | 3s4s - 3p( <sup>2</sup> P <sup>o</sup> )4s                                          | $^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 1301.146   | 280       | 4         | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P - ^1P$   | 1-0 | 197,504,768 |
| Si III  | 1303.320   | 320       | 4         | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P - ^1P$   | 2-1 | 197,504,768 |
| Si III  | 1312.590   | 260       | 10        | 3s3p - 3s4s                                                                         | $^1P - ^1S$   | 1-0 | 197,504,768 |
| Si III  | 1327.703   | P         | 53        | 3s4s - 3s6p                                                                         | $^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 1328.80    | P         | 48        | 2p <sup>2</sup> 3p <sup>2</sup> - 2p <sup>2</sup> 3p <sup>2</sup> P <sup>2</sup> 3d | $^1S - ^1P^o$ | 0-1 | 504,768     |
| Si III  | 1341.465   | 160       | 39        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1D^o$ | 3-3 | 504,768     |
| Si III  | 1341.496   | P         | 39        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1D^o$ | 2-3 | 504,768     |
| Si III  | 1342.351   | P         | 39        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1D^o$ | 3-2 | 504,768     |
| Si III  | 1342.392   | 140       | 39        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1D^o$ | 2-2 | 504,768     |
| Si III  | 1342.432   | P         | 39        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1D^o$ | 1-2 | 504,768     |
| Si III  | 1343.388   | 120       | 39        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1D^o$ | -1  | 504,768     |
| Si III  | 1359.751   | P         | 68        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1S$ | 0-1 | 504,768     |
| Si III  | 1360.360   | 20        | 68        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1S$ | 1-1 | 504,768     |
| Si III  | 1361.597   | 160       | 46        | 3s( <sup>2</sup> S)4s - 3p( <sup>2</sup> P <sup>o</sup> )4s                         | $^1S - ^1P^o$ | 1-2 | 197,504,768 |
| Si III  | 1361.719   | P         | 68        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1S$ | 2-1 | 504,768     |
| Si III  | 1362.366   | 100       | 38        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1P^o$ | 1-0 | 504,768     |
| Si III  | 1363.459   | 140       | 38        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1P^o$ | 2-1 | 504,768     |
| Si III  | 1363.504   | P         | 38        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1P^o$ | 1-1 | 504,768     |
| Si III  | 1365.253   | 160       | 38        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1P^o$ | 3-2 | 504,768     |
| Si III  | 1365.292   | P         | 38        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1P^o$ | 2-2 | 504,768     |
| Si III  | 1365.337   | P         | 38        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1D - ^1P^o$ | 1-2 | 504,768     |
| Si III  | 1367.049   | 140       | 46        | 3s( <sup>2</sup> S)4s - 3p( <sup>2</sup> P <sup>o</sup> )4s                         | $^1S - ^1P^o$ | 1-1 | 197,504,768 |
| Si III  | 1369.437   | 100       | 46        | 3s( <sup>2</sup> S)4s - 3p( <sup>2</sup> P <sup>o</sup> )4s                         | $^1S - ^1P^o$ | 1-0 | 504,768     |
| Si III  | 1371.652   | 60        | 67        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1P$ | 1-2 | 504,768     |
| Si III  | 1373.030   | 100       | 67        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1P$ | 2-2 | 504,768     |
| Si III  | 1375.083   | 40        | 67        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1P$ | 0-1 | 504,768     |
| Si III  | 1375.688   | 40        | 67        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1P$ | 1-1 | 504,768     |
| Si III  | 1377.082   | 60        | 67        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1P$ | 2-1 | 504,768     |
| Si III  | 1377.238   | 40        | 67        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1P$ | 1-0 | 504,768     |
| Si III  | 1387.948   | 25        | 37        | 3s3d - 3s5p                                                                         | $^1D - ^1P^o$ | 2-1 | 504,768     |
| Si III  | 1387.979   | 10        | 37        | 3s3d - 3s5p                                                                         | $^1D - ^1P^o$ | 1-0 | 504,768     |
| Si III  | 1387.994   | 8         | 37        | 3s3d - 3s5p                                                                         | $^1D - ^1P^o$ | 1-1 | 504,768     |
| Si III  | 1388.011   | 50        | 37        | 3s3d - 3s5p                                                                         | $^1D - ^1P^o$ | 3-2 | 504,768     |
| Si III  | 1388.052   | 8         | 37        | 3s3d - 3s5p                                                                         | $^1D - ^1P^o$ | 2-2 | 504,768     |
| Si III  | 1388.098   | 1         | 37        | 3s3d - 3s5p                                                                         | $^1D - ^1P^o$ | 1-2 | 504,768     |
| Si III  | 1399.615   | P         | 73        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1D$ | 1-2 | 504,768     |
| Si III  | 1417.237   | 260       | 9         | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P^o - ^1S$ | 1-0 | 197,504,768 |
| Si III  | 1424.775   | 40        | 62        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )4s                         | $^1D - ^1P^o$ | 2-1 | 504,768     |
| Si III  | 1433.690   | 120       | 66        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1D$ | 2-3 | 504,768     |
| Si III  | 1435.776   | 160       | 61        | 3s( <sup>2</sup> S)3d - 3p( <sup>2</sup> P <sup>o</sup> )4d                         | $^1D - ^1F^o$ | 2-3 | 197,504,768 |
| Si III  | 1436.166   | 140       | 52        | 3s( <sup>2</sup> S)4s - 3p( <sup>2</sup> P <sup>o</sup> )3d                         | $^1S - ^1P^o$ | 0-1 | 197,504,768 |
| Si III  | 1436.724   | 80        | 66        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1D$ | 1-2 | 504,768     |
| Si III  | 1438.228   | 40        | 66        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1D$ | 2-2 | 504,768     |
| Si III  | 1438.702   | 40        | 66        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1D$ | 0-1 | 504,768     |
| Si III  | 1439.391   | 40        | 66        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1D$ | 1-1 | 504,768     |
| Si III  | 1440.908   | P         | 66        | 3s( <sup>2</sup> S)4p - 3p( <sup>2</sup> P <sup>o</sup> )4p                         | $^1P^o - ^1D$ | 2-1 | 504,768     |
| Si III  | 1441.732   | 100       | 3.05      | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P^o - ^1D$ | 1-2 | 504,768     |
| Si III  | 1447.196   | 120       | 3.05      | 3s3p - 2p <sup>2</sup> 3p <sup>2</sup>                                              | $^1P^o - ^1D$ | 2-2 | 504,768     |



Si III

Si III

| Element | Wavelength | Intensity | Multiplet | Configuration                                                                 | Term             | J-J | Reference   |
|---------|------------|-----------|-----------|-------------------------------------------------------------------------------|------------------|-----|-------------|
| Si III  | 1457.253   | 100       | 60        | 3s3d - 3s6p                                                                   | $^1D - ^1P$      | 2-1 | 504,768     |
| Si III  | 1500.241   | 240       | 36        | 3s3d - 3s4f                                                                   | $^1D - ^1F$      | 3-4 | 197,504,768 |
| Si III  | 1501.156   | P         | 36        | 3s3d - 3s3f                                                                   | $^1D - ^1F$      | 3-3 | 197,504,768 |
| Si III  | 1501.191   | 200       | 36        | 3s3d - 3s4f                                                                   | $^1D - ^1F$      | 2-3 | 197,504,768 |
| Si III  | 1501.780   | P         | 36        | 3s3d - 3s4f                                                                   | $^1D - ^1F$      | 3-2 | 504,768     |
| Si III  | 1501.827   | P         | 36        | 3s3d - 3s4f                                                                   | $^1D - ^1F$      | 2-2 | 197,504,768 |
| Si III  | 1501.870   | 180       | 36        | 3s3d - 3s4f                                                                   | $^1D - ^1F$      | 1-2 | 504,768     |
| Si III  | 1506.060   | 120       | 72        | 3s <sup>2</sup> (S)4p - 3p <sup>2</sup> (P)4p                                 | $^1P^o - ^1P$    | 1-1 | 504,768     |
| Si III  | 1513.533   | 40        | 94        | 2p <sup>6</sup> 3p( <sup>2</sup> P)3d - 2p <sup>6</sup> 3p( <sup>2</sup> P)5f | $^1F^o - F[7/2]$ | 3-3 | 504,768     |
| Si III  | 1560.974   | P         | 71        | 3s4p - 3s6d                                                                   | $^1P^o - ^1D$    | 1-2 | 504,768     |
| Si III  | 1588.950   | 40        | 59        | 3s <sup>2</sup> (S)3d - 3p <sup>2</sup> (P)3d                                 | $^1D - ^1P^o$    | 2-1 | 504,768     |
| Si III  | 1622.892   | P         | 45        | 3s4s - 3s5p                                                                   | $^3S - ^3P$      | 1-0 | 504,768     |
| Si III  | 1622.913   | P         | 45        | 3s4s - 3s5p                                                                   | $^3S - ^3P^o$    | 1-1 | 504,768     |
| Si III  | 1623.055   | P         | 45        | 3s4s - 3s5p                                                                   | $^3S - ^3P^o$    | 1-2 | 504,768     |
| Si III  | 1636.990   | 20        | 47        | 2p <sup>6</sup> 3p <sup>2</sup> - 3s5p                                        | $^3S - ^3P$      | 0-1 | 504,768     |
| Si III  | 1673.315   | 140       | 58        | 3s3d - 3s5f                                                                   | $^1D - ^1F$      | 2-3 | 504,768     |
| Si III  | 1778.715   | P         | 35        | 3s <sup>2</sup> (S)3d - 3p <sup>2</sup> (P)3d                                 | $^1D - ^1F$      | 3-4 | 504,768     |
| Si III  | 1783.079   | P         | 35        | 3s <sup>2</sup> (S)3d - 3p <sup>2</sup> (P)3d                                 | $^1D - ^1F$      | 3-3 | 504,768     |
| Si III  | 1783.146   | P         | 35        | 3s <sup>2</sup> (S)3d - 3p <sup>2</sup> (P)3d                                 | $^1D - ^1F$      | 2-3 | 504,768     |
| Si III  | 1786.371   | P         | 35        | 3s <sup>2</sup> (S)3d - 3p <sup>2</sup> (P)3d                                 | $^1D - ^1F$      | 3-2 | 504         |
| Si III  | 1786.438   | P         | 35        | 3s <sup>2</sup> (S)3d - 3p <sup>2</sup> (P)3d                                 | $^1D - ^1F$      | 2-2 | 504,768     |
| Si III  | 1786.515   | P         | 35        | 3s <sup>2</sup> (S)3d - 3p <sup>2</sup> (P)3d                                 | $^1D - ^1F$      | 1-2 | 504,768     |
| Si III  | 1803.023   | 60        | 51        | 3s4s - 3s5p                                                                   | $^3S - ^3P^o$    | 0-1 | 504,768     |
| Si III  | 1838.466   | P         | 65        | 3s4p - 3s6s                                                                   | $^1P - ^3S$      | 0-1 | 504,768     |
| Si III  | 1839.585   | P         | 65        | 3s4p - 3s6s                                                                   | $^1P - ^3S$      | 1-1 | 504,768     |
| Si III  | 1842.064   | P         | 65        | 3s4p - 3s6s                                                                   | $^1P - ^3S$      | 2-1 | 504,768     |
| Si III  | 1842.547   | 180       | 20        | 2p <sup>6</sup> 3p <sup>2</sup> - 3s4p                                        | $^1D - ^1P^o$    | 2-1 | 504,768     |
| Si III  | 1856.062   | 20        | 70        | 3s4p - 3s6s                                                                   | $^1P - ^3S$      | 1-0 | 504,768     |
| Si III  | 1892.030   | 60        | 1         | 3s <sup>2</sup> - 3s3p                                                        | $^3S - ^3P$      | 0-1 | 504,768     |
| Si III  | 1953.968   | P         | 69        | 3s4p - 3s5d                                                                   | $^1P^o - ^1D$    | 1-2 | 504,768     |
| Si III  | 1979.233   | P         | 83        | 3s4d - 3s8f                                                                   | $^1D - ^1F$      | 2-3 | 504,768     |

Si IV

## SILICON, Z = 14

Si IV

Ground state  $1s^2 2s^2 2p^6 3s^2 S_{1/2}$ Ionization potential 364 093.1 cm<sup>-1</sup>, 45.141 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J                       | Reference   |
|---------|------------|-----------|-----------|---------------|----------------|-----------------------------|-------------|
| Si IV   | 327.137    | P         | 2.02      | 3s - 6p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 327.181    | P         | 2.02      | 3s - 6p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 361.560    | P         | 2.01      | 3s - 5p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 197,504,767 |
| Si IV   | 361.659    | P         | 2.01      | 3s - 5p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 412.155    | P         | 9         | 3p - 6d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 412.939    | P         | 9         | 3p - 6d       | $^1P^o - ^1D$  | $\frac{3}{2} -$             | 504,767     |
| Si IV   | 437.849    | P         | 8         | 3p - 6s       | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 438.734    | P         | 8         | 3p - 6s       | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 454.112    | P         | 7         | 3p - 5d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 197,504,767 |
| Si IV   | 455.065    | P         | 7         | 3p - 5d       | $^1P^o - ^1D$  | $\frac{3}{2} -$             | 197,504,767 |
| Si IV   | 457.818    | 250       | 2         | 3s - 4p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 197,504,767 |
| Si IV   | 458.155    | 200       | 2         | 3s - 4p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 515.118    | 150       | 6         | 3p - 5s       | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 516.348    | 200       | 6         | 3p - 5s       | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 559.533    | 2         | 5         | 3p - 4d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 197,677,504 |
| Si IV   | 560.980    | 5         | 5         | 3p - 4d       | $^1P^o - ^1D$  | $\frac{3}{2} -$             | 197,677,504 |
| Si IV   | 645.759    | 150       | 15        | 3d - 6f       | $^1D - ^1F^o$  |                             | 504,767     |
| Si IV   | 688.194    | 1         | 14        | 3d - 6p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 504,677,767 |
| Si IV   | 688.200    | P         | 14        | 3d - 6p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 504         |
| Si IV   | 688.395    | P         | 14        | 3d - 6p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 504         |
| Si IV   | 749.941    | 300       | 13        | 3d - 5f       | $^1D - ^1F^o$  |                             | 197,504,767 |
| Si IV   | 815.049    | 500       | 4         | 3p - 4s       | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 818.129    | 550       | 4         | 3p - 4s       | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 860.551    | P         | 12        | 3d - 5p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 860.560    | 20        | 12        | 3d - 5p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 504,677,767 |
| Si IV   | 861.118    | 5         | 12        | 3d - 5p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 504,677,767 |
| Si IV   | 895.228    | P         | 17        | 4s - 6p       | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 895.558    | P         | 17        | 4s - 6p       | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 1045.500   | P         | 21        | 4p - 6d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 1047.271   | P         | 21        | 4p - 6d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 1066.629   | 550       | 11        | 3d - 4f       | $^1D - ^1F^o$  |                             | 197,504,767 |
| Si IV   | 1122.486   | 550       | 3         | 3p - 3d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 197,504,767 |
| Si IV   | 1128.325   | P         | 3         | 3p - 3d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 197,504,767 |
| Si IV   | 1128.340   | 650       | 3         | 3p - 3d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 1210.652   | P         | 16        | 4s - 5p       | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 1211.757   | P         | 16        | 4s - 5p       | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 1228.349   | P         | 20        | 4p - 6s       | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 1230.795   | P         | 20        | 4p - 6s       | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 1365.549   | P         | 19        | 4p - 5d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 1368.571   | P         | 19        | 4p - 5d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 1368.573   | P         | 19        | 4p - 5d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 1393.755   | 1000      | 1         | 3s - 3p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 197,504,767 |
| Si IV   | 1402.770   | 800       | 1         | 3s - 3p       | $g^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 197,504,767 |
| Si IV   | 1533.220   | P         | 24        | 4d - 6f       | $^1D - ^1F^o$  |                             | 504,767     |
| Si IV   | 1634.607   | 70        | 28        | 4f - 6g       | $^1F^o - ^1G$  |                             | 504,767     |
| Si IV   | 1672.612   | P         | 27        | 4f - 6d       | $^1F^o - ^1D$  |                             | 504,767     |
| Si IV   | 1722.534   | 400       | 10        | 3d - 4p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 1727.377   | 300       | 10        | 3d - 4p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 1796.162   | P         | 23        | 4d - 6p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 504,767     |
| Si IV   | 1796.166   | P         | 23        | 4d - 6p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 504,767     |
| Si IV   | 1797.496   | P         | 23        | 4d - 6p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 504,767     |

Si V

## SILICON, Z = 14

Si V

Ground state  $1s^2 2s^2 2p^2 \ ^3S_1$ Ionization potential  $1.345 \times 10^6 \text{ cm}^{-1}$ , 166.77 eV

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                                | J - J | Reference |
|---------|------------|-----------|-----------|------------------------|-------------------------------------|-------|-----------|
| Si V    | 77.360     | 10        |           |                        |                                     |       | 231       |
| Si V    | 78.611     | 50        |           | $2p^2 - 2p^2(^1P^o)6d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 78.903     | 50        |           | $2p^2 - 2p^2(^1P^o)6d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 80.807     | 100       |           | $2p^2 - 2p^2(^1P^o)5d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 81.113     | 100       |           | $2p^2 - 2p^2(^1P^o)5d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 85.175     | 500       |           | $2p^2 - 2p^2(^1P^o)4d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 85.579     | 300       |           | $2p^2 - 2p^2(^1P^o)4d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 90.453     | 200       |           | $2p^2 - 2p^2(^1P^o)4s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 90.852     | 200       |           | $2p^2 - 2p^2(^1P^o)4s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 96.439     | 750       |           | $2p^2 - 2p^2(^1P^o)3d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 97.143     | 500       |           | $2p^2 - 2p^2(^1P^o)3d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 98.209     | 100       |           | $2p^2 - 2p^2(^1P^o)3d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 231       |
| Si V    | 117.860    | 1000      |           | $2p^2 - 2p^2(^1P^o)3s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197,231   |
| Si V    | 118.968    | 1000      |           | $2p^2 - 2p^2(^1P^o)3s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197,231   |

Si VI

## SILICON, Z = 14

Si VI

Ground state  $1s^2 2s^2 2p^2 \ ^3P_1$ Ionization potential 1 654 900  $\text{cm}^{-1}$ , 205.16 eV

| Element | Wavelength | Intensity | Multiplet | Configuration        | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------|----------------|-----------------------------|-----------|
| Si VI   | 65.004     | 20d       |           | $2p^3 - 2p^4(^1D)5d$ | $K^2P^0 - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 65.211     | 10        |           | $2p^3 - 2p^4(^1D)5d$ | $K^2P^0 - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 66.772     | 20        |           | $2p^3 - 2p^4(^1P)5d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 66.796     | 10        |           | $2p^3 - 2p^4(^1S)4d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 69.204     | 50d       |           | $2p^3 - 2p^4(^1D)4d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 69.236     | 250       |           | $2p^3 - 2p^4(^1D)4d$ | $K^2P^0 - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 69.421     | 50        |           | $2p^3 - 2p^4(^1D)4d$ | $K^2P^0 - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 69.448     | 100d      |           | $2p^3 - 2p^4(^1D)4d$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.181     | 250       |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.273     | 100       |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.304     | 10        |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 71.340     | 50        |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.366     | 150       |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.384     | 200b      |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.474     | 50        |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.534     | 50        |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.561     | 50        |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 71.644     | 10        |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 71.718     | 10        |           | $2p^3 - 2p^4(^3P)4d$ | $K^2P^0 - ^4F$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 72.896     | 50        |           | $2p^3 - 2p^4(^1D)4s$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 75.193     | 200b      |           | $2p^3 - 2p^4(^3P)4s$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI?  | 75.398     | 150       |           |                      |                |                             | 231       |
| Si VI   | 75.486     | 50        |           | $2p^3 - 2p^4(^3P)4s$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 75.587     | 50        |           | $2p^3 - 2p^4(^3P)4s$ | $K^2P^0 - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 77.429     | 500       |           | $2p^3 - 2p^4(^1S)3d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 77.718     | 300       |           | $2p^3 - 2p^4(^1S)3d$ | $K^2P^0 - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 80.395     | 250       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 80.449     | 500       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 80.491     | 250       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 80.501     | 500       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 80.577     | 600       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 80.698     | 500       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 80.725     | 500       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 80.821     | 400       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 80.908     | 400       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 81.030     | 350       |           | $2p^3 - 2p^4(^1D)3d$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 83.006     | 200       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.128     | 750       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.258     | 250       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.283     | 50        |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 83.358     | 400       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.526     | 400       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.611     | 400       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.639     | 150       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 83.684     | 50        |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 83.729     | 50        |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.802     | 300       |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^4F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 83.965     | 10        |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 84.082     | 600b      |           | $2p^3 - 2p^4(^3P)3d$ | $K^2P^0 - ^4F$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 91.369     | 200       |           | $2p^3 - 2p^4(^1S)3s$ | $K^2P^0 - ^2S$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 91.798     | 200       |           | $2p^3 - 2p^4(^1S)3s$ | $K^2P^0 - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 96.020     | 500       |           | $2p^3 - 2p^4(^1D)3s$ | $K^2P^0 - ^2D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 96.488     | 500       |           | $2p^3 - 2p^4(^1D)3s$ | $K^2P^0 - ^2D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VI   | 99.095     | 500       |           | $2p^3 - 2p^4(^3P)3s$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VI   | 99.460     | 750       |           | $2p^3 - 2p^4(^3P)3s$ | $K^2P^0 - ^2P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |

Si VI

Si VI

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term         | J-J         | Reference |
|---------|------------|-----------|-----------|------------------------|--------------|-------------|-----------|
| Si VI   | 99 598     | 500       |           | $2p^5 - 2p^6(P)3s$     | $g^2P - ^2P$ | $1_2 - 1_2$ | 231       |
| Si VI   | 99 966     | 500       |           | $2p^5 - 2p^6(P)3s$     | $g^2P - ^2P$ | $1_2 - 3_2$ | 231       |
| Si VI   | 100 640    | 500d      |           | $2p^5 - 2p^6(P)3s$     | $g^2P - ^4P$ | $3_2 - 3_2$ | 231       |
| Si VI   | 100 963    | 50        |           | $2p^5 - 2p^6(P)3s$     | $g^2P - ^4P$ | $3_2 - 3_2$ | 231       |
| Si VI   | 101 160    | 10        |           | $2p^5 - 2p^6(P)3s$     | $g^2P - ^4P$ | $1_2 - 3_2$ | 231       |
| Si VI   | 102 846    | 50        |           | $2s2p^6 - 2s2p^6(P)3s$ | $^3S - ^2P$  | $1_2 - 1_2$ | 231       |
| Si VI   | 103 163    | 100       |           | $2s2p^6 - 2s2p^6(P)3s$ | $^3S - ^2P$  | $1_2 - 3_2$ | 231       |
| Si VI   | 246 001    | 400       |           | $2s^22p^5 - 2s2p^6$    | $g^2P - ^3S$ | $3_2 - 1_2$ | 197,231   |
| Si VI   | 249 125    | 400       |           | $2s^22p^5 - 2s2p^6$    | $g^2P - ^3S$ | $1_2 - 1_2$ | 197,231   |

Si VII

## SILICON, Z = 14

Si VII

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ Ionization potential  $1\ 988\ 000\ \text{cm}^{-1} = 246.5\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                            | Term                | J   | Reference   |
|---------|------------|-----------|-----------|------------------------------------------|---------------------|-----|-------------|
| Si VII  | 54.462     | 50b       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 231         |
| Si VII  | 54.522     | 50d       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231,231     |
| Si VII  | 56.528     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 57.325     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 57.434     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 231         |
| Si VII  | 57.589     | 50b       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-2 | 231,487     |
| Si VII  | 58.388     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3S^{\circ}$ | 2-1 | 231         |
| Si VII  | 58.445     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 231         |
| Si VII  | 58.526     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3S^{\circ}$ | 1-1 | 231         |
| Si VII  | 58.580     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 58.719     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 1-2 | 231         |
| Si VII  | 58.782     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3D - ^3F^{\circ}$ | 2-3 | 231         |
| Si VII  | 59.884     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 231         |
| Si VII  | 59.966     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3D - ^3F^{\circ}$ | 2-3 | 231         |
| Si VII  | 60.221     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3D - ^3P^{\circ}$ | 2-1 | 231         |
| Si VII  | 60.837     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 60.989     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 1-1 | 231         |
| Si VII  | 61.306     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 62.940     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3D - ^3D^{\circ}$ | 2-2 | 231         |
| Si VII  | 63.586     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3S - ^3P^{\circ}$ | 0-1 | 231         |
| Si VII  | 65.595     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 231,233     |
| Si VII  | 68.026     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-2 | 231         |
| Si VII  | 68.148     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 68.190     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-1 | 231         |
| Si VII  | 68.212     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 1-2 | 231         |
| Si VII  | 68.408     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 231         |
| Si VII  | 68.456     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-1 | 231         |
| Si VII  | 68.593     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-2 | 231         |
| Si VII  | 68.642     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-1 | 231         |
| Si VII  | 68.669     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-0 | 231         |
| Si VII  | 68.715     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 0-1 | 231         |
| Si VII  | 69.385     | 150       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3S^{\circ}$ | 2-1 | 231         |
| Si VII  | 69.580     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3S^{\circ}$ | 1-1 | 231         |
| Si VII  | 69.602     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-1 | 231         |
| Si VII  | 69.663     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 231         |
| Si VII  | 69.790     | 200b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-1 | 231         |
| Si VII  | 69.861     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-2 | 231         |
| Si VII  | 69.872     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 0-1 | 231         |
| Si VII  | 70.027     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 70.072     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3D - ^3F^{\circ}$ | 2-3 | 231         |
| Si VII  | 70.123     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3F^{\circ}$ | 2-3 | 231         |
| Si VII  | 70.222     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 1-2 | 231         |
| Si VII  | 70.250     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3D - ^3P^{\circ}$ | 2-1 | 231         |
| Si VII  | 70.323     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3P - ^3F^{\circ}$ | 1-2 | 231         |
| Si VII  | 70.427     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3D - ^3D^{\circ}$ | 2-2 | 231         |
| Si VII  | 70.730     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3d$ | $^3D - ^3P^{\circ}$ | 2-1 | 231         |
| Si VII  | 71.384     | 200b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3D - ^3F^{\circ}$ | 2-3 | 231         |
| Si VII  | 71.955     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3D - ^3D^{\circ}$ | 2-2 | 231,233,487 |
| Si VII  | 72.324     | 300b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3D - ^3P^{\circ}$ | 2-1 | 231         |
| Si VII  | 73.123     | 500       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 231         |
| Si VII  | 73.350     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 1-2 | 231         |
| Si VII  | 73.433     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3S^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 0-1 | 231         |
| Si VII  | 75.193     | 200b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3D^{\circ} 3d$ | $^3S - ^3P^{\circ}$ | 0-1 | 231,233     |
| Si VII  | 79.236     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3s$ | $^3P - ^3P^{\circ}$ | 2-2 | 231         |
| Si VII  | 79.262     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^3P^{\circ} 3s$ | $^3P - ^3P^{\circ}$ | 2-1 | 231         |

Si VII

Si VII

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J-J | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-----|-----------|
| Si VII  | 79 491     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3s$ | $K^3P - ^3P^o$ | 1-2 | 231       |
| Si VII  | 79 523     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3s$ | $K^3P - ^3P^o$ | 1-1 | 231       |
| Si VII  | 79 615     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3s$ | $K^3P - ^3P^o$ | 0-1 | 231       |
| Si VII  | 81 449     | 50        |           | $2s^2 2p^4 - 2s^2 2p^3(^3D)3s$   | $^3P^o - ^3D$  | 2-3 | 233       |
| Si VII  | 81 558     | 250       |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3s$ | $^3D - ^3P^o$  | 2-1 | 231       |
| Si VII  | 81 620     | 600       |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3s$ | $K^3P - ^3D^o$ | 2-3 | 231       |
| Si VII  | 81 895     | 500       |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3s$ | $K^3P - ^3D^o$ | 1-2 | 231       |
| Si VII  | 81 998     | 150       |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3s$ | $K^3P - ^3D^o$ | 0-1 | 231       |
| Si VII  | 84 082     | 600b      |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3s$ | $^3D - ^3D^o$  | 2-2 | 231       |
| Si VII  | 85 219     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3s$ | $^3S - ^3P^o$  | 0-1 | 231       |
| Si VII  | 85 289     | 500       |           | $2s^2 2p^4 - 2s^2 2p^3(^3S^o)3s$ | $K^3P - ^3S^o$ | 2-1 | 231       |
| Si VII  | 85 584     | 500       |           | $2s^2 2p^4 - 2s^2 2p^3(^3S^o)3s$ | $K^3P - ^3S^o$ | 1-1 | 231       |
| Si VII  | 85 698     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3S^o)3s$ | $K^3P - ^3S^o$ | 0-1 | 231       |
| Si VII  | 88 008     | 150       |           | $2s^2 2p^4 - 2s^2 2p^3(^3P)3s$   | $^3P^o - ^3P$  | 2-2 | 231, 233  |
| Si VII  | 217 826    | 350       |           | $2s^2 2p^4 - 2s^2 2p^3$          | $^3D - ^3P^o$  | 2-1 | 197, 231  |
| Si VII  | 272 641    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3$          | $K^3P - ^3P^o$ | 2-1 | 197, 231  |
| Si VII  | 274 175    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3$          | $K^3P - ^3P^o$ | 1-0 | 197, 231  |
| Si VII  | 275 352    | 250       |           | $2s^2 2p^4 - 2s^2 2p^3$          | $K^3P - ^3P^o$ | 2-2 | 197, 231  |
| Si VII  | 275 665    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3$          | $K^3P - ^3P^o$ | 1-1 | 197, 231  |
| Si VII  | 276 839    | 200b      |           | $2s^2 2p^4 - 2s^2 2p^3$          | $K^3P - ^3P^o$ | 0-1 | 197, 231  |
| Si VII  | 278 445    | 200       |           | $2s^2 2p^4 - 2s^2 2p^3$          | $K^3P - ^3P^o$ | 1-2 | 197, 231  |

Si VIII

SILICON, Z = 14

Si VIII

Ground state  $1s^2 2s^2 2p^2 \ ^3S_1$ Ionization potential  $2.445 \times 10^8 \text{ cm}^{-1}$  303.15 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                        | Term              | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------------|-------------------|-----------------------------|-----------|
| Si VIII | 49.987     | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 50.019     | 50d       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 50.524     | 50b       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 51.718     | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 51.819     | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 52.554     | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4d$       | $^3P^\circ - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 53.770     | 10        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)4s$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 58.885     | 150c      |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^\circ)3p$ | $^4S^\circ - ^4P$ | $\frac{3}{2} -$             | 231       |
| Si VIII | 60.989     | 100b      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 61.019     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 61.070     | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 61.175     | 50d       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 61.223     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^4S^\circ - ^4D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 61.395     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 61.446     | 100d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 61.798     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 61.852     | 100b      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si VIII | 61.895     | 150d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 61.914     | 150d      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 62.586     | 50d       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 62.808     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 62.849     | 150d      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 62.884     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 63.229     | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 63.266     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^3P^\circ - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 63.732     | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 63.903     | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3F$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 64.281     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 64.327     | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3P^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 64.355     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3P^\circ - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 65.833     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3d$       | $^3P^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 67.157     | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^\circ)3d$ | $^4P - ^4D^\circ$ | $\frac{3}{2} -$             | 231       |
| Si VIII | 67.318     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^\circ)3d$ | $^4P - ^4D^\circ$ | $\frac{3}{2} -$             | 231       |
| Si VIII | 67.408     | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^\circ)3d$ | $^4P - ^4D^\circ$ | $\frac{1}{2} -$             | 231       |
| Si VIII | 69.632     | 150       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 69.790     | 200b      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 69.905     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 70.458     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 70.473     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$       | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 72.228     | 200       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 72.324     | 300b      |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$       | $^3P^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 72.420     | 200d      |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$       | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 74.186     | 100       |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$       | $^3P^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 74.371     | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3P)3s$       | $^3P^\circ - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 75.986     | 50        |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^\circ)3s$ | $^4P - ^4S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 76.198     | 20        |           | $2s^2 2p^3 - 2s^2 2p^2(^3S^\circ)3s$ | $^4P - ^4S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 214.756    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 216.800    | 20d       |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 216.918    | 100       |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3D^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 232.864    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3P^\circ - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 233.159    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3P^\circ - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si VIII | 235.221    | 10        |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3P^\circ - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 235.563    | 20        |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3P^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 276.839    | 200b      |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 277.054    | 200       |           | $2s^2 2p^3 - 2s^2 2p^3$              | $^3D^\circ - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 231       |



## Si VIII

## Si VIII

| Element | Wavelength | Intensity | Multiplet | Configuration         | Term        | J - J                       | Reference |
|---------|------------|-----------|-----------|-----------------------|-------------|-----------------------------|-----------|
| Si VIII | 307.65     | 20P       |           | $2s^2 2p^1 - 2s 2p^2$ | $^3P - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 693,487   |
| Si VIII | 308.26     | 20P       |           | $2s^2 2p^1 - 2s 2p^2$ | $^3P - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 693,487   |
| Si VIII | 314.31     | 50        |           | $2s^2 2p^1 - 2s 2p^2$ | $^3S - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 774       |
| Si VIII | 316.202    | 100       |           | $2s^2 2p^1 - 2s 2p^2$ | $^3S - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |
| Si VIII | 319.829    | 100d      |           | $2s^2 2p^1 - 2s 2p^2$ | $^3S - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 231       |

Si IX

SILICON, Z = 14

Si IX

Ground state  $1s^2 2s^2 2p^2 \ ^3P_0$ Ionization potential  $2\ 831\ 470\ \text{cm}^{-1}$ ,  $351.05\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term                    | J - J | Reference |
|---------|------------|-----------|-----------|----------------------------------|-------------------------|-------|-----------|
| Si IX   | 44 215     | 10        |           | $2s^2 2p^2 - 2s^2 2p^4 d$        | $^3P - ^1D^\circ$       | 1-2   | 231       |
| Si IX   | 44 249     | 10        |           | $2s^2 2p^2 - 2s^2 2p^4 d$        | $^3P - ^1D^\circ$       | 2-3   | 231       |
| Si IX   | 51 113     | 50        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3D) 3p$ | $^1D - ^1D^\circ$       | 2-2   | 231       |
| Si IX   | 51 362     | 100       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3D) 3p$ | $^1D - ^1F^\circ$       | 2-3   | 231       |
| Si IX   | 52 671     | 10        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^1D^\circ - ^1F^\circ$ |       | 233       |
| Si IX   | 52 810     | 20        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3p$ | $^3P - ^1D^\circ$       | 1-2   | 231       |
| Si IX   | 52 838     | 50        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3p$ | $^3P - ^1D^\circ$       | 2-3   | 231       |
| Si IX   | 53 992     | 10        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3p$ | $^3P - ^1S^\circ$       | 2-1   | 231       |
| Si IX   | 54 841     | 100       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3S^\circ - ^3P$       | 2-1   | 231       |
| Si IX   | 54 870     | 100       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3S^\circ - ^3P$       | 2-2   | 231       |
| Si IX   | 54 907     | 100       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3S^\circ - ^3P$       | 2-3   | 231       |
| Si IX   | 55 094     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3P - ^1P^\circ$       | 1-0   | 231       |
| Si IX   | 55 116     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3P - ^1P^\circ$       | 1-1   | 231       |
| Si IX   | 55 234     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3P - ^1P^\circ$       | 2-1   | 231       |
| Si IX   | 55 272     | 150       |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3P - ^1P^\circ$       | 2-2   | 231       |
| Si IX   | 55 305     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3P - ^1D^\circ$       | 0-1   | 231       |
| Si IX   | 55 356     | 100       |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3P - ^1D^\circ$       | 1-2   | 231       |
| Si IX   | 55 401     | 100       |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3P - ^3D^\circ$       | 2-3   | 231       |
| Si IX   | 55 511     | 50        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3D) 3d$ | $^3D^\circ - ^3D$       | 3-3   | 231,233   |
| Si IX   | 55 781     | 150       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3D) 3d$ | $^3D^\circ - ^3F^\circ$ | 3-4   | 231,233   |
| Si IX   | 56 027     | 150       |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^1D - ^1F^\circ$       | 2-3   | 231       |
| Si IX   | 57 157     | 50        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3D) 3d$ | $^3P^\circ - ^3D$       | 2-3   | 231,233   |
| Si IX   | 57 434     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^1D - ^1D^\circ$       | 2-2   | 231       |
| Si IX   | 57 589     | 50b       |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^1D - ^3F^\circ$       | 2-2   | 233       |
| Si IX   | 57 778     | 100       |           | $2s^2 2p^2 - 2s^2 2p^3 d$        | $^3S - ^1P^\circ$       | 0-1   | 231       |
| Si IX   | 58 906     | 50d       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3D^\circ - ^3F^\circ$ | 3-4   | 231       |
| Si IX   | 59 004     | 100       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3D^\circ - ^3F^\circ$ | 2-3   | 231       |
| Si IX   | 59 077     | 50        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3D^\circ - ^3F^\circ$ | 1-2   | 231       |
| Si IX   | 59 966     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3P^\circ - ^3D$       |       | 231,233   |
| Si IX   | 60 989     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3s$ | $^3S^\circ - ^3P$       | 2-3   | 231       |
| Si IX   | 61 109     | 50        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3s$ | $^3S^\circ - ^3P$       | 2-2   | 231       |
| Si IX   | 61 190     | 50d       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3s$ | $^3S^\circ - ^3P$       | 2-1   | 231       |
| Si IX   | 61 355     | 50        |           | $2s^2 2p^2 - 2s^2 2p^4 (^3P) 3d$ | $^3P^\circ - ^3P$       | 1-2   | 231       |
| Si IX   | 61 502     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 s$        | $^3P - ^3P^\circ$       |       | 231       |
| Si IX   | 61 546     | 100       |           | $2s^2 2p^2 - 2s^2 2p^4 (^3D) 3s$ | $^3D^\circ - ^3D$       |       | 231,233   |
| Si IX   | 61 600     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 s$        | $^3P - ^3P^\circ$       | 0-1   | 231       |
| Si IX   | 61 649     | 100       |           | $2s^2 2p^2 - 2s^2 2p^3 s$        | $^3P - ^3P^\circ$       | 2-2   | 231       |
| Si IX   | 61 852     | 100b      |           | $2s^2 2p^2 - 2s^2 2p^3 s$        | $^3P - ^3P^\circ$       | 2-1   | 233       |
| Si IX   | 62 974     | 50        |           | $2s^2 2p^2 - 2s^2 2p^3 s$        | $^1D - ^1P^\circ$       | 2-1   | 231       |
| Si IX   | 65 236     | 10        |           | $2s^2 2p^2 - 2s^2 2p^3 s$        | $^1S - ^1P^\circ$       | 0-1   | 231       |
| Si IX   | 223.72     | 5P        |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3S^\circ$       | 0-1   | 487,812   |
| Si IX   | 225.033    | 20        |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3S^\circ$       | 1-1   | 231,812   |
| Si IX   | 227.007    | 20        |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3S^\circ$       | 2-1   | 231,812   |
| Si IX   | 258.10     | P         |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^1D - ^1D^\circ$       | 2-2   | 487,812   |
| Si IX   | 290.63     | 130P      |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3P^\circ$       | 0-    | 487,812   |
| Si IX   | 292.83     | 270P      |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3P^\circ$       | 1-    | 487,812   |
| Si IX   | 296.19     | 420P      |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3P^\circ$       | 2-    | 487,812   |
| Si IX   | 345.10     | 30        |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3D^\circ$       | 1-2   | 774       |
| Si IX   | 349.96     | 40        |           | $2s^2 2p^2 - 2s^2 2p^2$          | $^3P - ^3D^\circ$       | 2-3   | 774       |

Si X

## SILICON, Z = 14

Si X

Ground state  $1s^2 2s^2 2p^2 \text{ } ^3\text{P}_1$ Ionization potential  $3\,237\,400\text{ cm}^{-1}$ , 401.38 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                                      | Term                                | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------------------------|-------------------------------------|-----------------------------|-----------|
| Si X    | 47.545     | 50        |           | $2s^2 2p - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3p$    | $\text{K}^3\text{P}^o - ^3\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 48.553     | 10        |           | $2s^2 2p - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3p$    | $\text{K}^3\text{P}^o - ^3\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 49.701     | 100       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{D} - ^3\text{F}^o$         |                             | 231, 233  |
| Si X    | 50.154     | 50        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si X    | 50.254     | 50d       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{P} - ^3\text{D}^o$         |                             | 231, 233  |
| Si X    | 50.305     | 50        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{P} - ^3\text{D}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si X    | 50.333     | 50        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{P} - ^3\text{D}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si X    | 50.524     | 50b       |           | $2s^2 2p - 2s^2 3d$                                | $\text{K}^3\text{P}^o - ^3\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 50.691     | 100       |           | $2s^2 2p - 2s^2 3d$                                | $\text{K}^3\text{P}^o - ^3\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 51.635     | 10        |           | $1s^2 2p^3 - 1s^2 2p^2 \text{ } ^3\text{P}^o_1 3d$ | $^3\text{S}^o - ^3\text{P}$         | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si X    | 51.676     | 20        |           | $1s^2 2p^3 - 1s^2 2p^2 \text{ } ^3\text{P}^o_1 3d$ | $^3\text{S}^o - ^3\text{P}$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 52.070     | 50        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{P} - ^3\text{D}^o$         | $\frac{1}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 52.155     | 100d      |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{P} - ^3\text{D}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 52.485     | 100       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{D} - ^3\text{F}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 52.611     | 50        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{D} - ^3\text{F}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 53.463     | 10        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{D} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| Si X    | 53.573     | 50d       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{D} - ^3\text{D}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 53.595     | 50d       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{D} - ^3\text{D}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 54.462     | 50b       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si X    | 54.522     | 50d       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{1}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 54.571     | 50        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si X    | 54.599     | 50d       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 54.664     | 10        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{1}{2}$ | 231       |
| Si X    | 54.702     | 10        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231       |
| Si X    | 56.680     | 50d       |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{P} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 56.804     | 50        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3d$  | $^3\text{P} - ^3\text{D}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 57.209     | 20        |           | $2s^2 2p^2 - 2s^2 p^3 \text{ } ^3\text{P}^o_1 3s$  | $^3\text{D} - ^3\text{P}^o$         | $\frac{3}{2} - \frac{3}{2}$ | 231, 233  |
| Si X    | 253.81     | 200P      |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{P}$ | $\frac{1}{2} - \frac{3}{2}$ | 487, 812  |
| Si X    | 256.58     | P         |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{P}$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| Si X    | 258.39     | 500P      |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 487, 812  |
| Si X    | 261.27     | 200P      |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 487, 812  |
| Si X    | 272.00     | 280P      |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{S}$ | $\frac{1}{2} - \frac{1}{2}$ | 467, 812  |
| Si X    | 277.27     | 310P      |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{S}$ | $\frac{3}{2} - \frac{1}{2}$ | 487, 812  |
| Si X    | 347.43     | 40        |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 774       |
| Si X    | 356.07     | 40        |           | $2s^2 2p - 2s^2 p^2$                               | $\text{K}^3\text{P}^o - ^3\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 774       |

Si XI

## SILICON, Z = 14

Si XI

Ground state  $1s^2 2s^2 \ ^1S_0$ Ionization potential  $3\ 840\ 470\ \text{cm}^{-1}$ , 476.15 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------|---------------|-------|-----------|
| Si XI   | 43.290     | 10        |           | $2s2p - 1s^2 p^2 P^o 3p$     | $^3P^o - ^3D$ | 2-3   | 231       |
| Si XI   | 43.763     | 10        |           | $2s^2 - 2s3p$                | $^3S - ^1P^o$ | 0-1   | 231       |
| Si XI   | 45.398     | 10        |           | $2s2p - 1s^2 p^2 P^o 3p$     | $^1P^o - ^3D$ | 1-2   | 231       |
| Si XI   | 46.264     | 10        |           | $2s2p - 2s3d$                | $^3P^o - ^3D$ | 0-1   | 231       |
| Si XI   | 46.300     | 50        |           | $2s2p - 2s3d$                | $^1P^o - ^3D$ | 1-2   | 231       |
| Si XI   | 46.401     | 100       |           | $2s2p - 2s3d$                | $^3P^o - ^3D$ | 2-3   | 231       |
| Si XI   | 47.489     | 50        |           | $1s^2 p^2 - 1s^2 p^2 P^o 3d$ | $^3P - ^3P^o$ | 2-2   | 231       |
| Si XI   | 47.607     | 50        |           | $1s^2 p^2 - 1s^2 p^2 P^o 3d$ | $^1P - ^3D^o$ | 1-2   | 231       |
| Si XI   | 47.653     | 50        |           | $1s^2 p^2 - 1s^2 p^2 P^o 3d$ | $^3P - ^3D^o$ | 2-3   | 231       |
| Si XI   | 47.899     | 50        |           | $1s^2 p^2 - 1s^2 p^2 P^o 3d$ | $^1D - ^1F^o$ | 2-3   | 231       |
| Si XI   | 49.222     | 50        |           | $2s2p - 2s3d$                | $^1P^o - ^3D$ | 1-2   | 231       |
| Si XI   | 49.265     | 10        |           | $1s^2 p^2 - 1s^2 p^2 P^o 3d$ | $^1D - ^3D^o$ | 2-2   | 231       |
| Si XI   | 52.30      | 100       |           | $2s2p - 2s3s$                | $^1P^o - ^1S$ | 1-0   | 774       |
| Si XI   | 303.41     | 50P       |           | $2s^2 - 2s2p$                | $^3S - ^1P^o$ | 0-1   | 774       |

Si XII

## SILICON, Z = 14

Si XII

Ground state  $1s^2 2s^2 3s^2$ Ionization potential  $4\,221\,460\text{ cm}^{-1}$ ,  $523.38\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term         | J     | J     | Reference |
|---------|------------|-----------|-----------|---------------|--------------|-------|-------|-----------|
| Si XII  | 40.91      | 100P      |           | $2s^2 3p$     | $2^3S - ^3P$ | $1/2$ | $3/2$ | 774       |
| Si XII  | 40.95      | 50P       |           | $2s^2 3p$     | $2^3S - ^3P$ | $1/2$ | $1/2$ | 774       |
| Si XII  | 44.021     | 50        |           | $2p^2 3d$     | $^3P - ^3D$  | $1/2$ | $3/2$ | 231       |
| Si XII  | 44.165     | 100       |           | $2p^2 3d$     | $^3P - ^3D$  | $3/2$ | $5/2$ | 231       |
| Si XII  | 45.656     | 10        |           | $2p^2 3s$     | $^3P - ^3S$  | $3/2$ | $1/2$ | 231       |
| Si XII  | 499.27     | P         |           | $2s^2 2p$     | $2^3S - ^3P$ | $1/2$ | $3/2$ | 487       |
| Si XII  | 521.10     | P         |           | $2s^2 2p$     | $2^3S - ^3P$ | $1/2$ | $1/2$ | 487       |

Si XIV

## SILICON, Z = 14

Si XIV

Ground state  $1s^2S_{1/2}$ Ionization potential  $21\,560\,628\text{ cm}^{-1}$ , 2673.1 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J         | Reference |
|---------|------------|-----------|-----------|---------------|----------------|---------------|-----------|
| Si XIV  | 4 770      | P         |           | $1s - 6p$     | $R^2S - ^2P^o$ | $\frac{1}{2}$ | 309       |
| Si XIV  | 4 831      | P         |           | $1s - 5p$     | $R^2S - ^2P^o$ | $\frac{1}{2}$ | 309       |
| Si XIV  | 4 947      | P         |           | $1s - 4p$     | $R^2S - ^2P^o$ | $\frac{1}{2}$ | 309       |
| Si XIV  | 5 217      | P         |           | $1s - 3p$     | $R^2S - ^2P^o$ | $\frac{1}{2}$ | 309       |
| Si XIV  | 6 182      | P         |           | $1s - 2p$     | $R^2S - ^2P^o$ | $\frac{1}{2}$ | 309       |
| Si XIV  | 20 21      | P         |           | $2 - 7$       |                |               | 309       |
| Si XIV  | 20 88      | P         |           | $2 - 6$       |                |               | 309       |
| Si XIV  | 22 09      | P         |           | $2 - 5$       |                |               | 309       |
| Si XIV  | 24 74      | P         |           | $2 - 4$       |                |               | 309       |
| Si XIV  | 33 39      | P         |           | $2 - 3$       |                |               | 309       |
| Si XIV  | 51 20      | P         |           | $3 - 7$       |                |               | 309       |
| Si XIV  | 55 72      | P         |           | $3 - 6$       |                |               | 309       |
| Si XIV  | 65 30      | P         |           | $3 - 5$       |                |               | 309       |
| Si XIV  | 95 5       | P         |           | $3 - 4$       |                |               | 309       |
| Si XIV  | 110 37     | P         |           | $4 - 7$       |                |               | 309       |
| Si XIV  | 133 8      | P         |           | $4 - 6$       |                |               | 309       |
| Si XIV  | 206 4      | P         |           | $4 - 5$       |                |               | 309       |
| Si XIV  | 237 2      | P         |           | $5 - 7$       |                |               | 309       |
| Si XIV  | 380 2      | P         |           | $5 - 6$       |                |               | 309       |
| Si XIV  | 630 6      | P         |           | $6 - 7$       |                |               | 309       |

P I

## PHOSPHORUS, Z = 15

P I

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^3 \ ^4S_{3/2}$ Ionization potential 84 580 cm<sup>-1</sup>; 10.486 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term                 | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------------|-----------------------------|-----------|
| P I     | 1241.49    | 1         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1242.02    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)7s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1243.37    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1245.19    | 6         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1247.31    | 2         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1248.20    | 1         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)7s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1248.61    | 1         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)7s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1253.74    | 6         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1278.57    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1282.61    | 6         |           |                                |                      |                             | 496       |
| P I     | 1282.96    | 6w        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1283.89    | 6         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1284.80    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1285.84    | 2         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1286.44    | 9         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1372.03    | 9         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)3d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1373.49    | 60        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1374.73    | 6         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)3d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1377.06    | 60        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1377.93    | 60        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1379.40    | 75        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1381.47    | 75        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1381.65    | 45        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1411.31    | 24        |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1411.75    | 2         |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1420.08    | 30        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1425.29    | 30        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1427.77    | 1         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)8s$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1428.05    | 1         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1429.77    | 12        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1430.13    | 150d      |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)3d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1430.73    | 30        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)3d$ | $g^4S^{\circ} - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1431.50    | 1         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1440.24    | 15        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)7s$ | $^1D^{\circ} - ^2P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1442.76    | 15        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)7s$ | $^1D^{\circ} - ^2P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1445.66    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1446.01    | 12        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)7s$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1446.33    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)7s$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1447.50    | 60        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1450.38    | 9         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1453.01    | 45        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1467.39    | 3         |           |                                |                      |                             | 496       |
| P I     | 1467.58    | 9         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1469.71    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1473.65    | 6         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^2P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1476.11    | 9         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)5d$ | $^1D^{\circ} - ^2P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1488.01    | 60        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6s$ | $^1D^{\circ} - ^2P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1491.36    | 150       |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1492.99    | 120       |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1493.34    | 45        |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1499.51    | 24        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)6s$ | $^1D^{\circ} - ^2P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1501.81    | 60        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1502.17    | 24        |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1503.12    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I     | 1503.48    | 3         |           | $3s^2 3p^2 - 3s^2 3p^2(^2P)4d$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 496       |

P I

P I

| Element          | Wavelength | Intensity | Multiplet | Configuration                      | Term                    | J - J                       | Reference |
|------------------|------------|-----------|-----------|------------------------------------|-------------------------|-----------------------------|-----------|
| P I              | 1504.37    | 36        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1504.72    | 6b        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1505.84    | 2         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 496       |
| P I              | 1506.63    | 21        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1506.98    | 18        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 496       |
| P I <sup>1</sup> | 1508.74    | 9w        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 6s$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 496       |
| P I              | 1515.10    | 6w        |           |                                    |                         |                             | 496       |
| P I              | 1522.59    | 2         |           |                                    |                         |                             | 496       |
| P I              | 1530.58    | 12        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1534.73    | 15        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1D) 4s$ | ${}^4S^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1541.69    | 30        |           |                                    |                         |                             | 496       |
| P I              | 1543.26    | 45        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$ | $\frac{3}{2} - \frac{7}{2}$ | 496       |
| P I              | 1545.95    | 45        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1546.32    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1548.43    | 180       |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1551.04    | 105       |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1551.42    | 45        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1554.84    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1555.25    | 6         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 4d$ | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1556.18    | 2         |           |                                    |                         |                             | 496       |
| P I              | 1575.18    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1D) 3d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1575.47    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1D) 3d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 496       |
| P I              | 1583.73    | 24        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 6d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1586.25    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 6d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 496       |
| P I              | 1586.88    | 2         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 6d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1595.08    | 6         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 8s$ | ${}^4P^{\circ} - {}^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 496       |
| P I              | 1595.72    | 1         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 8s$ | ${}^4P^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1596.06    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 6d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1597.97    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 6d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 496       |
| P I              | 1598.76    | 3         |           |                                    |                         |                             | 496       |
| P I              | 1599.25    | 15        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 8s$ | ${}^4P^{\circ} - {}^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I              | 1611.29    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 7s$ | ${}^4P^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1614.19    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 7s$ | ${}^4P^{\circ} - {}^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I              | 1614.67    | 3         |           |                                    |                         |                             | 496       |
| P I              | 1614.87    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 7s$ | ${}^4P^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 496       |
| P I              | 1615.79    | 36        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5s$ | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1616.20    | 120       |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5s$ | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1618.11    | 45        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1618.93    | 36        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 7s$ | ${}^4P^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1621.33    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5d$ | ${}^4P^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I <sup>2</sup> | 1622.08    | 3         |           |                                    |                         |                             | 496       |
| P I              | 1623.83    | 75        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5s$ | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 496       |
| P I              | 1623.99    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 496       |
| P I              | 1624.43    | 2         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5d$ | ${}^4P^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1624.67    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5d$ | ${}^4P^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1625.40    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1625.80    | 75        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1627.86    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5s$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1629.17    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1629.59    | 15        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1633.69    | 2         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5s$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1634.10    | 21        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5s$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1635.79    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1636.20    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1638.68    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1638.89    | 15        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5s$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 496       |
| P I              | 1639.09    | 24        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 3d$ | ${}^1D^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |
| P I              | 1652.97    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5d$ | ${}^4P^{\circ} - {}^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I              | 1653.68    | 24        |           | $3s^2 3p^1 - 3s^2 3p^1 ({}^1P) 5d$ | ${}^4P^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 496       |
| P I              | 1671.07    | 210       |           | $3s^2 3p^1 - 3s^2 3p^1$            | ${}^1D^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 496       |



P I

P I

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term                | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------|---------------------|-----------------------------|-----------|
| P I     | 1671.49    | 105       | 2         | $3s^2 3p^1 - 3s^2 3p^1$        | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1671.68    | 540       |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1672.05    | 105       |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1672.48    | 270       |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1673.94    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1674.61    | 690       | 2         | $3s^2 3p^1 - 3s^2 3p^1$        | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1679.71    | 900       | 2         | $3s^2 3p^1 - 3s^2 3p^1$        | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1685.99    | 360       | 6         | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1F$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1688.64    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)6s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1689.25    | 105       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1690.17    | 30        | 6         | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1690.90    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1691.75    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1692.48    | 15        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1694.06    | 300       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1F$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1694.50    | 120       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1F$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1695.35    | 45        | 6         | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1706.41    | 180       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1707.57    | 120       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1708.03    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1708.45    | 12        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1708.90    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1718.55    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1(^1S)4s$ | $^1P^{\circ} - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1719.00    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4s$ | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1719.31    | 90        |           | $3s^2 3p^1 - 3s^2 3p^1(^1S)4s$ | $^1P^{\circ} - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1727.85    | 15        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4s$ | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1754.40    | 90        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1F$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1755.86    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1756.65    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)4d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1757.47    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1757.95    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1F$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1759.91    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1760.40    | 45        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1D^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1761.67    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1D^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1768.45    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1D^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1768.94    | 45        |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1D^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1774.99    | 750       | 1         | $3s^2 3p^1 - 3s^2 3p^1(^1P)4s$ | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1782.87    | 600       | 1         | $3s^2 3p^1 - 3s^2 3p^1(^1P)4s$ | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1787.68    | 540       | 1         | $3s^2 3p^1 - 3s^2 3p^1(^1P)4s$ | $^3S^{\circ} - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1833.98    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1834.83    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1844.33    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1845.19    | 30        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1847.19    | 300       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1849.65    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1849.52    | 9         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1849.84    | 105       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1851.22    | 240       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1852.09    | 120       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1855.48    | 1         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1857.04    | 45        | 5         | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1858.91    | 450       |           | $3s^2 3p^1 - 3s^2 3p^1(^1D)4s$ | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1859.43    | 450       |           | $3s^2 3p^1 - 3s^2 3p^1(^1D)4s$ | $^1D^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 488,496   |
| P I     | 1860.63    | 45        |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1863.78    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1864.37    | 105       |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)3d$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1864.64    | 3         |           | $3s^2 3p^1 - 3s^2 3p^1(^1P)5s$ | $^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1905.48    | 90        |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1906.40    | 60        |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |
| P I     | 1907.66    | 120       |           | $3s^2 3p^1 - 3s^2 3p^1$        | $^1P^{\circ} - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 496       |

P I

P I

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J                           | Reference |
|---------|------------|-----------|-----------|------------------------------|---------------|-----------------------------|-----------|
| P I     | 1954.01    | 12        |           | $3s^23p^3 - 3s^23p^2(^1P)3d$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 496       |
| P I     | 1954.20    | 21        |           | $3s^23p^3 - 3s^23p^2(^1P)3d$ | $^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 496       |
| P I     | 1955.16    | 21        |           | $3s^23p^3 - 3s^23p^2(^1P)3d$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{5}{2}$ | 496       |
| P I     | 1955.79    | 21        |           | $3s^23p^3 - 3s^23p^2(^1P)3d$ | $^1P^o - ^1D$ | $\frac{3}{2} - \frac{5}{2}$ | 496       |

Ground state  $1s^2 2s^2 2p^3 3s^2 3p^2 \ ^3P$ .Ionization potential  $15^{\circ} 100 \text{ cm}^{-1}$  19.73 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term                | J-J | Reference |
|---------|------------|-----------|-----------|---------------------------------------|---------------------|-----|-----------|
| P II    | 782.59     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3P^{\circ}$ | 1-2 | 496       |
| P II    | 782.72     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3D^{\circ}$ | 1-1 | 496       |
| P II    | 782.90     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3P^{\circ}$ | 1-0 | 496       |
| P II    | 783.71     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3P^{\circ}$ | 0-1 | 496       |
| P II    | 784.46     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3P^{\circ}$ | 2-2 | 496       |
| P II    | 784.81     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3D^{\circ}$ | 2-3 | 496       |
| P II    | 786.18     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3D^{\circ}$ | 1-2 | 496       |
| P II    | 786.52     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3P^{\circ}$ | 2-1 | 496       |
| P II    | 801.35     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3F^{\circ}$ | 1-2 | 496       |
| P II    | 802.20     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3F^{\circ}$ | 2-3 | 496       |
| P II    | 808.25     | 50        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3P - ^3P^{\circ}$ | 1-2 | 496       |
| P II    | 810.00     | 30        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3P - ^3P^{\circ}$ | 0-1 | 496       |
| P II    | 810.24     | 100       |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3P - ^3P^{\circ}$ | 2-2 | 496       |
| P II    | 811.10     | 20        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3P - ^3P^{\circ}$ | 1-1 | 496       |
| P II    | 811.85     | 30        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3P - ^3P^{\circ}$ | 1-0 | 496       |
| P II    | 813.10     | 40        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3P - ^3P^{\circ}$ | 2-1 | 496       |
| P II    | 813.768    | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3D - ^3P^{\circ}$ | 2-1 | 496, 594  |
| P II    | 824.64     | 30        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3D - ^3F^{\circ}$ | 2-3 | 496       |
| P II    | 840.04     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3D - ^3D^{\circ}$ | 2-1 | 496       |
| P II    | 841.21     | 20        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3D - ^3D^{\circ}$ | 2-2 | 496       |
| P II    | 844.01     | 20        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3D - ^3D^{\circ}$ | 2-2 | 496       |
| P II    | 861.61     | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3D - ^3F^{\circ}$ | 2-2 | 496       |
| P II    | 865.44     | 100       |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3D - ^3P^{\circ}$ | 2-1 | 496       |
| P II    | 872.84     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3D - ^3P^{\circ}$ | 2-1 | 496       |
| P II    | 906.89     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3D - ^3P^{\circ}$ |     | 496       |
| P II    | 906.987    | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3S^{\circ}$ | 0-1 | 496, 594  |
| P II    | 907.56     | 40        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3S - ^3P^{\circ}$ | 0-1 | 496       |
| P II    | 908.38     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3S^{\circ}$ | 1-1 | 496       |
| P II    | 910.88     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4d$ | $^3P - ^3S^{\circ}$ | 2-1 | 496       |
| P II    | 913.59     | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3D - ^3P^{\circ}$ | 2-1 | 496       |
| P II    | 927.771    | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3S - ^3P$         | 2-1 | 496, 594  |
| P II    | 928.550    | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3S - ^3P$         | 2-2 | 496, 594  |
| P II    | 929.642    | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3S - ^3P$         | 2-3 | 496, 594  |
| P II    | 961.04     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 0-1 | 496       |
| P II    | 962.13     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-2 | 496       |
| P II    | 962.57     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 1-1 | 496       |
| P II    | 963.59     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-0 | 496       |
| P II    | 963.81     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 0-1 | 496       |
| P II    | 964.09     | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3D - ^3D^{\circ}$ | 2-2 | 496       |
| P II    | 964.95     | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-2 | 496       |
| P II    | 965.43     | 20        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-3 | 496       |
| P II    | 966.52     | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 1-2 | 496       |
| P II    | 968.17     | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-1 | 496       |
| P II    | 969.38     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3D^{\circ}$ | 2-2 | 496       |
| P II    | 972.24     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 5s$ | $^3S - ^3P^{\circ}$ | 0-1 | 496       |
| P II    | 972.807    | 30        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 0-1 | 496, 594  |
| P II    | 974.36     | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 1-1 | 496       |
| P II    | 977.258    | 1         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3P^{\circ}$ | 2-1 | 496, 594  |
| P II    | 1015.47    | 100       |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3D - ^3F^{\circ}$ | 2-3 | 496       |
| P II    | 1033.41    | 100       |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3S - ^3P^{\circ}$ | 0-1 | 496       |
| P II    | 1064.80    | 150       |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3D - ^3P^{\circ}$ | 2-1 | 496       |
| P II    | 1124.945   | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4s$ | $^3P - ^3P^{\circ}$ | 0-1 | 496, 594  |
| P II    | 1130.925   | 10        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 4s$ | $^3P - ^3P^{\circ}$ | 2-1 | 496, 594  |
| P II    | 1141.00    | 5         |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3F^{\circ}$ | 1-2 | 496       |
| P II    | 1142.88    | 20        |           | $3s^2 3p^2 - 3s^2 3p^1 3P^{\circ} 3d$ | $^3P - ^3F^{\circ}$ | 2-3 | 496       |

| Element | Wavelength | Intensity | Multiplet | Configuration               | Term        | J   | Reference |
|---------|------------|-----------|-----------|-----------------------------|-------------|-----|-----------|
| P II?   | 1143.71    | 1         |           |                             |             |     | 496       |
| P II    | 1145.01    | 1         |           | $3s^2 3p^2 - 3s^2 3p(3P)3d$ | $^2P - ^2F$ | 2-2 | 496       |
| P II    | 1149.96    | 70        | 3         | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^2P - ^2P$ | 1-2 | 488,496   |
| P II    | 1152.81    | 50        | 3         | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^2P - ^2P$ | 0-1 | 488,496   |
| P II    | 1153.99    | 120       | 3         | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^2P - ^2P$ | 2-2 | 488,496   |
| P II    | 1155.00    | 40        | 3         | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^2P - ^2P$ | 1-1 | 488,496   |
| P II    | 1156.96    | 50        | 3         | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^2P - ^2P$ | 1-0 | 488,496   |
| P II    | 1159.08    | 80        | 3         | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^2P - ^2P$ | 2-1 | 488,496   |
| P II    | 1231.18    | 50        |           | $3s^2 3p^2 - 3s^2 3p^2$     | $^1S - ^1P$ | 0-1 | 496       |
| P II    | 1249.82    | 200       |           | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^1D - ^1P$ | 2-1 | 496       |
| P II    | 1264.47    | 30        |           | $3s^2 3p^2 - 3s^2 3p(3P)3d$ | $^1D - ^2F$ | 2-3 | 496       |
| P II    | 1267.06    | 5         |           | $3s^2 3p^2 - 3s^2 3p(3P)3d$ | $^1D - ^2F$ | 2-2 | 496       |
| P II    | 1278.094   | 5         |           | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^1D - ^2P$ | 2-2 | 496,594   |
| P II    | 1284.31    | 5         |           | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^1D - ^2P$ | 2-1 | 496       |
| P II    | 1289.57    | 30        |           | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 1-2 | 496       |
| P II    | 1294.64    | 150       |           | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 2-2 | 496       |
| P II    | 1301.87    | 200       | 2         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^2P$ | 0-1 | 488,496   |
| P II    | 1304.47    | 200       | 2         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^2P$ | 1-0 | 488,496   |
| P II    | 1304.68    | 150       | 2         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^2P$ | 1-1 | 488,496   |
| P II    | 1305.48    | 350       | 2         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^2P$ | 1-2 | 488,496   |
| P II    | 1309.87    | 250       | 2         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^2P$ | 2-1 | 488,496   |
| P II    | 1310.70    | 600       | 2         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^2P$ | 2-2 | 488,496   |
| P II    | 1452.89    | 300       |           | $3s^2 3p^2 - 3s^2 3p^2$     | $^1D - ^1D$ | 2-2 | 496       |
| P II    | 1473.129   | 10        |           | $3s^2 3p^2 - 3s^2 3p^2$     | $^1D - ^2P$ | 2-2 | 496,594   |
| P II    | 1485.49    | 250       |           | $3s^2 3p^2 - 3s^2 3p(3P)4s$ | $^1S - ^1P$ | 0-1 | 496       |
| P II    | 1489.834   | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^1D$ | 1-1 | 496,594   |
| P II    | 1494.990   | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^1D$ | 2-2 | 496,594   |
| P II    | 1496.44    | 5         |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^1D$ | 3-3 | 496       |
| P II    | 1506.44    | 30        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2G$ | 3-4 | 496       |
| P II    | 1506.975   | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2G$ | 2-3 | 496,594   |
| P II    | 1512.87    | 5h        |           | $3s^2 3p^2 - 3s^2 3p(3P)5p$ | $^1D - ^1D$ | 1-2 | 496       |
| P II    | 1521.62    | 300w      |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2F$ | 3-4 | 496       |
| P II    | 1522.11    | 4         |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2F$ | 1-2 | 496       |
| P II    | 1522.392   | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2F$ | 3-3 | 496,594   |
| P II    | 1522.59    | 5         |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2F$ | 2-2 | 496       |
| P II    | 1523.44    | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2F$ | 2-3 | 496       |
| P II    | 1525.58    | 1         |           | $3s^2 3p^2 - 3s^2 3p(3P)5p$ | $^1D - ^2S$ | 1-1 | 496       |
| P II    | 1532.51    | 700w      | 1         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 0-1 | 488,496   |
| P II    | 1535.90    | 1000w     | 1         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 1-2 | 488,496   |
| P II    | 1536.39    | 700w      | 1         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 1-1 | 488,496   |
| P II    | 1542.29    | 1000w     | 1         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 2-3 | 488,496   |
| P II    | 1543.09    | 400       | 1         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 2-2 | 488,496   |
| P II    | 1543.61    | 150       | 1         | $3s^2 3p^2 - 3s^2 3p^2$     | $^2P - ^1D$ | 2-1 | 488,496   |
| P II    | 1552.51    | 5h        |           | $3s^2 3p^2 - 3s^2 3p(3P)5p$ | $^1D - ^1D$ | 1-2 | 496       |
| P II    | 1552.94    | 1         |           | $3s^2 3p^2 - 3s^2 3p(3P)5p$ | $^1D - ^1D$ | 2-2 | 496       |
| P II    | 1553.392   | 1         |           | $3s^2 3p^2 - 3s^2 3p(3P)5p$ | $^1D - ^2P$ | 1-1 | 496,594   |
| P II    | 1553.82    | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)5p$ | $^1D - ^2D$ | 3-2 | 496       |
| P II    | 1734.88    | 1         |           | $3s^2 3p^2 - 3s^2 3p(3P)4p$ | $^2S - ^2D$ | 2-2 | 496       |
| P II    | 1772.30    | 30        |           | $3s^2 3p^2 - 3s^2 3p^2$     | $^1D - ^1D$ | 2-3 | 496       |
| P II    | 1797.54    | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^1D$ | 2-2 | 496       |
| P II    | 1798.37    | 5         |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^2D$ | 2-1 | 496       |
| P II    | 1799.10    | 50        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^2D$ | 1-2 | 496       |
| P II    | 1799.91    | 20        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^2D$ | 1-1 | 496       |
| P II    | 1800.27    | 20        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^2D$ | 0-1 | 496       |
| P II    | 1805.11    | 30        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^2D$ | 2-2 | 496       |
| P II    | 1806.12    | 150       |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^2D$ | 2-3 | 496       |
| P II    | 1806.67    | 50        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^2P - ^2D$ | 1-2 | 496       |
| P II    | 1828.63    | 30        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^1D$ | 2-2 | 496       |
| P II    | 1836.47    | 10        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2D$ | 2-2 | 496       |
| P II    | 1837.51    | 20        |           | $3s^2 3p^2 - 3s^2 3p(3P)4f$ | $^1D - ^2D$ | 2-3 | 496       |

P II

P II

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------|---------------|-------|-----------|
| P II    | 1844.06    | 5         |           | $3s3p^2 - 3s^23p^2(P^2)4f$   | $^3P^o - ^3F$ | 2-3   | 496       |
| P II    | 1846.78    | 20        |           | $3s^23p^2 - 3s^23p^2(P^2)4f$ | $^3P^o - ^3F$ | 2-3   | 496       |
| P II    | 1850.61    | 20        |           | $3s3p^2 - 3s^23p^2(P^2)5p$   | $^3P^o - ^3S$ | 2-1   | 496       |
| P II    | 1852.27    | 20        |           | $3s3p^2 - 3s^23p^2(P^2)5p$   | $^3P^o - ^3S$ | 1-1   | 496       |
| P II    | 1852.65    | 10        |           | $3s3p^2 - 3s^23p^2(P^2)5p$   | $^3P^o - ^3S$ | 0-1   | 496       |
| P II    | 1854.59    | 150       |           | $3s3p^2 - 3s^23p^2(P^2)4f$   | $^1D^o - ^3G$ | 2-3   | 496       |
| P II    | 1864.22    | 150       |           | $3s3p^2 - 3s^23p^2(P^2)5p$   | $^1D^o - ^1D$ | 2-2   | 496       |
| P II    | 1872.36    | 1         |           | $3s3p^2 - 3s^23p^2(P^2)5p$   | $^3P^o - ^3P$ | 2-2   | 496       |
| P II    | 1876.79    | 100       |           | $3s3p^2 - 3s^23p^2(P^2)4f$   | $^1D^o - ^3F$ | 2-3   | 496       |
| P II    | 1879.62    | 250       |           | $3s3p^2 - 3s^23p^2(P^2)4f$   | $^1D^o - ^3F$ | 2-3   | 496       |
| P II    | 1928.30    | 5         |           | $3s3p^2 - 3s^23p^2(P^2)5p$   | $^1D^o - ^3D$ | 2-1   | 496       |
| P II    | 1945.54    | 50        |           | $3s3p^2 - 3s^23p^2(P^2)5p$   | $^1D^o - ^3P$ | 2-1   | 496       |

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^1$   $^3P_1$ Ionization potential 243 290 cm<sup>-1</sup>, 30.163 eV

| Emission | Wavelength | Intensity | Multiplet | Configuration                     | Term          | J-J                         | Reference |
|----------|------------|-----------|-----------|-----------------------------------|---------------|-----------------------------|-----------|
| P III    | 497.17     | 1         |           | $3s^2 3p - 3s^2 6s$               | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III    | 568.09     | 10        |           | $3s^2 3p - 3s^2 5s$               | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III    | 569.90     | 200b      |           | $3s^2 3p - 3s^2 5s$               | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III    | 579.98     | 1h        |           | $3s^2 3p - 3s^2 4d$               | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 581.898    | 1h        |           | $3s^2 3p - 3s^2 4d$               | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 781.726    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)4s$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 782.977    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)4s$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 783.752    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)4s$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 785.392    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)4s$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 786.244    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)4s$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 844.635    | 100       | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 845.047    | 100       | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 845.656    | 100       | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 846.125    | 100b      | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 846.494    | 10b       | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 847.658    | 300b      | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 848.023    | 200d      | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 848.445    | 100       | 5         | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3D^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 848.636    | 300d      |           | $3s^2 3p - 3s^2 4s$               | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III    | 852.679    | 500       |           | $3s^2 3p - 3s^2 4s$               | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III    | 853.346    | 10        |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 854.223    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 854.855    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 855.618    | 500       | 4         | $3s^2 3p - 3s^2 3d$               | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 856.963    | 200       |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 858.139    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 859.411    | 10        |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 859.667    | 800       | 4         | $3s^2 3p - 3s^2 3d$               | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 909.846    | 100       |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 913.989    | 500       | 3         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 917.130    | 400       | 3         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 918.706    | 500       | 3         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 921.863    | 500       | 3         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 963.993    | 100b      |           | $3s 3p^2 - 3s^2 4f$               | $^3D - ^3F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 964.251    | 100       |           | $3s 3p^2 - 3s^2 4f$               | $^3D - ^3F^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 972.807    | 300       |           | $3s 3p^2 - 2p^2 3p^2$             | $^3P - ^3S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 974.776    | 300       |           | $3s 3p^2 - 2p^2 3p^2$             | $^3P - ^3S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 977.888    | 400       |           | $3s 3p^2 - 2p^2 3p^2$             | $^3P - ^3S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 998.000    | 800       | 2         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 1003.592   | 1000      | 2         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3S$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 1049.824   | 400       |           | $3s 3p^2 - 2p^2 3p^2$             | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1050.518   | 100       |           | $3s 3p^2 - 2p^2 3p^2$             | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1050.817   | 400       |           | $3s 3p^2 - 2p^2 3p^2$             | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1093.627   | 200       |           | $3s 3p^2 - 3s^2 5p$               | $^3S - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1210.600   | 100       |           | $3s 3p^2 - 3s^2 5p$               | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1283.949   | 10        |           | $3s 3p^2 - 3s 3p(^3P^o)4s$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1290.134   | 1         |           | $3s 3p^2 - 3s 3p(^3P^o)4s$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1318.91    | 10        |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1325.509   | 70        |           | $3s 3p^2 - 3s 3p(^3P^o)3d$        | $^3P - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1334.866   | 650       | 1         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 1337.498   | 70        |           | $3s^2 3d - 3s^2 5p$               | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1337.710   | 150       |           | $3s^2 3d - 3s^2 5p$               | $^3D - ^3P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1343.687   | 70        |           | $3s 3p(^3P^o)3d - 3s 3p(^3P^o)4f$ | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III    | 1344.343   | 1000      | 1         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III    | 1344.900   | 650       | 1         | $3s^2 3p - 3s 3p^2$               | $^3P^o - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |

| Element | Wavelength | Intensity | Multiplet | Configuration                           | Term                 | J - J                       | Reference |
|---------|------------|-----------|-----------|-----------------------------------------|----------------------|-----------------------------|-----------|
| P III   | 1346.998   | 200       |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III   | 1347.508   | 10        |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III   | 1348.449   | 10        |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1P^{\circ} - ^1D$  | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P III   | 1349.110   | 200       |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1P^{\circ} - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P III   | 1354.957   | 10        |           | $3s^4s - 3s^25p$                        | $^3S - ^1P^{\circ}$  | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P III   | 1370.39    | 10        |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1D^{\circ} - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P III   | 1372.01    | 100       |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III   | 1372.711   | 300       |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III   | 1374.700   | 100       |           | $3s3p^2P^{\circ}3d - 3s3p^2P^{\circ}4f$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III   | 1379.873   | 500       | 7         | $3s3p^2 - 2p^23p^2$                     | $^1D - ^1D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III   | 1380.464   | 1000      | 7         | $3s3p^2 - 2p^23p^2$                     | $^1D - ^1D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III   | 1381.111   | 1000      | 7         | $3s3p^2 - 2p^23p^2$                     | $^1D - ^1D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III   | 1381.633   | 800       | 7         | $3s3p^2 - 2p^23p^2$                     | $^1D - ^1D^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III   | 1429.242   | 100       |           | $3s3p^2 - 2p^23p^2$                     | $^3S - ^1P^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P III   | 1430.409   | 200       |           | $3s3p^2 - 2p^23p^2$                     | $^3S - ^1P^{\circ}$  | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P III   | 1447.512   | 200       |           | $3s^4(^1S)4s - 3s3p^2P^{\circ}4s$       | $^1S - ^1P^{\circ}$  | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P III?  | 1471.218   | 10        |           |                                         |                      |                             | 597       |
| P III?  | 1492.031   | 500       |           |                                         |                      |                             | 597       |
| P III   | 1501.551   | 700       | 6         | $3s3p^2 - 3s^44p$                       | $^1D - ^1P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III   | 1502.273   | 1000      | 6         | $3s3p^2 - 3s^44p$                       | $^1D - ^1P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 488,597   |
| P III   | 1504.719   | 900b      | 6         | $3s3p^2 - 3s^44p$                       | $^1D - ^1P^{\circ}$  | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III   | 1618.665   | 600       |           | $3s^23d - 3s^44f$                       | $^1D - ^1F^{\circ}$  | $\frac{3}{2} -$             | 597       |
| P III   | 1618.944   | 600       |           | $3s^23d - 3s^44f$                       | $^1D - ^1F^{\circ}$  | $\frac{3}{2} -$             | 597       |
| P III   | 1635.799   | 200       |           | $3s3p^2 - 2p^23p^2$                     | $^1P - ^1P^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P III   | 1637.377   | 100       |           | $3s3p^2 - 2p^23p^2$                     | $^1P - ^1P^{\circ}$  | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P III   | 1645.914   | 200       |           | $3s3p^2 - 2p^23p^2$                     | $^1P - ^1P^{\circ}$  | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III   | 1647.546   | 300       |           | $3s3p^2 - 2p^23p^2$                     | $^1P - ^1P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P III   | 1674.26    | 1         |           | $3s^44p - 3s^46s$                       | $^1P^{\circ} - ^3S$  | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P III   | 1678.12    | 10        |           | $3s^44p - 3s^46s$                       | $^1P^{\circ} - ^3S$  | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P III   | 1693.03    | 100       |           | $3s^44p - 3s^45d$                       | $^1P^{\circ} - ^1D$  | $\frac{1}{2} -$             | 597       |
| P III   | 1696.92    | 100       |           | $3s^44p - 3s^45d$                       | $^1P^{\circ} - ^1D$  | $\frac{3}{2} -$             | 597       |
| P III   | 1756.82    | 10        |           | $3s^23p - 3s3p^2$                       | $g^1P^{\circ} - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P III   | 1757.68    | 100       |           | $3s^23p - 3s3p^2$                       | $g^1P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |

P IV

## PHOSPHORUS, Z = 15

P IV

Ground state  $1s^2 2s^2 2p^3 3s^1 \ ^1S_0$ Ionization potential 414 312.4 cm<sup>-1</sup>, 51.367 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term              | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------------|-------------------|-------|-----------|
| P IV    | 283.99     | 20h       |           | $3s^2 - 3s6p$                   | $^1S - ^1P^\circ$ | 0-1   | 597       |
| P IV    | 312.443    | 160       |           | $3s^2 - 3s5p$                   | $^1S - ^1P^\circ$ | 0-1   | 597       |
| P IV    | 359.628    | 20        |           | $3s3p - 3s6s$                   | $^3P - ^1S$       | 2-1   | 597       |
| P IV    | 388.315    | 240       |           | $3s^2 - 3s4p$                   | $^1S - ^1P^\circ$ | 0-1   | 597       |
| P IV    | 412.90     | 10h       |           | $3s3p - 3s5s$                   | $^3P - ^1S$       | 0-1   | 597       |
| P IV    | 415.022    | 20        |           | $3s3p - 3s5s$                   | $^3P - ^1S$       | 1-1   | 597       |
| P IV    | 415.815    | 40        |           | $3s3p - 3s5s$                   | $^3P - ^1S$       | 2-1   | 597       |
| P IV    | 444.249    | 20        |           | $3s3p - 3s4d$                   | $^3P - ^3D$       | 1-    | 597       |
| P IV    | 445.194    | 20        |           | $3s3p - 3s4d$                   | $^3P - ^3D$       | 2-    | 597       |
| P IV    | 472.957    | 80        |           | $3s3p - 3s5s$                   | $^1P^\circ - ^1S$ | 1-0   | 597       |
| P IV    | 522.02     | 10h       |           | $3s3p - 3s4d$                   | $^1P^\circ - ^3D$ | 1-2   | 597       |
| P IV    | 629.023    | 120       | 4         | $3s3p - 3s4s$                   | $^3P - ^1S$       | 0-1   | 488,597   |
| P IV    | 629.920    | 160       | 4         | $3s3p - 3s4s$                   | $^3P - ^1S$       | 1-1   | 488,597   |
| P IV    | 631.790    | 400       | 4         | $3s3p - 3s4s$                   | $^3P - ^1S$       | 2-1   | 488,597   |
| P IV    | 648.507    | 80        |           | $3s3d - 3s5f$                   | $^3D - ^3F^\circ$ | -4    | 597       |
| P IV    | 649.69     | 20        |           | $3s3d - 3s5f$                   | $^3D - ^3F^\circ$ | -3    | 597       |
| P IV    | 652.79     | 80        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 1-2   | 597       |
| P IV    | 653.51     | 80        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 0-1   | 597       |
| P IV    | 654.54     | 40        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 1-1   | 597       |
| P IV    | 654.86     | 120       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 2-2   | 597       |
| P IV    | 655.78     | 80        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 1-0   | 597       |
| P IV    | 656.55     | 80        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 2-1   | 597       |
| P IV    | 680.570    | 20        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3D - ^3P^\circ$ | 2-1   | 597       |
| P IV    | 756.510    | 240       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3D - ^3P^\circ$ | 2-1   | 597       |
| P IV    | 765.28     | 10        |           | $3s3d - 3s5p$                   | $^3D - ^1P^\circ$ | -1    | 597,487   |
| P IV    | 776.366    | 120       |           | $3s3p - 3s4s$                   | $^3P - ^1S$       | 1-0   | 597       |
| P IV    | 823.181    | 800       | 3         | $3s3p - 3s3d$                   | $^3P - ^3D$       | 0-1   | 488,597   |
| P IV    | 824.726    | 800       | 3         | $3s3p - 3s3d$                   | $^3P - ^3D$       | 1-    | 488,597   |
| P IV    | 827.932    | 1000      | 3         | $3s3p - 3s3d$                   | $^3P - ^3D$       | 2-    | 488,597   |
| P IV    | 843.984    | 40        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^1S - ^1P^\circ$ | 0-1   | 597       |
| P IV    | 845.995    | 80        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3D^\circ$ | 0-1   | 597       |
| P IV    | 846.125    | 80h       |           | $3s3d - 2p^3 3p^1 3p^1 3d$      | $^3D - ^3D^\circ$ | 2-2   | 597       |
| P IV    | 846.494    | 40h       |           | $3s3d - 2p^3 3p^1 3p^1 3d$      | $^3D - ^3F^\circ$ | 2-3   | 597       |
| P IV    | 846.999    | 200       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3D^\circ$ | 1-2   | 597       |
| P IV    | 847.658    | 240h      |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3D^\circ$ | 1-1   | 597       |
| P IV    | 849.764    | 160       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3D^\circ$ | 2-3   | 597       |
| P IV    | 850.390    | 120       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3D^\circ$ | 2-2   | 597       |
| P IV    | 851.09     | 10        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3D^\circ$ | 2-1   | 597       |
| P IV    | 860.449    | 80        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 1-0   | 597       |
| P IV    | 861.552    | 40        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 1-1   | 597       |
| P IV    | 863.325    | 120       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 1-2   | 597       |
| P IV    | 865.04     | 120       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 2-1   | 597       |
| P IV    | 866.84     | 20        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3P - ^3P^\circ$ | 2-2   | 597       |
| P IV    | 875.132    | 440       |           | $3s3d - 3s4f$                   | $^3D - ^3F^\circ$ | -4    | 597       |
| P IV    | 877.493    | 440       |           | $3s3d - 3s4f$                   | $^3D - ^3F^\circ$ | -3    | 597       |
| P IV    | 879.310    | 80        |           | $3s3d - 3s4f$                   | $^3D - ^3F^\circ$ | -2    | 597       |
| P IV    | 907.590    | 80        |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3D - ^3D^\circ$ | 2-2   | 597       |
| P IV    | 908.050    | 160       |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^3D - ^3F^\circ$ | 2-3   | 597       |
| P IV    | 950.662    | 1000      | 1         | $3s^2 - 3s3p$                   | $^1S - ^1P^\circ$ | 0-1   | 488,597   |
| P IV    | 963.993    | 100h      |           | $2p^3 3p^2 - 2p^3 3p^1 3p^1 3d$ | $^1S - ^1P^\circ$ | 0-1   | 597       |
| P IV    | 1006.218   | 40        |           | $3s3d - 3s4p$                   | $^3D - ^1P^\circ$ | 2-1   | 597       |
| P IV    | 1025.564   | 160       | 2         | $3s3p - 2p^3 3p^2$              | $^3P - ^3P^\circ$ | 1-2   | 488,597   |
| P IV    | 1028.093   | 40        | 2         | $3s3p - 2p^3 3p^2$              | $^3P - ^3P^\circ$ | 0-1   | 488,597   |
| P IV    | 1030.511   | 400       | 2         | $3s3p - 2p^3 3p^2$              | $^3P - ^3P^\circ$ | 2-2   | 488,597   |
| P IV    | 1033.099   | 320       | 2         | $3s3p - 2p^3 3p^2$              | $^3P - ^3P^\circ$ | 1-0   | 488,597   |



PIV

PIV

| Element | Wavelength | Intensity | Multiplet | Configuration           | Term            | J-J | Reference |
|---------|------------|-----------|-----------|-------------------------|-----------------|-----|-----------|
| P IV    | 1035.505   | 320       | 2         | $3s3p - 2p^23p^2$       | $^1P^o - ^1P^o$ | 2-1 | 488,597   |
| P IV    | 1064.60    | 120       |           | $3s3d - 2p^23p^23p^23d$ | $^3D - ^3D^o$   | -3  | 597       |
| P IV    | 1065.554   | 120       |           | $3s3d - 2p^23p^23p^23d$ | $^3D - ^3D^o$   | -2  | 597       |
| P IV    | 1066.640   | 80        |           | $3s3d - 2p^23p^23p^23d$ | $^3D - ^3D^o$   | -1  | 597       |
| P IV?   | 1072.528   | 120       |           |                         |                 |     | 597       |
| P IV?   | 1073.373   | 120       |           |                         |                 |     | 597       |
| P IV    | 1086.943   | 80        |           | $3s3d - 2p^23p^23p^23d$ | $^3D - ^3P^o$   | -0  | 597       |
| P IV    | 1088.608   | 120       |           | $3s3d - 2p^23p^23p^23d$ | $^3D - ^3P^o$   | -1  | 597       |
| P IV    | 1091.442   | 160       |           | $3s3d - 2p^23p^23p^23d$ | $^3D - ^3P^o$   | -2  | 597       |
| P IV    | 1093.318   | 80        |           | $3s4s - 2p^23p^23p^24s$ | $^3S - ^3P^o$   | 1-2 | 597       |
| P IV    | 1098.183   | 80        |           | $3s4s - 2p^23p^23p^24s$ | $^3S - ^3P^o$   | 1-1 | 597       |
| P IV    | 1101.65    | 40        |           | $3s4s - 2p^23p^23p^24s$ | $^3S - ^3P^o$   | 1-0 | 597       |
| P IV    | 1111.127   | 40        |           | $3s3p - 3s3d$           | $^3P^o - ^3D$   | 1-2 | 597       |
| P IV    | 1116.915   | 20        |           | $3s3p - 3s3d$           | $^3P^o - ^3D$   | 2-2 | 597       |
| P IV    | 1118.586   | 160       |           | $3s3p - 2p^23p^2$       | $^1P^o - ^3S$   | 1-0 | 597       |
| P IV    | 1161.783   | 40        | 5         | $3s4s - 3s5p$           | $^3S - ^3P^o$   | 0-1 | 597       |
| P IV    | 1197.822   | 40        |           | $3s4p - 3s5d$           | $^3P^o - ^3D$   | 1-2 | 597       |
| P IV    | 1203.410   | 40        |           | $3s4p - 3s5d$           | $^3P^o - ^3D$   | 0-1 | 597       |
| P IV    | 1204.302   | 40        |           | $3s4p - 3s5d$           | $^3P^o - ^3D$   | 1-2 | 597       |
| P IV    | 1206.513   | 40d       |           | $3s4p - 3s5d$           | $^3P^o - ^3D$   | 2-3 | 597       |
| P IV    | 1264.481   | 40        |           | $3s4s - 2p^23p^23p^24s$ | $^3S - ^3P^o$   | 0-1 | 597       |
| P IV    | 1467.424   | 40        |           | $3s^2 - 3s3p$           | $^3S - ^3P^o$   | 0-1 | 597       |
| P IV    | 1484.506   | 240       |           | $3s3d - 3s4p$           | $^3D - ^3P^o$   | -2  | 597       |
| P IV    | 1487.796   | 160       |           | $3s3d - 3s4p$           | $^3D - ^3P^o$   | -1  | 597       |
| P IV    | 1489.101   | 160       |           | $3s3d - 3s4p$           | $^3D - ^3P^o$   | -0  | 597       |
| P IV?   | 1614.85    | 80        |           | $2p^23p^2 - 3s4p$       | $^3S - ^3P^o$   | 0-1 | 597       |
| P IV    | 1640.476   | 120       |           | $3s3p - 2p^23p^2$       | $^3P^o - ^3D$   | 1-2 | 597       |
| P IV    | 1673.759   | 20        |           | $3s3p - 2p^23p^2$       | $^3P^o - ^3P^o$ | 1-0 | 597       |
| P IV    | 1691.807   | 40        |           | $3s4p - 3s5s$           | $^3P^o - ^3S$   | 1-0 | 597       |
| P IV    | 1888.652   | 400       |           | $3s3p - 3s3d$           | $^3P^o - ^3D$   | 1-2 | 488,597   |
| P IV    | 1902.62    | 40        |           | $3s4p - 3s5s$           | $^3P^o - ^3S$   | 0-1 | 597       |
| P IV    | 1904.80    | 40        |           | $3s4p - 3s5s$           | $^3P^o - ^3S$   | 1-1 | 597       |
| P IV    | 1910.18    | 40        |           | $3s4p - 3s5s$           | $^3P^o - ^3S$   | 2-1 | 597       |

P V

## PHOSPHORUS, Z = 15

P V

Ground state  $1s^2 2s^2 2p^3 \ ^3S_{1/2}$ Ionization potential  $524\,463\text{ cm}^{-1}$ , 65.023 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term        | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|-------------|-----------------------------|-----------|
| P V     | 210.004    | 10        |           | 3s - 8p       | $^3S - ^3P$ | $\frac{1}{2}$               | 597       |
| P V     | 217.220    | 20        |           | 3s - 7p       | $^3S - ^3P$ | $\frac{1}{2}$               | 597       |
| P V     | 229.832    | 200       |           | 3s - 6p       | $^3S - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P V     | 255.596    | 500       |           | 3s - 5p       | $^3S - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P V     | 255.688    | 500       |           | 3s - 5p       | $^3S - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P V     | 264.938    | 300       |           | 3p - 7d       | $^1P - ^1D$ | $\frac{3}{2}$               | 597       |
| P V     | 273.13     | 10        |           | 3p - 7s       | $^1P - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P V     | 290.609    | 150       |           | 3p - 6d       | $^1P - ^1D$ | $\frac{3}{2}$               | 597       |
| P V     | 296.112    | 70        |           | 3p - 6s       | $^1P - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P V     | 310.579    | 200       |           | 3p - 5d       | $^1P - ^1D$ | $\frac{1}{2}$               | 597       |
| P V     | 311.347    | 250       |           | 3p - 5d       | $^1P - ^1D$ | $\frac{3}{2}$               | 597       |
| P V     | 328.455    | 300       |           | 3s - 4p       | $^3S - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P V     | 328.768    | 300       |           | 3s - 4p       | $^3S - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P V     | 347.237    | 150       |           | 3p - 5s       | $^1P - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P V     | 348.194    | 250       |           | 3p - 5s       | $^1P - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P V     | 389.500    | 200       |           | 3p - 4d       | $^1P - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P V     | 390.70     | 350       |           | 3p - 4d       | $^1P - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P V     | 410.07     | 150h      |           | 3d - 6f       | $^1D - ^1F$ |                             | 597       |
| P V     | 475.610    | 550h      |           | 3d - 5f       | $^1D - ^1F$ |                             | 597       |
| P V     | 542.567    | 500       |           | 3p - 4s       | $^1P - ^3S$ | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P V     | 544.914    | 550       |           | 3p - 4s       | $^1P - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P V     | 673.888    | 650       |           | 3d - 4f       | $^1D - ^1F$ |                             | 597       |
| P V     | 865.435    | 1000      |           | 3p - 3d       | $^1P - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P V     | 871.396    | 1000d     |           | 3p - 3d       | $^1P - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P V     | 997.641    | 200       |           | 3d - 4p       | $^1D - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 597       |
| P V     | 1000.360   | 200       |           | 3d - 4p       | $^1D - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P V     | 1117.979   | 1000      |           | 3s - 3p       | $^3S - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 597       |
| P V     | 1128.006   | 650       |           | 3s - 3p       | $^3S - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 597       |
| P V     | 1385.11    | 20        |           | 4p - 5s       | $^1P - ^3S$ | $\frac{3}{2} - \frac{1}{2}$ | 597       |
| P V     | 1447.92    | 150       |           | 4d - 5f       | $^1D - ^1F$ | $\frac{3}{2}$               | 597       |
| P V     | 1610.54    | 20        |           | 4f - 5g       | $^1F - ^1G$ |                             | 597       |

P VI

## PHOSPHORUS, Z = 15

P VI

Ground state  $1s^2 2s^2 2p^3 \ ^4S_3$ Ionization potential: 1 778 250  $\text{cm}^{-1}$ , 220.47 eV

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                                | J - J | Reference |
|---------|------------|-----------|-----------|------------------------|-------------------------------------|-------|-----------|
| P VI    | 57.932     | P         |           | $2p^6 - 2p^4(^1P^o)9d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 58.294     | P         |           | $2p^6 - 2p^4(^1P^o)8d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 58.727     | P         |           | $2p^6 - 2p^4(^1P^o)7d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 58.956     | P         |           | $2p^6 - 2p^4(^1P^o)7d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 59.775     | P         |           | $2p^6 - 2p^4(^1P^o)6d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 60.016     | P         |           | $2p^6 - 2p^4(^1P^o)6d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 60.572     | P         |           | $2p^6 - 2p^4(^1P^o)6s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 487       |
| P VI    | 61.622     | P         |           | $2p^6 - 2p^4(^1P^o)5d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 61.869     | P         |           | $2p^6 - 2p^4(^1P^o)5d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 61.970     | P         |           | $2p^6 - 2p^4(^1P^o)5d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 487       |
| P VI    | 63.177     | P         |           | $2p^6 - 2p^4(^1P^o)5s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 487       |
| P VI    | 63.450     | P         |           | $2p^6 - 2p^4(^1P^o)5s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 65.308     | P         |           | $2p^6 - 2p^4(^1P^o)4d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 65.640     | P         |           | $2p^6 - 2p^4(^1P^o)4d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 65.940     | P         |           | $2p^6 - 2p^4(^1P^o)4d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 487       |
| P VI    | 69.121     | P         |           | $2p^6 - 2p^4(^1P^o)4s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 487       |
| P VI    | 69.452     | P         |           | $2p^6 - 2p^4(^1P^o)4s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 74.951     | P         |           | $2p^6 - 2p^4(^1P^o)3d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 75.648     | P         |           | $2p^6 - 2p^4(^1P^o)3d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |
| P VI    | 76.534     | P         |           | $2p^6 - 2p^4(^1P^o)3d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 487       |
| P VI    | 90.647     | P         |           | $2p^6 - 2p^4(^1P^o)3s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 487       |
| P VI    | 91.471     | P         |           | $2p^6 - 2p^4(^1P^o)3s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 487       |

Ground state  $1s^2 2s^2 2p^3 \ ^3P_1$ Ionization potential 2 124 300  $\text{cm}^{-1}$ ; 263.37 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------|---------------|-----------------------------|-----------|
| P VII   | 54.708     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)4d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 54.887     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)4d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P VII   | 56.174     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)4d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 56.282     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)4d$ | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 56.322     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)4d$ | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 56.338     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)4d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 58.972     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)4s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 59.028     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)4s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P VII   | 62.245     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1S)3d$ | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 62.515     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1S)3d$ | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 64.286     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)3d$ | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P VII   | 64.361     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)3d$ | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 64.579     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)3d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P VII   | 64.587     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)3d$ | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P VII   | 64.635     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)3d$ | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 64.729     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)3d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 66.432     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P VII   | 66.488     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 66.576     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3d$ | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 66.691     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3d$ | $^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 66.805     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3d$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 66.989     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3d$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 72.684     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1S)3s$ | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P VII   | 73.070     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1S)3s$ | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P VII   | 75.924     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^1D)3s$ | $^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 78.285     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 78.414     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P VII   | 79.382     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3s$ | $^3P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P VII   | 79.561     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3s$ | $^3P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 80.507     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3s$ | $^1S - ^3P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P VII   | 80.813     | P         |           | $2s^2 2p^3 - 2s^2 2p^4 \ ^3P)3s$ | $^1S - ^3P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P VII   | 219.910    | P         |           | $2s^2 2p^3 - 2s^2 2p^4$          | $^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P VII   | 223.482    | P         |           | $2s^2 2p^3 - 2s^2 2p^4$          | $^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |

P VIII

## PHOSPHORUS, Z = 15

P VIII

Ground state  $1s^2 2s^2 2p^3 \ ^3P_1$ Ionization potential  $2\,495\,000\text{ cm}^{-1}$ ,  $309.3\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term           | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------------|----------------|-------|-----------|
| P VIII  | 48.859     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S^0 4d$ | $K^2P - ^1D^0$ | 2-3   | 487       |
| P VIII  | 55.672     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1D^0$ | 2-3   | 487       |
| P VIII  | 55.710     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1D^0$ | 1-2   | 487       |
| P VIII  | 55.876     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1P^0$ | 2-2   | 487       |
| P VIII  | 55.926     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1P^0$ | 2-1   | 487       |
| P VIII  | 56.056     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1P^0$ | 1-2   | 487       |
| P VIII  | 56.106     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1P^0$ | 1-1   | 487       |
| P VIII  | 56.138     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1P^0$ | 1-0   | 487       |
| P VIII  | 56.171     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3d$ | $K^2P - ^1P^0$ | 0-1   | 487       |
| P VIII  | 57.042     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3d$ | $K^2P - ^1D^0$ | 2-    | 487       |
| P VIII  | 57.230     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3d$ | $K^2P - ^1D^0$ | 1-    | 487       |
| P VIII  | 58.018     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3d$ | $^1D - ^1F^0$  | 2-3   | 487       |
| P VIII  | 58.776     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3d$ | $^1D - ^1D^0$  | 2-2   | 487       |
| P VIII  | 59.302     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3d$ | $^1D - ^1P^0$  | 2-1   | 487       |
| P VIII  | 59.302     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S^0 3d$ | $K^2P - ^1D^0$ | 2-3   | 487       |
| P VIII  | 59.516     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S^0 3d$ | $K^2P - ^1D^0$ | 1-    | 487       |
| P VIII  | 64.051     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3s$ | $K^2P - ^1P^0$ | 2-2   | 487       |
| P VIII  | 64.100     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3s$ | $K^2P - ^1P^0$ | 2-1   | 487       |
| P VIII  | 64.288     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3s$ | $K^2P - ^1P^0$ | 1-2   | 487       |
| P VIII  | 64.337     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3s$ | $K^2P - ^1P^0$ | 1-1   | 487       |
| P VIII  | 64.361     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3s$ | $K^2P - ^1P^0$ | 1-0   | 487       |
| P VIII  | 64.423     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3s$ | $K^2P - ^1P^0$ | 0-1   | 487       |
| P VIII  | 65.788     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3s$ | $K^2P - ^1D^0$ | 2-3   | 487       |
| P VIII  | 66.051     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3s$ | $K^2P - ^1D^0$ | 1-    | 487       |
| P VIII  | 67.587     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D^0 3s$ | $^1D - ^1D^0$  | 2-2   | 487       |
| P VIII  | 68.384     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S^0 3s$ | $K^2P - ^1S^0$ | 2-1   | 487       |
| P VIII  | 68.385     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P^0 3s$ | $^1S - ^1P^0$  | 0-1   | 487       |
| P VIII  | 68.654     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S^0 3s$ | $K^2P - ^1S^0$ | 1-1   | 487       |
| P VIII  | 68.751     | P         |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S^0 3s$ | $K^2P - ^1S^0$ | 0-1   | 487       |
| P VIII  | 196.761    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $^1D - ^1P^0$  | 2-1   | 487       |
| P VIII  | 222.366    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $^1S - ^1P^0$  | 0-1   | 487       |
| P VIII  | 244.551    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $K^2P - ^1P^0$ | 2-1   | 487       |
| P VIII  | 246.318    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $K^2P - ^1P^0$ | 1-0   | 487       |
| P VIII  | 247.644    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $K^2P - ^1P^0$ | 2-2   | 487       |
| P VIII  | 248.043    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $K^2P - ^1P^0$ | 1-1   | 487       |
| P VIII  | 249.322    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $K^2P - ^1P^0$ | 0-1   | 487       |
| P VIII  | 251.225    | P         |           | $2s^2 2p^4 - 2s^2 2p^4$            | $K^2P - ^1P^0$ | 1-2   | 487       |

PIX

## PHOSPHORUS, Z = 15

PIX

Ground state  $1s^2 2s^2 2p^3 \ ^4S_{3/2}$ Ionization potential 2 997 600 cm<sup>-1</sup>, 371.6 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                        | Term              | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------------|-------------------|-----------------------------|-----------|
| P IX    | 41.556     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)4d$       | $^1D^\circ - ^1F$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P IX    | 48.925     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1S^\circ)3p$ | $^4S^\circ - ^4P$ | $\frac{1}{2}$               | 487       |
| P IX    | 50.483     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P IX    | 50.511     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 50.560     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 51.076     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 51.156     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^1D^\circ - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 51.861     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$       | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 51.889     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$       | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 52.160     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3d$       | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 52.552     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$       | $^1D^\circ - ^1F$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P IX    | 52.709     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3d$       | $^1D^\circ - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 55.066     | P         |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^\circ)3d$ | $^1P - ^1D^\circ$ | $\frac{1}{2}$               | 487       |
| P IX    | 55.220     | P         |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^\circ)3d$ | $^1P - ^1D^\circ$ | $\frac{3}{2}$               | 487       |
| P IX    | 55.299     | P         |           | $2s^2 2p^4 - 2s^2 2p^3(^1S^\circ)3d$ | $^1P - ^1D^\circ$ | $\frac{1}{2}$               | 487       |
| P IX    | 57.083     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 57.266     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 57.339     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1P)3s$       | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P IX    | 57.683     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$       | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 57.711     | P         |           | $2s^2 2p^3 - 2s^2 2p^2(^1D)3s$       | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 194.612    | P         |           | $2s^2 2p^3 - 2s^2 2p^4$              | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P IX    | 197.246    | P         |           | $2s^2 2p^3 - 2s^2 2p^4$              | $^1D^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 283.246    | P         |           | $2s^2 2p^3 - 2s^2 2p^4$              | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P IX    | 285.356    | P         |           | $2s^2 2p^3 - 2s^2 2p^4$              | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 289.528    | P         |           | $2s^2 2p^3 - 2s^2 2p^4$              | $^4S^\circ - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 308.652    | P         |           | $2s^2 2p^4 - 2p^5$                   | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P IX    | 314.772    | P         |           | $2s^2 2p^4 - 2p^5$                   | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P IX    | 314.951    | P         |           | $2s^2 2p^4 - 2p^5$                   | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P IX    | 321.326    | P         |           | $2s^2 2p^4 - 2p^5$                   | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |

P X

## PHOSPHORUS, Z = 15

P X

Ground state  $1s^2 2s^2 2p^3 \ ^3P_0$ .Ionization potential  $3\,423\,000\text{ cm}^{-1}$ , 424.4 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term                  | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------------|-----------------------|-------|-----------|
| P X     | 45.905     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^1P) 3d$ | ${}^1S^\circ - {}^1P$ | 2-1   | 487       |
| P X     | 45.931     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^1P) 3d$ | ${}^1S^\circ - {}^1P$ | 2-2   | 487       |
| P X     | 45.963     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^1P) 3d$ | ${}^1S^\circ - {}^1P$ | 2-3   | 487       |
| P X     | 46.018     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3P^\circ$ | 0-1   | 487       |
| P X     | 46.070     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3P^\circ$ | 1-0   | 487       |
| P X     | 46.090     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3P^\circ$ | 1-1   | 487       |
| P X     | 46.120     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3P^\circ$ | 1-2   | 487       |
| P X     | 46.201     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3P^\circ$ |       | 487       |
| P X     | 46.231     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3P^\circ$ | 2     | 487       |
| P X     | 46.245     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3D^\circ$ | 0-1   | 487       |
| P X     | 46.294     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3D^\circ$ | 1-2   | 487       |
| P X     | 46.334     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^3P - {}^3D^\circ$ | 2-3   | 487       |
| P X     | 46.636     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^1D) 3d$ | ${}^1D^\circ - {}^1F$ |       | 487       |
| P X     | 46.769     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^1D - {}^1F^\circ$ | 2-3   | 487       |
| P X     | 47.896     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3d$ | ${}^1D - {}^1D^\circ$ | 2-2   | 487       |
| P X     | 51.019     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3s$ | ${}^3P - {}^3P^\circ$ | 1-2   | 487       |
| P X     | 51.125     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3s$ | ${}^3P - {}^3P^\circ$ | 0-1   | 487       |
| P X     | 51.155     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3s$ | ${}^3P - {}^3P^\circ$ | 2-2   | 487       |
| P X     | 51.214     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3s$ | ${}^3P - {}^3P^\circ$ | 1-1   | 487       |
| P X     | 51.262     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3s$ | ${}^3P - {}^3P^\circ$ | 1-0   | 487       |
| P X     | 51.351     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3s$ | ${}^3P - {}^3P^\circ$ | 2-1   | 487       |
| P X     | 52.158     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^3P) 3s$ | ${}^1D - {}^1P^\circ$ | 2-1   | 487       |
| P X     | 52.594     | P         |           | $2s^2 2p^2 - 2s^2 2p^4 ({}^1D) 3s$ | ${}^1P^\circ - {}^1D$ | 2-    | 487       |
| P X     | 309.444    | P         |           | $2s^2 2p^2 - 2s^2 2p^2$            | ${}^3P - {}^1D^\circ$ | 0-1   | 487       |
| P X     | 312.872    | P         |           | $2s^2 2p^2 - 2s^2 2p^2$            | ${}^3P - {}^1D^\circ$ | 1-2   | 487       |
| P X     | 318.258    | P         |           | $2s^2 2p^2 - 2s^2 2p^2$            | ${}^3P - {}^1D^\circ$ | 2-3   | 487       |

P XI

## PHOSPHORUS, Z = 15

P XI

Ground state  $1s^2 2s^2 2p^3 4P_1$ Ionization potential  $3\,867\,500\text{ cm}^{-1}$ , 479.5 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                   | Term           | J-J                         | Reference |
|---------|------------|-----------|-----------|---------------------------------|----------------|-----------------------------|-----------|
| P XI    | 42.006     | P         |           | $2s^2 2p^3 - 2s^2 p^3 (P^*) 3d$ | $^3D - ^3F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 42.468     | P         |           | $2s^2 2p^3 - 2s^2 p^3 (P^*) 3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 42.479     | P         |           | $2s^2 2p^3 - 2s^2 p^3 (P^*) 3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 42.599     | P         |           | $2s^2 2p - 2s^2 3d$             | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P XI    | 42.764     | P         |           | $2s^2 2p - 2s^2 3d$             | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 43.488     | P         |           | $1s^2 2p^3 - 2p^4 (P) 3d$       | $^4S^o - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 43.529     | P         |           | $1s^2 2p^3 - 2p^4 (P) 3d$       | $^4S^o - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 44.115     | P         |           | $2s^2 2p^3 - 2s^2 p^3 (P^*) 3d$ | $^3D - ^3F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 45.997     | P         |           | $2s^2 2p - 2s^2 3s$             | $g^3P^o - ^4S$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P XI    | 46.203     | P         |           | $2s^2 2p - 2s^2 3s$             | $g^3P^o - ^4S$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P XI    | 231.669    | P         |           | $2s^2 2p - 2s^2 p^3$            | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P XI    | 234.841    | P         |           | $2s^2 2p - 2s^2 p^3$            | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P XI    | 236.995    | P         |           | $2s^2 2p - 2s^2 p^3$            | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XI    | 240.315    | P         |           | $2s^2 2p - 2s^2 p^3$            | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P XI    | 325.214    | P         |           | $2s^2 2p - 2s^2 p^3$            | $g^3P^o - ^1D$ | $\frac{3}{2}$               | 487       |



P XII

## PHOSPHORUS, Z = 15

P XII

Ground state  $1s^2 2s^2 3s$ Ionization potential 4 520 500  $\text{cm}^{-1}$ , 560.5 eV

| Element | Wavelength | Intensity | Multiplet | Configuration           | Term          | J - J | Reference |
|---------|------------|-----------|-----------|-------------------------|---------------|-------|-----------|
| P XII   | 36.978     | P         |           | $2s2p - 2p3p$           | $^3P^o - ^1D$ | 2-3   | 487       |
| P XII   | 37.345     | P         |           | $2s^3 - 2s3p$           | $^4S - ^1P^o$ | 0-1   | 487       |
| P XII   | 39.316     | P         |           | $2s2p - 2s3d$           | $^3P^o - ^3D$ | 0-1   | 487       |
| P XII   | 39.358     | P         |           | $2s2p - 2s3d$           | $^3P^o - ^3D$ | 1-2   | 487       |
| P XII   | 39.450     | P         |           | $2s2p - 2s3d$           | $^3P^o - ^3D$ | 2-3   | 487       |
| P XII   | 40.431     | P         |           | $1s^2 2p^2 - 1s^2 2p3d$ | $^1P - ^3D^o$ | 2-3   | 487       |
| P XII   | 41.638     | P         |           | $2s2p - 2s3d$           | $^1P^o - ^1D$ | 1-2   | 487       |
| P XII   | 278.676    | P         |           | $2s^3 - 2s2p$           | $^4S - ^1P^o$ | 0-1   | 487       |

P XIII

## PHOSPHORUS, Z = 15

P XIII

Ground state  $1s^2 2s^2 3s^1$ Ionization potential  $4\,933\,060\text{ cm}^{-1}$ , 611.6 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------------------|-----------|
| P XIII  | 35.086     | P         |           | $2s - 3p$     | $8^3S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P XIII  | 35.157     | P         |           | $2s - 3p$     | $8^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P XIII  | 38.652     | P         |           | $2p - 3s$     | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 487       |
| P XIII  | 38.825     | P         |           | $2p - 3s$     | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| P XIII  | 110.969    | P         |           | $3d - 4f$     | $^1D - ^1F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 487       |
| P XIII  | 456.100    | P         |           | $2s - 2p$     | $8^3S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 487       |
| P XIII  | 481.417    | P         |           | $2s - 2p$     | $8^3S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 487       |

P XV

## PHOSPHORUS, Z = 15

P XV

Ground state  $1s^2S_{1/2}$ Ionization potential  $24\,759\,943\text{ cm}^{-1}$ ,  $3069.76\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration | Term         | J - J          | Reference |
|---------|------------|-----------|-----------|---------------|--------------|----------------|-----------|
| P XV    | 4.154      | P         |           | $1s-6p$       | $2^1S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| P XV    | 4.207      | P         |           | $1s-5p$       | $2^1S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| P XV    | 4.308      | P         |           | $1s-4p$       | $2^1S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| P XV    | 4.543      | P         |           | $1s-3p$       | $2^1S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| P XV    | 5.383      | P         |           | $1s-2p$       | $2^1S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| P XV    | 17.60      | P         |           | $2-7$         |              |                | 309       |
| P XV    | 18.18      | P         |           | $2-6$         |              |                | 309       |
| P XV    | 19.24      | P         |           | $2-5$         |              |                | 309       |
| P XV    | 21.54      | P         |           | $2-4$         |              |                | 309       |
| P XV    | 29.07      | P         |           | $2-3$         |              |                | 309       |
| P XV    | 44.59      | P         |           | $3-7$         |              |                | 309       |
| P XV    | 48.53      | P         |           | $3-6$         |              |                | 309       |
| P XV    | 56.87      | P         |           | $3-5$         |              |                | 309       |
| P XV    | 83.2       | P         |           | $3-4$         |              |                | 309       |
| P XV    | 96.13      | P         |           | $4-7$         |              |                | 309       |
| P XV    | 116.5      | P         |           | $4-6$         |              |                | 309       |
| P XV    | 179.8      | P         |           | $4-5$         |              |                | 309       |
| P XV    | 206.6      | P         |           | $5-7$         |              |                | 309       |
| P XV    | 331.1      | P         |           | $5-6$         |              |                | 309       |
| P XV    | 549.3      | P         |           | $6-7$         |              |                | 309       |

S

SULFUR, Z = 16

S

Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| S       | 46.713     | 50        |           |               |      |       | 233       |
| S       | 46.765     | 50        |           |               |      |       | 233       |
| S       | 48.362     | 20        |           |               |      |       | 233       |
| S       | 49.990     | 120       |           |               |      |       | 233       |

S I

## SULFUR, Z = 16

S I

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^4 \ ^3P_2$ Ionization potential  $83\,559.3\text{ cm}^{-1}$ ,  $10.360\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                            | Term                 | J-J | Reference   |
|---------|------------|-----------|-----------|------------------------------------------|----------------------|-----|-------------|
| S I     | 1241.9     | 65        |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 8s$ | $R^3P - ^3S^{\circ}$ | 2-1 | 599,769     |
| S I     | 1247.17    | 65        |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 6d$ | $R^3P - ^3D^{\circ}$ | 2-3 | 599,769     |
| S I     | 1262.83    | 65        |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 7s$ | $R^3P - ^3S^{\circ}$ | 2-1 | 599         |
| S I     | 1269.20    | 65        |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 7s$ | $R^3P - ^3S^{\circ}$ | 1-1 | 599         |
| S I     | 1270.78    | 130       |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 5d$ | $R^3P - ^3D^{\circ}$ | 2-  | 599         |
| S I     | 1272.07    | 35        |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 7s$ | $R^3P - ^3S^{\circ}$ | 0-1 | 599         |
| S I     | 1277.24    | 170d      |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 5d$ | $R^3P - ^3D^{\circ}$ | 1-2 | 599         |
| S I     | 1280.13    | 130       |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 5d$ | $R^3P - ^3D^{\circ}$ | 0-1 | 599         |
| S I?    | 1283.11    | 15        |           |                                          |                      |     | 599         |
| S I     | 1295.661   | 500       | 9         | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $R^3P - ^3P^{\circ}$ | 2-2 | 488,599,769 |
| S I     | 1296.174   | 400       | 9         | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $R^3P - ^3P^{\circ}$ | 2-1 | 488,599,769 |
| S I     | 1302.344   | 500       | 9         | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $R^3P - ^3P^{\circ}$ | 1-2 | 488,599,769 |
| S I     | 1302.865   | 400       | 9         | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $R^3P - ^3P^{\circ}$ | 1-1 | 488,599,769 |
| S I     | 1303.114   | 400       | 9         | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $R^3P - ^3P^{\circ}$ | 1-0 | 488,599,769 |
| S I     | 1303.42    | 130       |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 6s$ | $R^3P - ^3S^{\circ}$ | 2-1 | 599         |
| S I     | 1305.885   | 400       | 9         | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $R^3P - ^3P^{\circ}$ | 0-1 | 488,599,769 |
| S I     | 1310.21    | 170       |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 6s$ | $R^3P - ^3S^{\circ}$ | 1-1 | 599         |
| S I     | 1313.25    | 130       |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 6s$ | $R^3P - ^3S^{\circ}$ | 0-1 | 599         |
| S I     | 1316.57    | 330       | 8         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 4d$ | $R^3P - ^3D^{\circ}$ | 2-3 | 488,599,769 |
| S I?    | 1318.97    | 130       |           |                                          |                      |     | 599         |
| S I     | 1323.521   | 230       | 8         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 4d$ | $R^3P - ^3D^{\circ}$ | 1-2 | 488,599,769 |
| S I     | 1326.635   | 170       | 8         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 4d$ | $R^3P - ^3D^{\circ}$ | 0-1 | 488,599,769 |
| S I?    | 1353.47    | 35        |           |                                          |                      |     | 599         |
| S I?    | 1363.04    | 100       |           |                                          |                      |     | 599         |
| S I     | 1381.571   | 330       | 7         | $3s^2 3p^4 - 3s^2 3p^4$                  | $R^3P - ^3P^{\circ}$ | 2-1 | 488,599,769 |
| S I     | 1385.524   | 230       | 7         | $3s^2 3p^4 - 3s^2 3p^4$                  | $R^3P - ^3P^{\circ}$ | 1-0 | 488,599,769 |
| S I     | 1388.463   | 400       | 7         | $3s^2 3p^4 - 3s^2 3p^4$                  | $R^3P - ^3P^{\circ}$ | 2-2 | 488,599,769 |
| S I     | 1389.160   | 230       | 7         | $3s^2 3p^4 - 3s^2 3p^4$                  | $R^3P - ^3P^{\circ}$ | 1-1 | 488,599,769 |
| S I     | 1392.607   | 330       | 7         | $3s^2 3p^4 - 3s^2 3p^4$                  | $R^3P - ^3P^{\circ}$ | 0-1 | 488,599,769 |
| S I     | 1396.147   | 400       | 7         | $3s^2 3p^4 - 3s^2 3p^4$                  | $R^3P - ^3P^{\circ}$ | 1-2 | 488,599,769 |
| S I     | 1401.541   | 330       | 6         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 5s$ | $R^3P - ^3S^{\circ}$ | 2-1 | 488,599,769 |
| S I     | 1409.368   | 330       | 6         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 5s$ | $R^3P - ^3S^{\circ}$ | 1-1 | 488,599,769 |
| S I     | 1412.899   | 230       | 6         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 5s$ | $R^3P - ^3S^{\circ}$ | 0-1 | 488,599,769 |
| S I     | 1425.065   | 500       | 5         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $R^3P - ^3D^{\circ}$ | 2-3 | 488,599,769 |
| S I     | 1425.229   | 400       | 5         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $R^3P - ^3D^{\circ}$ | 2-2 | 488,599,769 |
| S I     | 1433.328   | 500       | 5         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $R^3P - ^3D^{\circ}$ | 1-  | 488,599,769 |
| S I     | 1437.005   | 400       | 5         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $R^3P - ^3D^{\circ}$ | 0-1 | 488,599,769 |
| S I     | 1444.317   | 330       |           | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $R^3P - ^3D^{\circ}$ | 2-2 | 599,769     |
| S I     | 1448.254   | 500       | 12        | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $^1D - ^1P^{\circ}$  | 2-1 | 488,599,769 |
| S I     | 1471.82    | 130       |           | $3s^2 3p^4 - 3s^2 3p^4 (^3P^{\circ}) 4s$ | $^1D - ^1P^{\circ}$  | 2-2 | 599         |
| S I     | 1472.993   | 670       | 4         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $R^3P - ^3D^{\circ}$ | 2-3 | 488,599,769 |
| S I     | 1474.005   | 730       | 3         | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $R^3P - ^3D^{\circ}$ | 2-3 | 488,599,769 |
| S I     | 1474.390   | 500       | 3         | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $R^3P - ^3D^{\circ}$ | 2-2 | 488,599,769 |
| S I     | 1474.569   | 330       | 3         | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $R^3P - ^3D^{\circ}$ | 2-1 | 488,599,769 |
| S I     | 1481.680   | 500       | 4         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $R^3P - ^3D^{\circ}$ | 1-2 | 488,599,769 |
| S I     | 1483.036   | 670       | 3         | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $R^3P - ^3D^{\circ}$ | 1-2 | 488,599,769 |
| S I     | 1483.232   | 500       | 3         | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $R^3P - ^3D^{\circ}$ | 1-1 | 488,599,769 |
| S I     | 1485.613   | 230       | 4         | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $R^3P - ^3D^{\circ}$ | 0-1 | 488,599,769 |
| S I     | 1487.149   | 500       | 3         | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $R^3P - ^3D^{\circ}$ | 0-1 | 488,599,769 |
| S I     | 1592.72    | 65        |           | $3s^2 3p^4 - 3s^2 3p^4$                  | $^1D - ^1P^{\circ}$  | 2-2 | 599         |
| S I     | 1641.30    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $^1D - ^3D^{\circ}$  | 2-2 | 599         |
| S I     | 1666.691   | 730       | 11        | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $^1D - ^1D^{\circ}$  | 2-2 | 488,599,769 |
| S I     | 1687.49    | 330       |           | $3s^2 3p^4 - 3s^2 3p^4$                  | $^1S - ^1P^{\circ}$  | 0-1 | 599,769     |
| S I     | 1704.99    | 170       |           | $3s^2 3p^4 - 3s^2 3p^4 (^4S^{\circ}) 3d$ | $^1D - ^3D^{\circ}$  | 2-  | 599         |
| S I     | 1706.38    | 270       | 10        | $3s^2 3p^4 - 3s^2 3p^4 (^3D^{\circ}) 4s$ | $^1D - ^3D^{\circ}$  | 2-3 | 488,599     |

S1

S1

| Element          | Wavelength | Intensity | Multiplet | Configuration                            | Term                    | J - J | Reference   |
|------------------|------------|-----------|-----------|------------------------------------------|-------------------------|-------|-------------|
| S 1              | 1707.13    | 270       | 10        | $3s^2 3p^4 - 3s^2 3p^4 {}^1D^{\circ} 4s$ | ${}^1D - {}^1D^{\circ}$ | 2-1   | 488,599     |
| S 1 <sup>2</sup> | 1713.54    | 35        |           |                                          |                         |       | 599         |
| S 1              | 1782.258   | 500       | 13        | $3s^2 3p^4 - 3s^2 3p^4 {}^3P^{\circ} 4s$ | ${}^1S - {}^1P^{\circ}$ | 0-1   | 488,599,769 |
| S 1              | 1807.341   | 950       | 2         | $3s^2 3p^4 - 3s^2 3p^4 {}^1S^{\circ} 4s$ | ${}^3P - {}^3S^{\circ}$ | 2-1   | 488,599,769 |
| S 1              | 1820.361   | 850       | 2         | $3s^2 3p^4 - 3s^2 3p^4 {}^3S^{\circ} 4s$ | ${}^3P - {}^3S^{\circ}$ | 1-1   | 488,599,769 |
| S 1              | 1826.261   | 850       | 2         | $3s^2 3p^4 - 3s^2 3p^4 {}^1S^{\circ} 4s$ | ${}^3P - {}^3S^{\circ}$ | 0-1   | 488,599,769 |
| S 1              | 1900.27    | 670       | 1         | $3s^2 3p^4 - 3s^2 3p^4 {}^1S^{\circ} 4s$ | ${}^3P - {}^3S^{\circ}$ | 2-2   | 488,599     |
| S 1              | 1914.68    | 500       | 1         | $3s^2 3p^4 - 3s^2 3p^4 {}^1S^{\circ} 4s$ | ${}^3P - {}^3S^{\circ}$ | 1-2   | 488,599     |

S II

SULFUR, Z = 16

S II

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^4 \text{ } ^4\text{S}_{3/2}$ Ionization potential 188 824.5 cm<sup>-1</sup> 23.411 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term                                  | J - J                       | Reference |
|---------|------------|-----------|-----------|-------------------------------------------|---------------------------------------|-----------------------------|-----------|
| S II    | 640.41     | 50        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4d$ | ${}^4\text{S}^{\circ} - {}^4\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 322       |
| S II    | 640.93     | 50        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4d$ | ${}^4\text{S}^{\circ} - {}^4\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 641.81     | 100       |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4d$ | ${}^4\text{S}^{\circ} - {}^4\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 694.71     | 50        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4d$ | ${}^1\text{D}^{\circ} - {}^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 705.62     | 40        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{1}{2}$ | 322       |
| S II    | 707.86     | 50        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 798.92     | 50        |           | $3s^2 3p^2 - ?$                           | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 799.14     | 50        |           | $3s^2 3p^2 - ?$                           | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 800.04     | 50        |           | $3s^2 3p^2 - ?$                           | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 322       |
| S II    | 843.82     | 200       |           | $3s^2 3p^2 - ?$                           | ${}^1\text{D}^{\circ} - \text{I}$     | $\frac{3}{2} - \frac{1}{2}$ | 322       |
| S II    | 865.87     | 50        |           | $3s^2 3p^2 - ?$                           | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{1}{2} - \frac{3}{2}$ | 322       |
| S II    | 866.23     | 100       |           | $3s^2 3p^2 - ?$                           | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 867.15     | 100       |           | $3s^2 3p^2 - ?$                           | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{1}{2} - \frac{1}{2}$ | 322       |
| S II    | 867.50     | 100       |           | $3s^2 3p^2 - ?$                           | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 322       |
| S II    | 906.87     | 300       | 2         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^4\text{S}^{\circ} - {}^4\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 910.49     | 300       | 2         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^4\text{S}^{\circ} - {}^4\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 912.74     | 300       | 2         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^4\text{S}^{\circ} - {}^4\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 322,488   |
| S II    | 918.82     | 300       |           | $3s^2 3p^2 - ?$                           | ${}^1\text{P}^{\circ} - \text{I}$     | $\frac{1}{2} - \frac{1}{2}$ | 322       |
| S II    | 919.24     | 100       |           | $3s^2 3p^2 - ?$                           | ${}^1\text{P}^{\circ} - \text{I}$     | $\frac{3}{2} - \frac{1}{2}$ | 322       |
| S II    | 937.41     | 300       | 6         | $3s^2 3p^2 - 3s^2 3p^2 ({}^1\text{D}) 4s$ | ${}^1\text{D}^{\circ} - {}^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 937.69     | 300       | 6         | $3s^2 3p^2 - 3s^2 3p^2 ({}^1\text{D}) 4s$ | ${}^1\text{D}^{\circ} - {}^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 957.88     | 100       |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{D}$ |                             | 322       |
| S II    | 968.37     | 50        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 996.00     | 200       | 5         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1000.48    | 200       | 5         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1000.75    | 65        | 5         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{3}{2}$ | 599,487   |
| S II?   | 1006.15    | 270       |           |                                           |                                       |                             | 599       |
| S II?   | 1006.95    | 35        |           |                                           |                                       |                             | 599       |
| S II    | 1014.09    | 50        | 4         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322       |
| S II    | 1014.42    | 200       | 4         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1019.55    | 200       | 4         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 322,488   |
| S II    | 1030.87    | 100       | 9         | $3s^2 3p^2 - 3s^2 3p^2 ({}^1\text{D}) 4s$ | ${}^1\text{P}^{\circ} - {}^1\text{D}$ | $\frac{1}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1031.34    | 100       | 9         | $3s^2 3p^2 - 3s^2 3p^2 ({}^1\text{D}) 4s$ | ${}^1\text{P}^{\circ} - {}^1\text{D}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II?   | 1036.41    | 15        |           |                                           |                                       |                             | 599       |
| S II    | 1045.74    | 65        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{1}{2}$ | 599,487   |
| S II    | 1047.56    | 35        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{3}{2}$ | 599,487   |
| S II    | 1047.86    | 35        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{3}{2}$ | 599,487   |
| S II?   | 1048.43    | 35        |           |                                           |                                       |                             | 599       |
| S II    | 1049.06    | 35        |           | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 3d$ | ${}^1\text{D}^{\circ} - {}^1\text{F}$ | $\frac{3}{2} - \frac{3}{2}$ | 599,487   |
| S II?   | 1049.77    | 35        |           |                                           |                                       |                             | 599       |
| S II?   | 1052.25    | 65        |           |                                           |                                       |                             | 599       |
| S II?   | 1052.60    | 35        |           |                                           |                                       |                             | 599       |
| S II?   | 1053.21    | 35        |           |                                           |                                       |                             | 599       |
| S II?   | 1055.15    | 35        |           |                                           |                                       |                             | 599       |
| S II?   | 1056.79    | 65d       |           |                                           |                                       |                             | 599       |
| S II    | 1096.57    | 200       | 3         | $3s^2 3p^2 - 3s^2 3p^2$                   | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 322,488   |
| S II    | 1102.32    | 300       | 3         | $3s^2 3p^2 - 3s^2 3p^2$                   | ${}^1\text{D}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1124.39    | 100       | 8         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{1}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1125.00    | 100       | 8         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1131.05    | 200       | 8         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{1}{2} - \frac{1}{2}$ | 322,488   |
| S II    | 1131.65    | 200       | 8         | $3s^2 3p^2 - 3s^2 3p^2 ({}^3\text{P}) 4s$ | ${}^1\text{P}^{\circ} - {}^1\text{P}$ | $\frac{3}{2} - \frac{1}{2}$ | 322,488   |
| S II?   | 1152.11    | 65        |           |                                           |                                       |                             | 599       |
| S II?   | 1157.37    | 35        |           |                                           |                                       |                             | 599       |
| S II?   | 1171.91    | 65        |           |                                           |                                       |                             | 599       |
| S II?   | 1190.11    | 65        |           |                                           |                                       |                             | 599       |

S II

S II

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term          | J - J                       | Reference |
|---------|------------|-----------|-----------|------------------------------|---------------|-----------------------------|-----------|
| S II'   | 1191.80    | 65        |           |                              |               |                             | 599       |
| S II'   | 1204.30    | 500       |           |                              |               |                             | 599,769   |
| S II    | 1226.70    | 100       | 7         | $3s^1 3p^4 - 3s 3p^4$        | $^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 322,488   |
| S II    | 1227.45    | 100       | 7         | $3s^1 3p^4 - 3s 3p^4$        | $^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 322,488   |
| S II    | 1233.36    | 50        | 7         | $3s^1 3p^4 - 3s 3p^4$        | $^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1234.14    | 300       | 7         | $3s^1 3p^4 - 3s 3p^4$        | $^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1250.50    | 300       | 1         | $3s^1 3p^4 - 3s 3p^4$        | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 322,488   |
| S II    | 1253.79    | 500       | 1         | $3s^1 3p^4 - 3s 3p^4$        | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1259.53    | 500       | 1         | $3s^1 3p^4 - 3s 3p^4$        | $^4S^o - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 322,488   |
| S II    | 1936.84    | 300       |           | $3s 3p^4 - 3s^2 3p^2(^1P)4p$ | $^1P - ^4S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 285       |
| S II    | 1950.53    | 300       |           | $3s 3p^4 - 3s^2 3p^2(^1P)4p$ | $^1P - ^4S^o$ | $\frac{3}{2} - \frac{3}{2}$ | 285       |
| S II    | 1958.38    | 300       |           | $3s 3p^4 - 3s^2 3p^2(^1P)4p$ | $^1P - ^4S^o$ | $\frac{1}{2} - \frac{3}{2}$ | 285       |
| S II    | 1970.99    | 400       |           | $3s 3p^4 - 3s^2 3p^2(^1P)4p$ | $^1P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 285       |
| S II    | 1981.80    | 200       |           | $3s 3p^4 - 3s^2 3p^2(^1P)4p$ | $^1P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 285       |
| S II    | 1985.17    | 200       |           | $3s 3p^4 - 3s^2 3p^2(^1P)4p$ | $^1P - ^4P^o$ | $\frac{3}{2} - \frac{3}{2}$ | 285       |
| S II    | 1998.92    | 200       |           | $3s 3p^4 - 3s^2 3p^2(^1P)4p$ | $^1P - ^4P^o$ | $\frac{3}{2} - \frac{1}{2}$ | 285       |



S III

SULFUR, Z = 16

S III

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^2 \ ^3P_0$ .Ionization potential 282 750 cm<sup>-1</sup>, 35.06 eV

| Element | Wavelength | Intensity | Multiplet | Configuration             | Term              | J - J | Reference |
|---------|------------|-----------|-----------|---------------------------|-------------------|-------|-----------|
| S III   | 484.58     | 50        |           | $3s^2 3p^2 - 3s^2 3p^4 d$ | $^4P - ^4D^\circ$ | 1-2   | 323       |
| S III   | 485.22     | 50        |           | $3s^2 3p^2 - 3s^2 3p^4 d$ | $^4P - ^4D^\circ$ | 2-3   | 323       |
| S III   | 499.983    | 100       |           | $3s^2 3p^2 - 3s^2 3p^5 s$ | $^4D - ^4P^\circ$ | 2-1   | 598       |
| S III   | 543.031    | 200       |           | $3s^2 3p^2 - 3s^2 3p^5 s$ | $^4S - ^4P^\circ$ | 0-1   | 598       |
| S III   | 677.75     | 200       | 7         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4D^\circ$ | 0-1   | 323,488   |
| S III   | 678.46     | 200       | 7         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4D^\circ$ | 1-2   | 323,488   |
| S III   | 679.11     | 200       | 7         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4D^\circ$ | 1-1   | 323,488   |
| S III   | 680.69     | 200       | 7         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4D^\circ$ | 2-3   | 323,488   |
| S III   | 680.95     | 200b      | 7         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4D^\circ$ | 2-2   | 323,488   |
| S III   | 681.50     | 100b      | 6         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4D^\circ$ | 0-1   | 323,488   |
| S III   | 683.07     | 50        | 6         | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4P - ^4P^\circ$ | 1-0   | 323,488   |
| S III   | 683.47     | 100       | 6         | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4P - ^4P^\circ$ | 2-2   | 323,488   |
| S III   | 685.35     | 50        | 6         | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4P - ^4P^\circ$ | 2-1   | 323,488   |
| S III   | 698.73     | 200       | 5         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4P^\circ$ | 0-1   | 323,488   |
| S III   | 700.15     | 300       | 5         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4P^\circ$ | 1-2   | 323,488   |
| S III   | 700.29     | 300       | 5         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4P^\circ$ | 1-0   | 323,488   |
| S III   | 702.78     | P         | 5         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4P^\circ$ | 2-2   | 488       |
| S III   | 702.82     | P         | 5         | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4P - ^4P^\circ$ | 2-1   | 488       |
| S III   | 724.29     | 300       | 4         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4S^\circ$ | 0-1   | 323,488   |
| S III   | 725.86     | 3         | 4         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4S^\circ$ | 1-1   | 323,488   |
| S III   | 728.69     | 300       | 4         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4S^\circ$ | 2-1   | 323,488   |
| S III   | 729.529    | 400       | 12        | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4D - ^4P^\circ$ | 2-1   | 488,598   |
| S III   | 730.783    | 300       | 3         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 0-1   | 488,598   |
| S III   | 732.376    | 500       | 3         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 1-1   | 488,598   |
| S III   | 732.98     | 50        |           | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4D - ^4D^\circ$ | 2-3   | 598       |
| S III   | 733.34     | 50        |           | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4D - ^4D^\circ$ | 2-2   | 598       |
| S III   | 733.92     | 100       |           | $3s^2 3p^2 - 3s^2 3p^3 d$ | $^4D - ^4D^\circ$ | 2-1   | 598       |
| S III   | 735.251    | 400       | 3         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 2-1   | 488,598   |
| S III   | 736.25     | 200       | 11        | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4D - ^4P^\circ$ | 2-2   | 598       |
| S III   | 738.474    | 400       | 11        | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4D - ^4P^\circ$ | 2-1   | 488,598   |
| S III   | 788.984    | 400       | 10        | $3s^2 3p^2 - 3s^2 3p^2$   | $^4D - ^4S^\circ$ | 2-1   | 488,598   |
| S III   | 796.692    | 400       | 9         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4D - ^4P^\circ$ | 2-1   | 488,598   |
| S III   | 824.887    | 400       | 14        | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4S - ^4P^\circ$ | 0-1   | 488,598   |
| S III   | 836.315    | 400       | 13        | $3s^2 3p^2 - 3s^2 3p^4 s$ | $^4S - ^4P^\circ$ | 0-1   | 488,598   |
| S III   | 911.77     | 20        |           | $3s^2 3p^2 - 3s^2 3p^2$   | $^4S - ^4P^\circ$ | 0-1   | 598       |
| S III   | 1012.49    | 300       | 2         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 0-1   | 323,488   |
| S III   | 1015.51    | 200       | 2         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 1-1   | 323,488   |
| S III   | 1015.76    | 100       | 2         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 1-2   | 323,488   |
| S III   | 1021.10    | 100       | 2         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 2-1   | 323,488   |
| S III   | 1021.32    | 200       | 2         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4P^\circ$ | 2-2   | 323,488   |
| S III   | 1077.135   | 800       | 8         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4D - ^4D^\circ$ | 2-2   | 488,598   |
| S III   | 1122.42    | 200       |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4D^\circ - ^4P$ | 3-2   | 323       |
| S III   | 1126.48    | 50        |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4D^\circ - ^4P$ | 1-1   | 323       |
| S III   | 1126.85    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4D^\circ - ^4P$ | 2-1   | 323       |
| S III   | 1155.34    | 200       |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4D^\circ - ^4D$ | 3-3   | 323       |
| S III   | 1162.52    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4D^\circ - ^4D$ | 2-2   | 323       |
| S III   | 1166.13    | 50        |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4D^\circ - ^4D$ | 1-1   | 323       |
| S III   | 1190.17    | 200       | 1         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4D^\circ$ | 0-1   | 323,488   |
| S III   | 1194.02    | 400       | 1         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4D^\circ$ | 1-2   | 323,488   |
| S III   | 1194.40    | 300       | 1         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4D^\circ$ | 1-1   | 323,488   |
| S III   | 1200.97    | 400       | 1         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4D^\circ$ | 2-3   | 323,488   |
| S III   | 1201.71    | 200       | 1         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4D^\circ$ | 2-2   | 323,488   |
| S III   | 1202.10    | 50        | 1         | $3s^2 3p^2 - 3s^2 3p^2$   | $^4P - ^4D^\circ$ | 2-1   | 323,488   |
| S III   | 1328.12    | 50        |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4P^\circ - ^4S$ | 2-1   | 323       |
| S III   | 1328.52    | 50        |           | $3s^2 3p^2 - 3s^2 3p^4 p$ | $^4P^\circ - ^4S$ | 1-1   | 323       |

S III

S III

| Element | Wavelength | Intensity | Multiplet | Configuration                            | Term                             | J-J | Reference |
|---------|------------|-----------|-----------|------------------------------------------|----------------------------------|-----|-----------|
| S III   | 1343.25    | 50        |           | 3s3p <sup>1</sup> - 3s <sup>2</sup> 3p4p | <sup>1</sup> P° - <sup>1</sup> P | 2-2 | 323       |
| S III   | 1343.53    | 50        |           | 3s3p <sup>2</sup> - 3s <sup>2</sup> 3p4p | <sup>1</sup> P° - <sup>1</sup> P | 1-2 | 323       |
| S III   | 1350.67    | 50        |           | 3s3p <sup>1</sup> - 3s <sup>2</sup> 3p4p | <sup>1</sup> P° - <sup>1</sup> D | 2-3 | 323       |

S IV

SULFUR, Z = 16

S IV

Ground state  $1s^2s^2p^3s^3p\ ^4P_{11}$ Ionization potential  $381\,541.4\text{ cm}^{-1}$ ;  $47.304\text{ eV}$ 

| Element | Wavelength | Intensity | Multiplicity | Configuration            | Term           | J - J                       | Reference |
|---------|------------|-----------|--------------|--------------------------|----------------|-----------------------------|-----------|
| S IV    | 519.30     | 200       |              | $3s3p^2 - 3s3p(^3P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041       |
| S IV    | 520.11     | 200       |              | $3s3p^2 - 3s3p(^3P^o)4s$ | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 041       |
| S IV    | 520.83     | 300       |              | $3s3p^2 - 3s3p(^3P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041       |
| S IV    | 521.13     | 100       |              | $3s3p^2 - 3s3p(^3P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041       |
| S IV    | 521.99     | 200       |              | $3s3p^2 - 3s3p(^3P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 041       |
| S IV    | 522.54     | 200       |              | $3s3p^2 - 3s3p(^3P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041       |
| S IV    | 551.17     | 200       | 5            | $3s^23p - 3s^24s$        | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 487,488   |
| S IV    | 554.17     | P         | 5            | $3s^23p - 3s^24s$        | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 487       |
| S IV    | 652.523    | 300       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 653.000    | 300       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{1}{2} - \frac{1}{2}$ | 041       |
| S IV    | 653.560    | 400       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 653.988    | 300       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041       |
| S IV    | 654.37     | 100       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{1}{2}$ | 041       |
| S IV    | 655.553    | 400       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 655.887    | 200       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041       |
| S IV    | 656.30     | 100       | 8            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041       |
| S IV    | 657.34     | 500       | 4            | $3s^23p - 3s^23d$        | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 485,488   |
| S IV    | 660.945    | 300       | 7            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 661.42     | 600       | 4            | $3s^23p - 3s^23d$        | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 485,488   |
| S IV    | 663.707    | 300       | 7            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 664.822    | 300       | 7            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 666.114    | 400       | 7            | $3s3p^2 - 3s3p(^3P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 744.92     | 500       | 3            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 485,488   |
| S IV    | 748.40     | 500       | 3            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 485,488   |
| S IV    | 750.23     | 500       | 3            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 485,488   |
| S IV    | 753.76     | 500       | 3            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 485,488   |
| S IV    | 798.277    | 300       | 6            | $3s3p^2 - 2p^23p^2$      | $^1P - ^1S^o$  | $\frac{1}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 800.477    | 400       | 6            | $3s3p^2 - 2p^23p^2$      | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 803.996    | 400       | 6            | $3s3p^2 - 2p^23p^2$      | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 041,488   |
| S IV    | 809.69     | 400       | 2            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 485,488   |
| S IV    | 815.97     | 500       | 2            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 485,488   |
| S IV    | 836.286    | 400       |              | $3s3p^2 - 3s^24p$        | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| S IV    | 837.447    | 400       |              | $3s3p^2 - 3s^24p$        | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 038       |
| S IV    | 852.716    | 300       |              | $3s3p^2 - 2p^23p^2$      | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| S IV    | 853.135    | 300       |              | $3s3p^2 - 2p^23p^2$      | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 038       |
| S IV    | 1062.672   | 600       | 1            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 038,488   |
| S IV    | 1072.992   | 600       | 1            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 038,488   |
| S IV    | 1073.522   | 400       | 1            | $3s^23p - 3s^23p^2$      | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 038,488   |
| S IV    | 1108.36    | 200       |              | $3s3p^2 - 3s^24p$        | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 485       |
| S IV    | 1110.90    | 200       |              | $3s3p^2 - 3s^24p$        | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 485       |
| S IV    | 1138.227   | 100       |              | $3s3p^2 - 2p^23p^2$      | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 038       |
| S IV    | 1286.063   | 100       |              | $3s3p^2 - 2p^23p^2$      | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 038       |
| S IV    | 1296.640   | 200       |              | $3s3p^2 - 2p^23p^2$      | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 038       |
| S IV    | 1623.62    | 50        |              | $3s^23d - 3s^24p$        | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 485       |
| S IV    | 1624.00    | 200       |              | $3s^23d - 3s^24p$        | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 485       |
| S IV    | 1629.20    | 200       |              | $3s^23d - 3s^24p$        | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 485       |
| S IV    | 1739.03    | 50        |              | $3s^24p - 3s^25s$        | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 485       |
| S IV    | 1745.42    | 100       |              | $3s^24p - 3s^25s$        | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 485       |

S V

## SULFUR, Z = 16

S V

Ground state  $1s^2 2s^2 2p^6 3s^2 \ ^1S_0$   
 Ionization potential  $584\,700\text{ cm}^{-1}$ , 72.49 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term          | J - J | Reference |
|---------|------------|-----------|-----------|--------------------------------|---------------|-------|-----------|
| S V     | 437.37     | 100       | 4         | $3s3p - 3s4s$                  | $^1P^o - ^1S$ | 0-1   | 041,488   |
| S V     | 438.19     | 100       | 4         | $3s3p - 3s4s$                  | $^1P^o - ^1S$ | 1-1   | 041,488   |
| S V     | 439.65     | 100       | 4         | $3s3p - 3s4s$                  | $^1P^o - ^1S$ | 2-1   | 041,488   |
| S V     | 658.262    | 300       | 3         | $3s3p - 3s3d$                  | $^1P^o - ^1D$ | 0-1   | 041,488   |
| S V     | 659.853    | 400       | 3         | $3s3p - 3s3d$                  | $^1P^o - ^1D$ | 1-2   | 041,488   |
| S V     | 663.155    | 500       | 3         | $3s3p - 3s3d$                  | $^1P^o - ^1D$ | 2-3   | 041,488   |
| S V     | 676.21     | 100       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1D^o$ | 0-1   | 041       |
| S V     | 677.342    | 100       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1D^o$ | 1-2   | 041       |
| S V     | 678.08     | 200       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1D^o$ | 1-1   | 041       |
| S V     | 680.326    | 300       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1D^o$ | 2-3   | 041       |
| S V     | 680.940    | 500b      |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1D^o$ | 2-2   | 041       |
| S V     | 681.565    | 300b      |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1D^o$ | 2-1   | 041       |
| S V     | 686.150    | 100       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1P^o$ | 0-1   | 041       |
| S V     | 686.93     | 100       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1P^o$ | 1-0   | 041       |
| S V     | 688.04     | 50        |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1P^o$ | 1-1   | 041       |
| S V     | 689.838    | 100       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1P^o$ | 1-2   | 041       |
| S V     | 691.74     | 100       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1P^o$ | 2-1   | 041       |
| S V     | 693.522    | 200       |           | $2p^2 3p^2 - 2p^2 3p(^1P^o)3d$ | $^1P - ^1P^o$ | 2-2   | 041       |
| S V     | 726.476    | 800       | 1         | $3s^2 - 3s3p$                  | $^3S - ^1P^o$ | 0-1   | 041,488   |
| S V     | 843.241    | 600       | 2         | $3s3p - 2p^2 3p^2$             | $^1P^o - ^1P$ | 1-2   | 041,488   |
| S V     | 852.185    | 500       | 2         | $3s3p - 2p^2 3p^2$             | $^1P^o - ^1P$ | 0-1   | 041,488   |
| S V     | 854.792    | 700       | 2         | $3s3p - 2p^2 3p^2$             | $^1P^o - ^1P$ | 2-2   | 041,488   |
| S V     | 857.872    | 500       | 2         | $3s3p - 2p^2 3p^2$             | $^1P^o - ^1P$ | 1-0   | 041,488   |
| S V     | 860.462    | 500       | 2         | $3s3p - 2p^2 3p^2$             | $^1P^o - ^1P$ | 2-1   | 041,488   |
| S V     | 883.59     | 200       |           | $3s(^4S)3d - 3p(^1P^o)3d$      | $^1D - ^1D^o$ | -3    | 041       |
| S V     | 884.46     | 200       |           | $3s(^4S)3d - 3p(^1P^o)3d$      | $^1D - ^1D^o$ | -2    | 041       |
| S V     | 885.77     | 100       |           | $3s(^4S)3d - 3p(^1P^o)3d$      | $^1D - ^1D^o$ | -1    | 041       |
| S V     | 900.93     | 200       |           | $3s(^4S)3d - 3p(^1P^o)3d$      | $^1D - ^1P^o$ | 1-0   | 041       |
| S V     | 902.80     | 100       |           | $3s(^4S)3d - 3p(^1P^o)3d$      | $^1D - ^1P^o$ | -1    | 041       |
| S V     | 905.92     | 200       |           | $3s(^4S)3d - 3p(^1P^o)3d$      | $^1D - ^1P^o$ | -2    | 041       |

S VI

## SULFUR, Z = 16

S VI

Ground state  $1s^2 2s^2 2p^4 3s^1 S_{1/2}$ Ionization potential 710 194 cm<sup>-1</sup>, 88.051 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J-J         | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-------------|-----------|
| S VI    | 171.327    | 20        |           | 3s - 6p       | $4^1S - ^1P^o$ | $1/2 - 3/2$ | 598       |
| S VI    | 191.480    | 20        |           | 3s - 5p       | $4^1S - ^1P^o$ | $1/2 - 3/2$ | 598       |
| S VI    | 191.560    | 50        |           | 3s - 5p       | $4^1S - ^1P^o$ | $1/2 - 1/2$ | 598       |
| S VI    | 192.273    | 20        |           | 3p - 7d       | $^1P^o - ^1D$  | $3/2 -$     | 598       |
| S VI    | 204.190    | 50        |           | 3p - 6d       | $^1P^o - ^1D$  | $3/2 -$     | 598       |
| S VI    | 214.277    | 20        |           | 3p - 6s       | $^1P^o - ^1S$  | $3/2 - 1/2$ | 598       |
| S VI    | 227.197    | 200       |           | 3p - 5d       | $^1P^o - ^1D$  | $1/2 - 3/2$ | 598       |
| S VI    | 227.845    | 200       |           | 3p - 5d       | $^1P^o - ^1D$  | $3/2 - 3/2$ | 598       |
| S VI    | 248.985    | 400       | 2         | 3s - 4p       | $4^1S - ^1P^o$ | $1/2 - 3/2$ | 488, 598  |
| S VI    | 249.271    | 400       | 2         | 3s - 4p       | $4^1S - ^1P^o$ | $1/2 - 1/2$ | 488, 598  |
| S VI    | 251.905    | 200       |           | 3p - 5s       | $^1P^o - ^1S$  | $3/2 - 1/2$ | 598       |
| S VI    | 261.810    | 50        |           | 3d - 7f       | $^1D - ^1F^o$  |             | 598       |
| S VI    | 283.502    | 300       |           | 3d - 6f       | $^1D - ^1F^o$  |             | 598       |
| S VI    | 289.092    | 200       |           | 3p - 4d       | $^1P^o - ^1D$  | $1/2 - 3/2$ | 598       |
| S VI    | 290.132    | 300       |           | 3p - 4d       | $^1P^o - ^1D$  | $3/2 - 3/2$ | 598       |
| S VI    | 328.505    | 600       |           | 3d - 5f       | $^1D - ^1F^o$  | $3/2 -$     | 598       |
| S VI    | 388.940    | 600       | 4         | 3p - 4s       | $^1P^o - ^1S$  | $1/2 - 1/2$ | 488, 598  |
| S VI    | 390.859    | 800       | 4         | 3p - 4s       | $^1P^o - ^1S$  | $3/2 - 1/2$ | 488, 598  |
| S VI    | 464.654    | 1000      | 5         | 3d - 4f       | $^1D - ^1F^o$  |             | 488, 598  |
| S VI    | 648.628    | 100       |           | 3d - 4p       | $^1D - ^1P^o$  | $3/2 - 3/2$ | 598       |
| S VI    | 650.430    | 100       |           | 3d - 4p       | $^1D - ^1P^o$  | $3/2 - 1/2$ | 598       |
| S VI    | 706.480    | 600       | 3         | 3p - 3d       | $^1P^o - ^1D$  | $1/2 - 3/2$ | 488, 598  |
| S VI    | 712.682    | 400       | 3         | 3p - 3d       | $^1P^o - ^1D$  | $3/2 - 3/2$ | 488, 598  |
| S VI    | 712.844    | 300       | 3         | 3p - 3d       | $^1P^o - ^1D$  | $3/2 - 3/2$ | 488, 598  |
| S VI    | 933.382    | 400       | 1         | 3s - 3p       | $4^1S - ^1P^o$ | $1/2 - 3/2$ | 488, 598  |
| S VI    | 944.517    | 500       | 1         | 3s - 3p       | $4^1S - ^1P^o$ | $1/2 - 1/2$ | 488, 598  |
| S VI    | 1117.91    | 0         |           | 4f - 5g       | $^1F^o - ^1G$  |             | 052, 487  |

S VII

## SULFUR, Z = 16

S VII

Ground state  $1s^2 2s^2 2p^6 \ ^1S_0$ Ionization potential 2 266 990  $\text{cm}^{-1}$ , 281.06 eV

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                               | J - J | Reference |
|---------|------------|-----------|-----------|------------------------|------------------------------------|-------|-----------|
| S VII   | 46.212     | 10        |           | $2p^5 - 2p^5(^1P^o)7d$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 47.098     | 50        |           | $2p^5 - 2p^5(^1P^o)6d$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 47.307     | 50        |           | $2p^5 - 2p^5(^1P^o)6d$ | $g'S - \frac{3}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 48.647     | 150       |           | $2p^5 - 2p^5(^1P^o)5d$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 48.874     | 100       |           | $2p^5 - 2p^5(^1P^o)5d$ | $g'S - \frac{3}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 50.027     | 70        |           | $2p^5 - 2p^5(^1P^o)5s$ | $g'S - \frac{3}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 51.807     | 350       |           | $2p^5 - 2p^5(^1P^o)4d$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 52.097     | 200       |           | $2p^5 - 2p^5(^1P^o)4d$ | $g'S - \frac{3}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 54.652     | 100       |           | $2p^5 - 2p^5(^1P^o)4s$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 54.938     | 100       |           | $2p^5 - 2p^5(^1P^o)4s$ | $g'S - \frac{3}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 60.161     | 1000      |           | $2p^5 - 2p^5(^1P^o)3d$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 60.804     | 750       |           | $2p^5 - 2p^5(^1P^o)3d$ | $g'S - \frac{3}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 61.547     | 200       |           | $2p^5 - 2p^5(^1P^o)3d$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 72.029     | 1000      |           | $2p^5 - 2p^5(^1P^o)3s$ | $g'S - \frac{1}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |
| S VII   | 72.663     | 1000      |           | $2p^5 - 2p^5(^1P^o)3s$ | $g'S - \frac{3}{2}(\frac{3}{2})^o$ | 0-1   | 233,487   |

S VIII

SULFUR, Z = 16

S VIII

Ground state  $1s^2 2s^2 2p^4 \ ^3P_{2,1}$ Ionization potential  $2\ 652\ 720\ \text{cm}^{-1}$ ,  $328.89\ \text{eV}$ 

| Element | Wavelength | Intensity | Multiplet | Configuration                       | Term                   | J - J                       | Reference |
|---------|------------|-----------|-----------|-------------------------------------|------------------------|-----------------------------|-----------|
| S VIII  | 44.350     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 F$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 44.374     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 44.547     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 S$ | $\frac{1}{2} - \frac{1}{2}$ | 233, 487  |
| S VIII  | 45.279     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 45.290     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 45.370     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 45.458     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 45.508     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 47.566     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 47.594     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 47.793     | 10b       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 51.227     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 51.470     | 70        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 52.681     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 52.702     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 52.756     | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 F$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 52.789     | 300       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 52.854     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 52.958     | 350       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 52.985     | 70        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 53.073     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 53.239     | 30        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 54.118     | 500       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 54.266     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 54.370     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 54.385     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 54.424     | 150       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 54.501     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 54.566     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 54.604     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1d$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 59.236     | 70        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S \ ^1s$ | $g^1 P^{\circ} - ^1 S$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 59.593     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1S \ ^1s$ | $g^1 P^{\circ} - ^1 S$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 61.600     | 500       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1s$ | $g^1 P^{\circ} - ^1 D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 61.978     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1D \ ^1s$ | $g^1 P^{\circ} - ^1 D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 63.026     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 63.304     | 500       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 63.431     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 63.711     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 63.886     | 250       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 64.120     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 64.137     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 64.305     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $g^1 P^{\circ} - ^1 P$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 64.874     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $^1 S - ^1 P^{\circ}$  | $\frac{1}{2} - \frac{1}{2}$ | 233       |
| S VIII  | 65.149     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 \ ^1P \ ^1s$ | $^1 S - ^1 P^{\circ}$  | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S VIII  | 198.550    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4$             | $g^1 P^{\circ} - ^1 S$ | $\frac{3}{2} - \frac{1}{2}$ | 598       |
| S VIII  | 202.605    | 50        |           | $2s^2 2p^4 - 2s^2 2p^4$             | $g^1 P^{\circ} - ^1 S$ | $\frac{1}{2} - \frac{1}{2}$ | 598       |

SIX

## SULFUR, Z = 16

SIX

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ Ionization potential  $3\ 057\ 300\ \text{cm}^{-1}$ ; 379.05 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                        | Term              | J - J | Reference |
|---------|------------|-----------|-----------|--------------------------------------|-------------------|-------|-----------|
| S IX    | 46.373     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1P^o) 3d$ | $g^3P - {}^1D^o$  | 2-3   | 233       |
| S IX    | 46.413     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1P^o) 3d$ | $g^3P - {}^1F^o$  | 2-2   | 233       |
| S IX    | 46.585     | 10d       |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1P^o) 3d$ | $g^3P - {}^1F^o$  | 1-2   | 233       |
| S IX    | 46.624     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1P^o) 3d$ | $g^3P - {}^1P^o$  | 2-1   | 233       |
| S IX    | 47.052     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3d$ | $g^3P - {}^1S^o$  | 2-1   | 233       |
| S IX    | 47.188     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3d$ | $g^3P - {}^1P^o$  | 2-1   | 233       |
| S IX    | 47.249     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3d$ | $g^3P - {}^1P^o$  | 2-2   | 233       |
| S IX    | 47.433     | 200       |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3d$ | $g^3P - {}^1P^o$  | 1-2   | 233       |
| S IX    | 47.518     | 30        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1P^o) 3d$ | ${}^1D - {}^1P^o$ | 2-1   | 233       |
| S IX    | 47.616     | 10        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3d$ | $g^3P - {}^1D^o$  | 1-    | 233       |
| S IX    | 48.160     | 100b      |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3d$ | ${}^1D - {}^1F^o$ | 2-3   | 233       |
| S IX    | 48.564     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3d$ | ${}^1D - {}^1D^o$ | 2-2   | 233       |
| S IX    | 49.119     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1S^o) 3d$ | $g^3P - {}^1D^o$  | 2-3   | 233       |
| S IX    | 49.328     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1S^o) 3d$ | $g^3P - {}^1D^o$  | 1-    | 233       |
| S IX    | 54.178     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1P^o) 3s$ | ${}^1D - {}^1P^o$ | 2-1   | 233       |
| S IX    | 54.178     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3s$ | $g^3P - {}^1D^o$  | 2-3   | 233       |
| S IX    | 54.396     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3s$ | $g^3P - {}^1D^o$  | 1-2   | 233       |
| S IX    | 55.540     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1D^o) 3s$ | ${}^1D - {}^1D^o$ | 2-2   | 233       |
| S IX    | 56.081     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1S^o) 3s$ | $g^3P - {}^1S^o$  | 2-1   | 233       |
| S IX    | 56.125     | 20        |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1P^o) 3s$ | ${}^1S - {}^1P^o$ | 0-1   | 233       |
| S IX    | 56.332     | 20d       |           | $2s^2 2p^4 - 2s^2 2p^4 ({}^1S^o) 3s$ | $g^3P - {}^1S^o$  | 1-1   | 233       |
| S IX    | 179.32     | 450       |           | $2s^2 2p^4 - 2s^2 2p^4$              | ${}^1D - {}^1P^o$ | 2-1   | 160,372   |
| S IX    | 198.55     | 250b      |           | $2s^2 2p^4 - 2s^2 2p^4$              | ${}^1S - {}^1P^o$ | 0-1   | 160,372   |
| S IX    | 221.26     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4$              | $g^3P - {}^1P^o$  | 2-1   | 160,372   |
| S IX    | 223.27     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4$              | $g^3P - {}^1P^o$  | 1-0   | 160,372   |
| S IX    | 224.75     | 450       |           | $2s^2 2p^4 - 2s^2 2p^4$              | $g^3P - {}^1P^o$  | 2-2   | 160,372   |
| S IX    | 225.23     | 50        |           | $2s^2 2p^4 - 2s^2 2p^4$              | $g^3P - {}^1P^o$  | 1-1   | 160,372   |
| S IX    | 226.59     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4$              | $g^3P - {}^1P^o$  | 0-1   | 160,372   |
| S IX    | 228.84     | 100       |           | $2s^2 2p^4 - 2s^2 2p^4$              | $g^3P - {}^1P^o$  | 1-2   | 160,372   |



S X

## SULFUR, Z = 16

S X

Ground state  $1s^2 2s^2 2p^4 \ ^3S_1$ Ionization potential 3 606 000  $\text{cm}^{-1}$ , 447.1 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term                | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------|---------------------|-----------------------------|-----------|
| S X     | 42.51      | 15P       |           | $2s^2 2p^3 - 2s^2 2p^3 3d$       | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 774       |
| S X     | 42.54      | 35P       |           | $2s^2 2p^3 - 2s^2 2p^3 3d$       | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 774       |
| S X     | 42.58      | 50P       |           | $2s^2 2p^3 - 2s^2 2p^3 3d$       | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{5}{2}$ | 774       |
| S X     | 44.374     | 100b      |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P) 3s$ | $^3P^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S X     | 44.387     | 20        |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P) 3d$ | $^3P^{\circ} - ^3D$ | $\frac{1}{2} - \frac{3}{2}$ | 233       |
| S X     | 47.654     | 20        |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P) 3s$ | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S X     | 47.793     | 10b       |           | $2s^2 2p^3 - 2s^2 2p^3 (^3P) 3s$ | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 233       |
| S X     | 48.160     | 100b      |           |                                  |                     |                             | 233       |
| S X     | 177.59     | 250       |           | $2s^2 2p^3 - 2s 2p^4$            | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 160,372   |
| S X     | 180.41     | 100       |           | $2s^2 2p^3 - 2s 2p^4$            | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,372   |
| S X     | 180.79     | 450       |           | $2s^2 2p^3 - 2s 2p^4$            | $^3D^{\circ} - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,372   |
| S X     | 196.82     | 50        |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^{\circ} - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 372       |
| S X     | 228.21     | 250       |           | $2s^2 2p^3 - 2s 2p^4$            | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 372       |
| S X     | 228.75     | 350       |           | $2s^2 2p^3 - 2s 2p^4$            | $^3D^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 372       |
| S X     | 255.1      | 20        |           | $2s^2 2p^3 - 2s 2p^4$            | $^1P^{\circ} - ^3D$ | $\frac{3}{2} - \frac{3}{2}$ | 372       |
| S X     | 256.59     | 20        |           | $2s^2 2p^3 - 2s 2p^4$            | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 160,372   |
| S X     | 258.98     | 20        |           | $2s^2 2p^3 - 2s 2p^4$            | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,372   |
| S X     | 263.74     | 50        |           | $2s^2 2p^3 - 2s 2p^4$            | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,372   |

S XVI

## SULFUR, Z = 16

S XVI

Ground state  $1s^2S_{1/2}$ Ionization potential  $28\,182\,535\text{ cm}^{-1}$ , 3494.10 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term         | J - J          | Reference |
|---------|------------|-----------|-----------|---------------|--------------|----------------|-----------|
| S XVI   | 3.649      | P         |           | $1s-6p$       | $K^2S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| S XVI   | 3.696      | P         |           | $1s-5p$       | $K^2S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| S XVI   | 3.784      | P         |           | $1s-4p$       | $K^2S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| S XVI   | 3.991      | P         |           | $1s-3p$       | $K^2S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| S XVI   | 4.729      | P         |           | $1s-2p$       | $K^2S-^1P^o$ | $\frac{1}{2}-$ | 309       |
| S XVI   | 15.46      | P         |           | 2-7           |              |                | 309       |
| S XVI   | 15.97      | P         |           | 2-6           |              |                | 309       |
| S XVI   | 16.90      | P         |           | 2-5           |              |                | 309       |
| S XVI   | 18.93      | P         |           | 2-4           |              |                | 309       |
| S XVI   | 25.54      | P         |           | 2-3           |              |                | 309       |
| S XVI   | 39.18      | P         |           | 3-7           |              |                | 309       |
| S XVI   | 42.65      | P         |           | 3-6           |              |                | 309       |
| S XVI   | 49.97      | P         |           | 3-5           |              |                | 309       |
| S XVI   | 73.1       | P         |           | 3-4           |              |                | 309       |
| S XVI   | 84.48      | P         |           | 4-7           |              |                | 309       |
| S XVI   | 102.4      | P         |           | 4-6           |              |                | 309       |
| S XVI   | 158.0      | P         |           | 4-5           |              |                | 309       |
| S XVI   | 181.5      | P         |           | 5-7           |              |                | 309       |
| S XVI   | 291.0      | P         |           | 5-6           |              |                | 309       |
| S XVI   | 482.7      | P         |           | 6-7           |              |                | 309       |

Cl

## CHLORINE, Z = 17

Cl

Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Cl      | 39.528     | 1         |           |               |      |       | 179       |
| Cl      | 39.559     | 1         |           |               |      |       | 179       |
| Cl      | 39.634     | 1         |           |               |      |       | 179       |
| Cl      | 47.990     | 10        |           |               |      |       | 179       |

Cl I

## CHLORINE, Z = 17

Cl I

Ground state  $1s^2s^2p^63s^23p^4\ ^3P_{2,1}$ Ionization potential  $104\,591\text{ cm}^{-1}$  12.967 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term           | J - J                       | Reference   |
|---------|------------|-----------|-----------|------------------------------|----------------|-----------------------------|-------------|
| Cl I    | 1188.768   | 1000      |           | $3s^23p^4 - 3s^23p^4(^1D)4s$ | $g^1P^o - ^1D$ | $\frac{3}{2} -$             | 006         |
| Cl I    | 1201.358   | 900       |           | $3s^23p^4 - 3s^23p^4(^1D)4s$ | $g^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 006         |
| Cl I    | 1335.723   | 750       | 2         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 006,415,488 |
| Cl I    | 1347.238   | 1000      | 2         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 006,415,488 |
| Cl I    | 1351.657   | 850       | 2         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 006,415,488 |
| Cl I    | 1363.449   | 850       | 2         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 006,415,488 |
| Cl I    | 1373.118   | 350       | 1         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 006         |
| Cl I    | 1379.529   | 900       | 1         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 006,415,488 |
| Cl I    | 1389.688   | 500       | 1         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 006         |
| Cl I    | 1389.961   | 500       | 1         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{1}{2} - \frac{1}{2}$ | 006,415,488 |
| Cl I    | 1396.527   | 650       | 1         | $3s^23p^4 - 3s^23p^4(^3P)4s$ | $g^1P^o - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 006,415,488 |

CII

## CHLORINE, Z = 17

CIII

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^4 \ ^3P_2$ Ionization potential 192 000 cm<sup>-1</sup>, 23.8 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term          | J   | J        | Reference |
|---------|------------|-----------|-----------|---------------------------------------|---------------|-----|----------|-----------|
| Cl II   | 558.14     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1P^o$ | 1-1 | 345      |           |
| Cl II   | 562.28     | 300       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1D^o$ | 1-2 | 345, 487 |           |
| Cl II   | 562.54     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1P^o$ | 2-1 | 345      |           |
| Cl II   | 563.58     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1S^o$ | 2-1 | 345      |           |
| Cl II   | 565.75     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1P^o$ | 0-1 | 345      |           |
| Cl II   | 566.77     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1S^o$ | 0-1 | 345      |           |
| Cl II   | 571.95     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1D^o$ | 2-3 | 345      |           |
| Cl II   | 574.37     | 300       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1D^o$ | 1-2 | 345      |           |
| Cl II   | 575.30     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^4P - ^1D^o$ | 0-1 | 345      |           |
| Cl II   | 584.10     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4s$ | $^4P - ^1D^o$ | 2-2 | 345      |           |
| Cl II   | 586.25     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4s$ | $^4P - ^1D^o$ | 2-3 | 345      |           |
| Cl II   | 588.77     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4s$ | $^4P - ^1D^o$ | 1-2 | 345      |           |
| Cl II   | 589.82     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4s$ | $^4P - ^1D^o$ | 0-1 | 345      |           |
| Cl II   | 594.49     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^1D - ^1P^o$ | 2-1 | 345      |           |
| Cl II   | 599.19     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^1D - ^1D^o$ | 2-2 | 345      |           |
| Cl II   | 612.73     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4d$ | $^1D - ^1D^o$ | 2-3 | 345      |           |
| Cl II   | 617.27     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4d$ | $^4P - ^1D^o$ | 2-1 | 345      |           |
| Cl II   | 617.61     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4d$ | $^4P - ^1D^o$ | 2-2 | 345      |           |
| Cl II   | 618.02     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4d$ | $^4P - ^1D^o$ | 2-3 | 345      |           |
| Cl II   | 619.95     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4d$ | $^4P - ^1D^o$ | 1-1 | 345      |           |
| Cl II   | 620.28     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4d$ | $^4P - ^1D^o$ | 1-2 | 345      |           |
| Cl II   | 621.12     | 400       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4d$ | $^4P - ^1D^o$ | 0-1 | 345      |           |
| Cl II   | 626.70     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^4s$ | $^1D - ^1D^o$ | 2-2 | 345      |           |
| Cl II   | 634.24     | 100       |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^4P - ^1P^o$ | 2-1 | 345      |           |
| Cl II   | 635.87     | 200       |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^4P - ^1P^o$ | 1-0 | 345      |           |
| Cl II   | 636.62     | 200       |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^4P - ^1P^o$ | 2-2 | 345      |           |
| Cl II   | 637.06     | 100       |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^4P - ^1P^o$ | 1-1 | 345      |           |
| Cl II   | 638.23     | 200       |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^4P - ^1P^o$ | 0-1 | 345      |           |
| Cl II   | 639.42     | 200       |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^4P - ^1P^o$ | 1-2 | 345      |           |
| Cl II   | 650.88     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4s$ | $^4P - ^1S^o$ | 2-1 | 345      |           |
| Cl II   | 661.13     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1S^o$ | 2-1 | 345      |           |
| Cl II   | 653.90     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4s$ | $^4P - ^1S^o$ | 1-1 | 345      |           |
| Cl II   | 655.1      | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1S^o \ ^4s$ | $^4P - ^1S^o$ | 0-1 | 345      |           |
| Cl II   | 661.62     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1D^o$ | 2-1 | 345      |           |
| Cl II   | 661.82     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1D^o$ | 2-3 | 345      |           |
| Cl II   | 662.15     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1D^o$ | 2-2 | 345      |           |
| Cl II   | 663.08     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1P^o$ | 2-1 | 345      |           |
| Cl II   | 663.67     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1P^o$ | 2-2 | 345      |           |
| Cl II   | 664.67     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1D^o$ | 1-1 | 345      |           |
| Cl II   | 665.21     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1D^o$ | 1-2 | 345      |           |
| Cl II   | 666.08     | 300       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1D^o$ | 0-1 | 345      |           |
| Cl II   | 666.17     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1P^o$ | 1-1 | 345      |           |
| Cl II   | 667.49     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^4P - ^1P^o$ | 0-1 | 345      |           |
| Cl II   | 684.83     | 10        |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^1D - ^1P^o$ | 2-1 | 345      |           |
| Cl II   | 687.55     | 100       |           | $3s^2 3p^4 - 2p^6 3p^4 \ ^1P^o \ ^4s$ | $^1D - ^1P^o$ | 2-2 | 345      |           |
| Cl II   | 693.55     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1F^o$ | 2-3 | 345      |           |
| Cl II   | 696.11     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1F^o$ | 1-2 | 345      |           |
| Cl II   | 707.43     | 400       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1D^o$ | 2-3 | 345      |           |
| Cl II   | 709.16     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1D^o$ | 2-2 | 345      |           |
| Cl II   | 710.53     | 10        |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1D^o$ | 2-1 | 345      |           |
| Cl II   | 712.66     | 300       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1D^o$ | 1-2 | 345      |           |
| Cl II   | 714.03     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1D^o$ | 1-1 | 345      |           |
| Cl II   | 715.58     | 300       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1P^o \ ^3d$ | $^4P - ^1D^o$ | 0-1 | 345      |           |
| Cl II   | 717.15     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^1D - ^1D^o$ | 2-3 | 345      |           |
| Cl II   | 719.26     | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 \ ^1D^o \ ^3d$ | $^1D - ^1P^o$ | 2-2 | 345      |           |

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term          | J-J | Reference   |
|---------|------------|-----------|-----------|-------------------------------------------|---------------|-----|-------------|
| C II    | 725.27     | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4P - ^4P^o$ | 2-2 | 345         |
| C II    | 725.64     | 200       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4P - ^4P^o$ | 2-1 | 345         |
| C II    | 728.94     | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4P - ^4P^o$ | 1-2 | 345         |
| C II    | 729.39     | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4P - ^4P^o$ | 1-1 | 345         |
| C II    | 729.52     | 200       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4P - ^4P^o$ | 1-0 | 345         |
| C II    | 730.92     | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4P - ^4P^o$ | 0-1 | 345         |
| C II    | 753.66     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)3d$          | $^4D - ^4F^o$ | 2-2 | 345         |
| C II    | 754.55     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)3d$          | $^4D - ^4F^o$ | 2-3 | 345         |
| C II    | 771.00     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)3d$          | $^4D - ^4D^o$ | 2-3 | 345         |
| C II    | 774.76     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)3d$          | $^4D - ^4D^o$ | 2-1 | 345         |
| C II    | 777.55     | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)3d$          | $^4D - ^4D^o$ | 2-2 | 345         |
| C II    | 787.15     | 100       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)3d$          | $^4P - ^4P^o$ | 1-1 | 345         |
| C II    | 787.62     | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4D - ^4P^o$ | 2-1 | 345         |
| C II    | 788.75     | 400       | 5         | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4s$          | $^4P - ^4D^o$ | 2-3 | 345,488     |
| C II    | 789.01     | 700       | 5         | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4s$          | $^4P - ^4D^o$ | 2-2 | 345,488     |
| C II    | 792.19     | 200       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4s$          | $^4D - ^4P^o$ | 2-2 | 345         |
| C II    | 793.34     | 300       | 5         | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4s$          | $^4P - ^4D^o$ | 1-2 | 345,488     |
| C II    | 793.47     | 300       | 5         | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4s$          | $^4P - ^4D^o$ | 1-1 | 345,488     |
| C II    | 795.36     | 200       | 5         | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4s$          | $^4P - ^4D^o$ | 0-1 | 345,488     |
| C II    | 797.81     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)3d$          | $^4P - ^4F^o$ | 1-2 | 345         |
| C II    | 827.85     | 100       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)3d$          | $^4P - ^4D^o$ | 1-2 | 345         |
| C II    | 834.67     | 1000      | 4         | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 2-3 | 345,488     |
| C II    | 839.30     | 200       | 4         | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 1-1 | 345         |
| C II    | 839.63     | 200       | 4         | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 1-2 | 345,488     |
| C II    | 841.41     | 400       | 4         | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 0-1 | 345,488     |
| C II    | 851.70     | 700       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4s$          | $^4D - ^4D^o$ | 2-2 | 345         |
| C II    | 864.67     | 500       | 3         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 2-1 | 345,488     |
| C II    | 872.00     | 10        | 3         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 0-1 | 345,488     |
| C II    | 888.07     | 400       | 2         | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)4s$          | $^4P - ^4S^o$ | 2-1 | 345,488     |
| C II    | 893.56     | 300       | 2         | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)4s$          | $^4P - ^4S^o$ | 1-1 | 345,488     |
| C II    | 895.95     | 300       | 2         | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)4s$          | $^4P - ^4S^o$ | 0-1 | 345,488     |
| C II    | 906.60     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 2-  | 345         |
| C II    | 910.25     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)3d$          | $^4D - ^4D^o$ | 2-2 | 345         |
| C II    | 912.34     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 1-  | 345         |
| C II    | 914.90     | 100       |           | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^4P - ^4D^o$ | 0-1 | 345         |
| C II    | 926.96     | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)4s$          | $^4P - ^4S^o$ | 2-2 | 345         |
| C II    | 961.49     | 500       |           | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4D - ^4P^o$ | 2-1 | 169,345     |
| C II    | 1063.83    | 500       |           | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 2-  | 345,488     |
| C II    | 1067.94    | 200       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 1-0 | 038,345     |
| C II    | 1071.05    | 1000      | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 2-2 | 038,345,488 |
| C II    | 1071.76    | 500       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 1-1 | 038,345,488 |
| C II    | 1075.24    | 350       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 0-1 | 038,345     |
| C II    | 1079.08    | 750       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4P - ^4P^o$ | 1-2 | 038,345,488 |
| C II    | 1223.71    | 100       |           | $3s^2 3p^4 - 3s^2 3p^3$                   | $^4D - ^4P^o$ | 2-2 | 345         |
| C II    | 1401.16    | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4p$          | $^4P^o - ^4S$ | 1-0 | 345         |
| C II    | 1471.06    | 200       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4p$          | $^4P^o - ^4P$ | 2-1 | 345         |
| C II    | 1484.66    | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4p$          | $^4P^o - ^4P$ | 1-1 | 345         |
| C II    | 1528.91    | 100       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4p$          | $^4P^o - ^4D$ | 2-2 | 345         |
| C II    | 1542.94    | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4p$          | $^4P^o - ^4S$ | 2-1 | 345         |
| C II    | 1558.05    | 100       |           | $3s^2 3p^4 - 3s^2 3p^3(^4P^o)4p$          | $^4P^o - ^4S$ | 1-1 | 345         |
| C II    | 1767.24    | 100       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4p$          | $^4P^o - ^4P$ | 2-1 | 345         |
| C II    | 1772.01    | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4p$          | $^4P^o - ^4P$ | 2-2 | 345         |
| C II    | 1785.06    | 100       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4p$          | $^4P^o - ^4P$ | 1-0 | 345         |
| C II    | 1787.10    | 300       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4p$          | $^4P^o - ^4P$ | 1-1 | 345         |
| C II    | 1791.91    | 400       |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4p$          | $^4P^o - ^4P$ | 1-2 | 345         |
| C II    | 1797.91    | 10        |           | $3s^2 3p^4 - 3s^2 3p^3(^4D^o)4p$          | $^4P^o - ^4P$ | 0-1 | 345         |
| C II    | 1813.75    | 10        |           | $3s^2 3p^4(^4S^o)4p - 3s^2 3p^3(^4D^o)6s$ | $^4P - ^4D^o$ | 2-3 | 345         |
| C II    | 1814.43    | 10        |           | $3s^2 3p^4(^4S^o)4p - 3s^2 3p^3(^4D^o)6s$ | $^4P - ^4D^o$ | 1-2 | 345         |
| C II    | 1815.16    | 10        |           | $3s^2 3p^4(^4S^o)4p - 3s^2 3p^3(^4D^o)6s$ | $^4P - ^4D^o$ | 1-1 | 345         |
| C II    | 1815.61    | 10        |           | $3s^2 3p^4(^4S^o)4p - 3s^2 3p^3(^4D^o)6s$ | $^4P - ^4D^o$ | 0-1 | 345         |

CII

CII

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term                | J - J | Reference |
|---------|------------|-----------|-----------|----------------------------------|---------------------|-------|-----------|
| C I II  | 1883.14    | 100       |           | $3s3p^2 - 3s^23p^4^1D^{\circ}4p$ | $^1P^{\circ} - ^1D$ | 2-3   | 345       |
| C I II  | 1887.90    | 10        |           | $3s3p^2 - 3s^23p^4^1D^{\circ}4p$ | $^1P^{\circ} - ^1D$ | 2-2   | 345       |
| C I II  | 1910.76    | 10        |           | $3s3p^2 - 3s^23p^4^1D^{\circ}4p$ | $^1P^{\circ} - ^1D$ | 1-2   | 345       |
| C I II  | 1923.35    | 400       |           | $3s3p^2 - 3s^23p^4^1D^{\circ}4p$ | $^1P^{\circ} - ^1D$ | 0-1   | 345       |

Cl III

## CHLORINE, Z = 17

Cl III

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^4 \ ^3P_2$ Ionization potential 321 936 cm<sup>-1</sup>, 39 914 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term                 | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------------|-----------------------------|-----------|
| Cl III  | 406.274    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)5s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 407.513    | 10        |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)5s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 411.163    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| Cl III  | 411.373    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 411.812    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 415.196    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)5s$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 415.333    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)5s$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 421.771    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 421.990    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 422.713    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 433.664    | 10        |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 433.774    | 10        |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 441.398    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 442.947    | 200       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 447.169    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 457.245    | 200       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 457.444    | 10        |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4d$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 552.908    | 200b      |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 556.232    | 600       | 3         | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 043,488   |
| Cl III  | 556.605    | 700       | 3         | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 557.118    | 700       | 3         | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 558.385    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 560.636    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| Cl III  | 561.530    | 700       | 5         | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 561.680    | 700       | 5         | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 561.738    | 700       | 5         | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1F$  | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 564.287    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 564.514    | 200       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 565.272    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 565.480    | 400b      |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 572.693    | 400       | 2         | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 038,488   |
| Cl III  | 574.408    | 300       | 2         | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 038,488   |
| Cl III  | 575.582    | 300       | 2         | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 038,488   |
| Cl III  | 586.874    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)4s$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 587.078    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)4s$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 587.295    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)4s$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 591.118    | 300       | 6         | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1P^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 591.428    | 400       | 6         | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1P^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 591.646    | 400       | 6         | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1P^{\circ} - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 043,488   |
| Cl III  | 591.962    | 200       | 6         | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1P^{\circ} - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| Cl III  | 594.636    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| Cl III  | 595.990    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 596.240    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 605.855    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^1D)3d$ | $^1P^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 606.100    | 200       | 4         | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 606.345    | 500       | 4         | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 609.673    | 400       | 4         | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| Cl III  | 609.901    | 10        | 4         | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III? | 613.643    | 10        |           |                                |                      |                             | 038       |
| Cl III? | 613.874    | 100       |           |                                |                      |                             | 038       |
| Cl III? | 617.630    | 200       |           |                                |                      |                             | 038       |
| Cl III  | 619.025    | 100       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)3d$ | $^1D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 621.027    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 621.280    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl III  | 623.768    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4(^3P)4s$ | $^1D^{\circ} - ^1P$  | $\frac{3}{2} - \frac{1}{2}$ | 043       |



| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term              | J-J                         | Reference |
|---------|------------|-----------|-----------|---------------------------------------|-------------------|-----------------------------|-----------|
| CI III  | 630.380    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)4s$        | $^1P^\circ - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| CI III  | 630.746    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)4s$        | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 631.006    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1D)4s$        | $^1P^\circ - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| CI III  | 639.757    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1P^\circ - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| CI III  | 640.928    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1P^\circ - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| CI III  | 641.304    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1P^\circ - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 653.013    | 200       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 656.772    | 200       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1P^\circ - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| CI III  | 657.320    | 200       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1P^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III? | 661.414    | 200       |           |                                       |                   |                             | 038       |
| CI III? | 661.836    | 200       |           |                                       |                   |                             | 038       |
| CI III? | 666.040    | 300       |           |                                       |                   |                             | 038       |
| CI III? | 666.500    | 100       |           |                                       |                   |                             | 038       |
| CI III  | 669.949    | 200       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4s$        | $^1P^\circ - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| CI III  | 670.383    | 300       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4s$        | $^1P^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| CI III  | 673.127    | 300       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4s$        | $^1P^\circ - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| CI III  | 673.598    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4s$        | $^1P^\circ - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| CI III  | 746.864    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| CI III  | 747.415    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 747.553    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)3d$        | $^1D^\circ - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| CI III  | 930.94     | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4p$        | $^1P - ^1S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| CI III  | 936.28     | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4p$        | $^1P - ^1S^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 038       |
| CI III  | 939.31     | 10        |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4p$        | $^1P - ^1S^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 038       |
| CI III  | 943.22     | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4p$        | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| CI III  | 946.97     | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4p$        | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 038       |
| CI III  | 948.72     | 100       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4p$        | $^1P - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| CI III  | 953.40     | 200       |           | $3s^2 3p^2 - 3s^2 3p^2(^1P)4p$        | $^1P - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 038       |
| CI III  | 1005.280   | 500       | 1         | $3s^2 3p^2 - 3s^2 3p^2$               | $^3S^\circ - ^3P$ | $\frac{3}{2} - \frac{1}{2}$ | 038,488   |
| CI III  | 1008.777   | 600       | 1         | $3s^2 3p^2 - 3s^2 3p^2$               | $^3S^\circ - ^3P$ | $\frac{3}{2} - \frac{3}{2}$ | 038,488   |
| CI III  | 1015.023   | 700       | 1         | $3s^2 3p^2 - 3s^2 3p^2$               | $^3S^\circ - ^3P$ | $\frac{1}{2} - \frac{3}{2}$ | 038,488   |
| CI III  | 1683.18    | 10        |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1689.50    | 100       |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1S^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1797.98    | 200       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1808.51    | 400       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043,488   |
| CI III  | 1810.26    | 100       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1811.73    | 400       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043,488   |
| CI III  | 1822.50    | 600       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| CI III  | 1824.59    | 300       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1828.40    | 500       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043,488   |
| CI III  | 1832.08    | 400       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| CI III  | 1833.31    | 400       | 7         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1F - ^1D^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 043,488   |
| CI III  | 1848.74    | 10        |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1S^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1849.64    | 10        |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043,487   |
| CI III  | 1852.11    | 200       |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043,487   |
| CI III  | 1880.10    | 300       |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1889.06    | 10        |           | $3s^2 3p^2(^1P)4p - 3s^2 3p^2(^1D)5s$ | $^1D^\circ - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1897.85    | 300       | 8         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1901.61    | 500       | 8         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043,488   |
| CI III  | 1912.90    | 400       | 8         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043,488   |
| CI III  | 1914.09    | 300       | 8         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1P^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1916.53    | 400       | 8         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| CI III  | 1917.87    | 400       | 8         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1P^\circ$ | $\frac{3}{2} - \frac{1}{2}$ | 043,488   |
| CI III  | 1920.32    | 400       | 8         | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1P^\circ$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| CI III  | 1979.46    | 300       |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1D^\circ$ | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| CI III  | 1983.61    | 500       |           | $3s^2 3p^2(^1P)3d - 3s^2 3p^2(^1P)4p$ | $^1D - ^1D^\circ$ | $\frac{1}{2} - \frac{3}{2}$ | 043       |

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^2 \ ^3P_0$ Ionization potential 431 226 cm<sup>-1</sup>, 53 464 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term           | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------------|----------------|-------|-----------|
| Cl IV   | 318.750    | 100       |           | $3s^2 3p^2 - 3s^2 3p^5 s$          | $R^2P - ^1P^o$ | 1-2   | 043       |
| Cl IV   | 319.513    | 100       |           | $3s^2 3p^2 - 3s^2 3p^5 s$          | $R^2P - ^1P^o$ | 0-1   | 043       |
| Cl IV   | 319.616    | 300       |           | $3s^2 3p^2 - 3s^2 3p^5 s$          | $R^2P - ^1P^o$ | 2-2   | 043       |
| Cl IV   | 319.993    | 10        |           | $3s^2 3p^2 - 3s^2 3p^5 s$          | $R^2P - ^1P^o$ | 1-1   | 043       |
| Cl IV   | 320.250    | 100       |           | $3s^2 3p^2 - 3s^2 3p^5 s$          | $R^2P - ^1P^o$ | 1-0   | 043       |
| Cl IV   | 320.881    | 100       |           | $3s^2 3p^2 - 3s^2 3p^5 s$          | $R^2P - ^1P^o$ | 2-1   | 043       |
| Cl IV   | 331.835    | 200       |           | $3s^2 3p^2 - 3s^2 3p^5 s$          | $^1D - ^1P^o$  | 2-1   | 044       |
| Cl IV   | 437.825    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4 \ ^1P_1 4s$ | $^1S^o - ^1P$  | 2-3   | 043       |
| Cl IV   | 439.255    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4 \ ^1P_1 4s$ | $^1S^o - ^1P$  | 2-2   | 043       |
| Cl IV   | 440.245    | 200       |           | $3s^2 3p^2 - 3s^2 3p^4 \ ^1P_1 4s$ | $^1S^o - ^1P$  | 2-1   | 043       |
| Cl IV   | 463.011    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $R^2P - ^1P^o$ | 1-2   | 038       |
| Cl IV   | 464.292    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $R^2P - ^1P^o$ | 0-1   | 038       |
| Cl IV   | 464.861    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $R^2P - ^1P^o$ | 2-2   | 038       |
| Cl IV   | 465.350    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $R^2P - ^1P^o$ | 1-1   | 038       |
| Cl IV   | 466.132    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $R^2P - ^1P^o$ | 1-0   | 038       |
| Cl IV   | 467.194    | 300       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $R^2P - ^1P^o$ | 2-1   | 038       |
| Cl IV   | 486.172    | 800       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $^1D - ^1P^o$  | 2-1   | 044       |
| Cl IV   | 534.727    | 800       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1D^o$ | 0-1   | 043       |
| Cl IV   | 535.039    | 400       |           | $3s^2 3p^2 - 3s^2 3p^4 s$          | $^1S - ^1P^o$  | 0-1   | 044       |
| Cl IV   | 535.666    | 700       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1D^o$ | 1-2   | 043       |
| Cl IV   | 536.150    | 600       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1D^o$ | 1-1   | 043       |
| Cl IV   | 537.606    | 900       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1D^o$ | 2-3   | 043       |
| Cl IV   | 538.119    | 600       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1D^o$ | 2-2   | 043       |
| Cl IV   | 538.595    | 400       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1D^o$ | 2-1   | 043       |
| Cl IV   | 549.219    | 500       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1P^o$ | 0-1   | 043       |
| Cl IV   | 550.020    | 400       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1P^o$ | 1-0   | 043       |
| Cl IV   | 550.706    | 300       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1P^o$ | 1-1   | 043       |
| Cl IV   | 552.017    | 700       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1P^o$ | 1-2   | 043       |
| Cl IV   | 553.297    | 600       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1P^o$ | 2-1   | 043       |
| Cl IV   | 554.619    | 700       |           | $3s^2 3p^2 - 3s^2 3p^3 d$          | $R^2P - ^1P^o$ | 2-2   | 043       |
| Cl IV   | 599.733    | 200       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 0-1   | 044       |
| Cl IV   | 601.499    | 500       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 1-1   | 044       |
| Cl IV   | 604.590    | 500       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 2-1   | 044       |
| Cl IV   | 607.088    | 300       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1S^o$ | 0-1   | 038       |
| Cl IV   | 608.903    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1S^o$ | 1-1   | 038       |
| Cl IV   | 612.070    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1S^o$ | 2-1   | 038       |
| Cl IV   | 653.696    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $^1D - ^1P^o$  | 2-1   | 044       |
| Cl IV   | 662.454    | 300       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $^1D - ^1S^o$  | 2-1   | 044       |
| Cl IV   | 668.770    | 200       |           | $3s^2 3p^2 - 3s^2 3p^4 p$          | $^1D^o - ^1P$  | 3-2   | 043       |
| Cl IV   | 672.428    | 10        |           | $3s^2 3p^2 - 3s^2 3p^4 p$          | $^1D^o - ^1P$  | 1-0   | 043       |
| Cl IV   | 684.490    | 10        |           | $3s^2 3p^2 - 3s^2 3p^4 p$          | $^1D^o - ^1D$  | 3-3   | 043       |
| Cl IV   | 745.205    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $^1S - ^1P^o$  | 0-1   | 044       |
| Cl IV   | 756.563    | 100       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $^1S - ^1S^o$  | 0-1   | 044       |
| Cl IV   | 776.91     | 10        |           | $3s^2 3p^2 - 3s^2 3p^4 p$          | $^1P^o - ^1D$  | 2-3   | 043       |
| Cl IV   | 831.431    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 0-1   | 038       |
| Cl IV   | 834.659    | 300       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 1-0   | 038       |
| Cl IV   | 834.840    | 500       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 1-1   | 038       |
| Cl IV   | 834.967    | 500       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 1-2   | 038       |
| Cl IV   | 840.808    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 2-1   | 038       |
| Cl IV   | 840.933    | 600       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1P^o$ | 2-2   | 038       |
| Cl IV   | 973.212    | 500       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1D^o$ | 0-1   | 038       |
| Cl IV   | 977.560    | 600       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1D^o$ | 1-2   | 038       |
| Cl IV   | 977.901    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1D^o$ | 1-1   | 038       |
| Cl IV   | 984.952    | 700       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1D^o$ | 2-3   | 038       |
| Cl IV   | 985.749    | 400       |           | $3s^2 3p^2 - 3s^2 3p^2$            | $R^2P - ^1D^o$ | 2-2   | 038       |

Cl IV

Cl IV

| Element | Wavelength | Intensity | Multiplet | Configuration               | Term                | J - J | Reference |
|---------|------------|-----------|-----------|-----------------------------|---------------------|-------|-----------|
| Cl IV   | 1413.39    | 100       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3P^{\circ} - ^3P$ | 2-2   | 043       |
| Cl IV   | 1421.97    | 100       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3P^{\circ} - ^3P$ | 1-2   | 043       |
| Cl IV   | 1426.89    | 100       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3P^{\circ} - ^3P$ | 2-1   | 043       |
| Cl IV   | 1440.95    | 10        |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3P^{\circ} - ^3P$ | 1-0   | 043       |
| Cl IV   | 1529.28    | 10        |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3P$ | 1-2   | 043       |
| Cl IV   | 1532.19    | 100       |           | $3s^2 3p^4 p - 3s^2 3p^5 s$ | $^3D - ^3P^{\circ}$ | 3-2   | 043       |
| Cl IV   | 1533.25    | 100       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3P$ | 2-2   | 043       |
| Cl IV   | 1537.21    | 300       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3P$ | 3-2   | 043       |
| Cl IV   | 1539.30    | 200       |           | $3s^2 3p^4 p - 3s^2 3p^5 s$ | $^3D - ^3P^{\circ}$ | 2-1   | 043       |
| Cl IV   | 1545.19    | 200       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3P$ | 1-1   | 043       |
| Cl IV   | 1549.15    | 200       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3P$ | 2-1   | 043       |
| Cl IV   | 1551.27    | 100       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3P$ | 1-0   | 043       |
| Cl IV   | 1617.43    | 100       |           | $3s^2 3p^4 p - 3s^2 3p^5 s$ | $^3P - ^3P^{\circ}$ | 2-2   | 043       |
| Cl IV   | 1622.86    | 200       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3D$ | 3-3   | 043       |
| Cl IV   | 1638.95    | 10        |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3D$ | 1-2   | 043       |
| Cl IV   | 1643.40    | 100       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3D$ | 2-2   | 043       |
| Cl IV   | 1648.04    | 10        |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3D$ | 3-2   | 043       |
| Cl IV   | 1651.21    | 100       |           | $3s^2 3p^3 d - 3s^2 3p^4 p$ | $^3D^{\circ} - ^3D$ | 1-1   | 043       |

Cl V

## CHLORINE, Z = 17

Cl V

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^4$ Ionization potential  $547\,000\text{ cm}^{-1}$ , 67.8 eV

| Element | Wavelength | Intensity | Multiplet | Configuration              | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------|----------------|-----------------------------|-----------|
| Cl V    | 236.435    | 100       |           | $3s^2 3p - 3s^2 5d$        | $R^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Cl V    | 237.231    | 200       |           | $3s^2 3p - 3s^2 5d$        | $R^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Cl V    | 286.127    | 200       |           | $3s^2 3p - 3s^2 4d$        | $R^1P^o - ^1D$ | $\frac{1}{2} -$             | 043       |
| Cl V    | 287.327    | 300       |           | $3s^2 3p - 3s^2 4d$        | $R^1P^o - ^1D$ | $\frac{3}{2} -$             | 043       |
| Cl V    | 372.589    | 200       |           | $3s 3p^2 - 3s 3p(^1P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 373.165    | 200       |           | $3s 3p^2 - 3s 3p(^1P^o)4s$ | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 373.776    | 300       |           | $3s 3p^2 - 3s 3p(^1P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 373.911    | 10        |           | $3s 3p^2 - 3s 3p(^1P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 374.662    | 100       |           | $3s 3p^2 - 3s 3p(^1P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| Cl V    | 375.103    | 200       |           | $3s 3p^2 - 3s 3p(^1P^o)4s$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 390.148    | 400       |           | $3s^2 3p - 3s^2 4s$        | $R^1P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| Cl V    | 392.433    | 500       |           | $3s^2 3p - 3s^2 4s$        | $R^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 043       |
| Cl V    | 535.455    | 200       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 535.916    | 200       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{1}{2} - \frac{1}{2}$ | 043       |
| Cl V    | 536.532    | 300       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 537.006    | 400       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 537.461    | 300       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{1}{2}$ | 549       |
| Cl V    | 538.032    | 500       |           | $3s^2 3p - 3s^2 3d$        | $R^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 538.681    | 400       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 538.977    | 300       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 539.441    | 10        |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$ | 043       |
| Cl V    | 541.284    | 300       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 549       |
| Cl V    | 542.229    | 800       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Cl V    | 542.297    | 600       |           | $3s^2 3p - 3s^2 3d$        | $R^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 542.395    | 300       |           | $3s^2 3p - 3s^2 3d$        | $R^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 542.868    | 400       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 549       |
| Cl V    | 543.818    | 100       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Cl V    | 545.114    | 1000      |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Cl V    | 546.329    | 600       |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Cl V    | 547.630    | 1000      |           | $3s 3p^2 - 3s 3p(^1P^o)3d$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Cl V?   | 551.117    | 200       |           |                            |                |                             | 043       |
| Cl V?   | 551.643    | 100       |           |                            |                |                             | 043       |
| Cl V?   | 552.908    | 200b      |           |                            |                |                             | 043       |
| Cl V?   | 554.210    | 100       |           |                            |                |                             | 043       |
| Cl V?   | 555.485    | 1000b     |           |                            |                |                             | 043       |
| Cl V    | 629.354    | 300       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 633.186    | 400       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 038       |
| Cl V    | 635.323    | 400       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 639.226    | 300       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 038       |
| Cl V    | 676.785    | 300       |           | $3s 3p^2 - 2p^2 3p^2$      | $^1P - ^1S^o$  | $\frac{1}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 679.257    | 300       |           | $3s 3p^2 - 2p^2 3p^2$      | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 681.924    | 400       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 038       |
| Cl V    | 683.171    | 400       |           | $3s 3p^2 - 2p^2 3p^2$      | $^1P - ^1S^o$  | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 688.933    | 400       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 038       |
| Cl V    | 883.127    | 400       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 894.340    | 400       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |
| Cl V    | 894.910    | 100       |           | $3s^2 3p - 3s 3p^2$        | $R^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 038       |

Cl VI

## CHLORINE, Z = 17

Cl VI

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^4$   $^3S_1$ Ionization potential 780 000  $\text{cm}^{-1}$ , 9.7 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                      | Term              | J - J | Reference |
|---------|------------|-----------|-----------|------------------------------------|-------------------|-------|-----------|
| Cl VI   | 194.796    | 100       |           | $3s3p - 3s5d$                      | $^1P^\circ - ^1D$ | 1-2   | 535       |
| Cl VI   | 195.227    | 150       |           | $3s3p - 3s5d$                      | $^1P^\circ - ^1D$ | 2-3   | 535       |
| Cl VI   | 242.885    | 250       |           | $3s3p - 3s4d$                      | $^1P^\circ - ^1D$ | 0-1   | 535       |
| Cl VI   | 243.194    | 400       |           | $3s3p - 3s4d$                      | $^1P^\circ - ^1D$ | 1-2   | 535       |
| Cl VI   | 243.208    | 100       |           | $3s3p - 3s4d$                      | $^1P^\circ - ^1D$ | 1-1   | 535       |
| Cl VI   | 243.854    | 600       |           | $3s3p - 3s4d$                      | $^1P^\circ - ^1D$ | 2-3   | 535       |
| Cl VI   | 243.883    | 150       |           | $3s3p - 3s4d$                      | $^1P^\circ - ^1D$ | 2-2   | 535       |
| Cl VI   | 323.356    | 600       |           | $3s3p - 3s4s$                      | $^1P^\circ - ^1S$ | 0-1   | 535       |
| Cl VI   | 323.936    | 800       |           | $3s3p - 3s4s$                      | $^1P^\circ - ^1S$ | 1-1   | 535       |
| Cl VI   | 325.161    | 1000      |           | $3s3p - 3s4s$                      | $^1P^\circ - ^1S$ | 2-1   | 535       |
| Cl VI   | 399.938    | 250       |           | $3s3d - 3s4f$                      | $^1D - ^1F^\circ$ | 1-2   | 535       |
| Cl VI   | 399.957    | 350       |           | $3s3d - 3s4f$                      | $^1D - ^1F^\circ$ | 2-3   | 535       |
| Cl VI   | 399.995    | 400       |           | $3s3d - 3s4f$                      | $^1D - ^1F^\circ$ | 3-4   | 535       |
| Cl VI   | 550.355    | 250       |           | $3s3p - 3s3d$                      | $^1P^\circ - ^1D$ | 0-1   | 535       |
| Cl VI   | 551.992    | 500       |           | $3s3p - 3s3d$                      | $^1P^\circ - ^1D$ | 1-2   | 535       |
| Cl VI   | 552.053    | 100       |           | $3s3p - 3s3d$                      | $^1P^\circ - ^1D$ | 1-1   | 535       |
| Cl VI   | 555.485    | 1000b     |           | $3s3p - 3s3d$                      | $^1P^\circ - ^1D$ | 2-3   | 535       |
| Cl VI   | 555.580    | 150       |           | $3s3p - 3s3d$                      | $^1P^\circ - ^1D$ | 2-2   | 535       |
| Cl VI   | 565.480    | 400b      |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1D^\circ$ | 0-1   | 549       |
| Cl VI   | 566.630    | 200       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1D^\circ$ | 1-2   | 549       |
| Cl VI   | 567.479    | 100       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1D^\circ$ | 1-1   | 549       |
| Cl VI   | 570.025    | 400       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1D^\circ$ | 2-3   | 549       |
| Cl VI   | 570.529    | 200       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1D^\circ$ | 2-2   | 549       |
| Cl VI   | 570.881    | 10        |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1P^\circ$ | 1-0   | 549       |
| Cl VI   | 571.376    | 100       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1P^\circ$ | 0-1   | 549       |
| Cl VI   | 571.435    | 10        |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1D^\circ$ | 2-1   | 549       |
| Cl VI   | 576.419    | 200       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1P^\circ$ | 1-2   | 549       |
| Cl VI   | 577.444    | 100       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1P^\circ$ | 2-1   | 549       |
| Cl VI   | 580.444    | 200       |           | $2p^4 3p^2 - 2p^4 3p(^1P^\circ)3d$ | $^1P - ^1P^\circ$ | 2-2   | 549       |
| Cl VI   | 671.37     | 400       |           | $3s^2 - 3s3p$                      | $^3S - ^1P^\circ$ | 0-1   | 051       |
| Cl VI   | 724.129    | 150       |           | $3s3p - 2p^4 3p^2$                 | $^3P^\circ - ^3P$ | 1-2   | 535       |
| Cl VI   | 727.537    | 150       |           | $3s3p - 2p^4 3p^2$                 | $^3P^\circ - ^3P$ | 0-1   | 535       |
| Cl VI   | 730.311    | 200       |           | $3s3p - 2p^4 3p^2$                 | $^3P^\circ - ^3P$ | 2-2   | 535       |
| Cl VI   | 733.891    | 150       |           | $3s3p - 2p^4 3p^2$                 | $^3P^\circ - ^3P$ | 1-0   | 535       |
| Cl VI   | 736.762    | 150       |           | $3s3p - 2p^4 3p^2$                 | $^3P^\circ - ^3P$ | 2-1   | 535       |

Cl VII

## CHLORINE, Z = 17

Cl VII

Ground state  $1s^2 2s^2 2p^6 3s^2 S_{1/2}$ Ionization potential 921 902  $\text{cm}^{-1}$ , 114.30 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term          | J - J       | Reference |
|---------|------------|-----------|-----------|---------------|---------------|-------------|-----------|
| Cl VII  | 133.11     |           |           | $3s - 6p$     | $^2S - ^2P$   |             | 160       |
| Cl VII  | 149.37     |           |           | $3s - 5p$     | $^2S - ^2P^o$ | $1/2 - 3/2$ | 160       |
| Cl VII  | 149.43     |           |           | $3s - 5p$     | $^2S - ^2P^o$ | $1/2 - 1/2$ | 160       |
| Cl VII  | 155.32     |           |           | $3p - 6d$     | $^2P - ^2D$   | $1/2 - 3/2$ | 160       |
| Cl VII  | 155.78     |           |           | $3p - 6d$     | $^2P - ^2D$   | $3/2 - 5/2$ | 160       |
| Cl VII  | 174.035    | 150       |           | $3p - 5d$     | $^2P - ^2D$   | $1/2 - 3/2$ | 546       |
| Cl VII  | 174.603    | 200       |           | $3p - 5d$     | $^2P - ^2D$   | $3/2 - 5/2$ | 546       |
| Cl VII  | 190.594    | 100       |           | $3p - 5s$     | $^2P - ^2S$   | $1/2 - 1/2$ | 546       |
| Cl VII  | 191.283    | 200       |           | $3p - 5s$     | $^2P - ^2S$   | $3/2 - 5/2$ | 546       |
| Cl VII  | 196.123    | 500       |           | $3s - 4p$     | $^2S - ^2P^o$ | $1/2 - 3/2$ | 546       |
| Cl VII  | 196.388    | 400       |           | $3s - 4p$     | $^2S - ^2P^o$ | $3/2 - 1/2$ | 546       |
| Cl VII  | 207.757    | 2000      |           | $3d - 6f$     | $^2D - ^2F^o$ |             | 546       |
| Cl VII  | 224.144    | 300       |           | $3p - 4d$     | $^2P - ^2D$   | $1/2 - 3/2$ | 546       |
| Cl VII  | 225.078    | 500       |           | $3p - 4d$     | $^2P - ^2D$   | $3/2 - 5/2$ | 546       |
| Cl VII  | 240.829    | 300       |           | $3d - 5f$     | $^2D - ^2F^o$ | $3/2 - 5/2$ | 546       |
| Cl VII  | 240.865    | 200       |           | $3d - 5f$     | $^2D - ^2F^o$ | $5/2 - 7/2$ | 546       |
| Cl VII  | 293.253    | 400       |           | $3p - 4s$     | $^2P - ^2S$   | $1/2 - 1/2$ | 546       |
| Cl VII  | 294.889    | 500       |           | $3p - 4s$     | $^2P - ^2S$   | $3/2 - 1/2$ | 546       |
| Cl VII  | 340.229    | 750       |           | $3d - 4f$     | $^2D - ^2F^o$ | $3/2 - 5/2$ | 546       |
| Cl VII  | 340.298    | 900       |           | $3d - 4f$     | $^2D - ^2F^o$ | $5/2 - 7/2$ | 546       |
| Cl VII  | 455.273    | 100       |           | $3d - 4p$     | $^2D - ^2P^o$ | $3/2 - 3/2$ | 546       |
| Cl VII  | 456.556    | 50        |           | $3d - 4p$     | $^2D - ^2P^o$ | $5/2 - 1/2$ | 546       |
| Cl VII  | 598.211    | 600       |           | $3p - 3d$     | $^2P - ^2D$   | $1/2 - 3/2$ | 546       |
| Cl VII  | 604.785    | 1000      |           | $3p - 3d$     | $^2P - ^2D$   | $3/2 - 3/2$ | 546       |
| Cl VII  | 605.052    | 50        |           | $3p - 3d$     | $^2P - ^2D$   | $5/2 - 3/2$ | 546       |
| Cl VII  | 800.698    | 150       |           | $3s - 3p$     | $^2S - ^2P^o$ | $1/2 - 3/2$ | 052,546   |
| Cl VII  | 813.002    | 100       |           | $3s - 3p$     | $^2S - ^2P^o$ | $3/2 - 1/2$ | 052,546   |

CI VIII

## CHLORINE, Z = 17

CI VIII

Ground state  $1s^2 2s^2 2p^6 1S_0$ Ionization potential  $2\ 810\ 000\ \text{cm}^{-1}$ , 348.4 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term                                | J - J | Reference |
|---------|------------|-----------|-----------|----------------------------------|-------------------------------------|-------|-----------|
| CI VIII | 39.462     | 100       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)5d$ | $R^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 39.655     | 10        |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)5d$ | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 41.636     | 1         |           | $2s^2 2p^6 - 2s^2 2p^4(^1S)3p$   | $R^1S - ^1P^o$                      | 0-1   | 179,487   |
| CI VIII | 42.166     | 10        |           | $2s^2 2p^6 - 2s^2 2p^4(^1S)3p$   | $R^1S - ^1P^o$                      | 0-1   | 179,487   |
| CI VIII | 42.220     | 200       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)4d$ | $R^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 42.430     | 100       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)4d$ | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 44.361     | 200b      |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)4s$ | $R^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 44.603     | 200       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)4s$ | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 49.487     | 700       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)3d$ | $R^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 50.074     | 500       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)3d$ | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 50.700     | 200       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)3d$ | $R^1S - \frac{3}{2}[\frac{1}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 58.673     | 1000      |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)3s$ | $R^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 179,487   |
| CI VIII | 59.191     | 900       |           | $2s^2 2p^6 - 2s^2 2p^4(^1P^o)3s$ | $R^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 179,487   |

Ground state  $1s^2 2s^2 2p^5 \ ^2P_{3/2}$ Ionization potential  $3\,233\,000\text{ cm}^{-1}$ , 400.8 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-----------------------------|-----------|
| Cl IX   | 42.940     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3d$   | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 43.168     | 120       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3d$   | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 44.003     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$   | $g^3P^o - X1$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 44.088     | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$   | $g^3P^o - X2$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 44.183     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$   | $g^3P^o - X4$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 44.267     | 300b      |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$   | $g^3P^o - X5$  |                             | 179       |
| Cl IX   | 44.361     | 200b      |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$   | $g^3P^o - X2$  | $\frac{1}{2} -$             | 179       |
| Cl IX   | 44.530     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3d$   | $g^3P^o - X5$  | $\frac{1}{2} -$             | 179       |
| Cl IX   | 45.112     | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X1$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 45.261     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X2$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 45.332     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X3$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 45.378     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X4$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 45.396     | 300b      |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X1$  | $\frac{1}{2} -$             | 179       |
| Cl IX   | 45.465     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X5$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 45.519     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X6$  | $\frac{3}{2} -$             | 179       |
| Cl IX   | 45.539     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X2$  | $\frac{1}{2} -$             | 179       |
| Cl IX   | 45.657     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X4$  | $\frac{1}{2} -$             | 179       |
| Cl IX   | 45.745     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3d$   | $g^3P^o - X5$  | $\frac{1}{2} -$             | 179       |
| Cl IX   | 46.098     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P^o)3d$ | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 46.242     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P^o)3d$ | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 179       |
| Cl IX   | 49.234     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3s$   | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 179       |
| Cl IX   | 49.568     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^1S)3s$   | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 179       |
| Cl IX   | 51.026     | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$   | $g^3P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 51.378     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1D)3s$   | $g^3P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 52.055     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 179       |
| Cl IX   | 52.303     | 400       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 52.426     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 179       |
| Cl IX   | 52.677     | 200       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 52.726     | 300       |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 52.939     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 52.959     | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 179       |
| Cl IX   | 53.108     | 1         |           | $2s^2 2p^5 - 2s^2 2p^4(^1P)3s$   | $g^3P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 53.448     | 10        |           | $2s^2 2p^5 - 2s^2 2p^4(^3P^o)3s$ | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 179       |
| Cl IX   | 53.696     | 100       |           | $2s^2 2p^5 - 2s^2 2p^4(^3P^o)3s$ | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 179       |
| Cl IX   | 180.71     |           |           | $2s^2 2p^5 - 2s^2 2p^5$          | $g^3P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 160       |
| Cl IX   | 185.26     |           |           | $2s^2 2p^5 - 2s^2 2p^5$          | $g^3P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 160       |



ClX

## CHLORINE, Z = 17

ClX

Ground state  $1s^2 2s^2 2p^6 3p^2$ Ionization potential 3 673 000  $\text{cm}^{-1}$ , 455.4 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term                | J   | J | Reference |
|---------|------------|-----------|-----------|----------------------------------|---------------------|-----|---|-----------|
| Cl X    | 39.253     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3d$ | $\kappa^3P - ^1D^o$ | 2-  |   | 179       |
| Cl X    | 39.956     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3d$ | $\kappa^3P - ^1P^o$ | 2-  |   | 179       |
| Cl X    | 40.085     | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3d$ | $\kappa^3P - ^1D^o$ | 2-  |   | 179       |
| Cl X    | 40.136     | 1         |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3d$ | $\kappa^3P - ^1P^o$ | 1-  |   | 179       |
| Cl X    | 40.660     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3d$ | $^1D - ^1F^o$       | 2-3 |   | 179       |
| Cl X    | 40.994     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3d$ | $^1D - ^1D^o$       | 2-2 |   | 179       |
| Cl X    | 41.390     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3S^o)3d$ | $\kappa^3P - ^1D^o$ | 2-3 |   | 179       |
| Cl X    | 41.589     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^3S^o)3d$ | $\kappa^3P - ^1D^o$ | 1-2 |   | 179       |
| Cl X    | 45.396     | 300b      |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3s$ | $\kappa^3P - ^3D^o$ | 2-  |   | 179       |
| Cl X    | 45.431     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3s$ | $^1D - ^1P^o$       | 2-1 |   | 179       |
| Cl X    | 45.626     | 15        |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3s$ | $\kappa^3P - ^3D^o$ | 1-  |   | 179       |
| Cl X    | 46.476     | 200       |           | $2s^2 2p^4 - 2s^2 2p^3(^3D^o)3s$ | $^1D - ^1D$         | 2-2 |   | 179       |
| Cl X    | 46.845     | 100       |           | $2s^2 2p^4 - 2s^2 2p^3(^3S^o)3s$ | $\kappa^3P - ^3S^o$ | 2-1 |   | 179       |
| Cl X    | 46.908     | 10        |           | $2s^2 2p^4 - 2s^2 2p^3(^3P^o)3s$ | $^3S - ^1P^o$       | 0-1 |   | 179       |
| Cl X    | 47.085     | 15        |           | $2s^2 2p^4 - 2s^2 2p^3(^3S^o)3s$ | $\kappa^3P - ^3S^o$ | 1-1 |   | 179       |
| Cl X    | 164.5      |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $^1D - ^1P^o$       | 2-1 |   | 160       |
| Cl X    | 180.71     |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $^3S - ^1P^o$       | 0-1 |   | 160       |
| Cl X    | 201.50     |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $\kappa^3P - ^1P^o$ | 2-1 |   | 160       |
| Cl X    | 203.80     |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $\kappa^3P - ^1P^o$ | 1-0 |   | 160       |
| Cl X    | 205.40     |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $\kappa^3P - ^1P^o$ | 2-2 |   | 160       |
| Cl X    | 206.02     |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $\kappa^3P - ^1P^o$ | 1-1 |   | 160       |
| Cl X    | 207.41     |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $\kappa^3P - ^1P$   | 0-1 |   | 160       |
| Cl X    | 210.08     |           |           | $2s^2 2p^4 - 2s^2 2p^3$          | $\kappa^3P - ^1P^o$ | 1-2 |   | 160       |

Cl XI

## CHLORINE, Z = 17

Cl XI

Ground state  $1s^2 2s^2 2p^5 \ ^2P_{3/2}$ 

Ionization potential 529.3 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term                | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------------|---------------------|-----------------------------|-----------|
| Cl XI   | 40 392     | 10        |           | $2s^2 2p^1 - 2s^2 2p^4 (^4P) 3s$ | $^4S^{\circ} - ^4P$ | $\frac{1}{2} - \frac{3}{2}$ | 179,487   |
| Cl XI   | 40 787     | 10        |           | $2s^2 2p^1 - 2s^2 2p^4 (^4D) 3s$ | $^4D^{\circ} - ^4D$ |                             | 179,487   |
| Cl XI   | 162.84     |           |           | $2s^2 2p^1 - 2s 2p^4$            | $^4D^{\circ} - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 160       |
| Cl XI   | 166.08     |           |           | $2s^2 2p^1 - 2s 2p^4$            | $^4D^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 160       |
| Cl XI   | 166.64     |           |           | $2s^2 2p^1 - 2s 2p^4$            | $^4D^{\circ} - ^4P$ | $\frac{5}{2} - \frac{3}{2}$ | 160       |
| Cl XI   | 234.92     |           |           | $2s^2 2p^1 - 2s 2p^4$            | $^4S^{\circ} - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 160       |
| Cl XI   | 237.38     |           |           | $2s^2 2p^1 - 2s 2p^4$            | $^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 160       |
| Cl XI   | 242.80     |           |           | $2s^2 2p^1 - 2s 2p^4$            | $^4S^{\circ} - ^4P$ | $\frac{5}{2} - \frac{3}{2}$ | 160       |

Ground state  $1s^2S_{1/2}$   
Ionization potential  $31\,829\,006\text{ cm}^{-1}$ ;  $3946.19\text{ eV}$

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J          | Reference |
|---------|------------|-----------|-----------|---------------|----------------|----------------|-----------|
| Cl XVII | 3.231      | P         |           | $1s - 6p$     | $g^4S - ^4P^o$ | $\frac{1}{2}-$ | 309       |
| Cl XVII | 3.272      | P         |           | $1s - 5p$     | $g^4S - ^4P^o$ | $\frac{1}{2}-$ | 309       |
| Cl XVII | 3.351      | P         |           | $1s - 4p$     | $g^4S - ^4P^o$ | $\frac{1}{2}-$ | 309       |
| Cl XVII | 3.534      | P         |           | $1s - 3p$     | $g^4S - ^4P^o$ | $\frac{1}{2}-$ | 309       |
| Cl XVII | 4.187      | P         |           | $1s - 2p$     | $g^4S - ^4P^o$ | $\frac{1}{2}-$ | 309       |
| Cl XVII | 13.69      | P         |           | $2 - 7$       |                |                | 309       |
| Cl XVII | 14.15      | P         |           | $2 - 6$       |                |                | 309       |
| Cl XVII | 14.97      | P         |           | $2 - 5$       |                |                | 309       |
| Cl XVII | 16.76      | P         |           | $2 - 4$       |                |                | 309       |
| Cl XVII | 22.61      | P         |           | $2 - 3$       |                |                | 309       |
| Cl XVII | 34.70      | P         |           | $3 - 7$       |                |                | 309       |
| Cl XVII | 37.77      | P         |           | $3 - 6$       |                |                | 309       |
| Cl XVII | 44.26      | P         |           | $3 - 5$       |                |                | 309       |
| Cl XVII | 64.72      | P         |           | $3 - 4$       |                |                | 309       |
| Cl XVII | 74.82      | P         |           | $4 - 7$       |                |                | 309       |
| Cl XVII | 90.7       | P         |           | $4 - 6$       |                |                | 309       |
| Cl XVII | 140.0      | P         |           | $4 - 5$       |                |                | 309       |
| Cl XVII | 160.8      | P         |           | $5 - 7$       |                |                | 309       |
| Cl XVII | 257.8      | P         |           | $5 - 6$       |                |                | 309       |
| Cl XVII | 427.6      | P         |           | $6 - 7$       |                |                | 309       |

Ar

## ARGON, Z = 18

Ar

## Unclassified lines

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Ar      | 25.25      | 400       |           |               |      |       | 255       |
| Ar      | 25.59      | 400       |           |               |      |       | 255       |
| Ar      | 25.71      | 400       |           |               |      |       | 255       |
| Ar      | 26.04      | 300       |           |               |      |       | 255       |
| Ar      | 26.23      | 200       |           |               |      |       | 255       |
| Ar      | 26.36      | 400       |           |               |      |       | 255       |
| Ar      | 27.40      | 400       |           |               |      |       | 255       |
| Ar      | 27.54      | 400       |           |               |      |       | 255       |
| Ar      | 27.80      | 400       |           |               |      |       | 255       |
| Ar      | 27.94      | 400       |           |               |      |       | 255       |
| Ar      | 29.38      | 500       |           |               |      |       | 255       |
| Ar      | 29.57      | 500       |           |               |      |       | 255       |
| Ar      | 29.88      | 300       |           |               |      |       | 255       |
| Ar      | 30.06      | 200       |           |               |      |       | 255       |
| Ar      | 30.26      | 300       |           |               |      |       | 255       |
| Ar      | 30.59      | 300       |           |               |      |       | 255       |
| Ar      | 31.36      | 700       |           |               |      |       | 255       |
| Ar      | 31.46      | 600       |           |               |      |       | 255       |
| Ar      | 31.82      | 400       |           |               |      |       | 255       |
| Ar      | 31.97      | 500       |           |               |      |       | 255       |
| Ar      | 32.28      | 500       |           |               |      |       | 255       |
| Ar      | 32.46      | 500       |           |               |      |       | 255       |
| Ar      | 37.81      | 400       |           |               |      |       | 255       |
| Ar      | 38.04      | 300       |           |               |      |       | 255       |
| Ar      | 38.88      | 500       |           |               |      |       | 255       |
| Ar      | 39.34      | 300       |           |               |      |       | 255       |
| Ar      | 405.42     | 20        |           |               |      |       | 707       |
| Ar      | 409.12     | 20        |           |               |      |       | 707       |
| Ar      | 410.10     | 20        |           |               |      |       | 707       |
| Ar      | 415.86     | 20        |           |               |      |       | 707       |
| Ar      | 417.12     | 10        |           |               |      |       | 707       |
| Ar      | 429.80     | 10        |           |               |      |       | 707       |
| Ar      | 436.67     | 120       |           |               |      |       | 707       |
| Ar      | 438.64     | 10        |           |               |      |       | 707       |
| Ar      | 439.96     | 40        |           |               |      |       | 707       |
| Ar      | 440.91     | 30        |           |               |      |       | 707       |
| Ar      | 441.83     | 30        |           |               |      |       | 707       |
| Ar      | 443.42     | 80        |           |               |      |       | 707       |
| Ar      | 450.44     | 80        |           |               |      |       | 707       |
| Ar      | 451.55     | 60        |           |               |      |       | 707       |
| Ar      | 452.92     | 80        |           |               |      |       | 707       |
| Ar      | 454.76     | 20        |           |               |      |       | 707       |
| Ar      | 465.02     | 150       |           |               |      |       | 707       |
| Ar      | 466.82     | 60        |           |               |      |       | 707       |
| Ar      | 468.38     | 80        |           |               |      |       | 707       |
| Ar      | 470.57     | 80        |           |               |      |       | 707       |
| Ar      | 471.09     | 60        |           |               |      |       | 707       |
| Ar      | 471.97     | 60        |           |               |      |       | 707       |
| Ar      | 483.86     | 20        |           |               |      |       | 707       |
| Ar      | 485.79     | 60        |           |               |      |       | 707       |
| Ar      | 486.60     | 300       |           |               |      |       | 707       |
| Ar      | 492.64     | 50        |           |               |      |       | 707       |
| Ar      | 495.55     | 80        |           |               |      |       | 707       |
| Ar      | 496.91     | 40        |           |               |      |       | 707       |
| Ar      | 501.01     | 120       |           |               |      |       | 707       |

Ar

Ar

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Ar      | 502.42     | 40        |           |               |      |       | 707       |
| Ar      | 505.45     | 60        |           |               |      |       | 707       |
| Ar      | 509.02     | 200       |           |               |      |       | 707       |
| Ar      | 515.62     | 20        |           |               |      |       | 707       |
| Ar      | 517.17     | 80        |           |               |      |       | 707       |
| Ar      | 538.41     | 40        |           |               |      |       | 707       |
| Ar      | 539.19     | 30        |           |               |      |       | 707       |
| Ar      | 539.79     | 50        |           |               |      |       | 707       |
| Ar      | 554.50     | 120       |           |               |      |       | 707       |
| Ar      | 557.04     | 40        |           |               |      |       | 707       |
| Ar      | 559.48     | 40        |           |               |      |       | 707       |
| Ar      | 561.06     | 20        |           |               |      |       | 707       |
| Ar      | 562.18     | 30        |           |               |      |       | 707       |
| Ar      | 565.31     | 20        |           |               |      |       | 707       |
| Ar      | 570.61     | 80        |           |               |      |       | 707       |
| Ar      | 613.40     | 20        |           |               |      |       | 707       |
| Ar      | 614.69     | 10        |           |               |      |       | 707       |
| Ar      | 618.63     | 200       |           |               |      |       | 707       |
| Ar      | 619.04     | 200       |           |               |      |       | 707       |
| Ar      | 620.05     | 20        |           |               |      |       | 707       |
| Ar      | 621.05     | 20        |           |               |      |       | 707       |
| Ar      | 631.68     | 60        |           |               |      |       | 707       |
| Ar      | 649.03     | 50        |           |               |      |       | 707       |
| Ar      | 651.04     | 10        |           |               |      |       | 707       |
| Ar      | 663.93     | 10        |           |               |      |       | 707       |
| Ar      | 664.93     | 50        |           |               |      |       | 707       |
| Ar      | 670.39     | 20        |           |               |      |       | 707       |
| Ar      | 675.28     | 20        |           |               |      |       | 707       |
| Ar      | 680.60     | 20        |           |               |      |       | 707       |
| Ar      | 681.15     | 10        |           |               |      |       | 707       |
| Ar      | 684.81     | 100       |           |               |      |       | 707       |
| Ar      | 694.85     | 100       |           |               |      |       | 707       |
| Ar      | 698.08     | 20        |           |               |      |       | 707       |
| Ar      | 701.11     | 150       |           |               |      |       | 707       |
| Ar      | 716.42     | 10        |           |               |      |       | 707       |
| Ar      | 720.94     | 10        |           |               |      |       | 707       |
| Ar      | 725.11     | 100       |           |               |      |       | 707       |
| Ar      | 727.58     | 1         |           |               |      |       | 707       |
| Ar      | 783.14     | 250       |           |               |      |       | 707       |
| Ar      | 783.65     | 120       |           |               |      |       | 707       |
| Ar      | 784.38     | 30        |           |               |      |       | 707       |
| Ar      | 792.08     | 10        |           |               |      |       | 707       |
| Ar      | 794.53     | 10        |           |               |      |       | 707       |
| Ar      | 795.37     | 20        |           |               |      |       | 707       |
| Ar      | 796.62     | 10        |           |               |      |       | 707       |
| Ar      | 798.12     | 20        |           |               |      |       | 707       |
| Ar      | 803.59     | 20        |           |               |      |       | 707       |
| Ar      | 804.59     | 60        |           |               |      |       | 707       |
| Ar      | 807.46     | 30        |           |               |      |       | 707       |
| Ar      | 815.14     | 30        |           |               |      |       | 707       |
| Ar      | 820.56     | 20        |           |               |      |       | 707       |
| Ar      | 820.98     | 50        |           |               |      |       | 707       |
| Ar      | 828.86     | 20        |           |               |      |       | 707       |
| Ar      | 845.68     | 150       |           |               |      |       | 707       |
| Ar      | 855.71     | 10        |           |               |      |       | 707       |
| Ar      | 868.20     | 10        |           |               |      |       | 707       |
| Ar      | 869.24     | 10        |           |               |      |       | 707       |
| Ar      | 892.07     | 10        |           |               |      |       | 707       |
| Ar      | 892.74     | 10        |           |               |      |       | 707       |
| Ar      | 893.50     | 50        |           |               |      |       | 707       |

Ar

Ar

| Element | Wavelength | Intensity | Multiplet | Configuration | Term | J - J | Reference |
|---------|------------|-----------|-----------|---------------|------|-------|-----------|
| Ar      | 894.97     | 10        |           |               |      |       | 707       |
| Ar      | 904.89     | 80        |           |               |      |       | 707       |
| Ar      | 912.91     | 10        |           |               |      |       | 707       |
| Ar      | 913.80     | 10        |           |               |      |       | 707       |
| Ar      | 917.72     | 10        |           |               |      |       | 707       |
| Ar      | 934.84     | 20        |           |               |      |       | 707       |

Ar I

## ARGON, Z = 18

Ar I

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^4 \ ^3S_0$ Ionization potential 127 109.9  $\text{cm}^{-1}$ ; 15.759 eV

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                                | J - J | Reference   |
|---------|------------|-----------|-----------|------------------------|-------------------------------------|-------|-------------|
| Ar I    | 806.875    | 80        |           | $3p^4 - 3p^3(^3P^o)8s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 807.220    | 80        |           | $3p^4 - 3p^3(^3P^o)7s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 807.702    | 80        |           | $3p^4 - 3p^3(^3P^o)6d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 809.933    | 80        |           | $3p^4 - 3p^3(^3P^o)6d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 816.233    | 160       |           | $3p^4 - 3p^3(^3P^o)5d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 816.466    | 160       |           | $3p^4 - 3p^3(^3P^o)7s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 820.129    | 10        |           | $3p^4 - 3p^3(^3P^o)5d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 825.346    | 40        |           | $3p^4 - 3p^3(^3P^o)6s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197,059,487 |
| Ar I    | 826.364    | 80        |           | $3p^4 - 3p^3(^3P^o)4d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 197,059,487 |
| Ar I    | 834.392    | 240       |           | $3p^4 - 3p^3(^3P^o)4d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 197,059,487 |
| Ar I    | 835.003    | 240       |           | $3p^4 - 3p^3(^3P^o)6s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 842.808    | 80        |           | $3p^4 - 3p^3(^3P^o)4d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 866.805    | 200       |           | $3p^4 - 3p^3(^3P^o)3d$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 869.754    | 100       |           | $3p^4 - 3p^3(^3P^o)5s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 876.063    | 200       | 4         | $3p^4 - 3p^3(^3P^o)3d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,488     |
| Ar I    | 879.949    | 120       |           | $3p^4 - 3p^3(^3P^o)5s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,487     |
| Ar I    | 894.310    | 200       | 3         | $3p^4 - 3p^3(^3P^o)3d$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,488     |
| Ar I    | 1048.218   | 1000      | 2         | $3p^4 - 3p^3(^3P^o)4s$ | $g^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 059,488     |
| Ar I    | 1066.660   | 750       | 1         | $3p^4 - 3p^3(^3P^o)4s$ | $g^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 059,488     |

Ar II

## ARGON, Z = 18

Ar II

Ground state  $1s^2s^2p^43s^3p^4^1P_1^o$ Ionization potential 222 848.2  $\text{cm}^{-1}$ ; 27.629 eV

| Element | Wavelength  | Intensity | Multiplet | Configuration              | Term           | J - J                       | Reference   |
|---------|-------------|-----------|-----------|----------------------------|----------------|-----------------------------|-------------|
| Ar II   | 487.2274 ST | 20        |           | $3s^3p^4 - 3s^3p^4(^1D)4d$ | $g^4P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 488.7928 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 488.9616 ST | 20        |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 489.1955 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 490.7010 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 492.4080 ST | 20        |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 494.6678 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 496.6438 ST | 25        |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 496.6594 ST | 25        |           | $3s^3p^4 - 3s^3p^4(^1P)5d$ | $g^4P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 500.8019 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1D)4d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 501.1899 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1D)4d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 502.027     | 20        |           | $3s^3p^4 - 3s^3p^4(^1P)6s$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 501         |
| Ar II   | 502.1632 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)6s$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 503.6501 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1D)4d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 504.811     | 50        |           | $3s^3p^4 - 3s^3p^4(^1D)4d$ | $g^4P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 487,059     |
| Ar II   | 505.0119 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1D)4d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 510.5511 ST | 40        |           | $3s^3p^4 - 3s^3p^4(^1D)5s$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 510.5566 ST | 60        |           | $3s^3p^4 - 3s^3p^4(^1D)5s$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 514.3097 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1D)5s$ | $g^4P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 518.9090 ST | 100       | 12        | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 519.3271 ST | 100       | 12        | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 522.7921 ST | 100       | 12        | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 524.6805 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 526.4971 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 528.6508 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 530.4951 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 533.0796 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 535.0713 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 537.1398 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 537.4195 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1F$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 540.8063 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1F$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 541.3017 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 542.9125 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 543.2035 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 543.508     | 20        |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 501         |
| Ar II   | 543.7307 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1P)5s$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 546.1770 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1P)5s$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 547.1647 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1P)4d$ | $g^4P^o - ^1D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 547.4602 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 547.9958 ST | 50        |           | $3s^3p^4 - 3s^3p^4(^1P)5s$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 548.7810 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1P)5s$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 550.4807 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)5s$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 550.9042 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)5s$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 553.1260 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1P)5s$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 555.7662 ST | 100       |           | $3s^3p^4 - 3s^3p^4(^1S)3d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 556.8172 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1S)3d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 560.2229 ST | 200       |           | $3s^3p^4 - 3s^3p^4(^1S)3d$ | $g^4P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501     |
| Ar II   | 572.0139 ST | 200       | 11        | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 573.3622 ST | 200       | 11        | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501,488 |
| Ar II   | 576.7361 ST | 200       | 11        | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 578.1068 ST | 200       | 11        | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501,488 |
| Ar II   | 578.6046 ST | 200       | 10        | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501,488 |
| Ar II   | 580.2634 ST | 300       | 10        | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 308,501,488 |
| Ar II   | 583.4368 ST | 200       | 10        | $3s^3p^4 - 3s^3p^4(^1D)3d$ | $g^4P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 308,501,488 |
| Ar II   | 597.7003 ST | 200       | 9         | $3s^3p^4 - 3s^3p^4(^1S)4s$ | $g^4P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 308,501,488 |



Ar II

Ar II

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term                 | J - J                       | Reference   |
|---------|------------|-----------|-----------|---------------------------------------|----------------------|-----------------------------|-------------|
| Ar II?  | 597.76     | 20        |           | $3s^2 3p^5 - 3s^2 3p^4(^1S)4s$        | $\kappa^2 P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 707,375     |
| Ar II   | 602.8581   | 200       | 9         | $3s^2 3p^5 - 3s^2 3p^4(^1S)4s$        | $\kappa^2 P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II?  | 603.26     | 20        |           | $3s^2 3p^5 - 3s^2 3p^4(^1S)4s$        | $\kappa^2 P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 707,375     |
| Ar II   | 612.3719   | 500       |           | $3s^2 3p^5 - 3s^2 3p^4(^1D)3d$        | $\kappa^2 P^o - ^2F$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 661.8692   | 500       | 8         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 664.5626   | 400       | 8         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 666.0112   | 600       | 7         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2F$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 670.9450   | 500       | 8         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 671.8516   | 600       | 6         | $3s^2 3p^5 - 3s^2 3p^4(^1D)4s$        | $\kappa^2 P^o - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 672.8565   | 200       | 6         | $3s^2 3p^5 - 3s^2 3p^4(^1D)4s$        | $\kappa^2 P^o - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 676.2428   | 600       |           | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 677.9521   | 500       |           | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 679.2187   | 300       |           | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 679.4001   | 600       | 6         | $3s^2 3p^5 - 3s^2 3p^4(^1D)4s$        | $\kappa^2 P^o - ^2D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 686.4888   | 200       |           | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 691.0377   | 100       |           | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 693.3015   | 200       |           | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 697.4893   | 200       | 5         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^4F$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 697.9414   | 200       |           | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 698.7748   | 400       | 5         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^4F$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 704.5233   | 400       | 5         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^4F$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 718.0903   | 400       | 4         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 723.3611   | 500       | 4         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 725.5481   | 400       | 4         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 730.9293   | 500       | 4         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^2P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 737.4541   | 100       | 3         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501     |
| Ar II   | 740.2695   | 1000      | 3         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 744.9252   | 800       | 3         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 745.3217   | 700       | 3         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 748.1977   | 400       | 3         | $3s^2 3p^5 - 3s^2 3p^4(^1P)4s$        | $\kappa^2 P^o - ^4P$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 754.8243   | 300       | 2         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^4D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 762.1995   | 300       | 2         | $3s^2 3p^5 - 3s^2 3p^4(^1P)3d$        | $\kappa^2 P^o - ^4D$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 919.7815   | 1000      | 1         | $3s^2 3p^5 - 3s^2 3p^4$               | $\kappa^2 P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 932.0528   | 1000      | 1         | $3s^2 3p^5 - 3s^2 3p^4$               | $\kappa^2 P^o - ^2S$ | $\frac{1}{2} - \frac{1}{2}$ | 308,501,488 |
| Ar II   | 1268.483   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4D - [12]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1280.225   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4D - 2[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1282.620   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4D - 2[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1284.793   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4D - 2[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1348.751   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 0[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1351.333   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 0[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1354.915   | 200       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 1[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1357.435   | 20        |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 1[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1360.735   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 1[2]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1363.032   | 200       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 1[2]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1376.106   | 50        |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1376.56    | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1377.211   | 400       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1377.442   | 20        |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[7]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1379.378   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1379.884   | 300       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1380.728   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[2]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1382.228   | 200       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1382.770   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)5f$ | $^4D - 2[2]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1396.231   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)7f$ | $^4F - 2[5]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1451.879   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4F - 1[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1455.484   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4F - 0[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1459.878   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4F - 1[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1463.155   | 200       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4F - 2[5]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1464.176   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4F - 1[3]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |
| Ar II   | 1465.153   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)6f$ | $^4F - 2[4]^o$       | $\frac{1}{2} - \frac{1}{2}$ | 501,502     |

Ar II

Ar II

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term           | J - J                        | Reference |
|---------|------------|-----------|-----------|-------------------------------------------|----------------|------------------------------|-----------|
| Ar II   | 1474.537   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 6f$ | $^4F - 2[5]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1544.177   | 200       |           | $3s^2 3p^4 (^1D) 3d - 3s^2 3p^4 (^1D) 5f$ | $^4G - 2[5]^o$ | $\frac{9}{2} - \frac{11}{2}$ | 501,502   |
| Ar II   | 1544.711   | 200       |           | $3s^2 3p^4 (^1D) 3d - 3s^2 3p^4 (^1D) 5f$ | $^4G - 2[5]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1547.356   | 100       |           | $3s^2 3p^4 - 3s^2 3p^4 (^1D) 4p$          | $^4S - ^4D^o$  | $\frac{1}{2} - \frac{3}{2}$  | 501       |
| Ar II   | 1557.305   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^4P - 2[2]^o$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502   |
| Ar II   | 1559.072   | 300       | 14        | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1560.191   | 400       |           | $3s^2 3p^4 - 3s^2 3p^4 (^1D) 4p$          | $^4S - ^4P^o$  | $\frac{1}{2} - \frac{1}{2}$  | 501,488   |
| Ar II   | 1562.442   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1563.043   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 1[3]^o$ | $\frac{7}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1565.377   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^4P - 2[1]^o$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502   |
| Ar II   | 1566.811   | 100       | 14        | $3s^2 3p^4 (^1P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1567.987   | 400       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 1[4]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1571.391   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 1[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1574.401   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1574.993   | 600       |           | $3s^2 3p^4 - 3s^2 3p^4 (^1D) 4p$          | $^4S - ^4P^o$  | $\frac{1}{2} - \frac{3}{2}$  | 501,488   |
| Ar II   | 1575.815   | 300       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 1[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1576.898   | 300       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 1[4]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1578.812   | 300       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 1[2]^o$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502   |
| Ar II   | 1580.770   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1580.960   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^4P - 2[2]^o$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502   |
| Ar II   | 1583.833   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1586.261   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 1[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1589.465   | 500       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 2[5]^o$ | $\frac{9}{2} - \frac{11}{2}$ | 501,502   |
| Ar II   | 1590.233   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1591.939   | 1         |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[1]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1593.587   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 2[4]^o$ | $\frac{9}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1594.799   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[2]^o$ | $\frac{7}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1595.737   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[1]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1596.151   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[1]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1598.575   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[3]^o$ | $\frac{7}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1598.722   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1598.880   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[1]^o$ | $\frac{1}{2} - \frac{1}{2}$  | 501,502   |
| Ar II   | 1599.130   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[3]^o$ | $\frac{7}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1599.607   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1600.133   | 400       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[4]^o$ | $\frac{7}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1600.694   | 600       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[4]^o$ | $\frac{7}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1602.554   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1602.891   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 2[5]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1603.075   | 400       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1603.442   | 400       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1604.082   | 500       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1606.197   | 300       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[2]^o$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502   |
| Ar II   | 1606.926   | 400       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 4f$ | $^4D - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1607.180   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 2[4]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1615.807   | 50        |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1616.972   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4F - 2[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1627.085   | 20        |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 6f$ | $^4F - 1[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1628.825   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4P - 1[2]^o$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502   |
| Ar II   | 1629.834   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 6f$ | $^4F - 2[5]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1640.343   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4P - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1650.535   | 100       |           | $3s^2 3p^4 (^3F) 4p - 3s^2 3p^4 (^1D) 5g$ | $^4D^o - 2[4]$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1653.322   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 6f$ | $^4D - 1[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1662.253   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^4F - 2[4]^o$ | $\frac{7}{2} - \frac{9}{2}$  | 501,502   |
| Ar II   | 1686.076   | 50        |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4P - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1689.470   | 50        |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^4F - 2[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1701.358   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^4D - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1702.188   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4P - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1705.980   | 100       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4P - 1[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1710.909   | 50        |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^4D - 2[2]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |
| Ar II   | 1713.218   | 200       |           | $3s^2 3p^4 (^3P) 3d - 3s^2 3p^4 (^3P) 5f$ | $^4P - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502   |

Ar II

Ar II

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term           | J - J                        | Reference   |
|---------|------------|-----------|-----------|-------------------------------------------|----------------|------------------------------|-------------|
| Ar II   | 1718.680   | 100       |           | $3s^2 3p^4 (^2P) 4p - 3s^2 3p^4 (^2P) 7g$ | $^1P^o - 2[2]$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502     |
| Ar II   | 1719.346   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^1D - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1725.147   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1P - 2[1]^o$ | $\frac{1}{2} - \frac{5}{2}$  | 501,502     |
| Ar II   | 1725.549   | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1P - 2[1]^o$ | $\frac{1}{2} - \frac{5}{2}$  | 501,502     |
| Ar II   | 1729.075   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^1D) 4f$ | $^1D - 2[2]^o$ | $\frac{3}{2} -$              | 501,502     |
| Ar II   | 1729.259   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1P - 2[2]^o$ | $\frac{1}{2} - \frac{5}{2}$  | 501,502     |
| Ar II   | 1733.372   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1P - 2[1]^o$ | $\frac{3}{2} - \frac{5}{2}$  | 501,502     |
| Ar II   | 1735.378   | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5p$ | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1736.834   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1P - 2[2]^o$ | $\frac{3}{2} - \frac{5}{2}$  | 501,502     |
| Ar II   | 1750.694   | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1P - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1751.679   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5p$ | $^1D - ^1D^o$  | $\frac{3}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1755.819   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 1[4]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1763.669   | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5p$ | $^1D - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$  | 501         |
| Ar II   | 1768.043   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5p$ | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1770.658   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1771.829   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5p$ | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1776.672   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5p$ | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1782.596   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1785.672   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 1[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1788.104   | 300       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 2[5]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1791.561   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1793.435   | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 2[4]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1812.475   | 50        |           | $3s^2 3p^4 (^2P) 4s - 3s^2 3p^4 (^2P) 5p$ | $^1P - ^1D^o$  | $\frac{3}{2} - \frac{7}{2}$  | 501         |
| Ar II   | 1813.014   | 100       |           | $3s^2 3p^4 (^1D) 3d - 3s^2 3p^4 (^1D) 4f$ | $^1G - 2[4]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1813.766   | 100       |           | $3s^2 3p^4 (^1D) 3d - 3s^2 3p^4 (^1D) 4f$ | $^1G - 2[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1816.14    | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1D - 1[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1823.205   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1F - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1824.842   | 50        |           | $3s^2 3p^4 (^2P) 4s - 3s^2 3p^4 (^2P) 5p$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1830.770   | 500       |           | $3s^2 3p^4 (^1D) 3d - 3s^2 3p^4 (^1D) 4f$ | $^1G - 2[5]^o$ | $\frac{3}{2} - \frac{11}{2}$ | 501,502     |
| Ar II   | 1831.527   | 500       |           | $3s^2 3p^4 (^1D) 3d - 3s^2 3p^4 (^1D) 4f$ | $^1G - 2[5]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1834.038   | 200       |           | $3s^2 3p^4 (^2P) 4s - 3s^2 3p^4 (^2P) 5p$ | $^1P - ^1P^o$  | $\frac{3}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1854.986   | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 5f$ | $^1D - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1866.089   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1868.660   | 300       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1872.589   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1873.140   | 600       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[4]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1877.523   | 400       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 0[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1879.420   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1879.790   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1886.386   | 400       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1888.782   | 400       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1889.029   | 600       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[5]^o$ | $\frac{3}{2} - \frac{11}{2}$ | 501,502     |
| Ar II   | 1897.352   | 50        |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 1[2]^o$ | $\frac{3}{2} - \frac{5}{2}$  | 501,502     |
| Ar II?  | 1899.287   | 100       |           | $3s^2 3p^4 (^2P) 4p - 3s^2 3p^4 (^2P) 6d$ | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{7}{2}$  | 501         |
| Ar II   | 1899.847   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1900.638   | 400       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[4]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1907.988   | 400       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[5]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1909.5689  | 50        | ST        | $3s^2 3p^4 - 3s^2 3p^4 (^2P) 4p$          | $^1S - ^1S^o$  | $\frac{1}{2} - \frac{1}{2}$  | 308,501     |
| Ar II   | 1911.053   | 50        |           | $3s^2 3p^4 - 3s^2 3p^4 (^2P) 4p$          | $^1S - ^1S^o$  | $\frac{1}{2} - \frac{3}{2}$  | 501         |
| Ar II   | 1919.199   | 300       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1920.007   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[4]^o$ | $\frac{3}{2} - \frac{9}{2}$  | 501,502     |
| Ar II   | 1931.419   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[3]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1932.230   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[3]^o$ | $\frac{3}{2} - \frac{5}{2}$  | 501,502     |
| Ar II   | 1933.694   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[4]^o$ | $\frac{3}{2} - \frac{7}{2}$  | 501,502     |
| Ar II   | 1937.041   | 100       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1F - 2[2]^o$ | $\frac{3}{2} - \frac{5}{2}$  | 501,502     |
| Ar II   | 1941.0724  | 300       | 13        | $3s^2 3p^4 - 3s^2 3p^4 (^2P) 4p$          | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$  | 308,501,488 |
| Ar II   | 1946.795   | 200       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1P - 1[2]^o$ | $\frac{1}{2} - \frac{3}{2}$  | 501,502     |
| Ar II   | 1961.3610  | 400       | 13        | $3s^2 3p^4 - 3s^2 3p^4 (^2P) 4p$          | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$  | 308,501,488 |
| Ar II   | 1962.161   | 300       |           | $3s^2 3p^4 (^2P) 3d - 3s^2 3p^4 (^2P) 4f$ | $^1P - 0[3]^o$ | $\frac{3}{2} - \frac{3}{2}$  | 501,502     |
| Ar II?  | 1966.953   | 100       |           | $3s^2 3p^4 (^2P) 4p - 3s^2 3p^4 (^2P) 6d$ | $^1D^o - ^1F$  | $\frac{3}{2} - \frac{7}{2}$  | 501         |

Ar II

Ar II

| Element | Wavelength | Intensity | Multiplet | Configuration                         | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------------------------------|----------------|-----------------------------|-----------|
| Ar II?  | 1972.274   | 200       |           | $3s^2 3p^4(^1P)4p - 3s^2 3p^4(^1P)6d$ | $^1D^o - ^1F$  | $\frac{1}{2} - \frac{3}{2}$ | 501       |
| Ar II   | 1973.4837  | 200       | ST        | $3s^2 3p^4 - 3s^2 3p^4(^1P)4p$        | $^1S - ^1D^o$  | $\frac{1}{2} - \frac{3}{2}$ | 308, 501  |
| Ar II   | 1974.462   | 300       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)4f$ | $^1P - 1[3]^o$ | $\frac{3}{2} - \frac{5}{2}$ | 501, 502  |
| Ar II   | 1976.765   | 300       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)4f$ | $^1P - 2[1]^o$ | $\frac{1}{2} - \frac{3}{2}$ | 501, 502  |
| Ar II?  | 1977.200   | 20        |           | $3s^2 3p^4(^1P)4p - 3s^2 3p^4(^1P)7s$ | $^1D^o - ^1P$  | $\frac{3}{2} - \frac{5}{2}$ | 501       |
| Ar II?  | 1981.74    | 100       |           | $3s^2 3p^4(^1P)4p - 3s^2 3p^4(^1P)6d$ | $^1D^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 501       |
| Ar II   | 1983.299   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)4f$ | $^1P - 1[2]^o$ | $\frac{3}{2} - \frac{5}{2}$ | 501, 502  |
| Ar II   | 1983.829   | 100       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)4f$ | $^1P - 1[2]^o$ | $\frac{3}{2} - \frac{5}{2}$ | 501, 502  |
| Ar II   | 1988.629   | 300       |           | $3s^2 3p^4(^1P)3d - 3s^2 3p^4(^1P)4f$ | $^1P - 2[2]^o$ | $\frac{1}{2} - \frac{3}{2}$ | 501, 502  |
| Ar II?  | 1995.555   | 20        |           | $3s^2 3p^4(^1P)4p - 3s^2 3p^4(^1P)7s$ | $^1D^o - ^1P$  | $\frac{3}{2} - \frac{5}{2}$ | 501       |

Ar III

ARGON, Z = 18

Ar III

Ground state  $1s^2 2s^2 2p^6 3s^3 3p^2$ Ionization potential  $329\,965.8\text{ cm}^{-1}$ , 40.909 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                    | Term           | J-J | Reference |
|---------|------------|-----------|-----------|----------------------------------|----------------|-----|-----------|
| Ar III  | 395.92     | 50        |           | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)5s$ | $g^3P - ^4S^o$ | 2-1 | 059       |
| Ar III  | 396.38     | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)4d$ | $g^3P - ^4D^o$ | 2-3 | 059       |
| Ar III  | 397.67     | 50        |           | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)5s$ | $g^3P - ^4S^o$ | 1-1 | 059       |
| Ar III  | 398.86     | 50        |           | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)5s$ | $g^3P - ^4S^o$ | 2-2 | 059       |
| Ar III  | 466.530    | 250       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3P^o$ | 2-1 | 059       |
| Ar III  | 467.390    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3P^o$ | 2-2 | 059       |
| Ar III  | 468.467    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3P^o$ | 1-0 | 059       |
| Ar III  | 468.956    | 150       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3P^o$ | 1-1 | 059       |
| Ar III  | 469.831    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3P^o$ | 1-2 | 059       |
| Ar III  | 469.968    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3P^o$ | 0-1 | 059       |
| Ar III? | 473.025    | 300       |           |                                  |                |     | 059       |
| Ar III  | 473.918    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3D^o$ | 2-2 | 059,487   |
| Ar III  | 476.432    | 350       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)3d$ | $g^3P - ^3D^o$ | 1-2 | 059,487   |
| Ar III  | 481.848    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)4s$ | $g^3P - ^3P^o$ | 2-1 | 059,487   |
| Ar III  | 482.548    | 400       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)4s$ | $g^3P - ^3P^o$ | 2-2 | 059,487   |
| Ar III  | 484.116    | 250       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)4s$ | $g^3P - ^3P^o$ | 1-0 | 059,487   |
| Ar III  | 484.445    | 250       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)4s$ | $g^3P - ^3P^o$ | 1-1 | 059,487   |
| Ar III  | 485.150    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)4s$ | $g^3P - ^3P^o$ | 1-2 | 059,487   |
| Ar III  | 485.515    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^2P^o)4s$ | $g^3P - ^3P^o$ | 0-1 | 059,487   |
| Ar III? | 487.025    | 350       |           |                                  |                |     | 059       |
| Ar III? | 487.988    | 350       |           |                                  |                |     | 059       |
| Ar III  | 488.452    | 350       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3S^o$ | 2-1 | 059,487   |
| Ar III? | 490.68     | 150       |           |                                  |                |     | 059       |
| Ar III  | 491.121    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3S^o$ | 1-1 | 059,487   |
| Ar III  | 492.228    | 150       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3S^o$ | 0-1 | 059,487   |
| Ar III  | 508.441    | 450       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)4s$ | $g^3P - ^3D^o$ | 2-3 | 487,337   |
| Ar III  | 508.611    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)4s$ | $g^3P - ^3D^o$ | 2-2 | 487,337   |
| Ar III  | 508.675    | 180       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)4s$ | $g^3P - ^3D^o$ | 2-1 | 487,337   |
| Ar III  | 511.505    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)4s$ | $g^3P - ^3D^o$ | 1-2 | 487,337   |
| Ar III  | 511.570    | 180       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)4s$ | $g^3P - ^3D^o$ | 1-1 | 487,337   |
| Ar III  | 512.770    | 180       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)4s$ | $g^3P - ^3D^o$ | 0-1 | 487,337   |
| Ar III  | 529.900    | 450       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3D^o$ | 2-3 | 059       |
| Ar III  | 532.413    | 350       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3D^o$ | 2-2 | 059       |
| Ar III  | 534.26     | 50        |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3D^o$ | 2-1 | 059       |
| Ar III  | 535.580    | 350       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3D^o$ | 1-2 | 059       |
| Ar III? | 536.745    | 400       |           |                                  |                |     | 059       |
| Ar III  | 537.459    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3D^o$ | 1-1 | 059       |
| Ar III  | 538.788    | 300       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $g^3P - ^3D^o$ | 0-1 | 059       |
| Ar III  | 553.470    | 450       | 4         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)4s$ | $g^3P - ^4S^o$ | 2-1 | 059,488   |
| Ar III  | 556.893    | 300       | 4         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)4s$ | $g^3P - ^4S^o$ | 1-1 | 059,488   |
| Ar III  | 558.321    | 250       | 4         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)4s$ | $g^3P - ^4S^o$ | 0-1 | 059,488   |
| Ar III  | 573.468    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)4s$ | $g^3P - ^4S^o$ | 2-2 | 059       |
| Ar III  | 577.153    | 150       |           | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)4s$ | $g^3P - ^4S^o$ | 1-2 | 059       |
| Ar III  | 578.386    | 200       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $^1D - ^3F^o$  | 2-2 | 060       |
| Ar III  | 579.212    | 150       |           | $3s^2 3p^4 - 3s^2 3p^4(^2D^o)3d$ | $^1D - ^3F^o$  | 2-3 | 060       |
| Ar III? | 604.152    | 500       |           |                                  |                |     | 059       |
| Ar III? | 623.767    | 250       |           |                                  |                |     | 060       |
| Ar III  | 636.818    | 150       | 3         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 2-1 | 059,488   |
| Ar III  | 637.282    | 1000      | 3         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 2-3 | 059,488   |
| Ar III  | 641.364    | 250       | 3         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 1-1 | 059,488   |
| Ar III  | 641.808    | 600       | 3         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 1-2 | 059,488   |
| Ar III  | 643.256    | 450       | 3         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 0-1 | 059,488   |
| Ar III  | 690.170    | 400d      | 2         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 2-3 | 059,488   |
| Ar III  | 695.537    | 300       | 2         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 1-2 | 059,488   |
| Ar III  | 697.74     | 100       | 2         | $3s^2 3p^4 - 3s^2 3p^4(^4S^o)3d$ | $g^3P - ^3D^o$ | 0-1 | 059       |

## Ar III

## Ar III

| Element | Wavelength | Intensity | Multiplet | Configuration                             | Term            | J - J | Reference   |
|---------|------------|-----------|-----------|-------------------------------------------|-----------------|-------|-------------|
| Ar III  | 699.72     | 50        |           | $3s^2 3p^4 - 3s^2 3p^3(^4S^o)3d$          | $^1D^o - ^1D^o$ | 2-    | 060         |
| Ar III  | 769.152    | 600       | 5         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^1D^o - ^1P^o$ | 2-1   | 059,169,488 |
| Ar III  | 871.099    | 500       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^3P^o - ^1P^o$ | 2-1   | 059,488     |
| Ar III  | 875.534    | 450       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^3P^o - ^1P^o$ | 1-0   | 059,488     |
| Ar III  | 878.728    | 600       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^3P^o - ^1P^o$ | 2-2   | 059,488     |
| Ar III  | 879.622    | 400       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^3P^o - ^1P^o$ | 1-1   | 059,488     |
| Ar III  | 885.179    | 450       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^3P^o - ^1P^o$ | 0-1   | 059,488,252 |
| Ar III  | 887.404    | 500       | 1         | $3s^2 3p^4 - 3s^2 3p^3$                   | $^3P^o - ^1P^o$ | 1-2   | 059,488     |
| Ar III  | 1002.095   | 150       |           | $3s^2 3p^4 - 3s^2 3p^3$                   | $^1D^o - ^1P^o$ | 2-2   | 060         |
| Ar III? | 1205.95    | 50        |           |                                           |                 |       | 060         |
| Ar III  | 1460.077   | 200       |           | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^2D^o)4p$ | $^1D^o - ^1D$   | 3-3   | 059         |
| Ar III  | 1460.234   | 100       |           | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^2D^o)4p$ | $^1D^o - ^1D$   | 2-3   | 059         |
| Ar III  | 1465.532   | 100       |           | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^2D^o)4p$ | $^1D^o - ^1D$   |       | 059         |
| Ar III  | 1465.712   | 150       |           | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^2D^o)4p$ | $^3D^o - ^1D$   | 2-2   | 059         |
| Ar III  | 1467.841   | 150       |           | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^2D^o)4p$ | $^3D^o - ^1D$   | 1-1   | 059         |
| Ar III  | 1468.006   | 100       |           | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^2D^o)4p$ | $^3D^o - ^1D$   | 1-2   | 059         |
| Ar III  | 1669.10    | 50        | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 2-3   | 059         |
| Ar III  | 1669.304   | 250       | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 3-3   | 059         |
| Ar III  | 1669.671   | 350       | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 4-3   | 059,488     |
| Ar III  | 1673.14    | 50        | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 1-2   | 059         |
| Ar III  | 1673.241   | 150       | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 2-2   | 059         |
| Ar III  | 1673.425   | 350       | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 3-2   | 059,488     |
| Ar III  | 1675.484   | 350       | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 1-1   | 059         |
| Ar III  | 1675.637   | 200       | 6         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 2-1   | 059,488     |
| Ar III  | 1914.398   | 450       | 7         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 3-2   | 059,488     |
| Ar III  | 1914.653   | 150       | 7         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 2-2   | 059         |
| Ar III  | 1915.564   | 350       | 7         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 2-1   | 059,488     |
| Ar III  | 1918.06    | 50        | 7         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 1-0   | 059         |
| Ar III  | 1918.667   | 200       | 7         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 1-2   | 059         |
| Ar III  | 1919.515   | 200       | 7         | $3s^2 3p^3(^4S^o)3d - 3s^2 3p^3(^4S^o)4p$ | $^3D^o - ^3P$   | 1-1   | 059         |
| Ar III  | 1957.83    | 50        |           | $3s^2 3p^3(^4S^o)4s - 3s^2 3p^3(^2D^o)4p$ | $^3S^o - ^3P$   | 1-0   | 059         |
| Ar III  | 1962.74    | 100       |           | $3s^2 3p^3(^4S^o)4s - 3s^2 3p^3(^2D^o)4p$ | $^3S^o - ^3P$   | 1-1   | 059         |
| Ar III  | 1973.780   | 200       |           | $3s^2 3p^3(^4S^o)4s - 3s^2 3p^3(^2D^o)4p$ | $^3S^o - ^3P$   | 1-2   | 059         |

Ar IV

ARGON, Z = 18

Ar IV

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^2 \ ^3S_1$ Ionization potential  $482\,400\text{ cm}^{-1}$ , 59.81 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                  | Term                 | J - J                       | Reference |
|---------|------------|-----------|-----------|--------------------------------|----------------------|-----------------------------|-----------|
| Ar IV   | 396.869    | 160       |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 398.546    | 160       |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 399.634    | 120       |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)4s$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 059       |
| Ar IV?  | 423.58     | 10        |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)4s$ | $^3D^{\circ} - ^3P$  | $\frac{3}{2} - \frac{3}{2}$ | 707,375   |
| Ar IV   | 443.40     |           |           | $3s^2 3p^3 - 3s^2 3p^2(^1D)3d$ | $^3D^{\circ} - ^3F$  | $\frac{3}{2} - \frac{3}{2}$ | 295       |
| Ar IV   | 451.20     |           |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 267       |
| Ar IV   | 451.87     |           |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 267       |
| Ar IV   | 452.91     |           |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)3d$ | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 267       |
| Ar IV   | 683.278    | 400       | 3         | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^3P$  | $\frac{3}{2} - \frac{1}{2}$ | 059,488   |
| Ar IV   | 688.392    | 300       | 3         | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^3P$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 689.007    | 500       | 3         | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^3P$  | $\frac{3}{2} - \frac{3}{2}$ | 059,488   |
| Ar IV   | 699.408    | 240       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3S$  | $\frac{1}{2} - \frac{1}{2}$ | 059       |
| Ar IV   | 700.277    | 320       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3S$  | $\frac{3}{2} - \frac{1}{2}$ | 059       |
| Ar IV   | 754.205    | 160       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3P$  | $\frac{1}{2} - \frac{1}{2}$ | 059       |
| Ar IV   | 755.212    | 120       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3P$  | $\frac{3}{2} - \frac{1}{2}$ | 059       |
| Ar IV   | 760.439    | 120       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3P$  | $\frac{1}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 761.470    | 200       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3P$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV?  | 772.41     | 10        |           | $3s^2 3p^3 - 3s^2 3p^2(^3P)4p$ | $^3P - ^3P^{\circ}$  | $\frac{3}{2} - \frac{3}{2}$ | 707,375   |
| Ar IV   | 800.573    | 200       | 2         | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^3D$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 801.086    | 400       | 2         | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^3D$  | $\frac{3}{2} - \frac{3}{2}$ | 059,488   |
| Ar IV   | 801.409    | 400       | 2         | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^3D$  | $\frac{3}{2} - \frac{3}{2}$ | 059,488   |
| Ar IV   | 801.913    | 200       | 2         | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^3D$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 840.029    | 600       | 1         | $3s^2 3p^3 - 3s 3p^4$          | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 059,488   |
| Ar IV   | 843.772    | 800       | 1         | $3s^2 3p^3 - 3s 3p^4$          | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 059,488   |
| Ar IV   | 850.602    | 1000      | 1         | $3s^2 3p^3 - 3s 3p^4$          | $g^4S^{\circ} - ^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 059,488   |
| Ar IV   | 900.362    | 200       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3D$  | $\frac{1}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 901.168    | 400       |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3D$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 901.804    | 80        |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^3D$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 1037.931   | 40        |           | $3s^2 3p^3 - 3s 3p^4$          | $^3D^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |
| Ar IV   | 1187.80    | 40        |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^4P$  | $\frac{1}{2} - \frac{1}{2}$ | 059       |
| Ar IV   | 1190.354   | 80        |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^4P$  | $\frac{3}{2} - \frac{1}{2}$ | 059       |
| Ar IV   | 1197.84    | 40        |           | $3s^2 3p^3 - 3s 3p^4$          | $^3P^{\circ} - ^4P$  | $\frac{3}{2} - \frac{3}{2}$ | 059       |

Ar V

## ARGON, Z = 18

Ar V

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^2 \ ^3P_0$   
 Ionization potential  $605\ 100\ \text{cm}^{-1}$ , 75.02 eV

| Element | Wavelength | Intensity | Multiplet | Configuration           | Term           | J-J | Reference   |
|---------|------------|-----------|-----------|-------------------------|----------------|-----|-------------|
| Ar V    | 336.555    | 150       | 6         | $3s^2 3p^2 - 3s^2 3p4s$ | $K^3P - ^3P^0$ | 1-2 | 549         |
| Ar V    | 337.555    | 150       | 6         | $3s^2 3p^2 - 3s^2 3p4s$ | $K^3P - ^3P^0$ | 0-1 | 549         |
| Ar V    | 337.998    | 300       | 6         | $3s^2 3p^2 - 3s^2 3p4s$ | $K^3P - ^3P^0$ | 2-2 | 488,549     |
| Ar V    | 338.426    | 100       | 6         | $3s^2 3p^2 - 3s^2 3p4s$ | $K^3P - ^3P^0$ | 1-1 | 549         |
| Ar V    | 339.009    | 150       | 6         | $3s^2 3p^2 - 3s^2 3p4s$ | $K^3P - ^3P^0$ | 1-0 | 549         |
| Ar V    | 339.886    | 150       | 6         | $3s^2 3p^2 - 3s^2 3p4s$ | $K^3P - ^3P^0$ | 2-1 | 549         |
| Ar V    | 350.878    | 150       | 8         | $3s^2 3p^2 - 3s^2 3p4s$ | $^1D - ^3P^0$  | 2-1 | 488,549     |
| Ar V    | 436.60     |           |           | $3s^2 3p^2 - 3s^2 3p3d$ | $^1D - ^3F^0$  | 3-4 | 267         |
| Ar V    | 445.997    | 250       | 5         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3D^0$ | 0-1 | 197,549     |
| Ar V    | 446.949    | 400       | 5         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3D^0$ | 1-2 | 197,549     |
| Ar V    | 447.527    | 200       | 5         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3D^0$ | 1-1 | 549         |
| Ar V    | 449.065    | 900       | 5         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3D^0$ | 2-3 | 197,549     |
| Ar V    | 449.493    | 200       | 5         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3D^0$ | 2-2 | 549         |
| Ar V    | 450.079    | 50        | 5         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3D^0$ | 2-1 | 549         |
| Ar V    | 458.121    | 150       | 4         | $3s^2 3p^2 - 3s\ 3p3d$  | $K^3P - ^3P^0$ | 0-1 | 549         |
| Ar V    | 458.975    | 100       | 4         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3P^0$ | 1-0 | 549         |
| Ar V    | 459.728    | 50        | 4         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3P^0$ | 1-1 | 488,549     |
| Ar V    | 461.227    | 300b      | 4         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3P^0$ | 1-2 | 488,549     |
| Ar V    | 462.415    | 150       | 4         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3P^0$ | 2-1 | 549         |
| Ar V    | 463.938    | 350       | 4         | $3s^2 3p^2 - 3s^2 3p3d$ | $K^3P - ^3P^0$ | 2-2 | 197,549     |
| Ar V    | 511.886    | 25        |           | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3P^0$ | 0-1 | 549         |
| Ar V    | 513.914    | 50        |           | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3P^0$ | 1-1 | 549         |
| Ar V    | 517.250    | 25        |           | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3P^0$ | 2-1 | 549         |
| Ar V    | 522.090    | 150       | 3         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3S^0$ | 0-1 | 549,488     |
| Ar V    | 524.189    | 250       | 3         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3S^0$ | 1-1 | 549,488     |
| Ar V    | 527.693    | 400       | 3         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3S^0$ | 2-1 | 549,488     |
| Ar V    | 558.481    | 250       | 7         | $3s^2 3p^2 - 3s3p^1$    | $^1D - ^3P^0$  | 2-1 | 549,488     |
| Ar V    | 635.12     | 150       |           | $3s3p^1 - 3s^2 3p^2$    | $^1P^0 - ^1S$  | 1-0 | 707,375     |
| Ar V    | 705.353    | 150       | 2         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3P^0$ | 0-1 | 549,488     |
| Ar V    | 709.195    | 250       | 2         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3P^0$ | 1-  | 549,488     |
| Ar V    | 715.599    | 200       | 2         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3P^0$ | 2-1 | 549,488     |
| Ar V    | 715.645    | 150       | 2         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3P^0$ | 2-2 | 549,488     |
| Ar V    | 822.161    | 200       | 1         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3D^0$ | 0-1 | 197,549,488 |
| Ar V    | 827.052    | 250       | 1         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3D^0$ | 1-2 | 197,549,488 |
| Ar V    | 827.349    | 150       | 1         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3D^0$ | 1-1 | 059,549     |
| Ar V    | 834.878    | 200       | 1         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3D^0$ | 2-3 | 549,488     |
| Ar V    | 835.792    | 50        | 1         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3D^0$ | 2-2 | 549         |
| Ar V    | 836.126    | 100       | 1         | $3s^2 3p^2 - 3s3p^1$    | $K^3P - ^3D^0$ | 2-1 | 549         |



Ar VI

ARGON, Z = 18

Ar VI

Ground state  $1s^2 2s^2 2p^6 3s^2 3p^2 \text{ } ^3\text{P}^{\circ}_2$ Ionization potential 736 600 cm<sup>-1</sup>, 91.32 eV

| Element | Wavelength | Intensity | Multiplet | Configuration                                        | Term                                | J - J       | Reference |
|---------|------------|-----------|-----------|------------------------------------------------------|-------------------------------------|-------------|-----------|
| Ar VI   | 180.074    | 80        |           | $3s^2 3p - 3s^2 5d$                                  | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $1/2 - 3/2$ | 549       |
| Ar VI   | 180.719    | 120       |           | $3s^2 3p - 3s^2 5d$                                  | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $3/2 - 5/2$ | 549       |
| Ar VI   | 219.896    | 120       |           | $3s^2 3p - 3s^2 4d$                                  | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $1/2 - 3/2$ | 549       |
| Ar VI   | 220.946    | 200       |           | $3s^2 3p - 3s^2 4d$                                  | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $3/2 - 5/2$ | 549       |
| Ar VI   | 281.433    | 120       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 4s$ | $^1\text{P} - ^1\text{P}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 281.915    | 160       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 4s$ | $^1\text{P} - ^1\text{P}$           | $1/2 - 3/2$ | 549       |
| Ar VI   | 282.423    | 240       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 4s$ | $^1\text{P} - ^1\text{P}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 282.556    | 40        |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 4s$ | $^1\text{P} - ^1\text{P}$           | $1/2 - 3/2$ | 549       |
| Ar VI   | 283.164    | 120       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 4s$ | $^1\text{P} - ^1\text{P}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 292.154    | 200       |           | $3s^2 3p - 3s^2 4s$                                  | $g^2 \text{P}^{\circ} - ^2\text{S}$ | $1/2 - 3/2$ | 549       |
| Ar VI   | 294.052    | 240       |           | $3s^2 3p - 3s^2 4s$                                  | $g^2 \text{P}^{\circ} - ^2\text{S}$ | $3/2 - 5/2$ | 549       |
| Ar VI   | 455.813    | 80        |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $1/2 - 3/2$ | 549       |
| Ar VI   | 456.375    | 120       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $1/2 - 3/2$ | 549       |
| Ar VI   | 457.007    | 200       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 457.475    | 800b      |           | $3s^2 3p - 3s^2 3d$                                  | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $1/2 - 3/2$ | 549       |
| Ar VI   | 457.475    | 800b      |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 458.039    | 40        |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $1/2 - 3/2$ | 549       |
| Ar VI   | 459.320    | 400       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 459.603    | 100       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 460.058    | 40        |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{D}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 460.202    | 40        |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{P}$           | $1/2 - 3/2$ | 549       |
| Ar VI   | 461.227    | 300b      |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{P}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 461.898    | 40        |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{P}$           | $1/2 - 3/2$ | 549       |
| Ar VI   | 462.007    | 1000d     |           | $3s^2 3p - 3s^2 3d$                                  | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $3/2 - 5/2$ | 197, 549  |
| Ar VI   | 462.146    | 160       |           | $3s^2 3p - 3s^2 3d$                                  | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $3/2 - 5/2$ | 549       |
| Ar VI   | 464.257    | 160       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{P}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 465.586    | 80        |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{P}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 466.932    | 160       |           | $3s^2 3p^2 - 3s^2 3p \text{ } ^1\text{P}^{\circ} 3d$ | $^1\text{P} - ^1\text{P}$           | $3/2 - 5/2$ | 549       |
| Ar VI   | 544.731    | 160       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^4\text{P}$ | $1/2 - 3/2$ | 549       |
| Ar VI   | 548.905    | 200       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{P}$ | $1/2 - 3/2$ | 549       |
| Ar VI   | 551.371    | 320       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{P}$ | $3/2 - 5/2$ | 549       |
| Ar VI   | 555.639    | 160       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{P}$ | $3/2 - 5/2$ | 549       |
| Ar VI   | 587.006    | 40        |           | $3s^2 3p^2 - 2p^2 3p^1$                              | $^1\text{P} - ^1\text{S}^{\circ}$   | $1/2 - 3/2$ | 549       |
| Ar VI   | 588.921    | 200       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{S}$ | $1/2 - 3/2$ | 549       |
| Ar VI   | 589.783    | 80        |           | $3s^2 3p^2 - 2p^2 3p^1$                              | $^1\text{P} - ^1\text{S}^{\circ}$   | $3/2 - 5/2$ | 549       |
| Ar VI   | 594.096    | 100       |           | $3s^2 3p^2 - 2p^2 3p^1$                              | $^1\text{P} - ^1\text{S}^{\circ}$   | $3/2 - 5/2$ | 549       |
| Ar VI   | 596.694    | 160       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{S}$ | $3/2 - 5/2$ | 549, 252  |
| Ar VI   | 754.93     | 100       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $1/2 - 3/2$ | 252       |
| Ar VI   | 767.06     | 200       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $3/2 - 5/2$ | 252       |
| Ar VI   | 767.71     | 100       |           | $3s^2 3p - 3s^2 3p^2$                                | $g^2 \text{P}^{\circ} - ^2\text{D}$ | $3/2 - 5/2$ | 252       |

Ar VII

## ARGON, Z = 18

Ar VII

Ground state  $1s^2 2s^2 2p^6 3s^2 {}^1S_0$ Ionization potential  $1\,000\,400\text{ cm}^{-1}$ , 124.03 eV

| Element | Wavelength | Intensity | Multiplet | Configuration      | Term                    | J - J | Reference |
|---------|------------|-----------|-----------|--------------------|-------------------------|-------|-----------|
| Ar VII  | 151.698    | 50        |           | $3s3p - 3s5d$      | ${}^1P^{\circ} - {}^1D$ | 0-1   | 549       |
| Ar VII  | 151.876    | 100       |           | $3s3p - 3s5d$      | ${}^1P^{\circ} - {}^1D$ | 1-2   | 549       |
| Ar VII  | 152.259    | 150       |           | $3s3p - 3s5d$      | ${}^1P^{\circ} - {}^1D$ | 2-3   | 549       |
| Ar VII  | 176.566    | 500       |           | $3s^2 - 3s4p$      | $g^1S - {}^1P^{\circ}$  | 0-1   | 549       |
| Ar VII  | 191.759    | 150       |           | $3s3p - 3s4d$      | ${}^1P^{\circ} - {}^1D$ | 0-1   | 549       |
| Ar VII  | 192.041    | 250       |           | $3s3p - 3s4d$      | ${}^1P^{\circ} - {}^1D$ | 1-2   | 549       |
| Ar VII  | 192.635    | 350       |           | $3s3p - 3s4d$      | ${}^1P^{\circ} - {}^1D$ | 2-3   | 549       |
| Ar VII  | 249.384    | 100       |           | $3s3p - 3s4s$      | ${}^1P^{\circ} - {}^1S$ | 0-1   | 549       |
| Ar VII  | 249.886    | 250       |           | $3s3p - 3s4s$      | ${}^1P^{\circ} - {}^1S$ | 1-1   | 197,549   |
| Ar VII  | 250.940    | 350       |           | $3s3p - 3s4s$      | ${}^1P^{\circ} - {}^1S$ | 2-1   | 197,549   |
| Ar VII  | 297.621    | 150       |           | $3s3d - 3s4f$      | ${}^1D - {}^1F^{\circ}$ | 1-2   | 549       |
| Ar VII  | 297.658    | 200       |           | $3s3d - 3s4f$      | ${}^1D - {}^1F^{\circ}$ | 2-3   | 549       |
| Ar VII  | 297.701    | 300       |           | $3s3d - 3s4f$      | ${}^1D - {}^1F^{\circ}$ | 3-4   | 549       |
| Ar VII  | 473.938    | 200       |           | $3s3p - 3s3d$      | ${}^1P^{\circ} - {}^1D$ | 0-1   | 197,549   |
| Ar VII  | 475.656    | 400       |           | $3s3p - 3s3d$      | ${}^1P^{\circ} - {}^1D$ | 1-2   | 197,549   |
| Ar VII  | 475.733    | 100       |           | $3s3p - 3s3d$      | ${}^1P^{\circ} - {}^1D$ | 1-1   | 549       |
| Ar VII  | 479.379    | 600       |           | $3s3p - 3s3d$      | ${}^1P^{\circ} - {}^1D$ | 2-3   | 197,549   |
| Ar VII  | 479.485    | 100       |           | $3s3p - 3s3d$      | ${}^1P^{\circ} - {}^1D$ | 2-2   | 549       |
| Ar VII  | 585.754    | 750       |           | $3s^2 - 3s3p$      | $g^1S - {}^1P^{\circ}$  | 0-1   | 549,252   |
| Ar VII  | 630.306    | 100       |           | $3s3p - 2p^6 3p^2$ | ${}^1P^{\circ} - {}^1P$ | 1-2   | 549       |
| Ar VII  | 634.208    | 100       |           | $3s3p - 2p^6 3p^2$ | ${}^1P^{\circ} - {}^1P$ | 0-1   | 549       |
| Ar VII  | 637.052    | 200       |           | $3s3p - 2p^6 3p^2$ | ${}^1P^{\circ} - {}^1P$ | 2-2   | 549       |
| Ar VII  | 637.466    | 50        |           | $3s3p - 2p^6 3p^2$ | ${}^1P^{\circ} - {}^1P$ | 1-1   | 549       |
| Ar VII  | 641.318    | 100       |           | $3s3p - 2p^6 3p^2$ | ${}^1P^{\circ} - {}^1P$ | 1-0   | 549       |
| Ar VII  | 644.388    | 100       |           | $3s3p - 2p^6 3p^2$ | ${}^1P^{\circ} - {}^1P$ | 2-1   | 549       |

Ar VIII

ARGON, Z = 18

Ar VIII

Ground state  $1s^2 2s^2 2p^6 3s^2 S_{1/2}$ Ionization potential  $1\ 157\ 400\ \text{cm}^{-1}$ ; 143.50 eV

| Element | Wavelength | Intensity | Multiplet | Configuration | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|---------------|----------------|-----------------------------|-----------|
| Ar VIII | 120.093    | 100       |           | 3s - 5p       | $k^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 120.157    | 50        |           | 3s - 5p       | $k^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 122.624    | 10        |           | 3p - 6d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 123.633    | 50        |           | 3p - 6d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 137.926    | 150       |           | 3p - 5d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 138.440    | 250       |           | 3p - 5d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 148.725    | 100       |           | 3p - 5s       | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 149.333    | 150       |           | 3p - 5s       | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 158.923    | 400       |           | 3s - 4p       | $k^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 159.175    | 250       |           | 3s - 4p       | $k^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 179.400    | 500       |           | 3p - 4d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 180.254    | 750       |           | 3p - 4d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 184.273    | 150       |           | 3d - 5f       | $^1D - ^1F^o$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 184.315    | 250       |           | 3d - 5f       | $^1D - ^1F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 229.437    | 250       |           | 3p - 4s       | $^1P^o - ^1S$  | $\frac{1}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 230.875    | 350       |           | 3p - 4s       | $^1P^o - ^1S$  | $\frac{3}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 260.253    | 200       |           | 3d - 4f       | $^1D - ^1F^o$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 260.332    | 300       |           | 3d - 4f       | $^1D - ^1F^o$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 337.257    | 100d      |           | 3d - 4p       | $^1D - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 338.222    | 10d       |           | 3d - 4p       | $^1D - ^1P^o$  | $\frac{3}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 519.429    | 150       |           | 3p - 3d       | $^1P^o - ^1D$  | $\frac{1}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 526.457    | 250       |           | 3p - 3d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{3}{2}$ | 549       |
| Ar VIII | 526.870    | 50        |           | 3p - 3d       | $^1P^o - ^1D$  | $\frac{3}{2} - \frac{1}{2}$ | 549       |
| Ar VIII | 700.398    | 1000P     |           | 3s - 3p       | $k^2S - ^1P^o$ | $\frac{1}{2} - \frac{3}{2}$ | 549,252   |
| Ar VIII | 713.990    | 500P      |           | 3s - 3p       | $k^2S - ^1P^o$ | $\frac{1}{2} - \frac{1}{2}$ | 549,252   |

Ar IX

## ARGON, Z = 18

Ar IX

Ground state  $1s^2 2s^2 2p^6 \ ^1S_0$ 

Ionization potential 422.8 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration                | Term                                | J - J | Reference   |
|---------|------------|-----------|-----------|------------------------------|-------------------------------------|-------|-------------|
| Ar IX?  | 30.95      | 500       |           |                              |                                     |       | 255         |
| Ar IX   | 31.52      | 600       |           | $2p^6 - 2p^5(^3P^o)6d$       | $K^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 255         |
| Ar IX   | 31.66      | 700       |           | $2p^6 - 2p^5(^3P^o)6d$       | $K^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 255         |
| Ar IX?  | 32.54      | 500       |           |                              |                                     |       | 255         |
| Ar IX   | 32.64      | 400       |           | $2p^6 - 2p^5(^3P^o)5d$       | $K^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 255         |
| Ar IX   | 35.02      | 700       |           | $2p^6 - 2p^5(^3P^o)4d$       | $K^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 255         |
| Ar IX   | 35.28      | 300       |           | $2p^6 - 2p^5(^3P^o)4d$       | $K^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 255         |
| Ar IX   | 35.82      | 500       |           | $2s^2 2p^6 - 2s 2p^6(^1S)3p$ | $K^1S - ^1P^o$                      | 0-1   | 259         |
| Ar IX?  | 36.55      | 400       |           |                              |                                     |       | 255         |
| Ar IX?  | 36.67      | 500       |           |                              |                                     |       | 255         |
| Ar IX?  | 36.78      | (X)       |           |                              |                                     |       | 255         |
| Ar IX?  | 36.98      | 400       |           |                              |                                     |       | 255         |
| Ar IX   | 41.48      | 600       |           | $2p^6 - 2p^5(^3P^o)3d$       | $K^1S - \frac{1}{2}[\frac{3}{2}]^o$ | 0-1   | 255         |
| Ar IX   | 42.02      | 200       |           | $2p^6 - 2p^5(^3P^o)3d$       | $K^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 255         |
| Ar IX   | 42.56      | 700       |           | $2p^6 - 2p^5(^3P^o)3d$       | $K^1S - \frac{3}{2}[\frac{1}{2}]^o$ | 0-1   | 255         |
| Ar IX   | 48.730     | 500       |           | $2p^6 - 2p^5(^3P^o)3s$       | $K^1S - \frac{1}{2}[\frac{1}{2}]^o$ | 0-1   | 549,254,487 |
| Ar IX   | 49.180     | 500       |           | $2p^6 - 2p^5(^3P^o)3s$       | $K^1S - \frac{3}{2}[\frac{3}{2}]^o$ | 0-1   | 549,254,487 |

Ar X

## ARGON, Z = 18

Ar X

Ground state  $1s^2 2s^2 2p^6 \ ^1P_1$ 

Ionization potential 479.1 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration              | Term           | J - J                       | Reference |
|---------|------------|-----------|-----------|----------------------------|----------------|-----------------------------|-----------|
| Ar X    | 37.42      | 700       |           | $2p^5 - 2p^4(^1D)3d$       | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 255,259   |
| Ar X    | 37.59      | 700       |           | $2p^5 - 2p^4(^1D)3d$       | $g^1P^o - ?$   |                             | 255,259   |
| Ar X    | 38.22      | 600       |           | $2p^5 - 2p^4(^1P)3d$       | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 255,259   |
| Ar X?   | 38.40      | 500       |           |                            |                |                             | 255       |
| Ar X?   | 38.64      | 700       |           |                            |                |                             | 255       |
| Ar X    | 41.56      | 400       |           | $2p^5 - 2p^4(^1S)3s$       | $g^1P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 255       |
| Ar X    | 41.89      | 200       |           | $2p^5 - 2p^4(^1S)3s$       | $g^1P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 255       |
| Ar X    | 42.96      | 500       |           | $2p^5 - 2p^4(^1D)3s$       | $g^1P^o - ^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 255,254   |
| Ar X    | 43.29      | 800       |           | $2p^5 - 2p^4(^1D)3s$       | $g^1P^o - ^1D$ | $\frac{1}{2} - \frac{3}{2}$ | 255,254   |
| Ar X    | 43.72      | 700       |           | $2p^5 - 2p^4(^1P)3s$       | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 255       |
| Ar X    | 43.93      | 900       |           | $2p^5 - 2p^4(^1P)3s$       | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 255       |
| Ar X    | 44.07      | 700       |           | $2p^5 - 2p^4(^1P)3s$       | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{1}{2}$ | 255,254   |
| Ar X    | 44.26      | 900       |           | $2p^5 - 2p^4(^1P)3s$       | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 255,254   |
| Ar X    | 44.49      | 900       |           | $2p^5 - 2p^4(^1P)3s$       | $g^1P^o - ^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 255,254   |
| Ar X    | 44.67      | 800       |           | $2p^5 - 2p^4(^1P)3s$       | $g^1P^o - ^1P$ | $\frac{1}{2} - \frac{3}{2}$ | 255       |
| Ar X    | 44.85      | 600       |           | $2s2p^5 - 2s2p^4(^1P^o)3s$ | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{1}{2}$ | 255       |
| Ar X    | 45.05      | 700       |           | $2s2p^5 - 2s2p^4(^1P^o)3s$ | $^1S - ^1P^o$  | $\frac{1}{2} - \frac{3}{2}$ | 255       |
| Ar X    | 165.53     | 400       |           | $2s^2 2p^5 - 2s2p^6$       | $g^2P^o - ^1S$ | $\frac{3}{2} - \frac{1}{2}$ | 160,255   |
| Ar X    | 170.63     | 200       |           | $2s^2 2p^5 - 2s2p^6$       | $g^2P^o - ^1S$ | $\frac{1}{2} - \frac{1}{2}$ | 160,255   |

Ar XI

## ARGON, Z = 18

Ar XI

Ground state  $1s^2 2s^2 2p^4 \ ^3P_2$ 

Ionization potential 539.0 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term           | J - J | Reference |
|---------|------------|-----------|-----------|------------------------|----------------|-------|-----------|
| Ar XI   | 34.24      | 700       |           | $2p^4 - 2p^3(^1D^o)3d$ | $K^3P - ^3P^o$ | 2-2   | 255       |
| Ar XI   | 34.35      | 800       |           | $2p^4 - 2p^3(^1D^o)3d$ | $K^3P - ^3D^o$ | 2-3   | 255       |
| Ar XI   | 34.52      | 700       |           | $2p^4 - 2p^3(^1D^o)3d$ | $K^3P - ^3D^o$ | 1-2   | 255       |
| Ar XI   | 35.39      | 700       |           | $2p^4 - 2p^3(^1S^o)3d$ | $K^3P - ^3D^o$ | 2-3   | 255       |
| Ar XI   | 35.58      | 600       |           | $2p^4 - 2p^3(^1S^o)3d$ | $K^3P - ^3D^o$ | 1-2   | 255       |
| Ar XI   | 39.50      | 600       |           | $2p^4 - 2p^3(^1D^o)3s$ | $^1D - ^1D^o$  | 2-2   | 255       |
| Ar XI   | 39.74      | 500       |           | $2p^4 - 2p^3(^1S^o)3s$ | $K^3P - ^3S^o$ | 2-1   | 255       |
| Ar XI?  | 39.82      | 500       |           |                        |                |       | 255       |
| Ar XI   | 39.95      | 300       |           | $2p^4 - 2p^3(^1S^o)3s$ | $K^3P - ^3S^o$ | 1-1   | 255       |
| Ar XI   | 40.02      | 200       |           | $2p^4 - 2p^3(^1S^o)3s$ | $K^3P - ^3S^o$ | 0-1   | 255       |
| Ar XI   | 151.86     |           |           | $2s^2 2p^4 - 2s 2p^5$  | $^1D - ^1P^o$  | 2-1   | 160,257   |
| Ar XI   | 184.51     |           |           | $2s^2 2p^4 - 2s 2p^5$  | $K^3P - ^3P^o$ | 2-1   | 160,257   |
| Ar XI   | 187.08     |           |           | $2s^2 2p^4 - 2s 2p^5$  | $K^3P - ^3P^o$ | 1-0   | 160,257   |
| Ar XI   | 188.82     |           |           | $2s^2 2p^4 - 2s 2p^5$  | $K^3P - ^3P^o$ | 2-2   | 160,257   |
| Ar XI   | 189.57     |           |           | $2s^2 2p^4 - 2s 2p^5$  | $K^3P - ^3P^o$ | 1-1   | 160,257   |
| Ar XI   | 190.96     |           |           | $2s^2 2p^4 - 2s 2p^5$  | $K^3P - ^3P^o$ | 0-1   | 160,257   |
| Ar XI   | 194.09     |           |           | $2s^2 2p^4 - 2s 2p^5$  | $K^3P - ^3P^o$ | 1-2   | 160,257   |

Ar XII

## ARGON, Z = 18

Ar XII

Ground state  $1s^2 2s^2 2p^6 {}^4S_{3/2}$ 

Ionization potential 618.5 eV?

| Element | Wavelength | Intensity | Multiplet | Configuration          | Term                    | J - J                       | Reference |
|---------|------------|-----------|-----------|------------------------|-------------------------|-----------------------------|-----------|
| Ar XII  | 34.68      | 700       |           | $2p^3 - 2p^3({}^3P)3s$ | ${}^4S^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 255       |
| Ar XII  | 34.79      | 600       |           | $2p^3 - 2p^3({}^3P)3s$ | ${}^4S^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 255       |
| Ar XII  | 34.88      | 500       |           | $2p^3 - 2p^3({}^3P)3s$ | ${}^4S^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 255       |
| Ar XII  | 45.41      | 400       |           | $2p^3 - 2p^3({}^1D)3s$ | ${}^1D^{\circ} - {}^1D$ |                             | 255       |
| Ar XII  | 46.71      | 500       |           | $2p^3 - 2p^3({}^1D)3s$ | ${}^1P^{\circ} - {}^1D$ | $\frac{3}{2} - \frac{3}{2}$ | 255       |
| Ar XII  | 149.93     |           |           | $2s^2 2p^3 - 2s 2p^4$  | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{1}{2}$ | 160,257   |
| Ar XII  | 153.63     |           |           | $2s^2 2p^3 - 2s 2p^4$  | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,257   |
| Ar XII  | 154.44     |           |           | $2s^2 2p^3 - 2s 2p^4$  | ${}^1D^{\circ} - {}^1P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,257   |
| Ar XII  | 215.49     |           |           | $2s^2 2p^3 - 2s 2p^4$  | ${}^4S^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{1}{2}$ | 160,257   |
| Ar XII  | 218.28     |           |           | $2s^2 2p^3 - 2s 2p^4$  | ${}^4S^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,257   |
| Ar XII  | 224.23     |           |           | $2s^2 2p^3 - 2s 2p^4$  | ${}^4S^{\circ} - {}^4P$ | $\frac{3}{2} - \frac{3}{2}$ | 160,257   |

Ar XVIII

## ARGON, Z = 18

Ar XVIII

Ground state  $1s^2 S_{1/2}$ Ionization potential  $35\,699\,937\text{ cm}^{-1}$ , 4426.11 eV

| Element  | Wavelength | Intensity | Multiplet | Configuration | Term       | J             | J             | Reference |
|----------|------------|-----------|-----------|---------------|------------|---------------|---------------|-----------|
| Ar XVIII | 2 881      | P         |           | $1s-6p$       | $2^1S-^1P$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 109       |
| Ar XVIII | 2 918      | P         |           | $1s-5p$       | $2^1S-^1P$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 109       |
| Ar XVIII | 2 987      | P         |           | $1s-4p$       | $2^1S-^1P$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 109       |
| Ar XVIII | 3 151      | P         |           | $1s-3p$       | $2^1S-^1P$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 109       |
| Ar XVIII | 3 733      | P         |           | $1s-2p$       | $2^1S-^1P$ | $\frac{1}{2}$ | $\frac{3}{2}$ | 109       |
| Ar XVIII | 12 21      | P         |           | $2-7$         |            |               |               | 109       |
| Ar XVIII | 12 61      | P         |           | $2-6$         |            |               |               | 109       |
| Ar XVIII | 13 35      | P         |           | $2-5$         |            |               |               | 109       |
| Ar XVIII | 14 94      | P         |           | $2-4$         |            |               |               | 109       |
| Ar XVIII | 20 16      | P         |           | $2-3$         |            |               |               | 109       |
| Ar XVIII | 30 94      | P         |           | $3-7$         |            |               |               | 109       |
| Ar XVIII | 33 68      | P         |           | $3-6$         |            |               |               | 109       |
| Ar XVIII | 39 47      | P         |           | $3-5$         |            |               |               | 109       |
| Ar XVIII | 57 7       | P         |           | $3-4$         |            |               |               | 109       |
| Ar XVIII | 66 7       | P         |           | $4-7$         |            |               |               | 109       |
| Ar XVIII | 80 9       | P         |           | $4-6$         |            |               |               | 109       |
| Ar XVIII | 124 8      | P         |           | $4-5$         |            |               |               | 109       |
| Ar XVIII | 143 4      | P         |           | $5-7$         |            |               |               | 109       |
| Ar XVIII | 229 9      | P         |           | $5-6$         |            |               |               | 109       |
| Ar XVIII | 381 4      | P         |           | $6-7$         |            |               |               | 109       |



## **SECTION II**

### **Finding List**

| Element  | Wavelength | Intensity | Multiplet | Element  | Wavelength | Intensity | Multiplet |
|----------|------------|-----------|-----------|----------|------------|-----------|-----------|
| Ar XVIII | 2.881      | P         |           | Ne IX    | 13.55      |           |           |
| Ar XVIII | 2.918      | P         |           | Cl XVI   | 13.69      | P         |           |
| Ar XVIII | 2.987      | P         |           | F VIII   | 13.780     |           |           |
| Ar XVIII | 3.151      | P         |           | Cl XVII  | 14.15      | P         |           |
| Cl XVII  | 3.231      | P         |           | O VIII   | 14.453     | 2         |           |
| Cl XVII  | 3.272      | P         |           | F VIII   | 14.458     |           |           |
| Cl XVII  | 3.351      | P         |           | O VIII   | 14.524     | 3         |           |
| Cl XVII  | 3.534      | P         |           | O VIII   | 14.634     | 8         |           |
| S XVI    | 3.649      | P         |           | O VIII   | 14.821     | 25        |           |
| S XVI    | 3.696      | P         |           | Ar XVIII | 14.94      | P         |           |
| Ar XVIII | 3.733      | P         |           | Cl XVII  | 14.97      | P         |           |
| S XVI    | 3.784      | P         |           | F IX     | 14.984     | P         |           |
| S XVI    | 3.991      | P         |           | O VIII   | 15.176     | 80        |           |
| P XV     | 4.154      | P         |           | S XVI    | 15.46      | P         |           |
| Cl XVII  | 4.187      | P         |           | S XVI    | 15.97      | P         |           |
| P XV     | 4.207      | P         |           | O VIII   | 16.006     | 108       |           |
| P XV     | 4.308      | P         |           | Cl XVII  | 16.76      | P         |           |
| P XV     | 4.543      | P         |           | F VIII   | 16.807     |           |           |
| S XVI    | 4.729      | P         |           | S XVI    | 16.90      | P         |           |
| Si XIV   | 4.770      | P         |           | F VIII   | 16.951     |           |           |
| Si XIV   | 4.831      | P         |           | O VII    | 17.200     | 50        |           |
| Si XIV   | 4.947      | P         |           | O VII    | 17.396     | 100       |           |
| Si XIV   | 5.217      | P         |           | P XV     | 17.60      | P         |           |
| P XV     | 5.383      | P         |           | O VII    | 17.768     | 200       |           |
| Al XIII  | 5.534      | P         |           | P XV     | 18.18      | P         |           |
| Al XIII  | 5.605      | P         |           | O VII    | 18.627     | 500       |           |
| Al XIII  | 5.739      | P         |           | S XVI    | 18.93      | P         |           |
| Al XIII  | 6.053      | P         |           | O VIII   | 18.969     | 1000      |           |
| Si XIV   | 6.182      | P         |           | N VII    | 19.118     | P         |           |
| Al XII   | 6.314      |           |           | P XV     | 19.24      | P         |           |
| Mg XII   | 6.497      | P         |           | N VII    | 19.361     | P         |           |
| Mg XII   | 6.580      | P         |           | N VII    | 19.826     | P         |           |
| Al XII   | 6.635      |           |           | Ar XVIII | 20.16      | P         |           |
| Mg XII   | 6.738      | P         |           | Si XIV   | 20.21      | P         |           |
| Mg XII   | 7.106      | P         |           | Si XIV   | 20.88      | P         |           |
| Al XIII  | 7.173      | P         |           | N VII    | 20.910     | P         |           |
| Mg XI    | 7.310      |           |           | P XV     | 21.54      | P         |           |
| Mg XI    | 7.473      |           |           | O VII    | 21.602     | 1000      |           |
| Na XI    | 7.735      | P         |           | O VII    | 21.804     | 300       |           |
| Al XII   | 7.757      |           |           | Si XIV   | 22.09      | P         |           |
| Na XI    | 7.833      | P         |           | Cl XVII  | 22.61      | P         |           |
| Mg XI    | 7.850      |           |           | Al XIII  | 23.44      | P         |           |
| Na XI    | 8.021      | P         |           | N VI     | 23.771     | 10        |           |
| Mg XII   | 8.421      | P         |           | Al XIII  | 24.22      | P         |           |
| Na XI    | 8.459      | P         |           | Si XIV   | 24.74      | P         |           |
| Mg XI    | 9.168      |           |           | N VII    | 24.781     | 100P      |           |
| Ne X     | 9.362      | P         |           | N VI     | 24.898     | 30        |           |
| Ne X     | 9.481      | P         |           | Ar       | 25.25      | 400       |           |
| Ne X     | 9.708      | P         |           | S XVI    | 25.54      | P         |           |
| Na XI    | 10.025     | P         |           | Ar       | 25.59      | 400       |           |
| Ne X     | 10.239     | P         |           | Al XIII  | 25.63      | P         |           |
| F IX     | 11.560     | P         |           | Ar       | 25.71      | 400       |           |
| F IX     | 11.707     | P         |           | C VI     | 26.026     | P         |           |
| F IX     | 11.988     | P         |           | Ar       | 26.04      | 300       |           |
| Ne X     | 12.134     | P         |           | Ar       | 26.23      | 200       |           |
| Ar XVIII | 12.21      | P         |           | C VI     | 26.357     | P         |           |
| Ar XVIII | 12.61      | P         |           | Ar       | 26.36      | 400       |           |
| F IX     | 12.644     | P         |           | C VI     | 26.990     | P         |           |
| Ar XVIII | 13.35      | P         |           | Ar       | 27.40      | 400       |           |
| Ne IX    | 13.44      |           |           | Mg XII   | 27.52      | P         |           |

| Element  | Wavelength | Intensity | Multiplet | Element  | Wavelength | Intensity | Multiplet |
|----------|------------|-----------|-----------|----------|------------|-----------|-----------|
| Ar       | 27.54      | 400       |           | P XII    | 37.345     | P         |           |
| Ar       | 27.80      | 400       |           | Ar X     | 37.42      | 700       |           |
| Ar       | 27.94      | 400       |           | B V      | 37.483     | P         |           |
| Mg XII   | 28.43      | P         |           | Ar X     | 37.59      | 700       |           |
| C VI     | 28.466     | P         |           | Cl XVII  | 37.77      | P         |           |
| Al XIII  | 28.70      | P         |           | Ar       | 37.81      | 400       |           |
| N VI     | 28.787     | 100       |           | B V      | 37.960     | P         |           |
| P XV     | 29.07      | P         |           | Ar       | 38.04      | 300       |           |
| N VI     | 29.084     |           |           | Ar X     | 38.22      | 600       |           |
| Ar       | 29.38      | 500       |           | Ar X?    | 38.40      | 500       |           |
| Ar       | 29.57      | 500       |           | Ar X?    | 38.64      | 700       |           |
| Ar       | 29.88      | 300       |           | P XIII   | 38.652     | P         |           |
| Ar       | 30.06      | 200       |           | Al XIII  | 38.73      | P         |           |
| Mg XII   | 30.09      | P         |           | P XIII   | 38.825     | P         |           |
| Ar       | 30.26      | 300       |           | B V      | 38.871     | P         |           |
| Ar       | 30.59      | 300       |           | Ar       | 38.88      | 500       |           |
| Ar XVIII | 30.94      | P         |           | S XVI    | 39.18      | P         |           |
| Ar IX?   | 30.95      | 500       |           | Al XI    | 39.180     | 1         |           |
| Ar       | 31.36      | 700       |           | Cl X     | 39.253     | 10        |           |
| Ar       | 31.46      | 600       |           | P XII    | 39.316     | P         |           |
| Ar IX    | 31.52      | 600       |           | Ar       | 39.34      | 300       |           |
| Ar IX    | 31.66      | 700       |           | P XII    | 39.358     | P         |           |
| Ar       | 31.82      | 400       |           | P XII    | 39.450     | P         |           |
| Ar       | 31.97      | 500       |           | Cl VIII  | 39.462     | 100       |           |
| C V      | 32.064     |           |           | Ar XVIII | 39.47      | P         |           |
| C V      | 32.188     |           |           | Ar XI    | 39.50      | 600       |           |
| Ar       | 32.28      | 500       |           | Cl       | 39.528     | 1         |           |
| C V      | 32.400     |           |           | Cl       | 39.559     | 1         |           |
| Ar       | 32.46      | 500       |           | Cl       | 39.634     | 1         |           |
| Ar IX?   | 32.54      | 500       |           | Ne X     | 39.65      | P         |           |
| Ar IX    | 32.64      | 400       |           | Cl VIII  | 39.655     | 10        |           |
| C V      | 32.754     |           |           | Ar XI    | 39.74      | 500       |           |
| Na XI    | 32.76      | P         |           | Ar XI?   | 39.82      | 500       |           |
| Si XIV   | 33.39      | P         |           | Ar XI    | 39.95      | 300       |           |
| C V      | 33.426     | 30        |           | Cl X     | 39.956     | 100       |           |
| Ar XVIII | 33.68      | P         |           | Ar XI    | 40.02      | 200       |           |
| Mg XII   | 33.70      | P         |           | Cl X     | 40.085     | 200       |           |
| C VI     | 33.736     | 1000P     |           | Na XI    | 40.11      | P         |           |
| Na XI    | 33.85      | P         |           | Cl X     | 40.136     | 1         |           |
| Ar XI    | 34.24      | 700       |           | C V      | 40.270     | 300       |           |
| Ar XI    | 34.35      | 800       |           | Cl XI    | 40.392     | 10        |           |
| Ar XI    | 34.52      | 700       |           | P XII    | 40.431     | P         |           |
| Ar XII   | 34.68      | 700       |           | Cl X     | 40.660     | 100       |           |
| Cl XVII  | 34.70      | P         |           | C V      | 40.731     | 15        |           |
| Ar XII   | 34.79      | 600       |           | Cl XI    | 40.787     | 10        |           |
| Ar XII   | 34.88      | 500       |           | Si XII   | 40.91      | 100P      |           |
| C V      | 34.973     | 100       |           | Si XII   | 40.95      | 50P       |           |
| Ar IX    | 35.02      | 700       |           | Ne X     | 40.96      | P         |           |
| P XIII   | 35.086     | P         |           | Cl X     | 40.994     | 10        |           |
| P XIII   | 35.157     | P         |           | B V      | 40.996     | P         |           |
| Ar IX    | 35.28      | 300       |           | Cl X     | 41.390     | 100       |           |
| Ar XI    | 35.39      | 700       |           | Ar IX    | 41.48      | 600       |           |
| Ar XI    | 35.58      | 600       |           | P IX     | 41.556     | P         |           |
| Na XI    | 35.82      | P         |           | Ar X     | 41.56      | 400       |           |
| Ar IX    | 35.82      | 500       |           | Cl X     | 41.589     | 10        |           |
| Ar IX?   | 36.55      | 400       |           | Cl VIII  | 41.636     | 1         |           |
| Ar IX?   | 36.67      | 500       |           | P XII    | 41.638     | P         |           |
| Ar IX?   | 36.78      | 500       |           | Ar X     | 41.89      | 200       |           |
| P XII    | 36.978     | P         |           | P XI     | 42.006     | P         |           |
| Ar IX?   | 36.98      | 400       |           | Ar IX    | 42.02      | 200       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Cl VIII | 42.166     | 10        |           | Cl IX   | 45.378     | 300       |           |
| Cl VIII | 42.220     | 200       |           | Cl IX   | 45.396     | 300b      |           |
| Cl VIII | 42.430     | 100       |           | Cl X    | 45.396     | 300b      |           |
| P XI    | 42.468     | P         |           | Si XI   | 45.398     | 10        |           |
| P XI    | 42.479     | P         |           | Ar XII  | 45.41      | 400       |           |
| S X     | 42.51      | 15P       |           | Cl X    | 45.431     | 10        |           |
| S X     | 42.54      | 35P       |           | S VIII  | 45.458     | 20        |           |
| Ar IX   | 42.56      | 200       |           | Cl IX   | 45.465     | 10        |           |
| S X     | 42.58      | 50P       |           | Mg XII  | 45.47      | P         |           |
| P XI    | 42.599     | P         |           | S VIII  | 45.508     | 20        |           |
| S XVI   | 42.65      | P         |           | Cl IX   | 45.519     | 200       |           |
| P XI    | 42.764     | P         |           | Cl IX   | 45.539     | 200       |           |
| Cl IX   | 42.940     | 100       |           | Cl X    | 45.626     | 15        |           |
| Ar X    | 42.96      | 500       |           | Si XII  | 45.656     | 10        |           |
| Cl IX   | 43.168     | 120       |           | Cl IX   | 45.657     | 100       |           |
| Ar X    | 43.29      | 800       |           | Cl IX   | 45.745     | 10        |           |
| Si XI   | 43.290     | 10        |           | P X     | 45.905     | P         |           |
| Ne X    | 43.35      | P         |           | P X     | 45.931     | P         |           |
| P XI    | 43.488     | P         |           | P X     | 45.963     | P         |           |
| P XI    | 43.529     | P         |           | P XI    | 45.997     | P         |           |
| Al IX   | 43.549     | 10        |           | P X     | 46.018     | P         |           |
| Ar X    | 43.72      | 700       |           | P X     | 46.070     | P         |           |
| Si XI   | 43.763     | 10        |           | Na IX   | 46.090     | 100       |           |
| Ar X    | 43.93      | 900       |           | P X     | 46.090     | P         |           |
| Cl IX   | 44.003     | 200       |           | Cl IX   | 46.098     | 100       |           |
| Si XII  | 44.021     | 50        |           | P X     | 46.120     | P         |           |
| Mg X    | 44.050     | 100       |           | P X     | 46.201     | P         |           |
| Ar X    | 44.07      | 700       |           | P XI    | 46.203     | P         |           |
| Cl IX   | 44.088     | 400       |           | S VII   | 46.212     | 10        |           |
| P XI    | 44.115     | P         |           | P X     | 46.231     | P         |           |
| Al X    | 44.136     | 10        |           | Cl IX   | 46.242     | 10        |           |
| Si XII  | 44.165     | 100       |           | P X     | 46.245     | P         |           |
| Cl IX   | 44.183     | 200       |           | Si XI   | 46.264     | 10        |           |
| Si IX   | 44.215     | 10        |           | P X     | 46.294     | P         |           |
| Si IX   | 44.249     | 10        |           | Ne IX   | 46.3       | P         |           |
| Cl XVII | 44.26      | P         |           | Si XI   | 46.300     | 50        |           |
| Ar X    | 44.26      | 900       |           | P X     | 46.334     | P         |           |
| Cl IX   | 44.267     | 300b      |           | S IX    | 46.373     | 50        |           |
| S VIII  | 44.350     | 20        |           | Si XI   | 46.401     | 100       |           |
| Cl VIII | 44.361     | 200b      |           | S IX    | 46.413     | 50        |           |
| Cl IX   | 44.361     | 200b      |           | Cl X    | 46.476     | 200       |           |
| S VIII  | 44.374     | 100b      |           | S IX    | 46.585     | 10d       |           |
| S X     | 44.374     | 100b      |           | S IX    | 46.624     | 10        |           |
| S X     | 44.387     | 20        |           | P X     | 46.636     | P         |           |
| Ar X    | 44.49      | 900       |           | Ar XII  | 46.71      | 500       |           |
| Cl IX   | 44.530     | 100       |           | Mg IX   | 46.711     | 10        |           |
| S VIII  | 44.547     | 50        |           | S       | 46.713     | 50        |           |
| P XV    | 44.59      | P         |           | S       | 46.765     | 50        |           |
| Cl VIII | 44.603     | 200       |           | P X     | 46.769     | P         |           |
| Ar X    | 44.67      | 800       |           | Cl X    | 46.845     | 100       |           |
| Na IX   | 44.723     | 10        |           | Al      | 46.896     | 10        |           |
| Ar X    | 44.85      | 600       |           | Cl X    | 46.908     | 10        |           |
| Al X    | 44.902     | 10        |           | S IX    | 47.052     | 50        |           |
| Ar X    | 45.05      | 700       |           | Cl X    | 47.085     | 15        |           |
| Cl IX   | 45.112     | 400       |           | S VII   | 47.098     | 50        |           |
| Cl IX   | 45.261     | 200       |           | S IX    | 47.188     | 10        |           |
| S VIII  | 45.279     | 50        |           | Mg X    | 47.231     | 300       |           |
| S VIII  | 45.290     | 50        |           | S IX    | 47.249     | 50        |           |
| Cl IX   | 45.332     | 100       |           | S VII   | 47.307     | 50        |           |
| S VIII  | 45.370     | 20        |           | Mg X    | 47.310     | 500       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Al IX   | 47.417     | 1         |           | Mg IX   | 49.586     | 1         |           |
| S IX    | 47.433     | 200       |           | Si X    | 49.701     | 100       |           |
| Al IX   | 47.489     | 50        |           | Al IX   | 49.854     | 100       |           |
| Si XI   | 47.489     | 50        |           | S XVI   | 49.97      | P         |           |
| S IX    | 47.518     | 30        |           | Si VIII | 49.987     | 10        |           |
| Al IX   | 47.534     | 100       |           | S       | 49.990     | 120       |           |
| Si X    | 47.545     | 50        |           | Si VIII | 50.019     | 50d       |           |
| S VIII  | 47.566     | 10        |           | S VII   | 50.027     | 70        |           |
| S VIII  | 47.594     | 10        |           | Cl VIII | 50.074     | 500       |           |
| Si XI   | 47.607     | 50        |           | Si X    | 50.154     | 50        |           |
| S IX    | 47.616     | 10        |           | Si X    | 50.254     | 50d       |           |
| Si XI   | 47.653     | 50        |           | Ne IX   | 50.3       | P         |           |
| S X     | 47.654     | 20        |           | Si X    | 50.305     | 50        |           |
| Ne IX   | 47.7       | P         |           | Si X    | 50.333     | 50        |           |
| Al IX   | 47.755     | 10        |           | B IV    | 50.435     | 100       |           |
| Na IX   | 47.776     | 10        |           | P IX    | 50.483     | P         |           |
| S VIII  | 47.793     | 10b       |           | P IX    | 50.511     | P         |           |
| S X     | 47.793     | 10b       |           | Si VIII | 50.524     | 50b       |           |
| Mg IX   | 47.818     | 10d       |           | Si X    | 50.524     | 50b       |           |
| Na IX   | 47.836     | 100       |           | P IX    | 50.560     | P         |           |
| Al IX   | 47.856     | 50        |           | F IX    | 50.58      | P         |           |
| P X     | 47.896     | P         |           | Al X    | 50.67      | 50        |           |
| Si XI   | 47.899     | 50        |           | Si X    | 50.691     | 100       |           |
| Mg IX   | 47.947     | 100d      |           | Cl VIII | 50.700     | 200       |           |
| Cl      | 47.990     | 10        |           | Al X    | 50.762     | 250       |           |
| Ne IX   | 48.0       | P         |           | Mg IX   | 50.777     | 10        |           |
| Mg IX   | 48.024     | 10d       |           | Al X    | 50.802     | 50        |           |
| S IX    | 48.160     | 100b      |           | Al X    | 50.946     | 10        |           |
| S X?    | 48.160     | 100b      |           | P X     | 51.019     | P         |           |
| Al XI   | 48.297     | 250       |           | Cl IX   | 51.026     | 400       |           |
| Al XI   | 48.338     | 150       |           | Al X    | 51.039     | 10        |           |
| Mg IX   | 48.340     | 100       |           | P IX    | 51.076     | P         |           |
| S       | 48.362     | 20        |           | Si IX   | 51.113     | 50        |           |
| P XV    | 48.53      | P         |           | P X     | 51.125     | P         |           |
| Ne X    | 48.55      | P         |           | P X     | 51.155     | P         |           |
| Na IX   | 48.553     | 200       |           | P IX    | 51.156     | P         |           |
| Si X    | 48.553     | 10        |           | Si XIV  | 51.20      | P         |           |
| S IX    | 48.564     | 20        |           | P X     | 51.214     | P         |           |
| B V     | 48.587     | 1000P     |           | S VIII  | 51.227     | 100       |           |
| S VII   | 48.647     | 150       |           | P X     | 51.262     | P         |           |
| Ar IX   | 48.730     | 500       |           | Na VIII | 51.316     | 10        |           |
| Mg IX   | 48.794     | 10        |           | P X     | 51.351     | P         |           |
| P VIII  | 48.859     | P         |           | Al X    | 51.362     | 350       |           |
| S VII   | 48.874     | 100       |           | Si IX   | 51.362     | 100       |           |
| P IX    | 48.925     | P         |           | Cl IX   | 51.378     | 300       |           |
| B IV    | 48.939     |           |           | Al X    | 51.400     | 1         |           |
| F IX    | 48.96      | P         |           | Al X    | 51.454     | 1         |           |
| Al IX   | 49.094     | 1         |           | S VIII  | 51.470     | 70        |           |
| S IX    | 49.119     | 100       |           | Mg IX   | 51.560     | 10        |           |
| Ar IX   | 49.180     | 500       |           | Mg IX   | 51.591     | 300       |           |
| Si XI   | 49.222     | 50        |           | Si X    | 51.635     | 10        |           |
| Cl IX   | 49.234     | 100       |           | Mg IX   | 51.654     | 400       |           |
| Si XI   | 49.265     | 10        |           | Si X    | 51.676     | 20        |           |
| Na IX   | 49.326     | 100       |           | Si VIII | 51.718     | 20        |           |
| S IX    | 49.328     | 50        |           | Na VIII | 51.789     | 10        |           |
| Na IX   | 49.386     | 200       |           | S VII   | 51.807     | 350       |           |
| B IV    | 49.456     |           |           | Si VIII | 51.819     | 20        |           |
| Cl VIII | 49.487     | 700       |           | P IX    | 51.861     | P         |           |
| Ne IX   | 49.5       | P         |           | P IX    | 51.889     | P         |           |
| Cl IX   | 49.568     | 100       |           | Al X    | 51.979     | 300       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Cl IX   | 52.055     | 200       |           | Si VIII | 53.770     | 10        |           |
| Si X    | 52.070     | 50        |           | Al VIII | 53.785     | 10        |           |
| S VII   | 52.097     | 200       |           | Al VIII | 53.800     | 10        |           |
| Na IX   | 52.116     | 100       |           | Mg VIII | 53.812     | 10        |           |
| Si X    | 52.155     | 100d      |           | Al VIII | 53.823     | 10        |           |
| P X     | 52.158     |           | P         | Na IX   | 53.860     | 300       |           |
| P IX    | 52.160     |           | P         | Mg VIII | 53.905     | 100       |           |
| Na IX   | 52.186     | 200       |           | Si IX   | 53.992     | 10        |           |
| Al XI   | 52.299     | 500       |           | Mg IX   | 54.011     | 200       |           |
| Si XI   | 52.30      | 100       |           | Al X    | 54.115     | 220       |           |
| Cl IX   | 52.303     | 400       |           | S VIII  | 54.118     | 500       |           |
| Mg VIII | 52.395     | 10        |           | Mg      | 54.131     | 10        |           |
| Ne IX   | 52.4       |           | P         | Na XI   | 54.14      |           | P         |
| Cl IX   | 52.426     | 300       |           | S IX    | 54.178     | 100       |           |
| Al XI   | 52.446     | 600       |           | S IX    | 54.178     | 100       |           |
| Si X    | 52.485     | 100       |           | Al VIII | 54.217     | 200b      |           |
| Na IX   | 52.487     | 1         |           | Al XI   | 54.217     | 200b      |           |
| P IX    | 52.552     |           | P         | Al VIII | 54.258     | 200       |           |
| Si VIII | 52.554     | 20        |           | S VIII  | 54.266     | 100       |           |
| P X     | 52.594     |           | P         | Al IX   | 54.312     | 10d       |           |
| Si X    | 52.611     | 50        |           | S VIII  | 54.370     | 20        |           |
| Si IX   | 52.671     | 10        |           | Na VIII | 54.380     | 100       |           |
| Cl IX   | 52.677     | 200       |           | S VIII  | 54.385     | 100       |           |
| S VIII  | 52.681     | 20        |           | Al XI   | 54.388     | 70        |           |
| B IV    | 52.682     | 330       |           | S IX    | 54.396     | 50        |           |
| S VIII  | 52.702     | 20        |           | Si      | 54.403     | 50d       |           |
| P IX    | 52.709     |           | P         | S VIII  | 54.424     | 150       |           |
| Cl IX   | 52.726     | 300       |           | Al IX   | 54.457     | 200       |           |
| S VIII  | 52.756     | 300       |           | Si VII  | 54.462     | 50b       |           |
| S VIII  | 52.789     | 300       |           | Si X    | 54.462     | 50b       |           |
| Si IX   | 52.810     | 20        |           | Mg IX   | 54.463     | 10        |           |
| Si IX   | 52.838     | 50        |           | S VIII  | 54.501     | 20        |           |
| S VIII  | 52.854     | 100       |           | Si VII  | 54.522     | 50d       |           |
| Cl IX   | 52.939     | 10        |           | Si X    | 54.522     | 50d       |           |
| S VIII  | 52.958     | 350       |           | S VIII  | 54.566     | 50        |           |
| Cl IX   | 52.959     | 1         |           | Si X    | 54.571     | 50        |           |
| S VIII  | 52.985     | 70        |           | Si X    | 54.599     | 50d       |           |
| Si      | 53.025     | 20        |           | S VIII  | 54.604     | 50        |           |
| Si      | 53.063     | 20        |           | S VII   | 54.652     | 100       |           |
| S VIII  | 53.073     | 50        |           | Si X    | 54.664     | 10        |           |
| Cl IX   | 53.108     | 1         |           | Si X    | 54.702     | 10        |           |
| Mg IX   | 53.112     | 10        |           | P VII   | 54.708     |           | P         |
| Mg IX   | 53.188     | 200d      |           | Si IX   | 54.841     | 100       |           |
| Mg IX   | 53.222     | 200d      |           | Si IX   | 54.870     | 100       |           |
| S VIII  | 53.239     | 30        |           | Mg VIII | 54.886     | 100       |           |
| Al IX   | 53.376     | 10        |           | P VII   | 54.887     |           | P         |
| Al      | 53.412     | 10        |           | Si IX   | 54.907     | 100       |           |
| Al IX   | 53.424     | 10        |           | S VII   | 54.938     | 100       |           |
| Cl IX   | 53.448     | 10        |           | Mg IX   | 55.060     | 200       |           |
| Si X    | 53.463     | 10        |           | P IX    | 55.066     |           | P         |
| Mg VIII | 53.484     | 10d       |           | Si IX   | 55.094     | 50        |           |
| Al IX   | 53.488     | 1         |           | Si IX   | 55.116     | 50        |           |
| Mg VIII | 53.512     | 100d      |           | Al      | 55.143     | 10        |           |
| F IX    | 53.53      |           | P         | P IX    | 55.220     |           | P         |
| Al IX   | 53.554     | 10        |           | Mg VIII | 55.222     | 10d       |           |
| Si X    | 53.573     | 50d       |           | Al X    | 55.227     | 150       |           |
| Si X    | 53.595     | 50d       |           | Si IX   | 55.234     | 50        |           |
| Al      | 53.598     | 10        |           | Al X    | 55.272     | 500       |           |
| Cl IX   | 53.696     | 100       |           | Si IX   | 55.272     | 150       |           |
| Na VIII | 53.750     | 10        |           | P IX    | 55.299     |           | P         |

| Element            | Wavelength | Intensity | Multiplet | Element          | Wavelength | Intensity | Multiplet |
|--------------------|------------|-----------|-----------|------------------|------------|-----------|-----------|
| Si IX              | 55.305     | 50        |           | Na VIII          | 57.230     | 10d       |           |
| Na VIII            | 55.345     | 10        |           | P VIII           | 57.230     | P         |           |
| Si IX              | 55.356     | 100       |           | Al               | 57.244     | 50        |           |
| Al X               | 55.376     | 750       |           | P IX             | 57.266     | P         |           |
| Na VIII            | 55.396     | 100       |           | Al               | 57.271     | 50        |           |
| Si IX              | 55.401     | 100       |           | Si VII           | 57.325     | 50        |           |
| Si IX              | 55.511     | 50        |           | P IX             | 57.339     | P         |           |
| S IX               | 55.540     | 100       |           | Al X             | 57.368     | 350       |           |
| Al                 | 55.622     | 1         |           | Si VII           | 57.434     | 50        |           |
| Al IX              | 55.667     | 10        |           | Si IX            | 57.434     | 50        |           |
| P VIII             | 55.572     | P         |           | Al VIII          | 57.553     | 10        |           |
| P VIII             | 55.710     | P         |           | Si VII           | 57.589     | 50b       |           |
| Si XIV             | 55.72      | P         |           | Si IX            | 57.589     | 50b       |           |
| Al X               | 55.731     | 50        |           | Mg VIII          | 57.590     | 10        |           |
| Si IX              | 55.781     | 150       |           | Al VIII          | 57.624     | 10        |           |
| P VIII             | 55.876     | P         |           | Al               | 57.663     | 10        |           |
| P VIII             | 55.926     | P         |           | P IX             | 57.683     | P         |           |
| Si IX              | 56.027     | 150       |           | Ar XVIII         | 57.7       | P         |           |
| P VIII             | 56.056     | P         |           | P IX             | 57.711     | P         |           |
| S IX               | 56.081     | 50        |           | Mg VIII          | 57.716     | 100       |           |
| Ne IX              | 56.1       | P         |           | Si IX            | 57.778     | 100       |           |
| Ne VIII            | 56.10      | 100       |           | Ne VIII          | 57.79      | 100       |           |
| P VIII             | 56.106     | P         |           | Mg X             | 57.876     | 600       |           |
| S IX               | 56.125     | 20        |           | Mg X             | 57.920     | 400       |           |
| P VII <sub>1</sub> | 56.138     | P         |           | P V <sub>1</sub> | 57.932     | P         |           |
| Si                 | 56.145     | 50        |           | P VIII           | 58.018     | P         |           |
| Al VIII            | 56.150     | 50b       |           | Al IX            | 58.060     | 10        |           |
| Al IX              | 56.150     | 50b       |           | Na VIII          | 58.070     | 10        |           |
| P VIII             | 56.171     | P         |           | Al IX            | 58.112     | 50        |           |
| P VII              | 56.174     | P         |           | Al               | 58.144     | 50        |           |
| Al                 | 56.274     | 30        |           | Si               | 58.150     | 50        |           |
| P VII              | 56.282     | P         |           | Na VIII          | 58.201     | 500b      |           |
| Al IX              | 56.304     | 70        |           | Na IX            | 58.201     | 500b      |           |
| P VII              | 56.322     | P         |           | Al IX            | 58.222     | 100       |           |
| S IX               | 56.332     | 20d       |           | Al IX            | 58.276     | 1         |           |
| P VII              | 56.338     | P         |           | Na IX            | 58.279     | 600       |           |
| Mg VIII            | 56.358     | 10d       |           | P VI             | 58.294     | P         |           |
| Mg VIII            | 56.403     | 10d       |           | Mg VII           | 58.316     | 10        |           |
| Si VII             | 56.528     | 50        |           | Al VII           | 58.384     | 10        |           |
| Al                 | 56.545     | 10        |           | Si VII           | 58.388     | 50        |           |
| Si                 | 56.645     | 50d       |           | Al               | 58.441     | 10        |           |
| Al X               | 56.650     | 10d       |           | Si VII           | 58.445     | 100       |           |
| Si X               | 56.680     | 50d       |           | Ne IX            | 58.5       | P         |           |
| Al X               | 56.762     | 10        |           | P VIII           | 58.506     | P         |           |
| Al X               | 56.802     | 200       |           | Al               | 58.512     | 10        |           |
| Si X               | 56.804     | 50        |           | Si VII           | 58.526     | 10        |           |
| Mg IX              | 56.861     | 10        |           | Mg VIII          | 58.537     | 10d       |           |
| P XV               | 56.87      | P         |           | Be IV            | 58.574     | P         |           |
| Al IX              | 56.899     | 100b      |           | Si VII           | 58.580     | 100       |           |
| Al IX              | 56.945     | 250       |           | Mg VIII          | 58.614     | 200d      |           |
| Al X               | 56.964     | 150       |           | Mg VIII          | 58.667     | 300d      |           |
| Al X               | 57.024     | 250       |           | Cl VIII          | 58.673     | 1000      |           |
| P VIII             | 57.042     | P         |           | Si VII           | 58.719     | 50        |           |
| Al X               | 57.072     | 10        |           | P VI             | 58.727     | P         |           |
| P IX               | 57.083     | P         |           | Al VII           | 58.752     | 1         |           |
| Na VIII            | 57.096     | 10        |           | P VIII           | 58.776     | P         |           |
| Al                 | 57.116     | 50        |           | Si VII           | 58.782     | 50        |           |
| Na VIII            | 57.119     | 10        |           | Al X             | 58.808     | 1         |           |
| Si IX              | 57.157     | 50        |           | Al X             | 58.858     | 100       |           |
| Si X               | 57.209     | 20        |           | Si VIII          | 58.885     | 150d      |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Si IX   | 58.906     | 50d       |           | Al IX   | 60.645     | 10        |           |
| Na IX   | 58.954     | 100       |           | Si      | 60.673     | 100       |           |
| P VI    | 58.956     | P         |           | Al X    | 60.700     | 10        |           |
| P VII   | 58.972     | P         |           | Be IV   | 60.743     | P         |           |
| Al X    | 58.987     | 150       |           | Al      | 60.788     | 50        |           |
| Si IX   | 59.004     | 100       |           | S VII   | 60.804     | 750       |           |
| Na VIII | 59.009     | 100       |           | Mg VIII | 60.806     | 10        |           |
| P VII   | 59.028     | P         |           | Al      | 60.809     | 50        |           |
| Mg VIII | 59.038     | 200       |           | Ne VIII | 60.81      | 200       |           |
| Na IX   | 59.042     | 200       |           | Si VII  | 60.837     | 100       |           |
| Si IX   | 59.077     | 50        |           | Al IX   | 60.896     | 300       |           |
| Na VIII | 59.101     | 10        |           | Si VII  | 60.989     | 100b      |           |
| Al X    | 59.107     | 400       |           | Si VIII | 60.989     | 100b      |           |
| Mg VIII | 59.153     | 300       |           | Si IX   | 60.989     | 100b      |           |
| Cl VIII | 59.191     | 900       |           | Si VIII | 61.019     | 100       |           |
| Na VIII | 59.204     | 300       |           | Mg IX   | 61.038     | 200       |           |
| S VIII  | 59.236     | 70        |           | Al IX   | 61.069     | 600       |           |
| Na VIII | 59.249     | 10        |           | Si VIII | 61.070     | 200       |           |
| Al      | 59.298     | 10        |           | B IV    | 61.088     |           |           |
| P VIII  | 59.302     | P         |           | Na VIII | 61.088     | 200       |           |
| Be IV   | 59.320     | P         |           | Mg IX   | 61.088     | 100       |           |
| Al IX   | 59.381     | 10d       |           | Si IX   | 61.109     | 50        |           |
| Al XIII | 59.39      | P         |           | Mg IX   | 61.127     | 300       |           |
| Al      | 59.481     | 10d       |           | Mg IX   | 61.175     | 200       |           |
| P VIII  | 59.516     | P         |           | Si VIII | 61.175     | 50d       |           |
| S VIII  | 59.543     | 20        |           | Si IX   | 61.190     | 50d       |           |
| Mg VII  | 59.640     | 1         |           | Si VIII | 61.223     | 100       |           |
| Na VIII | 59.759     | 200       |           | Al      | 61.262     | 10        |           |
| Al IX   | 59.761     | 300       |           | Si VI   | 61.306     | 50        |           |
| P VI    | 59.775     | P         |           | Na VIII | 61.347     | 1         |           |
| Al VII  | 59.821     | 10        |           | Si IX   | 61.355     | 50        |           |
| Si VII  | 59.884     | 50        |           | Mg IX   | 61.359     | 10        |           |
| Al VII  | 59.911     | 10        |           | Al      | 61.373     | 50        |           |
| F IX    | 59.95      | P         |           | Mg IX   | 61.393     | 100       |           |
| Si VII  | 59.966     | 100b      |           | Si VIII | 61.395     | 50        |           |
| Si IX   | 59.966     | 100b      |           | Si VIII | 61.446     | 100d      |           |
| Na VIII | 59.992     | 10        |           | Al      | 61.472     | 100       |           |
| P VI    | 60.016     | P         |           | Mg IX   | 61.489     | 200       |           |
| Al      | 60.052     | 50        |           | Si IX   | 61.502     | 50        |           |
| Na VIII | 60.053     | 100       |           | Si IX   | 61.546     | 100       |           |
| Na VIII | 60.073     | 100       |           | S VII   | 61.547     | 200       |           |
| Mg VII  | 60.138     | 10        |           | Si IX   | 61.600     | 50        |           |
| Si      | 60.151     | 20        |           | S VIII  | 61.600     | 500       |           |
| S VII   | 60.161     | 1000      |           | P VI    | 61.622     | P         |           |
| Al IX   | 60.162     | 10d       |           | Al IX   | 61.647     | 10        |           |
| Al IX   | 60.197     | 50        |           | Si IX   | 61.649     | 100       |           |
| Si VII  | 60.221     | 100       |           | Al VIII | 61.694     | 150       |           |
| Al IX   | 60.222     | 10        |           | Si VIII | 61.798     | 100       |           |
| Al IX   | 60.262     | 10        |           | Si VIII | 61.852     | 100b      |           |
| Al IX   | 60.312     | 50        |           | Si IX   | 61.852     | 100b      |           |
| B IV    | 60.313     | 1000      |           | P VI    | 61.869     | P         |           |
| Al IX   | 60.347     | 100       |           | Mg VIII | 61.891     | 200       |           |
| Mg VIII | 60.384     | 10        |           | Si VIII | 61.895     | 150d      |           |
| Si      | 60.421     | 20        |           | Al      | 61.900     | 10        |           |
| Ne VIII | 60.45      | 100       |           | Si VIII | 61.914     | 150d      |           |
| Si      | 60.459     | 20        |           | Mg IX   | 61.924     | 400       |           |
| Al IX   | 60.504     | 150       |           | Al      | 61.933     | 50        |           |
| Al IX   | 60.549     | 200       |           | Mg VIII | 61.964     | 100b      |           |
| P VI    | 60.572     | P         |           | Mg IX   | 61.964     | 100b      |           |
| Al IX   | 60.588     | 300       |           | P VI    | 61.970     | P         |           |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| O VIII  | 61.977     | P         |           | S VIII  | 63.711     | 50        |           |
| S VIII  | 61.978     | 250       |           | Al VIII | 63.714     | 100       |           |
| Al VIII | 62.016     | 100       |           | Si VIII | 63.732     | 150       |           |
| Mg IX   | 62.020     | 10        |           | Na VII  | 63.778     | 10        |           |
| Al      | 62.070     | 50        |           | Si      | 63.879     | 50        |           |
| Si      | 62.154     | 50        |           | S VIII  | 63.886     | 250       |           |
| Mg VII  | 62.166     | 10d       |           | Si VIII | 63.903     | 150       |           |
| P VII   | 62.245     | P         |           | Al VIII | 63.933     | 10        |           |
| Si      | 62.251     | 100       |           | Al VIII | 63.965     | 150d      |           |
| Na VIII | 62.276     | 100       |           | Al VIII | 64.004     | 200       |           |
| Mg VIII | 62.291     | 10        |           | O VIII  | 64.03      | P         |           |
| Al VII  | 62.296     | 200b      |           | P VIII  | 64.051     | P         |           |
| Al IX   | 62.296     | 200b      |           | Be IV   | 64.065     | P         |           |
| Al IX   | 62.327     | 250       |           | Al VII  | 64.066     | 10        |           |
| Ne VIII | 62.36      | 100       |           | Al VIII | 64.086     | 10        |           |
| Al IX   | 62.369     | 150       |           | P VIII  | 64.100     | P         |           |
| Si      | 62.386     | 50d       |           | Na VII  | 64.113     | 10        |           |
| Al VII  | 62.432     | 10        |           | S VIII  | 64.120     | 50        |           |
| Si      | 62.454     | 20        |           | Mg VII  | 64.122     | 200       |           |
| Al VII  | 62.474     | 100b      |           | S VIII  | 64.137     | 100       |           |
| Al IX   | 62.474     | 100b      |           | Na VIII | 64.205     | 200       |           |
| P VII   | 62.515     | P         |           | Na VIII | 64.237     | 400       |           |
| Si VIII | 62.586     | 50d       |           | Mg VIII | 64.246     | 10        |           |
| Al IX   | 62.587     | 100       |           | Al      | 64.269     | 10        |           |
| Mg      | 62.615     | 10        |           | Si VIII | 64.281     | 100       |           |
| Mg VII  | 62.696     | 100       |           | P VII   | 64.286     | P         |           |
| Na VII  | 62.725     | 10d       |           | P VIII  | 64.288     | P         |           |
| Mg IX   | 62.751     | 500       |           | Na VIII | 64.302     | 500       |           |
| Si VIII | 62.808     | 100       |           | S VIII  | 64.305     | 20        |           |
| Si VIII | 62.849     | 150d      |           | Al VII  | 64.325     | 50        |           |
| Si VIII | 62.884     | 50        |           | Si VIII | 64.327     | 150       |           |
| Al IX   | 62.916     | 150       |           | P VIII  | 64.337     | P         |           |
| Si VII  | 62.940     | 50        |           | Si VIII | 64.355     | 50        |           |
| Si IX   | 62.974     | 50        |           | Al VII  | 64.358     | 50        |           |
| Al VII  | 63.025     | 500b      |           | P VII   | 64.361     | P         |           |
| Al IX   | 63.025     | 500b      |           | P VIII  | 64.361     | P         |           |
| S VIII  | 63.026     | 50        |           | Mg VII  | 64.377     | 100b      |           |
| Na VIII | 63.114     | 100       |           | Mg VIII | 64.377     | 100b      |           |
| Al X    | 63.134     | 200       |           | Al      | 64.418     | 10        |           |
| Mg X    | 63.152     | 700       |           | P VIII  | 64.423     | P         |           |
| P VI    | 63.177     | P         |           | Al VII  | 64.481     | 10        |           |
| Si      | 63.183     | 50d       |           | Mg VIII | 64.488     | 100d      |           |
| Na VII  | 63.185     | 10        |           | Al VII  | 64.513     | 10        |           |
| Al VIII | 63.203     | 10        |           | Mg VIII | 64.518     | 100d      |           |
| Na VII  | 63.227     | 10        |           | P VII   | 64.579     | P         |           |
| Si VIII | 63.229     | 150       |           | P VII   | 64.587     | P         |           |
| Si VIII | 63.266     | 50        |           | Al IX   | 64.625     | 50        |           |
| Mg X    | 63.295     | 900       |           | Mg VIII | 64.635     | 200       |           |
| S VIII  | 63.304     | 500       |           | Mg VIII | 64.635     | 200       |           |
| Na VII  | 63.361     | 10        |           | P VII   | 64.635     | P         |           |
| Mg VII  | 63.396     | 100d      |           | Al XIII | 64.64      | P         |           |
| S VIII  | 63.431     | 100       |           | Mg VIII | 64.702     | 200       |           |
| Na VII  | 63.442     | 10        |           | Al VII  | 64.704     | 150       |           |
| P VI    | 63.450     | P         |           | Cl XVII | 64.72      | P         |           |
| Si      | 63.478     | 20        |           | P VII   | 64.729     | P         |           |
| Al IX   | 63.509     | 500d      |           | Si      | 64.772     | 50d       |           |
| Al      | 63.560     | 10        |           | Mg VIII | 64.811     | 10        |           |
| Si VII? | 63.586     | 100       |           | Al VII  | 64.815     | 120       |           |
| Al IX   | 63.632     | 300       |           | S VIII  | 64.874     | 20        |           |
| Na VIII | 63.695     | 10        |           | Mg VIII | 64.878     | 100       |           |

| Element  | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|----------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Al IX    | 64.885     | 150       |           | Si VI   | 66.772     | 20        |           |
| Na VII   | 64.904     | 10        |           | Mg VII  | 66.788     | 10        |           |
| Al VII   | 64.904     | 100b      |           | Si VI   | 66.796     | 10        |           |
| Al IX    | 64.904     | 100b      |           | P VII   | 66.805     | P         |           |
| Si VI    | 65.004     | 20d       |           | Al IX   | 66.836     | 100d      |           |
| Al VII   | 65.014     | 10d       |           | Si      | 66.912     | 100       |           |
| Al VIII  | 65.128     | 10d       |           | Si      | 66.977     | 20d       |           |
| S VIII   | 65.149     | 50        |           | P VII   | 66.989     | P         |           |
| Si VI    | 65.211     | 10        |           | Al      | 66.996     | 10d       |           |
| Si IX    | 65.236     | 10        |           | Na      | 67.027     | 100       |           |
| Al VIII  | 65.298     | 10        |           | Al VIII | 67.044     | 10        |           |
| Si XIV   | 65.30      | P         |           | Mg IX   | 67.090     | 500       |           |
| P VI     | 65.308     | P         |           | Al VIII | 67.096     | 100       |           |
| Al VIII  | 65.381     | 50        |           | Al VIII | 67.121     | 100       |           |
| Na VII   | 65.388     | 100       |           | Mg IX   | 67.135     | 600       |           |
| N. VII   | 65.474     | 100       |           | Si VIII | 67.157     | 150       |           |
| Al VIII  | 65.494     | 50        |           | Al VIII | 67.166     | 10        |           |
| Ne X     | 65.52      | P         |           | Mg IX   | 67.239     | 700       |           |
| Si VII   | 65.595     | 50        |           | Al VIII | 67.244     | 150       |           |
| Mg IX    | 65.609     | 400       |           | Al VIII | 67.288     | 500       |           |
| Al       | 65.632     | 50        |           | Si VIII | 67.318     | 100       |           |
| P VI     | 65.640     | P         |           | Al VIII | 67.360     | 250       |           |
| Na VIII  | 65.672     | 10        |           | Ne VIII | 67.39      | 300       |           |
| Mg X     | 65.672     | 200       |           | Al VIII | 67.408     | 500       |           |
| Si       | 65.711     | 50        |           | Si VIII | 67.408     | 150       |           |
| Na VIII  | 65.730     | 10        |           | Al VIII | 67.437     | 50        |           |
| Mg VIII  | 65.735     | 100       |           | Mg VII  | 67.453     | 10        |           |
| P VIII   | 65.788     | P         |           | Na      | 67.461     | 100d      |           |
| Mg VIII  | 65.806     | 200       |           | Al VIII | 67.464     | 600       |           |
| Al       | 65.821     | 50        |           | Mg VII  | 67.470     | 100d      |           |
| Si VIII  | 65.833     | 50        |           | Na VIII | 67.478     | 100       |           |
| Mg X     | 65.847     | 300       |           | Mg VII  | 67.497     | 200       |           |
| Al VII   | 65.865     | 50        |           | Al VIII | 67.529     | 10        |           |
| Al VII   | 65.882     | 50        |           | Al VII  | 67.565     | 150b      |           |
| Ne VIII  | 65.89      | 200       |           | Al VIII | 67.565     | 150b      |           |
| P VI     | 65.940     | P         |           | Si      | 67.574     | 50d       |           |
| Al IX    | 66.038     | 50        |           | P VIII  | 67.587     | P         |           |
| P VIII   | 66.051     | P         |           | Na VIII | 67.672     | 400       |           |
| Na VIII  | 66.059     | 200       |           | Mg VIII | 67.731     | 400b      |           |
| Mg VIII  | 66.069     | 300       |           | Mg IX   | 67.731     | 400b      |           |
| Al IX    | 66.092     | 50        |           | O VIII  | 67.76      | P         |           |
| Al IX    | 66.142     | 120       |           | Na VII  | 67.826     | 100d      |           |
| Al IX    | 66.239     | 60        |           | Al IX   | 67.828     | 10        |           |
| Al IX    | 66.275     | 50        |           | Al      | 67.873     | 10        |           |
| Al VIII  | 66.321     | 60b       |           | Na VII  | 67.877     | 100d      |           |
| Al IX    | 66.321     | 60b       |           | Na VII  | 67.912     | 200d      |           |
| Na VIII  | 66.358     | 10        |           | Al VIII | 67.946     | 500       |           |
| Al VIII  | 66.363     | 10        |           | Mg VII  | 67.993     | 100d      |           |
| P VII    | 66.432     | P         |           | Al      | 68.000     | 10        |           |
| Na VIII  | 66.433     | 200d      |           | Si VII  | 68.026     | 10        |           |
| P VII    | 66.488     | P         |           | Mg VII  | 68.064     | 200       |           |
| Na VIII  | 66.498     | 400       |           | Mg VII  | 68.100     | 200       |           |
| P VII    | 66.576     | P         |           | Mg VII  | 68.144     | 300d      |           |
| Al IX    | 66.624     | 10        |           | Si VII  | 68.148     | 250       |           |
| P VII    | 66.691     | P         |           | Al VI   | 68.167     | 50d       |           |
| Al VIII  | 66.704     | 150       |           | Si VII  | 68.190     | 50        |           |
| Si       | 66.726     | 100       |           | Na VIII | 68.193     | 100       |           |
| Ar XVIII | 66.73      | P         |           | Si VII  | 68.212     | 50        |           |
| Al VIII  | 66.731     | 200       |           | Al VI   | 68.223     | 10        |           |
| Al VIII  | 66.771     | 350       |           | Si      | 68.270     | 50d       |           |

| Element | Wavelength | Intensity | Multiplet | Element  | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|----------|------------|-----------|-----------|
| Al VI   | 68 289     | 1         |           | Al VIII  | 69 420     | 50        |           |
| Si      | 68 340     | 50        |           | Si VI    | 69 421     | 50        |           |
| Mg VII  | 68 352     | 200       |           | Si VI    | 69 448     | 100d      |           |
| Al VIII | 68 375     | 750       |           | P VI     | 69 452     | P         |           |
| P VIII  | 68 384     |           | P         | Mg VIII  | 69 467     | 500b      |           |
|         |            |           |           |          |            |           |           |
| P VIII  | 68 385     |           | P         | Mg IX    | 69 467     | 500b      |           |
| Si VII  | 68 408     | 100       |           | Al VIII  | 69 502     | 100       |           |
| Na VII  | 68 422     | 10d       |           | Mg IX    | 69 513     | 100       |           |
| Al      | 68 439     | 50        |           | Mg VIII  | 69 577     | 100       |           |
| Mg VIII | 68 450     | 100       |           | Si VII   | 69 580     | 100       |           |
|         |            |           |           |          |            |           |           |
| Si VII  | 68 456     | 10        |           | Si VII   | 69 602     | 100       |           |
| Al      | 68 458     | 50        |           | Al VIII  | 69 611     | 200       |           |
| Si      | 68 497     | 50d       |           | Mg VII   | 69 615     | 300b      |           |
| Na VII  | 68 519     | 100d      |           | Mg IX    | 69 615     | 300b      |           |
| Si      | 68 522     | 50d       |           | Al       | 69 631     | 200       |           |
|         |            |           |           |          |            |           |           |
| Al VII  | 68 531     | 100b      |           | Si VIII  | 69 632     | 150       |           |
| Al IX   | 68 531     | 100b      |           | Si VII   | 69 663     | 200       |           |
| Mg VIII | 68 550     | 100       |           | Mg XII   | 69 71      | P         |           |
| Mg VIII | 68 580     | 10        |           | Al IX    | 69 716     | 100       |           |
| Si VII  | 68 593     | 50        |           | Al VIII  | 69 773     | 150       |           |
|         |            |           |           |          |            |           |           |
| Mg VIII | 68 606     | 200       |           | Si VII   | 69 790     | 200b      |           |
| Al VII  | 68 637     | 50b       |           | Si VIII  | 69 790     | 200b      |           |
| Al IX   | 68 637     | 50b       |           | Al IX    | 69 850     | 50d       |           |
| Si VII  | 68 642     | 50        |           | Si VII   | 69 861     | 100       |           |
| P VIII  | 68 654     |           | P         | Si VII   | 69 872     | 100       |           |
|         |            |           |           |          |            |           |           |
| Si VII  | 68 669     | 50        |           | Mg VII   | 69 900     | 10        |           |
| Al VII  | 68 681     | 10b       |           | Si VIII  | 69 905     | 50        |           |
| Al IX   | 68 681     | 10b       |           | Mg IX    | 69 950     | 600       |           |
| Si VII  | 68 715     | 100       |           | Si VII   | 70 027     | 250       |           |
| P VIII  | 68 751     |           | P         | Al       | 70 040     | 50        |           |
|         |            |           |           |          |            |           |           |
| Al      | 68 783     | 10        |           | Si VII   | 70 072     | 250       |           |
| Si      | 68 786     | 100       |           | Al       | 70 090     | 100       |           |
| Al VIII | 68 825     | 50b       |           | Si VII   | 70 123     | 20        |           |
| Al IX   | 68 825     | 50b       |           | Al VIII  | 70 161     | 300       |           |
| Si      | 68 833     | 20        |           | Mg VII   | 70 193     | 100       |           |
|         |            |           |           |          |            |           |           |
| Si      | 68 853     | 100       |           | Si VII   | 70 222     | 200       |           |
| Na VII  | 68 866     | 10        |           | Si VII   | 70 250     | 200       |           |
| Al      | 68 904     | 10        |           | Na       | 70 320     | 10        |           |
| Na VII  | 68 908     | 100       |           | Al VIII  | 70 323     | 200       |           |
| Mg IX   | 68 949     | 10        |           | Si VII   | 70 323     | 50        |           |
|         |            |           |           |          |            |           |           |
| Al IX   | 68 958     | 50        |           | Al VIII? | 70 402     | 1         |           |
| Mg IX   | 68 986     | 100       |           | Si VII   | 70 427     | 50        |           |
| Mg IX   | 69 009     | 100       |           | Si VIII  | 70 458     | 100       |           |
| Mg IX   | 69 058     | 10        |           | Si VIII  | 70 473     | 100       |           |
| Mg IX   | 69 116     | 100       |           | Mg       | 70 512     | 10        |           |
|         |            |           |           |          |            |           |           |
| Na VIII | 69 120     | 300       |           | Mg       | 70 563     | 10        |           |
| P VI    | 69 121     |           | P         | Si       | 70 594     | 100       |           |
| Mg IX   | 69 161     | 300       |           | Na IX    | 70 615     | 700       |           |
| Al      | 69 165     | 200       |           | Na IX    | 70 653     | 600       |           |
| Si VI   | 69 204     | 50d       |           | Al VIII  | 70 727     | 250       |           |
|         |            |           |           |          |            |           |           |
| Si VI   | 69 236     | 250       |           | Si VII   | 70 730     | 50        |           |
| Al IX   | 69 258     | 50d       |           | Na VIII  | 70 741     | 10        |           |
| Na VII  | 69 314     | 10        |           | Mg       | 70 762     | 100d      |           |
| Mg      | 69 327     | 10        |           | Si       | 70 771     | 100d      |           |
| Mg IX   | 69 374     | 200       |           | Mg       | 70 787     | 100d      |           |
|         |            |           |           |          |            |           |           |
| Al      | 69 379     | 50        |           | Al       | 70 802     | 50        |           |
| Si VII  | 69 385     | 150       |           | Mg       | 70 878     | 10d       |           |
| Na VII  | 69 395     | 10d       |           | Mg VIII  | 70 953     | 100       |           |
| Mg VIII | 69 413     | 400b      |           | Mg VIII  | 71 007     | 200d      |           |
| Mg IX   | 69 413     | 400b      |           | Al       | 71 077     | 10        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Mg VIII | 71.118     | 300       |           | Si VI   | 72.896     | 50        |           |
| Al      | 71.139     | 50        |           | Al VI   | 72.926     | 100       |           |
| Mg VIII | 71.168     | 100       |           | O VII   | 73.0       | P         |           |
| Si VI   | 71.181     | 250       |           | P VII   | 73.076     | P         |           |
| Si VI   | 71.273     | 100       |           | Al VI   | 73.076     | 100       |           |
| Al      | 71.277     | 50        |           | S XVI   | 73.1       | P         |           |
| Si VI   | 71.304     | 10        |           | Mg      | 73.112     | 10        |           |
| Si VI   | 71.340     | 50        |           | Si VII  | 73.123     | 500       |           |
| Si VI   | 71.366     | 150       |           | Na      | 73.128     | 10        |           |
| Si VI   | 71.384     | 200b      |           | Mg VIII | 73.250     | 400       |           |
| Si VII  | 71.384     | 200b      |           | Al      | 73.278     | 100       |           |
| Na      | 71.386     | 10        |           | Al VI   | 73.334     | 1         |           |
| Mg      | 71.454     | 100       |           | Si VII  | 73.350     | 250       |           |
| Si VI   | 71.474     | 50        |           | Si VII  | 73.433     | 200       |           |
| Si VI   | 71.534     | 50        |           | Al IX   | 73.451     | 1         |           |
| Si VI   | 71.561     | 50        |           | Ne VIII | 73.55      | 400       |           |
| Al      | 71.590     | 70        |           | Al IX   | 73.625     | 1         |           |
| Mg      | 71.621     | 10d       |           | Al VIII | 73.703     | 150       |           |
| Al      | 71.625     | 70        |           | Mg      | 73.710     | 10        |           |
| Si VI   | 71.644     | 10        |           | Al VIII | 73.733     | 100       |           |
| Si VI   | 71.718     | 10        |           | Al VIII | 73.760     | J         |           |
| Mg      | 71.724     | 10d       |           | Mg      | 73.773     | 10        |           |
| Al      | 71.774     | 10d       |           | Mg VIII | 73.825     | 100       |           |
| Mg VII  | 71.786     | 100       |           | Mg VIII | 73.862     | 200       |           |
| Mg IX   | 71.841     | 100       |           | Al VIII | 73.879     | 200       |           |
| Al      | 71.867     | 10d       |           | Mg VIII | 73.890     | 100       |           |
| Si      | 71.900     | 200       |           | O VII   | 73.9       | P         |           |
| Mg IX   | 71.901     | 200       |           | Mg VIII | 73.927     | 100       |           |
| Si VII  | 71.955     | 200       |           | Mg VIII | 73.981     | 200       |           |
| Al      | 71.987     | 10        |           | Al      | 74.016     | 120       |           |
| Na VII  | 72.020     | 100       |           | Mg VIII | 74.021     | 300       |           |
| Mg VIII | 72.027     | 300b      |           | Al VII  | 74.095     | 100d      |           |
| Mg IX   | 72.027     | 300b      |           | Na VII  | 74.097     | 100       |           |
| S VII   | 72.029     | 1000      |           | Na VII  | 74.180     | 200       |           |
| Na VII  | 72.079     | 100       |           | Si VIII | 74.186     | 100       |           |
| Al VIII | 72.223     | 200       |           | Na VII  | 74.217     | 200       |           |
| Mg IX   | 72.226     | 300       |           | Na VII  | 74.255     | 300       |           |
| Si VIII | 72.228     | 200       |           | Al      | 74.259     | 10        |           |
| Al VII  | 72.270     | 500d      |           | Na VII  | 74.268     | 300       |           |
| O VII   | 72.3       | P         |           | Mg VIII | 74.274     | 200b      |           |
| Mg IX   | 72.312     | 400       |           | Mg IX   | 74.274     | 200b      |           |
| Al VIII | 72.324     | 200       |           | Mg VI   | 74.319     | 300b      |           |
| Si VII  | 72.324     | 300b      |           | Mg VIII | 74.319     | 300b      |           |
| Si VIII | 72.324     | 300b      |           | Mg IX   | 74.319     | 300b      |           |
| Al VIII | 72.401     | 150       |           | Al      | 74.321     | 50        |           |
| Si VIII | 72.420     | 200d      |           | Al VI   | 74.346     | 50        |           |
| Mg VI   | 72.430     | 100       |           | Mg VIII | 74.366     | 400b      |           |
| Mg VII  | 72.546     | 10b       |           | Mg IX   | 74.366     | 400b      |           |
| Mg VIII | 72.546     | 10b       |           | Si VIII | 74.371     | 20        |           |
| S VII   | 72.663     | 1000      |           | Ne IX   | 74.4       | P         |           |
| Al      | 72.674     | 300       |           | Mg VIII | 74.411     | 100b      |           |
| Mg VIII | 72.684     | 100d      |           | Mg IX   | 74.411     | 100b      |           |
| P VII   | 72.684     | P         |           | Al VI   | 74.444     | 300       |           |
| Al VI   | 72.714     | 1         |           | Mg VI   | 74.461     | 10b       |           |
| Mg VII  | 72.787     | 100       |           | Mg IX   | 74.461     | 10b       |           |
| Al VI   | 72.810     | 25        |           | Al VI   | 74.504     | 50d       |           |
| Mg VII  | 72.852     | 10        |           | Mg IX   | 74.520     | 100       |           |
| Na VII  | 72.865     | 200       |           | Mg VI   | 74.574     | 200       |           |
| Al VI   | 72.865     | 50        |           | Al VI   | 74.592     | 150       |           |
| Mg VII  | 72.896     | 1d        |           | Ne VIII | 74.64      | 300       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Al VI   | 74.656     | 250       |           | P VII   | 75.924     |           | P         |
| Mg      | 74.676     | 100       |           | Be IV   | 75.928     | 1000      | P         |
| Mg IX   | 74.738     | 100       |           | Mg VII  | 75.975     | 400       |           |
| Al IX   | 74.785     | 50        |           | Al VIII | 75.985     | 50        |           |
| Al VI   | 74.813     | 50        |           | Si VIII | 75.986     | 50        |           |
| Cl XVII | 74.82      |           | P         | Al VII  | 76.010     | 50        |           |
| Al VIII | 74.841     | 200       |           | Al VII  | 76.086     | 10        |           |
| Mg VIII | 74.858     | 600       |           | Na VIII | 76.123     | 500       |           |
| Na VII  | 74.861     | 300       |           | Mg      | 76.169     | 10        | J         |
| Al VI   | 74.892     | 100       |           | Na VIII | 76.173     | 100       |           |
| P VI    | 74.951     |           | P         | Si VIII | 76.198     | 20        |           |
| Na VIII | 74.956     | 300       |           | Mg VIII | 76.199     | 100       |           |
| Al VIII | 74.965     | 150       |           | Na VIII | 76.217     | 200       |           |
| Ne VII  | 74.97      | 300       |           | Al VII  | 76.221     | 50        |           |
| Na VII  | 74.980     | 300b      |           | Al VII  | 76.257     | 100       |           |
| Na VIII | 74.980     | 300b      |           | G VII   | 76.3       |           | P         |
| Mg VIII | 75.034     | 700       |           | Al VII  | 76.342     | 10        |           |
| Na VIII | 75.043     | 400       |           | Al VII  | 76.383     | 500       |           |
| Al VIII | 75.058     | 50        |           | Mg VII  | 76.392     | 300       |           |
| Na VIII | 75.096     | 300       |           | Al VII  | 76.422     | 500       |           |
| Mg      | 75.112     | 100       |           | Mg      | 76.459     | 100       |           |
| Al      | 75.164     | 100       |           | Na VII  | 76.501     | 10        |           |
| Si VI   | 75.193     | 200b      |           | P VI    | 76.534     |           | P         |
| Si VII  | 75.193     | 200b      |           | Al VII  | 76.543     | 1000      |           |
| Al      | 75.226     | 100d      |           | Na VII  | 76.565     | 10        |           |
| Mg VI   | 75.248     | 100       |           | Al VII  | 76.572     | 1000      |           |
| Al VII  | 75.270     | 250       |           | Ne VII  | 76.58      | 200       |           |
| Al VII  | 75.302     | 350       |           | Al VI   | 76.618     | 200       |           |
| Mg VI   | 75.334     | 100d      |           | Na VII  | 76.626     | 10d       |           |
| O VII   | 75.35      |           | P         | Al VI   | 76.697     | 200       |           |
| Al VII  | 75.360     | 600       |           | Mg VIII | 76.714     | 100       |           |
| Na VIII | 75.385     | 100       |           | Mg VIII | 76.740     | 200       |           |
| Al VIII | 75.397     | 70        |           | Mg VIII | 76.788     | 300       |           |
| Si VI?  | 75.398     | 150       |           | Al      | 76.794     | 200       |           |
| Na VIII | 75.428     | 200       |           | Na VII  | 76.827     | 10        |           |
| Si VI   | 75.486     | 50        |           | Al      | 76.853     | 200       |           |
| Al VII  | 75.488     | 200b      |           | Na VII  | 76.862     | 10        |           |
| Al VIII | 75.488     | 200b      |           | Mg VI   | 76.908     | 1         |           |
| O VII   | 75.5       |           | P         | Al VI   | 76.953     | 50        |           |
| Na VIII | 75.518     | 300       |           | Al      | 76.984     | 100       |           |
| Mg      | 75.528     | 10d       |           | Mg VII  | 77.033     | 100       |           |
| Al VII  | 75.532     | 200       |           | Al      | 77.052     | 50        |           |
| Al VIII | 75.577     | 150       |           | Na      | 77.076     | 10        |           |
| Si VI   | 75.587     | 50        |           | Mg VII  | 77.144     | 200       |           |
| Al VIII | 75.623     | 100       |           | Na VIII | 77.267     | 600       |           |
| P VI    | 75.648     |           | P         | Mg      | 77.301     | 10        |           |
| Mg      | 75.666     | 300       |           | O VII   | 77.31      |           | P         |
| Al VIII | 75.734     | 50        |           | Al      | 77.315     | 10        |           |
| Al XIII | 75.74      |           | P         | Na VII  | 77.353     | 100       |           |
| Al VIII | 75.778     | 250       |           | Si V?   | 77.360     | 10        |           |
| Ne VII  | 75.78      | 300       |           | Al IX   | 77.381     | 150       |           |
| Al VII  | 75.809     | 100       |           | Mg VI   | 77.405     | 200b      |           |
| Mg VI   | 75.834     | 200       |           | Mg VIII | 77.405     | 200b      |           |
| Al VII  | 75.850     | 100b      |           | Si VI   | 77.429     | 500       |           |
| Al VIII | 75.850     | 100b      |           | Al VII  | 77.448     | 150b      |           |
| Mg XII  | 75.87      |           | P         | Al IX   | 77.448     | 150b      |           |
| O VIII  | 75.89      |           | P         | Mg VI   | 77.511     | 100b      |           |
| Mg VI   | 75.890     | 10        |           | Mg VIII | 77.511     | 100b      |           |
| Al VII  | 75.894     | 100b      |           | Na      | 77.558     | 10        |           |
| Al VIII | 75.894     | 100b      |           | Mg VIII | 77.572     | 500       |           |

| Element  | Wavelength | Intensity | Multiplet | Element  | Wavelength | Intensity | Multiplet |
|----------|------------|-----------|-----------|----------|------------|-----------|-----------|
| Al VIII  | 77.605     | 300       |           | Si VII   | 79.491     | 100       |           |
| Mg VI    | 77.639     | 10        |           | Si VII   | 79.523     | 100       |           |
| Mg VIII  | 77.671     | 500       |           | Al       | 79.557     | 10        |           |
| O VII    | 77.68      | P         |           | P VII    | 79.561     | P         |           |
| Si VI    | 77.718     | 300       |           | Na VII   | 79.571     | 100       |           |
| Mg VIII  | 77.737     | 600b      |           | Si VII   | 79.615     | 100       |           |
| Mg IX    | 77.737     | 600b      |           | Na       | 79.620     | 100       |           |
| Na IX    | 77.764     | 700       |           | Al VII   | 79.635     | 10        |           |
| Al VII   | 77.770     | 100       |           | Al VII   | 79.690     | 150       |           |
| Al VII   | 77.806     | 70        |           | Mg VIII  | 79.695     | 200       |           |
| Al VII   | 77.896     | 500       |           | Na VII   | 79.761     | 10        |           |
| Na IX    | 77.911     | 800       |           | Al       | 79.783     | 50        |           |
| Al VI    | 77.945     | 500b      |           | Na VII   | 79.786     | 10        |           |
| Al VII   | 77.945     | 500b      |           | Mg VI    | 79.817     | 200       |           |
| Na       | 78.023     | 10        |           | Mg VI    | 79.830     | 400       |           |
| Al VI    | 78.112     | 100       |           | Mg VI    | 79.857     | 400       |           |
| Al       | 78.149     | 100       |           | Mg       | 79.880     | 200       |           |
| Al VI    | 78.178     | 50        |           | Na VII   | 79.893     | 300d      |           |
| Al VIII? | 78.225     | 1         |           | Al VII   | 79.919     | 300       |           |
| Mg VI    | 78.239     | 10        |           | Al VII   | 79.952     | 250       |           |
| Al       | 78.256     | 70        |           | Na VII   | 80.008     | 300       |           |
| P VII    | 78.285     | P         |           | Al       | 80.014     | 10        |           |
| Al VII   | 78.327     | 1000      |           | Mg VI    | 80.032     | 200       |           |
| Al VII   | 78.351     | 1000b     |           | Mg VI    | 80.075     | 200       |           |
| Al VIII  | 78.351     | 1000b     |           | Na VII   | 80.133     | 10        |           |
| Mg       | 78.376     | 10        |           | Na VII   | 80.174     | 10        |           |
| Ne IX    | 78.38      |           |           | Mg VIII  | 80.229     | 400d      |           |
| Mg VII   | 78.405     | 10        |           | Na VII   | 80.245     | 100       |           |
| P VII    | 78.414     | P         |           | Mg VIII  | 80.255     | 400d      |           |
| Al       | 78.421     | 10        |           | Al VIII  | 80.320     | 10        |           |
| Mg VIII  | 78.446     | 600d      |           | Na VI    | 80.345     | 10        |           |
| Na VII   | 78.459     | 10        |           | Si VI    | 80.395     | 250       |           |
| Al VI    | 78.459     | 70        |           | Al       | 80.403     | 10        |           |
| Al       | 78.508     | 150       |           | Mg IX    | 80.428     | 100       |           |
| Mg VII   | 78.521     | 200       |           | Si VI    | 80.449     | 500       |           |
| Al       | 78.573     | 70        |           | Al VIII  | 80.483     | 10d       |           |
| Mg VIII  | 78.574     | 600d      |           | Si VI    | 80.491     | 250       |           |
| Si V     | 78.611     | 50        |           | Si VI    | 80.501     | 500       |           |
| Al VI    | 78.628     | 10        |           | P VII    | 80.507     | P         |           |
| Mg       | 78.643     | 100d      |           | Mg       | 80.563     | 100       |           |
| Mg       | 78.668     | 100d      |           | Si VI    | 80.577     | 600       |           |
| Al VI    | 78.712     | 10        |           | Ne VII   | 80.62      | 300       |           |
| Na VII   | 78.771     | 10        |           | Na VI    | 80.645     | 10d       |           |
| Al       | 78.836     | 100       |           | Si VI    | 80.698     | 500       |           |
| Si V     | 78.903     | 50        |           | Al VIII  | 80.704     | 100       |           |
| Na VII   | 78.907     | 300       |           | Mg VI    | 80.724     | 10        |           |
| Al       | 78.938     | 300       |           | Si VI    | 80.725     | 500       |           |
| O VII    | 78.94      | 50        |           | Na VIII  | 80.756     | 10        |           |
| Na VII   | 78.982     | 200       |           | Al VI    | 80.770     | 70        |           |
| Al VII   | 79.012     | 500       |           | Mg VIII  | 80.806     | 10d       |           |
| Mg VI    | 79.059     | 10d       |           | Si V     | 80.807     | 100       |           |
| Mg VII   | 79.131     | 500       |           | P VII    | 80.813     | P         |           |
| Mg VII   | 79.168     | 500       |           | Si VI    | 80.821     | 400       |           |
| Al VII   | 79.197     | 500       |           | Mg VIII  | 80.889     | 100       |           |
| Si VII   | 79.236     | 250       |           | Ar XVIII | 80.9       | P         |           |
| Mg VII   | 79.248     | 100       |           | Si VI    | 80.908     | 400       |           |
| Si VII   | 79.262     | 50        |           | F IX     | 80.91      | P         |           |
| P VII    | 79.382     | P         |           | Mg VI    | 80.930     | 200       |           |
| Al VIII  | 79.455     | 120       |           | N VII    | 80.96      | P         |           |
| Na VII   | 79.477     | 200       |           | Mg VII   | 81.024     | 100       |           |

| Element  | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|----------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Si VI    | 81.030     | 350       |           | Al      | 82.908     | 50d       |           |
| Mg VI    | 81.106     | 300       |           | Mg VII  | 82.940     | 400       |           |
| Si V     | 81.113     | 100       |           | Mg VII  | 82.969     | 400       |           |
| Mg VII   | 81.133     | 300       |           | Na XI   | 82.97      | P         |           |
| Na IX    | 81.175     | 500       |           | Si VI   | 83.006     | 200       |           |
| Al VI?   | 81.176     | 50        |           | Mg VII  | 83.015     | 500d      |           |
| Na VIII  | 81.210     | 500       |           | Al      | 83.102     | 10        |           |
| Al VII   | 81.234     | 50        |           | Si VI   | 83.128     | 750       |           |
| Mg VIII? | 81.304     | 100       |           | Na      | 83.180     | 100       |           |
| Al VI?   | 81.339     | 10        |           | P XV    | 83.2       | P         |           |
| Na IX    | 81.350     | 500       |           | Be III  | 83.202     |           |           |
| Mg VIII? | 81.368     | 10        |           | Na VIII | 83.240     | 700       |           |
| Na VII   | 81.430     | 100       |           | Si VI   | 83.258     | 250       |           |
| Si       | 81.449     | 50        |           | Si VI   | 83.283     | 50        |           |
| Si VII   | 81.449     | 50        |           | Na VIII | 83.288     | 800       |           |
| Na VI    | 81.498     | 200b      |           | Al      | 83.335     | 10        |           |
| Na VII   | 81.498     | 200b      |           | Si VI   | 83.358     | 400       |           |
| O VII    | 81.50      | 100       |           | Na VIII | 83.391     | 900       |           |
| Na VI    | 81.543     | 100d      |           | Mg VI   | 83.403     | 400b      |           |
| Si VII   | 81.558     | 250       |           | Mg VII  | 83.403     | 400b      |           |
| Al       | 81.560     | 100       |           | Al VIII | 83.465     | 50        |           |
| Na VI    | 81.584     | 100d      |           | Mg VI   | 83.519     | 300b      |           |
| Si VII   | 81.620     | 600       |           | Mg VII  | 83.519     | 300b      |           |
| Al       | 81.667     | 100       |           | Si VI   | 83.526     | 400       |           |
| Mg VIII  | 81.732     | 300       |           | Mg VI   | 83.560     | 200b      |           |
| Al VI    | 81.738     | 50b       |           | Mg VII  | 83.560     | 200b      |           |
| Al VII   | 81.738     | 50b       |           | Mg VII  | 83.587     | 200       |           |
| Mg VIII  | 81.790     | 200       |           | Si VI   | 83.611     | 400       |           |
| Al VII   | 81.806     | 200d      |           | Mg VII  | 83.635     | 10        |           |
| Mg VIII  | 81.844     | 400       |           | Al VIII | 83.635     | 10        |           |
| Na VII   | 81.855     | 400       |           | Na VI   | 83.639     | 100       |           |
| O VII    | 81.89      | 150       |           | Si VI   | 83.639     | 150       |           |
| Be III   | 81.891     |           |           | N VII   | 83.65      | P         |           |
| Si VII   | 81.895     | 500       |           | Si VI   | 83.684     | 50        |           |
| Mg VIII  | 81.943     | 200       |           | Mg VII  | 83.716     | 300       |           |
| Mg VIII  | 81.979     | 200       |           | Si VI   | 83.729     | 50        |           |
| Si VII   | 81.998     | 150       |           | Mg VII  | 83.766     | 500       |           |
| Al VI    | 82.082     | 70        |           | Si VI   | 83.802     | 300       |           |
| Al       | 82.105     | 70        |           | Al VII  | 83.831     | 350       |           |
| Mg       | 82.111     | 10        |           | Mg VII  | 83.910     | 300       |           |
| Al       | 82.128     | 70        |           | Mg VII  | 83.959     | 400d      |           |
| Mg VI    | 82.238     | 200b      |           | Si VI   | 83.965     | 10        |           |
| Mg VIII  | 82.238     | 200b      |           | Al VII  | 84.007     | 200       |           |
| Ne VII   | 82.26      | 600       |           | Mg VII  | 84.025     | 500       |           |
| Al VI    | 82.267     | 50        |           | Na VIII | 84.050     | 500       |           |
| Mg VIII  | 82.317     | 300       |           | Si VI   | 84.082     | 600b      |           |
| Al VI    | 82.338     | 10        |           | Si VII  | 84.082     | 600b      |           |
| Be III   | 82.377     |           |           | Mg VII  | 84.087     | 300b      |           |
| Al       | 82.423     | 50        |           | Mg VIII | 84.087     | 300b      |           |
| Mg VI    | 82.475     | 100       |           | Al VII  | 84.098     | 100       |           |
| Na       | 82.516     | 10        |           | Mg VII  | 84.189     | 10        |           |
| Al VIII  | 82.543     | 150       |           | Na VII  | 84.221     | 400       |           |
| Al       | 82.582     | 50        |           | Ne VII  | 84.34      | 200       |           |
| Mg VIII  | 82.598     | 200       |           | Al      | 84.479     | 10        |           |
| Si       | 82.622     | 50d       |           | S XVI   | 84.48      | P         |           |
| Na VII   | 82.636     | 10        |           | Mg VII  | 84.642     | 500       |           |
| Na VII   | 82.685     | 10        |           | Al VI?  | 84.650     | 100       |           |
| Mg VIII  | 82.709     | 200       |           | Mg VI   | 84.745     | 200d      |           |
| Mg VIII  | 82.822     | 300       |           | Be III  | 84.758     | 100       |           |
| Mg VI    | 82.853     | 100       |           | Al VI?  | 84.801     | 20        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Mg VIII | 84.827     | 10d       |           | Al      | 86.393     | 100       |           |
| Al VI?  | 84.828     | 70        |           | Na VIII | 86.417     | 500       |           |
| Na VII  | 84.832     | 10        |           | Mg      | 86.417     | 200d      |           |
| Mg VIII | 84.919     | 100       |           | Al      | 86.427     | 100       |           |
| Al VI?  | 84.928     | 10        |           | Mg      | 86.440     | 200d      |           |
| Al      | 85.046     | 1         |           | Na VIII | 86.479     | 600       |           |
| Mg VIII | 85.064     | 10        |           | Na VIII | 86.530     | 100       |           |
| Mg      | 85.091     | 10        |           | Al      | 86.540     | 10        |           |
| Mg VI   | 85.153     | 10b       |           | Na VII  | 86.596     | 400       |           |
| Mg VIII | 85.153     | 10b       |           | Na VII  | 86.652     | 500       |           |
| Si V    | 85.175     | 500       |           | Al VII  | 86.671     | 10        |           |
| Al      | 85.189     | 10        |           | Al VII  | 86.689     | 50        |           |
| Si VII  | 85.219     | 100       |           | F VII   | 86.728     | 10        |           |
| Mg VIII | 85.248     | 200       |           | Na VII  | 86.758     | 300b      |           |
| Na VII  | 85.260     | 300       |           | Na VIII | 86.758     | 300b      |           |
| Si VII  | 85.289     | 500       |           | Mg      | 86.762     | 100       |           |
| Na VII  | 85.297     | 300       |           | Mg VI   | 86.807     | 200       |           |
| Mg VII  | 85.336     | 10        |           | Mg VIII | 86.847     | 200       |           |
| Mg VII  | 85.407     | 700       |           | Al VII  | 86.887     | 750       |           |
| Al VI   | 85.423     | 100       |           | Na      | 86.890     | 10        |           |
| Na VII  | 85.458     | 400       |           | Al      | 86.975     | 10        |           |
| Al VI   | 85.515     | 1000      |           | Mg VIII | 87.017     | 100       |           |
| Al VI   | 85.569     | 200       |           | Al V    | 87.020     | 100       |           |
| Mg VI   | 85.577     | 200       |           | Al VII  | 87.060     | 600       |           |
| Si V    | 85.579     | 300       |           | Mg VII  | 87.131     | 500d      |           |
| Si VII  | 85.584     | 500       |           | Na VI   | 87.141     | 100b      |           |
| Mg VIII | 85.599     | 300       |           | Na VII  | 87.141     | 100b      |           |
| Si      | 85.614     | 20        |           | Mg VII  | 87.175     | 400d      |           |
| Mg VI   | 85.622     | 300       |           | Al VII  | 87.176     | 300       |           |
| Al VI   | 85.622     | 300       |           | Na VI   | 87.211     | 700b      |           |
| Al V    | 85.662     | 50        |           | Na VIII | 87.211     | 700b      |           |
| Si VII  | 85.698     | 100       |           | Al V    | 87.279     | 50d       |           |
| Al VI   | 85.724     | 300       |           | Al VI   | 87.334     | 400       |           |
| Mg VIII | 85.749     | 400       |           | Mg VI   | 87.406     | 10        |           |
| Al VI   | 85.764     | 400       |           | Na VII  | 87.471     | 10        |           |
| Al V    | 85.804     | 350       |           | Na      | 87.524     | 200       |           |
| Al VI   | 85.817     | 350       |           | Al VI   | 87.544     | 350       |           |
| Na VIII | 85.826     | 200       |           | Al VI   | 87.592     | 500       |           |
| Na VIII | 85.861     | 300       |           | Al VI   | 87.629     | 100       |           |
| Al V    | 85.865     | 100b      |           | Al VI   | 87.655     | 650       |           |
| Al VI   | 85.865     | 100b      |           | Mg      | 87.660     | 10        |           |
| Na VIII | 85.887     | 300       |           | Mg VII  | 87.722     | 600       |           |
| Al V    | 85.922     | 10b       |           | Mg VII  | 87.767     | 400       |           |
| Al VIII | 85.922     | 10b       |           | Al VI   | 87.783     | 250       |           |
| Na VIII | 85.936     | 100       |           | Al VI   | 87.802     | 250       |           |
| Al VI?  | 85.970     | 10        |           | Al VI   | 87.866     | 350       |           |
| Na VIII | 85.992     | 300       |           | Al VI   | 87.887     | 250       |           |
| Al VI   | 86.020     | 150       |           | Mg VII  | 87.889     | 500       |           |
| Mg VII  | 86.032     | 200d      |           | Al      | 87.932     | 100       |           |
| Na VIII | 86.039     | 500       |           | Si VII  | 88.008     | 150       |           |
| O VII   | 86.07      | 200       |           | Mg      | 88.016     | 200       |           |
| Al VI   | 86.070     | 150       |           | Al VII  | 88.033     | 900       |           |
| Al VI   | 86.097     | 150       |           | Na VI   | 88.038     | 100       |           |
| Mg      | 86.147     | 10        |           | Al      | 88.108     | 100       |           |
| Al VI   | 86.147     | 200       |           | Ne VIII | 88.11      | 700       |           |
| Mg VIII | 86.234     | 100       |           | Na VI   | 88.143     | 200d      |           |
| Al      | 86.282     | 50        |           | Al VI   | 88.170     | 1000      |           |
| Mg VIII | 86.359     | 100       |           | Na VI   | 88.223     | 100       |           |
| Al      | 86.360     | 100       |           | Al      | 88.241     | 10        |           |
| Na VIII | 86.381     | 400       |           | Na VI   | 88.246     | 200       |           |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Na VI   | 88.270     | 100d      |           | Na VII  | 90.830     | 10        |           |
| Al VI   | 88.273     | 750       |           | Si V    | 90.852     | 200       |           |
| Be III  | 88.314     | 330       |           | Al VI   | 90.858     | 600       |           |
| Al VI   | 88.325     | 100       |           | Mg VI   | 90.897     | 600b      |           |
| Na VI   | 88.340     | 100d      |           | Mg VII  | 90.897     | 600b      |           |
| Al VI   | 88.376     | 750       |           | Al V    | 90.914     | 200       |           |
| Na VI   | 88.387     | 10        |           | Al V    | 90.982     | 50d       |           |
| Al V    | 88.425     | 100       |           | Mg      | 91.013     | 10        |           |
| Na VI   | 88.460     | 100       |           | O VII   | 91.02      | 250       |           |
| Al VI   | 88.469     | 250       |           | Al      | 91.023     | 500       |           |
| N VII   | 88.51      | P         |           | Na VII  | 91.064     | 200       |           |
| Al V    | 88.539     | 400b      |           | Al V    | 91.078     | 10        |           |
| Al VI   | 88.539     | 400b      |           | Mg      | 91.129     | 10d       |           |
| Na      | 88.583     | 100       |           | Na VI   | 91.268     | 100       |           |
| Al V    | 88.636     | 100b      |           | Mg      | 91.302     | 10d       |           |
| Mg VII  | 88.680     | 600       |           | Al VI   | 91.332     | 500       |           |
| Al V    | 88.688     | 200b      |           | Si VI   | 91.369     | 200       |           |
| Al VI   | 88.688     | 100b      |           | Mg IX   | 91.385     | 10d       |           |
| Na VII  | 88.698     | 200       |           | Na VI   | 91.414     | 10d       |           |
| Na VII  | 88.747     | 300       |           | Mg VII  | 91.460     | 10d       |           |
| Al V    | 88.817     | 50        |           | P VI    | 91.471     | P         |           |
| Mg VI   | 88.827     | 200       |           | Na VI   | 91.475     | 10        |           |
| Na VII  | 88.865     | 400       |           | Al VIII | 91.487     | 50        |           |
| Mg XII  | 88.91      | P         |           | Mg VII  | 91.573     | 100       |           |
| Na VII  | 88.914     | 200       |           | Na VI   | 91.737     | 10        |           |
| Al V    | 88.945     | I         |           | Al V    | 91.750     | 50        |           |
| Mg VI   | 88.952     | 200       |           | Si VI   | 91.798     | 200       |           |
| Mg VI   | 89.021     | 10        |           | Na VI   | 91.836     | 10        |           |
| Mg      | 89.256     | 100       |           | Na VII  | 92.003     | 500       |           |
| Mg VII  | 89.407     | 200       |           | Al V    | 92.039     | 10        |           |
| Ne VII  | 89.41      | 400       |           | Mg VIII | 92.123     | 100d      |           |
| Mg VII  | 89.448     | 200       |           | Mg VII  | 92.256     | 300       |           |
| Mg VII  | 89.476     | 10        |           | Mg VIII | 92.324     | 10        |           |
| Mg      | 89.556     | 10        |           | Mg V    | 92.409     | 10d       |           |
| Mg VI   | 89.649     | 10        |           | Mg V    | 92.428     | 10d       |           |
| Na VIII | 89.759     | 200       |           | Mg      | 92.503     | 10        |           |
| Na VIII | 89.818     | 300       |           | Mg V    | 92.534     | 10        |           |
| Na VIII | 89.948     | 400       |           | Mg V    | 92.588     | 10        |           |
| Mg      | 90.165     | 10        |           | Na      | 92.608     | 10d       |           |
| Na VII  | 90.173     | 100       |           | Al VI   | 92.626     | 750       |           |
| Al VI   | 90.200     | 1000      |           | Al VI   | 92.636     | 200       |           |
| Na VII  | 90.252     | 400b      |           | Mg V    | 92.641     | 10        |           |
| Na VIII | 90.252     | 400b      |           | Mg      | 92.685     | 10        |           |
| Na XI   | 90.31      | P         |           | Na VII  | 92.774     | 200       |           |
| Mg      | 90.338     | 100       |           | Na VII  | 92.809     | 100       |           |
| Si V    | 90.453     | 200       |           | Na VII  | 92.843     | 100       |           |
| Mg      | 90.463     | 10        |           | Al VI   | 92.875     | 500       |           |
| Na VI   | 90.468     | 300       |           | Na VII  | 92.883     | 100       |           |
| Na VIII | 90.536     | 500       |           | Mg VII  | 92.898     | 200       |           |
| Al VII  | 90.550     | 300       |           | Na VII  | 92.930     | 200       |           |
| Al V    | 90.630     | 250b      |           | Mg VII  | 92.934     | 200       |           |
| Al VII  | 90.630     | 250b      |           | Si      | 92.957     | 50d       |           |
| Al V    | 90.646     | 100       |           | Mg VI   | 92.964     | 100b      |           |
| P VI    | 90.647     | P         |           | Mg VII  | 92.964     | 100b      |           |
| Cl XVII | 90.7       | P         |           | Al VI   | 92.970     | 250       |           |
| Al V    | 90.701     | 200       |           | Na VII  | 92.976     | 400       |           |
| Mg VII  | 90.706     | 400       |           | O VI    | 93.03      | 100       |           |
| Na VI   | 90.746     | 10        |           | Na      | 93.070     | 10        |           |
| Al VII  | 90.772     | 200       |           | Mg V    | 93.109     | 100b      |           |
| Mg VII  | 90.815     | 300       |           | Mg VI   | 93.109     | 100b      |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Na VIII | 93.120     | 100       |           | Mg VII  | 95.421     | 400b      |           |
| Na VIII | 93.197     | 10        |           | Al VI   | 95.436     | 100       |           |
| Na VIII | 93.242     | 200       |           | Mg VI   | 95.483     | 500b      |           |
| Al VII  | 93.269     | 10        |           | Mg VII  | 95.483     | 500b      |           |
| Al VII  | 93.295     | 120       |           | Si XIV  | 95.5       | P         |           |
| Na VIII | 93.339     | 10        |           | Na      | 95.551     | 200       |           |
| Na VII  | 93.393     | 400       |           | Mg V    | 95.556     | 100b      |           |
| Na VII  | 93.434     | 400       |           | Mg VII  | 95.556     | 100b      |           |
| Na VII  | 93.486     | 500       |           | Mg V    | 95.592     | 10        |           |
| Mg VI   | 93.493     | 300       |           | Al      | 95.624     | 100       |           |
| Al VII  | 93.516     | 100       |           | Mg VI   | 95.637     | 300b      |           |
| Na VII  | 93.528     | 100       |           | Mg VII  | 95.637     | 300b      |           |
| Al VII  | 93.542     | 1         |           | Mg VI   | 95.675     | 300       |           |
| Mg      | 93.650     | 200d      |           | F VII   | 95.697     | 10        |           |
| Al V    | 93.654     | 20        |           | Al      | 95.720     | 200       |           |
| Na VIII | 93.670     | 400       |           | F VII   | 95.775     | 100       |           |
| Mg      | 93.720     | 100d      |           | Na      | 95.796     | 10        |           |
| Al V    | 93.755     | 350       |           | Mg V    | 95.803     | 200b      |           |
| O VI    | 93.84      | 150       |           | Mg VI   | 95.803     | 200b      |           |
| Al V    | 93.855     | 200       |           | Al V    | 95.835     | 100       |           |
| Al V    | 93.880     | 70        |           | Al      | 95.859     | 10        |           |
| Na VIII | 93.898     | 200       |           | Ne VII  | 95.86      | 700       |           |
| Mg VIII | 93.911     | 10        |           | Mg V    | 95.909     | 100d      |           |
| Al V    | 93.955     | 300       |           | Na VI   | 95.933     | 300       |           |
| Mg      | 93.972     | 10        |           | Mg V    | 95.965     | 100       |           |
| Al V    | 93.981     | 100       |           | Al VII  | 95.965     | 200d      |           |
| Na VII  | 94.020     | 10        |           | Na      | 96.018     | 100       |           |
| Mg VII  | 94.043     | 400b      |           | Mg V    | 96.019     | 200b      |           |
| Mg VIII | 94.043     | 400b      |           | Mg VII  | 96.019     | 200b      |           |
| Al V    | 94.089     | 70        |           | Si VI   | 96.020     | 500       |           |
| Al V    | 94.117     | 120       |           | Al VI?  | 96.071     | 10        |           |
| Al V    | 94.160     | 100       |           | Mg V    | 96.085     | 100b      |           |
| Mg VII  | 94.174     | 300       |           | Mg VI   | 96.085     | 100b      |           |
| Al V    | 94.187     | 100       |           | O VII   | 96.12      | 300       |           |
| Na VI   | 94.208     | 100       |           | Na VI   | 96.124     | 10        |           |
| Mg VII  | 94.276     | 200b      |           | P XV    | 96.13      | P         |           |
| Mg VIII | 94.276     | 200b      |           | Al V    | 96.150     | 50        |           |
| Na VII  | 94.288     | 600       |           | Mg V    | 96.159     | 10b       |           |
| Al V    | 94.321     | 10        |           | Mg VI   | 96.159     | 100b      |           |
| Ne VII  | 94.33      | 600       |           | Na VI   | 96.196     | 100       |           |
| Al V    | 94.394     | 10        |           | Al VII  | 96.198     | 50        |           |
| Na VII  | 94.468     | 700       |           | Mg VI   | 96.240     | 100       |           |
| Mg      | 94.721     | 100       |           | Mg VI   | 96.256     | 200       |           |
| Mg V    | 94.793     | 10        |           | Mg VI   | 96.303     | 200       |           |
| Na VI   | 94.827     | 10d       |           | Na VI   | 96.307     | 100       |           |
| Al      | 94.970     | 150       |           | Al VII  | 96.319     | 10        |           |
| Ne VII  | 94.99      | 400       |           | Mg VI   | 96.378     | 100       |           |
| O VI    | 95.02      | 200       |           | Si V    | 96.439     | 750       |           |
| Mg VII  | 95.027     | 400       |           | Al VI   | 96.442     | 10        |           |
| Mg VII  | 95.089     | 10        |           | Mg VI   | 96.467     | 10        |           |
| Mg VII  | 95.139     | 100       |           | Na VI   | 96.475     | 300       |           |
| Na VI   | 95.182     | 100       |           | Si VI   | 96.488     | 500       |           |
| Mg VII  | 95.233     | 100       |           | Na      | 96.572     | 10        |           |
| Mg VII  | 95.259     | 200       |           | Mg VI   | 96.670     | 200       |           |
| Na VI   | 95.263     | 100       |           | Al VI   | 96.673     | 50d       |           |
| Na VI   | 95.319     | 10        |           | Mg VI   | 96.704     | 200       |           |
| Mg VI   | 95.385     | 400b      |           | O VI    | 96.78      | 250       |           |
| Mg VII  | 95.385     | 400b      |           | Mg VI   | 96.797     | 100       |           |
| Al      | 95.405     | 10        |           | Na VII  | 96.845     | 100       |           |
| Mg VI   | 95.421     | 400b      |           | Mg VI   | 96.857     | 100       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Na VII  | 96.872     | 200       |           | F VI    | 99.203     | 10        |           |
| Mg VI   | 96.903     | 10        |           | Mg V    | 99.205     | 1         |           |
| Na VII  | 96.922     | 300       |           | Mg VI   | 99.279     | 400       |           |
| Mg VI   | 96.939     | 400       |           | Al V    | 99.290     | 500       |           |
| Al      | 96.939     | 10        |           | Mg VI   | 99.333     | 400       |           |
| Mg VI   | 96.973     | 400       |           | Na VII  | 99.421     | 400       |           |
| Si V    | 97.143     | 500       |           | Al V    | 99.427     | 200       |           |
| Mg VI   | 97.251     | 500       |           | Si VI   | 99.460     | 750       |           |
| Mg VI   | 97.278     | 500       |           | N VI    | 99.5       | P         |           |
| Mg V    | 97.391     | 100       |           | Na VI   | 99.500     | 10        |           |
| N VI    | 97.4       | P         |           | Mg      | 99.535     | 100       |           |
| Mg V    | 97.439     | 200       |           | Al V    | 99.544     | 100       |           |
| Mg VIII | 97.465     | 200       |           | Na VII  | 99.556     | 400       |           |
| Mg VIII | 97.525     | 10        |           | Si VI   | 99.598     | 500       |           |
| Ne VII  | 97.54      | 700       |           | Mg      | 99.610     | 200       |           |
| Mg V    | 97.563     | 100       |           | Al V    | 99.616     | 350       |           |
| Mg V    | 97.606     | 200b      |           | Na VI   | 99.617     | 100       |           |
| Mg VIII | 97.606     | 200b      |           | O VI    | 99.68      | 250       |           |
| Na VI   | 97.636     | 10        |           | Na VI   | 99.680     | 100b      |           |
| Mg V    | 97.686     | 100b      |           | Na VII  | 99.680     | 100b      |           |
| Mg VIII | 97.686     | 100b      |           | Mg VI   | 99.713     | 300       |           |
| Na VII  | 97.790     | 100       |           | Mg VI   | 99.738     | 300       |           |
| Na VII  | 97.907     | 200       |           | Al V    | 99.769     | 20        |           |
| Na VII  | 98.016     | 100       |           | Mg V    | 99.788     | 100       |           |
| Mg VII  | 98.032     | 300       |           | Si VI   | 99.966     | 500       |           |
| Na VII  | 98.080     | 300b      |           | Mg      | 100.196    | 100       |           |
| Na VIII | 98.080     | 300b      |           | Be III  | 100.254    | 1000      |           |
| Ne VIII | 98.11      | 700       |           | Na      | 100.337    | 100       |           |
| Na VII  | 98.188     | 300       |           | Mg      | 100.374    | 100       |           |
| Si V    | 98.209     | 100       |           | Ne X    | 100.41     | P         |           |
| Mg V    | 98.235     | 100       |           | Mg      | 100.421    | 100       |           |
| Ne VIII | 98.27      | 700       |           | Na VI   | 100.469    | 200       |           |
| Na      | 98.271     | 10d       |           | Na VI   | 100.519    | 300       |           |
| Mg V    | 98.271     | 200       |           | Mg      | 100.519    | 10        |           |
| N VI    | 98.3       | P         |           | Mg      | 100.545    | 200       |           |
| Na VI   | 98.309     | 10        |           | Na VI   | 100.590    | 100       |           |
| Na VII  | 98.378     | 300       |           | Mg      | 100.597    | 200       |           |
| Na VII  | 98.394     | 300       |           | Al VI   | 100.616    | 600       |           |
| Mg V    | 98.406     | 100       |           | Al VI   | 100.639    | 100       |           |
| Mg V    | 98.444     | 100       |           | Si VI   | 100.640    | 500d      |           |
| Mg VI   | 98.508     | 300       |           | Mg VI   | 100.702    | 500       |           |
| Mg V    | 98.636     | 200       |           | Na VII  | 100.718    | 200       |           |
| Al VI?  | 98.684     | 10        |           | Na V    | 100.851    | 10        |           |
| F VIII  | 98.707     | 10        |           | Al VI   | 100.894    | 200       |           |
| F VIII  | 98.799     | 10        |           | Mg VI   | 100.904    | 400       |           |
| Mg V    | 98.805     | 200       |           | Al VI   | 100.919    | 200       |           |
| Mg V    | 98.872     | 100       |           | Na V    | 100.945    | 10        |           |
| Mg V    | 98.983     | 400b      |           | Mg V    | 100.949    | 10        |           |
| Mg VI   | 98.983     | 400b      |           | Si VI   | 100.963    | 50        |           |
| Mg VII  | 98.983     | 400b      |           | Al VI   | 101.027    | 150       |           |
| Na VI   | 99.004     | 10        |           | Si VI   | 101.160    | 10        |           |
| Mg V    | 99.025     | 200b      |           | Na      | 101.201    | 10        |           |
| Mg VI   | 99.025     | 200b      |           | Mg      | 101.322    | 100       |           |
| F VI    | 99.044     | 10        |           | Na      | 101.348    | 10        |           |
| Mg V    | 99.067     | 200       |           | Mg      | 101.398    | 10        |           |
| Si VI   | 99.095     | 500       |           | N VI    | 101.46     | P         |           |
| F VI    | 99.105     | 15        |           | Mg VI   | 101.508    | 200d      |           |
| N VII   | 99.13      | P         |           | Mg VI   | 101.556    | 300       |           |
| Mg V    | 99.149     | 10        |           | O VI    | 101.57     | 100       |           |
| Al V    | 99.200     | 50        |           | Mg V    | 101.671    | 300       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Mg V    | 101.782    | 300       |           | Mg      | 104.342    | 300       |           |
| Na VII  | 101.785    | 300       |           | Al VI   | 104.344    | 800       |           |
| Na VII  | 101.816    | 300       |           | Al V    | 104.363    | 500       |           |
| Mg      | 101.845    | 100       |           | Mg V    | 104.432    | 200       |           |
| Mg VII  | 101.956    | 200       |           | Na      | 104.440    | 10        |           |
| Na VIII | 102.043    | 10        |           | Al V    | 104.447    | 500       |           |
| Mg      | 102.053    | 10        |           | Al VI   | 104.466    | 400       |           |
| Mg V    | 102.079    | 200       |           | Al V    | 104.495    | 400       |           |
| Mg VII  | 102.138    | 100       |           | Mg VI   | 104.519    | 300       |           |
| Mg VI   | 102.189    | 500       |           | N VI    | 104.58     | P         |           |
| Na VII  | 102.226    | 100       |           | Mg VI   | 104.597    | 500       |           |
| Mg VI   | 102.239    | 500       |           | O VI    | 104.67     | 250       |           |
| O VI    | 102.30     | 150       |           | O VI    | 104.811    | 350       |           |
| Na VII  | 102.390    | 100       |           | Na VII  | 104.871    | 200       |           |
| S XVI   | 102.4      | P         |           | Na VII  | 104.955    | 300       |           |
| O VIII  | 102.43     | P         |           | Al      | 104.960    | 10        |           |
| Na VII  | 102.448    | 10        |           | N VI    | 105.0      | P         |           |
| Mg VII  | 102.471    | 300       |           | Mg      | 105.066    | 500       |           |
| N VI    | 102.6      | P         |           | Na VII  | 105.111    | 300       |           |
| Si VI   | 102.846    | 50        |           | Mg VII  | 105.159    | 100       |           |
| Li III  | 102.856    | P         |           | Na VII  | 105.205    | 200       |           |
| Ne VIII | 102.89     | 500       |           | Na VII  | 105.354    | 400       |           |
| Mg      | 102.906    | 300       |           | Mg VI   | 105.410    | 200       |           |
| Na VI   | 103.002    | 10        |           | Li III  | 105.468    | P         |           |
| Al VI   | 103.062    | 10        |           | Mg VI   | 105.502    | 300       |           |
| Na VI   | 103.078    | 100       |           | Mg      | 105.778    | 100       |           |
| Ne VIII | 103.10     | 600       |           | Na XI   | 105.82     | P         |           |
| Si VI   | 103.163    | 100       |           | Mg      | 105.830    | 100       |           |
| Na VI   | 103.210    | 200       |           | Na VI   | 106.040    | 300       |           |
| O VI    | 103.26     | 200       |           | Ne VII  | 106.07     | 900       |           |
| Mg V    | 103.333    | 10        |           | Na VI   | 106.077    | 300       |           |
| Na VII  | 103.354    | 100       |           | Na VI   | 106.125    | 400       |           |
| Li III  | 103.359    | P         |           | Ne VII  | 106.19     | 900       |           |
| Na VII  | 103.400    | 10        |           | Na V    | 106.278    | 100       |           |
| Na V    | 103.482    | 10        |           | Na V    | 106.302    | 100       |           |
| N VI    | 103.6      | P         |           | Na      | 106.345    | 200       |           |
| Mg VII  | 103.743    | 10        |           | Na V    | 106.399    | 100       |           |
| Na VII  | 103.779    | 300       |           | Mg      | 106.453    | 200       |           |
| Al V    | 103.805    | 500       |           | Al      | 106.471    | 10        |           |
| Na VII  | 103.842    | 200       |           | Na V    | 106.490    | 100       |           |
| Mg VII  | 103.859    | 10        |           | Mg VII  | 106.524    | 200d      |           |
| Al V    | 103.881    | 700       |           | Na VI   | 106.580    | 10        |           |
| Na VII  | 103.891    | 400d      |           | Na      | 106.703    | 10d       |           |
| Mg V    | 103.904    | 400       |           | Mg VII  | 106.707    | 100       |           |
| Al VI   | 103.940    | 300       |           | O VI    | 106.79     | 300       |           |
| Mg V    | 103.947    | 300       |           | Mg VII  | 106.809    | 10        |           |
| Al V    | 103.990    | 200       |           | Na VI   | 107.014    | 200       |           |
| Na VII  | 104.000    | 200       |           | Na VI   | 107.061    | 300b      |           |
| Na VII  | 104.036    | 220       |           | Na VII  | 107.061    | 300b      |           |
| Al VI   | 104.047    | 1000      |           | Ne VII  | 107.07     | 400       |           |
| Al V    | 104.073    | 500       |           | Na VI   | 107.093    | 300b      |           |
| Mg V    | 104.100    | 200       |           | Na VII  | 107.093    | 300b      |           |
| Al V    | 104.121    | 600       |           | N VI    | 107.15     | P         |           |
| Mg V    | 104.140    | 200       |           | Na VI   | 107.158    | 100b      |           |
| Li III  | 104.142    | P         |           | Na VIII | 107.158    | 100b      |           |
| Al V    | 104.180    | 700       |           | Na VI   | 107.227    | 300       |           |
| Mg V    | 104.182    | 100       |           | Na VI   | 107.288    | 400       |           |
| Mg V    | 104.214    | 100       |           | Na VI   | 107.535    | 300       |           |
| Al      | 104.227    | 10        |           | Na VI   | 107.553    | 300       |           |
| Na      | 104.314    | 10        |           | Na VI   | 107.608    | 400       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Al VI   | 107.620    | 700       |           | N VI    | 110.23     |           |           |
| Mg V    | 107.661    | 200       |           | Si XIV  | 110.37     |           | P         |
| Na VI   | 107.683    | 500       |           | Ne VI   | 110.410    | 20        |           |
| Al V    | 107.711    | 300       |           | Na      | 110.474    | 10        |           |
| Na VI   | 107.742    | 200       |           | Na      | 110.577    | 100       |           |
| Mg VI   | 107.820    | 400       |           | N VI    | 110.59     |           | P         |
| Na V    | 107.934    | 200b      |           | Ne VII  | 110.60     | 700       |           |
| Na VI   | 107.934    | 200b      |           | Na VII  | 110.647    | 200       |           |
| Al V    | 107.945    | 1000      |           | O VI    | 110.69     | 150       |           |
| Li III  | 107.999    |           | P         | Na VI   | 110.750    | 200       |           |
| Al V    | 108.004    | 250       |           | Na VII  | 110.778    | 300       |           |
| Mg VI   | 108.015    | 300       |           | Al XIII | 110.8      |           | P         |
| Na V    | 108.017    | 200       |           | Mg V    | 110.809    | 200       |           |
| Al V    | 108.057    | 500       |           | Na V    | 110.817    | 200b      |           |
| Na VII  | 108.079    | 10        |           | Na VII  | 110.817    | 200b      |           |
| Al V    | 108.112    | 600       |           | Mg V    | 110.859    | 400       |           |
| Mg VI   | 108.114    | 200       |           | Na V    | 110.878    | 200       |           |
| Mg VI   | 108.148    | 100       |           | Na V    | 110.921    | 10        |           |
| Na      | 108.159    | 10        |           | Mg V    | 110.939    | 200       |           |
| Na VII  | 108.193    | 200       |           | Si      | 110.957    | 100       |           |
| Al V    | 108.315    | 200       |           | P XIII  | 110.969    |           | P         |
| Mg VI   | 108.338    | 100       |           | Mg V    | 111.031    | 300       |           |
| Na VII  | 108.373    | 100       |           | Mg V    | 111.091    | 300       |           |
| Al V    | 108.385    | 500       |           | Ne VI   | 111.142    | 10        |           |
| Al V    | 108.404    | 250       |           | Mg VI   | 111.160    | 300       |           |
| Mg VI   | 108.441    | 10        |           | Al IV   | 111.196    | 100       |           |
| Al V    | 108.446    | 150       |           | Mg V    | 111.199    | 400b      |           |
| Al V    | 108.462    | 500       |           | Mg VI   | 111.199    | 400b      |           |
| Al V    | 108.526    | 20        |           | Na VII  | 111.211    | 300       |           |
| Al IV   | 108.535    | 50        |           | Mg V    | 111.247    | 200       |           |
| Na VI   | 108.555    | 400       |           | Na VII  | 111.390    | 200       |           |
| Al V    | 108.616    | 50        |           | Mg V    | 111.419    | 200       |           |
| Na VI   | 108.678    | 10        |           | Mg V    | 111.467    | 200       |           |
| Al V    | 108.707    | 300       |           | Mg V    | 111.496    | 200       |           |
| Na VII  | 108.733    | 200       |           | Na V    | 111.512    | 100       |           |
| Na VII  | 108.829    | 100       |           | Na V    | 111.552    | 10        |           |
| Al V    | 108.851    | 50        |           | Mg VI   | 111.552    | 500       |           |
| Al IV   | 108.913    | 50d       |           | Al IV   | 111.589    | 150       |           |
| F VI    | 108.975    | 100       |           | Na VI   | 111.725    | 100       |           |
| Al V    | 109.021    | 150       |           | Mg VI   | 111.746    | 400       |           |
| F VI    | 109.040    | 150       |           | Ne VII  | 111.78     | 600       |           |
| Mg V    | 109.174    | 10        |           | Al IV   | 111.781    | 50        |           |
| Ne X    | 109.28     |           | P         | Na VI   | 111.793    | 100       |           |
| Al VI   | 109.284    | 350       |           | Mg VI   | 111.864    | 400       |           |
| Na VII  | 109.362    | 100       |           | Na V    | 111.879    | 10        |           |
| Mg      | 109.420    | 100       |           | Mg VII  | 111.984    | 10d       |           |
| Al VI   | 109.514    | 1000      |           | Na V    | 112.009    | 300b      |           |
| Na VII  | 109.519    | 200       |           | Na VI   | 112.009    | 300b      |           |
| Na VI   | 109.763    | 10        |           | Na V    | 112.077    | 10        |           |
| Mg V    | 109.812    | 200       |           | Mg VII  | 112.135    | 10        |           |
| Al VI   | 109.843    | 600       |           | Na V    | 112.186    | 10        |           |
| Na VI   | 109.896    | 500       |           | Mg VII  | 112.269    | 1         |           |
| Al VI   | 109.974    | 200       |           | Na V    | 112.347    | 10        |           |
| Mg V    | 110.029    | 100       |           | Na VI   | 112.448    | 300d      |           |
| Na      | 110.085    | 200       |           | Na      | 112.526    | 10        |           |
| Mg V    | 110.121    | 10b       |           | Na      | 112.641    | 10        |           |
| Mg VII  | 110.121    | 10b       |           | Mg IV?  | 112.914    | 10        |           |
| O VI    | 110.148    | 120       |           | F VII   | 112.935    | 400       |           |
| C VI    | 110.22     |           | P         | Na VI   | 112.950    | 400       |           |
| O VI    | 110.220    | 250       |           | F VII   | 112.976    | 100       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Na      | 113.061    | 100       |           | Mg VI   | 117.226    | 300       |           |
| Na VI   | 113.125    | 400       |           | O VI    | 117.40     | 300       |           |
| Al      | 113.140    | 50        |           | Al IV   | 117.410    | 10        |           |
| Mg VI   | 113.189    | 500       |           | Na VI   | 117.491    | 400       |           |
| Mg V    | 113.217    | 200       |           | Mg VI   | 117.527    | 100       |           |
| Mg      | 113.279    | 10        |           | Na VI   | 117.609    | 300       |           |
| Al VI   | 113.314    | 50        |           | Na VI   | 117.699    | 300       |           |
| Mg V    | 113.414    | 200       |           | Na V    | 117.703    | 10        |           |
| Al VI   | 113.437    | 150       |           | Si V    | 117.860    | 1000      |           |
| Mg V    | 113.518    | 100       |           | Na V    | 117.876    | 10        |           |
| Na V    | 113.574    | 10        |           | Mg      | 117.880    | 10        |           |
| Al VI   | 113.623    | 50d       |           | Na VIII | 117.909    | 10        |           |
| Mg V    | 113.703    | 400       |           | Na V    | 117.990    | 400       |           |
| Al VI   | 113.756    | 50        |           | Mg V    | 118.083    | 500       |           |
| Mg V    | 113.823    | 100       |           | Mg IV?  | 118.158    | 10d       |           |
| F VI    | 113.840    | 10d       |           | Mg IV?  | 118.420    | 10        |           |
| C VI    | 113.87     | P         |           | Na VI   | 118.500    | 10        |           |
| Ne VI   | 113.870    | 10        |           | Al V    | 118.500    | 500       |           |
| Li III  | 113.905    | 10P       |           | Na VI   | 118.585    | 10        |           |
| Mg V    | 113.934    | 300       |           | Mg IV?  | 118.603    | 100       |           |
| Na      | 113.952    | 10        |           | Ne V    | 118.715    | 50        |           |
| Mg V    | 113.990    | 300       |           | Mg IV?  | 118.740    | 10        |           |
| Mg V    | 114.029    | 200       |           | Mg V    | 118.810    | 500       |           |
| Mg V    | 114.059    | 400       |           | Na VII  | 118.840    | 10        |           |
| Mg V    | 114.199    | 300       |           | Ne V    | 118.841    | 10        |           |
| Mg V    | 114.226    | 300       |           | Na VII  | 118.902    | 10        |           |
| Mg V    | 114.285    | 300       |           | Mg IV?  | 118.914    | 10        |           |
| Al IV   | 114.313    | 10        |           | Si V    | 118.968    | 1000      |           |
| Mg V    | 114.324    | 300       |           | Al V    | 118.984    | 300       |           |
| Mg VI   | 114.412    | 10        |           | Na VII  | 119.014    | 100       |           |
| Mg      | 114.498    | 10        |           | Na VII  | 119.100    | 10        |           |
| Mg VI   | 114.624    | 10        |           | Na VI   | 119.204    | 10b       |           |
| Na VI   | 114.666    | 400       |           | Na VII  | 119.204    | 10b       |           |
| Na V    | 114.700    | 100d      |           | Mg V    | 119.401    | 400       |           |
| Mg VI   | 114.725    | 10        |           | Mg V    | 119.447    | 400       |           |
| Al IV   | 114.737    | 50        |           | Na VI   | 119.684    | 300       |           |
| Na V    | 114.738    | 100       |           | Mg IV?  | 119.978    | 10        |           |
| Mg V    | 114.785    | 600d      |           | F V     | 119.986    | 10        |           |
| Mg V    | 115.013    | 600d      |           | F V     | 120.032    | 15        |           |
| Mg V    | 115.093    | 400       |           | Na      | 120.040    | 100       |           |
| Ne VII  | 115.36     | 700       |           | Mg IV?  | 120.086    | 10d       |           |
| Na VII  | 115.361    | 10        |           | Ar VIII | 120.093    | 100       |           |
| Mg V    | 115.399    | 400       |           | F VI    | 120.116    | 100       |           |
| Na VII  | 115.475    | 10        |           | Ar VIII | 120.157    | 50        |           |
| Ne VII  | 115.52     | 700       |           | Na      | 120.220    | 100       |           |
| Mg V    | 115.537    | 400       |           | Mg IV?  | 120.283    | 100d      |           |
| Na VI   | 115.729    | 200       |           | Na      | 120.298    | 100       |           |
| Na VI   | 115.780    | 10d       |           | Ne VII  | 120.32     | 500       |           |
| O VI    | 115.824    | 350       |           | O VII   | 120.331    | 350       |           |
| Ne VII  | 115.97     | 600       |           | Na      | 120.355    | 10        |           |
| F VI    | 116.094    | 10        |           | Mg IV?  | 120.415    | 10d       |           |
| O VI    | 116.347    | 120       |           | Na      | 120.430    | 10        |           |
| O VI    | 116.419    | 250       |           | C VI    | 120.50     | P         |           |
| Al IV   | 116.464    | 250       |           | Na VI   | 120.931    | 300       |           |
| P XV    | 116.5      | P         |           | Na VI   | 120.973    | 200       |           |
| Ne VII  | 116.66     | 700       |           | Na VI   | 121.004    | 100       |           |
| N VI    | 116.81     |           |           | Mg VI   | 121.025    | 500       |           |
| Al IV   | 116.921    | 150       |           | Ne VI   | 121.140    | 50d       |           |
| Mg VI   | 116.968    | 500       |           | Na V    | 121.263    | 10        |           |
|         |            |           |           | Mg VI   | 121.290    | 300       |           |

| Element  | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|----------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Mg IV?   | 121.543    | 10        |           | Mg IV   | 124.870    | 200       |           |
| Mg V     | 121.644    | 600       |           | Mg IV   | 124.990    | 200       |           |
| Ne VII   | 121.68     | 700       |           | Na V    | 125.178    | 400       |           |
| Na VI    | 121.773    | 400       |           | Mg VI   | 125.206    | 300       |           |
| Na VI    | 121.913    | 320       |           | Na V    | 125.216    | 400       |           |
| Mg V     | 121.922    | 500       |           | Na V    | 125.286    | 500       |           |
| Na VI    | 122.018    | 300b      |           | Na VI   | 125.383    | 10        |           |
| Na VII   | 122.018    | 300b      |           | Na V    | 125.428    | 300       |           |
| Mg V     | 122.034    | 400       |           | Mg IV   | 125.459    | 300b      |           |
| F V      | 122.042    | 10        |           | Mg VI   | 125.459    | 300b      |           |
| F VI     | 122.122    | 100       |           | Na V    | 125.461    | 300       |           |
| O V      | 122.128    | 10        |           | Al V    | 125.525    | 750       |           |
| F VI     | 122.169    | 10        |           | Mg V    | 125.600    | 400b      |           |
| F VI     | 122.200    | 200       |           | Mg VI   | 125.600    | 400b      |           |
| F VI     | 122.251    | 15        |           | Mg IV   | 125.811    | 100       |           |
| Na VII   | 122.252    | 100       |           | Ne V    | 125.830    | 20        |           |
| Na       | 122.330    | 10        |           | Na V    | 125.899    | 200       |           |
| O V      | 122.372    | 10        |           | Al V    | 126.065    | 750       |           |
| N VI     | 122.44     |           |           | Na V    | 126.090    | 10        |           |
| Ne V     | 122.520    | 200b      |           | Na V    | 126.210    | 100       |           |
| Ne VI    | 122.520    | 200b      |           | Mg V    | 126.280    | 400       |           |
| Ar VIII  | 122.624    | 10        |           | Na V    | 126.368    | 10        |           |
| Ne VI    | 122.686    | 100       |           | Mg VI   | 126.450    | 100       |           |
| Ar VIII  | 123.033    | 50        |           | Na V    | 126.458    | 10        |           |
| F VI     | 123.051    | 10        |           | Mg VI   | 126.488    | 100       |           |
| F VI     | 123.090    | 10        |           | Mg V    | 126.544    | 200       |           |
| Na VI    | 123.134    | 400       |           | Na V    | 126.557    | 200       |           |
| F VI     | 123.175    | 100       |           | Na V    | 126.608    | 100       |           |
| Mg IV?   | 123.184    | 10        |           | Mg V    | 126.677    | 10b       |           |
| Mg IV    | 123.273    | 200       |           | Na V    | 126.779    | 10b       |           |
| Mg IV    | 123.377    | 100d      |           | Na VII  | 126.779    | 10b       |           |
| Mg IV?   | 123.418    | 10        |           | Na V    | 126.814    | 100b      |           |
| Mg IV    | 123.500    | 10        |           | Na VII  | 126.814    | 100       |           |
| Mg IV    | 123.590    | 10        |           | Na V    | 126.920    | 10        |           |
| Mg VI    | 123.590    | 100d      |           | F VI    | 126.923    | 500       |           |
| F V      | 123.665    | 10        |           | Mg      | 126.961    | 10        |           |
| Ne V     | 123.712    | 30        |           | Na V    | 126.985    | 10        |           |
| Mg IV    | 123.722    | 10d       |           | Mg      | 127.013    | 10        |           |
| Na VI    | 123.744    | 400       |           | Na V    | 127.036    | 10        |           |
| Mg IV    | 123.770    | 10        |           | Na V    | 127.444    | 400       |           |
| F V      | 123.774    | 100       |           | Na V    | 127.473    | 400       |           |
| Na VI    | 123.868    | 300       |           | Ne VII  | 127.65     | 500       |           |
| Na VI    | 123.929    | 500       |           | F VII   | 127.653    | 400       |           |
| F IX     | 123.97     | 9         |           | F VII   | 127.796    | 500       |           |
| Na VI    | 123.970    | 200       |           | Na VI   | 127.837    | 400       |           |
| Al IV    | 124.034    | 400       |           | Na      | 127.953    | 100       |           |
| Na VI    | 124.059    | 400       |           | Al XIII | 128.02     | P         |           |
| Na VI    | 124.153    | 400       |           | Na V    | 128.025    | 400       |           |
| F VI     | 124.387    | 300d      |           | Na V    | 128.051    | 400       |           |
| Mg IV    | 124.414    | 200       |           | Ne X    | 128.06     | P         |           |
| F VI     | 124.440    | 10        |           | Na      | 128.112    | 300       |           |
| F VI     | 124.474    | 10        |           | Na V    | 128.229    | 1         |           |
| Na VII   | 124.532    | 10        |           | O V     | 128.235    | 10        |           |
| Mg IV    | 124.538    | 200       |           | O V     | 128.297    | 10        |           |
| Al IV    | 124.543    | 300       |           | O VII   | 128.412    | 150       |           |
| O V      | 124.598    | 250       |           | N V     | 128.430    | 1         |           |
| Mg IV    | 124.649    | 100       |           | O VII   | 128.500    | 200       |           |
| Mg IV    | 124.759    | 200       |           | N V     | 128.662    | 10        |           |
| Ar XVIII | 124.8      | P         |           | Ne V    | 128.793    | 10        |           |
| Na VI    | 124.850    | 10        |           |         |            |           |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| N V     | 128.954    | 10        |           | F V     | 132.819    | 200       |           |
| Ne V    | 129.034    | 50        |           | O V     | 132.851    | 200       |           |
| Na VI   | 129.040    | 200       |           | O V     | 132.885    | 10        |           |
| N V     | 129.337    | 20        |           | Al V    | 133.013    | 200       |           |
| Na IV   | 129.464    | 10        |           | F V     | 133.082    | 10        |           |
| Al IV   | 129.729    | 700       |           | Cl VII  | 133.11     |           |           |
| Mg IV   | 129.730    | 200       |           | Na V    | 133.162    | 500       |           |
| O VI    | 129.786    | 150       | 5         | Mg IV   | 133.202    | 600       |           |
| N V     | 129.811    | 30        |           | F V     | 133.208    | 100       |           |
| Mg IV   | 129.855    | 400       |           | Al V    | 133.242    | 100       |           |
| O VI    | 129.872    | 250       | 5         | O VII   | 133.31     | 250       |           |
| Na V    | 129.942    | 100       |           | O V     | 133.328    | 10        |           |
| Mg IV   | 129.969    | 300       |           | Na V    | 133.388    | 400       |           |
| Mg XII  | 130.0      |           | P         | O V     | 133.395    | 10        |           |
| Mg IV   | 130.085    | 200       |           | O V     | 133.521    | 300       |           |
| Mg IV   | 130.118    | 200       |           | F V     | 133.599    | 110       |           |
| Mg IV   | 130.24     | 100       |           | F V     | 133.662    | 100       |           |
| Mg IV   | 130.294    | 200b      |           | Si XIV  | 133.8      |           | P         |
| Mg VI   | 130.294    | 200b      |           | N VII   | 133.82     |           | P         |
| N VI    | 130.32     |           |           | Na VI   | 133.825    | 200       |           |
| Mg IV   | 130.352    | 100       |           | N V     | 133.994    | 70        |           |
| Al V    | 130.413    | 1000      |           | Na VI   | 134.021    | 100d      |           |
| N V     | 130.431    | 40        |           | Na VI   | 134.135    | 10        |           |
| Mg IV?  | 130.541    | 10        |           | Na V    | 134.183    | 10        |           |
| Mg IV   | 130.630    | 100b      |           | Na V    | 134.272    | 200       |           |
| Mg VI   | 130.630    | 100b      |           | F V     | 134.407    | 400       |           |
| Na V    | 130.680    | 200       |           | Na VI   | 134.532    | 300       |           |
| Mg VI   | 130.701    | 10        |           | F V     | 134.539    | 500       |           |
| Na V    | 130.723    | 100       |           | F VII   | 134.703    | 100       |           |
| Al V    | 130.848    | 1000      |           | Ne VII  | 134.82     | 200       |           |
| Al V    | 131.003    | 1000      |           | F VII   | 134.882    | 200       |           |
| N V     | 131.254    | 50        |           | F IX    | 134.94     |           | P         |
| Na V    | 131.345    | 300       |           | C VI    | 134.95     |           | P         |
| Na V    | 131.413    | 200       |           | Li III  | 134.998    | 200P      |           |
| Al V    | 131.441    | 1000      |           | Al      | 135.231    | 10        |           |
| F V     | 131.516    | 10        |           | F VI    | 135.397    | 300       |           |
| Na V    | 131.635    | 300d      |           | O V     | 135.523    | 350       |           |
| F V     | 131.639    | 10        |           | Al      | 135.620    | 50        |           |
| Al IV   | 131.652    | 150       |           | F V     | 135.621    | 1         |           |
| O V     | 131.750    | 100       |           | Mg V    | 135.638    | 200       |           |
| O V     | 131.807    | 100       |           | F V     | 135.692    | 10        |           |
| Mg V    | 132.171    | 600       |           | Na V    | 135.791    | 300       |           |
| F V     | 132.207    | 10        |           | Na V    | 135.854    | 300       |           |
| Na IV   | 132.211    | 100       |           | Mg V    | 135.953    | 100       |           |
| O VI    | 132.219    | 100       |           | Ne VI   | 136.089    | 40        |           |
| F V     | 132.310    | 100       |           | Mg V    | 136.128    | 10        |           |
| O VI    | 132.312    | 200       |           | Ne V    | 136.215    | 20        |           |
| N V     | 132.383    | 60        |           | Al V    | 136.249    | 50        |           |
| F       | 132.389    | 10d       |           | N V     | 136.429    | 80        |           |
| F V     | 132.453    | 200       |           | Na IV   | 136.435    | 10        |           |
| Na IV   | 132.465    | 10d       |           | Na IV   | 136.550    | 100       |           |
| F V     | 132.484    | 300       |           | Na IV   | 136.645    | 10        |           |
| Mg V    | 132.485    | 500       |           | Al V    | 136.668    | 100       |           |
| F V     | 132.511    | 300       |           | Na IV   | 136.748    | 10        |           |
| Mg V    | 132.623    | 300       |           | Na IV   | 136.854    | 100       |           |
| Al V    | 132.630    | 500       |           | F V     | 136.902    | 300       |           |
| F V     | 132.699    | 100d      |           | F V     | 136.955    | 10        |           |
| Na IV   | 132.740    | 10        |           | Na IV   | 137.062    | 10        |           |
| O V     | 132.800    | 100       |           | Na IV   | 137.144    | 10        |           |
| Mg IV   | 132.815    | 500       |           | Mg V    | 137.234    | 600       |           |



| Element | Wavelength | Intensity | Multiplet | Element  | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|----------|------------|-----------|-----------|
| Mg V    | 137.414    | 800       |           | Na VI    | 141.040    | 10        |           |
| Mg      | 137.509    | 10        |           | F VI     | 141.154    | 200       |           |
| Na VI   | 137.589    | 10        |           | C V      | 141.27     |           | P         |
| Na IV   | 137.714    | 10        |           | O V?     | 142.119    | 10        |           |
| Mg V    | 137.748    | 700       |           | Na IV    | 142.232    | 200b      |           |
| Mg VI   | 137.814    | 10        |           | Na V     | 142.232    | 200b      |           |
| Mg V    | 137.880    | 600       |           | Na IV    | 142.363    | 10        |           |
| Ar VIII | 137.926    | 150       |           | Na V     | 142.415    | 10        |           |
| Na IV   | 137.945    | 10        |           | F V?     | 142.422    | 100       |           |
| Mg IV   | 137.966    | 100       |           | Ne V     | 142.441    | 100       |           |
| O V     | 138.030    | 200       |           | Ne V     | 142.503    | 100       |           |
| O V     | 138.054    | 300       |           | Ne V     | 142.661    | 40        |           |
| O V     | 138.108    | 400       |           | Na IV    | 142.688    | 10        |           |
| F V     | 138.181    | 100d      |           | Ne V     | 142.724    | 150       |           |
| C V     | 138.2      |           | P         | N V      | 142.797    | 1         |           |
| F V     | 138.256    | 10d       |           | Ne IV    | 142.929    | 15        |           |
| Mg IV   | 138.262    | 300       |           | Mg V     | 142.933    | 600       |           |
| Mg IV   | 138.394    | 200       |           | N V      | 142.981    | 1         |           |
| Ne VI   | 138.397    | 30        |           | Ne V     | 143.219    | 50        |           |
| Ar VIII | 138.440    | 250       |           | N V      | 143.241    | 10        |           |
| Na      | 138.628    | 200       |           | Ne V     | 143.273    | 100       |           |
| Ne VI   | 138.630    | 30        |           | Ne V     | 143.344    | 150       |           |
| Na VI   | 138.693    | 200       |           | Ar XVIII | 143.4      |           | P         |
| Mg IV   | 138.693    | 100       |           | N V      | 143.520    | 10        |           |
| Na V    | 138.812    | 200       |           | F V?     | 143.794    | 10        |           |
| Na V    | 138.917    | 300       |           | F V      | 143.897    | 100       |           |
| O V     | 139.025    | 350       |           | N V      | 143.914    | 20        |           |
| C V     | 139.5      |           | P         | C V      | 143.94     |           |           |
| Mg      | 139.705    | 10        |           | F V      | 143.965    | 15        |           |
| F VI    | 139.758    | 500       |           | Ne IV    | 144.019    | 10        |           |
| F VI    | 139.800    | 600       |           | Ne IV    | 144.151    | 10        |           |
| Na IV   | 139.867    | 200b      |           | Ne IV    | 144.288    | 5         |           |
| Na VII  | 139.867    | 200b      |           | Na V     | 144.330    | 200       |           |
| F VI    | 139.900    | 700       |           | N V      | 144.392    | 30        |           |
| Mg IV   | 139.995    | 100       |           | F V?     | 144.445    | 10        |           |
| Cl XVII | 140.0      |           | P         | F V?     | 144.478    | 1         |           |
| O V     | 140.045    | 10        |           | Na V     | 144.546    | 200       |           |
| O V     | 140.109    | 10        |           | F V      | 144.637    | 100       |           |
| Mg IV   | 140.120    | 400       |           | Na V     | 144.661    | 100       |           |
| Ne IV   | 140.127    | 15        |           | F V      | 144.673    | 90        |           |
| Na V    | 140.171    | 10        |           | O V      | 144.802    | 100       |           |
| Mg IV   | 140.176    | 400       |           | O V      | 144.837    | 100       |           |
| Na V    | 140.258    | 10        |           | N V      | 144.978    | 40        |           |
| F V     | 140.266    | 10        |           | Na IV    | 144.979    | 10        |           |
| N V     | 140.356    | 160P      |           | F V      | 145.177    | 100d      |           |
| N V     | 140.358    |           | P         | F V      | 145.392    | 200       |           |
| F V     | 140.414    | 100       |           | F VI     | 145.462    | 100       |           |
| Mg IV   | 140.425    | 200       |           | Mg V     | 145.485    | 500       |           |
| Mg IV   | 140.475    | 200       |           | F VI     | 145.489    | 100       |           |
| Mg IV   | 140.523    | 200       |           | F V      | 145.547    | 300       |           |
| Mg IV?  | 140.564    | 200       |           | F VI     | 145.585    | 100       |           |
| Ne V    | 140.716    | 50        |           | F VI     | 145.630    | 100       |           |
| Ne V    | 140.757    | 150       |           | F VI     | 145.691    | 300       |           |
| F IV    | 140.781    | 1         |           | N V      | 145.742    | 50        |           |
| Ne V    | 140.791    | 150       |           | Na IV    | 145.846    | 10        |           |
| F IV    | 140.816    | 1         |           | Na IV    | 146.060    | 200       |           |
| Na VI   | 140.833    | 200       |           | Mg V     | 146.083    | 600       |           |
| Mg IV   | 140.867    | 400       |           | Ne IV    | 146.262    | 10        |           |
| Mg IV   | 140.918    | 200       |           | Na IV    | 146.298    | 100       |           |
| Mg IV   | 140.966    | 400       |           | O V      | 146.345    | 100       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Na IV   | 146.398    | 10b       |           | O VI    | 150.124    | 250       | 2         |
| Na VI   | 146.398    | 10b       |           | N V     | 150.171    | 140       |           |
| Mg V    | 146.464    | 500       |           | Mg XII  | 150.26     |           | P         |
| Mg IV   | 146.526    | 400       |           | Na IV   | 150.297    | 400       |           |
| F VI    | 146.576    | 200       |           | F IV    | 150.335    | 10        |           |
| F VI    | 146.613    | 300       |           | F IV    | 150.422    | 10        |           |
| Mg V    | 146.621    | 400       |           | N V     | 150.429    | 20        |           |
| F VI    | 146.676    | 400       |           | N V     | 150.488    | 50        |           |
| N V     | 146.716    | 30        |           | C V     | 150.51     |           | P         |
| F VI    | 146.718    | 200       |           | Na IV   | 150.545    | 300       |           |
| N V     | 146.767    | 60        |           | Na IV   | 150.647    | 200       |           |
| Mg IV   | 146.836    | 300       |           | Na IV   | 150.695    | 200       |           |
| N V     | 146.921    | 30        |           | Ne IV   | 150.931    | 5         |           |
| Mg IV   | 146.949    | 400       |           | Na IV   | 150.968    | 200b      |           |
| Mg IV   | 147.006    | 400       |           | Na V    | 150.968    | 200b      |           |
| Mg IV   | 147.052    | 400       |           | F IV    | 150.977    | 100       |           |
| C V     | 147.1      |           | P         | F IV    | 151.005    | 100       |           |
| Ne V    | 147.132    | 150       |           | Na IV   | 151.048    | 10        |           |
| Mg IV?  | 147.252    | 300       |           | F IV    | 151.079    | 1         |           |
| O V     | 147.261    | 250       |           | Na V    | 151.127    | 400       |           |
| Mg IV   | 147.321    | 400       |           | Na V    | 151.188    | 100       |           |
| Mg IV   | 147.405    | 500       |           | Na IV   | 151.303    | 100b      |           |
| N V     | 147.424    | 240P      |           | Na V    | 151.303    | 100b      |           |
| N V     | 147.427    |           | P         | Ne V    | 151.424    | 120       |           |
| Mg IV   | 147.535    | 500       |           | O V     | 151.449    | 400       |           |
| Mg IV   | 147.632    | 10        |           | Ne IV   | 151.456    |           | P         |
| Mg IV   | 147.746    | 400       |           | O V     | 151.491    | 500       |           |
| Mg IV?  | 147.887    | 100       |           | O V     | 151.548    | 600       |           |
| Na V    | 147.897    | 200       |           | Ar VII  | 151.698    | 50        |           |
| F V     | 147.946    | 400       |           | Mg      | 151.808    | 10        |           |
| F V     | 148.002    | 500       |           | Ne IV   | 151.817    | 75        |           |
| F V     | 148.108    | 100       |           | Ar XI   | 151.86     |           |           |
| N V     | 148.116    | 40        |           | Ar VII  | 151.876    | 100       |           |
| Mg IV   | 148.121    | 200       |           | Mg V    | 152.019    | 10        |           |
| N V     | 148.168    | 70        |           | Mg V    | 152.149    | 300       |           |
| N V     | 148.328    | 10        |           | Mg      | 152.153    | 100       |           |
| C V     | 148.35     |           |           | Ne IV   | 152.231    | 75        |           |
| N V     | 148.387    | 40        |           | Ar VII  | 152.259    | 150       |           |
| C V     | 148.5      |           | P         | O IV    | 152.264    | 10        |           |
| Na V    | 148.642    | 400       |           | F V     | 152.339    | 200       |           |
| F VI    | 148.653    | 400       |           | O IV    | 152.355    | 10        |           |
| Ne IV   | 148.660    | 5         |           | Mg V    | 152.384    | 100       |           |
| Ar VIII | 148.725    | 100       |           | F V     | 152.391    | 300       |           |
| Ne IV   | 148.787    | 15b       |           | F V     | 152.511    | 400       |           |
| Ne V    | 148.787    | 15b       |           | Mg V    | 152.527    | 100       |           |
| Na V    | 148.856    | 300       |           | F V     | 152.563    | 200       |           |
| Ne IV   | 148.942    | 20        |           | Mg V    | 152.591    | 10d       |           |
| Na V    | 149.001    | 200       |           | F IV    | 152.997    | 1         |           |
| O V     | 149.034    | 10        |           | F IV    | 153.102    | 10        |           |
| O VIII  | 149.06     |           | P         | N V     | 153.136    | 180       |           |
| O V     | 149.078    | 200       |           | F IV    | 153.141    | 10        |           |
| Ar VIII | 149.333    | 150       |           | O IV    | 153.162    | 10        |           |
| Cl VII  | 149.37     |           |           | N V     | 153.192    | 280       |           |
| Cl VII  | 149.43     |           |           | C V     | 153.53     |           |           |
| Na VI   | 149.442    | 10        |           | N V     | 153.624    | 30        |           |
| Ne IV   | 149.589    | 10        |           | Ar XII  | 153.63     |           |           |
| Na VI   | 149.621    | 10        |           | F VI    | 153.678    | 200       |           |
| Ar XII  | 149.93     |           |           | N V     | 153.683    | 60        |           |
| O VI    | 150.089    | 500       | 2         | F VI    | 153.741    | 300       |           |
| N V     | 150.116    | 70        |           | F VI    | 153.880    | 400       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| O V     | 153.948    | 250       |           | N V     | 158.862    | 40P       |           |
| Ar XII  | 154.44     |           |           | Ar VIII | 158.923    | 400       |           |
| Ne IV   | 154.488    | 25        |           | F IV    | 158.925    | 100       |           |
| F VI    | 154.506    | 300       |           | O V     | 158.926    | 200       |           |
| Na XI   | 154.8      |           | P         | N V     | 158.928    | 70P       |           |
| F       | 154.968    | 10        |           | Ar VIII | 159.175    | 250       |           |
| Na IV   | 155.090    | 100       |           | Mg III  | 159.209    | 10d       |           |
| Al XIII | 155.2      |           | P         | O V     | 159.343    | 400       |           |
| Na IV   | 155.248    | 200       |           | O V     | 159.380    | 400       |           |
| Cl VII  | 155.32     |           |           | F V     | 159.558    | 1         |           |
| Na IV   | 155.354    | 10        |           | F V     | 159.658    | 10        |           |
| Na IV   | 155.445    | 300       |           | Mg III  | 159.755    | 10d       |           |
| Na IV   | 155.515    | 400       |           | Al IV   | 160.073    | 800       |           |
| Na IV   | 155.622    | 10        |           | O IV?   | 160.141    | 10        |           |
| F IV    | 155.624    | 10        |           | Mg IV   | 160.230    | 600       |           |
| F IV    | 155.673    | 10        |           | Ne IV   | 160.471    | 50        |           |
| Na IV   | 155.693    | 200d      |           | C V     | 160.53     |           | P         |
| Cl VII  | 155.78     |           |           | Cl XVII | 160.8      |           | P         |
| Na IV   | 155.781    | 100       |           | Mg IV   | 160.804    | 400       |           |
| Na IV   | 155.832    | 10        |           | Mg III  | 161.135    | 10        |           |
| O V     | 156.126    | 100       |           | F VI    | 161.174    | 120       |           |
| O V     | 156.158    | 200       |           | N VI    | 161.22     |           |           |
| O V     | 156.225    | 300       |           | F VI    | 161.257    | 100       |           |
| C V     | 156.23     |           | b         | F VI    | 161.308    | 300       |           |
| F VI    | 156.247    | 600       |           | F VI    | 161.341    | 90        |           |
| Ne IV   | 156.480    | 25d       |           | F VI    | 161.414    | 100       |           |
| Na IV   | 156.536    | 800       |           | F VI    | 161.477    | 120       |           |
| Ne V    | 156.610    | 20        |           | Mg III  | 161.686    | 10d       |           |
| Na IV   | 156.780    | 500       |           | Al IV   | 161.686    | 700       |           |
| Ne IV   | 156.87     | 15        |           | F V     | 162.013    | 200       |           |
| Na IV   | 156.887    | 300       |           | F V     | 162.053    | 300       |           |
| O VIII  | 156.92     |           | P         | F V     | 162.082    | 300       |           |
| Na V    | 157.036    | 200       |           | F V     | 162.121    | 200       |           |
| Na IV   | 157.090    | 400       |           | F V     | 162.172    | 300       |           |
| C V     | 157.2      |           | P         | F V     | 162.215    | 300       |           |
| Na V    | 157.209    | 300       |           | F V     | 162.270    | 400       |           |
| Na V    | 157.511    | 200       |           | Na IV   | 162.445    | 800       |           |
| F V     | 157.515    | 100d      |           | O V     | 162.494    | 300       |           |
| Na IV   | 157.599    | 100       |           | N V     | 162.556    | 480P      | 3         |
| Ne IV   | 157.626    | 25        |           | N V     | 162.564    |           | P 3       |
| Ne IV   | 157.781    | 15        |           | Cl XI   | 162.84     |           |           |
| Na IV   | 157.782    | 300       |           | F VI    | 163.138    | 200       |           |
| Ne IV   | 157.862    | 10        |           | Na IV   | 163.187    | 600       |           |
| S XVI   | 158.0      |           | P         | F V     | 163.456    | 300       |           |
| N V     | 158.024    | 240P      |           | F V     | 163.501    | 400       |           |
| Ne IV   | 158.063    | 25        |           | F V     | 163.558    | 500       |           |
| N V     | 158.088    | 360P      |           | Ne IV   | 163.562    | 60        |           |
| Ne IV   | 158.105    | 10        |           | Mg III  | 163.586    | 10        |           |
| F IX    | 158.12     |           | P         | F V     | 163.596    | 200       |           |
| F IV    | 158.398    | 10        |           | Ne IV   | 163.602    | 10        |           |
| C V     | 158.47     |           |           | Na V    | 163.616    | 300       |           |
| Mg III  | 158.530    | 10d       |           | Na IV   | 163.840    | 400       |           |
| F V     | 158.537    | 400       |           | Na V    | 163.930    | 200       |           |
| O IV    | 158.553    | 10        |           | B V     | 163.99     |           | P         |
| F IV    | 158.601    | 100       |           | F VI    | 164.015    | 100       |           |
| O IV    | 158.606    | 50        |           | Ne V    | 164.023    | 100       |           |
| Ne IV   | 158.646    | 75        |           | Ne V    | 164.145    | 100       |           |
| B V     | 158.7      |           | P         | Mg III  | 164.159    | 10        |           |
| O V     | 158.813    | 100d      |           | O V     | 164.178    | 200       |           |
| Ne IV   | 158.822    | 75        |           | Ne V    | 164.294    | 80        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Mg III  | 164.384    | 200       |           | Mg X    | 170.21     | P         |           |
| Cl X    | 164.5      |           |           | O V     | 170.218    | 400       |           |
| O V     | 164.578    | 500       |           | Ar X    | 170.63     | 200       |           |
| F IV    | 164.612    | 200       |           | Na V    | 170.631    | 100       |           |
| O V     | 164.628    | 400       |           | O VIII  | 170.80     | P         |           |
| O V     | 164.656    | 600       |           | Mg III  | 170.802    | 500       |           |
| O V     | 164.710    | 400       |           | Na V    | 170.923    | 100       |           |
| Na IV?  | 164.841    | 400       |           | O IV    | 170.940    | 10        |           |
| Mg III  | 164.954    | 200       |           | O IV    | 170.988    | 10        |           |
| O V     | 164.986    | 200       |           | F IV    | 171.066    | 300       |           |
| Mg III  | 165.195    | 10        |           | O IV    | 171.071    | 100       |           |
| F IV    | 165.350    | 10        |           | Na V    | 171.076    | 100d      |           |
| F IV    | 165.479    | 1         |           | Ne VI?  | 171.114    | 50        |           |
| Ar X    | 165.53     | 400       |           | O IV    | 171.121    | 100       |           |
| C V     | 165.91     | P         |           | O IV    | 171.191    | 10        |           |
| F V     | 165.983    | 900       |           | Ne VI?  | 171.212    | 20        |           |
| Cl XI   | 166.08     |           |           | F V     | 171.214    | 10        |           |
| O V     | 166.113    | 300       |           | F V     | 171.241    | 100       |           |
| Ne IV   | 166.113    | P         |           | F V     | 171.302    | 200       |           |
| O V     | 166.152    | 400       |           | S VI    | 171.327    | 20        |           |
| F V     | 166.177    | 1000      |           | Mg III  | 171.395    | 400       |           |
| O V     | 166.234    | 500       |           | Li II   | 171.582    | 100       | 3         |
| F IV    | 166.444    | 200       |           | Mg IV   | 171.653    | 800       |           |
| F IV    | 166.499    | 200       |           | Mg III  | 171.896    | 10        |           |
| Cl XI   | 166.64     |           |           | O V     | 172.169    | 800       | 2         |
| N V     | 166.875    | 440P      |           | Mg IV   | 172.306    | 700       |           |
| N V     | 166.946    | 520P      |           | Ne IV   | 172.492    | 200       | 3         |
| O IV    | 167.145    | 10d       |           | Ne IV   | 172.525    | 250       | 3         |
| C V     | 167.39     |           |           | Ne IV   | 172.620    | 400       | 3         |
| Ne V    | 167.483    | 150       |           | F IV    | 172.653    | 10        |           |
| Na V    | 167.510    | 100       |           | O VI    | 172.935    | 950       | 4         |
| Ne V    | 167.610    | 30        |           | F V     | 173.020    | 100       |           |
| Ne V    | 167.670    | 250       |           | O VI    | 173.082    | 1000      | 4         |
| Ne V    | 167.837    | 25        |           | F VI    | 173.145    | 100       |           |
| F V     | 167.858    | 100       |           | C V     | 173.27     |           |           |
| Ne IV   | 167.921    | 25b       |           | B V     | 173.54     | P         |           |
| Ne V    | 167.921    | 25b       |           | F V     | 173.656    | 10        |           |
| O V     | 167.991    | 800       | 6         | F V     | 173.714    | 10        |           |
| O V     | 168.042    | 400       | 6         | O IV    | 173.803    | 10        |           |
| O V     | 168.077    | 400       | 6         | O IV    | 173.851    | 50        |           |
| Na IV   | 168.084    | 1000      |           | O IV    | 173.917    | 100       |           |
| Ne IV   | 168.101    | 10        |           | N VI    | 173.92     |           |           |
| Na IV   | 168.409    | 800       |           | Ne V    | 173.932    | 500       | 6         |
| F IV    | 168.450    | 200       |           | O IV    | 173.968    | 10        |           |
| N V     | 168.514    | 50P       |           | Na IV   | 174.008    | 10        |           |
| Na IV   | 168.544    | 500       |           | Cl VII  | 174.035    | 150       |           |
| N V     | 168.587    | 120P      |           | O IV    | 174.105    | 100       |           |
| Mg III  | 169.150    | 100       |           | Ne IV   | 174.120    | P         |           |
| F IV    | 169.166    | 200       |           | O IV    | 174.220    | 150       |           |
| O V     | 169.478    | 10        |           | Ne IV   | 174.303    | 15        |           |
| F IV    | 169.481    | 100       |           | F V     | 174.490    | 300       |           |
| F IV    | 169.502    | 100       |           | F V     | 174.513    | 300       |           |
| O V     | 169.586    | 10        |           | O V     | 174.558    | 200       |           |
| F IV    | 169.610    | 100       |           | F V     | 174.568    | 300       |           |
| F IV    | 169.661    | 200       |           | Cl VII  | 174.603    | 200       |           |
| Mg III  | 169.746    | 100       |           | F V     | 174.698    | 400       |           |
| F IV    | 169.748    | 200       |           | Ne IV   | 174.880    | 50        |           |
| F IV    | 169.79     | 300       |           | Ne IV   | 174.920    | 40        |           |
| F IV    | 169.839    | 300       |           | F IV    | 175.033    | 10        |           |
| F IV    | 170.187    | 200       |           | F IV    | 175.132    | 1         |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| C V     | 175.67     |           |           | Na IV   | 182.128    | 600       |           |
| Ne IV   | 176.007    | 250       |           | O V     | 182.205    | 200       |           |
| F IV    | 176.110    | 10        |           | C VI    | 182.23     |           | P         |
| F IV    | 176.367    | 400       |           | Mg III  | 182.240    | 300       |           |
| F V     | 176.472    | 10        |           | Na IV   | 182.282    | 400       |           |
| Ar VII  | 176.566    | 500       |           | O IV    | 182.711    | 150       |           |
| Ne IV   | 177.161    | 400       |           | Ne IV   | 182.829    |           | P         |
| S X     | 177.59     | 250       |           | O IV    | 182.832    | 200       |           |
| O IV    | 177.598    | 10        |           | Mg III  | 182.973    | 200       |           |
| O IV    | 177.659    | 10        |           | F V     | 182.979    | 400       |           |
| O IV    | 177.698    | 50        |           | F V     | 183.016    | 300       |           |
| O IV    | 177.761    | 100       |           | O IV?   | 183.139    | 10        |           |
| O IV    | 177.808    | 100       |           | Ne IV   | 183.165    | 75        |           |
| F IV    | 177.971    | 200       |           | F V     | 183.208    | 10        |           |
| Li II   | 178.015    | 100       | 2         | Ne IV   | 183.247    | 60        |           |
| F IV    | 178.126    | 100       |           | O IV    | 183.353    | 10        |           |
| F V     | 178.434    | 500       |           | O IV    | 183.395    | 50        |           |
| F IV    | 178.540    | 100       |           | Mg IV   | 183.439    | 400       |           |
| F V     | 178.599    | 400       |           | O IV    | 183.454    | 50        |           |
| F V     | 178.612    | 300       |           | Na III  | 183.575    | 10        |           |
| F IV    | 178.670    | 300       |           | Na III  | 183.747    | 100       |           |
| O V     | 178.713    | 200       |           | Mg IV   | 183.915    | 100       |           |
| F IV    | 178.724    | 100       |           | O VI    | 183.937    | 650       | 3         |
| F IV    | 178.805    | 100       |           | O VI    | 184.117    | 850       | 3         |
| Na XI   | 178.83     |           | P         | Mg IV   | 184.189    | 10        |           |
| S IX    | 179.32     | 450       |           | Na III  | 184.218    | 10        |           |
| Ar VIII | 179.400    | 500       |           | F V?    | 184.232    | 10        |           |
| P XV    | 179.8      |           | P         | Ar VIII | 184.273    | 150       |           |
| F IV    | 179.827    | 100       |           | F V?    | 184.282    | 1         |           |
| F IV    | 179.907    |           | 1         | Ar VIII | 184.315    | 250       |           |
| F IV    | 179.943    | 200       |           | Ar XI   | 184.51     |           |           |
| F IV    | 180.029    | 10        |           | Ne V    | 184.730    | 100       |           |
| Mg IV   | 180.070    | 800       |           | Cl IX   | 185.26     |           |           |
| Ar VI   | 180.074    | 80        |           | O IV    | 185.384    | 10        |           |
| Ar VIII | 180.254    | 750       |           | O V?    | 185.455    | 200       |           |
| O IV    | 180.351    | 50        |           | Ne IV   | 185.479    | 100       |           |
| Ne IV   | 180.402    | 75        |           | F IV    | 185.484    | 300       |           |
| S X     | 180.41     | 100       |           | O V     | 185.747    | 600       | 12        |
| O IV    | 180.481    | 100       |           | N V     | 186.063    | 520P      | 6         |
| Mg IV   | 180.617    | 1000      |           | N V     | 186.149    | 620P      | 6         |
| Cl IX   | 180.71     |           |           | Mg III  | 186.510    | 900       | 4         |
| Cl X    | 180.71     |           |           | F IV    | 186.558    | 100       |           |
| Ar VI   | 180.719    | 120       |           | Ne IV   | 186.575    | 750       | 7         |
| S X     | 180.79     | 450       |           | F V     | 186.715    | 400       |           |
| Mg IV   | 180.796    | 900       |           | C V     | 186.72     |           |           |
| O IV    | 181.150    | 200       |           | Ne IV   | 186.787    | 25        |           |
| O IV    | 181.275    | 250       |           | F V     | 186.788    | 400       |           |
| Mg IV   | 181.345    | 800       |           | F V     | 186.842    | 500       |           |
| S XVI   | 181.5      |           | P         | O IV    | 186.872    | 50        |           |
| F IV    | 181.521    | 400       |           | F V     | 186.879    | 300       |           |
| F IV    | 181.571    | 400       |           | Ne IV   | 186.915    | 75        |           |
| Ne IV   | 181.614    | 100       |           | O IV    | 186.936    | 100       |           |
| F IV    | 181.655    | 200       |           | F V     | 186.968    | 400       |           |
| Ne IV   | 181.691    | 100       |           | O IV    | 186.982    | 10        |           |
| N IV    | 181.746    | 100       |           | F V     | 187.008    | 400       |           |
| Na IV   | 181.758    | 800       |           | Ar XI   | 187.08     |           |           |
| O IV    | 181.876    | 150       |           | F IV    | 187.105    | 200       |           |
| O IV    | 181.995    | 200       |           | Mg III  | 187.194    | 800       | 3         |
| C VI    | 182.09     |           | P         | F IV    | 187.240    | 300       |           |
| Mg XII  | 182.1      |           | P         | Ne X    | 187.3      |           | P         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| F IV    | 187.916    | 100       |           | O V     | 194.593    | 530       | 11        |
| F IV    | 188.004    | 10        |           | P IX    | 194.612    | P         |           |
| O IV    | 188.152    | 100       |           | Ne IV   | 194.623    | 250b      |           |
| O IV    | 188.190    | 10        |           | F       | 194.655    | 10        |           |
| Ne VI?  | 188.424    | 30        |           | N VII   | 194.71     | P         |           |
| Mg III  | 188.526    | 300       |           | Cl VI   | 194.796    | 100       |           |
| F IV    | 188.656    | 200       |           | Ne VI?  | 194.839    | 20        |           |
| F IV    | 188.758    | 100       |           | F VI    | 194.840    | 100       |           |
| Ar XI   | 188.82     |           |           | Ne VI?  | 194.936    | 20        |           |
| F IV    | 188.834    | 10        |           | Cl VI   | 195.227    | 150       |           |
| Na III  | 188.870    | 200       |           | Ne V    | 195.368    | 50        |           |
| Na III  | 189.346    | 100       |           | Na III  | 195.538    | 10        |           |
| Ar XI   | 189.57     |           |           | Ne V    | 195.553    | 30        |           |
| F V     | 189.943    | 200       |           | Ne V    | 195.621    | 20        |           |
| Na IV   | 190.126    | 600       |           | O IV    | 195.863    | 350       |           |
| N V     | 190.155    | 200P      |           | O IV    | 196.009    | 400       |           |
| N V     | 190.249    | 320P      |           | Cl VII  | 196.123    | 500       |           |
| Na IV   | 190.440    | 1000      |           | O IV    | 196.348    | 10d       |           |
| Al      | 190.560    | 50        |           | F IV    | 196.351    | 400       |           |
| Ne IV   | 190.565    | 125       |           | Cl VII  | 196.388    | 400       |           |
| F V     | 190.571    | 600       |           | F IV    | 196.390    | 500       |           |
| Cl VII  | 190.594    | 100       |           | O IV    | 196.435    | 10d       |           |
| Ne IV   | 190.645    | 75        |           | F IV    | 196.448    | 600       |           |
| Na IV   | 190.835    | 800       |           | F V     | 196.713    | 200       |           |
| F V     | 190.839    | 700       |           | P VIII  | 196.761    | P         |           |
| Ar XI   | 190.96     |           |           | S X     | 196.82     | 50        |           |
| Na IV   | 191.000    | 600       |           | F V     | 196.870    | 100       |           |
| Na      | 191.205    | 10        |           | N IV    | 196.954    | 20d       |           |
| Cl VII  | 191.283    | 200       |           | F IV    | 196.968    | 100       |           |
| O V     | 191.397    | 10        |           | N IV    | 197.007    | 100d      |           |
| O V     | 191.458    | 100       |           | C V     | 197.02     |           |           |
| S VI    | 191.480    | 20        |           | F IV    | 197.108    | 200       |           |
| O V     | 191.556    | 200       |           | N IV    | 197.230    | 300       |           |
| S VI    | 191.560    | 50        |           | P IX    | 197.246    | P         |           |
| O IV    | 191.609    | 100d      |           | F       | 197.298    | 100d      |           |
| O IV    | 191.640    | 10        |           | F V     | 197.615    | 1         |           |
| O IV    | 191.695    | 100       |           | F V     | 197.780    | 10        |           |
| O IV    | 191.752    | 150       |           | C IV    | 197.82     | 10        |           |
| Ar VII  | 191.759    | 150       |           | O V?    | 198.031    | 250       |           |
| F V     | 191.892    | 300       |           | F V     | 198.476    | 100       |           |
| F V     | 191.973    | 400       |           | S IX    | 198.55     | 250b      |           |
| Ar VII  | 192.041    | 250       |           | S VIII  | 198.550    | 50        |           |
| O IV    | 192.139    | 200       |           | F V     | 198.765    | 1         |           |
| O IV    | 192.169    | 200       |           | F IV    | 199.004    | 300       |           |
| O IV    | 192.206    | 250       |           | C IV    | 199.04     | 10        |           |
| O IV    | 192.244    | 150       |           | F IV    | 199.086    | 300       |           |
| S VI    | 192.273    | 20        |           | Li II   | 199.282    | 300       | 1         |
| Ar VII  | 192.635    | 350       |           | F IV    | 199.607    | 100       |           |
| O V     | 192.751    | 850       | 5         | F IV    | 199.761    | 500       |           |
| O V     | 192.799    | 900       | 5         | Na IV   | 199.769    | 600       |           |
| O V     | 192.906    | 950       | 5         | F IV    | 199.804    | 500       |           |
| Na      | 193.807    | 10        |           | F IV    | 199.849    | 500       |           |
| Na III  | 194.032    | 100       |           | F IV    | 199.934    | 500       |           |
| Ar XI   | 194.09     |           |           | F IV    | 200.001    | 500       |           |
| F V     | 194.108    | 300       |           | F IV    | 200.089    | 700       |           |
| Na III  | 194.156    | 10        |           | O VIII  | 200.15     | P         |           |
| Ne IV   | 194.276    | 500       | 11        | F V?    | 200.335    | 10        |           |
| Na III  | 194.306    | 100d      |           | C IV    | 200.68     | 10d       |           |
| B V     | 194.36     | P         |           | O IV    | 200.827    | 50        |           |
| Ne IV   | 194.477    | 200       |           | F V     | 200.861    | 100       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| O IV    | 200.915    | 50        |           | Si XIV  | 206.4      | P         |           |
| O IV    | 200.966    | 50        |           | F V     | 206.430    | 200       |           |
| O IV    | 200.995    | 100       |           | F       | 206.548    | 10        |           |
| F IV    | 201.011    | 600       |           | F V     | 206.594    | 300       |           |
| O IV    | 201.022    | 10        |           | P XV    | 206.6      | P         |           |
| F IV    | 201.063    | 700       |           | C IV    | 206.641    | 300d      |           |
| O IV    | 201.073    | 50        |           | Na III  | 206.871    | 10        |           |
| O IV    | 201.098    | 50        |           | O IV    | 207.183    | 300       |           |
| F IV    | 201.101    | 600       |           | O IV    | 207.239    | 350       |           |
| F IV    | 201.160    | 800       |           | O IV    | 207.348    | 200       |           |
| F IV    | 201.222    | 600       |           | Na III  | 207.355    | 10        |           |
| F IV    | 201.465    | 400       |           | Cl X    | 207.41     |           |           |
| Cl X    | 201.50     |           |           | Na III  | 207.458    | 10        |           |
| O V     | 202.158    | 350       | 14        | Cl VII  | 207.757    | 200d      |           |
| Na III  | 202.184    | 400       |           | O V     | 207.794    | 670       | 16        |
| O V     | 202.191    | 350       | 14        | F IV    | 208.254    | 900       |           |
| O V     | 202.226    | 350       | 14        | Ne IV   | 208.485    | 500       | 2         |
| O V     | 202.282    | 350       | 14        | F IV    | 208.549    | 200       |           |
| O V     | 202.335    | 350       | 14        | Ne IV   | 208.734    | 500       | 2         |
| O V     | 202.393    | 450       | 14        | Ne IV   | 208.899    | 400       | 2         |
| Na III  | 202.490    | 200       |           | N V     | 209.274    | 800P      | 2         |
| S VIII  | 202.605    | 50        |           | N V     | 209.308    | 800P      | 2         |
| Na III  | 202.720    | 300       |           | P V     | 210.004    | 10        |           |
| Na III  | 202.760    | 300       |           | Cl X    | 210.08     |           |           |
| O IV    | 202.891    | 200       |           | F IV    | 210.480    | 100       |           |
| F IV    | 202.989    | 10        |           | F IV    | 210.545    | 100       |           |
| O IV    | 203.048    | 250       |           | F IV    | 211.152    | 10        |           |
| Na III  | 203.050    | 300       |           | N IV    | 211.396    | 10        |           |
| C IV    | 203.057    | 100d      |           | O IV    | 211.808    | 10d       |           |
| F IV    | 203.152    | 100       |           | C IV    | 212.421    | 500       | 5         |
| Na III  | 203.282    | 200       |           | Ne IV   | 212.556    | 750       | 6         |
| Na III  | 203.324    | 200       |           | O IV    | 212.578    | 100d      |           |
| O V     | 203.783    | 400       | 13        | O IV    | 212.974    | 150d      |           |
| Cl X    | 203.80     |           |           | O IV    | 213.061    | 150d      |           |
| O V     | 203.821    | 500       | 13        | F       | 213.684    | 10d       |           |
| O V     | 203.851    | 400       | 13        | F IV    | 213.848    | 700       |           |
| O V     | 203.890    | 550       | 13        | O IV    | 213.978    | 200       |           |
| O V     | 203.935    | 400       | 13        | O IV    | 214.032    | 250       |           |
| Na IV   | 203.959    | 200       |           | F IV    | 214.062    | 700       |           |
| S VI    | 204.190    | 50        |           | O IV    | 214.155    | 300       |           |
| Ne IV   | 204.270    | 75        |           | O IV    | 214.209    | 200       |           |
| Ne IV   | 204.531    | 125       |           | Na III  | 214.235    | 400       |           |
| O IV    | 204.708    | 10d       |           | O IV    | 214.249    | 50        |           |
| Ne IV   | 204.786    | 75        |           | S VI    | 214.277    | 20        |           |
| O IV    | 204.905    | 10        |           | O IV    | 214.290    | 50        |           |
| Ne IV   | 204.908    | 25        |           | Na III  | 214.596    | 200       |           |
| N VII   | 204.98     | P         |           | Si VIII | 214.756    | 100       |           |
| O IV    | 204.996    | 10        |           | F III   | 214.804    | 100d      |           |
| O V     | 205.102    | 250       |           | F III   | 214.865    | 100       |           |
| Cl X    | 205.40     |           |           | Na III  | 214.868    | 400       |           |
| Na IV   | 205.487    | 600       |           | O V     | 215.034    | 500       | 4         |
| F V     | 205.552    | 400       |           | Na III  | 215.042    | 200       |           |
| F V     | 205.778    | 300       |           | O V     | 215.104    | 550       | 4         |
| O IV    | 205.842    | 10        |           | Na III  | 215.230    | 400       |           |
| Na IV   | 205.956    | 400       |           | O V     | 215.245    | 600       | 4         |
| N IV    | 205.960    | 200d      |           | Na III  | 215.340    | 400       |           |
| O IV    | 206.002    | 50        |           | Ne IV   | 215.396    | 25        |           |
| Cl X    | 206.02     |           |           | Ar XII  | 215.49     |           |           |
| N IV    | 206.021    | 220d      |           | Na III  | 215.498    | 10        |           |
| Na IV   | 206.155    | 300       |           | Na III  | 215.671    | 400       |           |

| Element | Wavelength | Intensity | Multiplet | Element  | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|----------|------------|-----------|-----------|
| F V     | 215.676    | 10        |           | S IX     | 224.75     | 450       |           |
| Ne IV   | 215.711    | 15        |           | Si IX    | 225.033    | 20        |           |
| Ne IV   | 215.843    | 75        |           | Cl VII   | 225.078    | 500       |           |
| Na      | 215.870    | 100       |           | N IV     | 225.098    | 300       | 6         |
| O V     | 216.018    | 530       | 15        | F        | 225.114    | 10d       |           |
| Na III  | 216.120    | 100       |           | N IV     | 225.136    | 400       | 6         |
| Ne X    | 216.41     | P         |           | N IV     | 225.205    | 500       | 6         |
| Na XI   | 216.8      | P         |           | S IX     | 225.23     | 50        |           |
| Si VIII | 216.800    | 20d       |           | O IV     | 225.299    | 250       |           |
| Si VIII | 216.918    | 100       |           | F        | 225.627    | 10d       |           |
| O IV    | 216.960    | 10        |           | O III    | 226.038    | 50d       |           |
| P V     | 217.220    | 20        |           | F III    | 226.051    | 200       |           |
| N IV    | 217.227    | 100       |           | F III    | 226.091    | 300       |           |
| Ne IV   | 217.337    | 75        |           | F III    | 226.166    | 400       |           |
| Na      | 217.385    | 10        |           | F V      | 226.341    | 200       |           |
| Ne IV   | 217.640    | 75        |           | S IX     | 226.59     | 100       |           |
| Ne IV   | 217.777    | 75        |           | F V      | 226.608    | 90        |           |
| Si VII  | 217.826    | 350       |           | F IV     | 226.944    | 600       |           |
| Ne IV   | 217.830    | 125       |           | Si IX    | 227.007    | 20        |           |
| F V?    | 217.893    | 10        |           | F IV     | 227.079    | 300       |           |
| F V?    | 218.052    | 1         |           | F IV     | 227.101    | 500       |           |
| N IV    | 218.085    | 100d      |           | S VI     | 227.197    | 200       |           |
| Ne IV   | 218.131    | 100       |           | F IV     | 227.211    | 400       |           |
| Ne IV   | 218.184    | 50        |           | C V      | 227.22     |           |           |
| Ar XII  | 218.28     |           |           | O V      | 227.374    | 350       |           |
| Ne IV   | 218.343    | 75        |           | O V      | 227.468    | 350       |           |
| Ne IV   | 218.483    | 100d      |           | O V      | 227.510    | 500       |           |
| Ne IV   | 218.643    | 125       |           | O V      | 227.549    | 350       |           |
| Ne IV   | 218.766    | 250       |           | O V      | 227.636    | 350       |           |
| F III   | 219.277    | 10d       |           | O V      | 227.688    | 350       |           |
| F III   | 219.588    | 1d        |           | S VI     | 227.845    | 200       |           |
| Ar VI   | 219.896    | 120       |           | S X      | 228.21     | 250       |           |
| P VII   | 219.910    | P         |           | C IV     | 228.27     | 10d       |           |
| O V     | 220.352    | 870       | 10        | F IV     | 228.496    | 1         |           |
| F IV    | 220.765    | 700       |           | F IV     | 228.552    | 10        |           |
| Ar VI   | 220.946    | 200       |           | F IV     | 228.645    | 100       |           |
| S IX    | 221.26     | 100       |           | S X      | 228.75     | 350       |           |
| O IV    | 221.515    | 10        |           | S IX     | 228.84     | 100       |           |
| Al      | 221.543    | 10        |           | O III    | 228.893    | 10        |           |
| O IV    | 221.648    | 200       |           | Al       | 228.911    | 10        |           |
| O V     | 222.23     | 250       |           | O III    | 228.988    | 10        |           |
| P VIII  | 222.360    | P         |           | F IV     | 229.261    | 200       |           |
| Ne IV   | 222.600    | 200       |           | He II    | 229.431    | P         | 11        |
| O IV    | 222.763    | 250       |           | Ar VIII  | 229.437    | 250       |           |
| O IV    | 222.777    | 200       |           | He II    | 229.736    | P         | 10        |
| C IV    | 222.791    | 700       | 4         | P V      | 229.832    | 200       |           |
| N VII   | 223.12     | P         |           | Na III   | 229.868    | 300       |           |
| Ne IV   | 223.235    | 125       |           | O IV     | 229.896    | 10        |           |
| S IX    | 223.27     | 100       |           | Ar XVIII | 229.9      | P         |           |
| F IV    | 223.394    | 300       |           | O IV     | 230.040    | 10        |           |
| F IV    | 223.456    | 200       |           | F III    | 230.117    | 500       |           |
| P VII   | 223.482    | P         |           | He II    | 230.139    | P         | 9         |
| F IV    | 223.497    | 100       |           | C IV     | 230.43     | 100d      |           |
| Ne IV   | 223.601    | 125       |           | F III    | 230.573    | 10        |           |
| Si IX   | 223.72     | 5P        |           | Na III   | 230.593    | 200       |           |
| O IV    | 223.728    | 10        |           | O IV     | 230.682    | 50        |           |
| O IV    | 223.841    | 10        |           | He II    | 230.686    | P         | 8         |
| F V     | 223.999    | 1         |           | O IV     | 230.755    | 100       |           |
| Cl VII  | 224.144    | 300       |           | Ar VIII  | 230.875    | 350       |           |
| Ar XII  | 224.23     |           |           | F III    | 231.015    | 200       |           |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| O IV    | 231.031    | 150       |           | O IV    | 238.361    | 700       | 5         |
| O IV    | 231.070    | 500b      |           | O IV    | 238.573    | 750       | 5         |
| O V     | 231.070    | 500b      |           | Al VII  | 239.030    | 100d      |           |
| F III   | 231.100    | 300       |           | N IV    | 239.161    | 120       |           |
| O IV    | 231.101    | 300       |           | C IV    | 239.196    | 10        |           |
| O IV    | 231.144    | 200       |           | N IV    | 239.210    | 200       |           |
| O IV    | 231.200    | 300       |           | Al XIII | 239.5      |           | P         |
| O IV    | 231.240    | 300       |           | O IV    | 239.592    | 150       |           |
| F IX    | 231.3      |           | P         | N IV    | 239.618    | 400       |           |
| O IV    | 231.302    | 350       |           | N IV    | 239.693    | 100       |           |
| F III   | 231.371    | 10        |           | F IV    | 239.856    | 700       |           |
| He II   | 231.454    |           | P 7       | O IV    | 239.935    | 10        |           |
| P XI    | 231.669    |           | P         | F IV    | 240.017    | 700       |           |
| Mg III  | 231.730    | 1000      | 2         | O IV    | 240.079    | 50        |           |
| O V     | 231.823    | 500       |           | F IV    | 240.079    | 900       |           |
| He II   | 232.584    | 30P       | 6         | F IV    | 240.146    | 700       |           |
| Si VIII | 232.864    | 10        |           | F III   | 240.233    | 50        |           |
| F IV    | 233.159    | 200       |           | F IV    | 240.275    | 700       |           |
| Si VIII | 233.159    | 10        |           | P XI    | 240.315    |           | P         |
| F IV    | 233.222    | 600       |           | F IV    | 240.371    | 700       |           |
| F IV    | 233.297    | 200       |           | F III   | 240.550    | 100       |           |
| F IV    | 233.393    | 500       |           | F III   | 240.730    | 200d      |           |
| O IV    | 233.457    | 350       | 7         | Al VII  | 240.770    | 200d      |           |
| O IV    | 233.495    | 350       | 7         | Cl VII  | 240.829    | 300       |           |
| O IV    | 233.521    | 300       | 7         | F III   | 240.855    | 10        |           |
| F IV    | 233.526    | 400       |           | Cl VII  | 240.865    | 200       |           |
| C IV    | 233.53     | 200d      |           | O III   | 240.979    | 100d      |           |
| O IV    | 233.561    | 400       | 7         | O III   | 241.037    | 100d      |           |
| O IV    | 233.596    | 300       | 7         | F III   | 241.118    | 10d       |           |
| N IV    | 234.124    | 300       |           | O III   | 241.819    | 50        |           |
| N IV    | 234.195    | 400       |           | O III   | 241.875    | 50        |           |
| N IV    | 234.249    | 200       |           | O IV    | 242.045    | 100       |           |
| Mg III  | 234.258    | 850       | 1         | O IV    | 242.140    | 150       |           |
| Ne IV   | 234.319    | 125       |           | O IV    | 242.183    | 10        |           |
| He II   | 234.347    | 40P       | 5         | F V     | 242.324    | 300       |           |
| Ne IV   | 234.704    | 125       |           | F V     | 242.439    | 200       |           |
| P XI    | 234.841    |           | P         | Cl XI   | 242.80     |           |           |
| Cl XI   | 234.92     |           |           | Cl VI   | 242.885    | 250       |           |
| O IV    | 234.988    | 150       |           | He II   | 243.027    | 130P      | 3         |
| Si VIII | 235.221    | 10        |           | Cl VI   | 243.194    | 400       |           |
| Si VIII | 235.563    | 20        |           | Cl VI   | 243.208    | 100       |           |
| F V     | 235.840    | 100       |           | F III   | 243.364    | 100d      |           |
| O IV    | 236.071    | 50d       |           | F IV    | 243.736    | 200       |           |
| Cl V    | 236.435    | 100       |           | Al VI   | 243.760    | 600d      |           |
| O III   | 236.710    | 50d       |           | F IV    | 243.796    | 300       |           |
| P XI    | 236.995    |           | P         | Cl VI   | 243.854    | 600       |           |
| Si XIV  | 237.2      |           | P         | Cl VI   | 243.883    | 150       |           |
| Cl V    | 237.231    | 200       |           | F IV    | 243.922    | 400       |           |
| He II   | 237.331    | 70P       | 4         | O III   | 244.049    | 100d      |           |
| Cl XI   | 237.38     |           |           | P VIII  | 244.551    |           | P         |
| N IV    | 237.860    | 100       |           | F III   | 244.698    | 200       |           |
| N IV    | 237.903    | 200       |           | F III   | 244.768    | 400       |           |
| F IV    | 237.913    | 300       |           | C IV    | 244.907    | 1000      | 3         |
| F IV    | 237.955    | 400       |           | F III   | 245.002    | 300       |           |
| N IV    | 237.983    | 300       |           | O IV    | 245.720    | 50d       |           |
| F IV    | 238.012    | 300       |           | C IV    | 245.775    | 400d      | 11        |
| F IV    | 238.042    | 200       |           | C IV    | 245.830    | 500d      | 11        |
| F IV    | 238.099    | 100       |           | F III   | 245.860    | 100d      |           |
| C IV    | 238.200    | 200d      |           | Si VI   | 246.001    | 400       |           |
| C IV    | 238.250    | 300d      |           | O III   | 246.265    | 150       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| P VIII  | 246.318    | P         |           | O IV    | 255.252    | 250       |           |
| O IV    | 246.465    | 100       |           | O III   | 255.302    | 10        |           |
| O IV    | 246.503    | 150       |           | O IV    | 255.302    | 10        |           |
| O IV    | 246.563    | 200       |           | P V     | 255.596    | 500       |           |
| O III   | 247.080    | 50        |           | F III   | 255.624    | 100       |           |
| N IV    | 247.205    | 900       | 2         | P V     | 255.688    | 500       |           |
| C IV    | 247.357    | 10        |           | F III   | 255.725    | 500       |           |
| C IV    | 247.415    | 100       |           | F III   | 255.772    | 600       |           |
| Ne IV   | 247.422    | 50        |           | F III   | 255.865    | 700       |           |
| N V     | 247.561    | 85        | 5         | Be IV   | 256.27     | P         |           |
| P VIII  | 247.644    | P         |           | He II   | 256.317    | 320P      | 2         |
| N V     | 247.706    | 100       | 5         | F III   | 256.360    | 500       |           |
| Ne IV   | 247.807    | 40        |           | O III   | 256.425    | 100       |           |
| Ne IV   | 248.004    | 40        |           | O III   | 256.460    | 150       |           |
| Be IV   | 248.04     | P         |           | O III   | 256.506    | 150       |           |
| P VIII  | 248.043    | P         |           | F III   | 256.525    | 100       |           |
| O III   | 248.320    | 50d       |           | Si X    | 256.58     | P         |           |
| O V     | 248.459    | 400       | 9         | S X     | 256.59     | 20        |           |
| O III   | 248.538    | 50        |           | F III   | 256.673    | 100       |           |
| O III   | 248.574    | 60        |           | F III   | 256.723    | 10        |           |
| O III   | 248.618    | 100       |           | F III   | 256.890    | 200       |           |
| C V     | 248.668    | 10        |           | Cl XVII | 257.8      | P         |           |
| C V     | 248.744    | 10        |           | Si IX   | 258.10     | P         |           |
| S VI    | 248.985    | 400       | 2         | O IV    | 258.116    | 100       |           |
| Si VI   | 249.125    | 400       |           | O IV    | 258.207    | 150       |           |
| O IV    | 249.223    | 150       |           | Si X    | 258.39     | 500P      |           |
| F IV    | 249.228    | 100       |           | S X     | 258.98     | 20        |           |
| S VI    | 249.271    | 400       | 2         | Al VII  | 259.035    | 10        |           |
| P VIII  | 249.322    | P         |           | Al VII  | 259.219    | 10        |           |
| O IV    | 249.345    | 200       |           | C IV    | 259.471    | 600       | 10        |
| Ar VII  | 249.584    | 100       |           | C IV    | 259.542    | 700       | 10        |
| F IV    | 249.744    | 10        |           | Ar VIII | 260.253    | 200       |           |
| Ar VII  | 249.886    | 250       |           | F III   | 260.313    | 400       |           |
| Al VIII | 250.139    | 10        |           | Ar VIII | 260.332    | 300       |           |
| Na III  | 250.515    | 800       |           | F III   | 260.375    | 300       |           |
| Ar VII  | 250.940    | 350       |           | O IV    | 260.389    | 550       | 9         |
| F IV    | 251.026    | 1000      |           | N IV    | 260.455    | 200       |           |
| O IV    | 251.114    | 50        |           | F III   | 260.498    | 300       |           |
| Ne III  | 251.145    | 200b      | 5         | O IV    | 260.556    | 500       | 9         |
| O IV    | 251.148    | 50        |           | F III   | 260.782    | 100       |           |
| P VIII  | 251.225    | P         |           | O III   | 261.027    | 200d      |           |
| Al VIII | 251.347    | 10        |           | Al VII  | 261.053    | 10        |           |
| Na III  | 251.371    | 600       |           | Al VII  | 261.219    | 10        |           |
| Ne III  | 251.558    | 200       | 5         | Si X    | 261.27     | 200P      |           |
| Mg      | 251.600    | 100       |           | N VII   | 261.45     | P         |           |
| Ne III  | 251.726    | 200       | 5         | F III   | 261.716    | 700       |           |
| S VI    | 251.905    | 200       |           | F III   | 261.751    | 600       |           |
| O IV    | 252.564    | 300d      |           | S VI    | 261.810    | 50        |           |
| O IV    | 252.948    | 300       |           | O III   | 262.113    | 100       |           |
| O IV    | 253.082    | 350       |           | O III   | 262.289    | 10        |           |
| O III   | 253.548    | 10        |           | Ne X    | 262.3      | P         |           |
| Si X    | 253.81     | 200P      |           | B V     | 262.37     | P         |           |
| F III   | 254.162    | 400       |           | C IV    | 262.553    | 300       |           |
| F III   | 254.193    | 300       |           | C IV    | 262.624    | 400       |           |
| F IV    | 254.491    | 200       |           | O III   | 262.729    | 10        |           |
| F IV    | 254.595    | 100       |           | O III   | 262.882    | 50        |           |
| F IV    | 254.681    | 10        |           | O III   | 263.692    | 150       |           |
| O III   | 255.044    | 10        |           | O III   | 263.728    | 200       |           |
| S X     | 255.1      | 20        |           | S X     | 263.74     | 50        |           |
| O III   | 255.158    | 50        |           | O III   | 263.768    | 150       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| F III   | 263 807    | 800       |           | O IV    | 272 125    | 350       |           |
| O III   | 263 818    | 250       |           | O IV    | 272 174    | 250       |           |
| O III   | 263 861    | 150       |           | O IV    | 272 270    | 300       |           |
| O III   | 263 903    | 10        |           | O IV    | 272 311    | 300       |           |
| O III   | 264 257    | 200       |           | Na III  | 272 441    | 10d       |           |
| O III   | 264 338    | 250d      |           | Si VII  | 272 641    | 200       |           |
| O III   | 264 480    | 300       |           | F III   | 272 710    | 400       |           |
| N III   | 264 837    | 100       |           | F III   | 272 758    | 300       |           |
| P V     | 264 918    | 300       |           | F III   | 272 915    | 300       |           |
| N III   | 264 948    | 200       |           | P V     | 273 13     | 10        |           |
| C III   | 265 029    | 10d       |           | F III   | 273 207    | 200       |           |
| C VI    | 265 05     | P         |           | C III   | 274 051    | 200d      |           |
| O IV    | 265 062    | 10        |           | Si VII  | 274 175    | 200       |           |
| C III   | 265 287    | 10d       |           | F III   | 274 260    | 600       |           |
| O V     | 265 550    | 300       |           | Al XIII | 275 1      | P         |           |
| N V     | 266 196    | 120       | 4         | O III   | 275 281    | 100       |           |
| N V     | 266 379    | 150       | 4         | Al VI   | 275 350    | 300d      |           |
| O IV    | 266 690    | 10        |           | Si VII  | 275 352    | 250       |           |
| O IV?   | 266 729    | 10        |           | O III   | 275 366    | 150       |           |
| Na III  | 266 893    | 500       |           | O III   | 275 513    | 200       |           |
| O IV    | 266 932    | 300       |           | Si VII  | 275 665    | 200       |           |
| O III   | 266 967    | 250b      |           | Mg VII  | 276 145    | 200       |           |
| O IV    | 266 967    | 250b      |           | Mg V    | 276 581    | 1000      |           |
| O III   | 266 985    | 350       |           | F III   | 276 786    | 500       |           |
| O III   | 267 050    | 350       |           | Si VII  | 276 839    | 200b      |           |
| O III   | 267 050    | 150       |           | Si VIII | 276 839    | 200b      |           |
| Ne III  | 267 059    | 300b      | 4         | F III   | 276 895    | 400       |           |
| O III   | 267 121    | 200       |           | Mg VII  | 277 007    | 300       |           |
| F IX    | 267 19     | P         |           | Si VIII | 277 054    | 200       |           |
| C V     | 267 26     |           |           | Si X    | 277 27     | 310P      |           |
| Ne III  | 267 516    | 300b      | 4         | O III   | 277 385    | 350       | 12        |
| Na III  | 267 642    | 800       |           | O III   | 277 514    | 50        |           |
| Ne III  | 267 709    | 200       | 4         | Mg VII  | 278 406    | 400       |           |
| N III   | 267 851    | 10        |           | Si VII  | 278 445    | 200       |           |
| Na III  | 267 868    | 600       |           | P XII   | 278 676    | P         |           |
| N III   | 267 952    | 100       |           | Al V    | 278 699    | 800       |           |
| O III   | 268 451    | 50d       |           | C VI    | 279 02     | P         |           |
| Na III  | 268 623    | 500       |           | Al VII  | 279 256    | 10        |           |
| F IV    | 268 785    | 400       |           | O IV    | 279 456    | 100       |           |
| F IV    | 268 817    | 100       |           | O IV    | 279 633    | 500       | 4         |
| Mg VI   | 268 986    | 650       |           | F III   | 279 692    | 700       |           |
| F IV    | 269 076    | 300       |           | O III   | 279 787    | 150       |           |
| F IV    | 269 225    | 200       |           | F IV    | 279 854    | 300       |           |
| Mg      | 269 295    | 10        |           | O IV    | 279 937    | 550       | 4         |
| O IV    | 269 559    | 50d       |           | F III   | 280 010    | 600       |           |
| F IV    | 270 225    | 600       |           | O III   | 280 030    | 100       |           |
| C III   | 270 324    | 10d       |           | C III   | 280 043    | 300       |           |
| Mg VI   | 270 394    | 750       |           | O III   | 280 116    | 50        |           |
| C III   | 270 583    | 100d      |           | O III   | 280 234    | 50        |           |
| F III   | 270 675    | 400       |           | O III   | 280 265    | 150       |           |
| O V     | 270 982    | 10        |           | O III   | 280 328    | 50        |           |
| N IV    | 270 995    | 600       | 12        | O III   | 280 412    | 50        |           |
| C III   | 271 014    | 100d      |           | O III   | 280 483    | 50        |           |
| Be IV   | 271 18     | P         |           | C III   | 280 522    | 200d      |           |
| O III   | 271 403    | 50        |           | P V     | 280 609    | 150       |           |
| O III   | 271 523    | 50        |           | Mg VII  | 280 744    | 300       |           |
| O III   | 271 611    | 10        |           | F III   | 280 811    | 10        |           |
| O IV    | 271 989    | 300       |           | F III   | 280 905    | 100       |           |
| Si X    | 272 00     | 280P      |           | Mg XII  | 281 1      | P         |           |
| O IV    | 272 076    | 300       |           | F III   | 281 207    | 300       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| F III   | 281 350    | 400       |           | F III   | 290 848    | 600       |           |
| C III   | 281 390    | 200       |           | F III   | 290 947    | 500       |           |
| Al V    | 281 397    | 700       |           | S XVI   | 291 0      | P         |           |
| Ar VI   | 281 433    | 120       |           | O IV    | 291 054    | 50        |           |
| Ar VI   | 281 915    | 160       |           | O IV    | 291 203    | 50        |           |
| N III   | 282 093    | 100d      |           | C I, I  | 291 3261   | 500       |           |
| N III   | 282 213    | 200d      |           | Mg VI   | 291 348    | 300       |           |
| O IV    | 282 213    | 50        |           | Mg VI   | 291 458    | 200       |           |
| Ar VI   | 282 423    | 240       |           | Ar VI   | 292 154    | 200       |           |
| Ne III  | 282 50     | 10        | 8         | N III   | 292 447    | 300       |           |
| Ar VI   | 282 556    | 40        |           | N III   | 292 595    | 400       |           |
| Na II   | 282 827    | 10        |           | O VIII  | 292 8      | P         |           |
| Ar VI   | 283 164    | 120       |           | Si IX   | 292 83     | 270P      |           |
| Ne III  | 283 178    | 300b      | 3         | Mg VI   | 293 026    | 200       |           |
| Ne III  | 283 206    | 600       | 3         | Ne IV   | 293 123    | 75        |           |
| P IX    | 283 246    | P         |           | Mg VI   | 293 124    | 400d      |           |
| N IV    | 283 420    | 900       | 5         | Cl VII  | 293 253    | 400       |           |
| N IV    | 283 470    | 950       | 5         | Ne IV   | 293 429    | 50        |           |
| S VI    | 283 502    | 300       |           | Ne IV   | 293 649    | 25        |           |
| N IV    | 283 579    | 1000      | 5         | Ne IV   | 293 947    | 5         |           |
| Ne III  | 283 690    | 500b      | 3         | Ar VI   | 294 052    | 240       |           |
| O VIII  | 283 83     | P         |           | Ne IV   | 294 100    | 15        |           |
| Ne III  | 283 894    | 300       | 3         | Ne IV   | 294 390    | 15        |           |
| P IV    | 283 99     | 20h       |           | O IV    | 294 650    | 50        |           |
| Al IX   | 284 042    | 10d       |           | O IV    | 294 853    | 50        |           |
| N III   | 284 296    | 100       |           | Cl VII  | 294 889    | 500       |           |
| N III   | 284 346    | 200       |           | O IV    | 295 051    | 50        |           |
| P IX    | 285 356    | P         |           | O IV    | 295 140    | 50        |           |
| Al VIII | 285 467    | 50d       |           | F III   | 295 365    | 200       |           |
| N IV    | 285 563    | 500       | 11        | Mg      | 295 393    | 10        |           |
| O IV    | 285 714    | 300       |           | F III   | 295 405    | 100       |           |
| O IV    | 285 838    | 350       |           | O III   | 295 511    | 150       |           |
| O III   | 286 038    | 10        |           | O III   | 295 619    | 250       |           |
| Cl V    | 286 127    | 200       |           | G II    | 295 657    | 300       |           |
| O V     | 286 448    | 400       |           | F III   | 295 710    | 500       |           |
| Ne IV   | 286 448    | 75        |           | O III   | 295 716    | 300       |           |
| Ne IV   | 286 934    | 75        |           | O IV    | 295 874    | 100       |           |
| Ne IV   | 287 206    | 50        |           | F III   | 295 886    | 600       |           |
| Cl V    | 287 327    | 300       |           | O III   | 295 944    | 150       |           |
| F IV    | 287 994    | 1         |           | O III   | 296 012    | 200       |           |
| F IV    | 288 078    | 10        |           | P V     | 296 112    | 70        |           |
| F IV    | 288 267    | 100       |           | Si IX   | 296 19     | 420P      |           |
| C III   | 288 415    | 10        |           | O III   | 296 270    | 50d       |           |
| Mg VI   | 288 652    | 10        |           | C IV    | 296 857    | 600       | 8         |
| C       | 289 048    | 300       |           | C IV    | 296 951    | 700       | 8         |
| S VI    | 289 092    | 200       |           | N IV    | 297 595    | 250       | 15        |
| C IV    | 289 143    | 900       | 9         | Ar VII  | 297 621    | 150       |           |
| C IV    | 289 230    | 1000      | 9         | N IV    | 297 644    | 350       | 15        |
| O IV    | 289 292    | 150       |           | Ar VII  | 297 658    | 200       |           |
| O IV    | 289 469    | 100       |           | Ar VII  | 297 701    | 300       |           |
| P IX    | 289 528    | P         |           | N IV    | 297 712    | 250       | 15        |
| O IV    | 289 590    | 50        |           | N IV    | 297 768    | 250       | 15        |
| O IV    | 289 898    | 100       |           | N IV    | 297 815    | 400       | 15        |
| O IV    | 289 933    | 50        |           | O III   | 299 275    | 100d      |           |
| S VI    | 290 132    | 300       |           | O IV    | 299 49     | 150       |           |
| F IV    | 290 147    | 400       |           | O IV    | 299 620    | 100       |           |
| F IV    | 290 440    | 300       |           | N III   | 299 670    | 10        |           |
| F IV    | 290 461    | 200       |           | O IV    | 299 710    | 100       |           |
| F IV    | 290 608    | 200       |           | N III   | 299 820    | 100       |           |
| Si IX   | 290 63     | 130P      |           | O IV    | 299 850    | 200       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Na II   | 300.151    | 100       | 4         | P V     | 310.579    | 200       |           |
| N IV    | 300.316    | 300       |           | Al VI   | 310.908    | 300d      |           |
| O III   | 300.455    | 150d      |           | C III   | 311.157    | 100d      |           |
| Ne III  | 301.124    | 400       | 7         | P V     | 311.347    | 250       |           |
| C III   | 301.206    | 200       |           | F III   | 311.415    | 400       |           |
| C III   | 301.243    | 300       |           | O IV    | 311.490    | 250       |           |
| C III   | 301.279    | 100       |           | N III   | 311.539    | 200       |           |
| Na II   | 301.311    | 10        |           | N III   | 311.628    | 300       |           |
| Na II   | 301.432    | 100       | 3         | O IV    | 311.679    | 300       |           |
| N IV    | 303.009    | 350       | 14        | O IV    | 311.726    | 150       |           |
| N IV    | 303.048    | 400       | 14        | Mg VIII | 311.806    | 100d      |           |
| N IV    | 303.079    | 350       | 14        | Na VI   | 311.921    | 400       |           |
| N IV    | 303.123    | 500       | 14        | Al VI   | 312.241    | 300d      |           |
| N IV    | 303.163    | 350       | 14        | Mg V    | 312.311    | 1000      |           |
| Si XI   | 303.41     | 50P       |           | C IV    | 312.422    | 1000      | 2         |
| O III   | 303.411    | 350       | 6         | P IV    | 312.443    | 160       |           |
| C III   | 303.432    | 400d      |           | C IV    | 312.453    | 950       | 2         |
| O III   | 303.460    | 350       | 6         | Na VI   | 312.608    | 300       |           |
| C III   | 303.468    | 100       |           | P X     | 312.872    | P         |           |
| O III   | 303.515    | 350       | 6         | Ne III  | 313.048    | 400       | 2         |
| O III   | 303.621    | 350       | 6         | Ne III  | 313.677    | 300       | 2         |
| O VIII  | 303.69     | P         |           | Mg VIII | 313.743    | 100d      |           |
| O III   | 303.693    | 350       | 6         | Na VI   | 313.748    | 500       |           |
| C VI    | 303.70     | P         |           | Ne III  | 313.92     | 100       | 2         |
| Be IV   | 303.72     | P         |           | Si VIII | 314.31     | 50        |           |
| He II   | 303.781    | 665       | 1         | C III   | 314.395    | 100d      |           |
| He II   | 303.786    | 335       | 1         | Mg VI   | 314.554    | 300       |           |
| O III   | 303.799    | 450       | 6         | Mg VI   | 314.676    | 400       |           |
| N III   | 303.891    | 200       |           | N III   | 314.715    | 800       | 7         |
| N III   | 303.981    | 200       |           | P IX    | 314.772    | P         |           |
| N III   | 304.032    | 200       |           | N III   | 314.850    | 900       | 7         |
| N III   | 304.818    | 400d      |           | N III   | 314.877    | 600       | 7         |
| N III   | 304.874    | 400       |           | P IX    | 314.951    | P         |           |
| N III   | 304.912    | 300       |           | Mg VIII | 315.022    | 200d      |           |
| O III   | 305.596    | 400       | 5         | N IV    | 315.053    | 800       | 18        |
| O III   | 305.656    | 450       | 5         | F III   | 315.221    | 800       |           |
| O III   | 305.703    | 400       | 5         | F III   | 315.539    | 700       |           |
| O III   | 305.769    | 500       | 5         | F III   | 315.748    | 600       |           |
| O III   | 305.836    | 400       | 5         | Si VIII | 316.202    | 100       |           |
| O III   | 305.879    | 200       | 5         | F III   | 316.488    | 400       |           |
| N III   | 305.918    | 100       |           | F III   | 316.823    | 300       |           |
| O IV    | 306.621    | 400       |           | O III   | 316.967    | 150       |           |
| O IV    | 306.882    | 350       |           | F III   | 316.998    | 200       |           |
| Na V    | 307.152    | 800       |           | Mg VIII | 317.029    | 100d      |           |
| Al VI   | 307.248    | 350d      |           | O III   | 317.265    | 50d       |           |
| Si VIII | 307.65     | 20P       |           | Na VI   | 317.641    | 600       |           |
| C IV    | 307.806    | 100f      |           | P X     | 318.258    | P         |           |
| O III   | 308.051    | 50        |           | Cl IV   | 318.750    | 100       |           |
| Si VIII | 308.26     | 20P       |           | Mg VII  | 319.016    | 400d      |           |
| Na V    | 308.264    | 1000      |           | C III   | 319.266    | 300d      |           |
| O III   | 308.306    | 100       |           | Cl IV   | 319.513    | 100       |           |
| Ne III  | 308.559    | 100       | 10        | Cl IV   | 319.616    | 300       |           |
| Al VI   | 308.560    | 300d      |           | Na IV   | 319.638    | 1000      |           |
| P IX    | 308.652    | P         |           | F IV    | 319.695    | 300       |           |
| Al VII  | 309.012    | 100d      |           | F IV    | 319.740    | 10        |           |
| Al VII  | 309.122    | 100d      |           | Si VIII | 319.829    | 100d      |           |
| P X     | 309.444    | P         |           | Cl IV   | 319.993    | 10        |           |
| Al VI   | 309.596    | 400d      |           | O III   | 319.996    | 150       |           |
| Al VI   | 309.852    | 300d      |           | F IV    | 320.004    | 200       |           |
| C III   | 310.1697   | 700       | 3         | F IV    | 320.192    | 100       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Cl IV   | 320.250    | 100       |           | Ne II   | 331.50     | 120       |           |
| He I    | 320.392    | 20        |           | Cl IV   | 331.835    | 200       |           |
| O III   | 320.720    | 100d      |           | N III   | 332.133    | 200       |           |
| Cl IV   | 320.881    | 100       |           | N III   | 332.527    | 300       |           |
| O III   | 320.979    | 600       | 11        | Na V    | 332.550    | 800       |           |
| Mg IV   | 320.999    | 1000      |           | Al X    | 332.891    | 10        |           |
| N III   | 321.071    | 100       |           | Na V    | 333.910    | 900       |           |
| N III   | 321.161    | 200       |           | Na XI   | 334.5      | P         |           |
| N III   | 321.270    | 100d      |           | N IV    | 335.050    | 1000      | 10        |
| P IX    | 321.326    | P         |           | Mg VIII | 335.230    | 10d       |           |
| C III   | 321.372    | 10d       |           | Ar V    | 336.555    | 150       | 6         |
| O IV    | 321.457    | 50        |           | Ar VIII | 337.257    | 100d      |           |
| N IV    | 322.503    | 600       | 4         | Ar V    | 337.555    | 150       | 6         |
| N IV    | 322.570    | 650       | 4         | Ar V    | 337.998    | 300       | 6         |
| C III   | 322.5741   | 800       |           | O VIII  | 338.19     | P         |           |
| F III   | 322.650    | 800       |           | Ar VIII | 338.222    | 10d       |           |
| F III   | 322.685    | 700       |           | N III   | 338.345    | 200       |           |
| N IV    | 322.724    | 750       | 4         | Ar V    | 338.426    | 100       | 6         |
| Mg XII  | 322.9      | P         |           | Mg VIII | 339.067    | 100d      |           |
| N IV    | 323.175    | 700       | 17        | Ar V    | 339.009    | 150       | 6         |
| Mg IV   | 323.310    | 900       |           | O IV    | 339.330    | 50        |           |
| Cl VI   | 323.356    | 600       |           | O IV    | 339.436    | 10        |           |
| N III   | 323.431    | 400       | 6         | C III?  | 339.773    | 100       |           |
| N III   | 323.488    | 500       | 6         | Ar V    | 339.886    | 150       | 6         |
| N III   | 323.615    | 600       | 6         | Cl VII  | 340.229    | 750       |           |
| N III   | 323.671    | 400       | 6         | Cl VII  | 340.298    | 900       |           |
| F IX    | 323.9      | P         |           | C III   | 341.143    | 500       |           |
| Cl VI   | 323.936    | 800       |           | C III   | 341.179    | 600       |           |
| Ne II   | 324.56     | 120       |           | C III   | 341.242    | 700       |           |
| Cl VI   | 325.161    | 1000      |           | O V     | 341.391    | 10        |           |
| P XI    | 325.214    | P         |           | Mg      | 341.790    | 10        |           |
| C III   | 325.570    | 100d      |           | F III   | 341.924    | 700       |           |
| Ne II   | 326.54     | 350       |           | Al VII  | 343.290    | 10        |           |
| Ne II   | 326.77     | 200       |           | Al VII  | 343.650    | 10d       |           |
| C III   | 327.112    | 400d      |           | F III   | 343.892    | 700       |           |
| Si IV   | 327.137    | P         | 2.02      | F III   | 343.931    | 400       |           |
| C III   | 327.176    | 400d      |           | F III   | 344.388    | 600       |           |
| Si IV   | 327.181    | P         | 2.02      | N IV    | 344.915    | 250       | 13        |
| Ne II   | 327.25     | 120       |           | N IV    | 345.023    | 250       | 13        |
| O IV    | 327.320    | 50        |           | N IV    | 345.063    | 400       | 13        |
| Ne II   | 327.33     | 200       |           | Si IX   | 345.10     | 30        |           |
| O IV    | 327.519    | 10        |           | N IV    | 345.107    | 250       | 13        |
| Ne II   | 327.63     | 120       |           | N IV    | 345.201    | 250       | 13        |
| C III   | 327.784    | 100       |           | O III   | 345.309    | 500       | 15        |
| Ne II   | 328.08     | 120       |           | O IV    | 346.372    | 200       |           |
| Al VIII | 328.200    | 10d       |           | O IV    | 346.688    | 150       |           |
| F IV    | 328.213    | 10        |           | P V     | 347.237    | 150       |           |
| O III   | 328.448    | 500       | 10        | Si X    | 347.43     | 40        |           |
| P V     | 328.455    | 300       |           | C III   | 347.777    | 300       |           |
| S VI    | 328.505    | 600       |           | C III   | 347.854    | 300       |           |
| O III   | 328.742    | 450       |           | P V     | 348.194    | 250       |           |
| P V     | 328.768    | 300       |           | N III   | 348.690    | 10d       |           |
| Ne II   | 330.20     | 120       |           | N III   | 348.800    | 10d       |           |
| Ne II   | 330.62     | 120       |           | F II    | 348.800    | 10        |           |
| C III   | 330.637    | 100       |           | Mg VI   | 349.155    | 700d      |           |
| C III   | 330.687    | 100       |           | O III   | 349.825    | 150       |           |
| Na V    | 330.718    | 10        |           | O III   | 349.918    | 100       |           |
| Ne II   | 330.77     | 200       |           | Si IX   | 349.96     | 40        |           |
| Ne II   | 331.06     | 65        |           | O III   | 349.961    | 50        |           |
| P XV    | 331.1      | P         |           | C III   | 350.132    | 10d       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| C III   | 350.330    | 200d      |           | O III   | 359.384    | 350       |           |
| Na VII  | 350.645    | 500       |           | Ne V    | 359.385    | 500       | 3         |
| Ar V    | 350.878    | 150       | 8         | P IV    | 359.628    | 20        |           |
| Mg V    | 351.089    | 850       |           | Na V    | 360.319    | 800       |           |
| N IV    | 351.931    | 500       | 16        | Na V    | 360.367    | 800       |           |
| N III   | 351.979    | 100       |           | C III   | 360.557    | 600       |           |
| N IV    | 352.058    | 400       |           | C III   | 360.623    | 700       |           |
| Al VII  | 352.160    | 100d      |           | F IV    | 360.635    | 100       |           |
| Mg V    | 352.202    | 700       |           | C III   | 360.675    | 500       |           |
| Ne II   | 352.237    | 120       |           | Na IV   | 360.761    | 600       |           |
| Na VII  | 352.275    | 600       |           | F IV    | 361.208    | 10        |           |
| Ne II   | 352.946    | 250       |           | Na VI   | 361.250    | 800d      |           |
| C III   | 353.000    | 300d      |           | Ne II   | 361.427    | 350       | 5         |
| Mg V    | 353.094    | 1000      |           | Si IV   | 361.560    | P         | 2.01      |
| Ne II   | 353.206    | 200       |           | Si IV   | 361.659    | P         | 2.01      |
| Na VII  | 353.294    | 800       |           | Na VI   | 362.444    | 400       |           |
| Mg V    | 353.300    | 650       |           | Ne II   | 362.456    | 250       | 5         |
| F II    | 353.421    | 15        |           | N III   | 362.833    | 600       | 10        |
| Al VII  | 353.776    | 200d      |           | N III   | 362.881    | 650       | 10        |
| Ne II   | 353.922    | 120       |           | N III   | 362.946    | 650       | 10        |
| Mg V    | 354.223    | 700       |           | N III   | 362.985    | 500       | 10        |
| Na VII  | 354.950    | 400       |           | C III   | 363.7538   | 400       |           |
| Ne II   | 354.954    | 250       |           | Mg VII  | 363.770    | 10        |           |
| F IV    | 355.045    | 200       |           | Na VI   | 363.774    | 200       |           |
| O III   | 355.137    | 300       |           | C III   | 363.7852   | 500       |           |
| O III   | 355.293    | 150       |           | C III   | 363.8598   | 600       |           |
| Mg V    | 355.326    | 850       |           | Na VI   | 364.477    | 300       |           |
| O III   | 355.333    | 250       |           | O III   | 364.739    | 150       |           |
| Ne II   | 355.450    | 120       |           | O III   | 364.867    | 100       |           |
| O III   | 355.469    | 250       |           | O III   | 364.940    | 50        |           |
| Ne II   | 355.647    | 200       |           | Mg VII  | 365.230    | 200d      |           |
| Ne II   | 355.848    | 65        |           | Ne V    | 365.594    | 1000      | 5         |
| C VI    | 355.89     | P         |           | C III   | 365.778    | 100d      |           |
| Ne II   | 355.946    | 120       |           | F III   | 365.874    | 700       |           |
| Mg VIII | 356.000    | 10        |           | Na VI   | 366.110    | 400       |           |
| Si X    | 356.07     | 40        |           | C III   | 366.169    | 400d      |           |
| Ne II   | 356.131    | 250       |           | Na VI   | 366.240    | 10        |           |
| Ne II   | 356.436    | 120       |           | F III   | 366.391    | 600       |           |
| Ne II   | 356.534    | 200       | 6         | O IV    | 367.192    | 100       |           |
| O III   | 356.558    | 10        |           | Na V    | 367.557    | 200       |           |
| O III   | 356.625    | 50        |           | Mg VII  | 367.679    | 400d      |           |
| O III   | 356.725    | 100       |           | Mg IX   | 368.071    | 100d      |           |
| O III   | 356.768    | 10        |           | C III   | 369.415    | 500       |           |
| Ne II   | 356.795    | 350d      | 6         | C III   | 369.472    | 200       |           |
| Al VII  | 356.885    | 250d      |           | Na V    | 369.743    | 300       |           |
| Ne II   | 357.534    | 350       | 6         | N VII   | 370.74     | P         |           |
| Ne IV   | 357.831    | 250       | 5         | C III?  | 370.951    | 10d       |           |
| Ne V    | 357.955    | 400       | 3         | C III   | 371.694    | 1000      | 7         |
| N III   | 358.278    | 250       | 11        | C III   | 371.747    | 1000      | 7         |
| N III   | 358.327    | 400       | 11        | C III   | 371.784    | 800       | 7         |
| N III   | 358.356    | 400       | 11        | Na II   | 372.069    | 600       | 2         |
| N III   | 358.401    | 250       | 11        | Cl V    | 372.589    | 200       |           |
| N III   | 358.469    | 400       | 11        | Cl V    | 373.165    | 200       |           |
| Ne V    | 358.472    | 500       | 3         | Cl V    | 373.776    | 300       |           |
| N III   | 358.509    | 400       | 11        | O III   | 373.805    | 400       | 4         |
| N III   | 358.578    | 500       | 11        | Cl V    | 373.911    | 10        |           |
| Ne IV   | 358.721    | 1000d     | 5         | O III   | 374.005    | 400       | 4         |
| C III   | 358.740    | 400       |           | O III   | 374.075    | 500       | 4         |
| O III   | 359.016    | 400       |           | O III   | 374.165    | 400       | 4         |
| O III   | 359.223    | 400       |           | N III   | 374.204    | 900       | 5         |

| Element  | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|----------|------------|-----------|-----------|---------|------------|-----------|-----------|
| O III    | 374.331    | 400       | 4         | C III   | 389.0898   | 700       |           |
| O III    | 374.436    | 400       | 4         | P V     | 389.500    | 200       |           |
| N III    | 374.441    | 1000      | 5         | C III   | 390.055    | 300       |           |
| Cl V     | 374.662    | 100       |           | Cl V    | 390.148    | 400       |           |
| Cl V     | 375.103    | 200       |           | P V     | 390.700    | 550       |           |
| F II     | 375.300    | 200       |           | S VI    | 390.859    | 800       | 4         |
| F II     | 375.434    | 100       |           | O II    | 391.912    | 50        |           |
| F II     | 375.718    | 100       |           | O II    | 391.943    | 100       |           |
| F II     | 375.793    | 100       |           | O II    | 392.002    | 150       |           |
| F II     | 375.928    | 100d      |           | O II    | 392.322    | 150       |           |
| B III    | 376.372    | 100       |           | Al IX   | 392.418    | 10P       |           |
| Na II    | 376.375    | 300       | 1         | Cl V    | 392.433    | 500       |           |
| Mg       | 376.665    | 100       |           | F II    | 393.676    | 100       |           |
| F II     | 376.686    | 100       |           | F II    | 394.204    | 10        |           |
| O II     | 376.693    | 10        |           | F III   | 395.442    | 300       |           |
| O II     | 376.745    | 10        |           | O III   | 395.558    | 600       | 9         |
| O II     | 377.045    | 10        |           | Ar III  | 395.92     | 50        |           |
| F II     | 377.140    | 10        |           | F III   | 395.968    | 200       |           |
| Na III   | 378.143    | 1000      |           | F III   | 396.247    | 100       |           |
| F III    | 378.563    | 100       |           | Na VII  | 396.335    | 200       |           |
| F III    | 378.603    | 200       |           | Ar III  | 396.38     | 200       |           |
| C III    | 379.065    | 100       |           | N VII   | 396.68     | P         |           |
| C III    | 379.254    | 10d       |           | Ar IV   | 396.869    | 160       |           |
| Ne III   | 379.308    | 700       | 6         | O III   | 397.120    | 100       |           |
| O III    | 379.505    | 200       |           | O III   | 397.231    | 50        |           |
| O III    | 379.575    | 150       |           | O III   | 397.310    | 10        |           |
| O III    | 379.631    | 100       |           | Na VII  | 397.490    | 300       |           |
| O IV     | 379.775    | 200       |           | Ar III  | 397.67     | 50        |           |
| O IV     | 379.919    | 150       |           | C III?  | 398.168    | 10        |           |
| Na III   | 380.107    | 800       |           | Ar IV   | 398.546    | 160       |           |
| Si XIV   | 380.2      | P         |           | C III?  | 398.551    | 10        |           |
| F II     | 380.903    | 200       |           | Ar III  | 398.86     | 50        |           |
| Na VII   | 381.300    | 300       |           | N III   | 398.885    | 250       |           |
| Ar XVIII | 381.4      | P         |           | N III   | 399.045    | 350       |           |
| Al VIII? | 381.689    | 10        |           | N III   | 399.084    | 100       |           |
| B V      | 381.70     | P         |           | Na VII  | 399.182    | 400       |           |
| O III    | 382.214    | 50d       |           | Mg VI   | 399.289    | 600       |           |
| N VII    | 382.45     | P         |           | Ar IV   | 399.634    | 120       |           |
| O III    | 382.903    | 50d       |           | C III   | 399.637    | 600d      |           |
| Al VIII  | 383.785    | 50        |           | C III   | 399.688    | 600d      |           |
| C IV     | 384.032    | 950       | 7         | Ne VI   | 399.820    | 50        |           |
| C IV     | 384.178    | 1000      | 7         | Cl VI   | 399.938    | 250       |           |
| Na XI    | 384.3      | P         |           | Cl VI   | 399.957    | 350       |           |
| Al IX    | 385.030    | 10P       |           | Cl VI   | 399.995    | 400       |           |
| Na VII   | 385.061    | 10        |           | F II    | 400.575    | 100       |           |
| Na VII   | 385.254    | 10        |           | Mg VI   | 400.676    | 700       |           |
| C III    | 386.2028   | 850       | 2         | Na V    | 400.722    | 1000      |           |
| Ne IV    | 387.141    | 700       | 10        | Ne VI   | 401.138    | 150       |           |
| N IV     | 387.353    | 400       | 9         | Al X    | 401.183    | 10        |           |
| O III    | 387.398    | 100       |           | B V     | 401.83     | P         |           |
| O III    | 387.482    | 150       |           | Ne VI   | 401.939    | 250       |           |
| O III    | 387.639    | 200       |           | O II    | 403.035    | 10        |           |
| Mg VI    | 387.787    | 200d      |           | O II    | 403.087    | 10        |           |
| Al VIII  | 387.970    | 100       |           | Ne VI   | 403.262    | 100       |           |
| Mg VI    | 388.020    | 300d      |           | O II    | 403.273    | 10        |           |
| Ne IV    | 388.218    | 500       | 10        | Mg VI   | 403.315    | 800       |           |
| P IV     | 388.315    | 240       |           | O II    | 403.372    | 10        |           |
| S VI     | 388.940    | 600       | 4         | Ne X    | 404.8      | P         |           |
| C III    | 388.9687   | 500       |           | Ar      | 405.42     | 20        |           |
| C III    | 389.0045   | 600       |           | F II    | 405.640    | 300       |           |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ne II   | 405.852    | 600       | 4         | Cl III  | 421.771    | 300       |           |
| Cl III  | 406.274    | 100       |           | Cl III  | 421.990    | 300       |           |
| F II    | 407.046    | 400       |           | F II    | 422.012    | 100       |           |
| Ne II   | 407.136    | 550       | 4         | Ne V    | 422.214    | 150       |           |
| F II    | 407.505    | 300       |           | Ne V    | 422.347    | 50        |           |
| Cl III  | 407.513    | 10        |           | F II    | 422.618    | 650       |           |
| Na IV   | 408.682    | 800       |           | Cl III  | 422.713    | 100       |           |
| Ar      | 409.12     | 20        |           | Ar IV?  | 423.58     | 10        |           |
| C III?  | 409.204    | 10        |           | Si III  | 423.817    | P         | 3.04      |
| C III   | 409.325    | 600       |           | Na VI   | 423.821    | 200       |           |
| Na IV   | 409.615    | 800       |           | O II    | 424.577    | 10        |           |
| O VIII  | 409.97     | P         |           | N V     | 424.61     | 35        |           |
| Be IV   | 410.01     | P         |           | N V     | 424.75     | 40        |           |
| P V     | 410.073    | 150h      |           | Na      | 425.245    | 10        |           |
| Ar      | 410.10     | 20        |           | O II    | 425.273    | 10        |           |
| Na IV   | 410.371    | 1000      |           | C II    | 425.326    | 10        |           |
| Na IV   | 410.540    | 600       |           | Na      | 425.493    | 100       |           |
| Na VIII | 411.145    | 100       |           | O II    | 426.526    | 50d       |           |
| Cl III  | 411.163    | 300       |           | Si III  | 426.644    | P         | 3.03      |
| Na IV   | 411.333    | 700       |           | Cl XVII | 427.6      | P         |           |
| Cl III  | 411.373    | 400       |           | Ne III  | 427.840    | 300       | 9         |
| C III   | 411.697    | 10        |           | N III   | 428.180    | 500       | 15        |
| B III   | 411.810    | 300       |           | N III   | 428.244    | 400       | 15        |
| Cl III  | 411.812    | 400       |           | Mg VII  | 429.134    | 100d      |           |
| C III   | 411.9577   | 300       |           | F III   | 429.511    | 650       |           |
| Si IV   | 412.155    | P         | 9         | O II    | 429.557    | 100       |           |
| Na IV   | 412.240    | 800       |           | O II    | 429.647    | 250       |           |
| P IV?   | 412.9      | 10h       |           | O II    | 429.716    | 200       |           |
| Si IV   | 412.939    | P         | 9         | Ar      | 429.80     | 10        |           |
| N III   | 413.681    | 10        |           | O II    | 429.918    | 250       | 3         |
| N III   | 413.797    | 10        |           | O II    | 430.041    | 300       | 3         |
| Na VI   | 414.370    | 200       |           | F III   | 430.154    | 700       |           |
| C?      | 414.592    | 10        |           | O II    | 430.177    | 300       | 3         |
| P IV    | 415.022    | 20        |           | F III   | 430.218    | 500       |           |
| Cl III  | 415.196    | 100       |           | Mg VIII | 430.467    | 10d       |           |
| Cl III  | 415.333    | 100       |           | F IV    | 430.758    | 950       |           |
| Na VI   | 415.505    | 400       |           | Mg      | 430.767    | 10        |           |
| P IV    | 415.815    | 40        |           | F II    | 430.909    | 250       |           |
| Ar      | 415.86     | 20        |           | Mg VII  | 431.318    | 200d      |           |
| Ne V    | 416.198    | 800       | 4         | Ne IV   | 431.472    | 125       |           |
| C III   | 416.769    | 500       |           | F II    | 431.545    | 200       |           |
| Ne V    | 416.834    | 250       |           | F II    | 431.826    | 150       |           |
| Ar      | 417.12     | 10        |           | Ne VI?  | 432.393    | 50        |           |
| Na VI   | 417.595    | 600       |           | Ne VI   | 433.176    | 400       |           |
| F II    | 417.874    | 100       |           | Ne IV   | 433.237    | 250       |           |
| O II    | 418.598    | 50        |           | C III   | 433.3391   | 800       |           |
| C III   | 418.609    | 200d      |           | Cl III  | 433.664    | 10        |           |
| N III   | 418.705    | 600       | 16        | Cl III  | 433.774    | 10        |           |
| O II    | 418.812    | 10        |           | N III   | 433.911    | 500       | 9         |
| N III   | 418.910    | 500       | 16        | N III   | 434.014    | 500       | 9         |
| C IV    | 419.525    | 950       | 6         | N III   | 434.066    | 600       | 9         |
| F IV    | 419.644    | 900       |           | N III   | 434.129    | 450       | 9         |
| C IV    | 419.714    | 1000      | 6         | N III   | 434.246    | 500       | 9         |
| F IV    | 420.041    | 950       |           | O III   | 434.256    | 200       |           |
| Ne V    | 420.386    | 100       |           | N III   | 434.280    | 500       | 9         |
| F IV    | 420.727    | 1000      |           | B III   | 434.627    | 100       |           |
| N IV    | 420.769    | 100       |           | O III   | 434.646    | 150       |           |
| Ne V    | 420.951    | 150       |           | Mg VII  | 434.710    | 10d       |           |
| Na VI   | 421.465    | 100       |           | O III   | 434.840    | 100       |           |
| Ne IV   | 421.609    | 750       | 9         | Mg VII  | 434.923    | 200d      |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| O III   | 434.975    | 500       | 14        | Ar V    | 446.949    | 400       | 5         |
| F II    | 435.634    | 300       |           | Ar V    | 447.527    | 200       | 5         |
| Ne VI   | 435.649    | 400       |           | O VI    | 447.717    | 10        |           |
| F II    | 436.279    | 200       |           | Ne II   | 447.813    | 550       | 3         |
| O II    | 436.510    | 50        |           | O VI    | 447.840    | 10        |           |
| F II    | 436.563    | 100       |           | Ar V    | 449.065    | 900       | 5         |
| Ar V    | 436.60     |           |           | Ar V    | 449.493    | 200       | 5         |
| O II    | 436.649    | 10        |           | Ar V    | 450.079    | 50        | 5         |
| Ar      | 436.67     | 120       |           | N V     | 450.08     | 50        |           |
| Mg VIII | 436.726    | 100d      |           | Ar      | 450.44     | 80        |           |
| N V     | 436.85     | 60        |           | C III   | 450.7338   | 800       |           |
| Na      | 436.946    | 10        |           | Ar IV   | 451.20     |           |           |
| C II    | 437.102    | 100d      |           | Ar      | 451.55     | 60        |           |
| Si III  | 437.255    | P         | 3 02      | Ne VI   | 451.843    | 200       |           |
| O II    | 437.332    | 150       |           | N III   | 451.869    | 850       | 4         |
| B V     | 437.36     | P         |           | Ar IV   | 451.87     |           |           |
| S V     | 437.37     | 100       | 4         | N III   | 452.226    | 900       | 4         |
| O II    | 437.683    | 150       |           | Ne VI   | 452.745    | 300       |           |
| Cl IV   | 437.825    | 400       |           | Ar IV   | 452.91     |           |           |
| Si IV   | 437.849    | P         | 8         | Ar      | 452.92     | 80        |           |
| S V     | 438.19     | 100       | 4         | N II    | 453.257    | 20        |           |
| Ar      | 438.64     | 10        |           | N II    | 453.340    | 100       |           |
| Si IV   | 438.734    | P         | 8         | Ne VI   | 454.072    | 300       |           |
| C II    | 438.824    | P         |           | Si IV   | 454.112    | P         | 7         |
| C II    | 438.897    | 100P      |           | Ne II   | 454.648    | 350       | 2         |
| Mg IX   | 439.180    | 10        |           | Ar      | 454.76     | 20        |           |
| Cl IV   | 439.255    | 300       |           | Si IV   | 455.065    | P         | 7         |
| S V     | 439.65     | 100       | 4         | Ne II   | 455.270    | 450       | 2         |
| Ar      | 439.96     | 40        |           | Cl VII  | 455.273    | 100       |           |
| Cl IV   | 440.245    | 200       |           | Li III  | 455.63     | P         |           |
| Na VI   | 440.266    | 300       |           | Ar VI   | 455.813    | 80        |           |
| Ne VI   | 440.404    | 100       |           | N III   | 456.078    | 100       |           |
| O II    | 440.552    | 150       |           | P XIII  | 456.100    | P         |           |
| O II    | 440.598    | 100       |           | Ne II   | 456.344    | 250       | 2         |
| Ne VI   | 440.60     | 10        |           | Ar VI   | 456.375    | 120       |           |
| Al XIII | 440.9      | P         |           | Cl VII  | 456.556    | 50        |           |
| Ar      | 440.91     | 30        |           | Ne II   | 456.895    | 350       | 2         |
| Li III  | 441.00     | P         |           | O II    | 456.997    | 50        |           |
| Cl III  | 441.398    | 300       |           | Ar VI   | 457.007    | 200       |           |
| N VII   | 441.75     | P         |           | Cl III  | 457.169    | 300       |           |
| Ar      | 441.83     | 30        |           | F II    | 457.177    | 500       |           |
| O II    | 442.001    | 200       |           | Cl III  | 457.245    | 200       |           |
| O II    | 442.048    | 200       |           | Cl III  | 457.444    | 10        |           |
| O IV    | 442.705    | 50        |           | Ar VI   | 457.475    | 800b      |           |
| O IV    | 442.873    | 10        |           | Ar VI   | 457.475    | 800b      |           |
| Cl III  | 442.947    | 200       |           | Si IV   | 457.818    | 250       | 2         |
| Ar IV   | 443.40     |           |           | Ar VI   | 458.039    | 40        |           |
| Ar      | 443.42     | 80        |           | Ar V    | 458.121    | 150       | 4         |
| O II    | 443.681    | 10        |           | Si IV   | 458.155    | 200       | 2         |
| Mg IX   | 443.981    | 10d       |           | O II    | 458.422    | 10        |           |
| P IV    | 444.249    | 20        |           | B III   | 458.700    | 100       |           |
| Ne II   | 445.032    | 450       | 3         | Ar V    | 458.975    | 100       | 4         |
| Na V    | 445.046    | 500       |           | Ar VI   | 459.320    | 400       |           |
| Na V    | 445.190    | 600       |           | C III   | 459.462    | 900       | 6         |
| P IV    | 445.194    | 20        |           | C III   | 459.521    | 950       | 6         |
| O II    | 445.601    | 200       |           | Ar VI   | 459.603    | 100       |           |
| O II    | 445.638    | 200       |           | C III   | 459.633    | 1000      | 6         |
| Ar V    | 445.997    | 250       | 5         | Ar V    | 459.728    | 50        | 4         |
| Ne II   | 446.252    | 550       | 3         | Na V    | 459.897    | 600       |           |
| Ne II   | 446.591    | 450       | 3         | C III   | 460.0487   | 800       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar VI   | 460.058    | 40        |           | O II    | 470.408    | 200       |           |
| Ar VI   | 460.202    | 40        |           | Ar      | 470.57     | 80        |           |
| Ne II   | 460.725    | 1000      | 1         | Ar      | 471.09     | 60        |           |
| Na V    | 461.051    | 850       |           | O IV    | 471.273    | 50        |           |
| C II    | 461.120    | 100d      |           | O IV    | 471.603    | 10        |           |
| Ar V    | 461.227    | 300b      | 4         | F II    | 471.949    | 200       |           |
| Ar VI   | 461.227    | 300b      |           | Ar      | 471.97     | 60        |           |
| Ar VI   | 461.898    | 40        |           | F II    | 471.990    | 400       | 3         |
| Ar VI   | 462.007    | 1000d     |           | N III   | 472.232    | 350       | 18        |
| Ar VI   | 462.146    | 160       |           | N III   | 472.392    | 400       | 18        |
| Ne II   | 462.388    | 930       | 1         | F II    | 472.710    | 350       | 3         |
| Ar V    | 462.415    | 150       | 4         | P IV    | 472.957    | 80        |           |
| Cl IV   | 463.011    | 300       |           | F II    | 473.016    | 300       | 3         |
| Na V    | 463.263    | 1000      |           | Ar III? | 473.025    | 300       |           |
| N IV    | 463.737    | 300       |           | Ar III  | 473.918    | 300       |           |
| Ar V    | 463.938    | 350       | 4         | Ar VII  | 473.938    | 200       |           |
| O II    | 464.194    | 100       |           | N II    | 474.493    | 10P       |           |
| Ar VI   | 464.257    | 160       |           | O VIII  | 474.54     | 1         |           |
| F III   | 464.284    | 600       |           | N II    | 474.546    | 10P       |           |
| Cl IV   | 464.292    | 300       |           | N II    | 474.602    | 10P       |           |
| O II    | 464.310    | 50        |           | N II    | 474.706    | 20P       |           |
| F V     | 464.370    | 650       |           | N II    | 474.787    | 20P       |           |
| S VI    | 464.654    | 1000      | 5         | N II    | 474.891    | 200P      |           |
| O II    | 464.785    | 150       |           | P V     | 475.610    | 550h      |           |
| Cl IV   | 464.861    | 400       |           | N II    | 475.647    | 100P      |           |
| Ne X    | 465.0      | P         |           | Ar VII  | 475.656    | 400       |           |
| Ar      | 465.02     | 150       |           | N II    | 475.698    | 200P      |           |
| F III   | 465.113    | 650       |           | Ar VII  | 475.733    | 100       |           |
| Ne VII  | 465.221    | 700       |           | N II    | 475.757    | P         |           |
| Cl IV   | 465.350    | 300       |           | N II    | 475.803    | 250P      |           |
| F V     | 465.374    | 700       |           | N II    | 475.884    | 100P      |           |
| O II    | 465.529    | 50        |           | Ar III  | 476.432    | 350       |           |
| Ar VI   | 465.586    | 80        |           | C III   | 477.6246   | 300       |           |
| O II    | 465.760    | 100       |           | Ar VII  | 479.379    | 600       |           |
| Mg      | 465.972    | 10        |           | Ar VII  | 479.485    | 100       |           |
| F V     | 465.978    | 750       |           | Ne V    | 480.406    | 250       | 2         |
| Si III  | 466.129    | 80        | 3.01      | O III   | 480.955    | 200       |           |
| Cl IV   | 466.132    | 300       |           | O V     | 481.12     | 700       |           |
| C II    | 466.352    | 10P       |           | Ne V    | 481.281    | 150       | 2         |
| C II    | 466.407    | 100P      |           | O III   | 481.354    | 150       |           |
| C II    | 466.491    | 200P      |           | Ne V    | 481.361    | 250       | 2         |
| Ar III  | 466.530    | 250       |           | O III   | 481.381    | 100       |           |
| C II    | 466.547    | 10P       |           | P XIII  | 481.417    | P         |           |
| Ar      | 466.82     | 60        |           | O II    | 481.587    | 200b      | 10        |
| Ar VI   | 466.932    | 160       |           | O III   | 481.587    | 200b      |           |
| F V     | 466.99     | 650       |           | O II    | 481.635    | 10        | 10        |
| Cl IV   | 467.194    | 300       |           | O II    | 481.704    | 50        | 10        |
| Ar III  | 467.390    | 300       |           | O II    | 481.755    | 150       | 10        |
| O II    | 467.926    | 10        |           | Ar III  | 481.848    | 300       |           |
| Ar      | 468.38     | 80        |           | Li III  | 482.14     | P         |           |
| Ar III  | 468.467    | 200       |           | Ar III  | 482.548    | 400       |           |
| O II    | 468.766    | 100       |           | S XVI   | 482.7      | P         |           |
| C III   | 468.931    | 10        |           | Ne V    | 482.987    | 500       | 2         |
| Ar III  | 468.956    | 150       |           | Na VII  | 483.216    | 200       |           |
| Ne IV   | 469.773    | 700       | 4         | Na VII  | 483.328    | 300       |           |
| Ne IV   | 469.820    | 1000      | 4         | C III   | 483.567    | 300       |           |
| Ar III  | 469.831    | 200       |           | C III   | 483.618    | 400       |           |
| Ne IV   | 469.866    | 900       | 4         | C III   | 483.733    | 500       |           |
| Ne IV   | 469.921    | 700       | 4         | O II    | 483.752    | 200       | 9         |
| Ar III  | 469.968    | 200       |           | Ar      | 483.86     | 20        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| O II    | 483.976    | 250       | 9         | Ar II   | 494.6678   | ST 50     |           |
| O II    | 484.025    | 100       | 9         | Ar      | 495.55     | 80        |           |
| Ar III  | 484.116    | 250       |           | Na VIII | 496.249    | 100       |           |
| Ar III  | 484.445    | 250       |           | Ar II   | 496.6438   | ST 25     |           |
| S III   | 484.58     | 50        |           | Ar II   | 496.6594   | ST 25     |           |
| F II    | 484.600    | 550       |           | Ar      | 496.91     | 40        |           |
| O II    | 485.086    | 300       | 8         | P III?  | 497.17     | 1         |           |
| Ar III  | 485.150    | 300       |           | F IV    | 497.363    | 500       |           |
| S III   | 485.22     | 50        |           | F IV    | 497.802    | 600       |           |
| O II    | 485.465    | 10        | 8         | F IV    | 497.842    | 400       |           |
| O II    | 485.515    | 250       | 8         | C III   | 497.910    | 100       |           |
| Ar III  | 485.515    | 200       |           | O VI    | 498.090    | 10d       |           |
| O II    | 485.572    | 50        |           | O VI    | 498.431    | 100d      |           |
| O II    | 485.631    | 200       |           | F IV    | 498.790    | 700       |           |
| Ar      | 485.79     | 60        |           | F IV    | 498.911    | 400       |           |
| N II    | 485.849    | 10P       |           | Si XII  | 499.27     | P         |           |
| Cl IV   | 486.172    | 800       |           | C III   | 499.425    | 700       |           |
| Ar      | 486.60     | 300       |           | C III   | 499.462    | 800       |           |
| Na VII  | 486.740    | 400       |           | C III   | 499.530    | 900       |           |
| Al III  | 486.95     | 100       |           | C III   | 499.583    | 700       |           |
| Ar III? | 487.025    | 350       |           | F IX    | 499.8      | P         |           |
| Ne V    | 487.070    | 30d       |           | O II    | 499.871    | 100       |           |
| Ar II   | 487.2274   | ST 20     |           | S III   | 499.983    | 300       |           |
| Ar III? | 487.988    | 350       |           | O II    | 500.343    | 50        |           |
| Ne III  | 488.103    | 800       | 1         | Ar II   | 500.8019   | ST 50     |           |
| Ar III  | 488.452    | 350       |           | Ar      | 501.01     | 120       |           |
| Ar II   | 488.7928   | ST 50     |           | Ar II   | 501.1899   | ST 50     |           |
| Ne III  | 488.868    | 700       | 1         | Ar II   | 502.027    | 20        |           |
| Ne V    | 488.940    | P         |           | Ar II   | 502.1632   | ST 100    |           |
| Ar II   | 488.9616   | ST 20     |           | Ar      | 502.42     | 40        |           |
| Ar II   | 489.1955   | ST 100    |           | Ar II   | 503.6501   | ST 50     |           |
| Ne III  | 489.501    | 1000      | 1         | C VI    | 504.65     | P         |           |
| Na VI   | 489.580    | 500       |           | Ar II   | 504.811    | 50        |           |
| Ne III  | 489.641    | 400       | 1         | Ar II   | 505.0119   | ST 50     |           |
| Ne III  | 490.310    | 700       | 1         | Ar      | 505.45     | 60        |           |
| F IV    | 490.566    | 800       |           | He I    | 505.5001   | 4         |           |
| Ar III? | 490.68     | 150       |           | He I    | 505.6840   | 6         |           |
| Ar II   | 490.7010   | ST 50     |           | He I    | 505.9122   | 8         |           |
| F IV    | 490.997    | 1000      |           | N II    | 505.986    | 100P      |           |
| Mg      | 491.045    | 10        |           | N II    | 506.054    | 200P      |           |
| Ne III  | 491.050    | 900       | 1         | N II    | 506.153    | 300P      |           |
| Ar III  | 491.121    | 200       |           | F V     | 506.163    | 850       |           |
| Na VI   | 491.240    | 300       |           | He I    | 506.2000   | 10        |           |
| Na VI   | 491.340    | 600       |           | He I    | 506.5702   | 15        |           |
| O III   | 491.714    | 10        |           | C III   | 506.658    | 10        |           |
| Na VII  | 491.950    | 400d      |           | He I    | 507.0576   | 20        | 10        |
| O III   | 491.980    | 50        |           | O III   | 507.391    | 800       | 3         |
| Ar III  | 492.228    | 150       |           | O III   | 507.683    | 850       | 3         |
| Na VIII | 492.329    | 10        |           | He I    | 507.7178   | 30        | 9         |
| Ar II   | 492.4080   | ST 20     |           | F V     | 508.079    | 900       |           |
| Ar      | 492.64     | 50        |           | O III   | 508.182    | 900       | 3         |
| C III   | 492.6500   | 700       |           | F III   | 508.384    | 900       |           |
| C III   | 493.341    | 500       |           | Ar III  | 508.441    | 450       |           |
| C III   | 493.364    | 500       |           | N II    | 508.484    | 10P       |           |
| C III   | 493.396    | 500       |           | Ar III  | 508.611    | 300       |           |
| C III   | 493.464    | 500       |           | He I    | 508.6431   | 40        | 8         |
| C III   | 493.519    | 500       |           | N II    | 508.668    | P         |           |
| C III   | 493.587    | 700       |           | Ar III  | 508.675    | 180       |           |
| Na VI   | 494.160    | 300       |           | N II    | 508.697    | 150P      |           |
| Na VI   | 494.382    | 700       |           | N II    | 508.928    | 10P       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| N II    | 509.006    | 15P       |           | Ar II   | 519.3271   | ST 100    | 12        |
| Ar      | 509.02     | 200       |           | Ar VIII | 519.429    | 150       |           |
| N III   | 509.586    | 400       | 14        | O VI    | 519.610    | 200d      |           |
| N III   | 509.897    | 350       | 14        | O VI    | 519.723    | 200d      |           |
| He I    | 509.9979   | 50        | 7         | S IV    | 520.11     | 200       |           |
| Si III  | 510.079    | P         | 6.08      | C VI    | 520.6      | P         |           |
| Na V    | 510.102    | 10        |           | Si III  | 520.79     | 10        | 6.06      |
| He I    | 510.2586   | f         |           | S IV    | 520.83     | 300       |           |
| Si III  | 510.414    | P         | 6.08      | Si III  | 520.92     | 20        | 6.06      |
| Ar II   | 510.5511   | ST 40     |           | Si XII  | 521.10     | P         |           |
| Ar II   | 510.5566   | ST 60     |           | S IV    | 521.13     | 100       |           |
| N II    | 510.758    | 250P      |           | Si III  | 521.149    | P         | 6.06      |
| B III   | 510.777    | 200       |           | Si III  | 521.510    | P         | 6.06      |
| B III   | 510.865    | 300       |           | Ne IV   | 521.741    | 125       | 8         |
| Si III  | 511.096    | P         | 6.8       | Ne IV   | 521.820    | 125       | 8         |
| Na V    | 511.193    | 100       |           | Si III  | 521.861    | P         | 6.06      |
| Al III  | 511.215    | 400       |           | S IV    | 521.99     | 200       |           |
| Ar III  | 511.505    | 300       |           | P IV    | 522.02     | 10h       |           |
| C III   | 511.5225   | 1000      |           | Ar V    | 522.090    | 150       | 3         |
| Ar III  | 511.570    | 180       |           | He I    | 522.2128   | 160       | 4         |
| N V     | 511.834    | 70        |           | F III   | 522.288    | 300       |           |
| Ar V    | 511.886    | 25        |           | S IV    | 522.54     | 200       |           |
| Si III  | 511.994    | P         | 6.07      | Ar II   | 522.7921   | ST 100    | 12        |
| He I    | 512.0982   | 70        | 6         | F III   | 523.661    | 400       |           |
| Si III  | 512.219    | P         | 6.07      | He I    | 523.7238   | f         |           |
| He I    | 512.5183   | f         |           | Ar V    | 524.189    | 250       | 3         |
| B V     | 512.53     | P         |           | F V     | 524.597    | 600       |           |
| Si III  | 512.557    | P         | 6.07      | Ar II   | 524.6805   | ST 100    |           |
| Si III  | 512.681    | P         | 6.07      | F V     | 525.292    | 650       |           |
| Ar III  | 512.770    | 180       |           | O III   | 525.795    | 900       | 8         |
| Si III  | 512.772    | P         | 6.07      | F V     | 526.298    | 700       |           |
| Si III  | 513.245    | P         | 6.07      | Ar VIII | 526.457    | 250       |           |
| F II    | 513.649    | 400       |           | Ar II   | 526.3971   | ST 100    |           |
| N II    | 513.849    | P         |           | Ar VIII | 526.870    | 50        |           |
| Ar V    | 513.914    | 50        |           | Ar V    | 527.693    | 300       | 3         |
| F V     | 513.975    | 700       |           | B III   | 528.219    | 10        |           |
| F V     | 514.087    | 600       |           | Ar II   | 528.6508   | ST 50     |           |
| Ar II   | 514.3097   | ST 100    |           | Na VI   | 528.730    | 10        |           |
| Na V    | 514.350    | 10        |           | O V     | 529.20     | 500       |           |
| O VIII  | 514.80     | P         |           | N II    | 529.355    | 250       | 6         |
| F II    | 514.945    | 600       |           | N II    | 529.413    | 250       | 6         |
| Si IV   | 515.118    | 150       | 6         | N II    | 529.491    | 250       | 6         |
| O II    | 515.498    | 250       | 17        | N II    | 529.637    | 250       | 6         |
| He I    | 515.6165   | 100       | 5         | N II    | 529.722    | 250       | 6         |
| Ar      | 515.62     | 20        |           | N II    | 529.867    | 400       | 6         |
| O II    | 515.640    | 200       | 17        | Ar III  | 529.900    | 450       |           |
| Na      | 515.952    | 100       |           | N III   | 530.037    | 200       |           |
| Si IV   | 516.348    | 200       | 6         | N III   | 530.268    | 250       |           |
| He I    | 516.3592   | f         |           | C II    | 530.274    | 300P      |           |
| C II    | 516.652    | 10d       |           | C II    | 530.359    | 400P      |           |
| C II    | 517.069    | 100d      |           | C II    | 530.454    | P         |           |
| Ar      | 517.17     | 80        |           | Ar II   | 530.4951   | ST 100    |           |
| Ar V    | 517.250    | 25        |           | C II    | 531.721    | 5P        |           |
| Mg XII  | 517.5      | P         |           | C II    | 531.742    | 5P        |           |
| O II    | 517.937    | 200       | 16        | C II    | 531.917    | 100d      |           |
| O II    | 518.242    | 250       | 16        | Ar III  | 532.413    | 350       |           |
| B III   | 518.244    | 460       |           | C II    | 532.654    | 100P      |           |
| B III   | 518.271    | 230       |           | C II    | 532.705    | 200P      |           |
| Ar II   | 518.9090   | ST 100    | 12        | Ar II   | 533.0796   | ST 100    |           |
| S IV    | 519.30     | 200       |           | Si III  | 533.226    | P         | 6.05      |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| N II    | 533.511    | 350       | 5         | Cl V    | 541.284    | 300       |           |
| Si III  | 533.530    | P         | 6.05      | Ar II   | 541.3017   | ST        | 50        |
| N II    | 533.581    | 400       | 5         | Ne IV   | 542.073    |           | 500       |
| Si III  | 533.592    | P         | 6.05      | Cl V    | 542.229    |           | 800       |
| N II    | 533.650    | 350       | 5         | Cl V    | 542.297    |           | 600       |
| N II    | 533.729    | 500       | 5         | Cl V    | 542.395    |           | 300       |
| N II    | 533.815    | 350       | 5         | P V     | 542.567    |           | 500       |
| C II?   | 533.935    | 100d      |           | Cl V    | 542.868    |           | 400       |
| Si III  | 534.189    | P         | 6.05      | Ar II   | 542.9125   | ST        | 200       |
| Ar III  | 534.26     | 50        |           | S III   | 543.031    |           | 200       |
| Si III  | 534.276    | P         | 6.05      | Ar II   | 543.2035   | ST        | 200       |
| Si III  | 534.339    | P         | 6.05      | C II    | 543.257    |           | 200d      |
| Cl IV   | 534.727    | 800       |           | C II    | 543.444    |           | 300d      |
| Cl IV   | 535.039    | 400       |           | C II    | 543.446    |           | 30P       |
| Ar II   | 535.0713   | ST        | 50        | Ar II   | 543.508    |           | 20        |
| F VI    | 535.204    | 1000      |           | Ar II   | 543.7307   | ST        | 200       |
| C III   | 535.2885   | 850       |           | Cl V    | 543.818    |           | 100       |
| Cl V    | 535.455    | 200       |           | Ne IV   | 543.891    |           | 750       |
| N VII   | 535.51     | P         |           | Ar VI   | 544.731    |           | 160       |
| Ar III  | 535.580    | 350       |           | P V     | 544.914    |           | 550       |
| Cl IV   | 535.666    | 700       |           | Cl V    | 545.114    |           | 1000      |
| Cl V    | 535.916    | 200       |           | Ar II   | 546.1770   | ST        | 200       |
| Cl IV   | 536.150    | 600       |           | Cl V    | 546.329    |           | 600       |
| Cl V    | 536.532    | 300       |           | F II    | 546.851    |           | 900       |
| Ar III? | 536.745    | 400       |           | C II    | 547.140    |           | P         |
| Ne IV   | 536.965    | 5         |           | C II    | 547.153    |           | 10        |
| Cl V    | 537.006    | 400       |           | Ar II   | 547.1647   | ST        | 200       |
| He I    | 537.0296   | 400       | 3         | C II    | 547.277    |           | 5         |
| Ar II   | 537.1398   | ST        | 100       | C II    | 547.291    |           | 5         |
| He I    | 537.3309   | f         |           | Ar II   | 547.4602   | ST        | 200       |
| Ar II   | 537.4195   | ST        | 50        | Cl V    | 547.630    |           | 1000      |
| Ar III  | 537.459    | 300       |           | N II    | 547.818    |           | 10P       |
| Cl V    | 537.461    | 300       |           | F II    | 547.875    |           | 400       |
| Cl IV   | 537.606    | 900       |           | Ar II   | 547.9958   | ST        | 50        |
| O II    | 537.830    | 450       | 7         | F II    | 548.322    |           | 300       |
| Cl V    | 538.032    | 500       |           | F II    | 548.517    |           | 200       |
| C III   | 538.0801   | 900       | 5         | Ar II   | 548.7810   | ST        | 200       |
| Cl IV   | 538.119    | 600       |           | Ar VI   | 548.905    |           | 200       |
| C III   | 538.1487   | 950       | 5         | Cl IV   | 549.219    |           | 500       |
| O II    | 538.256    | 500       | 7         | P XV    | 549.3      |           | P         |
| C III   | 538.3120   | 1000      | 5         | C II    | 549.3195   | ST        | 300       |
| O II    | 538.318    | 350       | 7         | C II    | 549.3785   | ST        | 400       |
| Ar      | 538.41     | 40        |           | C II    | 549.5110   | ST        | 500       |
| Cl IV   | 538.595    | 400       |           | C II    | 549.5730   | ST        | 300       |
| Cl V    | 538.681    | 400       |           | Cl IV   | 550.020    |           | 400       |
| Ar III  | 538.788    | 300       |           | Cl VI   | 550.355    |           | 250       |
| He I    | 538.8956   | f         |           | Ar II   | 550.4807   | ST        | 100       |
| Cl V    | 538.977    | 300       |           | Cl IV   | 550.706    |           | 300       |
| O II    | 539.086    | 400       | 2         | Ar II   | 550.9042   | ST        | 100       |
| Ar      | 539.19     | 30        |           | Cl V?   | 551.117    |           | 200       |
| Cl V    | 539.441    | 10        |           | S IV    | 551.17     |           | 200       |
| O II    | 539.547    | 400       | 2         | Ar VI   | 551.371    |           | 320       |
| Ne IV   | 539.731    | 15        |           | Cl V?   | 551.643    |           | 100       |
| Ar      | 539.79     | 50        |           | C II    | 551.874    |           | 10        |
| O II    | 539.853    | 350       | 2         | Cl VI   | 551.992    |           | 500       |
| C VI    | 539.95     | P         |           | Cl IV   | 552.017    |           | 700       |
| Li III  | 540.00     | P         |           | Cl VI   | 552.053    |           | 100       |
| Ar II   | 540.8063   | ST        | 50        | Cl III  | 552.908    |           | 200b      |
| He I    | 540.9354   | f         |           | Cl V?   | 552.908    |           | 200b      |
| Ne IV   | 541.127    | 400       | 1         | Ar II   | 553.1260   | ST        | 100       |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Cl IV   | 553.297    | 600       |           | Cl III  | 564.287    | 400       |           |
| O IV    | 553.328    | 800       | 3         | Cl III  | 564.514    | 200       |           |
| Ar III  | 553.470    | 450       | 4         | Ne VII  | 564.529    | 200       |           |
| O IV    | 554.074    | 850       | 3         | C II    | 564.565    | 40        |           |
| S IV    | 554.17     | P         | 5         | C II    | 564.582    | 40        |           |
| Cl V?   | 554.210    | 100       |           | C II    | 564.608    | 100       |           |
| O III   | 554.275    | 10        |           | C II    | 564.635    | 50        |           |
| Ar      | 554.50     | 120       |           | C II    | 564.663    | 200       |           |
| O IV    | 554.514    | 900       | 3         | C II    | 564.698    | 40        |           |
| Cl IV   | 554.619    | 700       |           | Cl III  | 565.272    | 300       |           |
| C II    | 554.655    | 200       |           | Si III  | 565.289    | 20        | 6.4       |
| O II    | 555.056    | 250       | 6         | Ar      | 565.31     | 20        |           |
| O II    | 555.121    | 250       | 6         | Cl III  | 565.480    | 400b      |           |
| O IV    | 555.262    | 800       | 3         | Cl VI   | 565.480    | 400b      |           |
| Cl V?   | 555.485    | 1000b     |           | C III   | 565.5280   | 700       |           |
| Cl VI   | 555.485    | 1000b     |           | Si III  | 565.698    | 40        | 6.04      |
| Cl VI   | 555.580    | 150       |           | Cl II   | 565.75     | 10        |           |
| Ar VI   | 555.639    | 160       |           | C III   | 566.490    | 400       |           |
| Ar II   | 555.7662   | ST        | 100       | Si III  | 566.546    | P         | 6.04      |
| Cl III  | 556.232    | 600       | 3         | Si III  | 566.613    | 160       | 3         |
| Cl III  | 556.605    | 100       | 3         | Cl VI   | 566.630    | 200       |           |
| Ar II   | 556.8172   | ST        | 200       | Cl II   | 566.77     | 10        |           |
| Ar III  | 556.893    | 300       | 4         | Cl VI   | 567.479    | 100       |           |
| Ar      | 557.04     | 40        |           | F III   | 567.629    | 500       |           |
| Cl III  | 557.118    | 700       | 3         | F III   | 567.676    | 700       |           |
| Cl II   | 558.14     | 100       |           | F III   | 567.737    | 650       |           |
| Ar III  | 558.321    | 250       | 4         | F III   | 567.794    | 500       |           |
| Cl III  | 558.385    | 100       |           | Si III  | 567.878    | P         | 19        |
| Ar V    | 558.481    | 250       | 7         | P III   | 568.09     | 10        |           |
| Ne VI   | 558.595    | 50        |           | Ne V    | 568.418    | 400       | 1         |
| Ne VII  | 558.61     | 400b      |           | Ne V    | 569.759    | 250       | 1         |
| Ar      | 559.48     | 40        |           | Ne V    | 569.830    | 500       | 1         |
| Si IV   | 559.533    | 2         | 5         | P III   | 569.90     | 200b      |           |
| N II    | 559.762    | 10P       |           | Cl VI   | 570.025    | 400       |           |
| Ne VII  | 559.947    | 300       |           | Cl VI   | 570.529    | 200       |           |
| Ar II   | 560.2229   | ST        | 200       | Ar      | 570.61     | 80        |           |
| C II    | 560.2394   | ST        | 400       | F IV    | 570.636    | 900       |           |
| Al III  | 560.390    | 700       | 3         | Cl VI   | 570.881    | 10        |           |
| C II    | 560.4367   | ST        | 500       | F IV    | 571.302    | 900       |           |
| C II    | 560.4386   | ST        | 40        | Cl VI   | 571.376    | 100       |           |
| Cl III  | 560.636    | 100       |           | F IV    | 571.384    | 950       |           |
| Si IV   | 560.980    | 5         | 5         | Cl VI   | 571.435    | 10        |           |
| Ar      | 561.06     | 20        |           | Cl II   | 571.95     | 100       |           |
| Ne VII  | 561.378    | 200       |           | Ar II   | 572.0139   | ST        | 11        |
| Cl III  | 561.530    | 700       | 5         | N II    | 572.069    | P         |           |
| Cl III  | 561.680    | 700       | 5         | Ne V    | 572.106    | 250       | 1         |
| Ne VII  | 561.728    | 400       |           | Ne V    | 572.336    | 800       | 1         |
| Cl III  | 561.738    | 700       | 5         | F IV    | 572.657    | 1000      |           |
| Ar      | 562.18     | 30        |           | Cl III  | 572.693    | 400       | 2         |
| Cl II   | 562.28     | 300       |           | Ar II   | 573.3622   | ST        | 11        |
| C II    | 562.338    | 150       |           | Ar III  | 573.468    | 200       |           |
| C II    | 562.367    | 150       |           | Si III  | 573.538    | P         | 6.03      |
| C II    | 562.473    | 150       |           | Si III  | 573.951    | P         | 6.03      |
| C II    | 562.497    | 150       |           | Si III  | 573.961    | P         | 6.03      |
| Cl II   | 562.54     | 10        |           | O III   | 574.065    | 1         |           |
| C II    | 562.562    | 300       |           | F IX    | 574.1      | P         |           |
| Ne VI   | 562.735    | 10        |           | C III   | 574.2809   | 1000      | 11        |
| Ne VI   | 562.805    | 150       |           | Cl II   | 574.37     | 300       |           |
| Ne VII  | 562.992    | 200       |           | Cl III  | 574.408    | 300       | 2         |
| Cl II   | 563.58     | 10        |           | N II    | 574.650    | 500       | 11        |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Si III  | 574.799    | P         | 6.03      | Cl III  | 591.962    | 200       | 6         |
| Si III  | 574.814    | P         | 6.03      | Ar VI   | 594.096    | 100       |           |
| Si III  | 574.824    | P         | 6.03      | Cl II   | 594.49     | 10        |           |
| Cl II   | 575.30     | 10        |           | Cl III  | 594.636    | 400       |           |
| Cl III  | 575.582    | 300       | 2         | C II    | 594.8000   | ST 600    | 6         |
| F IV    | 575.633    | 200       |           | C II    | 595.0219   | ST 700    | 6         |
| F IV    | 576.266    | 300       |           | C II    | 595.0245   | ST 70     | 6         |
| F IV    | 576.349    | 200       |           | Ne I    | 595.919    | 100       |           |
| Cl VI   | 576.419    | 200       |           | Cl III  | 595.990    | 300       |           |
| Ar II   | 576.7361   | ST 200    | 11        | Cl III  | 596.240    | 400       |           |
| C II    | 576.8748   | 100       |           | Be IV   | 596.44     | P         |           |
| C II    | 577.0859   | 200       |           | Ar VI   | 596.694    | 160       |           |
| Ar III  | 577.153    | 150       |           | Ar II   | 597.7003   | ST 200    | 9         |
| Cl VI   | 577.444    | 100       |           | Ar II?  | 597.76     | 20        |           |
| F IV    | 577.737    | 400       |           | O III   | 597.818    | 750       | 13        |
| Ar II   | 578.1068   | ST 200    | 11        | Cl VII  | 598.211    | 600       |           |
| Ar III  | 578.386    | 200       |           | Ne I    | 598.705    | 75        |           |
| Ar II   | 578.6046   | ST 200    | 10        | Ne I    | 598.890    | 35b       |           |
| Ne I    | 578.82     |           |           | Cl II   | 599.19     | 10        |           |
| Ar III  | 579.212    | 150       |           | O III   | 599.598    | 900       | 7         |
| Ne I    | 579.75     |           |           | Cl IV   | 599.733    | 200       |           |
| P III   | 579.98     | 1h        |           | Ne I    | 600.036    | 70        |           |
| Ar II   | 580.2634   | ST 300    | 10        | C II    | 600.251    | 100       |           |
| O II    | 580.400    | 300       | 15        | C II    | 600.337    | 100P      |           |
| Cl VI   | 580.444    | 200       |           | C II    | 600.353    | 300       |           |
| Ne I    | 580.50     |           |           | C II    | 600.503    | 100       |           |
| O II    | 580.967    | 350       | 15        | C II    | 600.518    | 100       |           |
| Ne I    | 581.14     |           |           | O II    | 600.585    | 300       | 14        |
| P III   | 581.898    | 1h        |           | C VI    | 601.31     | P         |           |
| N II    | 582.156    | 400       | 10        | He I    | 601.4041   | f         |           |
| Ne I    | 582.46     |           |           | N III   | 601.468    | 100       |           |
| Ar II   | 583.4368   | ST 200    | 10        | Cl IV   | 601.499    | 500       |           |
| O VIII  | 584.05     | P         |           | N III   | 601.878    | 10        |           |
| Cl II   | 584.10     | 100       |           | Ne I    | 602.725    | 170       |           |
| He I    | 584.3340   | 1000      | 2         | Ar II   | 602.8581   | ST 200    | 9         |
| Ne I    | 585.25     |           |           | Ne IV   | 602.999    | 10        |           |
| C III   | 585.261    | 600       |           | Ar II?  | 603.26     | 20        |           |
| C III   | 585.417    | 800       |           | Ar III? | 604.152    | 500       |           |
| C III   | 585.496    | 500       |           | O V     | 604.41     | 500       |           |
| C III   | 585.608    | 600       |           | Cl IV   | 604.590    | 500       |           |
| C III   | 585.666    | 600       |           | Cl VII  | 604.785    | 1000      |           |
| Ar VII  | 585.754    | 750       |           | Cl VII  | 605.052    | 50        |           |
| Cl II   | 586.25     | 10        |           | Ne IV   | 605.595    | 10        |           |
| Ne I    | 586.30     |           |           | F II    | 605.668    | 700       | 1         |
| Cl III  | 586.874    | 400       |           | Cl III  | 605.855    | 100       |           |
| Ar VI   | 587.006    | 40        |           | Si III  | 605.873    | P         | 18        |
| Cl III  | 587.078    | 300       |           | Cl III  | 606.100    | 200       | 4         |
| Ne I    | 587.20     | 35        |           | F II    | 606.284    | 600       | 1         |
| Cl III  | 587.295    | 400       |           | Cl III  | 606.345    | 500       | 4         |
| Cl II   | 588.77     | 10        |           | Ne IV   | 606.527    | 25        |           |
| Ar VI   | 588.921    | 200       |           | F II    | 606.805    | 800       | 1         |
| Ne I    | 589.16     | 35        |           | F II    | 606.925    | 500       | 1         |
| Ar VI   | 589.783    | 80        |           | Cl IV   | 607.088    | 300       |           |
| Cl II   | 589.82     | 10        |           | F II    | 607.472    | 600       | 1         |
| Ne I    | 589.92     | 35b       |           | F II    | 608.065    | 700       | 1         |
| Cl III  | 591.118    | 300       | 6         | O IV    | 608.395    | 700       | 2         |
| He I    | 591.4117   | 40f       | 1         | Cl IV   | 608.903    | 400       |           |
| Cl III  | 591.428    | 400       | 6         | C III   | 609.025    | 400       |           |
| Cl III  | 591.646    | 400       | 6         | Ne IV   | 609.168    | 5         |           |
| Ne I    | 591.82     | 70        |           | C III   | 609.275    | 600       |           |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Cl III  | 609.673    | 400       | 4         | Ne I    | 629.738    | 200       | 3         |
| O III   | 609.705    | 300       | 16        | P IV    | 629.920    | 160       | 4         |
| O IV    | 609.829    | 750       | 2         | F III   | 630.131    | 600       |           |
| Mg X    | 609.85     | P         |           | F III   | 630.194    | 700       |           |
| Cl III  | 609.901    | 10        | 4         | Ar VII  | 630.306    | 100       |           |
| O III   | 610.043    | 350       | 16        | Cl III  | 630.380    | 100       |           |
| O III   | 610.746    | 400       | 16        | Si XIV  | 630.6      | P         |           |
| O III   | 610.850    | 10        | 16        | Cl III  | 630.746    | 100       |           |
| Cl IV   | 612.070    | 40        |           | Cl III  | 631.006    | 100       |           |
| Ar II   | 612.3719   | ST 500    |           | Ar      | 631.68     | 60        |           |
| Cl II   | 612.73     | 10        |           | P IV    | 631.790    | 400       | 4         |
| Ar      | 613.40     | 20        |           | O VIII  | 632.7      | P         |           |
| Cl III? | 613.643    | 10        |           | Na VI   | 632.90     | 10        |           |
| Cl III? | 613.874    | 100       |           | Cl V    | 633.186    | 400       |           |
| Ar      | 614.69     | 10        |           | Ar VII  | 634.208    | 100       |           |
| Ne I    | 615.627    | 170       | 7         | Cl II   | 634.24     | 100       |           |
| Na XI   | 616.0      | P         |           | Si III  | 634.255    | P         | 16        |
| O II    | 616.291    | 350       | 5         | Ar V?   | 635.12     | 150       |           |
| O II    | 616.363    | 200       | 5         | N II    | 635.197    | 400       | 13        |
| O IV    | 616.933    | 400       |           | Cl V    | 635.323    | 400       |           |
| O IV    | 617.033    | 350       |           | Cl II   | 635.87     | 200       |           |
| O II    | 617.051    | 300       | 5         | C II    | 635.9945   | ST 300    |           |
| Cl II   | 617.27     | 10        |           | C II    | 636.2511   | ST 400    |           |
| Cl II   | 617.61     | 100       |           | Cl II   | 636.62     | 200       |           |
| Cl III? | 617.630    | 200       |           | Ar III  | 636.818    | 150       | 3         |
| Cl II   | 618.02     | 200       |           | Ar VII  | 637.052    | 200       |           |
| Ar      | 618.63     | 200       |           | Cl II   | 637.06     | 100       |           |
| Ne I    | 618.671    | 170       | 6         | Ar III  | 637.282    | 1000      | 3         |
| Cl III  | 619.025    | 100       |           | Ar VII  | 637.466    | 50        |           |
| Ar      | 619.04     | 200       |           | Na VI   | 638.21     | 10        |           |
| Ne I    | 619.101    | 120       | 5         | Cl II   | 638.23     | 200       |           |
| N VII   | 619.84     | P         |           | Cl V    | 639.226    | 300       |           |
| Cl II   | 619.95     | 10        |           | Cl II   | 639.42     | 200       |           |
| Ar      | 620.05     | 20        |           | Cl III  | 639.757    | 100       |           |
| Cl II   | 620.28     | 100       |           | S II    | 640.41     | 50        |           |
| Cl III  | 621.027    | 300       |           | Cl III  | 640.928    | 100       |           |
| Ar      | 621.05     | 20        |           | S II    | 640.93     | 50        |           |
| Cl II   | 621.12     | 400       |           | Cl III  | 641.304    | 100       |           |
| Cl III  | 621.280    | 400       |           | Ar VII  | 641.318    | 100       |           |
| C III   | 622.144    | 200       |           | Ar III  | 641.364    | 250       | 3         |
| Ar III? | 623.767    | 250       |           | C II    | 641.593    | 300       |           |
| Cl III  | 623.768    | 300       |           | C II    | 641.627    | 300       |           |
| O IV    | 624.617    | 650       | 6         | C II    | 641.771    | 300       |           |
| Si III  | 624.997    | P         | 17        | C II    | 641.800    | 300       |           |
| O IV    | 625.130    | 700       | 6         | Ar III  | 641.808    | 600       | 3         |
| Mg X    | 625.28     | P         |           | S II    | 641.81     | 100       |           |
| O IV    | 625.852    | 700       | 6         | C II    | 641.888    | 630       |           |
| Cl II   | 626.70     | 100       |           | Ar III  | 643.256    | 450       | 3         |
| Ne I    | 626.822    | 200       | 4         | F VI    | 643.98     | 700       |           |
| O V     | 627.36     | 500       |           | O II    | 644.148    | 600       | 13        |
| O V     | 627.63     | 700       |           | Ar VII  | 644.388    | 100       |           |
| Be IV   | 627.90     | P         |           | N II    | 644.634    | 650       | 4         |
| N V     | 628.744    | 70        |           | N II    | 644.837    | 750       | 4         |
| N V     | 628.874    | 50        |           | F VI    | 645.02     | 600       |           |
| P IV    | 629.023    | 120       | 4         | N II    | 645.178    | 850       | 4         |
| N II    | 629.167    | 300P      |           | Si IV   | 645.759    | 150       | 15        |
| Cl V    | 629.354    | 300       |           | F VI    | 646.10     | 500       |           |
| N II    | 629.447    | 200P      |           | F VI    | 646.36     | 800       |           |
| N II    | 629.670    | P         |           | F VI    | 647.31     | 600       |           |
| O V     | 629.732    | 1000      | 1         | F V     | 647.771    | 500       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| F V     | 647.879    | 600       |           | Cl II   | 662.15     | 100       |           |
| F VI    | 648.50     | 700       |           | Cl IV   | 662.454    | 300       |           |
| P IV    | 648.507    | 80        |           | Cl II   | 663.08     | 200       |           |
| S VI    | 648.628    | 100       |           | S V     | 663.155    | 500       | 3         |
| Ar      | 649.03     | 50        |           | Cl II   | 663.67     | 200       |           |
| P IV    | 649.69     | 20        |           | S IV    | 663.707    | 300       | 7         |
| S VI    | 650.430    | 100       |           | Ar      | 663.93     | 10        |           |
| Cl II   | 650.88     | 100       |           | Ar II   | 664.5626   | ST 400    | 8         |
| Ar      | 651.04     | 10        |           | Cl II   | 664.67     | 200       |           |
| Cl II   | 651.13     | 100       |           | S IV    | 664.822    | 300       | 7         |
| C II    | 651.211    | 300       | 9         | Ar      | 664.93     | 50        |           |
| C II    | 651.234    | 300       | 9         | Cl II   | 665.21     | 100       |           |
| C II    | 651.269    | 700       | 9         | Ar II   | 666.0112   | ST 600    | 7         |
| C II    | 651.304    | 300P      | 9         | Cl III? | 666.040    | 300       |           |
| C II    | 651.345    | 800       | 9         | Cl II   | 666.08     | 300       |           |
| C II    | 651.389    | 300P      | 9         | S IV    | 666.114    | 400       | 7         |
| Si III  | 651.668    | 80        | 6.02      | Cl II   | 666.17     | 200       |           |
| Si III  | 652.223    | 120       | 6.02      | Cl III? | 666.500    | 100       |           |
| S IV    | 652.523    | 300       | 8         | F V     | 667.23     | 300       |           |
| P IV    | 652.79     | 80        |           | Cl II   | 667.49     | 100       |           |
| S IV    | 653.000    | 300       | 8         | Cl IV   | 668.770    | 200       |           |
| Cl III  | 653.013    | 200       |           | Cl III  | 669.949    | 200       |           |
| Si III  | 653.332    | 160       | 6.02      | Al III  | 670.144    | 100       |           |
| P IV    | 653.51     | 80        |           | N II    | 670.296    | 220P      |           |
| S IV    | 653.560    | 400       | 8         | Cl III  | 670.383    | 300       |           |
| Cl IV   | 653.696    | 400       |           | Ar      | 670.39     | 20        |           |
| Cl II   | 653.80     | 100       |           | N II    | 670.515    | 120P      |           |
| S IV    | 653.988    | 300       | 8         | N II    | 670.884    | 100P      |           |
| F V     | 654.034    | 600       |           | Ar II   | 670.9450   | ST 500    | 8         |
| S IV    | 654.37     | 100       | 8         | N II    | 671.016    | 500       | 3         |
| P IV    | 654.54     | 40        |           | Al III  | 671.198    | 200       |           |
| P IV    | 654.86     | 120       |           | Cl VI   | 671.37     | 400       |           |
| Cl II   | 655.09     | 100       |           | N II    | 671.386    | 500       | 3         |
| S IV    | 655.553    | 400       | 8         | N II    | 671.411    | 650       | 3         |
| P IV    | 655.78     | 80        |           | N II    | 671.630    | 500       | 3         |
| S IV    | 655.887    | 200       | 8         | Si III  | 671.718    | 40        | 6.01      |
| F III   | 656.125    | 700       |           | N II    | 671.773    | 500       | 3         |
| S IV    | 656.30     | 100       | 8         | Ar II   | 671.8516   | ST 600    | 6         |
| P IV    | 656.55     | 80        |           | N II    | 672.001    | 500       | 3         |
| Cl III  | 656.772    | 200       |           | Si III  | 672.293    | 80        | 6.01      |
| F III   | 656.878    | 750       |           | N VII   | 672.42     | P         |           |
| F V     | 657.220    | 200       |           | Cl IV   | 672.428    | 10        |           |
| Cl III  | 657.320    | 200       |           | Ar II   | 672.8565   | ST 200    | 6         |
| N II?   | 657.327    | 50        |           | O II    | 672.948    | 400       | 12        |
| F V     | 657.335    | 400       |           | Cl III  | 673.127    | 300       |           |
| S IV    | 657.34     | 500       | 4         | Si III  | 673.477    | 100       | 6.01      |
| S V     | 658.262    | 300       | 3         | Cl III  | 673.598    | 100       |           |
| F III   | 658.337    | 800       |           | O II    | 673.768    | 350       | 12        |
| O III   | 658.578    | 50        |           | P V     | 673.888    | 650       |           |
| N II?   | 659.538    | 10        |           | Ar      | 675.28     | 20        |           |
| O III   | 659.538    | 10        |           | F IV    | 676.130    | 850       |           |
| S V     | 659.853    | 400       | 3         | S V     | 676.21     | 100       |           |
| N II    | 660.286    | 750       | 9         | Ar II   | 676.2428   | ST 600    |           |
| S IV    | 660.945    | 300       | 7         | Cl V    | 676.785    | 300       |           |
| Cl III? | 661.414    | 200       |           | B III   | 677.004    | 500       |           |
| S IV    | 661.42     | 600       | 4         | B III   | 677.147    | 600       |           |
| Cl II   | 661.62     | 10        |           | F IV    | 677.154    | 800       |           |
| Cl II   | 661.82     | 200       |           | F IV    | 677.224    | 950       |           |
| Cl III? | 661.836    | 200       |           | S V     | 677.342    | 100       |           |
| Ar II   | 661.8692   | ST 500    | 8         | S III   | 677.75     | 200       | 7         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar II   | 677.9521   | ST        | 500       | S V     | 691.74     | 100       |           |
| Si III  | 678.055    | 40        | 15        | Ar II   | 693.3015   | ST        | 200       |
| S V     | 678.08     | 200       |           | S V     | 693.522    | 200       |           |
| S III   | 678.46     | 200       | 7         | Cl II   | 693.55     | 10        |           |
| F IV    | 679.003    | 800       |           | B II    | 693.952    | 200       | 2         |
| S III   | 679.11     | 200       | 7         | Na IX   | 694.26     | P         |           |
| F IV    | 679.217    | 1000      |           | S II    | 694.71     | 50        |           |
| Ar II   | 679.2187   | ST        | 300       | Ar      | 694.85     | 100       |           |
| Cl V    | 679.257    | 300       |           | Ar III  | 695.537    | 300       | 2         |
| Ar II   | 679.4001   | ST        | 600       | Al III  | 695.817    | 500       | 2         |
| S V     | 680.326    | 300       |           | Cl II   | 696.11     | 10        |           |
| P IV    | 680.570    | 20        |           | Al III  | 696.212    | 400       | 2         |
| Ar      | 680.60     | 20        |           | Ar II   | 697.4893   | ST        | 200       |
| S III   | 680.69     | 200       | 7         | Ar III  | 697.74     | 100       | 2         |
| F I     | 680.709    | 2         |           | Ar II   | 697.9414   | ST        | 200       |
| S V     | 680.940    | 500b      |           | Ar      | 698.08     | 20        |           |
| S III   | 680.95     | 200b      | 7         | S III   | 698.73     | 200       | 5         |
| Ar      | 681.15     | 10        |           | Ar II   | 698.7748   | ST        | 400       |
| O V     | 681.28     | 800       |           | Ar IV   | 699.408    | 240       |           |
| S III   | 681.50     | 100b      | 6         | Ar III  | 699.72     | 50        |           |
| S V     | 681.565    | 300b      |           | S III   | 700.15     | 300       | 5         |
| Na IX   | 681.72     | 10        |           | Ar IV   | 700.277    | 320       |           |
| Cl V    | 681.924    | 400       |           | S III   | 700.29     | 300       | 5         |
| F I     | 682.581    | 2         |           | Ar VIII | 700.398    | 1000P     |           |
| S III   | 683.07     | 50        | 6         | Ar      | 701.11     | 150       |           |
| Cl V    | 683.171    | 400       |           | O III   | 702.332    | 800       | 2         |
| Ar IV   | 683.278    | 400       | 3         | S III   | 702.78     | P         | 5         |
| Be IV   | 683.42     | P         |           | S III   | 702.82     | P         | 5         |
| S III   | 683.47     | 100       | 6         | O III   | 702.822    | 800       | 2         |
| Cl IV   | 684.490    | 10        |           | O III   | 7 2.899    | 850       | 2         |
| Ar      | 684.81     | 100       |           | O III   | 703.850    | 900       | 2         |
| Cl II   | 684.83     | 10        |           | Ar II   | 704.5233   | ST        | 400       |
| N III   | 684.996    | 700       | 3         | Ar V    | 705.353    | 150       | 2         |
| S III   | 685.35     | 50        | 6         | S II    | 705.62     | 50        |           |
| N III   | 685.513    | 750       | 3         | O III   | 705.762    | 100       |           |
| N III   | 685.816    | 800       | 3         | O III   | 706.224    | 150       |           |
| S V     | 686.150    | 100       |           | O III   | 706.298    | 100       |           |
| N III   | 686.335    | 700       | 3         | S VI    | 706.480    | 600       | 3         |
| C II    | 686.416    | 120       |           | O III   | 707.315    | 200       |           |
| C II    | 686.488    | 80        |           | Cl II   | 707.43     | 400       |           |
| Ar II   | 686.4888   | ST        | 200       | S II    | 707.86     | 50        |           |
| S V     | 686.92     | 100       |           | Cl II   | 709.16     | 200       |           |
| C II    | 687.0536   | ST        | 560       | Ar V    | 709.195    | 250       | 2         |
| C II    | 687.3453   | ST        | 1000      | Cl II   | 710.53     | 10        |           |
| C II    | 687.3521   | ST        | 110       | Si II   | 711.34     | 0h        | 6.09      |
| Cl II   | 687.55     | 100       |           | Si II   | 711.83     | 1h        | 6.09      |
| S V     | 688.04     | 50        |           | Cl II   | 712.66     | 300       |           |
| Si IV   | 688.194    | 1         | 14        | S VI    | 712.682    | 400       | 3         |
| Si IV   | 688.200    | P         | 14        | S VI    | 712.844    | 300       | 3         |
| Ar IV   | 688.392    | 300       | 3         | N V     | 713.518    | 85        |           |
| Si IV   | 688.395    | P         | 14        | N V     | 713.860    | 120       |           |
| Cl V    | 688.933    | 400       |           | Ar VIII | 713.990    | 500P      |           |
| Ar IV   | 689.007    | 500       | 3         | Cl II   | 714.03     | 200       |           |
| S V     | 689.838    | 100       |           | C III   | 714.879    | 100       |           |
| Ar III  | 690.170    | 400d      | 2         | Cl II   | 715.58     | 300       |           |
| C III   | 690.526    | 700       | 10        | Ar V    | 715.599    | 200       | 2         |
| Si III  | 690.689    | 40        | 14        | Ar V    | 715.645    | 150       | 2         |
| Ar II   | 691.0377   | ST        | 100       | Ar      | 716.42     | 10        |           |
| N III   | 691.187    | 100       |           | O V     | 716.55     | 500       |           |
| N III   | 691.388    | 50        |           | Cl II   | 717.15     | 200       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar II   | 718.0903   | ST 400    | 4         | S IV    | 744.92     | 500       | 3         |
| O II    | 718.484    | 850       | +         | Ar II   | 744.9252   | ST 800    | 3         |
| O II    | 718.562    | 800       | 4         | Cl IV   | 745.205    | 400       |           |
| Cl II   | 719.26     | 100       |           | Ar II   | 745.3217   | ST 700    | 3         |
| Ar      | 720.94     | 10        |           | Ne X    | 745.4      | P         |           |
| Ar II   | 723.3611   | ST 500    | 4         | F I     | 745.767    | 2         |           |
| Cl VI   | 724.129    | 150       |           | N II    | 745.841    | 500       | 12        |
| S III   | 724.29     | 300       | 4         | F I     | 746.400    | 1         |           |
| Ar      | 725.11     | 100       |           | F I     | 746.627    | 3         |           |
| Cl II   | 725.27     | 300       |           | Cl III  | 746.864    | 100       |           |
| Ar II   | 725.5481   | ST 400    | 4         | N II    | 746.984    | 650       | 8         |
| Cl II   | 725.64     | 200       |           | Cl III  | 747.415    | 100       |           |
| Be II   | 725.71     | 100       |           | Cl III  | 747.553    | 100       |           |
| Al III  | 725.716    | 200       |           | F I     | 747.999    | 2         |           |
| S III   | 725.86     | 3         | 4         | F I     | 748.134    | 1         |           |
| O VIII  | 726.6      | P         |           | N V     | 748.195    | 120       |           |
| B V     | 726.73     | P         |           | Ar II   | 748.1977   | ST 400    | 3         |
| Al III  | 726.948    | 300       |           | N V     | 748.291    | 150       |           |
| Cl VI   | 727.537    | 150       |           | F I     | 748.338    | 2         |           |
| Ar      | 727.58     | 1         |           | N II    | 748.369    | P         |           |
| S III   | 728.69     | 300       | 4         | O I     | 748.4      | 100       |           |
| O V     | 728.74     | 700       |           | S IV    | 748.40     | 500       | 3         |
| C VI    | 728.93     | P         |           | F I     | 748.580    | 4         |           |
| Cl II   | 728.94     | 300       |           | F I     | 748.709    | 2         |           |
| Li III  | 728.98     | P         |           | F I     | 748.946    | 3         |           |
| Cl II   | 729.39     | 300       |           | O I     | 749.3      | 100       |           |
| Cl II   | 729.52     | 200       |           | B V     | 749.74     | P         |           |
| S III   | 729.529    | 400       | 12        | Si IV   | 749.941    | 300       | 13        |
| O VIII  | 729.61     | P         |           | S IV    | 750.23     | 500       | 3         |
| Cl VI   | 730.311    | 200       |           | F I     | 750.418    | 1         |           |
| S III   | 730.783    | 300       | 3         | F I     | 750.610    | 3         |           |
| Cl II   | 730.92     | 300       |           | F I     | 750.885    | 1         |           |
| Ar II   | 730.9293   | ST 500    | 4         | F I     | 751.861    | 4         |           |
| B II    | 731.357    | 100       |           | O III   | 752.762    | 200       |           |
| Al XIII | 731.4      | P         |           | F I     | 752.884    | 4         |           |
| B II    | 731.442    | 100       |           | F I     | 753.303    | 4         |           |
| S III   | 732.376    | 500       | 3         | Cl II   | 753.66     | 10        |           |
| F I     | 732.960    | 1         |           | S IV    | 753.76     | 500       | 3         |
| S III   | 732.98     | 50        |           | F I     | 754.148    | 2         |           |
| S III   | 733.34     | 50        |           | Ar IV   | 754.205    | 160       |           |
| Cl VI   | 733.891    | 150       |           | Cl II   | 754.55     | 10        |           |
| S III   | 733.92     | 100       |           | Ar II   | 754.8243   | ST 300    | 2         |
| F I     | 734.642    | 1         |           | Ar VI   | 754.93     | 100       |           |
| F I     | 734.795    | 1         |           | Ar IV   | 755.212    | 120       |           |
| F I     | 735.154    | 1         |           | Si II   | 755.362    | 2         | 6.08      |
| S III   | 735.251    | 400       | 3         | F I     | 755.603    | 2         |           |
| F I     | 735.469    | 1         |           | O I     | 755.8      | 200       |           |
| Ne I    | 735.895    | 1000      | 2         | P IV    | 756.510    | 240       |           |
| S III   | 736.25     | 200       | 11        | Cl IV   | 756.563    | 100       |           |
| Cl VI   | 736.762    | 150       |           | O I     | 756.7      | 100       |           |
| F I     | 736.987    | 2         |           | F V     | 757.08     | 400       |           |
| Ar II   | 737.4541   | ST 100    | 3         | Ne IV   | 758.317    | 15d       |           |
| S III   | 738.474    | 400       | 11        | B III   | 758.476    | 100       |           |
| O II    | 739.949    | 100       |           | B III   | 758.673    | 200       |           |
| Ar II   | 740.2695   | ST 1000   | 3         | O V     | 758.677    | 700       | 3         |
| O II    | 740.838    | 10        |           | O V     | 759.440    | 700       | 3         |
| O II    | 741.293    | 1         |           | O V     | 760.229    | 700       | 3         |
| F III   | 742.69     | 100       |           | Ar IV   | 760.439    | 120       |           |
| Be II   | 743.579    | 300       |           | O V     | 760.445    | 800       | 3         |
| Ne I    | 743.718    | 400       | 1         | O V     | 761.130    | 700       | 3         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar IV   | 761.470    | 200       |           | F I     | 782.976    | 5         |           |
| O V     | 762.001    | 700       | 3         | P III   | 782.977    | 100       |           |
| Ar II   | 762.1995   | ST 300    | 2         | Ar      | 783.14     | 250       |           |
| N VII   | 762.88     | P         |           | Ar      | 783.65     | 120       |           |
| N III   | 763.340    | 700       | 2         | P II    | 783.71     | 5         |           |
| Ne IV   | 763.959    | P         |           | P III   | 783.752    | 100       |           |
| N III   | 764.357    | 750       | 2         | Ar      | 784.38     | 30        |           |
| N IV    | 765.148    | 850       | 1         | C III   | 784.393    | 300       |           |
| P IV    | 765.28     | 10        |           | P II    | 784.46     | 1         |           |
| Ar VI   | 767.06     | 200       |           | P II    | 784.81     | 5         |           |
| Ar VI   | 767.71     | 100       |           | P III   | 785.392    | 100       |           |
| Ar III  | 769.152    | 600       | 5         | Ne IV   | 786.141    | 5         |           |
| O I     | 769.355    | 100       |           | P II    | 786.18     | 5         |           |
| O I     | 769.411    | 100       |           | P III   | 786.244    | 100       |           |
| O I     | 770.264    | 50        |           | S V     | 786.476    | 800       | 1         |
| O I     | 770.294    | 50        |           | P II    | 786.52     | 5         |           |
| O I     | 770.350    | 50        |           | Cl II   | 787.15     | 100       |           |
| C IV    | 770.379    | 10d       |           | Cl II   | 787.62     | 300       |           |
| Ne VIII | 770.409    | 1000      |           | O IV    | 787.710    | 750       | 1         |
| O I     | 770.698    | 10        |           | Cl II   | 788.75     | 400       | 5         |
| Cl II   | 771.00     | 10        |           | S III   | 788.984    | 400       | 10        |
| N III   | 771.544    | 500       | 8         | Cl II   | 789.01     | 700       | 5         |
| N III   | 771.901    | 550       | 8         | F I     | 790.006    | 7         |           |
| N III   | 772.385    | 600       | 6         | O IV    | 790.103    | 650       | 1         |
| Ar IV?  | 772.41     | 10        |           | O IV    | 790.203    | 800       | 1         |
| N III   | 772.891    | 450       | 13        | O I     | 791.514    | 50        |           |
| N III   | 772.975    | 400       | 13        | F I     | 791.875    | 12        |           |
| O V     | 774.522    | 500       | 8         | O I     | 791.974    | 150       |           |
| Cl II   | 774.76     | 10        |           | Ar      | 792.08     | 10        |           |
| Be II   | 775.362    | 400       |           | Cl II   | 792.19     | 200       |           |
| N II    | 775.965    | 1000      | 7         | O I     | 792.233    | 50        |           |
| P IV    | 776.366    | 120       |           | O I     | 792.507    | 50        |           |
| Cl IV   | 776.91     | 10        |           | F I     | 792.536    | 10        |           |
| F I     | 776.926    | 4         |           | O I     | 792.938    | 150       |           |
| F I     | 777.010    | 5         |           | O I     | 792.968    | 200       |           |
| F I     | 777.531    | 4         |           | F I     | 793.237    | 1         |           |
| Cl II   | 777.55     | 300       |           | Cl II   | 793.34     | 300       | 5         |
| B V     | 777.57     | P         |           | Cl II   | 793.47     | 300       | 5         |
| N V     | 777.712    | 35        |           | F I     | 794.417    | 10        |           |
| F I     | 778.059    | 6         |           | Ar      | 794.53     | 10        |           |
| N V     | 778.172    | 40        |           | C II    | 794.964    | 10        |           |
| F I     | 779.192    | 2         |           | C II    | 795.134    | 100       |           |
| F I     | 779.365    | 6         |           | Cl II   | 795.36     | 200       | 5         |
| O IV    | 779.821    | 450       | 8         | Ar      | 795.37     | 20        |           |
| O IV    | 779.905    | 500       | 8         | F I     | 795.774    | 2         |           |
| F I     | 779.910    | 5         |           | Ar      | 796.62     | 10        |           |
| F I     | 779.972    | 2         |           | O II    | 796.661    | 500       | 11        |
| F I     | 780.134    | 1         |           | S III   | 796.692    | 400       | 9         |
| Ne IV   | 780.250    | 15d       |           | F I     | 796.982    | 3         |           |
| Ne VIII | 780.324    | 500       |           | Cl II   | 797.81     | 10        |           |
| F I     | 780.390    | 15        |           | S IV    | 798.277    | 300       | 6         |
| F I     | 780.519    | 10        |           | S II    | 798.92     | 50        |           |
| F I     | 780.713    | 5         |           | Ar      | 798.92     | 20        |           |
| F I     | 781.654    | 3         |           | S II    | 799.14     | 50        |           |
| P III   | 781.726    | 100       |           | C II    | 799.660    | 500       |           |
| F I     | 782.378    | 10        |           | C II    | 799.928    | 25P       |           |
| F I     | 782.575    | 2         |           | C II    | 799.944    | 350       |           |
| P II    | 782.59     | 5         |           | S II    | 800.04     | 50        |           |
| P II    | 782.72     | 1         |           | Si III  | 800.066    | 100       | 13        |
| P II    | 782.90     | 1         |           | S IV    | 800.477    | 400       | 6         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar IV   | 800.573    | 200       | 2         | Si II   | 820.63     | 3h        | 8.08      |
| Cl VII  | 800.698    | 150       |           | Si II   | 820.9210   | 3h        | u.        |
| O VIII  | 800.8      | P         |           | Ar      | 820.98     | 50        |           |
| Be IV   | 800.88     | P         |           | Si II   | 821.450    | 2h        | 8.07      |
| Ar IV   | 801.086    | 400       | 2         | Si III  | 822.004    | P         | 29        |
| P II    | 801.35     | 1         |           | Ar V    | 822.161    | 200       | 1         |
| Ar IV   | 801.409    | 400       | 2         | Si II   | 822.8613   | 5h        | 6.05      |
| Ar IV   | 801.913    | 200       | 2         | P IV    | 823.181    | 800       | 3         |
| O IV    | 802.198    | 300       |           | Si III  | 823.408    | 180       | 12        |
| P II    | 802.20     | 1         |           | P II    | 824.66     | 30        |           |
| O IV    | 802.250    | 250       |           | P IV    | 824.726    | 800       | 3         |
| Si II   | 803.234    | 3h        | 6.07      | S III   | 824.887    | 400       | 14        |
| Ar      | 803.59     | 20        |           | Ar I    | 825.346    | 40        |           |
| S IV    | 803.996    | 400       | 6         | Ar I    | 826.364    | 80        |           |
| Ar      | 804.59     | 60        |           | N VII   | 826.4      | P         |           |
| Si II   | 805.101    | 10h       | 6.07      | Si II   | 826.42     | 1h        | 8.06      |
| C II    | 806.384    | 500       | 8         | Ar V    | 827.052    | 250       | 1         |
| C II    | 806.533    | 200       | 8         | Ar V    | 827.349    | 150       | 1         |
| C II    | 806.568    | 500       | 8         | Cl II   | 827.85     | 100       |           |
| C II    | 806.676    | 250       | 8         | P IV    | 827.932    | 1000      | 3         |
| C II    | 806.686    | 150       | 8         | Ar      | 828.86     | 20        |           |
| C II    | 806.830    | 300       | 8         | Cl IV   | 831.431    | 400       |           |
| C II    | 806.860    | 300       | 8         | O II    | 832.762    | 700       | 1         |
| Ar I    | 806.875    | 80        |           | O III   | 832.927    | 700       | 1         |
| F I     | 806.964    | 150       | 2         | O II    | 833.332    | 750       | 1         |
| Ar I    | 807.220    | 80        |           | O III   | 833.742    | 800       | 1         |
| Ar      | 807.46     | 30        |           | Ar I    | 834.392    | 240       |           |
| Ar I    | 807.702    | 80        |           | O II    | 834.462    | 750       | 1         |
| P II    | 808.25     | 50        |           | Cl IV   | 834.659    | 300       |           |
| F I     | 809.599    | 125       | 2         | Cl II   | 834.67     | 1000      | 4         |
| C II    | 809.677    | 400       |           | Cl IV   | 834.840    | 500       |           |
| S IV    | 809.69     | 400       | 2         | Ar V    | 834.878    | 200       | 1         |
| C II    | 809.693    | 30P       |           | Cl IV   | 834.967    | 500       |           |
| C II    | 809.747    | 30P       |           | Ar I    | 835.003    | 240       |           |
| C II    | 809.764    | 300       |           | O III   | 835.096    | 700       | 1         |
| Ar I    | 809.933    | 80        |           | O III   | 835.292    | 800       | 1         |
| P II    | 810.00     | 30        |           | Ar V    | 835.792    | 50        | 1         |
| P II    | 810.24     | 100       |           | Ar V    | 836.126    | 100       | 1         |
| O I     | 810.667    | 50        |           | N II    | 836.187    | P         |           |
| O I     | 811.052    | 200       |           | N II    | 836.279    | P         |           |
| P II    | 811.10     | 20        |           | S IV    | 836.286    | 400       |           |
| O I     | 811.501    | 50        |           | N II    | 836.289    | P         |           |
| O I     | 811.710    | 50        |           | S III   | 836.315    | 400       | 13        |
| P II    | 811.85     | 30        |           | N II    | 836.616    | P         |           |
| O I     | 812.096    | 75        |           | N II    | 836.627    | P         |           |
| O I     | 812.158    | 75        |           | N II    | 836.837    | P         |           |
| Cl VII  | 813.002    | 100       |           | S IV    | 837.447    | 400       |           |
| P II    | 813.10     | 40        |           | Cl II   | 839.30     | 200       | 4         |
| P II    | 813.768    | 5         |           | Cl II   | 839.63     | 200       | 4         |
| Si IV   | 815.049    | 500       | 4         | Ar IV   | 840.029    | 600       | 1         |
| Ar      | 815.14     | 30        |           | P II    | 840.04     | 1         |           |
| S IV    | 815.97     | 500       | 2         | Cl IV   | 840.808    | 400       |           |
| Ar I    | 816.233    | 160       |           | Cl IV   | 840.933    | 600       |           |
| Ar I    | 816.466    | 160       |           | P II    | 841.21     | 20        |           |
| Si IV   | 818.129    | 550       | 4         | Cl II   | 841.41     | 400       | 4         |
| Si II   | 818.590    | 2h        | 6.06      | Be II   | 842.025    | 500       | 2         |
| Si II   | 819.49     | 0h        | 8.08      | Be II   | 842.031    | 250       | 2         |
| Ar I    | 820.129    | 10        |           | Ar I    | 842.808    | 80        |           |
| Si II   | 820.516    | 20h       | 6.06      | Si II   | 843.7192   | 20h       | 6.04      |
| Ar      | 820.56     | 20        |           | C VI    | 843.72     | P         |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar IV   | 843.772    | 800       | 1         | B II    | 864.08     | 10        |           |
| S II    | 843.82     | 200       |           | Cl II   | 864.67     | 500       | 3         |
| P IV    | 843.984    | 40        |           | P IV    | 865.04     | 120       |           |
| P II    | 844.01     | 20        |           | P V     | 865.435    | 1000      |           |
| P III   | 844.635    | 100       | 5         | P II    | 865.44     | 100       |           |
| P III   | 845.047    | 100       | 5         | S II    | 865.87     | 50        |           |
| P III   | 845.656    | 100       | 5         | B V     | 865.93     |           | P         |
| Ar      | 845.68     | 150       |           | S II    | 866.23     | 100       |           |
| Si II   | 845.7684   | 40b       | 6.04      | Ar I    | 866.805    | 200       |           |
| P IV    | 845.995    | 80        |           | P IV    | 866.84     | 20        |           |
| P III   | 846.125    | 100b      | 5         | S II    | 867.15     | 100       |           |
| P IV    | 846.125    | 80b       |           | S II    | 867.50     | 100       |           |
| P III   | 846.494    | 10b       | 5         | Ar      | 868.20     | 10        |           |
| P IV    | 846.494    | 40b       |           | Ar      | 869.24     | 10        |           |
| P IV    | 846.999    | 200       |           | Ar I    | 869.754    | 100       |           |
| P III   | 847.658    | 300b      | 5         | Ar III  | 871.099    | 500       | 1         |
| P IV    | 847.558    | 240b      |           | P V     | 871.396    | 1000d     |           |
| P III   | 848.023    | 200d      | 5         | N III   | 871.850    | 10        |           |
| Si II   | 848.0700   | 5         | 6.03      | Cl II   | 872.00     | 10        | 3         |
| P III   | 848.445    | 100       | 5         | P II    | 872.84     | 5         |           |
| P III   | 848.636    | 300d      |           | N I     | 875.092    | 65        |           |
| S V     | 849.241    | 600       | 2         | P IV    | 875.132    | 440       |           |
| P IV    | 849.764    | 160       |           | Ar III  | 875.534    | 450       | 1         |
| Si II   | 850.1409   | 10        | 6.03      | Ar I    | 876.063    | 200       | 4         |
| P IV    | 850.390    | 120       |           | P IV    | 877.493    | 440       |           |
| Ar IV   | 850.602    | 1000      | 1         | O I     | 877.802    | 100       |           |
| O I     | 850.74     |           | P         | O I     | 877.882    | 300       |           |
| P IV    | 851.09     | 10        |           | Ar III  | 878.728    | 600       | 1         |
| Cl II   | 851.70     | 700       |           | O I     | 878.976    | 75        |           |
| S V     | 852.185    | 500       | 2         | O I     | 879.023    | 70        |           |
| P III   | 852.679    | 500       |           | O I     | 879.104    | 80        |           |
| S IV    | 852.716    | 300       |           | Si III  | 879.233    | 10        | 28        |
| S IV    | 853.135    | 300       |           | P IV    | 879.310    | 80        |           |
| P III   | 853.346    | 10        |           | O I     | 879.554    | 75        |           |
| P III   | 854.223    | 100       |           | Ar III  | 879.622    | 400       | 1         |
| S V     | 854.792    | 700       | 2         | Ar I    | 879.949    | 120       |           |
| P III   | 854.855    | 100       |           | Mg      | 880.16     | 200       |           |
| Al III  | 855.040    | 400       |           | B II    | 882.536    | 200       |           |
| P III   | 855.618    | 500       | 4         | B II    | 882.670    | 200       |           |
| Ar      | 855.71     | 10        |           | O I     | 882.88     |           | P         |
| Al III  | 856.768    | 500       |           | F VII   | 883.097    |           |           |
| P III   | 856.963    | 200       |           | Cl V    | 883.127    | 400       |           |
| S V     | 857.872    | 500       | 2         | Ar III  | 883.179    | 450       | 1         |
| C II    | 858.0918   | 500       | 4         | Si III  | 883.398    | 100       | 27        |
| P III   | 858.139    | 100       |           | S V     | 883.59     | 200       |           |
| N II    | 858.376    | 100P      |           | S V     | 884.46     | 200       |           |
| Mg XII  | 858.4      |           | P         | C III   | 884.516    | 800       |           |
| C II    | 858.5590   | 900       | 4         | Mg II   | 884.6967   |           | P         |
| P III   | 859.411    | 10        |           | Mg II   | 884.7189   |           | P         |
| P III   | 859.667    | 800       | 4         | S V     | 885.77     | 100       |           |
| N II    | 860.205    |           | P         | Ar III  | 887.404    | 500       | 1         |
| P IV    | 860.449    | 80        |           | N I     | 888.019    | 35        |           |
| S V     | 860.462    | 500       | 2         | Cl II   | 888.07     | 400       | 2         |
| Si IV   | 860.551    |           | P         | N I     | 888.363    | 35        |           |
| Si IV   | 860.560    | 20        | 12        | Si II   | 889.7228   | 100       | 6.02      |
| Si IV   | 861.118    | 5         | 12        | F VII   | 890.762    |           |           |
| P IV    | 861.552    | 40        |           | Si III  | 891.479    |           | P         |
| P II    | 861.61     | 10        |           | Si II   | 892.0007   | 200       | 26        |
| O I     | 861.63     |           | P         | Al III  | 892.056    | 400       | 6.02      |
| P IV    | 863.325    | 120       |           | Ar      | 892.07     | 10        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar      | 892.74     | 10        |           | Si II   | 912.459    | 5         | 8.04      |
| Ar      | 893.50     | 50        |           | S II    | 912.74     | 300       | 2         |
| Cl II   | 893.56     | 300       | 2         | Ar      | 912.91     | 10        |           |
| Al III  | 893.905    | 500       |           | Si II   | 913.012    | 10        | 8.03      |
| Ar I    | 894.310    | 200       | 3         | Si II   | 913.264    | 3         | 8.04      |
| Cl V    | 894.340    | 400       |           | P II    | 913.59     | 10        |           |
| Cl V    | 894.910    | 100       |           | Ar      | 913.80     | 10        |           |
| Ar      | 894.97     | 10        |           | Si II   | 913.853    | 20        | 8.04      |
| Si IV   | 895.228    | P         | 17        | P III   | 913.989    | 500       | 3         |
| Si IV   | 895.558    | P         | 17        | Si II   | 914.476    | 2         | 8.04      |
| Cl II   | 895.95     | 300       | 2         | H I     | 914.576    | 2P        | 17        |
| O III   | 898.957    | 400       | 17        | Cl II   | 914.90     | 100       |           |
| Si II   | 899.4063   | 10        | 6.01      | H I     | 914.919    | 2P        | 16        |
| Ar IV   | 900.362    | 200       |           | C VI    | 915.30     | P         |           |
| S V     | 900.93     | 200       |           | H I     | 915.329    | 2P        | 15        |
| Ar IV   | 901.168    | 400       |           | N II    | 915.612    | 700       | 2         |
| Si II   | 901.7359   | 20        | 6.01      | H I     | 915.824    | 3P        | 14        |
| Ar IV   | 901.804    | 80        |           | N II    | 915.962    | 700       | 2         |
| S V     | 902.80     | 100       |           | N II    | 916.012    | 800       | 2         |
| C II    | 903.6235   | ST 200    | 3         | N II    | 916.020    | 600       | 2         |
| C II    | 903.9616   | ST 400    | 3         | H I     | 916.429    | 3P        | 13        |
| C II    | 904.1416   | ST 1000   | 3         | N II    | 916.701    | 1000      | 2         |
| C II    | 904.4801   | ST 200    | 3         | N II    | 916.710    | 800       | 2         |
| Ar      | 904.89     | 80        |           | P III   | 917.130    | 400       | 3         |
| Si II   | 905.71     | 0         | 8.05      | H I     | 917.181    | 4P        | 12        |
| N I     | 905.829    | 150       |           | Ar      | 917.72     | 10        |           |
| S V     | 905.92     | 200       |           | H I     | 918.129    | 5P        | 11        |
| Si II   | 906.126    | 0         | 8.05      | P III   | 918.706    | 500       | 3         |
| N I     | 906.202    | 35        |           | S II    | 918.82     | 300       |           |
| N I     | 906.426    | 35        |           | S II    | 919.24     | 100       |           |
| Si II   | 906.586    | 1         | 8.05      | H I     | 919.351    | 7P        | 10        |
| Cl II   | 906.60     | 10        |           | Ar II   | 919.7815   | ST 1000   | 1         |
| N I     | 906.722    | 35        |           | F IX    | 920.3      | P         |           |
| N I     | 906.824    | 35P       |           | H I     | 920.963    | 9P        | 9         |
| S II    | 906.87     | 300       | 2         | O IV    | 921.301    | 200       |           |
| P II?   | 906.89     | 5         |           | O IV    | 921.364    | 250       |           |
| P II    | 906.987    | 10        |           | P III   | 921.863    | 500       | 3         |
| Si II   | 907.033    | 0         | 8.05      | N IV    | 921.992    | 850       | 3         |
| N I     | 907.268    | 35P       |           | O I     | 922.011    | P         | 8         |
| Mg II   | 907.3752   | P         |           | N IV    | 922.519    | 800       | 3         |
| Mg II   | 907.4115   | P         |           | O VIII  | 922.6      | P         |           |
| P II    | 907.56     | 40        |           | N IV    | 923.057    | 700       | 3         |
| P IV    | 907.590    | 80        |           | H I     | 923.150    | 10P       | 8         |
| Si II   | 907.762    | 0         | 8.05      | N IV    | 923.220    | 1000      | 3         |
| P IV    | 908.050    | 160       |           | O IV    | 923.353    | 300       |           |
| N I     | 908.2332   | 3         |           | N IV    | 923.675    | 800       | 3         |
| P II    | 908.38     | 1         |           | N IV    | 924.283    | 850       | 3         |
| Si II   | 908.461    | 1         | 8.05      | Be II   | 925.246    | 100       |           |
| N I     | 908.7958   | 1         |           | D I     | 925.974    | P         | 7         |
| Si II   | 909.209    | 3         | 8.05      | H I     | 926.226    | 20P       | 7         |
| N I     | 909.6976   | ST 9      |           | Cl II   | 926.96     | 10        |           |
| P III   | 909.846    | 100       |           | P II    | 927.771    | 10        |           |
| Cl II   | 910.25     | 10        |           | Si II   | 928.297    | 5         | 8.03      |
| N I     | 910.2785   | ST 6      |           | P II    | 928.550    | 10        |           |
| S II    | 910.49     | 300       | 2         | Si II   | 929.206    | 1         | 8.03      |
| N I     | 910.6456   | ST 5      |           | O I     | 929.517    | P         |           |
| P II    | 910.88     | 5         |           | P II    | 929.642    | 10        |           |
| S III   | 911.77     | 20        |           | Si II   | 929.810    | 20        | 8.03      |
| Cl II   | 912.34     | 10        |           | Si II   | 930.242    | 0         | 8.03      |
| Si II   | 912.375    | 5         | 8.04      | D I     | 930.495    | P         | 6         |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| H I     | 930.748    | 30P       | 6         | O I     | 950.8845   | 200       |           |
| O I     | 930.889    | P         |           | N I     | 951.0791   | 5         |           |
| Cl III  | 930.94     | 100       |           | N I     | 951.2947   | 3         |           |
| Si II   | 931.200    | 5         | 8.03      | F I     | 951.871    | 500       | 1         |
| O I     | 931.479    | P         |           | N I     | 952.3037   | 18        |           |
| Si II   | 931.667    | 5         | 8.03      | O I     | 952.3179   | 200       |           |
| Ar II   | 932.0528   | ST 1000   | 1         | N I     | 952.4151   | 14        |           |
| Al II   | 933.08     | 10        |           | Al II   | 952.43     | 1         |           |
| S VI    | 933.382    | 400       | 1         | N I     | 952.5231   | 10        |           |
| Al II   | 933.95     | 10        |           | O I     | 952.9414   | 80        |           |
| Ar      | 934.84     | 20        |           | N VII   | 952.99     | P         |           |
| O I     | 935.183    | 400       |           | Al II   | 953.18     | 10        |           |
| Al II   | 935.20     | 50        |           | Cl III  | 953.40     | 200       |           |
| Si III  | 936.056    | 25        | 44        | N I     | 953.4150   | 25        |           |
| Si III  | 936.058    | 2         | 44        | N I     | 953.6548   | 27        |           |
| Si III  | 936.060    | 1         | 44        | N I     | 953.9698   | 30        |           |
| Si III  | 936.077    | 18        | 44        | N I     | 954.1040   | 30        |           |
| Si III  | 936.079    | 2         | 44        | Al II   | 954.35     | 20        |           |
| Si III  | 936.100    | 12        | 44        | F I     | 954.825    | 1000      | 1         |
| Cl III  | 936.28     | 100       |           | Al II   | 954.87     | 10        |           |
| O I     | 936.630    | 150       |           | N I     | 955.2647   | 4         |           |
| S II    | 937.41     | 300       | 6         | N IV    | 955.335    | 1000      | 8         |
| D I     | 937.548    | 40P       | 5         | N I     | 955.4376   | 4         |           |
| S II    | 937.69     | 300       | 6         | N I     | 955.5292   | 3         |           |
| H I     | 937.803    | 40P       | 5         | F I     | 955.545    | 750       | 1         |
| O I     | 937.841    | 150       |           | N I     | 955.8814   | 5         |           |
| O I     | 938.022    | P         |           | Al II   | 955.99     | 50        |           |
| O I     | 938.621    | P         |           | S II    | 957.88     | 100       |           |
| Si III  | 939.093    | 140       | 25        | F I     | 958.524    | 500       | 1         |
| O I     | 939.237    | P         |           | He II   | 958.670    | 13P       | 18        |
| Cl III  | 939.31     | 10        |           | He II   | 958.724    | 22P       | 18        |
| O I     | 939.837    | P         |           | N I     | 959.4936   | 5         |           |
| Cl III  | 943.22     | 100       |           | N I     | 960.2017   | P         |           |
| Be II   | 943.481    | 30        |           | P II    | 961.04     | 1         |           |
| Be II   | 943.540    | 70        |           | Cl II   | 961.49     | 500       |           |
| S VI    | 944.517    | 500       | 1         | P II    | 962.13     | 5         |           |
| C I     | 945.191    | 20        | 31        | P II    | 962.57     | 5         |           |
| C I     | 945.338    | 50        | 31        | P II    | 963.59     | 1         |           |
| C I     | 945.579    | 75        | 31        | P II    | 963.81     | 5         |           |
| C II    | 945.977    | 100       |           | N I     | 963.9904   | 25        | 3         |
| C II    | 946.198    | 200       |           | P III   | 963.993    | 100b      |           |
| Mg II   | 946.7032   | P         |           | P IV    | 963.993    | 100b      |           |
| Mg II   | 946.7694   | P         |           | P II    | 964.09     | 10        |           |
| Cl III  | 946.97     | 100       |           | P III   | 964.251    | 100       |           |
| C IV    | 948.098    | 200       |           | N I     | 964.6258   | 23        | 3         |
| N IV    | 948.155    | 100       |           | P II    | 964.95     | 10        |           |
| C IV    | 948.214    | 100       |           | N I     | 965.0415   | 23        | 3         |
| N IV    | 948.244    | 200       |           | P II    | 965.43     | 20        |           |
| N IV    | 948.540    | 250       |           | P II    | 966.52     | 10        |           |
| O I     | 948.6867   | 250       |           | Si III  | 967.946    | 180       | 24        |
| Cl III  | 948.72     | 100       |           | P II    | 968.17     | 1         |           |
| N VII   | 949.1      | P         |           | S II    | 968.37     | 50        |           |
| He II   | 949.301    | 9P        | 19        | P II    | 969.38     | 5         |           |
| He II   | 949.354    | 17P       | 19        | O I     | 971.7376   | 400       |           |
| D I     | 949.485    | 70P       | 4         | He II   | 972.083    | 18P       | 17        |
| H I     | 949.743    | 70P       | 4         | He II   | 972.138    | 32P       | 17        |
| Be II   | 949.746    | 100       |           | P II    | 972.24     | 5         |           |
| O I     | 950.1134   | 200       |           | D I     | 972.272    | 140P      | 3         |
| P IV    | 950.662    | 1000      | 1         | F I     | 972.401    | 20        |           |
| O I     | 950.7340   | 100       |           | H I     | 972.537    | 130P      | 3         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| P II    | 972.807    | 30        |           | Si III  | 1005.357   | 1         | 43        |
| P III   | 972.807    | 300       |           | Si III  | 1005.374   | 40        | 43        |
| Cl IV   | 973.212    | 500       |           | Si III  | 1005.378   | 5         | 43        |
| Be II   | 973.213    | 150       |           | Si III  | 1005.403   | 30        | 43        |
| O I     | 973.2346   | 250       |           | N III   | 1006.015   | 300       | 17        |
| Be II   | 973.276    | 350       |           | S II?   | 1006.15    | 270       |           |
| O I     | 973.8857   | 200       |           | P IV    | 1006.218   | 40        |           |
| F I     | 973.895    | 350       |           | S II?   | 1006.95    | 35        |           |
| P II    | 974.36     | 5         |           | Cl III  | 1008.777   | 600       | 1         |
| P III   | 974.776    | 300       |           | N I?    | 1008.875   | 5         |           |
| F I     | 976.217    | 100       |           | C II    | 1009.862   | 400       | 7         |
| O I     | 976.4480   | 250       |           | C II    | 1010.092   | 600       | 7         |
| F I     | 976.505    | 40        |           | C II    | 1010.374   | 1000      | 7         |
| C III   | 977.020    | 1000      | 1         | S III   | 1012.49    | 300       | 2         |
| P II    | 977.258    | 1         |           | S II    | 1014.09    | 50        | 4         |
| Cl IV   | 977.560    | 600       |           | S II    | 1014.42    | 200       | 4         |
| F I     | 977.745    | 100       |           | Cl III  | 1015.023   | 700       | 1         |
| P III   | 977.888    | 400       |           | P II    | 1015.47    | 100       |           |
| Cl IV   | 977.901    | 400       |           | S III   | 1015.51    | 200       | 2         |
| O I     | 977.9595   | 250       |           | S III   | 1015.76    | 100       | 2         |
| O I     | 978.6170   | 200       |           | S II    | 1019.53    | 200       | 4         |
| N III   | 979.842    | 400       | 12        | Si II   | 1020.6928  | 25        | 5.01      |
| N III   | 979.919    | 450       | 12        | S III   | 1021.10    | 100       | 2         |
| Be II   | 983.984    | 50        |           | S III   | 1021.32    | 200       | 2         |
| Be II   | 984.048    | 150       |           | Na XI   | 1021.6     | P         |           |
| B II    | 984.65     | 100       |           | Si II   | 1023.7002  | 50        | 5.01      |
| Cl IV   | 984.952    | 700       |           | He II   | 1025.241   | 42P       | 15        |
| Cl IV   | 985.749    | 400       |           | He II   | 1025.302   | 77P       | 15        |
| Al II   | 986.55     | 10        |           | D I     | 1025.443   | 320P      | 2         |
| Al II   | 987.80     | 10        |           | P IV    | 1025.564   | 16C       | 2         |
| O I     | 988.581    | 100       | 5         | H I     | 1025.722   | 300P      | 2         |
| O I     | 988.6548   | 300       | 5         | O I     | 1025.7616  | 450       | 4         |
| O I     | 988.7733   | 400       | 5         | Mg II   | 1025.9681  | P         |           |
| Al II   | 989.70     | 10        |           | Mg II   | 1026.1133  | P         |           |
| N III   | 989.790    | 800       | 1         | Be II   | 1026.890   | 200       |           |
| Si II   | 989.8730   | 100       | 6         | Be II   | 1026.959   | 400       |           |
| O I     | 990.1270   | 300       | 5         | O I     | 1027.4309  | 400       | 4         |
| O I     | 990.2044   | 300       | 5         | P IV    | 1028.093   | 40        | 2         |
| O I     | 990.8010   | 100       | 5         | O I     | 1028.1571  | 350       | 4         |
| Al II   | 990.88     | 50        |           | P IV    | 1030.511   | 400       | 2         |
| N III   | 991.514    | 600       | 1         | S II    | 1030.87    | 100       | 9         |
| N III   | 991.579    | 900       | 1         | Si III  | 1031.169   | 140       | 33        |
| He II   | 992.334    | 27P       | 16        | S II    | 1031.34    | 100       | 9         |
| He II   | 992.391    | 48P       | 16        | O VI    | 1031.912   | 850       | 1         |
| Si II   | 992.6826   | 200       | 6         | Si III  | 1032.851   | 60        | 33        |
| Si III  | 993.519    | 200       | 6         | N I?    | 1032.958   | 10        |           |
| Si III  | 994.787    | 260       | 6         | P IV    | 1033.099   | 320       | 2         |
| S II    | 996.00     | 200       | 5         | P II    | 1033.41    | 100       |           |
| Si III  | 997.389    | 320       | 6         | N I?    | 1033.453   | 10        |           |
| P V     | 997.641    | 200       |           | Si III  | 1033.920   | 160       | 33        |
| P III   | 998.000    | 800       | 2         | Si III  | 1034.287   | 80        | 33        |
| O I     | 999.493    | 200       | 7         | Si II   | 1034.967   | 0         | 13.08     |
| P V     | 1000.360   | 200       |           | P IV    | 1035.505   | 320       | 2         |
| S II    | 1000.48    | 200       | 5         | Si III  | 1035.657   | 60        | 33        |
| S II    | 1000.75    | 65        | 5         | N IV    | 1036.16    | 400w      |           |
| Ar III  | 1002.095   | 150       |           | Be II   | 1036.209   | 550       | 1         |
| P III   | 1003.592   | 1000      | 2         | Be II   | 1036.319   | 250       | 1         |
| Cl III  | 1005.280   | 500       | 1         | C II    | 1036.3367  | ST 500    | 2         |
| Si III  | 1005.349   | 60        | 43        | S II?   | 1036.41    | 15        |           |
| Si III  | 1005.353   | 5         | 43        | C II    | 1037.0182  | ST 1000   | 2         |

1037.053

## FINDING LIST

1097.990

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Si III  | 1037.053   | 140       | 33        | N I?    | 1067.399   | 35        |           |
| O VI    | 1037.613   | 750       | 1         | N I     | 1067.607   | 5         |           |
| Ar IV   | 1037.931   | 40        |           | Cl II   | 1067.94    | 200       | 1         |
| C VI    | 1038.42    | P         |           | N I     | 1068.476   | 20        |           |
| O I     | 1039.2303  | 400       | 3         | N I     | 1069.198   | 10        |           |
| O I     | 1040.9427  | 400       | 3         | N I     | 1069.984   | 15        |           |
| O I     | 1041.6876  | 400       | 3         | N I     | 1070.821   | 1         |           |
| N I?    | 1043.092   | 65        |           | Cl II   | 1071.05    | 1000      | 1         |
| N I?    | 1044.094   | 65        |           | N I?    | 1071.656   | 5         |           |
| N I?    | 1044.724   | 35        |           | F III   | 1071.66    | 10        |           |
| Si IV   | 1045.500   | P         | 21        | Cl II   | 1071.76    | 500       | 1         |
| S II    | 1045.74    | 65        |           | P IV?   | 1072.528   | 120       |           |
| N VII   | 1046.02    | P         |           | S IV    | 1072.992   | 600       | 1         |
| Si IV   | 1047.271   | P         | 21        | P IV?   | 1073.373   | 120       |           |
| S II    | 1047.56    | 35        |           | S IV    | 1073.522   | 400       | 1         |
| Al II   | 1047.82    | 10        |           | Cl II   | 1075.24    | 350       | 1         |
| S II    | 1047.86    | 35        |           | S III   | 1077.135   | 800       | 8         |
| Be II   | 1048.147   | 200       |           | N IV    | 1078.708   | 300       |           |
| N V     | 1048.20    | 40        |           | Cl II   | 1079.08    | 750       | 1         |
| Ar I    | 1048.218   | 1000      | 2         | B II    | 1081.85    | 200       |           |
| Be II   | 1048.220   | 400       |           | B II    | 1082.06    | 200       |           |
| S II?   | 1048.43    | 35        |           | Si II?  | 1082.400   | 2         |           |
| Al II   | 1048.53    | 50        |           | Si III  | 1083.210   | 120       | 23        |
| B II    | 1048.67    | 10        |           | N II    | 1083.990   | 400       | 1         |
| S II    | 1049.06    | 35        |           | Si II?  | 1084.144   | 3         |           |
| N V     | 1049.65    | 50        |           | N II    | 1084.562   | 150       | 1         |
| B V     | 1049.72    | P         |           | N II    | 1084.580   | 750       | 1         |
| S II?   | 1049.77    | 35        |           | He II   | 1084.908   | 73P       | 14        |
| P III   | 1049.824   | 400       |           | He II   | 1084.975   | 132P      | 14        |
| Al II   | 1049.93    | 100       |           | N II    | 1085.529   | P         | 1         |
| P III   | 1050.518   | 100       |           | N II    | 1085.546   | 400       | 1         |
| P III   | 1050.817   | 400       |           | N II    | 1085.701   | 1000      | 1         |
| S II?   | 1052.25    | 65        |           | N IV    | 1086.084   | b         |           |
| S II?   | 1052.60    | 35        |           | N IV    | 1086.269   | 50        |           |
| S II?   | 1053.21    | 35        |           | N IV    | 1086.691   | 100       |           |
| S II?   | 1055.15    | 35        |           | P IV    | 1086.943   | 80        |           |
| Al II   | 1055.28    | 20        |           | F V     | 1088.41    | 100       |           |
| Al II   | 1056.68    | 1         |           | P IV    | 1088.608   | 120       |           |
| S II?   | 1056.79    | 65d       |           | P IV    | 1091.442   | 160       |           |
| Si II   | 1056.899   | 2         | 13.07     | C II    | 1091.937   | 100       |           |
| Si II   | 1057.050   | 30        | 13.07     | C II    | 1092.232   | 10        |           |
| Si II   | 1057.503   | 15        | 13.07     | C II    | 1092.431   | 10        |           |
| Si II   | 1057.690   | 2         | 13.07     | C II    | 1092.726   | 200       |           |
| Li III  | 1060.41    | P         |           | Si III  | 1092.915   | P         | 42        |
| S IV    | 1062.672   | 600       | 1         | Si III  | 1092.940   | P         | 42        |
| C II    | 1063.285   | 5         |           | Si III  | 1092.969   | P         | 42        |
| C II    | 1063.313   | 5         |           | Si III  | 1093.105   | P         | 42        |
| N I?    | 1063.351   | 5         |           | Si III  | 1093.133   | P         | 42        |
| Cl II   | 1063.83    | 500       | 1         | N I?    | 1093.275   | 1         |           |
| P IV    | 1064.60    | 120       |           | Si III  | 1093.293   | P         | 42        |
| P II    | 1064.80    | 150       |           | P IV    | 1093.318   | 80        |           |
| P IV    | 1065.554   | 120       |           | P III   | 1093.627   | 200       |           |
| C I     | 1065.8913  | ST        | 12        | N I?    | 1094.688   | 1         |           |
| C II    | 1065.9199  | ST        | 12        | N I?    | 1095.279   | 40        |           |
| N I?    | 1066.126   | 5         |           | N I     | 1095.940   | 40        |           |
| C II    | 1066.1332  | ST        | 500       | N I     | 1096.322   | 0         |           |
| Si IV   | 1066.629   | 550       | 11        | S II    | 1096.57    | 200       | 3         |
| P IV    | 1066.640   | 80        |           | N I     | 1096.749   | 10        |           |
| N I?    | 1066.641   | 20        |           | N I?    | 1097.245   | 40        |           |
| Ar I    | 1066.660   | 750       | 1         | N I     | 1097.990   | 15        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| N I     | 1098.103   | 20        |           | C I     | 1129.161   | P         | 25        |
| P IV    | 1098.183   | 20        |           | C I     | 1129.196   | P         | 25        |
| N I     | 1098.264   | 20        |           | C I     | 1129.405   | 20        | 25        |
| F III   | 1099.10    | 10        |           | C I     | 1129.624   | 50        | 24        |
| N I     | 1099.153   | 10        |           | C I     | 1129.749   | 20        | 25        |
| N I     | 1100.3593  | 50        |           | C I     | 1129.924   | 50        | 24        |
| N I     | 1100.4649  | 15        |           | C I     | 1130.171   | 20        |           |
| Na III  | 1100.49    | 100       |           | P II    | 1130.925   | 10        |           |
| N I     | 1101.2910  | 45        |           | S II    | 1131.05    | 200       | 8         |
| F III   | 1101.55    | 10        |           | S II    | 1131.65    | 200       | 8         |
| P IV    | 1101.65    | 40        |           | Li II   | 1132.1     | 150       |           |
| S II    | 1102.32    | 300       | 3         | N IV    | 1133.117   | 200       |           |
| F III   | 1103.64    | 10        |           | C II?   | 1134.08    | 50        |           |
| C IV    | 1107.600   | 300       |           | N I     | 1134.1651  | 560       | 2         |
| C IV    | 1107.933   | 400       |           | N I     | 1134.4147  | 550       | 2         |
| S IV    | 1108.36    | 200       |           | C II?   | 1134.52    | 20        |           |
| Si III  | 1108.368   | 280       | 5         | N I     | 1134.9801  | 780       | 2         |
| Si III  | 1109.965   | 320       | 5         | N IV    | 1135.244   | 150       |           |
| S IV    | 1110.90    | 200       |           | N IV    | 1136.241   | 100       |           |
| P IV    | 1111.127   | 40        |           | Al IV   | 1136.80    | 150       |           |
| C I     | 1112.058   | 10        |           | S IV    | 1138.227   | 100       |           |
| Si III  | 1113.228   | 360       | 5         | C I     | 1138.383   | 20        | 23        |
| C I     | 1114.45    | 50        | 30        | O III   | 1138.545   | 100       |           |
| Li III  | 1116.33    | P         |           | C I     | 1138.557   | 30        | 23        |
| P IV    | 1116.915   | 20        |           | C I     | 1138.595   | 20        | 23        |
| C I     | 1117.581   | 20        |           | C II    | 1138.9358  | ST        | 200       |
| C I     | 1117.724   | 50        | 29        | C I     | 1138.946   | 50        | 23        |
| S VI    | 1117.91    | 0         |           | C I     | 1139.093   | 100       | 23        |
| P V     | 1117.979   | 1000      |           | C I     | 1139.300   | 20        |           |
| C I     | 1118.180   | 50        |           | C II    | 1139.3317  | ST        | 300       |
| P IV    | 1118.586   | 160       |           | C I     | 1139.426   | 50        |           |
| Al IV   | 1118.80    | 200d      |           | C II    | 1139.4730  | ST        | 10        |
| C?      | 1121.19    | 20        |           | C I     | 1139.514   | 20        | 22        |
| C I     | 1122.098   | 20        | 28        | F VI    | 1139.60    | 200       |           |
| C I     | 1122.260   | 50        |           | C I     | 1139.650   | 20        |           |
| Na III  | 1122.30    | 10        |           | C I     | 1139.766   | 150       |           |
| C I     | 1122.328   | 100       | 27        | C I     | 1139.812   | 150       | 22        |
| S III   | 1122.42    | 200       |           | N I?    | 1139.818   | 5         |           |
| C I     | 1122.447   | 20        | 27        | C I     | 1139.865   | 50        | 22        |
| Si IV   | 1122.486   | 550       | 3         | C I     | 1140.005   | 50        | 22        |
| C I     | 1122.725   | 50        |           | C I     | 1140.223   | 20        |           |
| C I     | 1122.794   | 20        |           | C I     | 1140.357   | 100       | 21        |
| C I     | 1123.107   | 20        |           | Si III  | 1140.545   | 120       | 32        |
| S II    | 1124.39    | 100       | 8         | C I     | 1140.574   | 20        |           |
| C VI    | 1124.9     | P         |           | C I     | 1140.641   | 150       | 21        |
| P II    | 1124.945   | 10        |           | P II    | 1141.00    | 5         |           |
| S II    | 1125.00    | 100       | 8         | C I     | 1141.327   | 20        | 20        |
| S III   | 1126.48    | 50        |           | Si III  | 1141.580   | 140       | 32        |
| S III   | 1126.85    | 100       |           | C II    | 1141.6246  | ST        | 300       |
| Si II   | 1127.442   | 20h       | 13.06     | C II    | 1141.6574  | ST        | 30P       |
| Si II   | 1127.907   | 40h       | 13.06     | C I     | 1141.678   | 20        | 20        |
| P V     | 1128.006   | 650       |           | C II    | 1141.7445  | ST        | 200       |
| C I     | 1128.252   | 50        | 26        | Al IV   | 1142.03    | 50d       |           |
| Si IV   | 1128.325   | P         | 3         | Si III  | 1142.282   | 120       | 32        |
| Si IV   | 1128.340   | 650       | 3         | P II    | 1142.88    | 20        |           |
| C I     | 1128.686   | 20        |           | Be II   | 1142.956   | 250       |           |
| C I     | 1128.752   | 100       | 26        | Al II   | 1142.97    | 100       |           |
| C I     | 1128.903   | 20        |           | Be II   | 1143.039   | 500       |           |
| C I     | 1129.030   | 100       |           | N I?    | 1143.606   | 90        |           |
| C I     | 1129.135   | 200       | 25        | N I     | 1143.6458  | 15        |           |

1143.6508

## FINDING LIST

1180.40

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| N I     | 1143.6508  | 30        |           | N I     | 1159.285   | 8         |           |
| P II?   | 1143.71    | 1         |           | N I     | 1159.8172  | P         |           |
| Si III  | 1144.306   | 160       | 32        | N I     | 1159.858   | 5         |           |
| Si III  | 1144.959   | 120       | 32        | Si III  | 1160.255   | 120       | 31        |
| P II    | 1145.01    | 1         |           | N I?    | 1160.480   | 10        |           |
| Si III  | 1145.122   | 150       | 41        | N I     | 1160.9370  | P         |           |
| Si III  | 1145.149   | 13        | 41        | Si III  | 1161.579   | 160       | 31        |
| Si III  | 1145.16    | 1         | 41        | P IV    | 1161.783   | 40        |           |
| Si III  | 1145.177   | 80        | 41        | Al IV   | 1161.85    | 10d       |           |
| Si III  | 1145.19    | 10        | 41        | S III   | 1162.52    | 100       |           |
| Si III  | 1145.22    | 50        | 41        | Al III  | 1162.66    | 10        |           |
| Si III  | 1145.669   | P         | 32        | N I     | 1163.8835  | 150       | 7         |
| O III   | 1149.603   | 50        |           | N I     | 1164.0016  | 30        | 7         |
| P II    | 1149.96    | 70        | 3         | N I     | 1164.2064  | 60        | 7         |
| Al      | 1150.27    | 10        |           | N I     | 1164.3246  | 95        | 7         |
| Al IV   | 1150.85    | 10        |           | O VIII  | 1164.8     | P         |           |
| O III   | 1150.882   | 100       |           | Al      | 1165.38    | 10d       |           |
| S II?   | 1152.11    | 65        |           | N I     | 1165.5943  | 40        |           |
| N I?    | 1152.139   | 20        |           | C III   | 1165.698   | 10P       |           |
| Al II?  | 1152.14    | 200       |           | N I     | 1165.8358  | 15        |           |
| O I     | 1152.152   | 250       | 6         | C III   | 1165.870   | 100P      |           |
| P II    | 1152.81    | 50        | 3         | S III   | 1166.13    | 50        |           |
| Na III  | 1153.04    | 40        |           | Li II   | 1166.4     | 200       |           |
| O III   | 1153.773   | 150       |           | N I?    | 1166.950   | 1         |           |
| P II    | 1153.99    | 120       | 3         | Al IV   | 1167.35    | 10        |           |
| N I?    | 1154.993   | 1         |           | N I     | 1167.4484  | 350       | 6         |
| Si III  | 1154.998   | 120       | 31        | N I     | 1168.2154  | 50        |           |
| P II    | 1155.00    | 40        | 3         | N I     | 1168.3344  | 200       |           |
| S III   | 1155.34    | 200       |           | N I     | 1168.4167  | 60        | 6         |
| C I     | 1155.809   | 50        | 19        | N I     | 1168.5358  | 300       | 6         |
| Si III  | 1155.957   | 120       | 31        | N IV    | 1168.599   | 150       |           |
| C I     | 1156.028   | 150       | 19        | C IV    | 1168.873   | 300       |           |
| C I     | 1156.199   | 20        | 19        | C IV    | 1168.990   | 400       |           |
| Al IV   | 1156.21    | 50        |           | N IV    | 1169.063   | 100       |           |
| C I     | 1156.389   | 100       | 19        | N IV    | 1169.478   | 50        |           |
| C I     | 1156.560   | 200       | 19        | N I     | 1169.6933  | 80        |           |
| N I?    | 1156.593   | 1         |           | N I     | 1170.1572  | 10        |           |
| C I     | 1156.765   | 20        |           | N I     | 1170.2766  | 80        |           |
| Si III  | 1156.782   | 80        | 31        | N I     | 1170.4165  | 5         |           |
| P II    | 1156.96    | 50        | 3         | N I     | 1170.6743  | 20        |           |
| Al II   | 1157.10    | 10        |           | N I     | 1171.0834  | 60        |           |
| C I     | 1157.186   | 20        | 17        | O VIII  | 1171.5     | P         |           |
| C I     | 1157.330   | 50        | 18        | Be IV   | 1171.56    | P         |           |
| S II?   | 1157.37    | 35        |           | S II?   | 1171.91    | 65        |           |
| C I     | 1157.405   | 150       | 17        | Si III  | 1172.529   | 80        | 30        |
| C I     | 1157.770   | 350       | 16        | Si III  | 1174.369   | 100       | 30        |
| C I     | 1157.910   | 730       | 16        | Si III  | 1174.432   | 120       | 30        |
| C I     | 1158.019   | 750       | 16        | C III   | 1174.933   | 350       | 4         |
| N I?    | 1158.051   | 10        |           | C III   | 1175.263   | 300       | 4         |
| Si III  | 1158.102   | 140       | 31        | C III   | 1175.590   | 200       | 4         |
| C I     | 1158.132   | 400       | 16        | C III   | 1175.711   | 1000      | 4         |
| Al II   | 1158.14    | 50        |           | C III   | 1175.987   | 300       | 4         |
| C I     | 1158.324   | 100       |           | C III   | 1176.370   | 350       | 4         |
| C I     | 1158.397   | 100       |           | N I     | 1176.5097  | 350       |           |
| C I     | 1158.492   | 20        | 16        | N I     | 1176.6304  | 180       |           |
| C I     | 1158.674   | 100       |           | Al II   | 1177.43    | 40        |           |
| C I     | 1158.732   | 100       | 15        | N I     | 1177.6948  | 320       |           |
| C I     | 1158.907   | 50        |           | Si III  | 1178.004   | 160       | 30        |
| C I     | 1158.967   | 200       | 15        | Al II   | 1179.34    | 10        |           |
| P II    | 1159.08    | 80        | 3         | Na III  | 1180.40    | 160       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| N I?    | 1180.428   | 1         |           | Al IV   | 1198.47    | 50        |           |
| Si III  | 1182.018   | 60        | 64        | C IV    | 1198.58    | 100d      |           |
| N III   | 1183.030   | 350       | 20        | N I     | 1199.5490  | ST 1000   | 1         |
| Al      | 1183.62    | 10        |           | N I     | 1200.2238  | ST 950    | 1         |
| N I?    | 1183.998   | 20        |           | N I     | 1200.7113  | ST 700    | 1         |
| N III   | 1184.544   | 400       | 20        | S III   | 1200.97    | 400       | 1         |
| Ar IV   | 1187.80    | 40        |           | Cl I    | 1201.358   | 900       |           |
| N IV    | 1188.006   | 300       |           | S III   | 1201.71    | 200       | 1         |
| Cl I    | 1188.768   | 1000      |           | S III   | 1202.10    | 50        | 1         |
| C I     | 1188.833   | 200       | 14        | P IV    | 1203.410   | 40        |           |
| N I     | 1188.972   | 40        |           | S II?   | 1204.30    | 500       |           |
| C I     | 1188.992   | 500       | 14        | P IV    | 1204.302   | 40        |           |
| C I     | 1189.065   | 200       | 14        | N VII   | 1205.0     | P         |           |
| Al II   | 1189.18    | 60        |           | Ar III? | 1205.95    | 50        |           |
| N I     | 1189.244   | 20        |           | Si III  | 1206.510   | 600       | 2         |
| C I     | 1189.249   | 250       | 14        | P IV    | 1206.513   | 40d       |           |
| C I     | 1189.447   | 500       | 14        | Si III  | 1206.533   | 600       | 11        |
| N I?    | 1189.628   | 90        |           | Si III  | 1207.517   | 180       | 22        |
| C I     | 1189.631   | 700       | 14        | Al II   | 1208.35    | 60        |           |
| C I     | 1190.021   | 35        |           | Al II   | 1209.19    | 40        |           |
| Al II   | 1190.05    | 80        |           | Al II   | 1210.09    | 80        |           |
| S II?   | 1190.11    | 65        |           | Si III  | 1210.456   | 200       | 21        |
| S III   | 1190.17    | 200       | 1         | P III   | 1210.600   | 100       |           |
| C I     | 1190.253   | 35        |           | Si IV   | 1210.652   | P         | 16        |
| Ar IV   | 1190.354   | 80        |           | Si IV   | 1211.757   | P         | 16        |
| Si II   | 1190.4157  | 100       | 5         | Al IV   | 1211.80    | 10        |           |
| S II?   | 1191.80    | 65        |           | Al II   | 1211.90    | 100       |           |
| Al II   | 1191.82    | 100       |           | Si III  | 1212.011   | 40        | 50        |
| C I     | 1191.838   | 120       | 13        | Si III  | 1212.247   | P         | 74        |
| C I     | 1192.218   | 70        | 12        | B V     | 1214.99    | P         |           |
| Si III  | 1192.228   | P         | 40        | Li III  | 1215.05    | P         |           |
| Si III  | 1192.258   | P         | 40        | He II   | 1215.088   | 143P      | 13        |
| Si III  | 1192.293   | P         | 40        | He II   | 1215.171   | 260P      | 13        |
| C I     | 1192.451   | 120       | 12        | He II   | 1215.175   | 30P       | 13        |
| C I     | 1193.009   | 700       | 11        | D I     | 1215.339   | 1000P     | 1         |
| C I     | 1193.031   | 300       | 11        | H I     | 1215.668   | 670P      | 1         |
| C I     | 1193.240   | 850       | 11        | H I     | 1215.674   | 330P      | 1         |
| C I     | 1193.264   | 150       | 11        | Si II?  | 1216.117   | 10h       |           |
| Si II   | 1193.2894  | 200       | 5         | Al IV   | 1216.78    | 50        |           |
| C I     | 1193.393   | 350       | 11        | O I     | 1217.643   | 100       | 9         |
| C I     | 1193.679   | 500       |           | Al IV   | 1219.19    | 10        |           |
| C I     | 1193.996   | 120       |           | Al      | 1220.57    | 10        |           |
| S III   | 1194.02    | 400       | 1         | Na III  | 1221.12    | 100       |           |
| C I     | 1194.064   | 350       |           | Si II   | 1222.288   | 0         | 8.02      |
| C I     | 1194.229   | 120       |           | Si II   | 1222.635   | 5         | 8.02      |
| C I     | 1194.301   | 120       | 10        | Na III  | 1223.44    | 80d       |           |
| S III   | 1194.40    | 300       | 1         | Cl II   | 1223.71    | 100       |           |
| C I     | 1194.406   | 200       |           | Si II   | 1223.907   | 20        | 8.02      |
| C I     | 1194.488   | 350       | 10        | Si II   | 1224.252   | 20        | 8.02      |
| Si II   | 1194.5001  | 250       | 5         | Na III  | 1224.73    | 80        |           |
| C I     | 1194.615   | 250       |           | N IV    | 1224.960   | 50        |           |
| Si III  | 1196.436   | P         | 40        | Si II   | 1224.972   | 10        | 8.02      |
| Si III  | 1196.470   | P         | 40        | N I     | 1225.028   | 40        |           |
| Be II   | 1197.094   | 330       | 5         | N IV    | 1225.192   | 150       |           |
| Be II   | 1197.188   | 670       | 5         | N I     | 1225.372   | 40        |           |
| Si II   | 1197.3936  | 100       | 5         | N IV    | 1225.719   | 200       |           |
| P IV    | 1197.822   | 40        |           | S II    | 1226.70    | 100       | 7         |
| Ar IV   | 1197.84    | 40        |           | Si II   | 1226.814   | 50        | 8.01      |
| Li II   | 1198.092   | 10        |           | N I     | 1226.831   | 5         |           |
| Si III  | 1198.297   | P         | 40        | Si II   | 1226.887   | 20        | 8.02      |

1226.986

## FINDING LIST

1274.300

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Si II   | 1226.986   | 40        | 8.01      | Si II   | 1251.164   | 200       | 8         |
| N I     | 1227.226   | 5         |           | Al IV   | 1251.35    | 50        |           |
| S II    | 1227.45    | 100       | 7         | Li II   | 1253.3     | 100       |           |
| Si II   | 1227.604   | 100       | 8.02      | C I     | 1253.467   | 50        |           |
| N I     | 1227.788   | 10        |           | C I     | 1253.541   | 100       |           |
| Al IV   | 1228.30    | 50        |           | P I     | 1253.74    | 6         |           |
| Si IV   | 1228.349   | P         | 20        | S II    | 1253.79    | 500       | 1         |
| N I     | 1228.410   | 40        |           | Ne III  | 1255.026   | 200       | 13        |
| Si II   | 1228.437   | 10        | 8.01      | Si I    | 1255.276   | 10        |           |
| Si II   | 1228.617   | 25        | 8.01      | Ne III  | 1255.685   | 500       | 13        |
| Si II   | 1228.746   | 150       | 8.01      | Si I    | 1256.490   | 40        |           |
| N I     | 1228.790   | 150       |           | C I     | 1256.498   | 200       |           |
| N I?    | 1229.172   | 20        |           | C III   | 1256.52    | 100d      |           |
| Si II   | 1229.388   | 200       | 8.01      | Na III  | 1256.68    | 20        |           |
| Al IV   | 1229.94    | 10        |           | Ne III  | 1257.190   | 600       | 13        |
| C IV    | 1230.046   | 200       |           | Al IV   | 1257.58    | 150       |           |
| B II    | 1230.160   | 200       |           | Si I    | 1258.795   | 50        |           |
| N I     | 1230.288   | 1         |           | Al II   | 1258.86    | 60        |           |
| C IV    | 1230.511   | 300       |           | S II    | 1259.53    | 500       | 1         |
| Si IV   | 1230.795   | P         | 20        | Si II   | 1260.4212  | 500       | 4         |
| P II    | 1231.18    | 50        |           | C I     | 1260.613   | 200       | 59        |
| Si II   | 1231.406   | 5         | 8.01      | C I     | 1260.736   | 250       | 9         |
| N I     | 1231.588   | 5         |           | C I     | 1260.927   | 200       | 9         |
| Si II?  | 1233.354   | 5h        |           | C I     | 1260.996   | 150       | 9         |
| S II    | 1233.36    | 50        | 7         | C I     | 1261.122   | 250       | 9         |
| S II    | 1234.14    | 300       | 7         | C I     | 1261.426   | 250       | 9         |
| Na III  | 1235.40    | 80d       |           | C I     | 1261.552   | 500       | 9         |
| Si III  | 1235.431   | 140       | 49        | Al IV   | 1262.51    | 50        |           |
| Si II?  | 1235.920   | 10        |           | S I     | 1262.83    | 65        |           |
| Ne X    | 1236.3     | P         |           | Al IV   | 1264.14    | 150d      |           |
| Al IV   | 1237.14    | 50        |           | P II    | 1264.47    | 30        |           |
| Si II?  | 1237.36    | 3h        |           | P IV    | 1264.481   | 40        |           |
| N V     | 1238.821   | 1000      | 1         | Si II   | 1264.7374  | 1000      | 4         |
| Mg II   | 1239.9252  | P         |           | Si II   | 1265.0010  | 100       | 4         |
| Al IV   | 1240.18    | 100       |           | Na III  | 1265.66    | 40        |           |
| Mg II   | 1240.3947  | P         |           | C I     | 1266.270   | 20        |           |
| Al IV   | 1240.83    | 150       |           | C I     | 1266.419   | 100       | 58        |
| P I     | 1241.49    | 1         |           | Al II   | 1266.66    | 20        |           |
| S I     | 1241.95    | 65        |           | P II    | 1267.06    | 5         |           |
| P I     | 1242.02    | 3         |           | C I     | 1267.596   | 50        | 57        |
| N V     | 1242.804   | 800       | 1         | Ar II   | 1268.483   | 100       |           |
| N I     | 1243.1796  | 550       | 5         | S I     | 1269.20    | 65        |           |
| N I     | 1243.3066  | 400       | 5         | N I?    | 1269.761   | 1         |           |
| P I     | 1243.37    | 3         |           | N IV    | 1270.280   | 250       |           |
| N IV    | 1243.73    | b         |           | S I     | 1270.78    | 130       |           |
| N IV    | 1244.92    | 50        |           | Mg II   | 1271.2388  | P         |           |
| P I     | 1245.19    | 6         |           | Al?     | 1271.27    | 10        |           |
| N IV    | 1246.51    | 100       |           | Al      | 1271.38    | 10        |           |
| Si II   | 1246.738   | 100       | 8         | Mg II   | 1271.9402  | P         |           |
| S I     | 1247.17    | 65        |           | S I     | 1272.07    | 35        |           |
| P I     | 1247.31    | 2         |           | N IV    | 1272.160   | 200       |           |
| C III   | 1247.383   | 800       | 9         | Al IV   | 1272.70    | 150d      |           |
| P I     | 1248.20    | 1         |           | Mg II   | 1272.7202  | P         |           |
| Si II   | 1248.426   | 150       | 8         | Mg II   | 1272.7212  | P         |           |
| P I     | 1248.61    | 1         |           | N IV    | 1272.74    | 100       |           |
| Al IV   | 1248.76    | 100d      |           | Mg II   | 1273.4232  | P         |           |
| P II    | 1249.82    | 200       |           | N IV    | 1273.47    | 150       |           |
| Si II   | 1250.089   | 100       | 13.05     | N IV    | 1273.716   | 100       |           |
| Si II   | 1250.433   | 150       | 13.05     | C I     | 1274.109   | 50        | 8         |
| S II    | 1250.50    | 300       | 1         | Si II   | 1274.300   | 3h        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| C I     | 1274.756   | 20        | 56        | C VI    | 1291.94    | P         |           |
| C I     | 1274.984   | 150       | 55        | Si III  | 1294.543   | 340       | 4         |
| N II    | 1275.038   | 300P      |           | P II    | 1294.64    | 150       |           |
| N II    | 1275.251   | P         |           | Al      | 1294.86    | 40        |           |
| N II    | 1275.275   | P         |           | S I     | 1295.661   | 500       | 9         |
| Si II   | 1275.662   | 5h        |           | S I     | 1296.174   | 400       | 9         |
| N II    | 1276.201   | 200P      |           | C III   | 1296.30    | 200d      |           |
| N II    | 1276.225   | P         |           | N IV    | 1296.600   | 250       |           |
| C I     | 1276.287   | 50        |           | S IV    | 1296.640   | 200       |           |
| C I     | 1276.483   | 100       |           | Si III  | 1296.726   | 280       | 4         |
| C I     | 1276.750   | 200       |           | C?      | 1298.14    | 100       |           |
| N II    | 1276.800   | 100P      |           | Si III  | 1298.891   | 300       | 4         |
| S I     | 1277.24    | 170d      |           | Si III  | 1298.960   | 360       | 4         |
| C I     | 1277.245   | 300       | 7         | Si III  | 1300.703   | P         | 54        |
| C I     | 1277.282   | 700       | 7         | Si III  | 1301.146   | 280       | 4         |
| C I     | 1277.513   | 100       | 7         | N I?    | 1301.681   | 1         |           |
| C I     | 1277.550   | 1000      | 7         | P II    | 1301.87    | 200       | 2         |
| C I     | 1277.723   | 250       | 7         | Al IV   | 1302.13    | 100       |           |
| C I     | 1277.954   | 70        | 7         | O I     | 1302.1686  | ST        | 500       |
| P II    | 1278.094   | 5         |           | S I     | 1302.344   | 500       | 9         |
| P I     | 1278.57    | 3         |           | S I     | 1302.865   | 400       | 9         |
| C I     | 1279.056   | 100       | 6         | S I     | 1303.114   | 400       | 9         |
| N I?    | 1279.223   | 1         |           | Si III  | 1303.320   | 320       | 4         |
| C I     | 1279.229   | 150       | 6         | S I     | 1303.42    | 130       |           |
| C I     | 1279.498   | 70        | 6         | Si II   | 1304.3720  | 100       | 3         |
| C I     | 1279.890   | 250       | 5         | P II    | 1304.47    | 200       | 2         |
| N I?    | 1279.995   | 5         |           | P II    | 1304.68    | 150       | 2         |
| S I     | 1280.13    | 130       |           | O I     | 1304.8575  | ST        | 500       |
| C I     | 1280.135   | 200       | 5         | P II    | 1305.48    | 350       | 2         |
| Ar II   | 1280.225   | 100       |           | Si II   | 1305.590   | 50h       | 13.04     |
| C I     | 1280.333   | 700       | 5         | S I     | 1305.885   | 400       | 9         |
| Si III  | 1280.354   | 120       | 63        | O I     | 1306.0286  | ST        | 450       |
| N I?    | 1280.362   | 5         |           | Mg II   | 1306.7139  | P         |           |
| C I     | 1280.404   | 75        | 5         | Mg II   | 1307.8754  | P         |           |
| C I     | 1280.597   | 200       | 5         | Mg II   | 1308.2792  | P         |           |
| C I     | 1280.847   | 250       | 5         | Mg II   | 1308.2809  | P         |           |
| P I     | 1282.61    | 6         |           | C III   | 1308.73    | 200       |           |
| Ar II   | 1282.620   | 100       |           | Si II   | 1309.2769  | 200       | 3         |
| P I     | 1282.96    | 6w        |           | Mg II   | 1309.4434  | P         |           |
| S I?    | 1283.11    | 15        |           | Si II   | 1309.458   | 20h       | 13.04     |
| Al IV   | 1283.48    | 10        |           | N IV    | 1309.557   | 200       |           |
| P I     | 1283.89    | 6         |           | Si II   | 1309.77    | 2h        | 13.04     |
| P III   | 1283.949   | 10        |           | P II    | 1309.87    | 250       | 2         |
| N IV    | 1284.218   | 150       |           | N I?    | 1310.057   | 5         |           |
| P II    | 1284.31    | 5         |           | S I     | 1310.21    | 170       |           |
| Ar II   | 1284.793   | 100       |           | N I     | 1310.5401  | 200       | 13        |
| P I     | 1284.80    | 3         |           | C I     | 1310.637   | 200       | 49        |
| P I     | 1285.84    | 2         |           | P II    | 1310.70    | 600       | 2         |
| S IV    | 1286.063   | 100       |           | N I     | 1310.9429  | 150       | 13        |
| P I     | 1286.44    | 9         |           | N I     | 1310.9495  | 25        | 13        |
| C I     | 1288.037   | 200       | 54        | Si II   | 1311.265   | 2h        |           |
| C I     | 1288.422   | 500       | 53        | C I     | 1311.363   | 1000      | 48        |
| C I     | 1288.710   | 100       | 52        | C I     | 1311.924   | 200       | 47        |
| C I     | 1288.917   | 100       |           | C I     | 1312.247   | 100       | 46        |
| P II    | 1289.57    | 30        |           | Si III  | 1312.590   | 260       | 10        |
| C I     | 1289.891   | 50        |           | N I?    | 1313.129   | 20        |           |
| C I     | 1289.977   | 300       | 51        | S I     | 1313.25    | 130       |           |
| P III   | 1290.134   | 1         |           | C I     | 1313.387   | 100       |           |
| C I     | 1291.304   | 100       | 50        | C I     | 1313.464   | 300       | 45        |
| Al      | 1291.81    | 10        |           | N I     | 1315.484   | 35        |           |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| C I     | 1315.918   | 200       | 44        | N II    | 1343.338   | 200P      |           |
| N I     | 1316.2906  | 2         |           | Si III  | 1343.388   | 120       | 39        |
| S I     | 1316.57    | 330       | 8         | O IV    | 1343.507   | 350       |           |
| B V     | 1318.05    | P         |           | S III   | 1343.53    | 50        |           |
| N I     | 1318.8224  | 5         |           | N II    | 1343.574   | P         |           |
| P III   | 1318.91    | 10        |           | P III   | 1343.687   | 70        |           |
| S I?    | 1318.97    | 130       |           | P III   | 1344.343   | 1000      | 1         |
| N I     | 1318.9981  | 150       | 12        | P III   | 1344.900   | 650       | 1         |
| N I     | 1319.0048  | 80        | 12        | N II    | 1345.076   | P         |           |
| N I     | 1319.6693  | 50        | 12        | N II    | 1345.313   | 100P      |           |
| N I     | 1319.6760  | 250       | 12        | N II    | 1345.340   | P         |           |
| Al      | 1320.71    | 10        |           | N III   | 1345.69    | 200       |           |
| S I     | 1323.521   | 230       | 8         | N III   | 1346.27    | 200       |           |
| C II    | 1323.8617  | ST        | 11        | N II    | 1346.413   | P         |           |
| C II    | 1323.9059  | ST        | 11        | N II    | 1346.441   | 10P       |           |
| C II    | 1323.9513  | ST        | 11        | Si II   | 1346.873   | 100       | 7         |
| N IV    | 1323.98    | 100b      |           | P III   | 1346.998   | 200       |           |
| C II    | 1323.9955  | ST        | 11        | Cl I    | 1347.238   | 1000      | 2         |
| C?      | 1324.14    | 150       |           | P III   | 1347.508   | 10        |           |
| C?      | 1324.22    | 200       |           | N III   | 1347.56    | 10        |           |
| N III   | 1324.40    | 150       |           | P III   | 1348.449   | 10        |           |
| C?      | 1324.60    | 10        |           | Si II   | 1348.543   | 100       | 7         |
| P III   | 1325.509   | 70        |           | Ar II   | 1348.751   | 100       |           |
| N IV    | 1325.685   | 50        |           | P III   | 1349.110   | 200       |           |
| N I     | 1326.5639  | 10        | 11        | Si II   | 1350.057   | 150       | 7         |
| N I     | 1326.5707  | 50        | 11        | Al II   | 1350.18    | 300       |           |
| S I     | 1326.635   | 170       | 8         | Si II   | 1350.520   | 20        | 7         |
| N IV    | 1326.964   | 20        |           | Si II   | 1350.658   | 20        | 7         |
| Si III  | 1327.703   | P         | 53        | Ar II   | 1351.333   | 100       |           |
| N I     | 1327.9170  | 25        | 11        | Cl I    | 1351.657   | 850       | 2         |
| N I     | 1327.9238  | 15        | 11        | Si II   | 1352.635   | 100       | 7         |
| S III   | 1328.12    | 50        |           | Al III  | 1352.83    | 200       |           |
| S III   | 1328.52    | 50        |           | S I?    | 1353.47    | 35        |           |
| Si III  | 1328.806   | P         | 48        | Si II   | 1353.718   | 100       | 7         |
| C I     | 1328.8332  | ST        | 4         | Al IV   | 1353.73    | 10        |           |
| C I     | 1329.0863  | ST        | 4         | C I     | 1354.288   | 500       | 43        |
| C I     | 1329.1001  | ST        | 4         | Ar II   | 1354.915   | 200       |           |
| C I     | 1329.1230  | ST        | 4         | P III   | 1354.957   | 10        |           |
| C I     | 1329.5775  | ST        | 4         | O I     | 1355.5975  | 400       | 1         |
| C I     | 1329.6005  | ST        | 4         | C I     | 1355.844   | 750       | 42        |
| Al      | 1332.57    | 20        |           | N I?    | 1355.887   | 150       |           |
| Al      | 1333.99    | 20        |           | C I     | 1357.134   | 300       | 41        |
| C II    | 1334.5323  | ST        | 1         | N I?    | 1357.359   | 1         |           |
| P III   | 1334.866   | 650       | 1         | Ar II   | 1357.435   | 20        |           |
| C II    | 1335.6627  | ST        | 1         | C I     | 1357.659   | 100       |           |
| C II    | 1335.7077  | ST        | 1         | O I     | 1358.5125  | 250       | 1         |
| Cl I    | 1335.723   | 750       | 2         | C I     | 1359.275   | 200       | 40        |
| Al      | 1336.86    | 40        |           | C I     | 1359.438   | 50        |           |
| Na III  | 1337.39    | 120d      |           | Al IV   | 1359.49    | 10        |           |
| P III   | 1337.498   | 70        |           | Si III  | 1359.751   | P         | 68        |
| P III   | 1337.710   | 150       |           | Si III  | 1360.360   | 20        | 68        |
| Al      | 1337.86    | 50        |           | N I?    | 1360.566   | 1         |           |
| O IV    | 1338.603   | 300       |           | Ar II   | 1360.735   | 100       |           |
| Si III  | 1341.465   | 160       | 39        | Si III  | 1361.597   | 160       | 46        |
| Si III  | 1341.496   | P         | 39        | Si III  | 1361.719   | P         | 68        |
| Si III  | 1342.351   | P         | 39        | Si III  | 1362.366   | 100       | 38        |
| Si III  | 1342.392   | 140       | 39        | B II    | 1362.460   | 500       | 1         |
| Si III  | 1342.432   | P         | 39        | Ar II   | 1363.032   | 200       |           |
| O IV    | 1342.995   | 200       |           | S I?    | 1363.04    | 100       |           |
| S III   | 1343.25    | 50        |           | Cl I    | 1363.449   | 850       | 2         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Si III  | 1363.459   | 140       | 38        | S I     | 1381.571   | 330       | 7         |
| Si III  | 1363.504   | P         | 38        | P III   | 1381.633   | 800       | 7         |
| Al      | 1364.10    | 10        |           | P I     | 1381.65    | 45        |           |
| C I     | 1364.164   | 600       | 39        | Ar II   | 1382.228   | 200       |           |
| Si III  | 1365.253   | 160       | 38        | Ar II   | 1382.770   | 100       |           |
| Si III  | 1365.292   | P         | 38        | Al III  | 1384.144   | 800       |           |
| Si III  | 1365.337   | P         | 38        | P V     | 1385.11    | 20        |           |
| Al      | 1365.54    | 10        |           | S I     | 1385.524   | 230       | 7         |
| Mg II   | 1365.5442  | P         |           | N III   | 1387.31    | 200       |           |
| Si IV   | 1365.549   | P         | 19        | Si III  | 1387.948   | 25        | 37        |
| Al      | 1367.02    | 10        |           | Si III  | 1387.979   | 10        | 37        |
| Si III  | 1367.049   | 140       | 46        | Si III  | 1387.994   | 8         | 37        |
| Al      | 1367.07    | 20        |           | Si III  | 1388.011   | 50        | 37        |
| Mg II   | 1367.2537  | P         |           | Si I    | 1388.052   | 8         | 37        |
| Mg II   | 1367.2568  | P         |           | Si III  | 1388.098   | 1         | 37        |
| Mg II   | 1367.7082  | P         |           | S I     | 1388.463   | 400       | 7         |
| Al      | 1368.51    | 10        |           | Al IV   | 1388.77    | 100       |           |
| Si IV   | 1368.571   | P         | 19        | S I     | 1389.160   | 230       | 7         |
| Si IV   | 1368.573   | P         | 19        | N V     | 1389.514   | 50        |           |
| Al      | 1369.20    | 10d       |           | Cl I    | 1389.688   | 500       | 1         |
| Mg II   | 1369.4231  | P         |           | N V     | 1389.822   | 40        |           |
| Si III  | 1369.437   | 100       | 46        | Cl I    | 1389.961   | 500       | 1         |
| Al      | 1370.00    | 10        |           | S III   | 1390.67    | 50        |           |
| P III   | 1370.39    | 10        |           | S I     | 1392.607   | 330       | 7         |
| Al II   | 1371.24    | 60        |           | Si IV   | 1393.755   | 1000      | 1         |
| O V     | 1371.287   | 670       | 7         | S I     | 1396.147   | 400       | 7         |
| Si III  | 1371.652   | 60        | 67        | Ar II   | 1396.231   | 100       |           |
| P III   | 1372.01    | 100       |           | Cl I    | 1396.527   | 650       | 1         |
| P I     | 1372.03    | 9         |           | Si III  | 1399.615   | P         | 73        |
| P III   | 1372.711   | 300       |           | Cl II   | 1401.16    | 10        |           |
| Si III  | 1373.030   | 100       | 67        | S I     | 1401.541   | 330       | 6         |
| Cl I    | 1373.118   | 350       | 1         | Si IV   | 1402.770   | 800       | 1         |
| P I     | 1373.49    | 60        |           | Si II   | 1403.783   | 5h        | 13.03     |
| P I     | 1374.73    | 6         |           | Si II   | 1404.170   | 1h        | 13.03     |
| P III   | 1374.780   | 100       |           | Si II   | 1404.478   | 6h        | 13.03     |
| Si III  | 1375.083   | 40        | 67        | Al IV   | 1404.72    | 100d      |           |
| Si III  | 1375.688   | 40        | 67        | Si II   | 1409.073   | 10h       | 13.02     |
| Ar II   | 1376.106   | 50        |           | S I     | 1409.368   | 330       | 6         |
| Ar II   | 1376.956   | 100       |           | Al IV   | 1409.52    | 10        |           |
| P I     | 1377.06    | 60        |           | Si II   | 1409.90    | 2h        | 13.02     |
| Si III  | 1377.082   | 60        | 67        | Si II   | 1410.219   | 20h       | 13.02     |
| Ar II   | 1377.211   | 400       |           | P I     | 1411.31    | 24        |           |
| Si III  | 1377.238   | 40        | 67        | N I?    | 1411.510   | 5         |           |
| Ar II   | 1377.442   | 20        |           | P I     | 1411.75    | 2         |           |
| N I?    | 1377.787   | 1         |           | N I     | 1411.9318  | 150       | 10        |
| P I     | 1377.93    | 60        |           | N I     | 1411.9395  | P         | 10        |
| B I     | 1378.43    | 300       |           | N I     | 1411.9494  | 300       | 10        |
| B I     | 1378.69    | 500b      |           | Al IV   | 1412.24    | 10        |           |
| B I     | 1378.9     | 300       |           | S I     | 1412.899   | 230       | 6         |
| N I?    | 1379.003   | 1         |           | Cl IV   | 1413.39    | 100       |           |
| Ar II   | 1379.378   | 100       |           | Al      | 1414.24    | 40        |           |
| P I     | 1379.40    | 75        |           | Al      | 1416.49    | 40        |           |
| Cl I    | 1379.529   | 900       | 1         | Si II   | 1416.972   | 10h       | 18.06     |
| Al III  | 1379.670   | 600       |           | Al      | 1417.14    | 10        |           |
| P III   | 1379.873   | 500       | 7         | Si III  | 1417.237   | 260       | 9         |
| Ar II   | 1379.884   | 300       |           | Al IV   | 1417.58    | 10        |           |
| P III   | 1380.464   | 1000      | 7         | Si II   | 1417.781   | 5         | 18.06     |
| Ar II   | 1380.728   | 100       |           | Si II   | 1418.110   | 0         | 18.06     |
| P III   | 1381.111   | 1000      | 7         | O V     | 1418.41    | 500       |           |
| P I     | 1381.47    | 75        |           | P I     | 1420.08    | 30        |           |

| Element        | Wavelength | Intensity | Multiplet | Element            | Wavelength | Intensity | Multiplet |
|----------------|------------|-----------|-----------|--------------------|------------|-----------|-----------|
| Al             | 1420.45    | 10        |           | Al                 | 1443.28    | 40        |           |
| Li II          | 1420.89    | 100       |           | Al                 | 1443.66    | 10        |           |
| Cl IV          | 1421.97    | 100       |           | S I                | 1444.317   | 330       |           |
| Al             | 1422.17    | 10        |           | P I                | 1445.66    | 3         |           |
| C <sup>2</sup> | 1422.57    | 10        |           | P I                | 1446.01    | 12        |           |
| Li III         | 1423.88    | P         |           | N IV               | 1446.114   | 250       |           |
| Si III         | 1424.775   | 40        | 62        | P I                | 1446.33    | 3         |           |
| Al IV          | 1425.00    | 10        |           | Si III             | 1447.196   | 120       | 3.05      |
| S I            | 1425.065   | 500       | 5         | Al IV              | 1447.47    | 100d      |           |
| S I            | 1425.229   | 400       | 5         | P I                | 1447.50    | 60        |           |
| P I            | 1425.29    | 30        |           | P III              | 1447.512   | 200       |           |
| Be I           | 1426.117   | 125       |           | P V                | 1447.92    | 150       |           |
| C III          | 1426.16    | 10        |           | S I                | 1448.254   | 500       | 12        |
| C III          | 1426.45    | 400       |           | Al IV              | 1449.70    | 10        |           |
| C III          | 1426.78    | 100       |           | P I                | 1450.38    | 9         |           |
| Cl IV          | 1426.89    | 100       |           | Ar II              | 1451.879   | 100       |           |
| Na III         | 1427.27    | 10        |           | P II               | 1452.89    | 300       |           |
| P I            | 1427.77    | 1         |           | P I                | 1453.01    | 45        |           |
| C III          | 1427.85    | 300       |           | Ar II              | 1455.484   | 100       |           |
| P I            | 1428.05    | 1         |           | Si III             | 1457.253   | 100       | 60        |
| C III          | 1428.17    | 200       |           | Al                 | 1457.92    | 50d       |           |
| C III          | 1428.53    | 200       |           | Na III             | 1458.15    | 60        |           |
| C III          | 1428.66    | 10        |           | C I                | 1459.0317  | 300       | 38        |
| C III          | 1428.95    | 100       |           | Mg IV              | 1459.52    | 100       |           |
| C III          | 1429.08    | 10        |           | Ar II              | 1459.878   | 100       |           |
| P III          | 1429.242   | 100       |           | Ar III             | 1460.077   | 200       |           |
| Al             | 1429.57    | 10        |           | Ar III             | 1460.234   | 100       |           |
| P I            | 1429.77    | 12        |           | N I <sup>2</sup>   | 1462.822   | 10        |           |
| P I            | 1430.13    | 150d      |           | Ar II              | 1463.155   | 200       |           |
| P III          | 1430.409   | 200       |           | C I                | 1463.3360  | 600       | 37        |
| P I            | 1430.73    | 30        |           | Ar II              | 1464.176   | 100       |           |
| P I            | 1431.50    | 1         |           | Ar II              | 1465.153   | 100       |           |
| C I            | 1431.597   | 100       | 65        | Ar III             | 1465.532   | 100       |           |
| Al IV          | 1431.93    | 100       |           | B I                | 1465.59    | 100d      |           |
| C I            | 1432.105   | 75        | 65        | B I                | 1465.69    | 200d      |           |
| C I            | 1432.530   | 50        | 65        | Ar III             | 1465.712   | 150       |           |
| S I            | 1433.328   | 500       | 5         | B I                | 1465.82    | 200d      |           |
| Si III         | 1433.690   | 120       | 66        | N I <sup>2</sup>   | 1466.723   | 1         |           |
| Si II          | 1434.400   | 1h        | 13.01     | N I <sup>2</sup>   | 1467.384   | 20        |           |
| Si II          | 1434.542   | 2h        | 13.01     | P I                | 1467.39    | 3         |           |
| Si III         | 1435.776   | 160       | 61        | C I                | 1467.402   | 350       | 36        |
| Si III         | 1436.166   | 140       | 52        | P IV               | 1467.424   | 40        |           |
| Na III         | 1436.21    | 240       |           | P I                | 1467.58    | 9         |           |
| Si III         | 1436.724   | 80        | 66        | Ar III             | 1467.841   | 150       |           |
| S I            | 1437.005   | 400       | 5         | C I                | 1467.877   | 30        |           |
| Al             | 1437.40    | 20        |           | Ar III             | 1468.006   | 100       |           |
| Si III         | 1438.228   | 40        | 66        | C I                | 1468.410   | 100       |           |
| Al             | 1438.32    | 10        |           | P I                | 1469.71    | 3         |           |
| N IV           | 1438.37    | 150       |           | C I                | 1470.094   | 100       | 35        |
| Si II          | 1438.576   | 2h        | 13        | N III              | 1470.68    | 10        |           |
| Si III         | 1438.702   | 40        | 66        | N III              | 1471.02    | 50        |           |
| Si II          | 1438.931   | 4h        | 13        | Cl II              | 1471.06    | 200       |           |
| Si III         | 1439.391   | 40        | 66        | P III <sup>2</sup> | 1471.218   | 10        |           |
| Al             | 1439.96    | 20        |           | N III              | 1471.69    | 100       |           |
| P I            | 1440.24    | 15        |           | Si II              | 1471.775   | 2         | 30        |
| Si III         | 1440.908   | P         | 66        | S I                | 1471.82    | 130       |           |
| Cl IV          | 1440.95    | 10        |           | C I                | 1472.231   | 60        |           |
| Si III         | 1441.732   | 100       | 3.05      | S I                | 1472.993   | 670       | 4         |
| Al IV          | 1441.81    | 50d       |           | P II               | 1473.129   | 10        |           |
| P I            | 1442.76    | 15        |           | P I                | 1473.65    | 6         |           |

1474.005

## FINDING LIST

1531.85

| Element | Wavelength | Intensity | Multiplet | Element            | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|--------------------|------------|-----------|-----------|
| S I     | 1474.005   | 730       | 3         | Si III             | 1500.241   | 240       | 36        |
| Si II   | 1474.304   | 1h        | 12, 2     | Si III             | 1501.150   | P         | 36        |
| S I     | 1474.390   | 500       | 3         | Si III             | 1501.191   | 200       | 36        |
| Ar II   | 1474.537   | 100       |           | P III              | 1501.551   | 700       | 6         |
| S I     | 1474.569   | 330       | 3         | Si III             | 1501.780   | P         | 36        |
| Si II   | 1474.649   | 15h       | 12, 02    | P I                | 1501.81    | 60        |           |
| Si II   | 1475.188   | 5h        | 12, 02    | Si III             | 1501.827   | P         | 36        |
| Mg II   | 1475.9998  | P         |           | Si III             | 1501.870   | 180       | 36        |
| P I     | 1476.11    | 9         |           | P I                | 1502.17    | 24        |           |
| O III   | 1476.89    | 600       |           | P III              | 1502.273   | 1000      | 6         |
| Si II   | 1476.928   |           | 12, 01    | P I                | 1503.12    | 5         |           |
| C III   | 1477.68    | 300       |           | P I                | 1503.48    | 3         |           |
| Mg II   | 1477.9972  | P         |           | P I                | 1504.37    | 36        |           |
| Mg II   | 1478.0037  | P         |           | P III              | 1504.719   | 900b      | 6         |
| C III   | 1478.05    | 200       |           | P I                | 1504.72    | 6b        |           |
| C III   | 1478.30    | 100       |           | P I                | 1505.84    | 2         |           |
| Mg II   | 1480.8797  | P         |           | Si III             | 1506.060   | 120       | 72        |
| Al IV   | 1481.46    | 10        |           | P II               | 1506.44    | 30        |           |
| S I     | 1481.680   | 500       | 4         | P I                | 1506.63    | 21        |           |
| N I?    | 1481.750   | 40        |           | O V                | 1506.72    | 800       |           |
| C I     | 1481.7635  | 450       | 34        | P II               | 1506.975   | 10        |           |
| Mg II   | 1482.8903  | P         |           | P I                | 1506.98    | 18        |           |
| S I     | 1483.036   | 670       | 3         | P I?               | 1508.74    | 9w        |           |
| S I     | 1483.232   | 500       | 3         | Si II              | 1508.741   | 3h        | 11.01     |
| P IV    | 1484.506   | 240       |           | Mg IV              | 1508.82    | 10        |           |
| Cl II   | 1484.66    | 10        |           | Si II              | 1509.101   | 100h      | 11.01     |
| Si II   | 1484.873   | 15        | 12        | C I                | 1510.668   | 25        |           |
| Si II   | 1485.024   | 90h       | 15, 04    | C I                | 1510.981   | 100       |           |
| Si II   | 1485.224   | 30        | 12        | C I                | 1511.907   | 25        |           |
| P II    | 1485.49    | 250       |           | Si II              | 1512.072   | 50h       | 11.01     |
| Si II   | 1485.513   | 100h      | 15, 04    | Be II              | 1512.269   | 555       | 4         |
| S I     | 1485.613   | 230       | 4         | Be II              | 1512.407   | 1000      | 4         |
| N IV    | 1486.496   | 100       |           | Be II              | 1512.419   | 110       | 4         |
| Al IV   | 1486.87    | 50d       |           | P II               | 1512.87    | 5h        |           |
| S I     | 1487.149   | 500       | 3         | C I                | 1513.150   | 50        |           |
| P IV    | 1487.796   | 160       |           | Si III             | 1513.533   | 40        | 94        |
| P I     | 1488.01    | 60        |           | Si II              | 1513.570   | 30        | 29        |
| P IV    | 1489.101   | 160       |           | P I                | 1515.10    | 6w        |           |
| P II    | 1489.834   | 10        |           | Si II              | 1516.910   | 60        | 29        |
| Mg IV   | 1490.41    | 10        |           | Si II              | 1518.221   | 5         | 29        |
| P I     | 1491.36    | 150       |           | N VII              | 1521.4     | P         |           |
| Be I    | 1491.765   | 250       |           | P II               | 1521.62    | 300w      |           |
| P III?  | 1492.031   | 500       |           | P II               | 1522.11    | 4         |           |
| N I     | 1492.6254  | 620       | 4         | P II               | 1522.392   | 10        |           |
| C I     | 1492.738   | 60        |           | P I                | 1522.59    | 2         |           |
| N I     | 1492.8195  | 100       | 4         | P II               | 1522.59    | 5         |           |
| Li II   | 1492.931   | 60        |           | P II               | 1523.44    | 10        |           |
| Li II   | 1492.973   | 100       |           | B I                | 1525.50    | 1         |           |
| P I     | 1492.99    | 120       |           | P II               | 1525.58    | 1         |           |
| Li II   | 1493.036   | 20        |           | B I                | 1525.84    | 1         |           |
| C I     | 1493.273   | 10        |           | Al IV              | 1526.15    | 50d       |           |
| P I     | 1493.34    | 45        |           | F IX               | 1526.3     | P         |           |
| C I     | 1494.532   | 25        |           | Si II              | 1526.7076  | 500       | 2         |
| N I     | 1494.6751  | 400       | 4         | N I?               | 1527.495   | 1         |           |
| P II    | 1494.990   | 10        |           | Cl II              | 1528.91    | 100       |           |
| B V     | 1495.38    | P         |           | Cl IV              | 1529.28    | 10        |           |
| N V     | 1495.5     | 40        |           | N <sup>+</sup> III | 1529.67    | 20        |           |
| P II    | 1496.44    | 5         |           | N VII              | 1530.2     | P         |           |
| N I?    | 1496.707   | 1         |           | P I                | 1530.58    | 12        |           |
| P I     | 1499.51    | 24        |           | C III              | 1531.85    | 2'0       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Cl IV   | 1532.19    | 100       |           | Si I?   | 1553.3712  | 1         |           |
| P II    | 1532.51    | 700w      | 1         | P II    | 1553.392   | 1         |           |
| Si IV   | 1533.220   | P         | 24        | P II    | 1553.82    | 10        |           |
| Cl IV   | 1533.25    | 100       |           | Si I?   | 1554.7021  | 2         |           |
| Si II   | 1533.4320  | 1000      | 2         | P I     | 1554.84    | 3         |           |
| B I     | 1533.81    | 10d       |           | P I     | 1555.25    | 6         |           |
| B I     | 1534.29    | 10d       |           | Si I    | 1555.5157  | 1         |           |
| P I     | 1534.73    | 15        |           | Si I?   | 1555.6630  | 1         |           |
| P II    | 1535.90    | 1000w     | 1         | Al II   | 1555.93    | 20        |           |
| P II    | 1536.39    | 700w      | 1         | Si I?   | 1556.1626  | 1         |           |
| Cl IV   | 1537.21    | 300       |           | P I     | 1556.18    | 2         |           |
| Al IV   | 1537.52    | 100       |           | Si I    | 1556.5273  | 1         |           |
| Cl IV   | 1539.30    | 200       |           | Al IV   | 1557.24    | 250d      |           |
| Al II   | 1539.84    | 300       | 10        | Ar II   | 1557.305   | 100       |           |
| Na III  | 1541.19    | 20        |           | Cl II   | 1558.05    | 100       |           |
| C I     | 1541.510   | 40        |           | Si I    | 1558.2400  | 2         |           |
| P I     | 1541.69    | 30        |           | B I     | 1558.71    | 200       |           |
| Al      | 1541.71    | 10        |           | N I?    | 1558.834   | 1         |           |
| C I     | 1542.1766  | 160       | 64        | Ar II   | 1559.072   | 300       |           |
| P II    | 1542.29    | 1000w     | 1         | B I     | 1559.11    | 300       |           |
| N I?    | 1542.499   | 5         |           | Si I    | 1559.3645  | 2         |           |
| Al      | 1542.66    | 20        |           | N I?    | 1559.751   | 1         |           |
| Cl II   | 1542.94    | 10        |           | Ar II   | 1560.191   | 400       | 14        |
| P II    | 1543.09    | 400       | 1         | C I     | 1560.3095  | 250       | 3         |
| P I     | 1543.26    | 45        |           | Al II   | 1560.35    | 50        |           |
| P II    | 1543.61    | 150       | 1         | C I     | 1560.6832  | 500       | 3         |
| Si I?   | 1543.713   | 1r        |           | C I     | 1560.7079  | 200       | 3         |
| C I     | 1543.960   | 60        |           | Si I    | 1560.7425  | 8         |           |
| Ar II   | 1544.177   | 200       |           | Si III  | 1560.974   | P         | 71        |
| Ar II   | 1544.711   | 200       |           | C I     | 1561.3407  | 200       | 3         |
| Cl IV   | 1545.19    | 200       |           | C I     | 1561.367   | P         | 3         |
| C I     | 1545.249   | 40        |           | C I     | 1561.4382  | 1000      | 3         |
| Si I    | 1545.565   | 1r        |           | Si I    | 1562.0065  | 4         |           |
| P I     | 1545.95    | 45        |           | Si I    | 1562.0331  | 1         |           |
| P I     | 1546.32    | 9         |           | Ar II   | 1562.442   | 200       |           |
| B I     | 1546.44    | 100d      |           | Si II   | 1562.451   | 10        | 11        |
| Si I    | 1546.559   | 1r        |           | Si II   | 1562.845   | 15        | 11        |
| B I     | 1546.85    | 200d      |           | Ar II   | 1563.043   | 100       |           |
| Ar II   | 1547.356   | 100       |           | Si I    | 1563.3641  | 1         |           |
| Si I?   | 1547.373   | 1r        |           | Al II   | 1563.58    | 20        |           |
| C IV    | 1548.195   | 1000      | 1         | Si II   | 1563.765   | 10        | 10.02     |
| P I     | 1548.43    | 180       |           | Si II   | 1564.066   | 5         | 10.02     |
| N V     | 1548.67    | P         |           | Al IV   | 1564.14    | 50d       |           |
| Na III  | 1548.68    | 160       |           | Si I    | 1564.6138  | 8         |           |
| Si I    | 1548.7149  | 2         |           | Ar II   | 1565.377   | 100       |           |
| Cl IV   | 1549.15    | 200       |           | B I     | 1566.32    | 200d      |           |
| N V     | 1549.336   | 85        |           | B I     | 1566.70    | 300d      |           |
| C IV    | 1550.768   | 950       | 1         | Ar II   | 1566.811   | 100       |           |
| P I     | 1551.04    | 105       |           | Si I    | 1567.7263  | 8         |           |
| Si I?   | 1551.2411  | 2         |           | Si I?   | 1567.8095  | 1         |           |
| Cl IV   | 1551.27    | 100       |           | Ar II   | 1567.98~   | 400       |           |
| P I     | 1551.42    | 45        |           | Si I    | 1568.1963  | 10        |           |
| Si I    | 1551.8595  | 2         |           | Si I    | 1568.6182  | 3         | 40        |
| Si I?   | 1551.9323  | 1         |           | Si I    | 1569.3185  | 8         |           |
| Si I    | 1552.2089  | 1         |           | Al II   | 1569.37    | 20        |           |
| P II    | 1552.51    | 5h        |           | Si I?   | 1569.3841  | 1         |           |
| P II    | 1552.94    | 1         |           | Si I    | 1570.0275  | 2         |           |
| Si I    | 1552.9498  | 2         |           | Si I    | 1570.5175  | 3         | 40        |
| N I?    | 1552.995   | 1         |           | Si I    | 1570.8104  | 1         |           |
| Al IV   | 1553.00    | 50d       |           | Si I    | 1571.3226  | 1         |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar II   | 1571.391   | 100       |           | Ar II   | 1590.213   | 200       |           |
| Si I    | 1571.4058  | 10        | 40        | Si I    | 1590.4788  | 20        |           |
| Si I?   | 1571.7956  | 6         |           | Si I    | 1590.5763  | 15        |           |
| Si I    | 1572.7173  | 2         |           | O III   | 1590.61    | 400       |           |
| Mg III  | 1572.72    | 400       |           | Si I    | 1591.1232  | 20        |           |
| Si I?   | 1572.9245  | 1         |           | O III   | 1591.33    | 600       |           |
| N I?    | 1572.976   | 1         |           | C III   | 1591.48    | 200       |           |
| Al II   | 1573.01    | 20        |           | Ar II   | 1591.939   | 1         |           |
| B I     | 1573.31    | 300       |           | Si I    | 1592.0200  | 20        |           |
| Si I?   | 1573.3483  | 1         |           | Mg III  | 1592.39    | 100       |           |
| Si I    | 1573.6350  | 10        |           | Si I    | 1592.4234  | 60        |           |
| B I     | 1573.67    | 500       |           | S I     | 1592.72    | 65        |           |
| Si I    | 1573.8840  | 25        | 40        | N I?    | 1592.867   | 20        |           |
| Si I?   | 1574.1275  | 1         |           | Ar II   | 1593.587   | 200       |           |
| Ar II   | 1574.401   | 100       |           | Si I    | 1594.1455  | 3         |           |
| Si I    | 1574.7456  | 1         |           | Si I    | 1594.5655  | 70        |           |
| Si I    | 1574.8435  | 30        |           | Ar II   | 1594.799   | 100       |           |
| Ar II   | 1574.993   | 600       | 14        | Si I    | 1594.9493  | 70        |           |
| Si I    | 1575.1268  | 10        |           | P I     | 1595.08    | 6         |           |
| P I     | 1575.18    | 9         |           | P I     | 1595.72    | 1         |           |
| P I     | 1575.47    | 3         |           | Ar II   | 1595.737   | 100       |           |
| Ar II   | 1575.815   | 300       |           | Si I    | 1595.7552  | 30        |           |
| C III   | 1576.49    | 300       |           | P I     | 1596.06    | 3         |           |
| Si I    | 1576.8294  | 12        | 39        | Al II   | 1596.07    | 80        |           |
| Ar II   | 1576.898   | 300       |           | Ar II   | 1596.151   | 100       |           |
| Si I    | 1577.0439  | 2         |           | O V     | 1596.37    | 500       |           |
| N I?    | 1577.131   | 5         |           | N I?    | 1597.181   | 10        |           |
| C III   | 1577.32    | 200       |           | Si I    | 1597.721   | 25        |           |
| C III   | 1577.89    | 200       |           | Si I?   | 1597.7357  | 20        |           |
| Ar II   | 1578.812   | 300       |           | Si I    | 1597.9627  | 60        |           |
| Mg      | 1579.05    | 10d       |           | P I     | 1597.97    | 3         |           |
| Si I    | 1580.3001  | 12        | 38        | Ar II   | 1598.575   | 100       |           |
| Ar II   | 1580.770   | 200       |           | Ar II   | 1598.722   | 200       |           |
| Al II   | 1580.90    | 20        |           | P I     | 1598.76    | 3         |           |
| Ar II   | 1580.960   | 100       |           | Ar II   | 1598.860   | 100       |           |
| Al IV   | 1582.04    | 150d      |           | Ar II   | 1599.130   | 100       |           |
| P I     | 1583.73    | 24        |           | N I?    | 1599.202   | 1         |           |
| Ar II   | 1583.833   | 100       |           | P I     | 1599.25    | 15        |           |
| Si I    | 1584.0216  | 8         |           | Al II   | 1599.44    | 40        |           |
| Si I    | 1584.3455  | 12        | 38        | Ar II   | 1599.607   | 100       |           |
| O III   | 1584.45    | 400       |           | Ar II   | 1600.133   | 400       |           |
| Al IV   | 1584.45    | 100d      |           | B I     | 1600.41    | 500d      |           |
| Al II   | 1584.72    | 40        |           | Ar II   | 1600.694   | 600       |           |
| Si I    | 1584.8540  | 2         |           | B I     | 1600.83    | 800d      |           |
| Si I    | 1585.9580  | 3         |           | Ar II   | 1602.554   | 200       |           |
| Si I    | 1586.1372  | 15        |           | Ar II   | 1602.891   | 200       |           |
| P I     | 1586.25    | 3         |           | Na III  | 1602.91    | 100       |           |
| Mg III  | 1586.26    | 300       |           | C I     | 1602.9715  | 200       | 63        |
| Ar II   | 1586.261   | 200       |           | N I?    | 1602.973   | 5         |           |
| Si I    | 1586.7913  | 20        |           | B I     | 1602.99    | 200d      |           |
| P I     | 1586.88    | 2         |           | Ar II   | 1603.075   | 400       |           |
| Si I    | 1586.8920  | 3         |           | Ar II   | 1603.442   | 400       |           |
| Si I    | 1587.7612  | 15        |           | Ar II   | 1604.082   | 500       |           |
| O III   | 1587.87    | 400       |           | Na III  | 1604.47    | 120       |           |
| Si III  | 1588.950   | 40        | 59        | Al III  | 1605.75    | 700       |           |
| Si I    | 1589.1728  | 15        |           | Si I    | 1605.8374  | 20        | 33        |
| Al IV   | 1589.27    | 50d       |           | Ar II   | 1606.197   | 300       |           |
| Ar II   | 1589.465   | 500       |           | Ar II   | 1606.926   | 400       |           |
| Si I    | 1589.6389  | 7         |           | C I     | 1606.960   | 50        |           |
| O III   | 1590.01    | 800       |           | Mg      | 1607.13    | 10        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Ar II   | 1607.180   | 100       |           | Na III  | 1624.07    | 240       |           |
| C I     | 1608.438   | 70        |           | B II    | 1624.16    | 400       | 3         |
| Si I    | 1608.9164  | 25        | 33        | B II    | 1624.37    | 400       | 3         |
| B I     | 1610.40    | 10        |           | P I     | 1624.43    | 2         |           |
| P V     | 1610.54    | 20        |           | P I     | 1624.67    | 3         |           |
| B I     | 1610.72    | 10        |           | P I     | 1625.40    | 30        |           |
| Na III  | 1610.97    | 80        |           | Si I    | 1625.5307  | 35        |           |
| P I     | 1611.29    | 30        |           | Al II   | 1625.62    | 120       | 9         |
| Al III  | 1611.85    | 900       |           | Si I    | 1625.7045  | 70        | 27        |
| Na III  | 1613.77    | 160       |           | P I     | 1625.80    | 75        |           |
| P I     | 1614.19    | 30        |           | Si I    | 1627.0498  | 20        |           |
| Si I    | 1614.5672  | 30        | 30        | Ar II   | 1627.085   | 20        |           |
| Si I    | 1614.6300  | 25        |           | N II    | 1627.349   | P         |           |
| P I     | 1614.67    | 3         |           | N I     | 1627.366   | 5         |           |
| P IV?   | 1614.85    | 80        |           | N II    | 1627.376   | 100P      |           |
| P I     | 1614.87    | 9         |           | Si I    | 1627.7451  | 30        | 27        |
| P I     | 1615.79    | 36        |           | P I     | 1627.86    | 9         |           |
| Ar II   | 1615.807   | 50        |           | Ar II   | 1628.825   | 100       |           |
| Si I    | 1615.9488  | 50        | 30        | N II    | 1628.896   | P         |           |
| P I     | 1616.20    | 120       |           | N II    | 1628.922   | P         |           |
| N V     | 1616.328   | 150       |           | N II    | 1629.079   | 100P      |           |
| Al II   | 1616.43    | 120       |           | P I     | 1629.17    | 60        |           |
| Si I    | 1616.5791  | 70        | 30        | S IV    | 1629.20    | 200       |           |
| Ar II   | 1616.972   | 100       |           | Si I    | 1629.4034  | 20        |           |
| Cl IV   | 1617.43    | 100       |           | Si I    | 1629.4382  | 100       | 27        |
| Si I    | 1618.0062  | 8         |           | P I     | 1629.59    | 15        |           |
| P I     | 1618.11    | 45        |           | N II    | 1629.832   | 10P       |           |
| Al II   | 1618.40    | 30        |           | Ar II   | 1629.834   | 100       |           |
| P III   | 1618.665   | 600       |           | Si I    | 1629.9458  | 100       | 27        |
| P I     | 1618.93    | 36        |           | Si I    | 1631.1676  | 70        | 26        |
| P III   | 1618.944   | 600       |           | Si I    | 1633.2230  | 45        | 26        |
| Si I    | 1619.0458  | 8         | 30        | Si I    | 1633.3262  | 40        | 27        |
| Si I    | 1619.5264  | 15        |           | Na III  | 1633.64    | 80        |           |
| N V     | 1619.688   | 250       |           | P I     | 1633.69    | 2         |           |
| B V     | 1619.92    | P         |           | Si I    | 1633.9829  | 90        |           |
| C III   | 1620.05    | 300       |           | P I     | 1634.10    | 21        |           |
| C III   | 1620.33    | 200       |           | Si IV   | 1634.607   | 70        | 28        |
| Si I    | 1620.4043  | 60        | 30        | P I     | 1635.79    | 9         |           |
| C III   | 1620.59    | 10        |           | P III   | 1635.799   | 200       |           |
| C III   | 1620.68    | 100       |           | P I     | 1636.20    | 9         |           |
| P I     | 1621.33    | 9         |           | Si III  | 1636.990   | 20        | 47        |
| Si I    | 1621.8380  | 2         |           | Si I    | 1637.0106  | 4         |           |
| Na III  | 1621.94    | 100       |           | P III   | 1637.377   | 100       |           |
| N V     | 1621.966   | 35        |           | O VII   | 1637.96    |           |           |
| P I?    | 1622.08    | 3         |           | Si I    | 1638.2823  | 2         |           |
| Cl IV   | 1622.86    | 200       |           | P I     | 1638.68    | 3         |           |
| Si I    | 1622.8806  | 90        | 30        | P I     | 1638.89    | 15        |           |
| Si III  | 1622.892   | P         | 45        | Cl IV   | 1638.95    | 10        |           |
| Si III  | 1622.913   | P         | 45        | Al IV   | 1639.00    | 100       |           |
| Si III  | 1623.055   | P         | 45        | P I     | 1639.09    | 24        |           |
| O VII   | 1623.29    |           |           | O VII   | 1639.58    |           |           |
| Si I    | 1623.3677  | 8         |           | Si I    | 1640.267   | 1         |           |
| Si I    | 1623.4983  | 10        |           | He II   | 1640.332   | 333P      | 12        |
| B II    | 1623.57    | 400       | 3         | Ar II   | 1640.343   | 100       |           |
| S IV    | 1623.62    | 50        |           | N I?    | 1640.437   | 10        |           |
| B II    | 1623.77    | 400       | 3         | He II   | 1640.474   | 600P      | 12        |
| P I     | 1623.83    | 75        |           | P IV    | 1640.476   | 120       |           |
| B II    | 1623.99    | 500       | 3         | He II   | 1640.490   | 70P       | 12        |
| P I     | 1623.99    | 30        |           | S I     | 1641.30    | 200       |           |
| S IV    | 1624.00    | 200       |           | Mg III  | 1642.86    | 100       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Cl IV   | 1643.40    | 100       |           | P I     | 1671.49    | 105       |           |
| O V     | 1643.66    | 1000      |           | P I     | 1671.68    | 540       | 2         |
| Al II   | 1644.22    | 80        |           | P I     | 1672.05    | 105       |           |
| Al II   | 1644.80    | 100       |           | P I     | 1672.48    | 270       |           |
| C III   | 1645.06    | 100       |           | Si I    | 1672.5961  | 80        | 23        |
| P III   | 1645.914   | 200       |           | Si IV   | 1672.612   | P         | 22        |
| N I?    | 1647.493   | 20        |           | Ar III  | 1673.14    | 50        | 6         |
| P III   | 1647.546   | 300       |           | Ar III  | 1673.241   | 150       | 6         |
| Cl IV   | 1648.04    | 10        |           | Al      | 1673.28    | 10        |           |
| Mg III  | 1648.88    | 10        |           | Si III  | 1673.315   | 140       | 58        |
| Ar II   | 1650.535   | 100       |           | Ar III  | 1673.425   | 350       | 6         |
| Na III  | 1650.91    | 20        |           | P IV    | 1673.559   | 20        |           |
| Si I    | 1651.0280  | 25        | 25        | P I     | 1673.94    | 3         |           |
| Cl IV   | 1651.21    | 100       |           | P III   | 1674.26    | 1         |           |
| Mg III  | 1652.26    | 10        |           | P I     | 1674.61    | 690       | 2         |
| P I     | 1652.97    | 30        |           | Si I    | 1675.2053  | 200       | 23        |
| Fe II   | 1653.076   | 60        |           | Ar III  | 1675.484   | 350       | 6         |
| Fe II   | 1653.132   | 100       |           | Ar III  | 1675.637   | 200       | 6         |
| N I?    | 1653.148   | 1         |           | N II    | 1675.726   | P         |           |
| Fe II   | 1653.212   | 20        |           | Al      | 1675.75    | 20        |           |
| Ar II   | 1653.322   | 100       |           | N II    | 1675.755   | 400P      |           |
| Si I    | 1653.3758  | 40        | 25        | Mg III  | 1675.76    | 10        |           |
| P I     | 1653.68    | 24        |           | N II    | 1675.920   | 100P      |           |
| N V     | 1655.922   | 40        |           | Si I    | 1676.8214  | 15        |           |
| C I     | 1656.2665  | 350       | 2         | N I?    | 1677.906   | 40        |           |
| C I     | 1656.9282  | 300       | 2         | P III   | 1678.12    | 10        |           |
| C I     | 1657.0078  | 1000      | 2         | Na III  | 1678.74    | 20        |           |
| C I     | 1657.3797  | 300       | 2         | O III   | 1679.06    | 400       |           |
| C I     | 1657.9070  | 300       | 2         | Mg III  | 1679.56    | 10        |           |
| C I     | 1658.1222  | 350       | 2         | P I     | 1679.71    | 900       | 2         |
| Na III  | 1658.71    | 40        |           | Mg IV   | 1680.02    | 10        |           |
| Mg IV   | 1658.92    | 10        |           | Fe II   | 1681.660   | 10        |           |
| Mg III  | 1659.28    | 10        |           | Ne II   | 1681.683   | 200       | 7         |
| Si I    | 1660.4759  | 15        | 24        | Al II   | 1681.81    | 60        |           |
| Si II   | 1661.059   | 3h        | 28        | Si I    | 1682.6717  | 70        |           |
| Be I    | 1661.478   | 1000      |           | Mg IV   | 1683.04    | 300       |           |
| Si II   | 1661.633   | 1h        | 28        | Si I    | 1683.1186  | 3         |           |
| Ar II   | 1662.253   | 100       |           | Cl III  | 1683.18    | 10        |           |
| B I     | 1662.62    | 200       |           | P I     | 1685.99    | 360       | 6         |
| B I     | 1663.05    | 300       |           | Ar II   | 1686.076   | 50        |           |
| B I     | 1664.25    | 200d      |           | Al II   | 1686.25    | 100       |           |
| Si I    | 1664.5113  | 35        | 24        | Si I    | 1686.8175  | 100       |           |
| B I     | 1664.76    | 200d      |           | Si I    | 1687.0918  | 20        |           |
| Si I    | 1666.3762  | 60        | 23        | S I     | 1687.49    | 330       |           |
| S I     | 1666.691   | 730       | 11        | N IV    | 1687.60    | 50        |           |
| B I     | 1666.87    | 800d      |           | N IV    | 1687.82    | 100       |           |
| Si II   | 1667.267   | 750       | 28        | N IV    | 1688.11    | 150       |           |
| B I     | 1667.30    | 1000d     |           | Ne II   | 1688.356   | 250       | 7         |
| Si I    | 1667.6288  | 70        | 23        | P I     | 1688.64    | 9         |           |
| Si I    | 1668.5204  | 70        | 23        | P I     | 1689.25    | 105       |           |
| Ar III  | 1669.10    | 50        | 6         | Si I    | 1689.2898  | 60        |           |
| Ar III  | 1669.304   | 250       | 6         | Ar II   | 1689.470   | 50        |           |
| Na III  | 1669.52    | 60d       |           | Cl III  | 1689.50    | 100       |           |
| N I?    | 1669.598   | 1         |           | Si I?   | 1689.921   | 1         |           |
| Ar III  | 1669.671   | 350       | 6         | P I     | 1690.17    | 30        |           |
| Al II   | 1670.786   | 600       | 2         | Si I    | 1690.7882  | 60        |           |
| N I?    | 1671.020   | 5         |           | P I     | 1690.90    | 9         |           |
| P I     | 1671.07    | 210       |           | Na III  | 1691.70    | 20        |           |
| Si I    | 1671.1168  | 40        | 23        | P I     | 1691.75    | 60        |           |
|         |            |           |           | P IV    | 1691.807   | 40        |           |



| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| P I     | 1692.48    | 15        |           | P I     | 1718.55    | 60        |           |
| P III   | 1692.03    | 100       |           | N IV    | 1718.551   | 1000      | 7         |
| Si I    | 1692.2926  | 125       | 18        | Ar II   | 1718.680   | 100       |           |
| Si I    | 1693.4676  | 60        |           | P I     | 1719.00    | 30        |           |
| P I     | 1694.06    | 300       | 6         | P I     | 1719.31    | 90        |           |
| P I     | 1694.50    | 120       | 6         | Ar II   | 1719.346   | 200       |           |
| N III   | 1694.79    | 10        |           | Al II   | 1719.43    | 300       | 6         |
| P I     | 1695.35    | 45        |           | Na III  | 1719.60    | 10        |           |
| Si I    | 1695.5074  | 90        | 18        | C II    | 1720.456   | 10        |           |
| Si I    | 1696.2065  | 200       | 18        | C II    | 1721.012   | 100       |           |
| N III   | 1696.54    | 150       |           | N I?    | 1721.014   | 1         |           |
| N IV    | 1696.86    | 150       |           | Al II   | 1721.26    | 500       | 6         |
| P III   | 1696.92    | 100       |           | C?      | 1721.3     | 5         |           |
| N III   | 1697.19    | 10        |           | C II    | 1721.682   | 200       |           |
| Mg III  | 1697.32    | 200       |           | N I?    | 1721.746   | 20        |           |
| Si I    | 1697.9409  | 250       | 18        | C?      | 1722.0     | 5         |           |
| N III   | 1698.16    | 100       |           | Mg III  | 1722.10    | 200       |           |
| Mg IV   | 1698.83    | 200d      |           | C II    | 1722.238   | 10        |           |
| N III   | 1699.00    | 100       |           | Si IV   | 1722.534   | 400       | 10        |
| N IV    | 1699.03    | 200       |           | Si I    | 1722.562   | 4         |           |
| N III   | 1699.32    | 250       |           | Si I    | 1724.242   | 6         |           |
| Si I    | 1699.7169  | 10        | 18        | Al II   | 1724.97    | 600       | 6         |
| Mg      | 1699.75    | 10        |           | N II    | 1725.028   | P         |           |
| Al      | 1699.78    | 10        |           | Ar II   | 1725.147   | 100       |           |
| N III   | 1699.95    | 200       |           | Ar II   | 1725.549   | 50        |           |
| Si I    | 1700.4193  | 90        | 18        | Al      | 1727.11    | 20        |           |
| Si I    | 1700.6354  | 80        | 16        | Si IV   | 1727.377   | 300       | 10        |
| Al      | 1701.05    | 10        |           | Si I    | 1727.444   | 2         |           |
| Ar II   | 1701.358   | 100       |           | P I     | 1727.85    | 15        |           |
| N IV    | 1702.006   | 250       |           | N I?    | 1728.170   | 20        |           |
| F II    | 1702.16    | 10        |           | Ar II   | 1729.075   | 100       |           |
| Ar II   | 1702.188   | 100       |           | Ar II   | 1729.259   | 100       |           |
| N V     | 1702.25    | 50P       |           | N I?    | 1729.481   | 5         |           |
| Si I?   | 1702.6978  | 1         |           | N III   | 1730.04    | 400       |           |
| Si I    | 1702.8685  | 70        | 16        | Al      | 1730.56    | 20        |           |
| N V     | 1703.218   | 60        |           | N I?    | 1730.734   | 5         |           |
| Mg III  | 1703.43    | 10d       |           | Mg III  | 1730.81    | 100       |           |
| Mg III  | 1703.78    | 100       |           | Na III  | 1731.08    | 10        |           |
| Si I    | 1704.4416  | 100       | 17        | Mg III  | 1731.88    | 100       |           |
| F II    | 1704.90    | 100       |           | N II    | 1732.428   | P         |           |
| Si II   | 1704.967   | 2h        | 10.01     | Ne II?  | 1732.69    | 200       |           |
| S I     | 1704.99    | 170       |           | Si I    | 1733.346   | 1         |           |
| Ar II   | 1705.980   | 100       |           | Ar II   | 1733.372   | 100       |           |
| S I     | 1706.38    | 270       | 10        | Si I    | 1734.718   | 8         |           |
| P I     | 1706.41    | 180       |           | Mg II   | 1734.8523  | P         |           |
| Si I    | 1707.1148  | 8         | 16        | P II    | 1734.88    | 1         |           |
| S I     | 1707.13    | 270       | 10        | Ar II   | 1735.378   | 50        |           |
| P I     | 1707.57    | 120       |           | Si I    | 1736.538   | 3         |           |
| O V     | 1708.01    | 700       |           | Ar II   | 1736.834   | 100       |           |
| P I     | 1708.03    | 3         |           | Mg II   | 1737.6124  | P         |           |
| P I     | 1708.45    | 12        |           | Mg II   | 1737.6283  | P         |           |
| P I     | 1708.90    | 3         |           | N I?    | 1738.502   | 1         |           |
| Si I?   | 1710.744   | 1         |           | Mg III  | 1738.91    | 600       |           |
| Si II   | 1710.826   | 10h       | 10        | S IV    | 1739.03    | 50        |           |
| Ar II   | 1710.909   | 50        |           | Mg III  | 1739.56    | 10        |           |
| Si II   | 1711.296   | 20h       | 10        | Al II   | 1739.75    | 40        |           |
| Ar II   | 1713.218   | 200       |           | Si I    | 1740.2988  | 20        | 80        |
| S I?    | 1713.54    | 35        |           | N II    | 1740.310   | 400P      |           |
| Mg III  | 1714.85    | 10        |           | Na III  | 1741.33    | 20        |           |
| Na III  | 1718.48    | 10        |           | N I     | 1742.7189  | 50        | 9         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| N I     | 1742.7306  | 350       | 9         | C ?     | 1751.2     | 100       |           |
| N II    | 1743.197   | 200P      |           | P I     | 1761.67    | 30        |           |
| N II    | 1743.228   | P         |           | Al II   | 1761.979   | 140       | 5         |
| Si I    | 1743.8941  | 20        | 79        | Na III  | 1762.13    | 10        |           |
| Mg III  | 1744.08    | 10        |           | Al I    | 1762.892   | 100       |           |
| F II    | 1744.86    | 100       |           | O III   | 1763.22    | 700       |           |
| N II    | 1745.046   | P         |           | N II    | 1763.639   | 100P      |           |
| N II    | 1745.076   | P         |           | Si I    | 1763.6612  | 80        |           |
| N I     | 1745.2482  | 150       | 9         | Ar II   | 1763.659   | 50        |           |
| N II    | 1745.256   | P         |           | Na III  | 1763.84    | 60        |           |
| N I     | 1745.2600  | 50        | 9         | Al II   | 1763.874   | 60        | 5         |
| Si I    | 1745.3475  | 25        | 15        | C I     | 1763.909   | 120       |           |
| S IV    | 1745.42    | 100       |           | Mg III  | 1763.93    | 200       |           |
| F II    | 1745.57    | 200       |           | Al II   | 1763.947   | 200       | 5         |
| Si I    | 1745.647   | I         |           | O III   | 1764.48    | 700       |           |
| Na III  | 1746.39    | 10        |           | Si I    | 1765.0296  | 90        |           |
| F II    | 1747.40    | 300       |           | N II    | 1765.140   | 50P       |           |
| Si I    | 1747.4144  | 40        | 15        | C I     | 1765.366   | 50        |           |
| Mg III  | 1747.64    | 400       |           | Si I    | 1765.6215  | 50        | 76        |
| N III   | 1747.86    | 450       | 19        | Al I    | 1765.632   | 200       |           |
| Mg III  | 1749.02    | 500       |           | Al II   | 1765.811   | 100       | 5         |
| Si I    | 1749.808   | 3         | 15        | Si I    | 1765.9452  | 8         | 76        |
| Al      | 1749.99    | 80        |           | Si I    | 1766.0634  | 100       |           |
| N I?    | 1750.079   | 10        |           | N II    | 1766.079   | 100P      |           |
| Al II   | 1750.52    | 120       |           | O III   | 1766.34    | 400       |           |
| Mg II   | 1750.6637  | P         |           | Si I    | 1766.3538  | 50        |           |
| Ar II   | 1750.694   | 50        |           | Al I    | 1766.381   | 200       |           |
| N III   | 1751.24    | 300       | 19        | Na III  | 1767.21    | 10        |           |
| Ar II   | 1751.679   | 200       |           | Cl II   | 1767.24    | 100       |           |
| N III   | 1751.7     | 500       | 19        | Al II   | 1767.735   | 160       | 5         |
| C I     | 1751.8277  | 800       | 62        | O III   | 1767.78    | 1000      |           |
| Na III  | 1752.06    | 20        |           | Ar II   | 1768.043   | 100       |           |
| Si I    | 1752.634   | 3         | 78        | O III   | 1768.24    | 900       |           |
| Na III  | 1752.65    | 60        |           | P I     | 1768.45    | 60        |           |
| Si I    | 1753.101   | 15        | 78        | P I     | 1768.94    | 45        |           |
| Mg II   | 1753.4744  | P         |           | Al I    | 1769.133   | 200       |           |
| P I     | 1754.40    | 90        |           | O III   | 1769.32    | 400       |           |
| Na III  | 1754.97    | 10        |           | Si I    | 1769.4609  | 2         |           |
| Li II   | 1755.331   | 10        |           | Si I    | 1769.7852  | 70        |           |
| Ar II   | 1755.819   | 100       |           | Si I    | 1770.6298  | 125       |           |
| P I     | 1755.86    | 9         |           | Ar II   | 1770.658   | 100       |           |
| P I     | 1756.65    | 9         |           | Si I    | 1770.9216  | 300       |           |
| P III   | 1756.82    | 10        |           | O III   | 1771.67    | 900       |           |
| N I?    | 1757.223   | 5         |           | Ar II   | 1771.829   | 200       |           |
| Si I    | 1757.283   | 3         |           | Cl II   | 1772.01    | 300       |           |
| P I     | 1757.47    | 60        |           | Si I    | 1772.2263  | 12        | 13        |
| P III   | 1757.68    | 100       |           | P II    | 1772.30    | 30        |           |
| P I     | 1757.95    | 60        |           | O III   | 1772.31    | 400       |           |
| Mg III  | 1758.01    | 100       |           | N II    | 1772.735   | P         |           |
| Si I    | 1759.5831  | 10        |           | Al      | 1772.78    | 40        |           |
| N I?    | 1759.789   | I         |           | O III   | 1773.00    | 500       |           |
| P I     | 1759.91    | 30        |           | Na III  | 1773.00    | 10        |           |
| Al II   | 1760.103   | 160       | 5         | Mg III  | 1773.09    | 300       |           |
| O III   | 1760.12    | 700       |           | Al      | 1773.18    | 40        |           |
| C II    | 1760.3954  | ST 450    | 10        | O III   | 1773.85    | 500       |           |
| P I     | 1760.40    | 45        |           | Al      | 1773.99    | 60        |           |
| O III   | 1760.42    | 500       |           | Al      | 1774.76    | 40        |           |
| C II    | 1760.4735  | ST 100    | 10        | P I     | 1774.99    | 750       | 1         |
| C II    | 1760.8191  | ST 300    | 10        | Na III  | 1775.32    | 10        |           |
| Na III  | 1761.05    | 20        |           | Be II   | 1776.100   | 500       | 3         |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Al II   | 1776.19    | 20        |           | Si IV   | 1797.496   | P         | 23        |
| Be II   | 1776.307   | 1000      | 3         | P II    | 1797.54    | 10        |           |
| Ar II   | 1776.672   | 100       |           | Cl II   | 1797.91    | 10        |           |
| Si I    | 1776.8745  | 150       | 13        | Cl III  | 1797.98    | 200       | 7         |
| Al      | 1776.97    | 80        |           | P II    | 1798.37    | 5         |           |
| Al      | 1777.82    | 60        |           | Al      | 1798.45    | 20        |           |
| Al      | 1778.25    | 20        |           | P II    | 1799.10    | 50        |           |
| Al      | 1778.59    | 20        |           | Si I    | 1799.1177  | 30        |           |
| Si III  | 1778.714   | P         | 35        | Al      | 1799.89    | 10        |           |
| C III   | 1779.12    | 10        |           | P II    | 1799.91    | 20        |           |
| O III   | 1779.16    | 700       |           | P II    | 1800.27    | 20        |           |
| N II    | 1780.551   | P         |           | Mg      | 1800.28    | 100       |           |
| O III   | 1781.03    | 600       |           | Si I    | 1800.404   | 1         | 70        |
| Al      | 1781.07    | 40        |           | Mg III  | 1800.75    | 400       |           |
| S I     | 1782.258   | 500       | 13        | Na III  | 1801.27    | 140       |           |
| Ar II   | 1782.596   | 100       |           | Al      | 1801.90    | 20        |           |
| Al      | 1782.65    | 20        |           | Al      | 1802.00    | 20        |           |
| P I     | 1782.87    | 600       | 1         | Si III  | 1803.023   | 60        | 51        |
| Na III  | 1782.92    | 240       |           | N III   | 1804.3     | 300       | 22        |
| Si III  | 1783.079   | P         | 35        | P II    | 1805.11    | 30        |           |
| Si III  | 1783.146   | P         | 35        | N III   | 1805.5     | 350       | 22        |
| Si I    | 1783.2318  | 25        | 73        | Al      | 1805.94    | 40        |           |
| Mg III  | 1783.36    | 400       |           | P II    | 1806.12    | 150       |           |
| Al      | 1783.55    | 40        |           | P II    | 1806.67    | 50        |           |
| Si I    | 1784.0884  | 8         | 73        | N I?    | 1807.328   | 1         |           |
| O III   | 1784.85    | 600       |           | S I     | 1807.341   | 950       | 2         |
| Cl II   | 1785.06    | 100       |           | Al II?  | 1807.42    | 60        |           |
| Al      | 1785.29    | 20        |           | Al      | 1807.58    | 20        |           |
| Ar II   | 1785.672   | 100       |           | Al      | 1807.64    | 20        |           |
| Si III  | 1786.371   | P         | 35        | Si II   | 1808.0117  | 150       | 1         |
| Si III  | 1786.438   | P         | 35        | Si I    | 1808.4293  | 20        | 69        |
| Si III  | 1786.515   | P         | 35        | Cl III  | 1808.51    | 400       | 7         |
| Al      | 1786.78    | 20        |           | Si I    | 1809.1042  | 100       | 67        |
| Si II   | 1786.817   | 4         | 18.05     | Cl III  | 1810.26    | 100       | 7         |
| Al      | 1786.93    | 20        |           | Na III  | 1810.74    | 80        |           |
| Cl II   | 1787.10    | 300       |           | N V     | 1811.08    | 30        |           |
| Al      | 1787.41    | 40        |           | Al      | 1811.09    | 10        |           |
| Si II   | 1787.538   | 8         | 18.05     | N V     | 1811.62    | 35        |           |
| P I     | 1787.68    | 540       | 1         | Na III  | 1811.70    | 100       |           |
| Mg III  | 1788.05    | 100       |           | Ar II   | 1812.475   | 50        |           |
| Ar II   | 1788.104   | 300       |           | Ar II   | 1813.014   | 100       |           |
| Al      | 1788.15    | 60        |           | Al      | 1813.15    | 20        |           |
| O III   | 1789.66    | 700       |           | Cl II   | 1813.75    | 10        |           |
| Si I    | 1790.2544  | 25        | 72        | Ar II   | 1813.766   | 100       |           |
| Al      | 1791.21    | 20        |           | Si I    | 1814.0789  | 250       | 68        |
| Na III  | 1791.23    | 200       |           | Na III  | 1814.35    | 60        |           |
| Mg III  | 1791.50    | 100       |           | Cl II   | 1814.43    | 10        |           |
| Ar II   | 1791.561   | 100       |           | Cl II   | 1815.16    | 10        |           |
| Na III  | 1791.80    | 160       |           | Cl II   | 1815.61    | 10        |           |
| Cl II   | 1791.91    | 400       |           | Ar II   | 1816.14    | 10        |           |
| Al      | 1792.04    | 60        |           | Na III  | 1816.83    | 40        |           |
| Ar II   | 1793.435   | 50        |           | Si II   | 1816.9278  | 200       | 1         |
| Al      | 1793.54    | 40        |           | Al      | 1817.15    | 20        |           |
| Al?     | 1793.92    | 10        |           | Al      | 1817.35    | 20        |           |
| Mg III  | 1794.68    | 300       |           | Si II   | 1817.4511  | 10        | 1         |
| Si IV   | 1796.162   | P         | 23        | Cl III  | 1817.73    | 400       | 7         |
| Si IV   | 1796.166   | P         | 23        | B I     | 1817.849   | 400       |           |
| Al      | 1797.18    | 20        |           | Si I    | 1817.9562  | 10        | 66        |
| Si I    | 1797.3565  | 6         | 70        | B I     | 1818.349   | 500       |           |
| Al      | 1797.45    | 60        |           | Al      | 1818.37    | 100       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Al IV   | 1818.55    | 50d       |           | N III   | 1839.59    | 100       |           |
| Na III  | 1819.01    | 40        |           | Al II?  | 1839.78    | 60        |           |
| Al      | 1819.28    | 80        |           | N II    | 1839.931   | P         |           |
| Al      | 1820.11    | 60        |           | Si I    | 1840.0415  | 8         | 65        |
| S I     | 1820.361   | 850       | 2         | Al      | 1840.62    | 10        |           |
| Mg III  | 1820.47    | 100       |           | N II    | 1840.983   | 100P      |           |
| Na III  | 1821.68    | 240       |           | Si I    | 1841.1515  | 125       | 11        |
| Al      | 1822.32    | 10        |           | Si I    | 1841.4486  | 400       | 11        |
| Si I    | 1822.4549  | 30        | 12        | N III   | 1841.68    | 50        |           |
| Cl III  | 1822.50    | 600       | 7         | Si III  | 1842.064   | P         | 65        |
| Ar II   | 1823.205   | 100       |           | N II    | 1842.284   | 10P       |           |
| Al      | 1823.63    | 10        |           | Si III  | 1842.547   | 180       | 20        |
| Al      | 1823.71    | 10        |           | B II    | 1842.80    | 300       |           |
| Na III  | 1824.52    | 10        |           | N II    | 1843.357   | 10P       |           |
| Cl III  | 1824.59    | 300       | 7         | Na III  | 1843.43    | 40        |           |
| Ar II   | 1824.842   | 50        |           | Si I    | 1843.7695  | 200       | 11        |
| Si I    | 1825.021   | 1         | 12        | N I?    | 1844.042   | 90        |           |
| Na III  | 1825.44    | 200       |           | P II    | 1844.06    | 5         |           |
| B I     | 1825.899   | 750d      | 3         | Mg      | 1844.18    | 100       |           |
| S I     | 1826.261   | 850       | 2         | N II    | 1844.259   | 10P       |           |
| B I     | 1826.400   | 1000d     | 3         | Al      | 1844.29    | 20        |           |
| Al      | 1827.56    | 20        |           | P I     | 1844.33    | 60        |           |
| Mg I    | 1827.94    | P         |           | Na III  | 1844.36    | 400       |           |
| Cl III  | 1828.40    | 500       | 7         | Na III  | 1845.10    | 240       |           |
| Al II   | 1828.59    | 500       |           | P I     | 1845.19    | 30        |           |
| P II    | 1828.63    | 30        |           | Si I    | 1845.5203  | 200       | 10        |
| Al      | 1829.28    | 40        |           | N II    | 1845.616   | 100P      |           |
| C?      | 1829.85    | 1         |           | N III   | 1845.64    | 250       |           |
| Si I    | 1829.8971  | 10        | 12        | N III   | 1845.80    | 200       |           |
| N II    | 1830.527   | 1P        |           | Si I    | 1846.1115  | 200       | 11        |
| Ar II   | 1830.770   | 500       |           | N I?    | 1846.399   | 150       |           |
| Ar II   | 1831.527   | 500       |           | Al      | 1846.42    | 40        |           |
| N II    | 1831.586   | 10P       |           | P II    | 1846.78    | 20        |           |
| Al      | 1831.62    | 40        |           | P I     | 1847.19    | 300       |           |
| Cl III  | 1832.08    | 400       | 7         | Si I    | 1847.4733  | 300       | 10        |
| Al II   | 1832.85    | 400       |           | Na III  | 1847.54    | 200       |           |
| C?      | 1833.26    | 1         |           | N II    | 1848.002   | 10P       |           |
| Al      | 1833.26    | 20        |           | Si I    | 1848.1503  | 200       | 10        |
| Cl III  | 1833.31    | 400       | 7         | O III   | 1848.26    | 500       |           |
| P I     | 1833.98    | 30        |           | Al      | 1848.69    | 40        |           |
| Ar II   | 1834.038   | 200       |           | Cl III  | 1848.74    | 10        |           |
| Al      | 1834.13    | 60        |           | Si I    | 1848.7478  | 250       | 11        |
| Al II   | 1834.82    | 200       |           | Al II   | 1848.90    | 40        |           |
| P I     | 1834.83    | 60        |           | P I     | 1849.05    | 3         |           |
| Na III  | 1835.22    | 300       |           | Al      | 1849.15    | 40        |           |
| N III   | 1835.578   | 150       |           | N II    | 1849.414   | 100P      |           |
| N II    | 1836.172   | 100P      |           | P I     | 1849.52    | 9         |           |
| P II    | 1836.47    | 10        |           | Na III  | 1849.58    | 700       |           |
| Si I    | 1836.5090  | 200       | 11        | Cl III  | 1849.64    | 10        |           |
| N I     | 1836.752   | 10        | 8         | P I     | 1849.84    | 105       |           |
| Al II   | 1836.97    | 80        |           | Na III  | 1850.24    | 400       |           |
| P II    | 1837.51    | 20        |           | Na III  | 1850.39    | 360       |           |
| Si I    | 1838.0113  | 40        | 65        | Al      | 1850.56    | 40        |           |
| Na III  | 1838.11    | 120       |           | P II    | 1850.61    | 20        |           |
| Al II   | 1838.21    | 40        |           | Si I    | 1850.6717  | 400       | 10        |
| Mg III  | 1838.32    | 100       |           | P I     | 1851.22    | 240       |           |
| Si III  | 1838.466   | P         | 65        | Si I    | 1851.7823  | 70        | 64        |
| Al      | 1839.39    | 10        |           | N II    | 1851.810   | P         |           |
| Al II?  | 1839.53    | 20        |           | P I     | 1852.09    | 120       |           |
| Si III  | 1839.585   | P         | 65        | Cl III  | 1852.11    | 200       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| P II    | 1852.27    | 20        |           | Al      | 1870.75    | 10        |           |
| Si I    | 1852.4715  | 250       | 10        | Si I    | 1870.782   | 3         | 9.02      |
| P II    | 1852.65    | 10        |           | Al      | 1871.74    | 50        |           |
| N II    | 1852.721   | P         |           | P II    | 1872.36    | 1         |           |
| S I     | 1853.1517  | 35        | 10        | Na II   | 1872.45    | 20        |           |
| C?      | 1853.2     | 1         |           | Ar I    | 1872.589   | 100       |           |
| Ne II?  | 1853.22    | 65        |           | O II    | 1872.78    | 800       |           |
| Ne II?  | 1854.11    | 65        |           | O II    | 1872.87    | 800       |           |
| P II    | 1854.59    | 150       |           | Si I    | 1873.1043  | 25        | 9         |
| Al III  | 1854.720   | 1000      | 1         | Ar II   | 1873.140   | 600       |           |
| Ar II   | 1854.986   | 50        |           | N I?    | 1873.217   | 5         |           |
| P I     | 1855.48    | 1         |           | Na III  | 1873.32    | 80        |           |
| Na III  | 1855.91    | 300       |           | Na III  | 1874.22    | 10        |           |
| Al II   | 1855.928   | 400       | 4         | Mg IV   | 1874.59    | 10d       |           |
| Si III  | 1856.062   | 20        | 70        | Si I    | 1874.8424  | 175       |           |
| Al      | 1856.10    | 20        |           | O III   | 1874.94    | 800       |           |
| Al      | 1856.27    | 40        |           | Al      | 1875.63    | 20        |           |
| O III   | 1856.62    | 500       |           | Si I    | 1875.8129  | 30        | 9         |
| Na III  | 1856.73    | 400       |           | Al      | 1875.98    | 40        |           |
| P I     | 1857.04    | 45        |           | P II    | 1876.79    | 100       |           |
| Na III  | 1857.57    | 100       |           | Al II   | 1877.04    | 100       |           |
| N V     | 1857.69    | 50        |           | Ar II   | 1877.523   | 400       |           |
| N II    | 1857.87    | 300P      |           | Al II   | 1878.50    | 60        |           |
| N V     | 1857.88    | 50        |           | N II    | 1878.624   | 200P      |           |
| Al II   | 1858.031   | 800       | 4         | Ar II   | 1879.420   | 100       |           |
| Mg III  | 1858.19    | 200d      |           | Mg III  | 1879.46    | 400d      |           |
| N II    | 1858.545   | 200P      |           | P II    | 1879.62    | 250       |           |
| P I     | 1858.91    | 450       | 5         | Ar II   | 1879.790   | 200       |           |
| Na III  | 1859.20    | 10        |           | Cl III  | 1880.10    | 300       |           |
| N II    | 1859.260   | 500P      |           | Ne II?  | 1880.21    | 200       |           |
| P I     | 1859.43    | 450       | 5         | Si I    | 1880.9684  | 5         | 9         |
| Na III  | 1859.61    | 10        |           | Al IV   | 1881.19    | 50        |           |
| N II    | 1859.636   | P         |           | Si I    | 1881.8538  | 30        | 8         |
| Al II   | 1859.99    | 240       |           | N V     | 1882.36    | 30        |           |
| N V     | 1860.37    | 85        |           | N V     | 1882.92    | 35        |           |
| B V     | 1860.46    | P         |           | Cl II   | 1883.14    | 300       |           |
| P I     | 1860.63    | 45        |           | Ne II?  | 1883.82    | 65        |           |
| Na III  | 1861.19    | 300       |           | N III   | 1885.25    | 500       | 24        |
| Si I    | 1861.7949  | 2         | 63        | Na III  | 1885.75    | 80        |           |
| Al II   | 1862.318   | 800       | 4         | Ar II   | 1886.386   | 400       |           |
| Na III  | 1862.40    | 120       |           | Mg III  | 1887.31    | 10        |           |
| N II    | 1862.588   | 200P      |           | N II    | 1887.404   | 350P      | 14        |
| Al III  | 1862.795   | 600       | 1         | Na III  | 1887.48    | 300       |           |
| P I     | 1863.78    | 3         |           | Si I    | 1887.6929  | 45        | 61        |
| P II    | 1864.22    | 150       |           | Cl II   | 1887.90    | 10        |           |
| N II    | 1864.364   | P         |           | Ne II?  | 1888.15    | 65        |           |
| P I     | 1864.37    | 105       |           | P IV    | 1888.652   | 400       | 5         |
| P I     | 1864.64    | 3         |           | Ar II   | 1888.782   | 400       |           |
| Si I    | 1865.0278  | 2         | 63        | Ar II   | 1889.029   | 600       |           |
| Mg      | 1865.64    | 10        |           | N I?    | 1889.056   | 10        |           |
| Ar II   | 1866.089   | 100       |           | Cl III  | 1889.06    | 10        |           |
| N II    | 1866.457   | P         |           | Ne II?  | 1889.77    | 65        |           |
| Mg III  | 1868.23    | 100       |           | Mg III  | 1890.35    | 200       |           |
| N II    | 1868.240   | 10P       |           | Na III  | 1890.75    | 240       |           |
| Ar II   | 1868.660   | 300       |           | Si III  | 1892.030   | 60        | 1         |
| Si II   | 1868.765   | 1         | 9.02      | Si I    | 1893.252   | 175       | 58        |
| Si II   | 1869.317   | 20        | 9.02      | Mg IV   | 1893.87    | 100       |           |
| Na III  | 1869.43    | 20        |           | C III?  | 1894.49    | 200       |           |
| Al      | 1869.56    | 20        |           | Si I    | 1895.461   | 1         | 58        |
| Si II   | 1870.227   | 15        | 9.02      | Al      | 1895.51    | 20        |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Mg III  | 1896.26    | 10        |           | Ar III  | 1915.564   | 350       | 7         |
| Si I    | 1896.339   | 1         | 58        | Ne II   | 1916.09    | 550       | 9         |
| N VI    | 1896.82    | 300       |           | Cl III  | 1916.53    | 400       | 8         |
| Ar II   | 1897.352   | 50        |           | Cl III  | 1917.87    | 400       | 8         |
| Al II   | 1897.44    | 120       |           | Ar III  | 1918.06    | 50        | 7         |
| Cl III  | 1897.85    | 300       | 8         | Na III  | 1918.46    | 120       |           |
| Al II   | 1899.19    | 80        |           | Ar III  | 1918.667   | 200       | 7         |
| Ar II?  | 1899.287   | 100       |           | N III   | 1918.69    | 10        | 29        |
| Na III  | 1899.70    | 60        |           | Mg III  | 1918.76    | 100       |           |
| Ar II   | 1899.847   | 100       |           | N III   | 1919.06    | 10        |           |
| Mg      | 1900.04    | 100       |           | Ar II   | 1919.199   | 300       |           |
| S I     | 1900.27    | 670       | 1         | N III   | 1919.44    | 50        | 29        |
| Ar II   | 1900.638   | 400       |           | Ar III  | 1919.515   | 200       | 7         |
| Si I    | 1901.3370  | 400       | 57        | N III   | 1919.71    | 100       | 29        |
| Mg III  | 1901.55    | 100       |           | Be I    | 1919.76    | 200       |           |
| Cl III  | 1901.61    | 500       | 8         | N III   | 1919.99    | 100       | 29        |
| Si II   | 1902.459   | 100h      | 18.04     | Ar II   | 1920.007   | 200       |           |
| P IV    | 1902.62    | 40        |           | O III   | 1920.04    | 600       |           |
| Al II   | 1904.32    | 40        |           | Na III  | 1920.12    | 120       |           |
| Si II   | 1904.326   | 5h        | 31        | Cl III  | 1920.32    | 400       | 8         |
| Si I    | 1904.6660  | 40        | 56        | O III   | 1920.75    | 500       |           |
| Al      | 1904.69    | 10        |           | N III   | 1920.86    | 400       | 29        |
| P IV    | 1904.80    | 40        |           | N III   | 1921.49    | 200       | 29        |
| P I     | 1905.48    | 90        |           | O III   | 1921.52    | 500       |           |
| Si II   | 1905.878   | 3h        | 31        | Al      | 1921.94    | 20        |           |
| N III   | 1906.22    | 100       |           | Al      | 1922.16    | 20        |           |
| Al II   | 1906.40    | 60        |           | Al      | 1922.26    | 10        |           |
| P I     | 1906.40    | 60        |           | C III   | 1922.93    | 300       |           |
| Al II   | 1906.60    | 40        |           | N III?  | 1923.11    | 100       |           |
| Al II   | 1906.67    | 40        |           | C III   | 1923.14    | 200       |           |
| Mg IV   | 1906.71    | 10        |           | C III   | 1923.31    | 200       |           |
| N III   | 1906.89    | 100       |           | Cl II   | 1923.35    | 400       |           |
| Be I    | 1907.12    | 100       |           | O III   | 1923.49    | 700       |           |
| N III   | 1907.28    | 400       |           | O III   | 1923.82    | 500       |           |
| N VI    | 1907.34    | 200       |           | N III?  | 1923.86    | 100       |           |
| Ne II   | 1907.49    | 350       | 9         | Mg III  | 1923.87    | 300       |           |
| P I     | 1907.66    | 120       |           | Mg      | 1924.48    | 10        |           |
| N VI    | 1907.87    | 200       |           | Al II   | 1924.83    | 200       |           |
| Ar II   | 1907.988   | 400       |           | Mg IV   | 1925.99    | 10        |           |
| N III   | 1907.99    | 300P      | 27        | Al II   | 1926.05    | 80        |           |
| N III   | 1908.21    | 400P      | 27        | Na III  | 1926.27    | 900       |           |
| Mg III  | 1908.46    | 300       |           | O III   | 1926.94    | 500       |           |
| N III   | 1908.96    | 100       | 27        | Al II?  | 1926.96    | 60        |           |
| Ar II   | 1909.5689  | 50        | ST        | Al      | 1927.09    | 40        |           |
| P IV    | 1910.18    | 40        |           | Al      | 1927.13    | 10        |           |
| Si II   | 1910.621   | 50h       | 18.04     | Na III  | 1927.21    | 300       |           |
| Cl II   | 1910.76    | 10        |           | C III?  | 1928.30    | 10        |           |
| Al II   | 1910.83    | 40        |           | P II    | 1928.30    | 5         |           |
| Al II   | 1911.01    | 40        |           | Mg      | 1928.43    | 10        |           |
| Ar II   | 1911.053   | 50        |           | Be I    | 1929.67    | 300       |           |
| Si II   | 1911.265   | 0h        | 18.04     | Al II   | 1929.99    | 240       |           |
| C?      | 1911.83    | 10        |           | Ne II   | 1930.02    | 450       | 9         |
| Be I    | 1912.49    | 100       |           | Mg III  | 1930.64    | 300       |           |
| C?      | 1912.75    | 10        |           | C I     | 1930.9054  | 1000      | 33        |
| Cl III  | 1912.90    | 400       | 8         | Al II?  | 1931.06    | 200       |           |
| Na III  | 1913.17    | 160       |           | C?      | 1931.15    | 100       |           |
| Cl III  | 1914.09    | 300       | 8         | Ar II   | 1931.419   | 100       |           |
| Ar III  | 1914.398   | 450       | 7         | O VIII  | 1931.8     | P         |           |
| Ar III  | 1914.653   | 150       | ?         | Ar II   | 1932.230   | 200       |           |
| S I     | 1914.68    | 500       | 1         | Al II   | 1932.39    | 240       |           |

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Mg III  | 1933.59    | 10        |           | Ar III  | 1957.83    | 50        |           |
| Ar II   | 1933.694   | 200       |           | Si I    | 1957.965   | 1         | 55        |
| Na III  | 1933.87    | 600       |           | Al II   | 1958.25    | 40        |           |
| Al II   | 1934.52    | 400       |           | S II    | 1958.38    | 300       |           |
| Al II   | 1934.73    | 300       |           | Al II   | 1958.77    | 20        |           |
| Na III  | 1935.54    | 10        |           | Al II   | 1959.00    | 10        |           |
| Al III  | 1935.88    | 60        |           | Al      | 1959.10    | 10        |           |
| S II    | 1936.84    | 300       |           | Si?     | 1960.17    | 0         |           |
| Al II   | 1936.93    | 300       |           | Al II?  | 1960.32    | 40        |           |
| Ar II   | 1937.041   | 100       |           | O II    | 1960.34    | 100       |           |
| Mg III  | 1937.80    | 200       |           | Al II?  | 1960.64    | 40        |           |
| Ne II   | 1938.82    | 350       | 9         | Na III  | 1960.76    | 400       |           |
| Mg III  | 1938.95    | 10        |           | Al II?  | 1960.84    | 40        |           |
| Al II   | 1939.27    | 300       |           | Ar II   | 1961.3610  | 400       | 13        |
| Na III  | 1939.32    | 10        |           | Ar II   | 1962.161   | 300       |           |
| Ar II   | 1941.0724  | ST 300    | 13        | Mg III  | 1962.18    | 10        |           |
| Mg III  | 1941.50    | 10        |           | O II    | 1962.24    | 300       |           |
| Na III  | 1941.61    | 10        |           | Al II   | 1962.59    | 100       |           |
| Si II   | 1941.667   | 50        | 27        | Al II   | 1962.72    | 120       |           |
| Na III  | 1941.77    | 10        |           | Ar III  | 1962.74    | 100       |           |
| Na III  | 1942.19    | 120       |           | O II    | 1963.84    | 200       |           |
| Na III  | 1943.40    | 120       |           | O II    | 1964.35    | 10        |           |
| Si?     | 1943.42    | 0         |           | Be I    | 1964.59    | 900       |           |
| Be I    | 1943.68    | 500       |           | Al      | 1964.99    | 60        |           |
| Si II   | 1944.586   | 15        | 23        | Na III  | 1965.04    | 360       |           |
| Na III  | 1944.99    | 60d       |           | Al II   | 1965.31    | 40        |           |
| Si II   | 1945.504   | 3         | 23        | Al      | 1966.38    | 10        |           |
| P II    | 1945.54    | 50        |           | Ar II?  | 1966.953   | 100       |           |
| Mg IV   | 1946.20    | 10        |           | S II    | 1970.99    | 400       |           |
| Na III  | 1946.43    | 400d      |           | Mg III  | 1971.57    | 10        |           |
| Na III  | 1946.70    | 10        |           | Ar II?  | 1972.274   | 200       |           |
| Ar II   | 1946.795   | 200       |           | Ar II   | 1973.4837  | ST 200    |           |
| N III   | 1946.99    | 250       |           | Ar III  | 1973.780   | 200       |           |
| Si II   | 1947.769   | 1         | 23        | Ar II   | 1974.462   | 300       |           |
| Si?     | 1949.17    | 0         |           | Mg      | 1974.75    | 10        |           |
| N III   | 1949.22    | 300       |           | Na III  | 1975.58    | 10        |           |
| Si II   | 1949.331   | 10        | 27        | Na III  | 1976.62    | 20        |           |
| Si II   | 1949.564   | 100       | 27        | Ar II   | 1976.765   | 300       |           |
| N III   | 1949.81    | 200       |           | Na III  | 1977.14    | 20        |           |
| S II    | 1950.53    | 300       |           | Ar II?  | 1977.200   | 20        |           |
| Na III  | 1950.79    | 300       |           | Mg III  | 1977.56    | 100       |           |
| Na III  | 1951.21    | 800       |           | Si I    | 1977.597   | 400       | 7         |
| N III   | 1951.43    | 100       |           | C III   | 1979.16    | 100       |           |
| N III   | 1952.20    | 50        |           | Si I    | 1979.206   | 400       | 7         |
| Si?     | 1952.96    | 0         |           | Si III  | 1979.233   | P 83      |           |
| N III   | 1953.66    | 150       |           | Mg III  | 1979.31    | 100       |           |
| N III   | 1953.80    | 150       |           | Cl III  | 1979.46    | 300       |           |
| Si III  | 1953.968   | P 69      |           | C III   | 1979.62    | 50        |           |
| P I     | 1954.01    | 12        |           | Si I    | 1980.617   | 300       | 7         |
| P I     | 1954.20    | 21        |           | Al      | 1980.82    | 20        |           |
| Mg III  | 1954.87    | 10        |           | Na III  | 1980.95    | 10        |           |
| Si I    | 1954.9664  | 50        | 55        | Ar II?  | 1981.74    | 100       |           |
| P I     | 1955.16    | 21        |           | S II    | 1981.80    | 200       |           |
| Na III  | 1955.31    | 160       |           | Ne VII  | 1981.974   | 600       |           |
| P I     | 1955.79    | 21        |           | Si I    | 1983.232   | 300       | 7         |
| Na III  | 1956.48    | 10        |           | Ar II   | 1983.299   | 100       |           |
| Mg IV   | 1956.58    | 10        |           | Cl III  | 1983.61    | 500       |           |
| Be I    | 1956.63    | 100       |           | Al II   | 1983.65    | 60        |           |
| Si?     | 1956.75    | 0         |           | Ar II   | 1983.829   | 100       |           |
| O II    | 1957.42    | 10        |           | Si I    | 1984.0688  | 3         |           |

1984.4393

## FINDING LIST

1998.92

| Element | Wavelength | Intensity | Multiplet | Element | Wavelength | Intensity | Multiplet |
|---------|------------|-----------|-----------|---------|------------|-----------|-----------|
| Si I    | 1984.4393  | 20        |           | C?      | 1991.14    | 5         |           |
| Be I    | 1985.13    | 300       |           | N II    | 1991.301   | 10P       |           |
| S II    | 1985.17    | 200       |           | Si I    | 1991.8522  | 50        |           |
| Na III  | 1985.58    | 600       |           | Ne VII  | 1992.060   | 300       |           |
| Si I    | 1986.363   | 500       | 7         | Ar II?  | 1993.555   | 20        |           |
| C II    | 1987.33    | 40        |           | C I     | 1993.620   | 50        | 32        |
| C II    | 1987.76    | 120       |           | Na III  | 1995.62    | 60        |           |
| C II    | 1988.09    | 80        |           | Al      | 1996.30    | 20        |           |
| C II    | 1988.51    | 40        |           | Ne VII  | 1997.345   | 100       |           |
| Ar II   | 1988.620   | 300       |           | Be I    | 1998.01    | 1000      |           |
| Al II   | 1988.71    | 40        |           | S II    | 1998.92    | 200       |           |
| Si I    | 1988.993   | 1000      | 7         |         |            |           |           |
| C?      | 1990.53    | 10        |           |         |            |           |           |
| Al II   | 1990.530   | 800       | 8         |         |            |           |           |
| Al II   | 1991.05    | 20        |           |         |            |           |           |



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## REFERENCES FOR EACH SPECTRUM

**Standard wavelengths:** 197, 306, 308, 368, 371, 500, 607, 610, 662, 794, 795, 796

**Surveys of spectra:** 197, 201, 242, 367, 488, 816

**Solar spectra:** 76, 77, 78, 317, 552, 708, 772, 774, 784, 812, 815, 820, 823

| Element      | References                   | Element       | References                   |
|--------------|------------------------------|---------------|------------------------------|
| H I, D I:    | 168, 309                     | O V:          | 72, 129, 168, 362            |
| He I:        | 168, 497, 703                | O VI:         | 71, 168, 555                 |
| He II:       | 168, 309, 703                | O VII:        | 164, 168, 202, 262, 555, 764 |
| Li II:       | 168, 307, 596, 775, 788      | O VIII:       | 168, 309, 817                |
| Li III:      | 168, 185, 253, 309           | F line list:  | 176                          |
| Be I:        | 333, 541                     | F I:          | 174, 420                     |
| Be II:       | 168, 332, 541                | F II:         | 42, 157, 174                 |
| Be III:      | 166, 168, 596                | F III:        | 42, 174                      |
| Be IV:       | 168, 185, 309, 595, 765      | F IV:         | 173                          |
| B line list: | 195                          | F V:          | 172, 176                     |
| B I:         | 134, 658                     | F VI:         | 171                          |
| B II:        | 168, 195, 658                | F VII:        | 71, 171                      |
| B III:       | 168, 195                     | F VIII:       | 164, 236, 764                |
| B IV:        | 168, 764, 765                | F IX:         | 309                          |
| B V:         | 168, 309                     | Ne I:         | 57, 554, 703                 |
| C line list: | 170, 816                     | Ne II:        | 57, 74, 251                  |
| C I:         | 167, 168, 306, 371, 668, 821 | Ne III:       | 57, 74, 338                  |
| C II:        | 168, 287, 306                | Ne IV:        | 57, 74, 544, 773             |
| C III:       | 34, 168                      | Ne V:         | 74, 544                      |
| C IV:        | 168                          | Ne VI:        | 71, 74, 252, 544             |
| C V:         | 168, 262, 596, 764, 765      | Ne VII:       | 71, 74, 252, 255, 316        |
| C VI:        | 168, 309, 765                | Ne VIII:      | 71, 74, 252, 255, 316        |
| N line list: | 170                          | Ne IX:        | 255, 262                     |
| N I:         | 137, 191, 196, 306, 334, 376 | Ne X:         | 309                          |
| N II:        | 168, 177, 200, 243, 247      | Na line list: | 692, 693                     |
| N III:       | 168, 177, 246                | Na III:       | 693, 758                     |
| N IV:        | 168, 824                     | Na IV:        | 693                          |
| N V:         | 71, 72, 168, 313, 770        | Na V:         | 692, 693                     |
| N VI:        | 72, 168, 262, 764            | Na VI:        | 692, 693                     |
| N VII:       | 168, 309                     | Na VII:       | 691, 692, 693                |
| O line list: | 170                          | Na VIII:      | 691, 693                     |
| O I:         | 63, 165, 250                 | Na IX:        | 691, 693                     |
| O II:        | 36, 168, 175                 | Na XI:        | 309                          |
| O III:       | 72, 168, 175, 240, 362, 771  | Mg line list: | 692, 693                     |
| O IV:        | 168, 175, 362                |               |                              |

| Element       | References    |
|---------------|---------------|
| Mg I          | 708           |
| Mg II         | 592           |
| Mg III        | 693           |
| Mg IV         | 692, 693      |
| Mg V          | 692, 693      |
| Mg VI         | 692, 693      |
| Mg VII        | 692, 693      |
| Mg VIII       | 691, 693      |
| Mg IX         | 691, 693      |
| Mg X          | 691           |
| Mg XI         | 236           |
| Mg XII        | 309           |
| Al line list: | 233, 693, 816 |
| Al I          | 198           |
| Al II         | 190, 653      |
| Al III        | 190           |
| Al IV         | 693           |
| Al V          | 233, 336, 693 |
| Al VI         | 233, 336, 693 |
| Al VII        | 233, 336, 693 |
| Al VIII       | 233, 693      |
| Al IX         | 233, 693      |
| Al X          | 233, 693      |
| Al XI         | 233           |
| Al XII        | 236           |
| Al XIII       | 309           |
| Si line list: | 231, 816      |
| Si I          | 370, 608, 610 |
| Si II         | 371, 504, 678 |
| Si III        | 504, 768      |
| Si IV         | 504, 767      |
| Si V          | 231           |
| Si VI         | 231           |
| Si VII        | 231, 233      |
| Si VIII       | 231, 233, 693 |
| Si IX         | 231, 233      |
| Si X          | 231, 233      |
| Si XI         | 231, 233      |
| Si XII        | 231, 233      |
| Si XIV        | 309           |
| P I           | 496           |
| P II          | 496, 594      |

| Element       | References         |
|---------------|--------------------|
| P III         | 597                |
| P IV          | 597                |
| P V           | 597                |
| P XV          | 309                |
| S line list:  | 233                |
| S I           | 599, 769           |
| S II          | 322                |
| S III         | 323, 598           |
| S IV          | 38, 41             |
| S V           | 41                 |
| S VI          | 52, 598            |
| S VII         | 233                |
| S VIII        | 233                |
| S IX          | 160, 233, 372      |
| S X           | 160, 233, 372      |
| S XVI         | 309                |
| Cl I          | 6, 415             |
| Cl II         | 38, 169, 345       |
| Cl III        | 38, 43             |
| Cl IV         | 38, 43, 44         |
| Cl V          | 38, 43, 549        |
| Cl VI         | 51, 535, 549       |
| Cl VII        | 52, 160, 546       |
| Cl VIII       | 179                |
| Cl IX         | 160, 179           |
| Cl X          | 160, 179           |
| Cl XI         | 160, 179           |
| Cl XVII       | 309                |
| Ar line list: | 255, 707           |
| Ar I          | 59, 554            |
| Ar II         | 59, 501, 502, 506  |
| Ar III        | 59, 60, 169, 337   |
| Ar IV         | 59, 267, 295       |
| Ar V          | 59, 267, 549       |
| Ar VI         | 252, 549           |
| Ar VII        | 252, 549           |
| Ar VIII       | 252, 549           |
| Ar IX         | 254, 255, 259, 549 |
| Ar X          | 160, 254, 255, 259 |
| Ar XI         | 160, 255, 257      |
| Ar XII        | 160, 255, 257      |
| Ar XVIII      | 309                |

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| 13. ABSTRACT<br>A tabulation of observed spectral lines below 2000 Angstroms has been prepared from the published literature up to January 1967. It is intended principally as an aid to the astrophysicist and to the plasma spectroscopist who deals with the spectra of highly stripped atoms. This report includes the first 18 elements, hydrogen through argon. The tabulation is divided into two main sections: the emission lines by spectrum, and a finding list. The entries give the element and spectrum, vacuum wavelength, intensity, and classification. A reference list is included. |                               |                                                                                                                                     |  |

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|                                                                                                                                                                                                                                                                                                                                                                                                          | ROLE   | WT | ROLE   | WT | ROLE   | WT |
| Tabulation<br>Atomic emission lines<br>Spectral lines below 2000Å<br>Highly stripped atoms<br>Plasma spectroscopy<br>Astrophysics<br>Hydrogen<br>Deuterium<br>Helium<br>Lithium<br>Beryllium<br>Boron<br>Carbon<br>Nitrogen<br>Oxygen<br>Fluorine<br>Neon<br>Sodium<br>Magnesium<br>Aluminum<br>Silicon<br>Phosphorus<br>Sulfur<br>Chlorine<br>Argon<br>Vacuum wavelength<br>Intensity<br>Classification |        |    |        |    |        |    |