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Rapid Quasirelativistic and Relativistic Calculations of Atomic Data for Plasma Modeling

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ABSTRACT

A rapid, yet accurate, approach for relativistic atomic structure and relativistic distorted wave exciatation of highly charged ions has been developed and the corresponding computer programs written. These have been applied to large scale calculations of collision strengths and oscillator strengths for Ne-like, Li-like, Na-like, Cu-like, F-like and Ni-like ions. In performing the latter two sets of calculations the atomic structure program was expanded to include the generalized Breit interaction together with other QED corrections. Very recently a version of the collision strength program that includes the generalized Breit interaction in calculating the scattering matrix elements has also been obtained. The effect of this has been found to be quite significant for many transitions involving excitation from the $1s$ shell in H-like, He-like and Li-like ions with $Z \geq 50$. It has been shown that distorted wave ionization cross sections can generally be expressed in the convenient form of a summation of the product of a readily calculated quantity that depends only on ion properties and a cross section having exactly the same form as a hydrogenic ionization cross section except that the radial functions are calculated using the appropriate potential for the actual ion being considered. Illustrative numerical results for ionization have been obtained and it appears that fits convenient for plasma modeling applications can be made. Versions of both the excitation and ionization programs that calculate excitation or ionization to specific final magnetic sublevels have been obtained. This is of interest for interpreting some EBIT experiments and some solar flare observations.

I. INTRODUCTION

This is the final technical report for reseach done during the period September 15, 1988 – September 14, 1990, with support by the Ultrashort Wavelength Laser Program, Innovative Science and Technology Office, Strategic Defense Initiative Organization (SDIO) under Contract No. N00014-88-K-2021. This research was also partially supported by the Lawrence Livermore National Laboratory (LLNL) under Subcontract No. 6181405. In addition, a slight amount of support for the work was received from a no cost extention of DOE Contract DE-FG02-85ER53208 and the Office of Fusion Energy of DOE provided us with computing time on the Cray Supercomputers at the National Energy Research Supercomputer Center at Livermore, CA, where some of our calculations are made. LLNL has also given us considerable computing time on a Cray XMP at their "Open Computer Facility". The continuation of this research from September 15, 1990, up to mid-August, 1991, will also be summarized.

During the latter period our research has suffered considerably due to lack of sufficient funding. However, a complete collapse was avoided due to support in the amount of $30,000 from the Division of Applied Plasma Physics, Office of Fusion Energy, DOE; $20,000 from LLNL; and recently $15,000 from the Ultrashort Wavelength Laser Program, Innovative Science and Technology Office, SDIO. We are extremely thankful for this support. This was just slightly more than sufficient to cover the salary of the very productive research associate, Dr. Honglin Zhang. Thus, except for some summer support, it was necessary to support the physics graduate student, Christopher Fontes, with a teaching assistantship, and there was no support at all for the salary of the Principal Investigator, Dr. D.H. Sampson. Hence, he has had to teach more. Moreover, he was incapacitated part of the time due to a broken leg that became infected. Thus, neither he nor Fontes have been able to put as much time into this research during the past year as previously.

The purpose of this work is to develop and apply the theory, procedures and associated computer programs for rapid, yet accurate, calculations of atomic data needed for modeling and predictive studies of X-ray lasers. This data can, of course, be used as well in modeling and studying other high temperature plasmas, for example those occurring in fusion energy research and astrophysics. Although we do calculate radiative oscillator strengths and have now expanded our programs to include autoionization, we have concentrated on the cross sections or collision strengths needed for determining the collision rates for excitation and ionization of highly charged ions by electron impact. The reason for doing this is that these rates tend to be the most lengthy and difficult to obtain. This occurs because to obtain a collision rate the corresponding cross section must be determined for several impact electron energies and for each energy many values for the free-electron momenta must be considered. Moreover, in most cases, especially for the collision driven X-ray laser schemes, the densities are sufficiently high that transitions between excited levels are important and the collision rates for thousands of transitions may be needed for a single plasma application. In addition, the values of the nuclear charge number Z are often sufficiently high that relativistic calculations should be made, which tend to further increase the length of the calculation. Thus, very rapid, yet accurate, fully relativistic procedures and computer programs are needed.

We have developed such programs both for excitation[1,2] and more recently for ionization[3,4] and have applied them to large scale calculations of atomic data in Ref. 5 – 10. Reprints or preprints of Ref. 3, 4, 9 and 10 are attached. Reprints of Ref. 1, 2, 5 – 8 were attached to the previous progress reports. We have also attached a preprint of Ref. 11. In that work we used the atomic data we have recently generated to show that the Van Regemorter approximation[12], which is still quite widely used for estimating excitation cross sections, is mostly very unreliable, and we have delineated the conditions for which it is an especially poor approximation.

In the next section we outline the principal features of the relativistic approach we have developed. Then in Section III we discuss the accomplishments we have made with it.

II. OUTLINE OF OUR RELATIVISTIC APPROACH

The relativistic approach we use has been described in detail in Ref. 1 and 2 and was also discussed in our previous progress reports. Hence, we only briefly describe the principal features here. The same relativistic Hartree-Fock-Slater, or Dirac-Fock-Slater, potential evaluated using a mean configuration is used in calculating all orbitals, bound and free, in considering a given class of transitions, such as the $n = 2 - n = 3$ transitions in fluorine-like ions. Hence, all orbitals are automatically orthogonal. In order to further reduce the number of radial functions and radial scattering integrals we calculate them for a fixed set of final, or scattered electron energies (usually six) starting near zero and going out to sufficiently high values to allow accurate determination of collision rates. For each of these we compute the radial integrals for three impact electron energies spanning the range of transition energies for the class of transitions being considered. Then we interpolate on these results to obtain values for the exact transition energy in each case. It should be mentioned that, although we usually calculate collision strengths for a fixed set of final electron energies in our large scale calculations, our computer programs have the option to calculate collision strengths for a set of impact electron energies, which are preferred by some scientists. If the factorization method of Bar-Shalom et al[13] is used, the interpolation is done on the Q^λ. In general we do use the factorization method[13] whenever we do large scale calculations for a big portion of an isoelectronic sequence, as in Ref. 5 - 10. Then the collision strength Ω has the form

$$\Omega = 8 \sum_{\substack{j_a, j'_a \\ j_{a1}, j'_{a1}}} \sum_{\lambda} B^\lambda(j_a j'_a, j_{a1} j'_{a1}) Q^\lambda(j_a j'_a, j_{a1} j'_{a1}) \,. \tag{1}$$

Here j_{a1} and j_a represent orbitals in the initial target ion wave function, and j'_{a1} and j'_a represent orbitals in the final target ion wave function. A convenient feature of Eq (1) is that B^λ is a function only of target ion quantum numbers and mixing coefficients plus λ, while the Q^λ contains the radial contribution and depends only on λ and the bound and free orbitals with the summations over the free-electron momenta performed within it. Since the Q^λ vary smoothly with Z, in treating a given class of transitions for a large portion of an isoelectronic sequence, one needs to make detailed calculations of the Q^λ for only a few values of Z (typically one in ten) and then these can be fitted to a power series in Z that generally gives accurate results to within a percent for the complete range of Z being considered. Since usually the Q^λ calculation is the lengthy part, this typically leads to a factor of 10 reduction in computing time.

We also have a quasirelativistic option in our programs that corresponds to dropping the small component of the radial functions and normalizing the large component as though it were the complete radial function. In addition, for the free electrons one uses the average (over j) value κ = -1 in the effective potential determining the free radial functions. They then become independent of j. This is a good approximation because one sums over j values for the free electrons in calculating the collision strength. Although as discussed in Ref. 2 the quasirelativistic results are quite accurate for most Z values, it only saves about a factor of 2.5 in computing time and it was not used in the large scale calculations of Ref. 5 – 10.

Finally we note that, as discussed in Ref. 1, 2 and 5 – 10, comparisons of collision strengths with results by other more elaborate relativistic programs such as that of Hagelstein and Jung[14] and the very elaborate program of Kim[15] and Kim and Desclaux[16], and comparison of oscillator strengths with those by the multiconfiguration Dirac-Fock program of Grant et al[17–19] indicate that the results by the present rapid relativistic programs are essentially as accurate as those by the most elaborate relativistic programs available when

$$Z \geq 2N \text{ or } 2.5N\ , \qquad (2)$$

where N is the number of bound electrons per ion.

III. ACCOMPLISHMENTS

In Ref. 5 the relativistic approach described in Sec. II was used to obtain collision strengths, or equivalently cross sections, for the 88 transitions from the ground level to the excited levels with $n = 3$ and 4 in the 71 neon-like ions with $22 \leq Z \leq 92$. In Ref. 6 similar calculations were made for the 66 transitions among the $2s_{1/2}$, $2p_{1/2}$ and $2p_{3/2}$ levels and from them to all the nlj levels with $n = 3$, 4 and 5 in the 85 Li-like ions with $8 \leq Z \leq 92$. In Ref. 7 similar calculations were made for the 90 transitions among the $3s_{1/2}$, $3p_{1/2}$, $3p_{3/2}$, $3d_{3/2}$ and $3d_{5/2}$ levels and from them to all the nlj levels with n=4 and 5 in the 71-Na-like ions with $22 \leq Z \leq 92$. In Ref. 8 similar calculations were made for the 21 transitions among the $4s_{1/2}$, $4p_{1/2}$, $4p_{3/2}$, $4d_{3/2}$, $4d_{5/2}$, $4f_{5/2}$ and $4f_{7/2}$ levels and the 63 transitions from them to the excited nlj levels with n=5 in the 33 Cu-like ions with $60 \leq Z \leq 90$.

More recently in Ref. 9 we completed the very large set of calculations of the collision strengths for all 330 nonvanishing transitions among the $n = 2$ levels and between the $n = 2$ and $n = 3$ levels in the 71 fluorine-like ions with $22 \leq Z \leq 92$. Also in Ref. 10 similar calculations were made for the 248 transitions from the ground level to the excited levels with $n = 4$ and 5 in the 33 nickel-like ions with $60 \leq Z \leq 92$ (reprints of Ref. 9 and 10 are attached). These works differ from the earlier relativistic calculations in Ref. 5 – 8 in that the point nuclear charge in the nuclear contribution to the Dirac-Fock-Slater potential used in calculating the bound and free radial functions was replaced with a finite nuclear charge having the Fermi distribution.[20] Also the generalized Breit interaction and the self energy and vacuum polarization QED contributions were included perturbatively in the atomic structure part of the calculations. In this connection it was noted in Sec. III A of Ref. 1 that for high Z the accuracy of our approach warrants an option in our atomic structure program to include the vacuum polarization and self energy QED corrections and the Breit interaction perturbatively. These do not affect the radial functions, but do improve the energies and slightly improve the mixing coefficients. In fact, the latter effect can be quite significant for a small fraction of cases involving large groups of mixed states at high Z. For example, in the case of F-like ions there were two instances among the 116 transitions with nonvanishing electric dipole oscillator strengths where inclusion of the generalized Breit interaction appreciably altered the mixing coefficients and redistributed the oscillator strengths for Z=92. In fact, once in a while this can occur for somewhat lower Z, such as the case for neon-like barium noted in Sec. III A of Ref. 1. However, use of these new options to our atomic structure program (in particular the Breit interaction) do greatly increases the length of the atomic structure calculations. Thus, although the time for the atomic structure calculations for a single Z value is still somewhat less than the time required to compute the Q^λ (see Eq. (1)), when one computes the atomic structure part for each Z value, as done in the large scale calculations for F-like and Ni-like ions in Ref. 9 and 10, while the detailed Q^λ calculations are done for only about one tenth of the Z values, the atomic structure part of the calculations requires more time than the collision part.

Regarding the current speed of our programs, we note that the collision program has been speeded up by a factor of 12 since the calculations in Ref. 5 and 6 were made. In order to give some indication of this current speed we note that the total average CPU time on a Cray XMP at the LLNL Open Computing Facility (OCF) was a little less than 0.01 sec per collision strength data point for F-like ions when the option to include the generalized Breit interaction and the other QED corrections in the structure part of the calculations was omitted and this time was slightly more than doubled when this option was used. However, we expect to reduce the time required by this option in future work (assuming we get funding) so that even with its inclusion, the atomic structure part again requires almost negligible time in large scale calculations of collision strengths. One way this can probably be done is by fitting the radial parts of the Breit matrix elements to power series in Z after detailed evaluations have been made for a few Z values. It should also be noted that without this option the transition energies for $\Delta n \geq 1$ transitions appear generally to be accurate to within better than 1% and the effect on mixing coefficients is usually small so that omitting this option will give sufficient accuracy for many purposes.

In very recent work we have extended our relativistic distorted wave program for excitation of highly charged ions to include the contribution of the generalized Breit interaction directly in calculating the scattering matrix elements.[21] This has been done previously only by Walker[22] for excitation from the $1s$ level to the $2s, 2p_{1/2}$ and $2p_{3/2}$ levels in hydrogenic ions with $Z = 25$, 50 and 100. Our results agree with his for these cases. We find that for $Z = 54$ the effect is about 20% for some excitation transitions from the $1s$ level in hydrogenic, He-like and Li-like ions. The effect has risen to about 60% for several transitions in these kinds of ions when $Z = 92$. In future work we intend to work out the algebra to put this in the factorization form of Eq. (1) for large scale productions of atomic data.

The collision program has also recently been expanded to give rapid programs for relativistic distorted wave electron impact ionization cross sections in Ref. 3 and 4 (copies attached). These give generally good agreement with other recent relativistic ionization work done in Ref. 23 – 27. The program of Ref. 3 calculates cross sections with the form of hydrogenic cross sections except that the orbitals are calculated using the Hartree-Fock-Slater potential for the target ion. Hence, it can obviously be applied to ionization of the valence electron in Li-like, Na-like and Cu-like ions. However, as shown in the Appendix of Ref. 28, such a program has much wider applications. In particular it was shown that such a program applies whenever both the initial and final states are pure states, such as is the case for ionization of He-like, Ne-like and Ni-like ions in their ground levels, and also it applies if only either the initial or final level is a pure state. Hence, it is applicable for ionization of F-like and Co-like ions as well as innershell ionization of Li-like, Na-like and Cu-like ions. Thus, it can be used to improve the papers[28–30] on the latter process as a mechanism for populating excited levels of He-like, Ne-like and Ni-like ions.

In fact, we have very recently shown in Ref. 4 (preprint attached) that in general when mixing is confined to the states in a complex, that is having the same set of principal quantum numbers, as well as parity and J value, distorted wave ionization cross sections can be expressed in the convenient form of a summation of the product of a readily calculated quantity that depends only on ion properties, such as mixing coefficients and angular momenta, with a cross section Q_H^{ps} having exactly the same form as a hydrogenic ionization cross section except that the radial functions should be calculated using the appropriate potential for the actual ion being considered. It is also convenient to express the Q_H^{ps} in terms of a reduced cross section Q_R by factoring out a $\pi a_o^2/I(\text{Ryd})^2$ factor, where I is the ionization energy. Then, as shown in Ref. 3, the relativistic distorted wave values for the Q_R are close to the non-relativistic Coulomb-Born-Exchange values of Ref. 31 for hydrogenic ions Q_R^H except for high Z and/or energies. Since the Q_R^H have been fitted to simple functions of the electron energy in threshold units that are readily integrated over a Maxwellian electron distribution function to obtain ionization rates, one would expect that accurate fits of the relativistic results for the reduced cross section could be made, as well, probably using the same functional form given by Eq (6) of Ref. 31, but allowing the coefficients to be slowly varying functions of an effective Z or of Z and N, where N is the number of bound electrons per ion. This would be very convenient for applications to plasma modeling.

We have also very recently expanded our programs to give a rapid relativistic autoionization program. We expect to apply this to indirect processes such as the resonance contribution to excitation, dielectronic recombination and the innershell excitation autoionization contribution to ionization, which is sometimes the dominant contribution even for high Z, as shown in Ref. 32.

In addition to the type of work just described, which has been the main thrust of our effort, we have in Ref. 33 made a version of our relativistic collision strength program that gives cross sections for excitation to specific magnetic sublevels of the target ion by directive electrons. This was done at the request of Livermore for use in comparing with and interpreting the electron beam ion trap (EBIT) experiments being done there. They have made measurements for Ba^{46+} in Ref. 34 and expect to go to considerably higher values of Z in future work.[35,36] The results by this program are of similar interest for EBIS experiments and results for that purpose have recently been sent to C. Bhalla at Kansas State at his request.[37]

Very recently we have also obtained a relativistic distorted wave program for ionization to specific magnetic sublevels of the final ion due to impact by directive electrons.[38] This is also of interest for interpreting EBIT experiments, as well as some solar flares.

Finally it should be mentioned that the complete set of results for each of our papers on large scale calculations of collision strengths and oscillator strengths are on file at the National Energy Research Supercomputer Center at Livermore, CA, under user number 1251. For those not having access to that network, the results are available on a magnetic tape at request from us. In general the file name is the letter R followed by the abbreviation for the isoelectronic sequence followed in turn by $DATA$. For example, the file on results for neon-like ions is named $RNEDATA$.

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Rapid relativistic distorted-wave approach for calculating cross sections for ionization of highly charged ions

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The rapid relativistic distorted-wave method of Zhang, Sampson, and Mohanty [Phys. Rev. A 40, 616 (1989)] for excitation, which uses the atomic-structure data of Sampson *et al.* [Phys. Rev. A 40, 604 (1989)], has been extended to ionization. In this approach the same Dirac-Fock-Slater potential evaluated using a single mean configuration is used in calculating the orbitals of all electrons bound and free. Values for the cross sections Q for ionization of various ions have been calculated, and generally good agreement is obtained with other recent relativistic calculations. When results are expressed in terms of the reduced ionization cross section Q_R, which is proportional to I^2Q, they are close to the nonrelativistic Coulomb-Born-exchange values of Moores, Golden, and Sampson [J. Phys. B 13, 385 (1980)] for hydrogenic ions except for high Z and/or high energies. This suggests that fits of the Q_R to simple functions of the impact electron energy in threshold units with coefficients that are quite slowly varying functions of an effective Z can probably be made. This would be convenient for plasma-modeling applications.

I. INTRODUCTION

Highly charged ions with very large values for the nuclear charge number Z are becoming of increased interest in the study of high-temperature plasmas, partly due to the interest in developing ultrashort-wavelength lasers. For highly charged ions with $Z \gtrsim 25$ or 30, the j dependence of the radial functions for some orbitals becomes significant so that a fully relativistic approach based on the Dirac equation should be used in calculating the properties of such ions. For the applications to high-temperature plasma modeling, it is also desirable to have a very rapid relativistic approach because an immense amount of atomic data is required. In Refs. 1 and 2 such an approach was developed, and in Refs. 3–6 it was applied to large-scale production of collision strengths, or equivalently excitation cross sections, and oscillator strengths. As discussed in these references, the approach appears to be accurate for

$$Z \gtrsim 2N \text{ or } 2.5N , \tag{1}$$

were N is the number of bound electrons per ion.

The approach was also recently extended to give cross sections for excitation of highly charged ions to specific magnetic sublevels by a directive beam of electrons.[7] This was motivated by the need for such cross sections in the modeling and design of electron-beam ion trap (EBIT) experiments at the Lawrence Livermore National Laboratory.[8–10] For this purpose ionization cross sections are needed, as well. Of course, ionization cross sections are also needed for the modeling of high-temperature plasmas, and recently electron-impact ionization cross sections for U^{91+} and U^{90+} have been measured.[11] The purpose of the present work is to extend the approach of Refs. 1–7 to give relativistic electron-impact ionization cross sections. Since ionization is like excitation summed over many final levels, as seen by comparing Eqs. (2) and (13) below, one expects the range of accuracy for ionization to be at least as great as for excitation given by Eq. (1).

In Sec. II the theory used in the present work is described. Then in Sec. III numerical results are given for ionization from the 1s, 2s, $2p_{1/2}$, and $2p_{3/2}$ subshells of various types of ions with various values of Z, and comparison is made with other recent works.[12–16]

II. OUTLINE OF THEORY

The present relativistic distorted-wave ionization program was obtained by modification of the relativistic distorted-wave excitation program of Ref. 2. Hence we first briefly review the approach used for excitation. Then we indicate the modifications required for ionization. By combining Eqs. (1) and (3) of Ref. 2, one can write the expression for the relativistic distorted-wave cross section $Q(i-f)$ for the excitation transition $i-f$ in an N-electron ion in the form

$$Q(i-f)=\frac{8\pi a_0^2}{k^2 g_i}\sum_J (2J+1)\sum_{\kappa,\kappa'}\left|\left\langle \Psi_i \left| \sum_{\substack{q,p \\ q<p}}^{N+1} \frac{1}{r_{qp}} \right| \Psi_f \right\rangle\right|^2 . \tag{2}$$

Here a_0 is the Bohr radius, k is the relativistic wave number of the impact electron, g_i is the statistical weight of the initial level of the N-electron target ion, and κ and κ' are the initial and final relativistic angular momentum quantum numbers of the free electron. The Ψ_i and Ψ_f in Eq. (2) are the initial and final antisymmetric wave functions for the total $(N+1)$-electron system consisting of target ion plus free electron, and J is the total angular momentum quantum number for this entire system. The relation between k, the relativistic momentum p, and the kinetic energy ε of the impact electron is

$$k^2=\frac{p^2a_0^2}{\hbar^2}=\varepsilon\left[1+\frac{\alpha^2}{4}\varepsilon\right], \qquad (3)$$

where α is the fine-structure constant $e^2/\hbar c$ and ε is in Rydbergs. The κ in Eq. (2) is related to the orbital and total angular momentum quantum numbers l and j for the impact electron in the usual way:

$$\kappa=l, j=l-\tfrac{1}{2};\quad \kappa=-(l+1),\quad j=l+\tfrac{1}{2}. \qquad (4)$$

Of course, analogous relations apply between κ', l', and j' pertaining to the scattered electron.

The initial antisymmetrized function Ψ_i in Eq. (2) can be written[17]

$$\Psi_i=\frac{1}{(N+1)^{1/2}}\sum_{k=1}^{N+1}(-1)^{N+1-k} \times\sum_{M_t,m}C(J_t jM_t m;JM) \times\Psi_{\beta_t J_t}(x_k^{-1})u_{\varepsilon ljm}(x_k), \qquad (5)$$

where x_k designates the space and spin coordinates of electron k, and x_k^{-1} means the space and spin coordinates for all N electrons other than electron k. The $\Psi_{\beta_t J_t}(x_k^{-1})$ is the initial antisymmetrized target-ion wave function constructed of Dirac spinors or orbitals as in Eq. (4) of Ref. 1. Here J_t is the quantum number corresponding to the total initial angular momentum of the target ion and β_t represents all other quantum numbers required to specify the initial state of the target ion. The $u_{\varepsilon ljm}$ in Eq. (5) is a Dirac spinor for the initial free electron (impact electron) in a central potential $V(r)$ due to the target ion. Specifically,

$$u_{\varepsilon ljm}(x)\equiv u_{\varepsilon\kappa m}(x) =\frac{1}{r}\begin{bmatrix}P_{\varepsilon\kappa}(r)\chi_{\kappa m}(\theta,\phi,\sigma)\\ iQ_{\varepsilon\kappa}(r)\chi_{-\kappa m}(\theta,\phi,\sigma)\end{bmatrix}, \qquad (6)$$

where the $\chi_{\kappa m}$ are the usual spin angular momentum functions, and the large and small components of the radial functions $P_{\varepsilon\kappa}$ and $Q_{\varepsilon\kappa}$ satisfy the coupled Dirac equations

$$\left[\frac{d}{dr}+\frac{\kappa}{r}\right]P_{\varepsilon\kappa}(r)=\frac{\alpha}{2}\left[\varepsilon-V+\frac{4}{\alpha^2}\right]Q_{\varepsilon\kappa}(r), \qquad (7)$$

and

$$\left[\frac{d}{dr}-\frac{\kappa}{r}\right]Q_{\varepsilon\kappa}(r)=-\frac{\alpha}{2}(\varepsilon-V)P_{\varepsilon\kappa}(r). \qquad (8)$$

Similar to Eq. (5), the final function Ψ_f in Eq. (2) for the excitation cross sections is given by

$$\Psi_f=\frac{1}{(N+1)^{1/2}}\sum_{k=1}^{N+1}(-1)^{N+1-k} \times\sum_{M_t',m'}C(J_t'j'M_t'm';JM) \times\Psi_{\beta_t'J_t'}(x_k^{-1})u_{\varepsilon'l'j'm'}(x_k), \qquad (9)$$

where primed quantities pertain to the final state in the exactly analogous way that corresponding unprimed quantities in Eq. (5) pertain to the initial state.

In order to extend Eq. (2) to ionization, all that is required is the following: (1) The $\Psi_{\beta_t'J_t'}(x_k^{-1})$ in Eq. (9) must be replaced by an antisymmetrized wave function for an N-electron system corresponding to the final $(N-1)$-electron ion plus an ejected electron:

$$\Psi_{\beta_t'J_t'}(x_k^{-1})=\frac{1}{N^{1/2}}\sum_{p\neq k}^{N+1}(-1)^{N-p}\sum_{M_t'',m''}C(J_t''j''M_t''m'';J_t'M_t')\Psi_{\beta_t''J_t''}(x_p^{-1})u_{\varepsilon''l''j''m''}(x_p), \qquad (10)$$

where $\Psi_{\beta_t''J_t''}$ is the antisymmetrized wave function corresponding to the final $(N-1)$-electron ion with total angular momentum J_t'', and $u_{\varepsilon''l''j''m''}(x_p)$ is a Dirac spinor for the ejected electron analogous to the Dirac spinor $u_{\varepsilon ljm}$ given by Eqs. (6)–(8) for the impact electron. A consequence of this is that then $P_{n_\alpha'l_\alpha'j_\alpha'}$ and $Q_{n_\alpha'l_\alpha'j_\alpha'}$ in the direct and exchange radial-scattering matrix elements given by Eqs. (9) and (10) of Ref. 2 are replaced with $P_{\varepsilon''l''j''}$ and $Q_{\varepsilon''l''j''}$. (2) Equation (2) must be summed over the total final angular momentum J_t' for the system consisting of the $(N-1)$-electron final ion with total angular momentum J_t'' plus the ejected electron with total angular momentum j''. (3) Equation (2) must also be summed over κ'' or, equivalently, j'' and l'' for the ejected electron. (4) Equation (2) must be integrated over the range 0 to $(\varepsilon-I)/2$ for the energy ε'' of the ejected electron, where I is the ionization energy. (5) Finally, one must divide by a factor of π to account for the fact that a final bound electron function with normalization

$$\int_0^\infty[P_{n_\alpha'\kappa_\alpha'}^2(r)+Q_{n_\alpha'\kappa_\alpha'}^2(r)]dr=1 \qquad (11)$$

has been replaced with a free ejected electron function with normalization

$$\int_0^\infty[P_{\varepsilon''\kappa''}(r)P_{\varepsilon'''\kappa''}(r)+Q_{\varepsilon''\kappa''}(r)Q_{\varepsilon'''\kappa''}(r)]dr=\pi\delta(\varepsilon''-\varepsilon'''). \qquad (12)$$

In summary, the relativistic distorted-wave ionization cross section is given by

$$Q=\frac{8a_0^2}{k^2g_i}\sum_J(2J+1)\sum_{J_t'}\sum_{\kappa,\kappa',\kappa''}\int_0^{(\varepsilon-I)/2}d\varepsilon''\left|\left\langle\Psi_i\left|\sum_{\substack{q,p\\ q<p}}^{N+1}\frac{1}{r_{qp}}\right|\Psi_f\right\rangle\right|^2, \qquad (13)$$

with Eq. (10) applied to Eq. (9) for Ψ_f.

All the orbitals bound and free entering Eq. (13) are Dirac spinors of the form given by Eq. (6) with the radial functions satisfying equations of the form of Eqs. (7) and (8). In fact, in the present approach the same central potential $V(r)$ is used for all electrons bound and free, and so the orbitals are all automatically orthogonal. This potential is the relativistic Hartree-Fock-Slater potential or so-called Dirac-Fock-Slater potential given in rydbergs by

$$V(r)=-\frac{2Z}{r}+V_c(r)-\left[\frac{24}{\pi}\rho\right]^{1/3}, \tag{14}$$

where

$$V_c(r)=\sum_{n'\kappa'} w_{n'\kappa'}\int_0^\infty \frac{2}{r_>}[P_{n'\kappa'}^2(r_2)+Q_{n'\kappa'}^2(r_2)]dr_2 , \tag{15}$$

and

$$\rho(r)=\frac{1}{4\pi r^2}\sum_{n'\kappa'} w_{n'\kappa'}[P_{n'\kappa'}^2(r)+Q_{n'\kappa'}^2(r)] . \tag{16}$$

Here $w_{n'\kappa'}$ is the occupation number of subshell $n'\kappa'=n'l'j'$, the summation is over all occupied subshells, $r_>$ is the greater of r and r_2, and $P_{n'\kappa'}$ and $Q_{n'\kappa'}$ are the so-called large and small components of the radial function of an electron in the $n'\kappa'$ subshell. The subscript a used in Eq. (11) to distinguish bound orbitals from free ones has been dropped here for convenience.

In the application to excitation in Refs. 3–6, the potential given by Eqs. (14)–(16) was evaluated using a single mean configuration with fractional occupation numbers in which the occupation for the active electron was approximately split between initial and final shells. In obtaining the ionization results given in Sec. III, we mostly used the initial configuration of the target ion in determining the potential with Eqs. (14)–(16). For example, in considering either inner-shell ionization or ionization of the valence electron of Li-like ions in the ground level, the configuration $1s^22s$ was used, while for ionization of a $2p_{1/2}$ electron in a Li-like ion the configuration $1s^22p_{1/2}$ was used. This is a simple, straightforward procedure. However, one that would more nearly correspond to the procedure used successfully for excitation in Refs. 3–7 would be to reduce the occupation number of the initial subshell of the active electron by 0.5 and put an occupation number of 0.5 in a very high subshell to mock up the effect of the ejected electron. Thus a few test cases, for which results in Sec III are indicated by asterisks as superscripts, were done this way. Specifically, test cases were done using the mean configurations

$$1s^{1.5}2s^16d_{5/2}^{0.5} , \tag{17}$$

$$1s^22s^{0.5}6d_{5/2}^{0.5} , \tag{18}$$

$$1s^22p_{1/2}^{0.5}6d_{5/2}^{0.5} , \tag{19}$$

and

$$1s^22s^22p_{1/2}^{1.5}2p_{3/2}^46d_{5/2}^{0.5} , \tag{20}$$

in determining the potential with Eqs. (14)–(16) for inner-shell ionization of Li-like ions in the ground configuration, ionization of the valence electron in Li-like ions initially in the $1s^22s$ and $1s^22p_{1/2}$ configurations, and ionization of a $2p_{1/2}$ electron in neonlike ions in the ground configuration, respectively. These altered potentials affect results appreciably only for relatively low Z, where the electron-electron contribution to the potential is most significant.

Although we expect eventually to write a more general program, at present the computer program only calculates ionization cross sections with the form of hydrogenic cross sections except that the orbitals are calculated using the potential of Eqs. (14)–(16). Thus, in this case, $J_t''=0$ and $J_t'=j''$, and so the summation over J_t' is omitted. The present program can obviously be applied to ionization of the valence electron in Li-like, Na-like, and Cu-like ions. However, as shown in the Appendix of Ref. 18, a program such as the present one has much wider applications. In particular, it applies whenever both the initial and final states are pure states, such as is the case for ionization of He-like, Ne-like, and Ni-like ions in their ground levels, and it also applies if only either the initial or final level is a pure state. Hence it is applicable for ionization of F-like and Co-like ions as well as inner-shell ionization of Li-like, Na-like, and Cu-like ions. In order to make application to these more complex cases, one must multiply by the initial occupation number $w_{n\kappa}$ of the active subshell $n\kappa$, and if more than one state for the final ion is possible, one must multiply by a branching ratio factor R considered, for example, in Ref. 19. Also, if mixing occurs in the initial or final level, one must multiply by the square of the mixing coefficient and sum over the mixed states. It is also convenient to express results in terms of a reduced cross section Q_R by factoring out a $\pi a_0^2/I^2$ factor, where I is the ionization energy in rydbergs. Then, if both initial and final states are pure ones, the cross section for ionization from subshell $n\kappa$ is given by

$$Q=\frac{\pi a_0^2}{I^2}w_{n\kappa}RQ_R , \tag{21}$$

while, if either the initial or final state is a mixed one, Eq. (21) should be multiplied by the square of the mixing coefficient and summed over the mixed states, as mentioned previously.

Finally, we note that it is well known that the relative phase of the two final free electrons is unknown when the central field approximation has been made in determining their orbitals. The choice of phase used in our approach is what is sometimes called the "natural"-phase approximation [see Eq. (10) of Ref. 14]. This is the correct choice in the special case of a nonrelativistic treatment as $Z\rightarrow\infty$. Thus one might expect it to be a good approximation for highly charged ions.

III. NUMERICAL RESULTS AND DISCUSSION

Ionization cross sections by the present method are compared with relativistic results available by other methods in Table I. The entries labeled Ref. 16 are results calculated with the relativistic distorted-wave program used in the calculations of the direct ionization contribution, as compared with the indirect excitation-autoionization contribution, in Ref. 15 dealing with ionization of Na-like Au ($Z=79$). That program also uses the so-called natural-phase approximation [Eq. (10) of Ref. 14]. Thus it differs from the present program in the physics used only in that the bound, incident, scattered, and ejected electron functions are calculated in the Dirac-Fock potential[20] rather than the more approximate Dirac-Fock-Slater potential used here. This is seen to have little effect in the cases considered in Table I, especially for the more highly charged ions, where the nuclear potential more completely dominates. The results in Refs. 12 and 13 were obtained in a similar way to those of Ref. 16 except that the "maximum-interference"-phase approximation [see Eq. (11) of Ref. 14] was used. Of course, this gives smaller cross sections than the natural-phase approximation, but the difference is usually small. One sees that the present results are also close to those of Refs. 12 and 13, but are always larger, as expected. Finally, the results of Ref. 14 differ from the others in that they include the full lowest-order QED interaction between the electrons rather than simply the Coulomb interaction $1/r_{ij}$ in calculating the scattering amplitudes. In other words, they include the so-called generalized Breit interaction. However, they omit the exchange and interference terms, which they estimate to have no more than a 15% effect. Thus, in comparing with those results, we also omit these terms. The agreement is seen to be rather good in this case as well, which is consistent with the conclusion reached in Ref. 14 and also demonstrated for hydrogenic ions in Ref. 21 that inclusion of the generalized Breit interaction has little effect on ionization until high-impact electron energies $\gtrsim 250$ keV are reached. Our results, like the relativistic calculations of these other workers, are about a factor of 4 smaller than the recent measurements of Ref. 11.

In Table II we give the present results for many additional cases involving ionization from the 1s, 2s, $2p_{1/2}$, and $2p_{3/2}$ subshells. In the interest of brevity, closed inactive subshells are omitted in giving the transitions for neonlike ions. The results are given for the reduced ionization cross section Q_R, which is related to the ionization cross section according to Eq. (21). In these cases the branching ratio R is unity except for inner-shell ionization of Li-like ions, where it is $\frac{1}{4}$ and $\frac{3}{4}$ for ionization to the $(1s2s)_0$ and $(1s2s)_1$ states of the He-like ions, respectively. Results of Moores, Golden, and Sampson[22] for the nonrelativistic Coulomb-Born-exchange reduced ionization cross section Q_R^H for hydrogenic ions in the

TABLE I. Comparison between present results and recent relativistic calculations by other workers of the cross sections (cm^2) for ionization from various sublevels of various types of ions with various values for the nuclear charge number Z. Here $2p^*$ means $2p_{1/2}$ and $2p$ means $2p_{3/2}$. The present results were obtained using the initial configuration of the target ion in calculating the Dirac-Fock-Slater potential with Eqs. (14)–(16). $x[y]=x\times10^y$.

Active subshell	Ion type	Z	Source	I (keV)	$u=\varepsilon/I$						
					1.25	1.351	1.448	1.50	1.552	1.737	
3s	Na	34	Present	1.036		9.72[−21]	1.09[−20]		1.18[−20]	1.29[−20]	
			Ref. 16	1.036		9.80[−21]	1.09[−20]		1.18[−20]	1.27[−20]	
$2p^*$	Ne	34	Present	2.582	3.33[−21]			4.80[−21]			
			Ref. 16	2.583	3.43[−21]			4.88[−21]			
2p	Ne	34	Present	2.539	6.92[−21]			9.97[−21]			
			Ref. 16	2.539	7.14[−21]			9.98[−21]			
					$u=\varepsilon/I$						
					1.05	1.125	1.25	1.50	2.00	2.50	3.00
3s	Na	79	Present	8.373		7.70[−23]	1.26[−22]	1.79[−22]	2.13[−22]	2.16[−22]	2.12[−22]
			Ref. 16	8.370		7.72[−23]	1.24[−22]	1.77[−22]	2.11[−22]	2.17[−22]	2.12[−22]
3s	Na	92	Present	12.204	1.68[−23]	3.67[−23]					
			Ref. 16	12.202	1.68[−23]	3.70[−23]					
					$u=\varepsilon/I$						
					1.10	1.50	2.00				
2s	Li	92	Present	32.96	4.20[−24]	1.24[−23]	1.55[−23]				
			Ref. 12	32.84	4.09[−24]	1.21[−23]	1.51[−23]				
2s	Ne	92	Present	25.31			1.34[−23]				
			Ref. 13	25.31			1.30[−23]				
$2p^*$	Ne	92	Present	29.27			4.93[−23]				
			Ref. 13	29.27			4.77[−23]				
2p	Ne	92	Present	30.00			3.69[−23]				
			Ref. 13	29.95			3.57[−23]				
1s	He	92	Present[a]	130.4	0.54[−24]	1.95[−24]	2.79[−24]				
			Ref. 14	130.2	0.51[−24]	1.76[−24]	2.72[−24]				

[a]Calculated with exchange and interference terms set to zero because that was done in the calculations of Ref. 14.

TABLE II. Comparison of values for the reduced ionization cross section Q_R. Here $2p^*$ means $2p_{1/2}$ and $2p$ means $2p_{3/2}$. Unasterisked entires were obtained using the initial configuration of the target ion in determining the Dirac-Fock-Slater potential with Eqs. (14)–(16), while the asterisked entries were obtained using the configurations of Eqs. (17)–(20) in determining the potential. $x[y]=x\times10^y$.

Active subshell	Type ion	Transition	Z	$I(\mathcal{R})$	$u=\varepsilon/I$ 1.125	1.25	1.50	2.25	4.00	6.00
$1s$	H[a]				0.283	0.479	0.724	0.978	0.954	0.819
	Li	$1s^22s$-$(1s2s)_1$	8	5.1316[1]	0.2667	0.4598	0.7151	1.0224	1.0542	0.9251
	Li	$1s^22s$-$(1s2s)_0$	8	5.1921[1]	0.2691	0.4643	0.7226	1.0344	1.0673	0.9366
	Li	$1s^22s$-$(1s2s)_0$	8	5.1921[1]	0.2602*		0.6858*			0.8605*
	He	$1s^2$-$1s$	8	5.4259[1]	0.2745	0.4716	0.7293	1.0303	1.0486	0.9139
	Li	$1s^22s$-$(1s2s)_1$	26	6.3881[2]	0.2848	0.4850	0.7396	1.0227	1.0403	0.9269
	Li	$1s^22s$-$(1s2s)_0$	26	6.4108[2]	0.2857	0.4865	0.7421	1.0264	1.0444	0.9305
	He	$1s^2$-$1s$	26	6.4949[2]	0.2866	0.4878	0.7429	1.0245	1.0393	0.9249
	Li	$1s^22s$-$(1s2s)_1$	56	3.1798[3]	0.3086	0.5260	0.8041	1.1346	1.2429	1.2103
	Li	$1s^22s$-$(1s2s)_0$	56	3.1855[3]	0.3091	0.5268	0.8055	1.1368	1.2456	1.2130
	He	$1s^2$-$1s$	56	3.2049[3]	0.3097	0.5277	0.8064	1.1369	1.2447	1.2121
	Li	$1s^22s$-$(1s2s)_1$	92	9.5369[3]	0.3770	0.6427	0.9852	1.4205	1.6817	1.7634
	Li	$1s^22s$-$(1s2s)_0$	92	9.5506[3]	0.3774	0.6435	0.9865	1.4226	1.6851	1.7684
	He	$1s^2$-$1s$	92	9.5865[3]	0.3781	0.6447	0.9881	1.4240	1.6855	1.7684
$2s$	H[a]				0.321	0.532	0.771	0.953	0.847	0.695
	Li	$1s^22s$-$1s^2$	8	1.0139[1]	0.3131	0.5240	0.7743	0.9970	0.9186	0.7646
	Li	$1s^22s$-$1s^2$	8	1.0139[1]	0.2966*		0.7308*			0.7040*
	Ne	$2s^2$-$2s$	26	1.0257[2]	0.2949	0.4947	0.7336	0.9528	0.8908	0.7491
	Li	$1s^22s$-$1s^2$	26	1.5042[2]	0.3198	0.5312	0.7745	0.9720	0.8800	0.7327
	Ne	$2s^2$-$2s$	34	2.0232[2]	0.3028	0.5062	0.7462	0.9589	0.8900	0.7501
	Ne	$2s^2$-$2s$	56	6.6576[2]	0.3126	0.5214	0.7661	0.9808	0.9204	0.7924
	Li	$1s^22s$-$1s^2$	56	7.8134[2]	0.3242	0.5389	0.7875	0.9973	0.9292	0.8011
	Ne	$2s^2$-$2s$	79	1.5083[3]	0.3207	0.5353	0.7882	1.0196	0.9889	0.8890
	Ne	$2s^2$-$2s$	92	2.2051[3]	0.3278	0.5476	0.8078	1.0524	1.0449	0.9596
	Li	$1s^22s$-$1s^2$	92	2.4232[3]	0.3372	0.5624	0.8275	1.0745	1.0680	0.9862
$2p^*$	H[a]				0.409	0.668	0.949	1.135	0.977	0.786
	Li	$1s^22p^*$-$1s^2$	8	9.2544[0]	0.4522	0.7492	1.0780	1.3268	1.1778	0.9614
	Li	$1s^22p^*$-$1s^2$	8	9.2544[0]	0.4140*		0.9826*			0.8566*
	Ne	$2p^{*2}$-$2p^*$	26	9.3633[1]	0.4077	0.6752	0.9801	1.2230	1.1069	0.9189
	Ne	$2p^{*2}$-$2p^*$	26	9.3633[1]	0.3955*		0.9514*			0.8832*
	Li	$1s^22p^*$-$1s^2$	26	1.4684[2]	0.4236	0.6939	0.9894	1.1945	1.0446	0.8531
	Li	$1s^22p^*$-$1s^2$	26	1.4684[2]	0.4132*		0.9659*			0.8298*
	Ne	$2p^{*2}$-$2p^*$	34	1.8980[2]	0.4128	0.6810	0.9822	1.2123	1.0875	0.9021
	Ne	$2p^{*2}$-$2p^*$	56	6.4199[2]	0.4196	0.6912	0.9949	1.2255	1.1112	0.9410
	Li	$1s^22p^*$-$1s^2$	56	7.7192[2]	0.4269	0.7007	1.0030	1.2239	1.1023	0.9338
	Ne	$2p^{*2}$-$2p^*$	79	1.4683[3]	0.4292	0.7089	1.0253	1.2812	1.2031	1.0603
	Ne	$2p^{*2}$-$2p^*$	92	2.1512[3]	0.4357	0.7216	1.0489	1.3270	1.2801	1.1579
	Li	$1s^22p^*$-$1s^2$	92	2.3984[3]	0.4460	0.7372	1.0682	1.3461	1.2986	1.1813
$2p$	H[a]				0.409	0.668	0.949	1.135	0.977	0.786
	Li	$1s^22p$-$1s^2$	8	9.2490[0]	0.4554	0.7494	1.0783	1.3270	1.1779	0.9614
	Ne	$2p^4$-$2p^3$	26	9.2677[1]	0.4097	0.6782	0.9839	1.2263	1.1081	0.9192
	Li	$1s^22p$-$1s^2$	26	1.4563[2]	0.4248	0.6956	0.9914	1.1959	1.0446	0.8526
	Ne	$2p^4$-$2p^3$	34	1.8660[2]	0.4157	0.6853	0.9874	1.2162	1.0886	0.9016
	Ne	$2p^4$-$2p^3$	56	6.1268[2]	0.4265	0.7012	1.0063	1.2332	1.1107	0.9360
	Li	$1s^22p$-$1s^2$	56	7.3934[2]	0.4324	0.7086	1.0118	1.2289	1.1002	0.9273
	Ne	$2p^4$-$2p^3$	79	1.3284[3]	0.4435	0.7295	1.0486	1.2950	1.1961	1.0413
	Ne	$2p^4$-$2p^3$	92	1.8603[3]	0.4566	0.7519	1.0828	1.3457	1.2656	1.1317
	Li	$1s^22p$-$1s^2$	92	2.0876[3]	0.4641	0.7630	1.0962	1.3579	1.2800	1.1483

[a]Nonrelativistic Coulomb-Born-Exchange values for hydrogenic ions from Moores, Golden and Sampson, Ref. 22. These values are independent of Z.

limit $Z \rightarrow \infty$ are included for comparison. These are independent of Z.

It is interesting to note that comparisons with other more elaborate calculations and experiments made, for example, in Refs. 22 and 23 indicate the $Q_R^{\rm H}$ lead to cross sections that are quite accurate for Z satisfying Eq. (1) with $Z \leq 26$. This tends to confirm our expectation that the present relativistic distorted-wave results are accurate for Z satisfying Eq. (1) because one sees from Table II that the present results agree rather well with the corresponding $Q_R^{\rm H}$ values for low and intermediate Z. Unfortunately, there are no results by the more elaborate relativistic programs of Refs. 12–16, with which we can compare for large Z, barely satisfying Eq. (1). However, the comparisons for Na-like and Ne-like selenium ($Z=34$) ions made in Table I with the results of Ref. 16 do show good agreement for $Z \simeq 3N$ and $3.4N$, which are quite close to $Z=2N$ or $2.5N$.

Initially, all our calculations were done using the initial configuration of the target ion in determining the Dirac-Fock-Slater potential with Eqs. (14)–(16). However, some of the results for Q_R for low Z, especially for ionization from the $2p_{1/2}$ and $2p_{3/2}$ subshells, looked slightly anomalous to us Hence we decided to do some additional test cases using the configurations given by Eqs. (17)–(20) in determining the potential with Eqs. (14)–(16). This latter procedure is more nearly like that used for excitation in Refs. 3–7. These results are indicated by asterisks as superscripts in Table II. One sees that the effect is quite large for $Z=8$, especially for ionization of the $2p_{1/2}$ electron in Li-like ions in the $1s^2 2p_{1/2}$ configuration,[24] where the asterisked entries are about 10% lower than corresponding unasterisked entries. However, the effect rapidly decreases as Z increases and is seen to be almost negligible ($\sim 2.5\%$) for the same transition when $Z=26$.

It appears that use of results determined using Eqs. (17)–(20) would reduce the "bumpiness" in the data for low Z and would give values for Q_R for any given subshell that vary quite smoothly with ionization energy and for which quite simple fits could be made. In this connection we note that accurate fits of the $Q_R^{\rm H}$ to simple functions of the impact electron energy in threshold units u that are readily integrated over a Maxwellian electron distribution function to obtain ionization rates have been made in Ref. 22. Since, as noted previously, the present relativistic results for Q_R are generally quite close to those of Ref. 22 for $Q_R^{\rm H}$, except for high-Z and/or high-impact electron energies, one would expect that fairly accurate fits of the relativistic results for the reduced cross section could be made, as well, probably using the same functional form given by Eq. (6) of Ref. 22, but allowing the coefficients to be slowly varying functions of an effective Z or of Z and N. This would be very convenient for applications to plasma modeling.

In future work we will attempt to do this. Also, we will consider ionization from additional higher subshells in various types of ions. In addition, we expect to extend the approach to autoionization so that we can treat the excitation-autoionization contribution, which sometimes considerably exceeds the direct contribution to ionization even for high Z, as shown in Ref. 15.

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Rapid Ionization Approach Based on the Factorization Method

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ABSTRACT

The factorization method of Bar-Shalom et al [Phys.Rev. A 38, 1773 (1988)] is extended to relativistic distorted wave cross sections for ionization by electron impact. This leads to a very great simplification for complex ions. In particular, when mixing is confined to the states in a complex (having the same set of n values, parity and J value) the ionization cross section takes the form of a summation over states of the product of a readily calculated quantity that depends only on target ion properties, such as mixing coefficients and angular momenta, and a cross section having exactly the same form as a hydrogenic cross section except that the radial functions should be calculated using the appropriate potential for the ion being considered. Similar results are obtained for intermediate coupling using LS coupling notation and for totally non-relativistic calculations. Only slightly more complicated formula apply when mixing is included outside a complex. It is also noted that similar expressions apply for photoionization. Sample numerical results are obtained and compared with relativistic calculations of Moores and Pindzola [Phys.Rev. A 42, 5384 (1990)]. Quite good agreement is obtained when mixing is included among the same set of states.

I. INTRODUCTION

Recently there is increased interest in the properties of highly charged ions with very large values for the nuclear charge number Z, partly due to the interest in developing ultrashort-wavelength lasers. Also increasingly accurate measurements of various electron-ion scattering processes involving very highly charged ions are being made as a result of technological advances associated with ion sources, traps and storage rings.[1,2] For such ions with $Z \gtrsim 25$ or 30 the j dependence of the radial functions for some orbitals becomes significant so that a fully relativistic approach based on the Dirac equation should be used in calculating their properties.

One of the processes of interest is ionization of highly charged ions by electron impact. Recently several fully relativistic computer programs have been obtained and applied to the calculation of cross sections for ionization of highly charged ions by electron impact.[3–9] Since relativistic ionization cross sections tend to be lenthy to compute and many are needed, it is desirable to have a very rapid method of calculation. Our purpose here is to show how such an approach can be obtained by extending the recent factorization method of Bar-Shalom et al[10] for excitation to ionization. For excitation this approach leads to a huge reduction in the angular part of the calculation. This is very beneficial when that part of the calculation is large in a conventional treatment. This occurs when a small number of orbital transitions contribute to a very large number of transitions, such as is the case for innershell excitation of Na-like ions and transitions between excited levels of Ne-like and Ni-like ions, all of which are of interest for X-ray laser research. Also, as pointed out in Ref. 11 and used in large-scale calculations in Ref. 12 - 17, the factorization method is ideal for calculating cross sections for a given class of transitions simultaneously for a large part of an isoelectronic sequence by using fits of the radial part to power series in Z. As we will show, similar benefits occur for ionization when the factorization method is used. In fact, the simplification in the appropriate formula for ionization is even somewhat greater. Moreover, similar simple formulae apply for photoionization and for semi-relativistic or totally non-relativistic calculations expressed in LS coupling notation.

In the next lengthy section the pertinent theory is outlined. Then in Sec. III a discussion of results and comparison with other work is given. In the final section we give a brief summary and conclusions.

II. THEORY

In outlining the appropriate theory we will follow the procedure used in Ref. 18, where results for ionization were obtained by first considering excitation to a highly excited bound level. Also many of the equations of Ref. 18 apply with only slight modification because the angular part of the matrix elements of the Coulomb interaction between electrons $1/r_{ij}$ is the same in jj coupling for a relativistic treatment as for a non-relativistic treatment. Since considerable use of these equations will be made, equation (x) of Ref. 18 will be designated equation (S,x).

First we will obtain the result for hydrogenic ions using the factorization method. There is little advantage in this for calculating hydrogenic cross sections. The reason we do it is because, in later considering complex ions by the factorization method, we will see that the result for ionization takes the form of a summation of the product of a readily calculated quantity that depends only on the ion properties and a cross section having exactly the same form as a hydrogenic cross section except that the radial functions should be calculated using the appropriate potential for the actual ion.

A. Hydrogenic Ions

The nonrelativistic cross section for excitation of hydrogenic ions is expressed in jj coupling by Eq. (S,20). This also applies for relativistic calculations of excitation of hydrogenic ions after a few modifications are made. First the impact electron energy in Rydbergs, which occurs in the denominator of Eq. (S,20) and which we will designate ϵ(Ryd), should be replaced by k^2, where k is the impact electron wave number. It is related to ϵ(Ryd) by the relativistic expression

$$k^2 = \epsilon(\mathrm{Ryd})[1 + \frac{\alpha^2}{4}\epsilon(\mathrm{Ryd})], \tag{1}$$

where α is the fine structure constant $e^2/\hbar c$. Also the "direct" and "exchange" radial integrals D^λ and E^λ given by Eqs. (S,14) and (S,18) should be replaced by the relativistic expressions, Eqs. (9) and (10) of Ref. 11.

We disgress for a moment to repeat these equations and other related equations for convenience and later reference

$$\begin{aligned} D^\lambda&(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j') \\ &= 2\int_0^\infty \int_0^\infty [P_{n_a l_a j_a}(r_1) P_{n'_a l'_a j'_a}(r_1) + Q_{n_a l_a j_a}(r_1) Q_{n'_a l'_a j'_a}(r_1)] \\ &\qquad \times \frac{r_<^\lambda}{r_>^{\lambda+1}} [P_{\epsilon l j}(r_2) P_{\epsilon' l' j'}(r_2) + Q_{\epsilon l j}(r_2) Q_{\epsilon' l' j'}(r_2)] dr_1 dr_2, \end{aligned} \tag{2}$$

and

$$\begin{aligned} E^\lambda&(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j') \\ &= 2\int_0^\infty \int_0^\infty [P_{n_a l_a j_a}(r_1) P_{\epsilon' l' j'}(r_1) + Q_{n_a l_a j_a}(r_1) Q_{\epsilon' l' j'}(r_1)] \\ &\qquad \times \frac{r_<^\lambda}{r_>^{\lambda+1}} [P_{\epsilon l j}(r_2) P_{n'_a l'_a j'_a}(r_2) + Q_{\epsilon l j}(r_2) Q_{n'_a l'_a j'_a}(r_2)] dr_1 dr_2, \end{aligned} \tag{3}$$

where $r_<$ ($r_>$) is the lesser (greater) of r_1 and r_2. In these equations (l_a, l) and (j_a, j) are the initial obital and total angular momentum quantum numbers for the bound electron and the impact electron, respectively. n_a is the initial principal quantum number. Primes on symbols indicate corresponding final state quantities. The "large" and "small" components $P_{n_a l_a j_a} \equiv P_{n_a \kappa_a}$ and $Q_{n_a l_a j_a} \equiv Q_{n_a \kappa_a}$ of the radial function satisfy the coupled Dirac equations

$$\left[\frac{d}{dr} + \frac{\kappa_a}{r}\right] P_{n_a \kappa_a} = \frac{\alpha}{2}\left[\epsilon_{n_a \kappa_a} - V + \frac{4}{\alpha^2}\right] Q_{n_a \kappa_a} \tag{4}$$

and

$$\left[\frac{d}{dr} - \frac{\kappa_a}{r}\right] Q_{n_a\kappa_a} = \frac{\alpha}{2}(V - \epsilon_{n_a\kappa_a}) P_{n_a\kappa_a}, \tag{5}$$

where $\epsilon_{n_a\kappa_a}$ is the energy eigenvalue and κ_a is the relativistic quantum number satisfying

$$\kappa_a = l_a, \quad j_a = l_a - \tfrac{1}{2}; \quad \kappa_a = -(l_a + 1), \quad j_a = l_a + \tfrac{1}{2}. \tag{6}$$

For the special case of hydrogenic ions $V = -2Z/r$, where Z is the nuclear charge number. The bound state radial functions satisfy the normalization condition

$$\int_0^\infty [P^2_{n_a\kappa_a}(r) + Q^2_{n_a\kappa_a}(r)]dr = 1. \tag{7}$$

Although the free electron radial functions $P_{\epsilon lj} \equiv P_{\epsilon\kappa}$ and $Q_{\epsilon lj} \equiv Q_{\epsilon\kappa}$ satisfy equations analogous to Eqs. (4) – (6), the normalization condition is

$$\int_0^\infty [P_{\epsilon'\kappa}(r)P_{\epsilon\kappa}(r) + Q_{\epsilon'\kappa}(r)Q_{\epsilon\kappa}(r)] = \pi\delta(\epsilon - \epsilon'). \tag{8}$$

Now we return to a consideration of Eq. (S,20) and separate the sums over λ in the direct and exchange contributions , letting $\lambda \to \lambda'$ in the latter. Also in order to apply the factorization method, we make use of the well known formula[19]

$$\begin{Bmatrix} j_a & \lambda' & j' \\ j'_a & J & j \end{Bmatrix} = \sum_t (-1)^{t+\lambda'+J}(2t+1) \begin{Bmatrix} j_a & j' & \lambda' \\ j & j'_a & t \end{Bmatrix} \begin{Bmatrix} j_a & t & j'_a \\ j' & J & j \end{Bmatrix}. \tag{9}$$

Then applying all this to Eq. (S,20) and dropping the Z^2 factor because we do not assume that the principal Z dependence has been scaled out, we have the relativistic expression for the cross section for electon impact excitation of a hydrogenic ion

$$\begin{aligned} Q_H(n_a l_a j_a - n'_a l'_a j'_a) = \frac{8\pi a_o^2}{(2j_a+1)k^2} \sum_J (2J+1) \sum_{\substack{l,l' \\ j,j'}} \Bigg[\sum_\lambda \begin{Bmatrix} j_a & \lambda & j'_a \\ j' & J & j \end{Bmatrix} \\ \times D^\lambda(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j') < j_a \parallel C^\lambda \parallel j'_a >< j \parallel C^\lambda \parallel j' > \\ - \sum_{\lambda'} \sum_t (-1)^{2j'+\lambda'+t}(2t+1) \begin{Bmatrix} j_a & j' & \lambda' \\ j & j'_a & t \end{Bmatrix} \begin{Bmatrix} j_a & t & j'_a \\ j' & J & j \end{Bmatrix} \\ \times E^{\lambda'}(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j') < j_a \parallel C^{\lambda'} \parallel j' >< j \parallel C^{\lambda'} \parallel j'_a > \Bigg]^2, \end{aligned} \tag{10}$$

where

$$< j_1 \parallel C^\lambda \parallel j_2 >= -(-1)^{j_1-1/2}[(2j_1+1)(2j_2+1)]^{1/2}\begin{pmatrix} j_1 & \lambda & j_2 \\ \frac{1}{2} & 0 & -\frac{1}{2} \end{pmatrix}. \quad (11)$$

We note that the compact result given by Eq. (11) is equivalent to that given by Eqs. (S,12), (S,13) and (S,19) except for a slight change in the phase factor because we here assume l is coupled before $s = 1/2$.

The result given by Eq. (10) can be considerably simplified by performing the summation over J using the formula[19]

$$\sum_J (2J+1)\begin{Bmatrix} j_a & \lambda & j'_a \\ j' & J & j \end{Bmatrix}\begin{Bmatrix} j_a & \lambda' & j'_a \\ j' & J & j \end{Bmatrix} = \frac{\delta_{\lambda\lambda'}}{2\lambda+1}. \quad (12)$$

Then after interchanging the labeling λ' and t in the exchange contribution so the results look more like the factorization results in Ref. 10, and using the fact that $(-1)^{2j'} = -1$ because j' is a half integer, the result can be written

$$Q_H(n_a l_a j_a - n'_a l'_a j'_a) = \frac{8\pi a_o^2}{(2j_a+1)k^2}\sum_\lambda Q^\lambda(n_a l_a j_a, n'_a l'_a j'_a), \quad (13)$$

where

$$Q^\lambda(n_a l_a j_a, n'_a l'_a j'_a) = \sum_{\substack{l,l' \\ j,j'}} P^\lambda(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j')^2 \quad (14)$$

and

$$\begin{aligned} P^\lambda(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j') &= (2\lambda+1)^{-1/2} D^\lambda(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j') \\ \times < j_a \parallel C^\lambda \parallel j'_a >< j \parallel C^\lambda \parallel j' > &+ \sum_t (-1)^{\lambda+t}(2\lambda+1)^{1/2}\begin{Bmatrix} j_a & j' & t \\ j & j'_a & \lambda \end{Bmatrix} \quad (15) \\ \times E^t(n_a l_a j_a \epsilon l j; n'_a l'_a j'_a \epsilon' l' j') &\cdot < j_a \parallel C^t \parallel j' >< j \parallel C^t \parallel j'_a > . \end{aligned}$$

In order to obtain the relativistic cross section for ionization from sublevel $n_a l_a j_a$ in a hydrogenic ion we simply replace the final excited bound electron with an ejected electron, sum over its angular momenta and integrate over its energy.

Also the π in Eq. (13) is omitted due to the different normalization for a free electron function, see Eq. (8). The result can be written

$$Q_H(n_a l_a j_a) = \frac{8a_o^2}{(2j_a+1)k^2} \int_0^{(\epsilon - I)/2} d\epsilon'' \sum_\lambda Q^\lambda(n_a l_a j_a), \tag{16}$$

where I is the ionization energy and

$$Q^\lambda(n_a l_a j_a) = \sum_{\substack{l,l',l'' \\ j,j',j''}} P^\lambda(n_a l_a j_a \epsilon l j; \epsilon'' l'' j'' \epsilon' l' j')^2 \tag{17}$$

in which P^λ is given by Eq. (15) with n'_a, l'_a and j'_a everywhere replaced by ϵ'', l'' and j''. This also means that the D^λ and E^λ in Eq. (15) should be given by Eqs. (2) and (3) with $P_{n'_a l'_a j'_a}$ and $Q_{n'_a l'_a j'_a}$ everywhere replaced by $P_{\epsilon'' l'' j''}$ and $Q_{\epsilon'' l'' j''}$. Finally we note that this procedure corresponds to using the "natural" phase approximation as defined in Ref. 5.

B. Complex Ions

Now we consider complex ions and again we first obtain results for excitation to a highly excited bound level. The distorted wave cross section for an excitation transition $\Delta_t J_t - \Delta'_t J'_t$ can be expressed in terms of the reactance matrix R. For ions more than a few times ionized the elements of the reactance matrix are small, especially for excitation to very highly excited levels. Hence, unitarization is unnecessary. Then the cross section is given by

$$Q(\Delta_t J_t - \Delta'_t J'_t) = \frac{2\pi a_o^2}{g_t k^2} \sum_J (2J+1) \sum_{\substack{l,l' \\ j,j'}} \mid R(\Delta_t J_t \epsilon l j J; \Delta'_t J'_t \epsilon' l' j') \mid^2. \tag{18}$$

Here J_t and J are the total angular momentum quantum numbers of the target ion and the total system, respectively. g_t is the statistical weight of the initial level of the target ion and Δ_t designates all quantum numbers in addition to J_t that are necessary to specify the initial level of the target ion. Other symbols have the same meanings as in the previous subsection. Primes on symbols indicate corresponding final state quantities. In general the initial and final levels of the ion will each be mixtures of pure states having the same total angular momentum and parity. Thus

$$R(\Delta_t J_t \epsilon l j J; \Delta_t' J_t' \epsilon' l' j') = \sum_{\beta_t, \beta_t'} b^{J_t}(\Delta_t, \beta_t) b^{J_t'}(\Delta_t', \beta_t') \times R(\beta_t J_t \epsilon l j J; \beta_t' J_t' \epsilon' l' j'), \tag{19}$$

where β_t designates all quantum numbers in addition to J_t neccessary to specify the pure state $\beta_t J_t$, which contributes to $\Delta_t J_t$ with corresponding mixing coefficient $b^{J_t}(\Delta_t, \beta_t)$. Again primes on symbols indicate corresponding final state quantities.

The reactance matrix has a direct and an exchange part

$$R = R^d - R^e. \tag{20}$$

In obtaining detailed results for the pure or unmixed expressions for R^d and R^e we first consider the case that there are only filled, or closed, subshells in addition to the active one, which we label a. Again the results of Ref. 18 apply with slight modifications. Specifically, Eqs. (S,32) - (S,38) are applicable after modifications analogous to those of the previous subsection are made. In particular, in order to use the factorization method, the 9-j in Eq. (S,38) should be re-expressed using the formula[19]

$$\left\{ \begin{matrix} J_a'' & J_a & j_a \\ j_a' & j & \lambda \\ J_a' & J & j' \end{matrix} \right\} = \sum_t (-1)^{2t}(2t+1) \left\{ \begin{matrix} J_a & t & J_a' \\ j' & J & j \end{matrix} \right\} \left\{ \begin{matrix} j_a & t & j_a' \\ J_a' & J_a'' & J_a \end{matrix} \right\} \left\{ \begin{matrix} j_a & j' & \lambda \\ j & j_a' & t \end{matrix} \right\}, \tag{21}$$

where the factor $(-1)^{2t}$ can be omitted because t is here an integer. Then applying the resulting expressions for R^d and R^e to Eq. (20) the result can be written

$$
\begin{aligned}
R(\beta_t J_t \epsilon l j J; \beta_t' J_t' \epsilon' l' j') &= R(n_a l_a j_a^w \alpha_a J_a \epsilon l j J; n_a l_a j_a^{w-1} \alpha_a'' J_a'' n_a' l_a' j_a' J_a' \epsilon' l' j' J) \\
&= 2\sqrt{w}(j_a^{w-1} \alpha_a'' J_a'' \,|\}\, j_a^w \alpha_a J_a)[(2J_t+1)(2J_t'+1)]^{1/2}(-1)^{J_t'+J_t''+j_a'+J_t+j+J} \\
&\times\Bigg[\sum_\lambda (-1)^\lambda \begin{Bmatrix} J_t & \lambda & J_t' \\ j' & J & j \end{Bmatrix} \begin{Bmatrix} j_a & \lambda & j_a' \\ J_t' & J_t'' & J_t \end{Bmatrix} D^\lambda(n_a l_a j_a \epsilon l j; n_a' l_a' j_a' \epsilon' l' j') \\
&\qquad \times < j_a \parallel C^\lambda \parallel j_a' >< j \parallel C^\lambda \parallel j' > \qquad (22) \\
&+ \sum_{\lambda'} \sum_t (-1)^{\lambda'}(2t+1) \begin{Bmatrix} J_t & t & J_t' \\ j' & J & j \end{Bmatrix} \begin{Bmatrix} j_a & t & j_a' \\ J_t' & J_t'' & J_t \end{Bmatrix} \begin{Bmatrix} j_a & j' & \lambda' \\ j & j_a' & t \end{Bmatrix} \\
&\qquad \times E^{\lambda'}(n_a l_a j_a \epsilon l j; n_a' l_a' j_a' \epsilon' l' j') < j_a \parallel C^{\lambda'} \parallel j' >< j \parallel C^{\lambda'} \parallel j_a' > \Bigg].
\end{aligned}
$$

In giving the exchange contribution in Eq. (22) we used the fact that since j' is an integer $(-1)^{2j'} = -1$. In writing Eq. (22) all symbols used previously have retained the same meanings and D^λ and E^λ are given by Eqs. (2) and (3). However, now the potentials used in Eqs. (4) and (5) determining $P_{n_a \kappa_a}$ and $Q_{n_a \kappa_a}$ and in the analogous equations determining $P_{\epsilon\kappa}$ and $Q_{\epsilon\kappa}$ should be those appropriate for the complex ion being considered. Here J_a is the initial total angular momentum of the active subshell a with occupation w, while J_a'' is the final total angular momentum of this subshell with occupation $w-1$. The (|}) is a coefficient of fractional parentage. α_a stands for any additional quantum numbers, such as the seniority number, required to completely specify the state when there are several states with the j_a^w configuration having the same J_a value. An analogous statement applies to α_a'', J_a'' and the j_a^{w-1} configuration.

In giving the final detailed form of the right hand side of Eq. (22) we have largely replaced the subscript a with the subscript t as compared with Eq (21) and Eqs. (S,32) - (S,38), which lead to Eq. (22). Our reasons for doing this should be explained. Of course, in the present case, where any spectator electrons are in closed subshells, $J_a = J_t$, the total angular momentum of the ion, and $J_a'' = J_t''$, the total angular momentum of the remaining core after one electron has been removed and put in the excited final level $n'_a l'_a j'_a$. Also J'_a, which is formed by coupling j'_a to J''_a, is equal to the final total angular momentum of the ion J'_t. Thus, it was valid to replace $J_a, J''_a \text{and} J'_a$ with $J_t, J''_t \text{and} J'_t$. The reason for doing so is that when we go to more complex cases with spectator electrons in partially filled subshells the factors where these replacements have been made remain unchanged and we only need add additional factors to account for the presence of the spectator electrons.

These additional factors all come from the fact that in order to use irreducible tensor techniques to evaluate the matrix elements, as done, for example, in Eqs. (S,32) - (S,37), the coupling must be of the same type for the initial and final states. This was considered in Ref. 18 and lead to Eqs. (S,52) and (S,58). Here as in Ref. 18 it will be assumed that the final excited level $n'_a l'_a j'_a$ is always higher than any partially filled spectator subshells because our intention is eventually to replace $n'_a l'_a j'_a$ by a free electron state in order that we have ionization.

By the same arguments as lead to Eq. (S,53) one finds that, if there are only lower partially filled subshells than the active subshell a and these have total angular momentum J_b, then the extra factor that should multiply the right hand side of Eq.(22) is

$$(-1)^{J_b+j_a+J''_a+J_t}[(2J''_t+1)(2J_a+1)]^{1/2}\left\{\begin{matrix} j_a & J''_a & J_a \\ J_b & J_t & J''_t \end{matrix}\right\}. \tag{23}$$

In this case the initial total angular momentum of the ion J_t equals J_{ba}, where J_{ba} is formed by coupling J_b to J_a. Similarly the final total angular momentum of the core J''_t equals J''_{ba}, which is formed by coupling J_b to J''_a. We note that Eq. (23) also applies for the case that there are no partially filled lower subshells than subshell a, but there is a single partially filled inactive higher subshell with total angular momentum J_b, provided the phase factor is replaced with $(-1)^{J_b+j_a+J_a+J''_t}$. Of course, according to standard practice one would then couple J_a first in the coupling of J_a to J_b so J_t and J''_t would equal J_{ab} and J''_{ab}, respectively.

If there are partially filled lower subshells than subshell a having total angular momentum J_b and also a single partially filled higher subshell having total angular momentum J_c, then the extra factor multiplying the right hand side of Eq. (22) should be

$$(-1)^{J_b+J_c+2j_a+2J_{ba}+J_a''+J_t''}[(2J_{ba}''+1)(2J_a+1)(2J_t''+1)(2J_{ba}+1)]^{1/2} \begin{Bmatrix} j_a & J_a'' & J_a \\ J_b & J_{ba} & J_{ba}'' \end{Bmatrix} \begin{Bmatrix} j_a & J_{ba}'' & J_{ba} \\ J_c & J_t & J_t'' \end{Bmatrix}. \tag{24}$$

In this case the initial total angular momentum of the ion J_t equals J_{bac}, which is formed by coupling J_{ba} to J_c, and the final total angular momentum of the core J_t'' equals J_{bac}'', which is formed by coupling J_{ba}'' to J_c. If in addition to the situation for which Eq. (24) applies there were yet another still higher partially filled subshell with total angular momentum J_d, then the extra factor multiplying the right hand side of Eq. (22) would be

$$\begin{aligned} &(-1)^{J_b+J_c+J_d+3j_a+2J_{ba}+J_{bac}+J_a''+J_{bac}''+J_t''} \\ &\times[(2J_{ba}''+1)(2J_a+1)(2J_{bac}''+1)(2J_{ba}+1)(2J_t''+1)(2J_{bac}+1)]^{1/2} \\ &\times \begin{Bmatrix} j_a & J_a'' & J_a \\ J_b & J_{ba} & J_{ba}'' \end{Bmatrix} \begin{Bmatrix} j_a & J_{ba}'' & J_{ba} \\ J_c & J_{bac} & J_{bac}'' \end{Bmatrix} \begin{Bmatrix} j_a & J_{bac}'' & J_{bac} \\ J_d & J_t & J_t'' \end{Bmatrix}. \end{aligned} \tag{25}$$

in which J_t'' and J_t would equal J_{bacd}'' and J_{bacd}, respectively. This pattern can be continued for any number of partially filled inactive subshells. For example, if in addition to the situation for which Eq. (25) applies there were still one other higher partially filled subshell with total angular momentum J_e, the extra factor multiplying Eq. (22) could be obtained by replacing J_t and J_t'' in Eq. (25) with J_{bacd} and J_{bacd}'' and then multiplying the result by the factor

$$(-1)^{J_e+j_a+J_{bacd}+J_t''}[(2J_t''+1)(2J_{bacd}+1)]^{1/2} \begin{Bmatrix} j_a & J_{bacd}'' & J_{bacd} \\ J_e & J_t & J_t'' \end{Bmatrix}, \tag{26}$$

where J_t'' and J_t here equal J_{bacde}'' and J_{bacde}, respectively.

Now we apply Eq. (22), with the appropriate modifications just discussed for more complex cases, to Eqs. (19) and (18). In doing this we can omit the phase factor $(-1)^{J_t+j+J}$ because J is formed from coupling J_t and j so $J_t + j + J$ is an integer. Also we will again interchange the labels t and λ' in the exchange part in order that the result be more like that obtained in the previous subsection. The summation over J can be performed immediately using the formula[19]

$$\sum_J (2J+1) \begin{Bmatrix} J_t & C & J_t' \\ j' & J & j \end{Bmatrix} \begin{Bmatrix} J_t & C' & J_t' \\ j' & J & j \end{Bmatrix} = \frac{\delta_{CC'}}{2C+1} \tag{27}$$

Then the result for the cross section can be written in the factorized form

$$\begin{aligned} Q(U-U') = \frac{8\pi a_o^2}{(2J_t+1)k^2} \sum_{\substack{S,S' \\ S_1,S_1'}} \sum_{\lambda} B^{\lambda}(U, SS_1; U', S'S_1') \\ \times Q^{\lambda}(n_a l_a j_a, n_a' l_a' j_a'; n_{a1} l_{a1} j_{a1}, n_{a1}' l_{a1}' j_{a1}'), \end{aligned} \tag{28}$$

where we used $g_t = (2J_t + 1)$. In order to simplify the notation we used $U = \Delta_t J_t$ and $U' = \Delta_t' J_t'$ for the initial and final levels. Also we let $S = \beta_t J_t$ and $S_1 = \beta_{t1} J_t$ indicate pure states contributing to U, while $S' = \beta_t' J_t'$ and $S_1' = \beta_{t1}' J_t'$ indicate pure states contributing to U'. Thus,

$$U = \sum_S b(U,S) \mid S >, \; U' = \sum_{S'} b(U',S') \mid S' >, \tag{29}$$

where the b's in Eq. (29) are the mixing coefficients formally written $b^{J_t}(\Delta_t, \beta_t)$ and $b^{J_t'}(\Delta_t', \beta_t')$. Similar to Eq. (14), except that now due to mixing non-diagonal terms contribute,

$$\begin{aligned} Q^{\lambda}(n_a l_a j_a, n_a' l_a' j_a'; n_{a1} l_{a1} j_{a1}, n_{a1}' l_{a1}' j_{a1}') = \sum_{\substack{l,l' \\ j,j'}} P^{\lambda}(n_a l_a j_a \epsilon l j; n_a' l_a' j_a' \epsilon' l' j') \\ \times P^{\lambda}(n_{a1} l_{a1} j_{a1} \epsilon l j; n_{a1}' l_{a1}' j_{a1}' \epsilon' l' j'), \end{aligned} \tag{30}$$

where the P^{λ} are given by Eq. (15), but, of course, the radial functions entering Eqs. (2) and (3) should now be calculated using the appropriate potentials for the actual complex ion being considered. The B^{λ} in Eq. (28) are readily calculated quantities depending only on the properties of the ion. In particular, we can write

$$B^{\lambda}(U, SS_1; U', S'S_1') = F^{\lambda}(US, U'S') F^{\lambda}(US_1, U'S_1'), \tag{31}$$

where

$$F^{\lambda}(US, U'S') = b(U,S)f^{\lambda}(S,S')b(U',S'). \tag{32}$$

For the case that Eq. (22) directly applies

$$\begin{aligned} f^{\lambda}(S,S') &= [(2J_t+1)(2J_t'+1)]^{1/2}(-1)^{J_t'+J_t''+j_a'} \\ &\times\sqrt{w}(j_a^{w-1}\alpha_a''J_a''\,|\}j_a^{w}\alpha_a J_a)\left\{\begin{matrix} j_a & \lambda & j_a' \\ J_t' & J_t'' & J_t \end{matrix}\right\} \end{aligned} \tag{33}$$

and in this special case J_t, J_t' and J_t'' equal J_a, J_a' and J_a'' , respectively. For more complex cases all that is required is that the right hand side of Eq. (33) be multiplied by the appropriate one of Eqs (23) - (25), or in the most complex case discussed, by Eq. (25) modified as discussed in connection with Eq. (26).

As in the previous subsection, in order to obtain results for ionization by electron impact we simply replace the final excited bound electron with a free ejected electron having energy ϵ'' and orbital and total angular momenta l'' and j''. Then we sum over J_t', l'' and j'', integrate over ejected electron energy and divide by π to acount for the different normalization for a free electron, see Eq. (8). Since now J_t'' is the total angular momentum of the final ion with one less bound electron and is a good quantum number, the phase factor in Eq. (33) with j_a' replaced by j'' will not contribute to the cross section because J_t' is formed from J_t'' and j'' so $J_t' + J_t'' + j''$ is an integer. Also the summation over J_t' can be performed using the analog of Eq. (27)

$$\sum_{J_t'}(2J_t'+1)\left\{\begin{matrix} j_a & \lambda & j'' \\ J_t' & J_t'' & J_t \end{matrix}\right\}\left\{\begin{matrix} j_{a1} & \lambda & j'' \\ J_t' & J_t'' & J_t \end{matrix}\right\} = \frac{\delta_{j_a j_{a1}}}{2j_a+1}. \tag{34}$$

Generally only states with the same parity can mix. In order that this be satisfied for both the initial and final levels of the ion, while Eq. (34) is also satisfied, it is necessary that $l_{a1} = l_a$. Moreover, it is usually valid for highly charged ions to include mixing only among states in a complex, that is with the same set of n values, as well as parity and J value. In addition, for ionization both $n_a l_a j_a \rightarrow \epsilon'' l'' j''$ and

$n'_{a1}l'_{a1}j'_{a1} \rightarrow \epsilon''l''j''$. Hence, it is apparent that only diagonal terms contribute to Eq. (30) in this case. Thus, collecting results, the relativistic cross section for ionization from initial ion level U to final ion level U'' with one less bound electron can be expressed in the very simple form

$$Q(U - U'') = \sum_{\substack{S,S'' \\ S_1,S_1''}} B(U,SS_1;U'',S''S_1'')Q_H^{ps}(n_a l_a j_a), \tag{35}$$

where Q_H^{ps} is given by Eqs. (15), (16) and (17) except that now the I in Eq. (16) is the actual ionization energy of the complex ion and the radial functions entering the expressions for D^λ and E^λ are those calculated using the appropriate potential for the complex ion being considered. Here, similar to Eq. (31)

$$B(U,SS_1;U'',S''S_1'') = F(US,U''S'')F(US_1,U''S_1''), \tag{36}$$

where

$$F(US,U''S'') = b(U,S)f(S,S'')b(U'',S''). \tag{37}$$

As before S and S_1 are states contributing to the initial target ion level U. Similarly S'' and S_1'' are states with total angular momentum J_t'' contributing to final ion level U'' with corresponding mixing coefficients $b(U'',S'')$ and $b(U'',S_1'')$. For the simple case that there are only filled subshells in addition to the active subshell a the factor $f(S,S'')$ is given by

$$f(S,S'') = \sqrt{w}(j_a^{w-1}\alpha_a''J_a''\,|\}j_a^w\alpha_a J_a). \tag{38}$$

Again for more complex cases all that is required is that the right hand side of Eq. (38) be multiplied by the appropriate one of Eqs. (23) - (25), or for the most complex case considered, by Eq. (25) modified as discussed in connection with Eq. (26).

One might have thought the summation over S_1 in Eq. (35) would not be neccessary due to the $\delta_{j_a j_{a1}}$ in Eq. (34); however, the same orbital transition can occur from different states contributing to the initial ion level. For example, in oxygen-like ions ionization from the $2p_{3/2}$ subshell can occur from any of the states $(2s_{1/2}^2 2p_{1/2}^2 2p_{3/2}^2)_0$, $(2s_{1/2}^2 2p_{3/2}^4)_0$ and $(2p_{1/2}^2 2p_{3/2}^4)_0$, which all contribute to each of the even parity levels with $J_t = 0$. Also ionization from $2p_{1/2}$ can occur from the first and last of these three states.

By procedures like that given in the appendix of Ref. 18, one finds that Eq. (35) also applies for photoionization if the collisional ionization cross sections on both sides of the equation are replaced with corresponding photoionization cross sections. Of course, Eq. (35) applies as well when non-relativistic calculations have been made and expressed in jj coupling notation. The only difference would be that the radial integrals D^λ and E^λ in Eq. (15) would be calculated non-relativistically. Also in that case the Q_H^{ps} is Eq. (35) becomes independent of j_a and one would usually want results expressed in LS coupling notation. Both of these matters will be discussed in the following subsection.

C. Modifications for Near Neutral Atoms or Ions

Although our interest here is principally in relativistic results for highly charged ions, the convenient expressions obtained in the previous subsection also apply with slight modification for distorted wave ionization calculations in general. In particular, we consider here the modifications that may be needed in treating near neutral atoms and ions of either high or low Z. For such cases there are two kinds of modifications that might be required. One of these is that one might not want to restrict the mixing to states in the same complex. This is especially true if Z is quite large so that even ionization from the ground level involves ionization from shells with large n for which states with neighboring n values have quite nearly the same energy. The other is that one might want results expressed using LS coupling notation, which is more familiar to most workers, rather than jj coupling notation, which is natural for relativistic calculations.

First we consider inclusion of mixing outside the states in a complex. In this case Eq. (34) and the argument following it regarding parity still apply so $j_{a1} = j_a$ and $l_{a1} = l_a$. Thus, the angular part of the calculation is unchanged and Eq. (35) still applies except that in performing the summation over states in Eq. (35) there will be additional contributions. These are terms in which $Q_H^{ps}(n_a l_a j_a)$ is replaced by $Q_H^{ps}(n_a n_{a1} l_a j_a)$, where the latter is also given by Eqs. (16) and (17) except that $Q^\lambda(n_a l_a j_a)$ is replaced with

$$Q^\lambda(n_a n_{a1} l_a j_a) = \sum_{\substack{l,l',l'' \\ j,j',j''}} P^\lambda(n_a l_a j_a \epsilon l j; \epsilon'' l'' j'' \epsilon' l' j') P^\lambda(n_{a1} l_a j_a \epsilon l j; \epsilon'' l'' j'' \epsilon' l' j'). \tag{39}$$

Now we consider the modifications to Eq. (35) that are required if LS coupling notation is used in place of jj coupling. Similar considerations were made in Subsection IVB of Ref. 18 and again we can make use of some of the equations in that reference. Of course, in using LS coupling one couples the orbital angular momenta of all electrons in each subshell nl to get a total orbital angular momentum for each subshell. Then these are coupled together successively working outward from lower to higher subshells until a total orbital angular momentum L_t for the atom or ion is obtained. Similarly spins are coupled in an analogous manner until total spin S_t is obtained. Then L_t and S_t are coupled to give total angular momentum for the ion J_t. However, for the final state of the ion we use this procedure only for the core, which corresponds to one less electron in the active subshell a. For the final excited electron in the subshell a' we couple l'_a and spin $s'_a = 1/2$ to form j'_a, as for jj coupling, because we will eventually go to the limit that this becomes a free (ejected) electron to give ionization. Then in order to use irreducible tensor techniques to evaluate the reactance matrix one must recouple the initial ion wave function so it is coupled in the same way. For the case that there are only filled subshells in addition to the active subshell a, the appropriate equations are given by Eqs. (S,45) - (S,48). Evaluation of the pure or unmixed reactance matrix elements then proceeds as in the jj coupling case because it is only the inactive electrons that are LS coupled. The final result for the cross section when one proceeds to ionization is given by an equation like Eq. (35)

$$Q(U - U'') = \sum_{j_a} \sum_{\substack{S,S'' \\ S_1,S_1''}} B(U, SS_1; U'', S''S_1'') Q_H^{ps}(n_a l_a j_a), \tag{40}$$

where again Eqs. (36) and (37) apply. However, the states S (or S_1) and S'' (or S_1'') contributing to the initial and final ion levels are now pure LS coupled states. Hence, the mixing coefficients now entering Eq. (37) will differ from those in the jj coupling case, but the numerical values obtained for $Q(U - U'')$ will be the same if the same physical approximations have been made in the calculations.

Also in the case that LS coupling is used the $f(S, S'')$ in Eq. (37) must be given by

$$\begin{aligned} f(S, S'') &= [(2L_t + 1)(2S_t + 1)(2J_t'' + 1)(2j_a + 1)]^{1/2} \\ &\times \sqrt{w} (l_a^{w-1} \alpha_a'' L_a'' S_a'' \,|\}\, l_a^w \alpha_a L_a S_a) \begin{Bmatrix} L_t'' & l_a & L_t \\ S_t'' & 1/2 & S_t \\ J_t'' & j_a & J_t \end{Bmatrix} \end{aligned} \tag{41}$$

in place of Eq. (38). In Eq. (41) the LS coupling coefficients of fractional parentage ($|\}$) will generally differ from the jj coupling ones in Eq. (38). In addition, the initial occupation w of the active subshell a will usually differ (be larger) for LS coupling because the subshell is indicated by $n_a l_a$ instead of $n_a l_a j_a$.

The extra factor in Eq. (41) as compared with Eq. (38) arises from the recoupling of the initial target ion wave function discussed above Eq. (40), see Eq. (S,48). However, it is important to note that the 9-j in Eq. (41) differs by a phase factor from that in Eq. (S,50) because here we have assumed L is coupled before S, rather than S before L as in Ref. 18.

Of course, Eq. (41) directly applies only when there are filled or empty subshells in addition to the active one. For that case we have used the fact that $L_a = L_t, S_a = S_t, J_a = J_t, L''_a = L''_t, S''_a = S''_t$ and $J''_a = J''_t$ in writing the recoupling factor. This was done because this factor then remains unchanged when one considers more complicated cases in which there are partially filled subshells in addition to the active subshell. In such cases additional recoupling of the initial target ion wave function is necessary in order to use irreducible tensor techniques in determining matrix elements, as considered in Ref. 18 in connection with Eq. (S,54). This results in the right hand side of Eq. (41) being multiplied by extra factors.

These extra factors are factors like those given by Eqs. (23) – (25) for the similar situation when jj coupling is used except that for each factor in the jj coupling case there are two factors. These are each exactly like the jj factor except that in one of them spins everywhere replace corresponding total angular momenta and in the other orbital angular momenta replace corresponding total angular momenta. For example, we consider the case that there are no partially filled higher subshells, but there are lower subshells with total spin S_b and total orbital angular momentum L_b. Then, analogous to Eq. (23) for the similar jj coupling case the extra factor multiplying the right hand side of Eq. (41) is

$$\begin{aligned}&(-1)^{L_b+l_a+L''_a+L_t}[(2L''_t+1)(2L_a+1)]^{1/2}\begin{Bmatrix} l_a & L''_a & L_a \\ L_b & L_t & L''_t \end{Bmatrix}\\ &\times(-1)^{S_b+1/2+S''_a+S_t}[(2S''_t+1)(2S_a+1)]^{1/2}\begin{Bmatrix} 1/2 & S''_a & S_a \\ S_b & S_t & S''_t \end{Bmatrix}.\end{aligned} \tag{42}$$

In this case the initial total orbital and spin angular momenta of the target ion are $L_t = L_{ba}$ and $S_t = S_{ba}$, while the total orbital and spin angular momenta of the final ion are $L''_t = L''_{ba}$ and $S''_t = S_{ba}$. Of course, L''_{ba} is obtained by coupling L_b to L''_a, and S''_{ba} is obtained by coupling S_b to S''_a.

As in the case of Eq. (35), if mixing is included among states outside the complex, then there will be contributions to Eq. (40) from additional terms in which $Q_H^{ps}(n_a l_a j_a)$ is replaced with $Q_H^{ps}(n_a n_{a1} l_a j_a)$ determined as discussed in connection with Eq. (39).

From comparison of Eqs. (41) and (42) with the analogous Eqs. (38) and (23), it appears that $f(S, S'')$ is considerably more complex when LS coupling is used than when jj coupling is used in writing the basis states. However, there are many more subshells when they are labeled by n, l and j values, as in jj coupling, than when they are labeled by n and l, as in LS coupling.

When LS coupling notation is strictly appropriate, the radial functions are calculated non-relativistically, as in the well known University College London program, "superstructure",[20] or semi-relativistically as in Cowan's well-known program.[21] Then intermediate coupling effects are calculated perturbatively. In either case the radial functions depend only on n and l, rather than on n, l and j, as in a fully relativistic treatment based on use of the Dirac equation. When the radial functions are independent of j values, the same is true of the Q_H^{ps} or Q_H given by Eqs. (16) and (17). This is considered in the appendix and leads to Eq. (A10), or when mixing is included among states outside the complex, to Eq. (A10) modified by Eqs. (A13) - (A15).

For very low Z atoms and ions it is well known that pure LS coupling becomes a good approximation. That is, intermediate coupling effects become negligible and the energies of the initial and final ions become independent of J_t and J_t''. Then the only dependence on j_a, J_t'' and J_t is in the f factor given by Eq. (41). Also L_t, S_t, L_t'' and S_t'' are good quantum numbers in this case. Then one can sum Eq. (40) over j_a and J_t'' using[19]

$$\sum_{J_t'', j_a} (2J_t'' + 1)(2j_a + 1) \begin{Bmatrix} L_t'' & l_a & L_t \\ S_t'' & 1/2 & S_t \\ J_t'' & j_a & J_t \end{Bmatrix}^2 = \frac{1}{(2L_t + 1)(2S_t + 1)}. \qquad (43)$$

This leads to a result for pure LS coupling that has a form like Eq. (35)

$$Q(U-U'')=\sum_{\substack{S,S''\\S_1,S_1''}} B(U,SS_1;U'',S''S_1'')Q_H^{ps}(n_a l_a), \tag{44}$$

where $Q_H^{ps}(n_a l_a)$ is given by Eq. (A10) with, of course, the non-relativistic radial integrals $D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l')$ and $E^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l')$ determined using the appropriate potentials for the ion being considered. Also the B in Eq. (44) has the same form as given by Eq. (37), and, if there are only filled subshells in addition to the active one,

$$f(S,S'')=\sqrt{w}(l_a^{w-1}\alpha_a'' L_a'' S_a'' \, |\} l_a^w \alpha_a L_a S_a), \tag{45}$$

which has an appearance like Eq. (38). For more complicated cases this should be multiplied by the appropriate factor discussed in the paragraph containing Eq. (42). If mixing outside a complex is included, similar to the discussion of Eqs. (35) and (40) for this situation, the summation over states in Eq. (44) will include contributions from terms in which $Q_H^{ps}(n_a l_a)$ is replaced with $Q_H^{ps}(n_a n_{a1} l_a)$ given by Eq. (A10) modified by Eqs. (A13) – (A15).

On another topic we note that in applying Eq. (35) to ionization by electron impact in complex cases, where several transitions involve ionization from the same subshell $n_a l_a j_a$, considerable computing time can be saved if for each impact electron energy the $Q_H^{ps}(n_a l_a j_a)$ (and $Q_H^{ps}(n_a n_{a1} l_a j_a)$ if mixing outside a complex is included) are calculated using three values for the transition energy spanning the range of actual transition energies. Then the results for the exact energy of each ionization transition are obtained by Lagrangian interpolation. Our tests indicate this is accurate to better than 1%. Analogous statements apply to Eqs. (40) and (44).

III. ILLUSTRATIVE RESULTS AND DISCUSSION

With the use of Eq. (35) we have calculated relativistic cross sections for ionization of carbon-like and nitrogen-like uranium and for innershell ionization of neon-like xenon initially in an excited level. Results are given in Tables I – III, where comparison is made with corresponding relativistic calculations of Moores and Pindzola[8] made using the multiconfiguration Dirac-Fock (MCDF) approximation.[22,23]

The present results were obtained using the more approximate Dirac-Fock-Slater atomic structure program of Ref. 24, but modified, as discussed in Ref. 16, to include the generalized Breit interaction and other QED corrections. In this program the potential V used in Eqs. (4) and (5) determining the radial functions is the Dirac-Fock-Slater potential given by Eqs. (4) – (6) of Ref. 16. In considering a given class of transitions this potential is determined using a single mean configuration with fractional occupation numbers for some subshells corresponding to approximately splitting the occupation of the active electron between initial and final subshells. For ionization we assume an occupation number of 0.5 for a very high subshell to mock up the effect of the ejected electron. The same potential is used for all electrons bound and free. Hence, all orbitals are automatically orthogonal and exchange is treated in a consistent manner, which can be important near threshold for some transitions.

The mean configuration used in determining the potential in the present calculations was

$$1s^2 2s^2 2\overline{p}^{0.5} 2p^{1.0} 8f^{0.5} \tag{46}$$

for ionization of C-like uranium,

$$1s^2 2s^2 2\overline{p}^{0.83} 2p^{1.67} 8f^{0.5} \tag{47}$$

for ionization of N-like uranium, and

$$1s^2 2s^{1.6} 2\overline{p}^{1.6} 2p^{3.3} 3s^{0.2} 3\overline{p}^{0.2} 3p^{0.2} 3\overline{d}^{0.2} 3d^{0.2} 8f^{0.5} \tag{48}$$

for innershell ionization of excited Ne-like xenon. Here and in the tables we have used $n\bar{l}$ and nl to indicate nlj with $j = l - 1/2$ and $j = l + 1/2$, respectively, as done in Ref. 8. We note that results are insensitive to how a given total occupation is distributed among the subshells of a given shell. Also they are insensitive to the precise high subshell used to mock up the effect of the ejected electron. For example, replacement of $8f^{0.5}$ witl. $6f^{0.5}$ or $10f^{0.5}$ had no effect on the results given in the tables.

Ordinarily in considering excitation, as in Ref. 12 - 17, the same mean configuration is used in determining the potential for the orbitals entering the radial scattering integrals given by Eqs. (2) and (3) and for the bound orbitals entering the analogous integrals that occur in diagonalizing the ion Hamiltonian to determine the energy levels. However, for determining ionization energies we used a different appropriate mean configuration for each ion. For N-like, C-like and B-like uranium considered in Tables I and II this was $1s^2 2s^2 2\bar{p} 2p^2$, $1s^2 2s^2 2\bar{p}^{0.66} 2p^{1.34}$ and $1s^2 2s^2 2\bar{p}^{0.33} 2p^{0.66}$, respectively. For excited neon-like Xenon considered in Table III, it was $1s^2 2s^{1.75} 2\bar{p}^{1.75} 2p^{3.5} 3s^{0.2} 3\bar{p}^{0.2} 3p^{0.2} 3\bar{d}^{0.2} 3d^{0.2}$ and for the final F-like ion it was the same except the occupations of the $2s, 2\bar{p}$ and $2p$ subshells were reduced by 0.25, 0.25 and 0.5, respectively.

It should be emphasized that the mean configurations are used solely in determining the potentials to be used in calculating the radial functions with Eqs. (3) and (4) or the analogs for free electrons, and that basically the calculations are multiconfiguration calculations. Usually we include all the mixing among the states in a complex. This was done in making the present calculations, but for comparison purposes calculations were also made with the more limited amount of mixing included by Moores and Pindzola.[8] Hence, our values given in Tables I and II and the SZ2 entries in Table III were calculated the latter way. For ionization of C-like and N-like uranium, as noted in Ref. 8, configuration mixing has very little effect, and we found the cross sections to be changed by less than 1%, usually much less, when mixing among all states in a complex was included. However, this is not true for the more complex case of innershell ionization of excited neon-like xenon for which results are given in Table III. The MP and SZ2 values in the table were obtained including only the mixing of the $2s^2 2\overline{p}^2 2p^3 3s$ and $2s^2 2\overline{p} 2p^4 3s$ states with $J_t = 1$ for the initial ion and the $2s^2 2\overline{p}^2 2p^2 3s$, $2s^2 2\overline{p} 2p^3 3s$ and $2s^2 2p^4 3s$ states with $J_t'' = 1/2$ for the final ion. Actually as given in Table I of Ref. 24 and Ref. 16 there are 7 states contributing to the initial levels and 15 contributing to the final levels of these transitions when all mixing within a complex is included. This was done in obtaining the SZ1 entries and one sees by comparing SZ1 and SZ2 entries that this has a significant effect on ionization cross sections for some transitions.

For the MP and SZ2 entries in Table I and II, where mixing was allowed among the same set of states in both sets of calculations, the differences in physical approximations made in the two sets of calculations are of two kinds. These are that (1) different potentials were used in calculating the radial functions with Eqs. (3) and (4) and their analogs for free electrons in the two sets of calculations, and (2) the Breit interaction was included in calculating the scattering matrix elements in the MP calculations, while it was not in the present calculations. As found in Ref. 5 and 8, the effect of (2) is generally small for ionization unless very high impact electron energies ($\gtrsim$ 250 keV) are considered. Of course, this effect is most likely to be important for high Z. It may be the principal reason for the differences in Table I and II between SZ and MP entries, which are rather small. For ioniation of Xe^{44+} considered in Table III the agreement between MP and SZ2 entries is also quite good, but worse than the agreement for U^{86+} and U^{85+}. In the case of Xe^{44+}, with a lower Z and larger number of bound electrons, the differences are probably mostly due to the effect of (1).

Finally, we note that a program for computing cross sections for ionization to specific magnetic sublevels of the final ion has been written.[25] This was also used to calculate numerical results for the total ionization cross sections for the transitions considered in the tables. Agreement with the results calculated with Eq. (35) was obtained to four or five significant figures. Since the the same physical approximations are used, but the angular parts of calculations are done in completely different ways, this is a good check that no errors were made in either computer program.

IV. SUMMARY AND CONCLUSIONS

The factorization method of Bar-Shalom et al[10] for excitation has been extended to ionization by electron impact. This leads to a very large simplification for complex ions. If the mixing is confined to that among states in a complex, as is usually valid for highly charged ions, the ionization cross section reduces to a very simple form. This is Eq. (35) for jj coupling notation, as appropriate for relativistic calculations, Eq. (40) for LS coupling notation, and Eq. (44) for pure LS coupling in which intermediate coupling effects are negligible. In these equations the B factors, which depend only on target ion properties such as mixing coefficients and angular momenta, are very readily calculated. The $Q_H^{ps}(n_a l_a j_a)$ or $Q_H^{ps}(n_a l_a)$ are ionization cross sections of exactly the same form as those for hydrogenic ions given by Eqs. (16) and (17) or Eq. (A10) except that the radial integrals D^λ and E^t should be evaluated using radial functions calculated with potentials appropriate for the particular ion being considered.

If mixing is included with states outside the complex, the results are nearly as simple. The only difference is there will be additional contributions in the summation over states in Eqs. (35), (40) or (44) that involve terms with $Q_H^{ps}(n_a l_a j_a)$ or $Q_H^{ps}(n_a l_a)$ replaced with $Q_H^{ps}(n_a n_{a1} l_a j_a)$ or $Q_H^{ps}(n_a n_{a1} l_a)$, which are determined as described in the discussion regarding Eq. (39) or Eqs. (A13) – (A15).

It is of interest to point out that these results apply, as well, to photoionization, if collision cross sections are everywhere replaced with corresponding photoionization cross sections.

We also note that it was shown in the appendix of Ref. 26 that a result like Eq. (35) applies in special cases, but it was not realized that it applies in general when mixing is confined to the states in a complex.

In addition to the fact that Eqs. (35), (40) and (44) are well suited for rapid calculations of ionization cross sections, they have the additional advantage that, when the Q_H^{ps} are expressed in terms of "reduced cross sections", it appears that simple fits convenient for plasma modeling calculations can be made. In particular, as discussed in Ref. 9, it appears that the "reduced cross section" can be fitted to simple functions of the impact electron energy in threshold units, like those made to non-relativistic Coulomb-Born-Exchange results in Ref. 27, but with coefficients that are slowly varying functions of Z and N or an effective Z.

Results with the program based on Eq. (35) were compared in Table I – III with recent relativistic distorted wave calculations of Moores and Pindzola[8]. The agreement was found to be quite good when the same degree of mixing was allowed. The fairly small differences in results for these cases could be attributed to the fact that different potentials were used in calculating the radial functions and the Breit interaction was included in calculating the scattering matrix elements in Ref. 8, while it was not in the present calculations.

As an additional check on Eq. (35) another relativistic distorted wave ionization program[25], which is based on the very different and more lengthy formation of the angular part of the calculation needed for calculating ionization to specific magnetic sublevels, was also used to calculate ionization cross sections for the cases considered in the tables. The two methods, which use the same physical approximations, gave exactly (to within 4 or 5 significant figures) the same numerical results.

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We wish to thank Robert E. H. Clark for discussions regarding needs for near neutral atoms and ions, including LS coupling results and results when mixing outside a complex is included. This work was supported in part by the Innovative Science and Technology Office of the Strategic Defense Initiative Organization and by the U.S. Department of Energy under Grant No. DE-FG02-90ER54104 and a Lawrence Livermore National Laboratory Subcontract.

APPENDIX

Here we outline the demonstration that the $Q_H(n_a l_a j_a)$ given by Eqs. (16) and (17) becomes independent of j value when the radial functions are independent of j value, as one would expect must be true. Of course, in this case the radial integrals are independent of j value

$$D^\lambda(n_a l_a j_a \epsilon l j; \epsilon'' l'' j'' \epsilon' l' j') \rightarrow D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') \tag{A1}$$

$$E^\lambda(n_a l_a j_a \epsilon l j; \epsilon'' l'' j'' \epsilon' l' j') \rightarrow E^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l'). \tag{A2}$$

Then one needs to show that when this is true the angular part of Eq. (16) also becomes independent of j values. In doing this, instead of using Eq. (11), one uses the more lengthy form[19]

$$\begin{aligned} < j_1 \parallel C^\lambda \parallel j_2 > &=< l_1 \tfrac{1}{2} j_1 \parallel C^\lambda \parallel l_2 \tfrac{1}{2} j_2 > \\ &= (-1)^{j_2+l_1+1/2+\lambda}[(2j_1+1)(2j_2+1)]^{1/2} \begin{Bmatrix} l_1 & \lambda & l_2 \\ j_2 & \frac{1}{2} & j_1 \end{Bmatrix} < l_1 \parallel C^\lambda \parallel l_2 > \end{aligned} \tag{A3}$$

for the angular factors in the application of Eq. (15) with $n'_a l'_a j'_a \rightarrow \epsilon'' l'' j''$ to Eq. (17) for ionization. Also we write

$$\sum_\lambda Q^\lambda = \sum_\lambda Q_d^\lambda + \sum_\lambda Q_{int}^\lambda + \sum_\lambda Q_{ex}^\lambda, \tag{A4}$$

where the first part comes from the square of the part of P^λ (see Eq. (15)) proportional to D^λ, the second part is the inteference part due to cross terms proportional to $D^\lambda E^t$ and the last part is the pure exchange part involving terms proportional to $E^t E^{t'}$. We consider the latter first and use [19]

$$\sum_\lambda (2\lambda+1)\left\{\begin{matrix} j_a & j' & t \\ j & j'' & \lambda \end{matrix}\right\}\left\{\begin{matrix} j_a & j' & t' \\ j & j'' & \lambda \end{matrix}\right\} = \frac{\delta_{tt'}}{2t+1}. \tag{A5}$$

$$\sum_{j'}(2j'+1)\left\{\begin{matrix} l_a & t & l' \\ j' & \frac{1}{2} & j_a \end{matrix}\right\}^2 = \frac{1}{2l_a+1}, \quad \sum_{j''}(2j''+1)\left\{\begin{matrix} l & t & l'' \\ j'' & \frac{1}{2} & j \end{matrix}\right\}^2 = \frac{1}{2l+1}, \tag{A6}$$

and

$$\sum_j (2j+1) = 2(2l+1). \tag{A7}$$

This leads to

$$\sum_\lambda Q^\lambda_{ex} = \frac{2(2j_a+1)}{(2l_a+1)}\sum_t \sum_{l,l',l''} \frac{1}{2t+1}[E^t(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') \\ \times < l_a \parallel C^t \parallel l' >< l \parallel C^t \parallel l'' >]^2. \tag{A8}$$

A very similar result is obtained for the "direct" part, the first part of Eq. (A4), by summing over j' and j'' using equations analogous to Eqs. (A6) and then using Eq. (A7). The interference terms, which involve a product of five 6-j's is most difficult to evaluate. By introducing a factor $(-1)(-1)^{2j'}$, which equals unity because j' is a half integer, one can perform the summation over j' and express the product of three of the $6-j$'s as a $9-j$ in analogy to Eq. (S,38). Then the product of this and one of the remaining $6-j$'s can be summed over j to lead to a product of two $6-j$'s in analogy to Eq. (S,42). One of these equals the remaining of the original $6-j$'s. These two are then eliminated by summing over j''. Specifically

$$\sum_{j''}(2j''+1)\left\{\begin{matrix} l_a & \lambda & l'' \\ j'' & \frac{1}{2} & j_a \end{matrix}\right\}^2 = \frac{1}{2l_a+1}. \tag{A9}$$

Finally applying all these to Eq. (16) one finds that, when the radial functions are independent of j values, it reduces to

$$Q_H(n_a l_a j_a - n_a' l_a' j_a') \to Q_H(n_a l_a) = \frac{16a_o^2}{(2l_a+1)k^2} \int_0^{(\epsilon-I)/2} d\epsilon'' \sum_{l,l',l''}$$

$$\times \Big\{ \sum_\lambda \frac{1}{2\lambda+1} D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l')^2 < l_a \parallel C^\lambda \parallel l'' >< l \parallel C^\lambda \parallel l' >$$

$$-\sum_\lambda \sum_t (-1)^{\lambda+t} D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') E^t(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') \begin{Bmatrix} l' & l & \lambda \\ l'' & l_a & t \end{Bmatrix} \tag{A10}$$

$$\times < l_a \parallel C^\lambda \parallel l'' >< l \parallel C^\lambda \parallel l' >< l_a \parallel C^t \parallel l' >< l \parallel C^t \parallel l'' >$$

$$+\sum_t \frac{1}{2t+1} E^t(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l')^2 [< l_a \parallel C^t \parallel l' >< l \parallel C^t \parallel l'' >]^2 \Big\},$$

where

$$< l_1 \parallel C^\lambda \parallel l_2 >= (-1)^{l_1} [(2l_1+1)(2l_2+1)]^{1/2} \begin{pmatrix} l_1 & \lambda & l_2 \\ 0 & 0 & 0 \end{pmatrix}. \tag{A11}$$

We note that Eq. (A10) is consistent with Eq. (S,24) for excitation to a high level $n_a' l_a'$ except that in the interference part of Eq. (S,24) the factor $< l_a \parallel C^\lambda \parallel l' ><$ $l \parallel C^\lambda \parallel l_a' >$ should have been replaced with

$$\begin{Bmatrix} l' & l & \lambda \\ l_a' & l_a & \lambda' \end{Bmatrix} < l_a \parallel C^{\lambda'} \parallel l' >< l \parallel C^{\lambda'} \parallel l_a' > . \tag{A12}$$

Of course, if mixing is included with states outside a complex, similar to the discussion connected with Eq. (39), there will be additional contributions to the summation over states in Eq. (40). These are terms in which $Q_H^{ps}(n_a l_a j_a)$ is replaced with $Q_H^{ps}(n_{a1} l_a j_a)$, but, if the radial functions do not depend on j value, this reduces to $Q_H^{ps}(n_a n_{a1} l_a)$ given by Eq.(A10) with the replacements

$$D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l')^2 \to D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') D^\lambda(n_{a1} l_a \epsilon l; \epsilon'' l'' \epsilon' l') \tag{A13}$$

$$D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') E^t(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') \to \tfrac{1}{2}[D^\lambda(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l')$$
$$\times E^t(n_{a1} l_a \epsilon l; \epsilon'' l'' \epsilon' l') + D^\lambda(n_{a1} l_a \epsilon l; \epsilon'' l'' \epsilon' l') E^t(n_a l_a \epsilon l j; \epsilon'' l'' j'' \epsilon' l' j')] \tag{A14}$$

and

$$E^t(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l')^2 \rightarrow E^t(n_a l_a \epsilon l; \epsilon'' l'' \epsilon' l') E^t(n_{a1} l_a \epsilon l; \epsilon'' l'' \epsilon' l'). \qquad (A15)$$

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TABLE I. Comparison of ionization cross sections for U^{86+}. Present results are labeled SZ. Those of Moores and Pindzola (Ref. 8) are labeled MP.

Transition	Threshold energy(keV) SZ	MP	Cross section $(10^{-24}cm^2)$ at 2th.u[a] SZ	MP
$2\bar{p}^2(0)$[b] $\rightarrow$ $2\bar{p}(1/2)$	31.06	31.06	43.5	45.2
$2\bar{p}2p(1)$ $\rightarrow$ $2\bar{p}(1/2)$	27.08	27.08	29.3	31.6
$2\bar{p}2p(2)$ $\rightarrow$ $2\bar{p}(1/2)$	27.06	27.06	29.3	31.6
$2\bar{p}2p(1)$ $\rightarrow$ $2p(3/2)$	31.17	31.17	21.7	23.3
$2\bar{p}2p(2)$ $\rightarrow$ $2p(3/2)$	31.15	31.15	21.7	23.3
$2p^2(2)$ $\rightarrow$ $2p(3/2)$	27.11	27.11	58.4	62.0
$2p^2(0)$ $\rightarrow$ $2p(3/2)$	27.02	27.02	58.6	62.0

[a] th.u. = threshold units = (incident energy)/(threshold energy)

[b] Here $n\bar{l}$ and nl mean nlj with $j = l-1/2$ and $j = l+1/2$, respectively. The quantity in parenthesis is the total angular momentum of the ion.

TABLE II. Comparison of ionization cross sections for U^{85+}. Notation as in Table I.

Transition	Threshold energy (keV) SZ	MP	Cross section ($10^{-24}cm^2$) at 2th.u. SZ	MP
$2\bar{p}^2 2p(3/2) \rightarrow 2\bar{p}^2(0)$	26.59	26.59	30.2	31.4
$2\bar{p}^2 2p(3/2) \rightarrow 2\bar{p}2p(1)$	30.57	30.57	16.8	17.4
$2\bar{p}^2 2p(3/2) \rightarrow 2\bar{p}2p(2)$	30.59	30.59	28.0	29.1
$2\bar{p}2p^2(3/2) \rightarrow 2\bar{p}2p(1)$	26.63	26.63	45.3	47.0
$2\bar{p}2p^2(3/2) \rightarrow 2\bar{p}2p(2)$	26.65	26.65	15.1	15.7
$2\bar{p}2p^2(5/2) \rightarrow 2\bar{p}2p(1)$	26.61	26.61	7.6	7.8
$2\bar{p}2p^2(5/2) \rightarrow 2\bar{p}2p(2)$	26.63	26.63	52.8	54.8
$2\bar{p}2p^2(1/2) \rightarrow 2\bar{p}2p(1)$	26.53	26.53	22.7	23.5
$2\bar{p}2p^2(1/2) \rightarrow 2\bar{p}2p(2)$	26.55	26.55	37.9	39.1
$2\bar{p}2p^2(3/2) \rightarrow 2p^2(2)$	30.69	30.69	22.3	23.2
$2\bar{p}2p^2(5/2) \rightarrow 2p^2(2)$	30.67	30.67	22.3	23.2
$2\bar{p}2p^2(1/2) \rightarrow 2p^2(0)$	30.68	30.68	22.3	23.2
$2p^3(3/2) \rightarrow 2p^2(2)$	26.63	26.63	75.5	78.0
$2p^3(3/2) \rightarrow 2p^2(0)$	26.72	26.72	15.1	15.6

TABLE III. Comparison of ionization cross sections for Xe^{44+}. Notation as in Table I except that SZ1 and SZ2 designate present results obtained with inclusion of all mixing in a complex and with the more limited amount of mixing included by MP, respectively.

Transition	Threshold energy (keV)			Cross section (10^{-24} cm^{2}) 1.25 th.u.			1.50 th.u.		
	SZ1	SZ2	MP	SZ1	SZ2	MP	SZ1	SZ2	MP
$2\bar{p}^2 2p^3 3s(1) \rightarrow 2\bar{p}^2 2p^2 3s(1/2)$	7.81	7.81	7.81	92	92	75	132	133	140
$2\bar{p}^2 2p^3 3s(1) \rightarrow 2\bar{p} 2p^3 3s(1/2)$	8.11	8.11	8.12	111	112	120	160	162	160
$2\bar{p}^2 2p^3 3s(1) \rightarrow 2p^4 3s(1/2)$	8.47	8.47	8.48	0.17	0.24	0.31	0.24	0.35	0.44
$2\bar{p} 2p^4 3s(1) \rightarrow 2\bar{p}^2 2p^2 3s(1/2)$	7.48	7.48	7.48	0.38	0.51	0.48	0.55	0.73	0.69
$2\bar{p} 2p^4 3s(1) \rightarrow 2\bar{p} 2p^3 3s(1/2)$	7.78	7.78	7.78	99	124	130	142	178	180
$2\bar{p} 2p^4 3s(1) \rightarrow 2p^4 3s(1/2)$	8.14	8.14	8.15	91	163	170	131	241	250

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RELATIVISTIC DISTORTED-WAVE COLLISION STRENGTHS AND OSCILLATOR STRENGTHS FOR F-LIKE IONS WITH $22 \leqslant Z \leqslant 92$*

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Relativistic distorted-wave collision strengths have been calculated for the three transitions among the three levels with a hole in the $n = 2$ shell and for the 327 transitions from these levels to the excited levels with two holes in the $n = 2$ shell and one electron in the $n = 3$ shell in all the 71 F-like ions with nuclear charge number Z in the range $22 \leqslant Z \leqslant 92$. The results are given here for a sample of 18 values of Z. The calculations were made for the six final, or scattered, electron energies $E' = 0.008$, 0.04, 0.10, 0.21, 0.41, and 0.75, where E' is in units of $Z_{\rm eff}^2$ rydbergs with $Z_{\rm eff} = Z - 6.667$. In addition, the transition energies and electric dipole oscillator strengths are given. To our knowledge the present work is the first comprehensive publication of the results of fully relativistic calculations of the collision strengths for excitation of F-like ions. © 1991 Academic Press, Inc.

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CONTENTS

INTRODUCTION

The achievement of x-ray lasing using neon-like ions[1] has stimulated interest in the cross sections or rates for species of adjacent stages of ionization such as fluorine-like ions. Moreover, it has been suggested that it might be possible and would be of interest to design an x-ray laser using F-like ions.[2] In the present work, using the rapid relativistic atomic structure and distorted-wave collision strength programs of Refs. 3 and 4, but with some modifications discussed below, we have calculated collision strengths for the three transitions among the three levels with a hole in the $2s_{1/2}$, $2p_{1/2}$, or $2p_{3/2}$ subshells and for the 327 nonvanishing transitions from the three levels to the 110 possible excited levels with two holes in the $n = 2$ shell and one electron in the $n = 3$ shell. The calculations were made for all 71 F-like ions with nuclear charge number Z in the range

$$22 \leqslant Z \leqslant 92 \tag{1}$$

and for the six scattered, or final, electron energies

$$E' = 0.008, 0.04, 0.10, 0.21, 0.41, \text{and } 0.75, \tag{2}$$

where E' is in units of $Z_{\rm eff}^2$ rydbergs with

$$Z_{\rm eff} = Z - \tfrac{5}{6}(N-1), \tag{3}$$

in which N is the number of bound electrons per ion, 9 in the present case. This range of energies is expected to cover those ordinarily needed for determining the collision rates for applications to very high temperature plasmas. The electric dipole oscillator strengths have also been calculated.

We note that relativistic distorted-wave calculations have previously been made by Hagelstein[2] for the same transitions as those considered here for the single case of F-like selenium ($Z = 34$). However, the present results are the first comprehensive fully relativistic calculations of collision strengths for many different F-like ions that have been published to our knowledge.

Most of the theory and procedures used in the present calculations were described in detail in Refs. 3 and 4 and were used in making the large-scale calculations of collision strengths and oscillator strengths for Ne-like, Li-like, Na-like, and Cu-like ions in Refs. 5–8. When a given class of transitions is treated with this approach, all orbitals, bound and free, are solutions of the Dirac equation with the same relativistic Hartree–Fock–Slater, or Dirac–Fock–Slater, central potential. Hence, all orbitals are automatically orthogonal. In the present case this potential is given in rydbergs by

$$V(r) = -\frac{2Z(r)}{r} + V_c(r) - \left[\frac{24}{\pi}\rho(r)\right]^{1/3}, \tag{4}$$

where

$$V_c(r) = \sum_{n'\kappa'} w_{n'\kappa'} \int_0^\infty \frac{2}{r_>}[P_{n'\kappa'}^2(r_2) + Q_{n'\kappa'}^2(r_2)]dr_2 \tag{5}$$

and

$$\rho(r)=\frac{1}{4\pi r^2}\sum_{n'\kappa'} w_{n'\kappa'}[P^2_{n'\kappa'}(r)+Q^2_{n'\kappa'}(r)]. \qquad (6)$$

Here $w_{n'\kappa'}$ is the occupation number of subshell $n'\kappa' = n'l'j'$, the summation is over all occupied subshells, $r_>$ is the greater of r and r_2, and $P_{n'\kappa'}$ and $Q_{n'\kappa'}$ are the so-called large and small components of the radial wave function of an electron in the $n'\kappa'$ subshell. This potential differs from that used in Refs. 3–8 only in that the point nuclear charge Z used in those references has been replaced with a distributed nuclear charge $Z(r)$. $Z(r)$ in turn differs from Z only for extremely small r, where it is given by the Fermi charge distribution of Chen et al.[9] This is also the option usually used in applications of the well-known multiconfiguration Dirac–Fock program of Grant et al.[10-12] Judging from a few test calculations, this modification appears to have little effect on collision strengths and oscillator strengths, but does significantly alter the energy values for very high Z.

In considering a given class of transitions, a single mean configuration with fractional occupation numbers for some subshells is used in determining the potential with Eqs. (4)–(6). In the present applications, for the transitions among the $n = 3$ levels, this mean configuration is

$$1s^2_{1/2}2s^{1.9}_{1/2}2p^{1.9}_{1/2}2p^{2.7}_{3/2}3s^{0.1}_{1/2}3p^{0.1}_{1/2}3p^{0.1}_{3/2}3d^{0.1}_{3/2}3d^{0.1}_{5/2} \qquad (7)$$

in considering the 327 nonvanishing transitions between the $n = 2$ and $n = 3$ shells, and

$$1s^2_{1/2}2s^{1.9}_{1/2}2p^{1.9}_{1/2}2p^{3.2}_{3/2} \qquad (8)$$

in considering the three possible transitions within the $n = 2$ shell. We note that test cases indicate that small changes in the mean occupation numbers within a shell have a very small effect on the results.

It should be noted that these mean configurations are used solely in determining the potential with Eqs. (4)–(6) and that, basically, the calculations are multiconfiguration calculations. In the present work we include all the mixing among the states in a complex, that is, among states having the same set of n values, parity, and total J value. Each of these groups of mixed states is designated by a capital letter. A number following a group letter indicates a particular energy level in the group. For example, E2 indicates the next to the lowest energy level in Group E, which consists of all the even parity states that have total J value for the target ion equal to 3/2 plus two holes in the $n = 2$ shell and one electron in the $n = 3$ shell. The jj-coupled state making the dominant contribution to each level for each value of Z in the range given by Eq. (1) is given in Table I. A word should be said about the notation used in that table. First we note that the quite common abbreviations

$$nl^* = nlj, \qquad j = l - 1/2 \qquad (9)$$

and

$$nl = nlj, \qquad j = l + 1/2 \qquad (10)$$

are used here. Also, the occupation number of a relativistic subshell, including the case where it is unity, follows the subshell on line rather than appearing as a superscript. In addition, the subscripts indicating J value are put on line and the closed $1s^2$ subshell is omitted. Some examples are

$$[(2s\ 2\ 2p{*}2\ 2p\ 2)0\ 3s\ 1]1/2$$
$$= [1s^2_{1/2}(2s^2_{1/2}2p^2_{1/2}2p^2_{3/2})_0 3s_{1/2}]_{1/2}, \qquad (11)$$

$$[(2s\ 1\ 2p{*}1\ 2p\ 4)1\ 3p\ 1]1/2$$
$$= [1s^2_{1/2}(2s_{1/2}2p_{1/2}2p^4_{3/2})_1 3p_{3/2}]_{1/2}, \qquad (12)$$

and

$$[(2s\ 2\ 2p{*}1\ 2p\ 3)2\ 3d{*}1]3/2$$
$$= [1s^2_{1/2}(2s^2_{1/2}2p_{1/2}2p^3_{3/2})_2 3d_{3/2}]_{3/2}. \qquad (13)$$

Prior to doing a large-scale calculation, such as the present one, we generally compare results for the transition energies ΔE and oscillator strengths f for two or three values of Z with the corresponding results by the widely used multiconfiguration Dirac–Fock (MCDF) code of Grant et al.[10-12] In the present case this was done for $Z = 34$ and 92. The results generally compared well, but for a few cases, specifically the B1–E9, B1–E10, and B1–E11 transitions and the A1–F2, A1–F3, and A1–F4 transitions for $Z = 92$, there was a significant redistribution of the oscillator strengths by our program (Ref. 3) as compared with the results of the Grant program. This discrepancy almost completely disappeared when the Grant program was also run without inclusion of the generalized Breit interaction. Thus we concluded that the discrepancy was due principally to the change in the mixing coefficients occurring when the generalized Breit interaction is included perturbatively in the atomic structure calculations, as is done in the Grant program. For this reason we decided to delay the present calculations until we had added an option to include the generalized Breit interaction perturbatively in our relativistic structure program. Specifically, the generalized Breit interaction is given by[13]

$$B(1,2) = -2\alpha_1\cdot\alpha_2\frac{\cos(\omega r_{12})}{r_{12}} + 2(\alpha_1\cdot\nabla_1)(\alpha_2\cdot\nabla_2)\frac{\cos(\omega r_{12})-1}{\omega^2 r_{12}}, \qquad (14)$$

where ω is the wavenumber of the exchanged virtual photon and the α_i are the usual Dirac matrices. In writing

Eq. (14) we have used distances in units of the Bohr radius and energies in rydbergs, which accounts for the presence of the factor of 2. Also we added an option to include the vacuum polarization and self-energy QED corrections in the same way as in the Grant program using the work of Fullerton and Rinker[14] and Mohr.[15,16] The procedure used is that the diagonal matrix elements of these interactions are added after diagonalization of the Dirac–Coulomb Hamiltonian, but before the final diagonalization of the Breit interaction. This is the procedure used in the default option of the new version of the program of Grant and co-workers called GRASP.[12] Thus, these QED corrections affect the mixing coefficients slightly, but the principal effect is on the energies at high Z, where they sometimes contribute nearly as much as the Breit interaction. In most cases our values for the Breit contribution to the transition energies are within 1% of those of the Grant program and agreement for the vacuum polarization and self-energy contributions is nearly as good.

In addition we also modified our program to include retardation effects in determining the oscillator strengths using the so-called Babushkin gauge, which in the nonrelativistic limit corresponds to the length form.[12]

In Tables IIA and IIB we compare values for some transition energies ΔE and oscillator strengths f obtained in various ways for Z = 34 and 92. The entries labeled "1", "2", and "3" are our results computed with none of the new options, with all the new options except inclusion of retardation in calculating f values, and with all of the new options (finite nuclear charge, generalized Breit interaction, vacuum polarization, and self-energy QED corrections and retardation), respectively. The entries labeled "Grant" are obtained with the recent more efficient version of the program of Grant et al.[10,11] called GRASP[12] and differ in the physics used from the "3" entries for f values and the "2" entries for transition energies only in that the radial wave functions are obtained using the more accurate MCDF potential. Additionally, the relativistic Hartree–Fock values of Hagelstein[2] are included for Z = 34. These values, which are labeled "Hagel," are likewise obtained using a mean configuration in determining the central potential used in calculating the radial wave functions. They also include the new options added to our program except that the Breit interaction in the limit $\omega = 0$ is used. It is not clear whether retardation is included by Hagelstein in calculating f values. However, by comparing the present "2" and "3" entries for f values for Z = 34 one sees that retardation has essentially no effect for this relatively low value of Z. In fact, the "1" and "2" entries differ by rather small amounts for Z = 34, so that inclusion of the other new options in our program has quite small effects for this value of Z, as well. In general the agreement between all entries for Z = 34 is seen to be quite good with the exception of the B1–D3 and C1–J11 transitions, where there are appreciable differences between the results of Hagelstein[2] and the other entries.

For Z = 92, inspection of the "1", "2", and "3" entries for the f values in Table IIB indicates that in some cases use of these new options does have a significant effect for high Z. One also sees that our "3" entries generally agree very closely with the corresponding entries of the GRASP program[12] for Z = 92. In fact, we expect that the agreement would be generally good for the entire range of Z given by Eq. (1), but would improve with increase in Z except when the energies of two levels in a group become very close together and a switch in the jj-coupled states making the dominant contribution to each of the two levels occurs. This generally happens abruptly as Z is increased and any two codes that are not identical are likely to differ slightly with regard to the precise Z value at which the switch occurs with corresponding differences in f values being obtained.

With regard to transition energies, one sees in Table IIA that the "2" entries generally exceed the entries of the GRASP code by about 2 eV for Z = 34. This is due to the difference between the potential we use and the more accurate MCDF potential used in the GRASP code in calculating the radial functions. A few test cases indicate that this difference in the ΔE values of our program and the GRASP program remains about this amount (2 or 3 eV) independent of Z for all Z in the range given by Eq. (1) except that for $Z \geq 60$ the discrepancy increases with increase in Z for transitions involving s orbitals. We believe that this is due to numerical imprecision in the procedure we use for solving the coupled Dirac equations for the large and small components of the radial functions (for example, Eqs. (10) and (11) of Ref. 3). This discrepancy can in all likelihood be eliminated by using a logarithmic grid, which we intend to do eventually. However, we note that even for Z = 92, the maximum discrepancy between the "2" and "Grant" entries for ΔE is only about 0.38%. Also this appears to have negligible effect on f values for the $n = 2$ to $n' = 3$ transitions and on the evaluation of the generalized Breit interaction. Probably this is true of the collision strengths as well. However, for the relatively small ΔE associated with $\Delta n = 0$ transitions the discrepancy can be as large as about 5%. For this reason, we used the values for ΔE given by the GRASP program in determining the f values for the two allowed $\Delta n = 0$ transitions given in Table III. The GRASP values for ΔE are also the ones listed for the three $\Delta n = 0$ transitions in Table IV containing the collision strengths; they were used in determining the impact electron energy E_i(Ry) in the collision strength calculations for these transitions, wherein E_i(Ry) corresponds to each of the final or scattered electron energies E' given by Eq. (2). The appropriate equation is

$$E_i(\mathrm{Ry}) = \Delta E(\mathrm{Ry}) + Z_{\mathrm{eff}}^2 E', \qquad (15)$$

where Z_{eff} is given by Eq. (3). Of course, the orbitals and mixing coefficients used in calculating all the oscillator strengths in Table III and all the collision strengths plus all the other transition energies given in Table IV were obtained with our programs using the new options discussed above.

We have also included in Table IIA the experimental results for ΔE obtained by Gordon et al.[17] and Burkhalter et al.[18] These are labeled "Gord" and "Burk," respectively. One sees that in general the agreement between the various theoretical and experimental values is quite good.

Although the collision strengths Ω were calculated for all 71 values of Z in the range given by Eq. (1), in the interest of brevity the results for only approximately one-fourth of these Z values are given in Table IV. However, the less numerous f values for all Z in the range given by Eq. (1) are included in Table III. Results for Ω with exponents less than -9 were set equal to zero.

The relation between the cross section $Q(i-f)$ and the collision strength $\Omega(i-f)$ for a transition i-f is

$$Q(i\text{-}f) = \frac{\pi a_0^2}{k_i^2 g_i}\,\Omega(i\text{-}f), \qquad (16)$$

where a_0 is the Bohr radius, g_i is the statistical weight of the initial level, and k_i is the relativistic wavenumber of the impact electron in atomic units. The relation between k_i and the kinetic energy $E_i(\mathrm{Ry})$ of the impact electron is

$$k_i^2 = E_i(\mathrm{Ry})\left[1 + \frac{\alpha^2}{4}E_i(\mathrm{Ry})\right], \qquad (17)$$

where α is the fine structure constant $\alpha = e^2/\hbar c$ and $E_i(\mathrm{Ry})$ is determined with Eq. (15) using Z_{eff} given by Eq. (3). As in our previous large-scale calculations done in Refs. 5–8, we use the factorization formulation of Bar-Shalom et al.[19] to express the collision strengths in the form

$$\Omega = 8 \sum_{\substack{j_a, j'_a \\ j_{a1}, j'_{a1}}} \sum_{\lambda} B^\lambda(j_a j'_a, j_{a1} j'_{a1}) Q^\lambda(j_a j'_a, j_{a1} j'_{a1}), \qquad (18)$$

where the abbreviations $j_a = n_a l_a j_a$, $j'_a = n'_a l'_a j'_a$, $j_{a1} = n_{a1} l_{a1} j_{a1}$, and $j'_{a1} = n'_{a1} l'_{a1} j'_{a1}$ have been used. Here, j_a and j_{a1} represent orbitals in the initial target ion wave function, while j'_a and j'_{a1} represent orbitals in the final target ion wave function. A convenient feature of Eq. (18) is that the B^λ are functions only of the target ion quantum numbers and mixing coefficients plus λ, while Q^λ contains the radial contribution and depends only on λ and the bound and free orbitals with the summation over the free electron angular momenta l, j, l', and j' performed within it (see, for example, Eqs. (10), (21), and (23) of Ref. 19).

Since the Z^2Q^λ are slowly and smoothly varying functions of Z, it is necessary to make detailed relativistic distorted-wave calculations of them for only a few values of Z and then one can use fits to power series in Z to obtain results for the remaining Z values. In the present application we made detailed relativistic distorted-wave calculations for each of the six values of Z

$$Z = 22, 30, 42, 56, 74, \text{ and } 92 \qquad (19)$$

for each of the six scattered electron energies E' given by Eq. (2). In each case the Q^λs were calculated for three impact electron energies E_i in units of Z_{eff}^2 rydbergs. These were $E_i = 0.0016 + E'$, $E_i = 0.0258 + E'$, and $E_i = 0.05 + E'$ for the $\Delta n = 0$ transitions and $E_i = 0.08 + E'$, $E_i = 0.165 + E'$, and $E_i = 0.25 + E'$ for the $\Delta n = 1$ transitions, where 0.0016 and 0.05 span the range of transition energies in units of Z_{eff}^2 rydbergs for the transitions among the $n = 2$ levels, while 0.08 and 0.25 span the range of transition energies in these units for excitation to the $n = 3$ levels. Next, each Q^λ was fit to the form

$$Z^2Q^\lambda = a_1^\lambda Z^3 + a_2^\lambda Z^2 + a_3^\lambda Z + a_4^\lambda + a_5^\lambda Z^{-1} + a_6^\lambda Z^{-2}. \qquad (20)$$

These results were then used in Eq. (18) to compute the values for the 330 transitions for the 71 values of Z in the range given by Eq. (1). In doing this we obtained the values of the Q^λ for the exact energy of each transition by Lagrange interpolation, except that for optically allowed transitions the interpolation was done on $\ln Q^\lambda$ rather than Q^λ. Numerous test calculations have indicated that the numerical error due to these procedures is usually much less than 1% and the largest error we have ever found is about 3%.

The efficiency of our collision program has now been increased by about a factor of 12 since the calculations in Refs. 5 and 6 were made. Although the time required for the atomic structure calculations for a single Z is still somewhat less than the time required to calculate the Q^λ, the inclusion of the generalized Breit interaction has greatly increased the time for the structure calculations. Hence, when they were done for all 71 Z values, while the detailed Q^λ calculations were done for only the 6 Z values given by Eq. (19), the atomic structure part of the calculations took about 3/5 of the total time. This total CPU time required for the present calculations on a Cray XMP supercomputer at the Lawrence Livermore National Laboratory "Open Computer Facility" was slightly less than 50 min. In future work we expect to increase the efficiency of the atomic structure part. One way this can perhaps be done for large-scale calculations is to calculate the numerous radial matrix elements of the Breit interaction for only a few values of Z and use fits to power series in Z.

With regard to the accuracy of the present collision strengths, the only relativistic results available for comparison are those of Ref. 2 for $Z = 34$. The agreement is often poor, but comparison with a few results[20] by a more recent version of that program shows good agreement. Probably the comparisons in Table IIA for oscillator strengths also give an approximate indication of the accuracy of the present results for the direct, or nonresonance, part of the collision strength. The resonance contribution, which is probably important for some of the fairly weak transitions, especially for the lower Z values, could eventually be calculated by the relativistic version of the method used by Cowan,[21] in which the resonance or indirect contribution is treated as a two-step process of electron capture followed by autoionization. This could then be added to the present results to obtain the total contribution. We expect to expand our programs to include autoionization and calculate the resonance contribution to collision strengths in future works.

Finally, it should be mentioned that the complete set of the present results for all 71 Z values in the range covered by Eq. (1) is on file at the National Energy Research Supercomputer Center at Livermore, California, and is available[22] to those with access to that network; it is also available on magnetic tape by request from the authors.

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EXPLANATION OF TABLES

TABLE I. Labeling of Energy Levels

This table shows the jj-coupled basis state that makes the dominant contribution to each energy level for Z in the range $22 \leq Z \leq 92$. The abbreviations and notation discussed in connection with Eqs. (9)–(13) are used. The table is clarified by a specific example: The jj-coupled basis state making the dominant contribution to each of the energy levels in Group L when $Z = 34$ is $[(2s^2_{1/2}2p^2_{1/2}2p^2_{3/2})_2 3p_{3/2}]_{7/2}$ for the lowest energy level in the group L1, $[(2s^2_{1/2}2p_{1/2}2p^3_{3/2})_2 3p_{3/2}]_{7/2}$ for the next higher level L2, $[(2s_{1/2}2p^2_{1/2}2p^3_{3/2})_2 3d_{3/2}]_{7/2}$ for the next higher level L3, $[(2s_{1/2}2p^2_{1/2}2p^3_{3/2})_2 3d_{5/2}]_{7/2}$ for the next higher level L4, $[(2s_{1/2}2p^2_{1/2}2p^3_{3/2})_1 3d_{5/2}]_{7/2}$ for the next higher level L5, and $[(2s_{1/2}2p_{1/2}2p^4_{3/2})_1 3d_{5/2}]_{7/2}$ for the highest level in the group L6.

TABLE IIA. Comparison of Transition Energies and Oscillator Strengths from Various Calculations and Experiments for $Z = 34$

TABLE IIB. Comparison of Transition Energies and Oscillator Strengths from Various Calculations for $Z = 92$

Transition	Lower level–upper level labeled as described in Table I
ΔE(eV)	Transition energy in eV
f	Electric dipole oscillator strength (dimensionless)
Present	Results from present work (see text for explanation of 1, 2, and 3)
Grant	Results from the GRASP[12] version of the multiconfiguration Dirac–Fock code of Grant et al.[10,11]
Hagel	Relativistic Hartree–Fock values of Hagelstein[2]
Gord	Experimental results of Gordon et al.[17]
Burk	Experimental results of Burkhalter et al.[18]

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leq Z \leq 92$

This table gives the (dimensionless) electric dipole oscillator strengths for the allowed transitions. All Z values in the range $22 \leq Z \leq 92$ are included. The lower level is listed first. The labels designating the levels are explained in Table I.

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z^2_{\rm eff}$ Rydbergs, $22 \leq Z \leq 92$

Z = 22, 26, 30, 34, 38, 42, 46, 50, 54, 58, 62, 66, 70, 74, 78, 82, 87, and 92. This table gives values for the collision strength from which one can obtain values for the cross section using Eqs. (15), (16), and (17). In the present case the statistical weight g_i equals $2J + 1$, where J is the value for the total angular momentum quantum number for the initial level with a hole in an $n = 2$ subshell. The fine structure constant α in Eq. (17) has the value 1/137.039. The $Z_{\rm eff}$ in Eq. (15) is given by Eq. (3) and the transition energy ΔE_{if}(Ry) in Eq. (15) is obtained from the corresponding entry in eV given in this table by dividing by the conversion factor 13.60535 eV/Ry. 7.04-2 means 7.04×10^{-2}. Collision strengths with values less than 10^{-9} are given as 0. Each data block is headed by the relevant transition i–f, with the levels i and f labeled according to Table I.

Z	Nuclear charge number
ΔE	Transition energy in eV
E′	Scattered electron energy in units of $Z^2_{\rm eff}$ Ry, where the effective nuclear charge $Z_{\rm eff}$ is given by $Z - 6.667$ [Eq. (3)]

TABLE I. Labeling of Energy Levels

See page 31 for Explanation of Tables

Level Label	JJ State Label	JJ State	Dominant JJ State as a Function of Z 22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
A1	1	(2s 2 2p*2 2p 3)3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B1	1	(2s 2 2p*1 2p 4)1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C1	1	(2s 1 2p*2 2p 4)1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D1	1	[(2s 2 2p*2 2p 2)0 3s 1]1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D2	2	[(2s 2 2p*1 2p 3)1 3s 1]1/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
D3	3	[(2s 2 2p 4)0 3s 1]1/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4
D4	4	[(2s 2 2p*2 2p 2)2 3d*1]1/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	5	5	5	5	5	5	5	5	5
D5	5	[(2s 2 2p*2 2p 2)2 3d 1]1/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3	3	3	3	3	3	3	3
D6	6	[(2s 2 2p*1 2p 3)1 3d*1]1/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
D7	7	[(2s 2 2p*1 2p 3)2 3d*1]1/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
D8	8	[(2s 2 2p*1 2p 3)2 3d 1]1/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
D9	9	[(2s 1 2p*1 2p 4)1 3p*1]1/2	9	9	11	9	9	11	11	11	11	11	11	11	11	11	13	13	13	13	13	13	13	13	13	13
D10	10	[(2s 1 2p*1 2p 4)0 3p*1]1/2	10	10	10	11	11	13	13	13	13	13	13	13	13	13	11	11	11	11	11	11	11	11	11	11
D11	11	[(2s 1 2p*2 2p 3)2 3p 1]1/2	11	11	14	10	10	10	10	10	10	10	14	14	14	14	14	14	14	14	14	14	14	14	14	14
D12	12	[(2s 1 2p*1 2p 4)1 3p 1]1/2	12	12	12	12	12	12	12	12	12	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10
D13	13	[(2s 1 2p*2 2p 3)1 3p*1]1/2	13	13	13	13	13	9	9	9	9	9	12	12	12	12	12	9	9	9	9	9	9	9	9	9
D14	14	[(2s 1 2p*2 2p 3)1 3p 1]1/2	14	14	9	14	14	14	14	14	14	14	9	9	9	9	9	12	12	12	12	12	12	12	12	12
D15	15	[(2p*2 2p 4)0 3s 1]1/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
E1	1	[(2s 2 2p*2 2p 2)2 3s 1]3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
E2	2	[(2s 2 2p*1 2p 3)1 3s 1]3/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
E3	3	[(2s 2 2p*1 2p 3)2 3s 1]3/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
E4	4	[(2s 2 2p*2 2p 2)2 3d*1]3/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
E5	5	[(2s 2 2p*2 2p 2)2 3d 1]3/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
E6	6	[(2s 2 2p*2 2p 2)0 3d*1]3/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
E7	7	[(2s 2 2p*1 2p 3)1 3d*1]3/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
E8	8	[(2s 2 2p*1 2p 3)1 3d 1]3/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
E9	9	[(2s 2 2p*1 2p 3)2 3d*1]3/2	9	9	10	10	10	10	10	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
E10	10	[(2s 2 2p*1 2p 3)2 3d 1]3/2	10	10	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
E11	11	[(2s 2 2p 4)0 3d*1]3/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	12	12	12	12	12	12	12	12	12
E12	12	[(2s 1 2p*2 2p 3)2 3p*1]3/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	13	13	13	13	13	17
E13	13	[(2s 1 2p*2 2p 3)2 3p 1]3/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	17	17	17	17	13
E14	14	[(2s 1 2p*1 2p 4)1 3p*1]3/2	14	14	14	14	14	17	17	17	17	17	17	17	17	17	17	17	17	17	17	11	11	11	11	18
E15	15	[(2s 1 2p*1 2p 4)1 3p 1]3/2	15	15	15	15	15	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	11
E16	16	[(2s 1 2p*1 2p 4)0 3p 1]3/2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	14	14
E17	17	[(2s 1 2p*2 2p 3)1 3p*1]3/2	17	17	17	17	17	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	16	16	16
E18	18	[(2s 1 2p*2 2p 3)1 3p 1]3/2	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
E19	19	[(2p*2 2p 4)0 3d*1]3/2	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
F1	1	[(2s 2 2p*2 2p 2)2 3s 1]5/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F2	2	[(2s 2 2p*1 2p 3)2 3s 1]5/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
F3	3	[(2s 2 2p*2 2p 2)2 3d*1]5/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
F4	4	[(2s 2 2p*2 2p 2)2 3d 1]5/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
F5	5	[(2s 2 2p*2 2p 2)0 3d 1]5/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
F6	6	[(2s 2 2p*1 2p 3)1 3d 1]5/2	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7
F7	7	[(2s 2 2p*1 2p 3)1 3d*1]5/2	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6
F8	8	[(2s 2 2p*1 2p 3)2 3d 1]5/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
F9	9	[(2s 2 2p*1 2p 3)2 3d*1]5/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
F10	10	[(2s 2 2p 4)0 3d 1]5/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11
F11	11	[(2s 1 2p*2 2p 3)2 3p*1]5/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	12	12	12	12	12
F12	12	[(2s 1 2p*2 2p 3)2 3p 1]5/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	10	10	14	14
F13	13	[(2s 1 2p*1 2p 4)1 3p 1]5/2	13	13	13	13	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	10	10
F14	14	[(2s 1 2p*2 2p 3)1 3p 1]5/2	14	14	14	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
F15	15	[(2p*2 2p 4)0 3d 1]5/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
G1	1	[(2s 2 2p*2 2p 2)2 3d 1]7/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
G2	2	[(2s 2 2p*2 2p 2)2 3d*1]7/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1
G3	3	[(2s 2 2p*1 2p 3)1 3d 1]7/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
G4	4	[(2s 2 2p*1 2p 3)2 3d*1]7/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
G5	5	[(2s 2 2p*1 2p 3)2 3d 1]7/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
G6	6	[(2s 1 2p*2 2p 3)2 3p 1]7/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
H1	1	[(2s 2 2p*2 2p 2)2 3d 1]9/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H2	2	[(2s 2 2p*1 2p 3)2 3d 1]9/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
I1	1	[(2s 2 2p*2 2p 2)2 3p 1]1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3
I2	2	[(2s 2 2p*1 2p 3)1 3p*1]1/2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1
I3	3	[(2s 2 2p*2 2p 2)0 3p*1]1/2	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
I4	4	[(2s 2 2p*1 2p 3)1 3p 1]1/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
I5	5	[(2s 2 2p*1 2p 3)2 3p 1]1/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
I6	6	[(2s 2 2p 4)0 3p*1]1/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
I7	7	[(2s 1 2p*1 2p 4)1 3s 1]1/2	7	7	7	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
I8	8	[(2s 1 2p*1 2p 4)0 3s 1]1/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
I9	9	[(2s 1 2p*2 2p 3)1 3s 1]1/2	9	9	9	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	10	10	10
I10	10	[(2s 1 2p*2 2p 3)2 3d*1]1/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	7	7	7
I11	11	[(2s 1 2p*1 2p 4)1 3d*1]1/2	11	11	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
I12	12	[(2s 1 2p*2 2p 3)2 3d 1]1/2	12	12	12	12	14	11	11	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
I13	13	[(2s 1 2p*2 2p 3)1 3d*1]1/2	13	13	13	13	13	13	13	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
I14	14	[(2p*2 2p 4)0 3p*1]1/2	14	14	14	14	12	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

TABLE I. Labeling of Energy Levels

See page 31 for Explanation of Tables

Level Label	JJ State Label	JJ State	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
			Dominant JJ State as a Function of Z																							
J1	1	[(2s 2 2p*2 2p 2)2 3p*1]3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
J2	2	[(2s 2 2p*1 2p 3)1 3p*1]3/2	2	2	2	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
J3	3	[(2s 2 2p*1 2p 3)2 3p 1]3/2	3	3	6	3	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
J4	4	[(2s 2 2p*2 2p 2)0 3p 1]3/2	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
J5	5	[(2s 2 2p*1 2p 3)1 3p 1]3/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	7	7	7
J6	6	[(2s 2 2p*2 2p 2)2 3p 1]3/2	6	6	3	6	3	3	3	3	3	3	3	3	3	3	3	3	3	7	7	7	7	5	5	5
J7	7	[(2s 2 2p*1 2p 3)2 3p*1]3/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	3	3	3	3	3	3	3
J8	8	[(2s 2 2p 4)0 3p 1]3/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	10	10	10	10	10
J9	9	[(2s 1 2p*1 2p 4)1 3s 1]3/2	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	8	8	11	11
J10	10	[(2s 1 2p*2 2p 3)2 3s 1]3/2	10	9	9	9	9	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	8	8
J11	11	[(2s 1 2p*2 2p 3)1 3s 1]3/2	11	11	11	11	11	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	12
J12	12	[(2s 1 2p*2 2p 3)2 3d*1]3/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	9
J13	13	[(2s 1 2p*1 2p 4)1 3d*1]3/2	13	13	13	13	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
J14	14	[(2s 1 2p*1 2p 4)0 3d*1]3/2	14	14	14	16	16	17	17	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
J15	15	[(2s 1 2p*2 2p 3)2 3d 1]3/2	15	15	15	15	15	15	15	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
J16	16	[(2s 1 2p*1 2p 4)1 3d 1]3/2	16	16	16	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
J17	17	[(2s 1 2p*2 2p 3)1 3d 1]3/2	17	17	17	17	17	16	16	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	13
J18	18	[(2s 1 2p*2 2p 3)1 3d*1]3/2	18	18	18	18	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	16
J19	19	[(2p*2 2p 4)0 3p 1]3/2	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
K1	1	[(2s 2 2p*2 2p 2)2 3p 1]5/2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
K2	2	[(2s 2 2p*2 2p 2)2 3p*1]5/2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
K3	3	[(2s 2 2p*1 2p 3)1 3p 1]5/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4
K4	4	[(2s 2 2p*1 2p 3)2 3p*1]5/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3
K5	5	[(2s 2 2p*1 2p 3)2 3p 1]5/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
K6	6	[(2s 1 2p*2 2p 3)2 3s 1]5/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
K7	7	[(2s 1 2p*2 2p 3)2 3d 1]5/2	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
K8	8	[(2s 1 2p*2 2p 3)2 3d*1]5/2	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
K9	9	[(2s 1 2p*1 2p 4)1 3d 1]5/2	9	9	9	9	9	9	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
K10	10	[(2s 1 2p*1 2p 4)1 3d*1]5/2	10	10	10	10	12	12	12	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
K11	11	[(2s 1 2p*1 2p 4)0 3d 1]5/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
K12	12	[(2s 1 2p*2 2p 3)1 3d*1]5/2	12	12	12	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
K13	13	[(2s 1 2p*2 2p 3)1 3d 1]5/2	13	13	13	13	13	13	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
L1	1	[(2s 2 2p*2 2p 2)2 3p 1]7/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
L2	2	[(2s 2 2p*1 2p 3)2 3p 1]7/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
L3	3	[(2s 1 2p*2 2p 3)2 3d*1]7/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L4	4	[(2s 1 2p*2 2p 3)2 3d 1]7/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
L5	5	[(2s 1 2p*1 2p 4)1 3d 1]7/2	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
L6	6	[(2s 1 2p*2 2p 3)1 3d 1]7/2	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
M1	1	[(2s 1 2p*2 2p 3)2 3d 1]9/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Level Label	JJ State Label	JJ State	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
			Dominant JJ State as a Function of Z																							
A1	1	(2s 2 2p*2 2p 3)3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B1	1	(2s 2 2p*1 2p 4)1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C1	1	(2s 1 2p*2 2p 4)1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D1	1	[(2s 2 2p*2 2p 2)0 3s 1]1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D2	2	[(2s 2 2p*1 2p 3)1 3s 1]1/2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
D3	3	[(2s 2 2p*2 2p 2)2 3d*1]1/2	3	3	3	3	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
D4	4	[(2s 2 2p*2 2p 2)2 3d 1]1/2	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
D5	5	[(2s 2 2p 4)0 3s 1]1/2	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
D6	6	[(2s 2 2p*1 2p 3)1 3d*1]1/2	6	5	5	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
D7	7	[(2s 2 2p*1 2p 3)2 3d*1]1/2	7	7	7	7	5	5	5	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9
D8	8	[(2s 2 2p*1 2p 3)2 3d 1]1/2	8	8	8	8	8	8	8	5	5	5	5	9	9	9	9	9	9	8	8	8	8	8	8	8
D9	9	[(2s 1 2p*2 2p 3)1 3p*1]1/2	9	9	9	9	9	9	9	9	9	9	9	5	5	5	5	10	10	10	10	10	10	10	10	10
D10	10	[(2s 1 2p*2 2p 3)2 3p 1]1/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	5	5	5	11	11	11	11	11	11
D11	11	[(2s 1 2p*2 2p 3)1 3p 1]1/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	5	5	5	5	5	5
D12	12	[(2s 1 2p*1 2p 4)0 3p*1]1/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
D13	13	[(2s 1 2p*1 2p 4)1 3p*1]1/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
D14	14	[(2s 1 2p*1 2p 4)1 3p 1]1/2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
D15	15	[(2p*2 2p 4)0 3s 1]1/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
E1	1	[(2s 2 2p*2 2p 2)2 3s 1]3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
E2	2	[(2s 2 2p*1 2p 3)1 3s 1]3/2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
E3	3	[(2s 2 2p*1 2p 3)2 3s 1]3/2	3	3	4	4	2	2	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
E4	4	[(2s 2 2p*2 2p 2)2 3d*1]3/2	4	4	3	3	3	5	6	2	2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
E5	5	[(2s 2 2p*2 2p 2)2 3d 1]3/2	5	5	5	6	6	3	3	5	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
E6	6	[(2s 2 2p*2 2p 2)0 3d*1]3/2	6	6	6	5	5	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
E7	7	[(2s 2 2p*1 2p 3)1 3d*1]3/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	11	11	11	11
E8	8	[(2s 2 2p*1 2p 3)1 3d 1]3/2	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	11	11	11	11	7	7	7	7
E9	9	[(2s 2 2p*1 2p 3)2 3d*1]3/2	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	11	9	9	9	9	9	9	9	9
E10	10	[(2s 2 2p*1 2p 3)2 3d 1]3/2	10	10	10	10	10	10	10	10	10	10	11	11	11	11	11	8	8	8	8	8	8	12	12	12
E11	11	[(2s 1 2p*2 2p 3)2 3p*1]3/2	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	10	10	12	12	12	8	8	8
E12	12	[(2s 1 2p*2 2p 3)1 3p*1]3/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	10	10	10	10	10
E13	13	[(2s 1 2p*2 2p 3)2 3p 1]3/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
E14	14	[(2s 1 2p*2 2p 3)1 3p 1]3/2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
E15	15	[(2s 2 2p 4)0 3d*1]3/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	16	16	16	16
E16	16	[(2s 1 2p*1 2p 4)1 3p*1]3/2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	15
E17	17	[(2s 1 2p*1 2p 4)0 3p 1]3/2	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

TABLE I. Labeling of Energy Levels

See page 31 for Explanation of Tables

Level Label	JJ State Label	JJ State	Dominant JJ State as a Function of Z																							
			46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
E18	18	[(2s 1 2p*1 2p 4)1 3p 1]3/2	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
E19	19	[(2p*2 2p 4)0 3d*1]3/2	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
F1	1	[(2s 2 2p*2 2p 2)2 3s 1]5/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F2	2	[(2s 2 2p*1 2p 3)2 3s 1]5/2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
F3	3	[(2s 2 2p*2 2p 2)2 3d*1]5/2	3	3	3	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
F4	4	[(2s 2 2p*2 2p 2)2 3d 1]5/2	4	4	4	4	4	4	4	2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
F5	5	[(2s 2 2p*2 2p 2)0 3d 1]5/2	5	5	5	5	5	5	5	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
F6	6	[(2s 2 2p*1 2p 3)1 3d*1]5/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10
F7	7	[(2s 2 2p*1 2p 3)1 3d 1]5/2	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	10	10	6	6	6	6
F8	8	[(2s 2 2p*1 2p 3)2 3d*1]5/2	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	10	10	8	8	8	8	8	8
F9	9	[(2s 2 2p*1 2p 3)2 3d 1]5/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	10	10	7	7	7	7	7	7	7	7
F10	10	[(2s 1 2p*2 2p 3)2 3p*1]5/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	9	9	9	9
F11	11	[(2s 1 2p*2 2p 3)2 3p 1]5/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
F12	12	[(2s 1 2p*2 2p 3)1 3p 1]5/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
F13	13	[(2s 2 2p 4)0 3d 1]5/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
F14	14	[(2s 1 2p*1 2p 4)1 3p 1]5/2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
F15	15	[(2p*2 2p 4)0 3d 1]5/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
G1	1	[(2s 2 2p*2 2p 2)2 3d*1]7/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
G2	2	[(2s 2 2p*2 2p 2)2 3d 1]7/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
G3	3	[(2s 2 2p*1 2p 3)1 3d 1]7/2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
G4	4	[(2s 2 2p*1 2p 3)2 3d*1]7/2	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
G5	5	[(2s 2 2p*1 2p 3)2 3d 1]7/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
G6	6	[(2s 1 2p*2 2p 3)2 3p 1]7/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
H1	1	[(2s 2 2p*2 2p 2)2 3d 1]9/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H2	2	[(2s 2 2p*1 2p 3)2 3d 1]9/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
I1	1	[(2s 2 2p*2 2p 2)0 3p*1]1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
I2	2	[(2s 2 2p*2 2p 2)2 3p 1]1/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
I3	3	[(2s 2 2p*1 2p 3)1 3p*1]1/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
I4	4	[(2s 2 2p*1 2p 3)1 3p 1]1/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
I5	5	[(2s 2 2p*1 2p 3)2 3p 1]1/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6
I6	6	[(2s 1 2p*2 2p 3)1 3s 1]1/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5
I7	7	[(2s 2 2p 4)0 3p*1]1/2	7	7	7	7	7	7	7	7	7	7	7	7	7	9	9	9	9	9	9	9	9	9	9	9
I8	8	[(2s 1 2p*1 2p 4)0 3s 1]1/2	8	8	9	9	9	9	9	9	9	9	9	9	9	7	7	7	7	12	12	12	12	12	12	12
I9	9	[(2s 1 2p*2 2p 3)2 3d*1]1/2	9	9	8	8	8	8	8	8	12	12	12	12	12	12	12	12	12	7	11	11	11	11	11	11
I10	10	[(2s 1 2p*1 2p 4)1 3s 1]1/2	10	10	10	10	11	11	12	12	11	11	11	11	11	11	11	11	11	11	7	7	7	7	7	7
I11	11	[(2s 1 2p*2 2p 3)2 3d 1]1/2	11	11	11	11	12	12	11	11	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
I12	12	[(2s 1 2p*2 2p 3)1 3d*1]1/2	12	12	12	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
I13	13	[(2s 1 2p*1 2p 4)1 3d*1]1/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
I14	14	[(2p*2 2p 4)0 3p*1]1/2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
J1	1	[(2s 2 2p*2 2p 2)2 3p*1]3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
J2	2	[(2s 2 2p*2 2p 2)2 3p 1]3/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
J3	3	[(2s 2 2p*2 2p 2)0 3p 1]3/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
J4	4	[(2s 2 2p*1 2p 3)1 3p*1]3/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
J5	5	[(2s 2 2p*1 2p 3)2 3p*1]3/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
J6	6	[(2s 2 2p*1 2p 3)1 3p 1]3/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	8
J7	7	[(2s 2 2p*1 2p 3)2 3p 1]3/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
J8	8	[(2s 1 2p*2 2p 3)2 3s 1]3/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
J9	9	[(2s 1 2p*2 2p 3)1 3s 1]3/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
J10	10	[(2s 2 2p 4)0 3p 1]3/2	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
J11	11	[(2s 1 2p*2 2p 3)2 3d*1]3/2	11	11	11	11	11	11	11	11	11	10	10	13	13	13	13	13	13	13	13	13	14	14	14	14
J12	12	[(2s 1 2p*1 2p 4)1 3s 1]3/2	12	12	12	13	13	13	13	13	13	13	13	10	14	14	14	14	14	14	14	14	13	13	13	13
J13	13	[(2s 1 2p*2 2p 3)2 3d 1]3/2	13	13	13	12	12	12	14	14	14	14	14	14	10	15	15	15	15	15	15	15	15	15	15	15
J14	14	[(2s 1 2p*2 2p 3)1 3d*1]3/2	14	14	14	14	14	14	12	12	15	15	15	15	15	10	10	10	10	10	10	10	10	10	10	12
J15	15	[(2s 1 2p*2 2p 3)1 3d 1]3/2	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10
J16	16	[(2s 1 2p*1 2p 4)0 3d*1]3/2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
J17	17	[(2s 1 2p*1 2p 4)1 3d*1]3/2	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
J18	18	[(2s 1 2p*1 2p 4)1 3d 1]3/2	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
J19	19	[(2p*2 2p 4)0 3p 1]3/2	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
K1	1	[(2s 2 2p*2 2p 2)2 3p*1]5/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
K2	2	[(2s 2 2p*2 2p 2)2 3p 1]5/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
K3	3	[(2s 2 2p*1 2p 3)2 3p*1]5/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
K4	4	[(2s 2 2p*1 2p 3)1 3p 1]5/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6
K5	5	[(2s 2 2p*1 2p 3)2 3p 1]5/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	4	4
K6	6	[(2s 1 2p*2 2p 3)2 3s 1]5/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5
K7	7	[(2s 1 2p*2 2p 3)2 3d*1]5/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
K8	8	[(2s 1 2p*2 2p 3)2 3d 1]5/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
K9	9	[(2s 1 2p*2 2p 3)1 3d*1]5/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
K10	10	[(2s 1 2p*2 2p 3)1 3d 1]5/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
K11	11	[(2s 1 2p*1 2p 4)0 3d 1]5/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	12	12	12	12	12	12	12	12	12	12
K12	12	[(2s 1 2p*1 2p 4)1 3d*1]5/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	11	11	11	11	11	11
K13	13	[(2s 1 2p*1 2p 4)1 3d 1]5/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
L1	1	[(2s 2 2p*2 2p 2)2 3p 1]7/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
L2	2	[(2s 2 2p*1 2p 3)2 3p 1]7/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
L3	3	[(2s 1 2p*2 2p 3)2 3d*1]7/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L4	4	[(2s 1 2p*2 2p 3)2 3d 1]7/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
L5	5	[(2s 1 2p*2 2p 3)1 3d 1]7/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
L6	6	[(2s 1 2p*1 2p 4)1 3d 1]7/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
M1	1	[(2s 1 2p*2 2p 3)2 3d 1]9/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE I. Labeling of Energy Levels

See page 31 for Explanation of Tables

Level Label	JJ State Label	JJ State	Dominant JJ State as a Function of Z: 70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
A1	1	(2s 2 2p*2 2p 3)3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B1	1	(2s 2 2p*1 2p 4)1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C1	1	(2s 1 2p*2 2p 4)1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D1	1	[(2s 2 2p*2 2p 2)0 3s 1]1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D2	2	[(2s 2 2p*2 2p 2)2 3d*1]1/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
D3	3	[(2s 2 2p*2 2p 2)2 3d 1]1/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
D4	4	[(2s 2 2p*1 2p 3)1 3s 1]1/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
D5	5	[(2s 2 2p*1 2p 3)1 3d*1]1/2	5	5	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
D6	6	[(2s 2 2p*1 2p 3)2 3d*1]1/2	6	7	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
D7	7	[(2s 1 2p*2 2p 3)1 3p*1]1/2	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
D8	8	[(2s 2 2p*1 2p 3)2 3d 1]1/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
D9	9	[(2s 1 2p*2 2p 3)2 3p 1]1/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
D10	10	[(2s 1 2p*2 2p 3)1 3p 1]1/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
D11	11	[(2s 2 2p 4)0 3s 1]1/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
D12	12	[(2s 1 2p*1 2p 4)0 3p*1]1/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
D13	13	[(2s 1 2p*1 2p 4)1 3p*1]1/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
D14	14	[(2s 1 2p*1 2p 4)1 3p 1]1/2	14	14	14	14	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
D15	15	[(2p*2 2p 4)0 3s 1]1/2	15	15	15	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
E1	1	[(2s 2 2p*2 2p 2)2 3s 1]3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
E2	2	[(2s 2 2p*2 2p 2)2 3d*1]3/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
E3	3	[(2s 2 2p*2 2p 2)0 3d*1]3/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
E4	4	[(2s 2 2p*2 2p 2)2 3d 1]3/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
E5	5	[(2s 2 2p*1 2p 3)1 3s 1]3/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
E6	6	[(2s 2 2p*1 2p 3)2 3s 1]3/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
E7	7	[(2s 1 2p*2 2p 3)2 3p*1]3/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
E8	8	[(2s 2 2p*1 2p 3)1 3d*1]3/2	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
E9	9	[(2s 1 2p*2 2p 3)1 3p*1]3/2	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
E10	10	[(2s 2 2p*1 2p 3)2 3d*1]3/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
E11	11	[(2s 2 2p*1 2p 3)1 3d 1]3/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
E12	12	[(2s 2 2p*1 2p 3)2 3d 1]3/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
E13	13	[(2s 1 2p*2 2p 3)2 3p 1]3/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
E14	14	[(2s 1 2p*2 2p 3)1 3p 1]3/2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
E15	15	[(2s 1 2p*1 2p 4)1 3p*1]3/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
E16	16	[(2s 2 2p 4)0 3d*1]3/2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
E17	17	[(2s 1 2p*1 2p 4)0 3p 1]3/2	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
E18	18	[(2s 1 2p*1 2p 4)1 3p 1]3/2	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
E19	19	[(2p*2 2p 4)0 3d*1]3/2	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
F1	1	[(2s 2 2p*2 2p 2)2 3s 1]5/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F2	2	[(2s 2 2p*2 2p 2)2 3d*1]5/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
F3	3	[(2s 2 2p*2 2p 2)2 3d 1]5/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
F4	4	[(2s 2 2p*2 2p 2)0 3d 1]5/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
F5	5	[(2s 2 2p*1 2p 3)2 3s 1]5/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
F6	6	[(2s 1 2p*2 2p 3)2 3p*1]5/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
F7	7	[(2s 2 2p*1 2p 3)1 3d*1]5/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
F8	8	[(2s 2 2p*1 2p 3)2 3d*1]5/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
F9	9	[(2s 2 2p*1 2p 3)1 3d 1]5/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
F10	10	[(2s 2 2p*1 2p 3)2 3d 1]5/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
F11	11	[(2s 1 2p*2 2p 3)2 3p 1]5/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
F12	12	[(2s 1 2p*2 2p 3)1 3p 1]5/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
F13	13	[(2s 2 2p 4)0 3d 1]5/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
F14	14	[(2s 1 2p*1 2p 4)1 3p 1]5/2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
F15	15	[(2p*2 2p 4)0 3d 1]5/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
G1	1	[(2s 2 2p*2 2p 2)2 3d*1]7/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
G2	2	[(2s 2 2p*2 2p 2)2 3d 1]7/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
G3	3	[(2s 2 2p*1 2p 3)2 3d*1]7/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
G4	4	[(2s 2 2p*1 2p 3)1 3d 1]7/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
G5	5	[(2s 2 2p*1 2p 3)2 3d 1]7/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
G6	6	[(2s 1 2p*2 2p 3)2 3p 1]7/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
H1	1	[(2s 2 2p*2 2p 2)2 3d 1]9/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H2	2	[(2s 2 2p*1 2p 3)2 3d 1]9/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
I1	1	[(2s 2 2p*2 2p 2)0 3p*1]1/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
I2	2	[(2s 2 2p*2 2p 2)2 3p 1]1/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
I3	3	[(2s 2 2p*1 2p 3)1 3p*1]1/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
I4	4	[(2s 2 2p*1 2p 3)1 3p 1]1/2	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
I5	5	[(2s 1 2p*2 2p 3)1 3s 1]1/2	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
I6	6	[(2s 2 2p*1 2p 3)2 3p 1]1/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
I7	7	[(2s 1 2p*2 2p 3)2 3d*1]1/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
I8	8	[(2s 1 2p*2 2p 3)1 3d*1]1/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
I9	9	[(2s 1 2p*2 2p 3)2 3d 1]1/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
I10	10	[(2s 2 2p 4)0 3p*1]1/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
I11	11	[(2s 1 2p*1 2p 4)0 3s 1]1/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
I12	12	[(2s 1 2p*1 2p 4)1 3s 1]1/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
I13	13	[(2s 1 2p*1 2p 4)1 3d*1]1/2	13	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
I14	14	[(2p*2 2p 4)0 3p*1]1/2	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13

TABLE I. Labeling of Energy Levels

See page 31 for Explanation of Tables

Level Label	JJ State Label	JJ State	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
			Dominant jj State as a Function of Z																						
J1	1	[(2s 2 2p*2 2p 2)2 3p*1]3/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
J2	2	[(2s 2 2p*2 2p 2)2 3p 1]3/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
J3	3	[(2s 2 2p*2 2p 2)0 3p 1]3/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
J4	4	[(2s 2 2p*1 2p 3)1 3p*1]3/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
J5	5	[(2s 2 2p*1 2p 3)2 3p*1]3/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
J6	6	[(2s 1 2p*2 2p 3)2 3s 1]3/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
J7	7	[(2s 2 2p*1 2p 3)1 3p 1]3/2	7	7	7	7	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
J8	8	[(2s 2 2p*1 2p 3)2 3p 1]3/2	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
J9	9	[(2s 1 2p*2 2p 3)1 3s 1]3/2	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
J10	10	[(2s 1 2p*2 2p 3)2 3d*1]3/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
J11	11	[(2s 1 2p*2 2p 3)1 3d*1]3/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
J12	12	[(2s 1 2p*2 2p 3)2 3d 1]3/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
J13	13	[(2s 1 2p*2 2p 3)1 3d 1]3/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
J14	14	[(2s 1 2p*1 2p 4)1 3s 1]3/2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
J15	15	[(2s 2 2p 4)0 3p 1]3/2	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
J16	16	[(2s 1 2p*1 2p 4)0 3d*1]3/2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
J17	17	[(2s 1 2p*1 2p 4)1 3d*1]3/2	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
J18	18	[(2s 1 2p*1 2p 4)1 3d 1]3/2	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
J19	19	[(2p*2 2p 4)0 3p 1]3/2	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
K1	1	[(2s 2 2p*2 2p 2)2 3p*1]5/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
K2	2	[(2s 2 2p*2 2p 2)2 3p 1]5/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
K3	3	[(2s 2 2p*1 2p 3)2 3p*1]5/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
K4	4	[(2s 1 2p*2 2p 3)2 3s 1]5/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
K5	5	[(2s 2 2p*1 2p 3)1 3p 1]5/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
K6	6	[(2s 2 2p*1 2p 3)2 3p 1]5/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
K7	7	[(2s 1 2p*2 2p 3)2 3d*1]5/2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
K8	8	[(2s 1 2p*2 2p 3)1 3d*1]5/2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
K9	9	[(2s 1 2p*2 2p 3)2 3d 1]5/2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
K10	10	[(2s 1 2p*2 2p 3)1 3d 1]5/2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
K11	11	[(2s 1 2p*1 2p 4)1 3d*1]5/2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
K12	12	[(2s 1 2p*1 2p 4)0 3d 1]5/2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
K13	13	[(2s 1 2p*1 2p 4)1 3d 1]5/2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
L1	1	[(2s 2 2p*2 2p 2)2 3p 1]7/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
L2	2	[(2s 2 2p*1 2p 3)2 3p 1]7/2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
L3	3	[(2s 1 2p*2 2p 3)2 3d*1]7/2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L4	4	[(2s 1 2p*2 2p 3)2 3d 1]7/2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
L5	5	[(2s 1 2p*2 2p 3)1 3d 1]7/2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
L6	6	[(2s 1 2p*1 2p 4)1 3d 1]7/2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
M1	1	[(2s 1 2p*2 2p 3)2 3d 1]9/2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE IIA. Comparison of Transition Energies and Oscillator Strengths from Various Calculations and Experiments for $Z = 34$

See page 31 for Explanation of Tables

Transition	ΔE(eV)						f				
	Present		Grant	Hagel	Gord	Burk	Present			Grant	Hagel
	1	2					1	2	3		
A1 - D1	1519.5	1518.4	1516.6	1519.7	1520.1		0.0129	0.0128	0.0128	0.0124	0.013
A1 - D2	1545.8	1543.8	1541.8	1545.1	1544.7	1546.1	0.0125	0.0127	0.0127	0.0122	0.014
A1 - D3	1604.1	1601.4	1599.5	1602.8			0.0010	0.0011	0.0011	0.0011	
A1 - D4	1615.1	1613.4	1611.6	1614.4			0.0022	0.0020	0.0020	0.0022	
A1 - D5	1623.2	1621.2	1619.4	1622.4	1623.4	1617.3	0.0851	0.0847	0.0845	0.0818	0.088
A1 - D6	1652.2	1649.9	1648.0	1651.1			0.0006	0.0006	0.0006	0.0006	
A1 - D7	1672.6	1669.6	1667.8	1671.3	1671.6		0.2031	0.2031	0.2028	0.1986	0.220
A1 - D8	1687.9	1684.7	1682.7	1685.8			0.0548	0.0550	0.0549	0.0549	0.052
A1 - D9	1755.8	1753.5	1752.0	1754.4			0.0048	0.0059	0.0059	0.0068	
A1 - D10	1759.3	1756.9	1755.4	1757.9	1756.9		0.0668	0.0650	0.0647	0.0604	0.063
A1 - D11	1775.3	1772.6	1771.0	1773.6			0.0029	0.0027	0.0027	0.0024	
A1 - D12	1787.3	1784.5	1782.7	1785.4			0.0045	0.0047	0.0047	0.0042	
A1 - D13	1822.6	1819.7	1818.4	1820.8			0.0006	0.0006	0.0006	0.0006	
A1 - D14	1829.6	1826.9	1824.7	1827.2			0.0006	0.0006	0.0006	0.0004	
A1 - D15	1937.4	1934.7	1933.6	1935.5			0.0003	0.0003	0.0003	0.0003	
A1 - E1	1505.6	1504.0	1501.9	1505.2	1505.2	1505.0	0.0615	0.0619	0.0618	0.0599	0.067
A1 - E2	1542.0	1540.0	1537.9	1541.4	1541.7	1541.1	0.0159	0.0160	0.0160	0.0156	0.017
A1 - E3	1556.8	1554.2	1552.1	1555.5			0.0042	0.0040	0.0040	0.0039	
A1 - E4	1613.4	1611.8	1609.7	1612.8			0.0002	0.0001	0.0001	0.0001	
A1 - E5	1626.9	1625.1	1623.0	1626.1	1626.4	1623.0	0.1672	0.1751	0.1739	0.1719	0.185
A1 - E6	1635.8	1634.3	1632.2	1635.3			0.1413	0.1316	0.1312	0.1254	0.135
A1 - E7	1656.3	1653.9	1651.8	1655.1	1656.0		0.0130	0.0117	0.0117	0.0117	0.012
A1 - E8	1663.4	1660.7	1658.7	1661.8			0.0042	0.0031	0.0031	0.0033	
A1 - E9	1676.3	1673.5	1671.3	1674.4	1675.4		0.4730	0.4813	0.4801	0.4652	0.497
A1 - E10	1685.3	1682.3	1680.0	1683.3	1682.7		0.1361	0.1309	0.1307	0.1304	0.130
A1 - E11	1725.1	1721.8	1719.6	1722.9			0.0003	0.0003	0.0003	0.0002	
A1 - E12	1734.2	1732.1	1730.4	1733.0			0.0035	0.0033	0.0033	0.0032	
A1 - E13	1748.4	1746.0	1744.3	1746.8			0.0472	0.0475	0.0472	0.0457	
A1 - E14	1758.4	1755.9	1754.2	1756.8	1756.9		0.0600	0.0590	0.0588	0.0558	0.058
A1 - E15	1769.3	1766.8	1765.1	1767.7			0.0217	0.0212	0.0210	0.0199	0.019
A1 - E16	1793.3	1790.3	1788.5	1791.2			0.0001	0.0001	0.0001	0.0001	
A1 - E17	1813.0	1810.1	1808.7	1811.3			0.0062	0.0064	0.0064	0.0061	
A1 - E18	1826.6	1823.6	1822.1	1824.7			0.0069	0.0072	0.0072	0.0069	
A1 - E19	2045.7	2042.7	2041.6	2043.4			0.0002	0.0002	0.0002	0.0002	
A1 - F1	1500.8	1499.2	1497.1	1500.0		1501.0	0.0093	0.0091	0.0091	0.0088	
A1 - F2	1555.4	1552.8	1550.7	1554.2	1554.1	1554.8	0.0447	0.0450	0.0448	0.0440	0.049
A1 - F3	1613.3	1611.4	1609.3	1612.4			0.0002	0.0001	0.0001	0.0001	
A1 - F4	1630.4	1628.4	1626.3	1629.3	1629.2	1627.5	0.3552	0.3703	0.3688	0.3646	0.381
A1 - F5	1638.5	1636.9	1634.8	1637.9		1637.6	0.2585	0.2402	0.2390	0.2316	0.243
A1 - F6	1661.1	1658.5	1656.4	1659.6	1660.8	1658.6	0.0979	0.1032	0.1030	0.1016	0.106
A1 - F7	1662.7	1660.1	1658.0	1661.2			0.2069	0.1977	0.1971	0.1957	0.205
A1 - F8	1673.1	1670.1	1668.0	1671.2			0.0319	0.0331	0.0329	0.0328	0.033
A1 - F9	1677.9	1674.9	1672.8	1675.9	1675.4	1672.7	0.7754	0.7789	0.7766	0.7568	0.773
A1 - F10	1720.7	1717.6	1715.4	1718.7			0.0043	0.0049	0.0048	0.0048	
A1 - F11	1737.9	1735.6	1733.8	1736.4	1736.9		0.0461	0.0459	0.0459	0.0436	0.045
A1 - F12	1751.1	1748.7	1746.9	1749.5	1749.9		0.0707	0.0704	0.0700	0.0667	0.069
A1 - F13	1768.5	1765.8	1764.1	1766.8	1767.4		0.0658	0.0644	0.0640	0.0609	0.062
A1 - F14	1824.0	1820.9	1819.4	1822.1	1821.1		0.0188	0.0193	0.0192	0.0186	0.018
A1 - F15	2048.1	2044.9	2043.8	2045.6			0.0020	0.0020	0.0020	0.0020	
B1 - D1	1475.9	1475.7	1473.7	1476.9			0.0002	0.0002	0.0002	0.0002	
B1 - D2	1502.3	1501.1	1498.9	1502.3	1501.2		0.0397	0.0400	0.0400	0.0382	0.043
B1 - D3	1560.5	1558.6	1556.5	1560.0	1560.5		0.0371	0.0371	0.0369	0.0351	0.089
B1 - D4	1571.5	1570.6	1568.6	1571.6			0.0006	0.0006	0.0006	0.0006	
B1 - D5	1579.6	1578.5	1576.5	1579.6			0.0001	0.0001	0.0001	0.0001	
B1 - D6	1608.6	1607.2	1605.0	1608.3			0.0018	0.0017	0.0017	0.0018	
B1 - D7	1629.0	1626.9	1624.9	1628.5	1626.4		0.0471	0.0478	0.0472	0.0465	0.045
B1 - D8	1644.3	1642.0	1639.7	1643.0	1642.6		0.7365	0.7351	0.7323	0.7078	0.770
B1 - D9	1712.3	1710.8	1709.1	1711.6			0.0047	0.0048	0.0048	0.0043	
B1 - D10	1715.7	1714.2	1712.5	1715.1			0.0000	0.0000	0.0000	0.0000	
B1 - D11	1731.7	1729.9	1728.1	1730.8			0.0008	0.0008	0.0007	0.0011	
B1 - D12	1743.8	1741.8	1739.8	1742.6	1742.3		0.0762	0.0770	0.0768	0.0734	0.078
B1 - D13	1779.1	1777.0	1775.4	1778.0	1774.2		0.0839	0.0822	0.0819	0.0757	0.073
B1 - D14	1786.0	1784.2	1781.7	1784.9			0.0000	0.0000	0.0000	0.0003	
B1 - D15	1893.8	1892.0	1890.7	1892.7			0.0007	0.0007	0.0007	0.0006	
B1 - E1	1462.0	1461.3	1459.1	1462.4	1461.2		0.0007	0.0007	0.0007	0.0007	0.001
B1 - E2	1498.5	1497.3	1495.0	1498.6			0.0023	0.0023	0.0023	0.0022	
B1 - E3	1513.2	1511.5	1509.3	1512.7	1512.5	1511.4	0.0836	0.0839	0.0839	0.0810	0.089
B1 - E4	1569.8	1569.0	1566.9	1530.0			0.0026	0.0027	0.0027	0.0027	
B1 - E5	1583.3	1582.3	1580.2	1583.3			0.0097	0.0104	0.0103	0.0105	0.011
B1 - E6	1592.3	1591.5	1589.4	1592.5			0.0016	0.0015	0.0015	0.0013	

TABLE IIA. Comparison of Transition Energies and Oscillator Strengths from Various Calculations and Experiments for $Z = 34$

See page 31 for Explanation of Tables

Transition	ΔE (eV) Present 1	Present 2	Grant	Hagel	Gord	Burk	f Present 1	Present 2	Present 3	Grant	Hagel
B1 - E7	1612.8	1611.2	1609.0	1612.3			0.0162	0.0157	0.0154	0.0148	0.017
B1 - E8	1619.8	1618.0	1615.9	1619.0	1619.0		0.0812	0.0747	0.0745	0.0771	0.078
B1 - E9	1632.7	1630.7	1628.5	1631.6	1629.2		0.1745	0.1719	0.1705	0.1682	0.178
B1 - E10	1641.7	1639.5	1637.2	1640.5	1638.9		0.9544	0.9718	0.9684	0.9381	0.984
B1 - E11	1681.5	1679.1	1676.8	1680.1	1680.2		0.9895	0.9789	0.9764	0.9451	0.979
B1 - E12	1690.7	1689.3	1687.6	1690.2			0.0000	0.0000	0.0000	0.0000	
B1 - E13	1704.8	1703.2	1701.5	1704.0			0.0000	0.0000	0.0000	0.0000	
B1 - E14	1714.8	1713.2	1711.5	1714.0			0.0116	0.0122	0.0122	0.0115	0.012
B1 - E15	1725.8	1724.0	1722.3	1724.9	1724.4		0.0244	0.0252	0.0250	0.0240	0.026
B1 - E16	1749.8	1747.5	1745.7	1748.4	1749.9		0.0716	0.0720	0.0716	0.0685	0.072
B1 - E17	1769.5	1767.4	1765.9	1768.5	1767.4		0.0872	0.0855	0.0854	0.0813	0.085
B1 - E18	1783.1	1780.9	1779.3	1781.9	1780.6		0.0823	0.0801	0.0796	0.0754	0.073
B1 - E19	2002.2	1999.9	1998.9	2000.6			0.0033	0.0033	0.0033	0.0033	
C1 - J1	1331.1	1330.4	1328.0	1330.9			0.0000	0.0000	0.0000	0.0000	
C1 - J2	1358.0	1357.1	1354.5	1359.5			0.0004	0.0003	0.0003	0.0003	
C1 - J3	1363.2	1362.5	1360.1	1365.0			0.0000	0.0000	0.0000	0.0000	
C1 - J4	1376.2	1374.7	1372.3	1377.3			0.0000	0.0000	0.0000	0.0000	
C1 - J5	1387.1	1385.6	1383.1	1388.1			0.0000	0.0000	0.0000	0.0000	
C1 - J6	1397.2	1395.3	1392.9	1397.8			0.0005	0.0005	0.0005	0.0005	
C1 - J7	1402.4	1400.9	1397.9	1403.0			0.0014	0.0015	0.0015	0.0013	
C1 - J8	1446.1	1443.9	1441.5	1446.5			0.0005	0.0005	0.0005	0.0005	
C1 - J9	1484.0	1482.4	1480.1	1484.7			0.0605	0.0603	0.0603	0.0589	0.068
C1 - J10	1500.4	1498.7	1496.3	1501.0			0.0135	0.0144	0.0144	0.0131	0.016
C1 - J11	1554.0	1551.8	1549.8	1554.4			0.0676	0.0676	0.0673	0.0649	0.033
C1 - J12	1585.5	1583.6	1581.6	1585.9			0.0012	0.0012	0.0011	0.0010	
C1 - J13	1599.6	1597.7	1595.6	1599.9			0.1450	0.1454	0.1447	0.1449	0.155
C1 - J14	1612.7	1610.7	1608.6	1612.9			0.0377	0.0402	0.0404	0.0422	0.046
C1 - J15	1620.4	1618.1	1616.0	1620.4			0.5395	0.5305	0.5284	0.5160	0.552
C1 - J16	1641.1	1638.5	1636.3	1640.7			0.6179	0.6264	0.6247	0.6094	0.653
C1 - J17	1669.4	1666.8	1664.9	1669.3			0.5366	0.5534	0.5509	0.5411	0.546
C1 - J18	1673.2	1670.6	1668.6	1673.0			0.4422	0.4189	0.4177	0.3901	0.445
C1 - J19	1776.2	1774.0	1772.5	1776.1			0.1192	0.1186	0.1179	0.1103	0.112

TABLE IIB. Comparison of Transition Energies and Oscillator Strengths from Various Calculations for $Z = 92$

See page 31 for Explanation of Tables

Transition	ΔE(eV) Present 1	ΔE(eV) Present 2	ΔE(eV) Grant	f Present 1	f Present 2	f Present 3	f Grant
A1 - D1	13134	13127	13136	0.0239	0.0240	0.0240	0.0236
A1 - D2	14599	14559	14558	0.0520	0.0528	0.0545	0.0541
A1 - D3	14859	14813	14811	0.1003	0.0994	0.0953	0.0942
A1 - D4	17050	16986	16994	0.0053	0.0053	0.0050	0.0049
A1 - D5	18008	17927	17890	0.0465	0.0478	0.0478	0.0467
A1 - D6	18560	18480	18478	0.0001	0.0003	0.0003	0.0003
A1 - D7	18623	18527	18524	0.1569	0.1549	0.1518	0.1524
A1 - D8	18909	18806	18803	0.0010	0.0008	0.0008	0.0008
A1 - D9	19069	18970	18932	0.0340	0.0330	0.0308	0.0301
A1 - D10	19187	19096	19057	0.0010	0.0010	0.0010	0.0009
A1 - D11	21087	20981	20988	0.0000	0.0000	0.0000	0.0000
A1 - D12	21894	21766	21727	0.0000	0.0000	0.0000	0.0000
A1 - D13	22002	21871	21832	0.0000	0.0000	0.0000	0.0000
A1 - D14	22489	22355	22292	0.0000	0.0000	0.0000	0.0000
A1 - D15	23084	22938	22899	0.0000	0.0000	0.0000	0.0000
A1 - E1	13075	13051	13059	0.0934	0.0939	0.0943	0.0925
A1 - E2	14588	14553	14551	0.0080	0.0080	0.0083	0.0082
A1 - E3	14666	14641	14639	0.0119	0.0120	0.0127	0.0126
A1 - E4	14893	14846	14843	0.5381	0.5369	0.5143	0.5081
A1 - E5	17036	16972	16980	0.0047	0.0045	0.0042	0.0041
A1 - E6	17079	17001	17008	0.0047	0.0049	0.0046	0.0045
A1 - E7	17895	17811	17773	0.0338	0.0355	0.0355	0.0349
A1 - E8	18011	17928	17890	0.0580	0.0580	0.0580	0.0568
A1 - E9	18579	18494	18492	0.0107	0.0015	0.0015	0.0015
A1 - E10	18634	18536	18534	0.3086	0.3143	0.3077	0.3086
A1 - E11	18839	18747	18745	0.0000	0.0000	0.0000	0.0001
A1 - E12	18899	18800	18797	0.0011	0.0008	0.0007	0.0009
A1 - E13	19032	18931	18893	0.0469	0.0453	0.0424	0.0412
A1 - E14	19148	19055	19017	0.0229	0.0226	0.0211	0.0207
A1 - E15	21943	21801	21763	0.0000	0.0000	0.0000	0.0000
A1 - E16	22642	22513	22510	0.0000	0.0000	0.0000	0.0000
A1 - E17	23024	22886	22847	0.0000	0.0000	0.0000	0.0000
A1 - E18	23081	22933	22894	0.0000	0.0000	0.0000	0.0000
A1 - E19	24011	23858	23784	0.0000	0.0000	0.0000	0.0000
A1 - F1	13061	13036	13044	0.0234	0.0236	0.0237	0.0232
A1 - F2	14598	14554	14552	0.0453	0.0491	0.0516	0.0512
A1 - F3	14892	14845	14842	0.5780	0.6978	0.6686	0.6643
A1 - F4	14931	14898	14896	0.5294	0.4051	0.3880	0.3836
A1 - F5	17072	16991	16998	0.0145	0.0144	0.0136	0.0133
A1 - F6	17902	17810	17771	0.1395	0.1414	0.1415	0.1388
A1 - F7	18586	18499	18496	0.1258	0.1140	0.1116	0.1126
A1 - F8	18629	18529	18526	0.3562	0.3618	0.3541	0.3535
A1 - F9	18836	18748	18745	0.0000	0.0000	0.0000	0.0000
A1 - F10	18863	18762	18760	0.0000	0.0000	0.0000	0.0000
A1 - F11	19040	18940	18902	0.0463	0.0458	0.0428	0.0420
A1 - F12	19140	19045	19006	0.0574	0.0549	0.0513	0.0504
A1 - F13	22879	22749	22745	0.0000	0.0000	0.0000	0.0000
A1 - F14	23078	22927	22889	0.0000	0.0000	0.0000	0.0000
A1 - F15	24263	24106	24032	0.0001	0.0001	0.0001	0.0001
B1 - D1	9176	9217	9226	0.0000	0.0000	0.0000	0.0000
B1 - D2	10642	10649	10648	0.0000	0.0000	0.0000	0.0000
B1 - D3	10902	10903	10901	0.0000	0.0000	0.0000	0.0000
B1 - D4	13092	13076	13083	0.0632	0.0637	0.0640	0.0626
B1 - D5	14051	14017	13980	0.0000	0.0001	0.0001	0.0001
B1 - D6	14602	14570	14568	0.0160	0.0153	0.0161	0.0160
B1 - D7	14666	14617	14614	0.0246	0.0272	0.0287	0.0286
B1 - D8	14952	14896	14893	0.7963	0.7918	0.7590	0.7478
B1 - D9	15112	15060	15022	0.0000	0.0000	0.0000	0.0000
B1 - D10	15230	15186	15147	0.0023	0.0017	0.0016	0.0028
B1 - D11	17130	17071	17078	0.0136	0.0134	0.0126	0.0122
B1 - D12	17936	17856	17817	0.0371	0.0352	0.0353	0.0350
B1 - D13	18045	17961	17922	0.0478	0.0490	0.0490	0.0484
B1 - D14	18532	18445	18382	0.0002	0.0002	0.0002	0.0002
B1 - D15	19127	19028	18989	0.0741	0.0734	0.0687	0.0680

TABLE IIB. Comparison of Transition Energies and Oscillator Strengths from Various Calculations for $Z = 92$

See page 31 for Explanation of Tables

Transition	ΔE(eV) Present 1	ΔE(eV) Present 2	ΔE(eV) Grant	f Present 1	f Present 2	f Present 3	f Grant
B1 - E1	9117	9142	9150	0.0000	0.0000	0.0000	0.0000
B1 - E2	10631	10643	10641	0.0000	0.0000	0.0000	0.0000
B1 - E3	10709	10731	10729	0.0000	0.0000	0.0000	0.0000
B1 - E4	10935	10936	10933	0.0000	0.0000	0.0000	0.0000
B1 - E5	13079	13062	13070	0.0017	0.0010	0.0010	0.0010
B1 - E6	13122	13091	130[illegible]	0.1245	0.1260	0.1265	0.1241
B1 - E7	13938	13901	13863	0.0000	0.0000	0.0000	0.0000
B1 - E8	14054	14018	13981	0.0001	0.0001	0.0001	0.0001
B1 - E9	14621	14584	14582	0.0477	0.0610	0.0643	0.0638
B1 - E10	14676	14626	14624	0.0311	0.0258	0.0273	0.0272
B1 - E11	14882	14837	14835	0.1009	0.0313	0.0300	0.0291
B1 - E12	14942	14890	14887	1.4810	1.5402	1.4763	1.4563
B1 - E13	15075	15021	14983	0.0012	0.0006	0.0005	0.0024
B1 - E14	15190	15145	15107	0.0006	0.0004	0.0004	0.0006
B1 - E15	17985	17891	17853	0.1778	0.1790	0.1791	0.1760
B1 - E16	18685	18603	18600	0.4862	0.4813	0.4710	0.4712
B1 - E17	19066	18976	18937	0.0401	0.0412	0.0386	0.0383
B1 - E18	19124	19023	18984	0.1015	0.0963	0.0899	0.0881
B1 - E19	20054	19948	19875	0.0014	0.0015	0.0014	0.0018
C1 - J1	8576	8610	8643	0.0000	0.0000	0.0000	0.0000
C1 - J2	9767	9792	9825	0.0000	0.0000	0.0000	0.0000
C1 - J3	9797	9828	9861	0.0000	0.0000	0.0000	0.0000
C1 - J4	12558	12542	12575	0.0000	0.0000	0.0000	0.0000
C1 - J5	12640	12622	12655	0.0003	0.0003	0.0003	0.0003
C1 - J6	13029	13002	13009	0.1234	0.1244	0.1249	0.1224
C1 - J7	13127	13106	13113	0.0000	0.0000	0.0000	0.0001
C1 - J8	13692	13666	13699	0.0000	0.0000	0.0000	0.0000
C1 - J9	13718	13685	13717	0.0002	0.0002	0.0002	0.0002
C1 - J10	14529	14486	14483	0.0613	0.0664	0.0700	0.0694
C1 - J11	14649	14611	14608	0.0100	0.0098	0.0108	0.0107
C1 - J12	14813	14764	14761	0.4204	0.4550	0.4376	0.4345
C1 - J13	14924	14878	14875	1.1658	1.1226	1.0755	1.0613
C1 - J14	17046	16968	16975	0.0209	0.0207	0.0196	0.0194
C1 - J15	17733	17668	17700	0.0004	0.0005	0.0005	0.0006
C1 - J16	18534	18449	18445	0.0864	0.0860	0.0843	0.0839
C1 - J17	18605	18507	18504	0.5673	0.5621	0.5503	0.5476
C1 - J18	18845	18748	18745	0.0000	0.0000	0.0000	0.0000
C1 - J19	19126	19032	18994	0.1021	0.0997	0.0932	0.0909

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

Z	A1–C1	B1–C1	A1–D1	A1–D2	A1–D3	A1–D4	A1–D5	A1–D6	A1–D7	A1–D8	A1–D9	A1–D10	A1–D11	A1–D12	A1–D13
22	0.0704	0.0657	0.0003	0.0208	0.0072	0.0000	0.0178	0.0084	0.1905	0.0896	0.0011	0.0022	0.0298	0.0265	0.0032
23	0.0675	0.0623	0.0007	0.0212	0.0064	0.0000	0.0235	0.0067	0.1947	0.0796	0.0015	0.0042	0.0317	0.0243	0.0031
24	0.0649	0.0593	0.0012	0.0212	0.0055	0.0000	0.0296	0.0051	0.1979	0.0781	0.0021	0.0256	0.0142	0.0219	0.0030
25	0.0627	0.0566	0.0022	0.0210	0.0047	0.0000	0.0357	0.0038	0.2003	0.0763	0.0028	0.0434	0.0000	0.0194	0.0028
26	0.0607	0.0541	0.0034	0.0203	0.0039	0.0001	0.0418	0.0029	0.2020	0.0742	0.0036	0.0465	0.0004	0.0170	0.0026
27	0.0589	0.0518	0.0049	0.0192	0.0033	0.0002	0.0478	0.0022	0.2031	0.0720	0.0045	0.0492	0.0007	0.0148	0.0024
28	0.0573	0.0496	0.0066	0.0180	0.0027	0.0003	0.0537	0.0017	0.2037	0.0697	0.0053	0.0516	0.0010	0.0128	0.0021
29	0.0560	0.0477	0.0081	0.0167	0.0023	0.0004	0.0595	0.0014	0.2040	0.0673	0.0061	0.0538	0.0012	0.0110	0.0019
30	0.0548	0.0459	0.0095	0.0156	0.0019	0.0007	0.0650	0.0011	0.2039	0.0648	0.0068	0.0558	0.0015	0.0094	0.0016
31	0.0537	0.0442	0.0106	0.0147	0.0016	0.0009	0.0703	0.0009	0.2038	0.0623	0.0073	0.0577	0.0017	0.0081	0.0014
32	0.0528	0.0427	0.0115	0.0138	0.0013	0.0012	0.0754	0.0008	0.2035	0.0599	0.0074	0.0597	0.0020	0.0068	0.0011
33	0.0520	0.0412	0.0122	0.0132	0.0012	0.0016	0.0801	0.0007	0.2031	0.0574	0.0070	0.0620	0.0024	0.0057	0.0009
34	0.0513	0.0398	0.0128	0.0127	0.0011	0.0020	0.0845	0.0006	0.2028	0.0549	0.0059	0.0647	0.0027	0.0047	0.0006
35	0.0507	0.0386	0.0133	0.0122	0.0011	0.0025	0.0884	0.0005	0.2025	0.0525	0.0039	0.0681	0.0031	0.0038	0.0004
36	0.0503	0.0374	0.0136	0.0119	0.0036	0.0008	0.0918	0.0005	0.2022	0.0502	0.0015	0.0718	0.0034	0.0030	0.0003
37	0.0499	0.0362	0.0139	0.0116	0.0040	0.0937	0.0024	0.0004	0.2020	0.0478	0.0000	0.0744	0.0036	0.0024	0.0001
38	0.0496	0.0352	0.0142	0.0114	0.0047	0.0989	0.0002	0.0004	0.2018	0.0455	0.0015	0.0739	0.0037	0.0018	0.0001
39	0.0494	0.0342	0.0143	0.0112	0.0056	0.1014	0.0003	0.0003	0.2018	0.0433	0.0059	0.0703	0.0038	0.0014	0.0000
40	0.0493	0.0332	0.0145	0.0111	0.0065	0.1036	0.0003	0.0003	0.2018	0.0411	0.0109	0.0660	0.0038	0.0011	0.0000
41	0.0492	0.0323	0.0146	0.0110	0.0076	0.1055	0.0003	0.0003	0.2019	0.0389	0.0151	0.0624	0.0038	0.0009	0.0000
42	0.0492	0.0315	0.0147	0.0110	0.0087	0.1070	0.0003	0.0002	0.2020	0.0368	0.0182	0.0598	0.0037	0.0007	0.0001
43	0.0493	0.0307	0.0148	0.0110	0.0099	0.1083	0.0004	0.0002	0.2022	0.0347	0.0205	0.0580	0.0036	0.0005	0.0001
44	0.0494	0.0299	0.0148	0.0111	0.0112	0.1092	0.0004	0.0002	0.2025	0.0327	0.0221	0.0567	0.0035	0.0004	0.0001
45	0.0496	0.0292	0.0149	0.0112	0.0126	0.1098	0.0006	0.0002	0.2027	0.0307	0.0232	0.0558	0.0034	0.0004	0.0001
46	0.0499	0.0285	0.0150	0.0115	0.0140	0.1100	0.0008	0.0002	0.2029	0.0287	0.0240	0.0551	0.0033	0.0003	0.0001
47	0.0502	0.0278	0.0150	0.0119	0.0156	0.1098	0.0001	0.0017	0.2027	0.0268	0.0245	0.0547	0.0032	0.0002	0.0001
48	0.0505	0.0271	0.0151	0.0126	0.0174	0.1089	0.0001	0.0046	0.2005	0.0248	0.0249	0.0543	0.0031	0.0002	0.0001
49	0.0510	0.0265	0.0151	0.0137	0.0199	0.1070	0.0001	0.0271	0.1788	0.0227	0.0251	0.0540	0.0030	0.0002	0.0001
50	0.0514	0.0259	0.0152	0.0158	0.0241	0.1021	0.0001	0.1620	0.0452	0.0203	0.0252	0.0538	0.0030	0.0001	0.0001
51	0.0519	0.0254	0.0152	0.0197	0.0400	0.0836	0.0001	0.1943	0.0152	0.0170	0.0251	0.0535	0.0029	0.0001	0.0001
52	0.0525	0.0248	0.0153	0.0217	0.1168	0.0060	0.0001	0.2001	0.0139	0.0115	0.0250	0.0533	0.0028	0.0001	0.0001
53	0.0531	0.0243	0.0153	0.0234	0.1216	0.0006	0.0001	0.2024	0.0183	0.0038	0.0248	0.0531	0.0027	0.0001	0.0001
54	0.0538	0.0238	0.0154	0.0250	0.1191	0.0026	0.0000	0.2038	0.0194	0.0006	0.0245	0.0529	0.0026	0.0001	0.0001
55	0.0545	0.0233	0.0155	0.0265	0.1174	0.0037	0.0000	0.2048	0.0184	0.0001	0.0240	0.0527	0.0026	0.0001	0.0001
56	0.0552	0.0229	0.0155	0.0280	0.1161	0.0045	0.0000	0.2056	0.0172	0.0033	0.0201	0.0524	0.0025	0.0001	0.0001
57	0.0560	0.0224	0.0156	0.0294	0.1150	0.0049	0.0000	0.2064	0.0159	0.0220	0.0007	0.0521	0.0024	0.0001	0.0001
58	0.0568	0.0220	0.0157	0.0308	0.1140	0.0052	0.0000	0.2072	0.0149	0.0219	0.0001	0.0519	0.0024	0.0000	0.0001
59	0.0577	0.0216	0.0158	0.0322	0.1132	0.0054	0.0000	0.2080	0.0139	0.0211	0.0000	0.0515	0.0023	0.0000	0.0001
60	0.0586	0.0212	0.0159	0.0335	0.1123	0.0056	0.0000	0.2089	0.0129	0.0202	0.0008	0.0504	0.0022	0.0000	0.0001
61	0.0595	0.0208	0.0160	0.0347	0.1116	0.0057	0.0000	0.2099	0.0111	0.0199	0.0480	0.0029	0.0022	0.0000	0.0001
62	0.0605	0.0204	0.0161	0.0359	0.1108	0.0057	0.0000	0.2111	0.0168	0.0119	0.0500	0.0005	0.0021	0.0000	0.0001
63	0.0615	0.0200	0.0162	0.0371	0.1101	0.0058	0.0000	0.2123	0.0265	0.0000	0.0498	0.0002	0.0021	0.0000	0.0001
64	0.0626	0.0197	0.0164	0.0382	0.1094	0.0058	0.0000	0.2139	0.0203	0.0036	0.0495	0.0021	0.0001	0.0000	0.0001
65	0.0637	0.0193	0.0165	0.0393	0.1087	0.0058	0.0000	0.2158	0.0158	0.0051	0.0490	0.0021	0.0000	0.0000	0.0001
66	0.0649	0.0190	0.0167	0.0403	0.1080	0.0058	0.0000	0.2180	0.0122	0.0054	0.0466	0.0020	0.0000	0.0000	0.0001
67	0.0660	0.0187	0.0168	0.0413	0.1073	0.0058	0.0000	0.2208	0.0084	0.0053	0.0481	0.0019	0.0000	0.0000	0.0001
68	0.0673	0.0184	0.0170	0.0422	0.1067	0.0058	0.0000	0.2251	0.0031	0.0051	0.0477	0.0019	0.0000	0.0000	0.0000
69	0.0685	0.0181	0.0171	0.0431	0.1061	0.0058	0.0000	0.2265	0.0007	0.0049	0.0471	0.0018	0.0000	0.0000	0.0000
70	0.0698	0.0178	0.0173	0.0439	0.1055	0.0058	0.0000	0.2053	0.0210	0.0046	0.0466	0.0018	0.0000	0.0000	0.0000
71	0.0711	0.0175	0.0175	0.0447	0.1049	0.0057	0.0001	0.1648	0.0607	0.0043	0.0461	0.0017	0.0000	0.0000	0.0000
72	0.0725	0.0172	0.0177	0.0455	0.1043	0.0057	0.0206	0.1090	0.0952	0.0040	0.0455	0.0017	0.0000	0.0000	0.0000
73	0.0739	0.0169	0.0179	0.0462	0.1038	0.0057	0.1046	0.0007	0.1186	0.0037	0.0449	0.0017	0.0000	0.0000	0.0000
74	0.0753	0.0166	0.0181	0.0469	0.1032	0.0056	0.0898	0.0001	0.1330	0.0034	0.0443	0.0016	0.0000	0.0000	0.0000
75	0.0768	0.0164	0.0184	0.0476	0.1027	0.0056	0.0798	0.0001	0.1421	0.0031	0.0436	0.0016	0.0000	0.0000	0.0000
76	0.0783	0.0161	0.0186	0.0482	0.1022	0.0056	0.0728	0.0001	0.1481	0.0029	0.0430	0.0015	0.0000	0.0000	0.0000
77	0.0799	0.0159	0.0189	0.0488	0.1017	0.0055	0.0677	0.0001	0.1522	0.0027	0.0423	0.0015	0.0000	0.0000	0.0000
78	0.0815	0.0156	0.0191	0.0493	0.1012	0.0055	0.0640	0.0001	0.1549	0.0025	0.0416	0.0015	0.0000	0.0000	0.0000
79	0.0831	0.0154	0.0194	0.0499	0.1007	0.0055	0.0610	0.0001	0.1567	0.0023	0.0410	0.0014	0.0000	0.0000	0.0000
80	0.0847	0.0151	0.0197	0.0504	0.1002	0.0054	0.0587	0.0001	0.1579	0.0021	0.0402	0.0014	0.0000	0.0000	0.0000
81	0.0864	0.0149	0.0200	0.0508	0.0998	0.0054	0.0568	0.0001	0.1585	0.0019	0.0395	0.0014	0.0000	0.0000	0.0000
82	0.0882	0.0147	0.0203	0.0513	0.0993	0.0054	0.0553	0.0001	0.1589	0.0018	0.0388	0.0013	0.0000	0.0000	0.0000
83	0.0899	0.0144	0.0206	0.0517	0.0989	0.0053	0.0540	0.0002	0.1589	0.0017	0.0380	0.0013	0.0000	0.0000	0.0000
84	0.0918	0.0142	0.0209	0.0521	0.0985	0.0053	0.0529	0.0002	0.1587	0.0015	0.0373	0.0012	0.0000	0.0000	0.0000
85	0.0936	0.0140	0.0213	0.0525	0.0980	0.0053	0.0519	0.0002	0.1583	0.0014	0.0365	0.0012	0.0000	0.0000	0.0000
86	0.0955	0.0138	0.0216	0.0528	0.0976	0.0052	0.0511	0.0002	0.1577	0.0013	0.0357	0.0012	0.0000	0.0000	0.0000
87	0.0974	0.0135	0.0220	0.0532	0.0972	0.0052	0.0504	0.0002	0.1570	0.0012	0.0349	0.0011	0.0000	0.0000	0.0000
88	0.0993	0.0133	0.0224	0.0535	0.0968	0.0052	0.0497	0.0002	0.1561	0.0011	0.0341	0.0011	0.0000	0.0000	0.0000
89	0.1013	0.0131	0.0228	0.0538	0.0964	0.0051	0.0492	0.0003	0.1552	0.0010	0.0333	0.0011	0.0000	0.0000	0.0000
90	0.1033	0.0129	0.0232	0.0540	0.0961	0.0051	0.0487	0.0003	0.1541	0.0009	0.0325	0.0010	0.0000	0.0000	0.0000
91	0.1054	0.0127	0.0236	0.0543	0.0957	0.0051	0.0482	0.0003	0.1530	0.0009	0.0316	0.0010	0.0000	0.0000	0.0000
92	0.1075	0.0125	0.0240	0.0545	0.0953	0.0050	0.0478	0.0003	0.1518	0.0008	0.0308	0.0010	0.0000	0.0000	0.0000

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

Z	A1-D14	A1-D15	A1-E1	A1-E2	A1-E3	A1-E4	A1-E5	A1-E6	A1-E7	A1-E8	A1-E9	A1-E10	A1-E11	A1-E12	A1-E13
22	0.0003	0.0002	0.0340	0.0506	0.0000	0.0002	0.0473	0.0035	0.0573	0.0061	0.5999	0.0861	0.0011	0.0000	0.0127
23	0.0003	0.0003	0.0410	0.0433	0.0000	0.0001	0.0618	0.0056	0.0485	0.0066	0.6000	0.0977	0.0050	0.0000	0.0165
24	0.0004	0.0003	0.0468	0.0371	0.0001	0.0001	0.0762	0.0092	0.0407	0.0070	0.5951	0.1097	0.0040	0.0000	0.0206
25	0.0004	0.0003	0.0513	0.0321	0.0003	0.0001	0.0899	0.0148	0.0342	0.0070	0.5864	0.1209	0.0031	0.0001	0.0247
26	0.0004	0.0003	0.0546	0.0282	0.0006	0.0000	0.1026	0.0228	0.0289	0.0069	0.5751	0.1304	0.0025	0.0002	0.0287
27	0.0005	0.0003	0.0570	0.0252	0.0010	0.0000	0.1143	0.0329	0.0246	0.0065	0.5625	0.1378	0.0019	0.0003	0.0325
28	0.0005	0.0003	0.0587	0.0229	0.0014	0.0000	0.1251	0.0449	0.0212	0.0059	0.5491	0.1427	0.0015	0.0005	0.0359
29	0.0005	0.0003	0.0599	0.0210	0.0018	0.0000	0.1353	0.0582	0.0185	0.0054	0.5356	0.1451	0.0011	0.0008	0.0390
30	0.0005	0.0003	0.0607	0.0195	0.0022	0.0000	0.1446	0.0724	0.0165	0.0048	0.5225	0.1453	0.0008	0.0012	0.0415
31	0.0006	0.0003	0.0612	0.0183	0.0027	0.0000	0.1532	0.0872	0.0148	0.0043	0.5102	0.1436	0.0006	0.0016	0.0436
32	0.0006	0.0003	0.0616	0.0174	0.0031	0.0000	0.1610	0.1021	0.0136	0.0038	0.4990	0.1404	0.0005	0.0022	0.0453
33	0.0006	0.0003	0.0617	0.0166	0.0036	0.0001	0.1679	0.1168	0.0125	0.0034	0.4889	0.1360	0.0004	0.0027	0.0465
34	0.0006	0.0003	0.0618	0.0160	0.0040	0.0001	0.1737	0.1312	0.0117	0.0031	0.4801	0.1307	0.0003	0.0033	0.0472
35	0.0006	0.0003	0.0618	0.0154	0.0044	0.0002	0.1788	0.1453	0.0110	0.0028	0.4725	0.1247	0.0002	0.0040	0.0475
36	0.0006	0.0003	0.0618	0.0150	0.0048	0.0003	0.1827	0.1590	0.0104	0.0025	0.4661	0.1183	0.0003	0.0045	0.0473
37	0.0006	0.0003	0.0617	0.0147	0.0052	0.0003	0.1854	0.1724	0.0100	0.0022	0.4608	0.1117	0.0052	0.0001	0.0466
38	0.0006	0.0003	0.0616	0.0145	0.0056	0.0004	0.1870	0.1855	0.0096	0.0020	0.4564	0.1051	0.0058	0.0001	0.0453
39	0.0005	0.0003	0.0615	0.0143	0.0060	0.0005	0.1874	0.1985	0.0093	0.0019	0.4528	0.0984	0.0064	0.0003	0.0436
40	0.0005	0.0003	0.0613	0.0142	0.0065	0.0006	0.1866	0.2115	0.0090	0.0017	0.4499	0.0919	0.0069	0.0353	0.0071
41	0.0004	0.0003	0.0612	0.0142	0.0069	0.0008	0.1845	0.2246	0.0087	0.0016	0.4476	0.0855	0.0074	0.0332	0.0616
42	0.0003	0.0003	0.0611	0.0143	0.0074	0.0009	0.1811	0.2379	0.0085	0.0015	0.4458	0.0794	0.0078	0.0276	0.0305
43	0.0002	0.0002	0.0610	0.0144	0.0079	0.0011	0.1764	0.2515	0.0084	0.0014	0.4443	0.0735	0.0082	0.0198	0.0897
44	0.0002	0.0002	0.0609	0.0147	0.0085	0.0012	0.1702	0.2654	0.0082	0.0013	0.4432	0.0678	0.0085	0.0108	0.0991
45	0.0002	0.0002	0.0609	0.0151	0.0093	0.0014	0.1626	0.2796	0.0081	0.0012	0.4424	0.0625	0.0087	0.0031	0.1068
46	0.0001	0.0002	0.0608	0.0158	0.0102	0.0018	0.1535	0.2943	0.0080	0.0012	0.4418	0.0575	0.0088	0.0000	0.1098
47	0.0001	0.0002	0.0608	0.0168	0.0112	0.0025	0.1427	0.3091	0.0079	0.0012	0.4413	0.0528	0.0088	0.0016	0.1079
48	0.0001	0.0002	0.0608	0.0183	0.0003	0.0161	0.1298	0.3240	0.0078	0.0012	0.4410	0.0484	0.0088	0.0054	0.1039
49	0.0001	0.0002	0.0608	0.0210	0.0002	0.0211	0.1136	0.3383	0.0077	0.0012	0.4408	0.0444	0.0086	0.0093	0.0996
50	0.0001	0.0002	0.0609	0.0079	0.0176	0.0346	0.0893	0.3500	0.0077	0.0012	0.4406	0.0406	0.0084	0.0127	0.0957
51	0.0001	0.0002	0.0609	0.0031	0.0308	0.1149	0.0002	0.3552	0.0076	0.0014	0.4405	0.0371	0.0080	0.0153	0.0925
52	0.0000	0.0001	0.0610	0.0028	0.0555	0.0788	0.1309	0.2407	0.0076	0.0017	0.4404	0.0339	0.0074	0.0174	0.0897
53	0.0000	0.0001	0.0612	0.0028	0.1253	0.0195	0.3544	0.0105	0.0075	0.0023	0.4401	0.0309	0.0068	0.0190	0.0874
54	0.0000	0.0001	0.0613	0.0030	0.0908	0.2989	0.1233	0.0003	0.0075	0.0046	0.4384	0.0277	0.0064	0.0201	0.0854
55	0.0000	0.0001	0.0615	0.0031	0.0726	0.4375	0.0063	0.0002	0.0075	0.0507	0.3933	0.0251	0.0052	0.0208	0.0837
56	0.0000	0.0001	0.0617	0.0033	0.0585	0.4600	0.0001	0.0008	0.0075	0.4395	0.0047	0.0230	0.0043	0.0213	0.0821
57	0.0000	0.0001	0.0620	0.0034	0.0468	0.4735	0.0003	0.0014	0.0075	0.4445	0.0008	0.0080	0.0160	0.0214	0.0807
58	0.0000	0.0001	0.0622	0.0036	0.0370	0.4845	0.0011	0.0019	0.0074	0.4463	0.0001	0.0039	0.0168	0.0213	0.0794
59	0.0000	0.0001	0.0625	0.0038	0.0287	0.4938	0.0018	0.0023	0.0074	0.4475	0.0000	0.0017	0.0160	0.0209	0.0781
60	0.0000	0.0001	0.0629	0.0040	0.0219	0.5018	0.0024	0.0026	0.0072	0.4483	0.0004	0.0000	0.0149	0.0201	0.0770
61	0.0000	0.0001	0.0632	0.0042	0.0162	0.5085	0.0028	0.0029	0.0070	0.4328	0.0102	0.0055	0.0137	0.0193	0.0759
62	0.0000	0.0001	0.0636	0.0043	0.0117	0.5140	0.0031	0.0031	0.0070	0.3425	0.1064	0.0000	0.0107	0.0197	0.0748
63	0.0000	0.0001	0.0641	0.0045	0.0081	0.5186	0.0034	0.0033	0.0068	0.2225	0.2271	0.0000	0.0231	0.0045	0.0737
64	0.0000	0.0001	0.0645	0.0047	0.0054	0.5223	0.0036	0.0035	0.0050	0.1484	0.3038	0.0000	0.0203	0.0042	0.0727
65	0.0000	0.0001	0.0651	0.0049	0.0034	0.5251	0.0038	0.0036	0.0081	0.1124	0.3378	0.0000	0.0143	0.0068	0.0717
66	0.0000	0.0000	0.0656	0.0051	0.0019	0.5274	0.0039	0.0037	0.0922	0.0000	0.3674	0.0002	0.0103	0.0069	0.0707
67	0.0000	0.0000	0.0662	0.0052	0.0009	0.5290	0.0041	0.0039	0.0759	0.0031	0.3828	0.0060	0.0001	0.0066	0.0697
68	0.0000	0.0000	0.0668	0.0054	0.0003	0.5302	0.0042	0.0039	0.0663	0.0041	0.3953	0.0000	0.0000	0.0062	0.0687
69	0.0000	0.0000	0.0674	0.0056	0.0000	0.5310	0.0042	0.0040	0.0596	0.0042	0.3698	0.0301	0.0000	0.0058	0.0677
70	0.0000	0.0000	0.0681	0.0057	0.0000	0.5315	0.0043	0.0041	0.0546	0.0035	0.2792	0.1245	0.0000	0.0053	0.0667
71	0.0000	0.0000	0.0688	0.0059	0.0002	0.5317	0.0043	0.0041	0.0510	0.0000	0.2024	0.2065	0.0000	0.0048	0.0657
72	0.0000	0.0000	0.0696	0.0060	0.0005	0.5317	0.0044	0.0042	0.0484	0.1076	0.0453	0.2564	0.0000	0.0044	0.0647
73	0.0000	0.0000	0.0704	0.0062	0.0010	0.5315	0.0044	0.0043	0.0463	0.1228	0.0000	0.2866	0.0000	0.0040	0.0636
74	0.0000	0.0000	0.0712	0.0063	0.0015	0.5311	0.0044	0.0043	0.0446	0.1049	0.0012	0.3028	0.0000	0.0036	0.0626
75	0.0000	0.0000	0.0721	0.0065	0.0021	0.5306	0.0044	0.0043	0.0432	0.0933	0.0020	0.3126	0.0000	0.0033	0.0616
76	0.0000	0.0000	0.0730	0.0066	0.0027	0.5300	0.0044	0.0044	0.0421	0.0855	0.0025	0.3188	0.0000	0.0030	0.0605
77	0.0000	0.0000	0.0740	0.0067	0.0034	0.5293	0.0044	0.0044	0.0411	0.0799	0.0027	0.3227	0.0000	0.0028	0.0595
78	0.0000	0.0000	0.0750	0.0069	0.0041	0.5286	0.0044	0.0044	0.0403	0.0757	0.0028	0.3251	0.0000	0.0025	0.0584
79	0.0000	0.0000	0.0761	0.0070	0.0048	0.5278	0.0044	0.0044	0.0396	0.0725	0.0029	0.3265	0.0000	0.0023	0.0573
80	0.0000	0.0000	0.0772	0.0071	0.0055	0.5269	0.0044	0.0045	0.0390	0.0699	0.0028	0.3270	0.0000	0.0021	0.0563
81	0.0000	0.0000	0.0783	0.0072	0.0062	0.5260	0.0044	0.0045	0.0385	0.0679	0.0028	0.3270	0.0000	0.0019	0.0552
82	0.0000	0.0000	0.0795	0.0073	0.0069	0.5250	0.0044	0.0045	0.0381	0.0662	0.0027	0.3265	0.0000	0.0018	0.0540
83	0.0000	0.0000	0.0807	0.0075	0.0076	0.5240	0.0044	0.0045	0.0377	0.0648	0.0026	0.3256	0.0000	0.0016	0.0529
84	0.0000	0.0000	0.0820	0.0076	0.0082	0.5230	0.0044	0.0045	0.0373	0.0636	0.0025	0.3244	0.0000	0.0015	0.0518
85	0.0000	0.0000	0.0834	0.0077	0.0089	0.5220	0.0044	0.0045	0.0370	0.0625	0.0024	0.3230	0.0000	0.0014	0.0507
86	0.0000	0.0000	0.0847	0.0078	0.0095	0.5209	0.0043	0.0045	0.0367	0.0617	0.0023	0.3213	0.0000	0.0012	0.0495
87	0.0000	0.0000	0.0862	0.0079	0.0101	0.5198	0.0043	0.0045	0.0365	0.0609	0.0022	0.3194	0.0000	0.0011	0.0483
88	0.0000	0.0000	0.0877	0.0080	0.0107	0.5188	0.0043	0.0046	0.0362	0.0602	0.0020	0.3174	0.0000	0.0010	0.0472
89	0.0000	0.0000	0.0892	0.0080	0.0112	0.5177	0.0043	0.0046	0.0360	0.0596	0.0019	0.3151	0.0000	0.0010	0.0460
90	0.0000	0.0000	0.0909	0.0081	0.0117	0.5165	0.0043	0.0046	0.0359	0.0590	0.0018	0.3128	0.0000	0.0009	0.0448
91	0.0000	0.0000	0.0925	0.0082	0.0122	0.5154	0.0042	0.0046	0.0357	0.0585	0.0016	0.3103	0.0000	0.0008	0.0436
92	0.0000	0.0000	0.0943	0.0083	0.0127	0.5143	0.0042	0.0046	0.0355	0.0580	0.0015	0.3077	0.0000	0.0007	0.0424

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

Z	A1-E14	A1-E15	A1-E16	A1-E17	A1-E18	A1-E19	A1-F1	A1-F2	A1-F3	A1-F4	A1-F5	A1-F6	A1-F7	A1-F8	A1-F9
22	0.0593	0.0139	0.0005	0.0073	0.0159	0.0003	0.0021	0.0514	0.0000	0.0775	0.0293	0.0274	0.2942	0.0407	0.9215
23	0.0609	0.0127	0.0004	0.0077	0.0155	0.0003	0.0026	0.0509	0.0000	0.1074	0.0203	0.0250	0.2939	0.0463	0.9464
24	0.0614	0.0122	0.0003	0.0081	0.0151	0.0003	0.0031	0.0503	0.0000	0.1404	0.0098	0.0231	0.2980	0.0511	0.7621
25	0.0612	0.0122	0.0002	0.0083	0.0145	0.0003	0.0037	0.0496	0.0000	0.1732	0.0019	0.0220	0.3053	0.0545	0.9684
26	0.0606	0.0125	0.0002	0.0085	0.0139	0.0003	0.0043	0.0490	0.0001	0.2039	0.0003	0.0218	0.3140	0.0563	0.9656
27	0.0599	0.0130	0.0001	0.0086	0.0132	0.0003	0.0050	0.0483	0.0001	0.2318	0.0072	0.0224	0.3216	0.0561	0.9545
28	0.0592	0.0138	0.0001	0.0086	0.0124	0.0003	0.0056	0.0477	0.0001	0.2569	0.0236	0.0242	0.3256	0.0542	0.9365
29	0.0587	0.0147	0.0001	0.0084	0.0116	0.000[illegible]	0.0062	0.0470	0.0001	0.2796	0.0490	0.0274	0.3237	0.0511	0.9133
30	0.0583	0.0158	0.0001	0.0082	0.0107	0.000[illegible]	0.0069	0.0465	0.0001	0.3005	0.0819	0.0326	0.3147	0.0472	0.8870
31	0.0581	0.0170	0.0001	0.0079	0.0098	0.0002	0.0075	0.0460	0.0001	0.3196	0.1200	0.0409	0.2980	0.0431	0.8590
32	0.0581	0.0183	0.0001	0.0074	0.0089	0.0002	0.0080	0.0455	0.0001	0.3372	0.1603	0.0538	0.2734	0.0392	0.8307
33	0.0583	0.0197	0.0001	0.0069	0.0080	0.0002	0.0086	0.0451	0.0001	0.3536	0.2006	0.0740	0.2400	0.0358	0.8030
34	0.0588	0.0210	0.0001	0.0064	0.0072	0.0002	0.0091	0.0448	0.0001	0.3688	0.2390	0.1030	0.1971	0.0329	0.7766
35	0.0596	0.0224	0.0001	0.0058	0.0064	0.0002	0.0096	0.0446	0.0001	0.3829	0.2744	0.1385	0.1481	0.0307	0.7517
36	0.0607	0.0238	0.0001	0.0052	0.0056	0.0002	0.0100	0.0445	0.0000	0.3961	0.3064	0.1716	0.1024	0.0292	0.7285
37	0.0621	0.0251	0.0001	0.0046	0.0049	0.0002	0.0104	0.0446	0.0000	0.4083	0.3348	0.1944	0.0681	0.0284	0.7067
38	0.0640	0.0263	0.0001	0.0040	0.0043	0.0002	0.0108	0.0447	0.0000	0.4198	0.3597	0.2065	0.0457	0.0286	0.6862
39	0.0659	0.0274	0.0001	0.0035	0.0037	0.0002	0.0112	0.0451	0.0000	0.4304	0.3815	0.2112	0.0318	0.0299	0.6665
40	0.0678	0.0284	0.0001	0.0030	0.0032	0.0002	0.0115	0.0456	0.0000	0.4403	0.4003	0.2116	0.0232	0.0330	0.6469
41	0.0157	0.0293	0.0002	0.0025	0.0027	0.0001	0.0118	0.0464	0.0001	0.4494	0.4165	0.2099	0.0177	0.0390	0.6259
42	0.0024	0.0301	0.0008	0.0015	0.0024	0.0001	0.0121	0.0474	0.0002	0.4578	0.4304	0.2072	0.0141	0.0511	0.6003
43	0.00[illegible]	0.0306	0.0018	0.0002	0.0020	0.0001	0.0123	0.0488	0.0004	0.4654	0.4422	0.2041	0.0117	0.0780	0.5612
44	0.0156	0.0166	0.0016	0.0000	0.0018	0.0001	0.0126	0.0508	0.0007	0.4720	0.4522	0.2010	0.0100	0.1486	0.4796
45	0.0326	0.0000	0.0014	0.0000	0.0015	0.0001	0.0128	0.0534	0.0011	0.4775	0.4605	0.1979	0.0090	0.3268	0.2914
46	0.0329	0.0000	0.0012	0.0000	0.0013	0.0001	0.0130	0.0570	0.0017	0.4816	0.4673	0.1951	0.0083	0.5083	0.1007
47	0.0332	0.0000	0.0010	0.0000	0.0011	0.0001	0.0132	0.0618	0.0030	0.4837	0.4728	0.1925	0.0080	0.5671	0.0334
48	0.0335	0.0000	0.0009	0.0000	0.0010	0.0001	0.0134	0.0525	0.0217	0.4824	0.4770	0.1902	0.0080	0.5793	0.0135
49	0.0338	0.0000	0.0008	0.0000	0.0008	0.0001	0.0135	0.0001	0.0898	0.4749	0.4799	0.1882	0.0084	0.5790	0.0063
50	0.0339	0.0000	0.0006	0.0000	0.0007	0.0001	0.0137	0.0011	0.1191	0.4532	0.4813	0.1866	0.0094	0.5749	0.0033
51	0.0341	0.0000	0.0006	0.0000	0.0006	0.0001	0.0139	0.0021	0.1943	0.3879	0.4796	0.1852	0.0113	0.5689	0.0019
52	0.0342	0.0000	0.0005	0.0000	0.0006	0.0001	0.0140	0.0029	0.4704	0.1297	0.4690	0.1842	0.0154	0.5609	0.0011
53	0.0343	0.0000	0.0004	0.0000	0.0005	0.0001	0.0142	0.0038	0.6352	0.0160	0.4245	0.1836	0.0251	0.5474	0.0007
54	0.0343	0.0000	0.0004	0.0000	0.0004	0.0001	0.0143	0.0046	0.6280	0.3216	0.1319	0.1834	0.0579	0.5113	0.0004
55	0.0343	0.0000	0.0003	0.0000	0.0004	0.0001	0.0145	0.0056	0.6180	0.4560	0.0125	0.1837	0.2383	0.3280	0.0003
56	0.0343	0.0000	0.0003	0.0000	0.0003	0.0001	0.0146	0.0065	0.6134	0.4772	0.0004	0.1845	0.5038	0.0601	0.0002
57	0.0342	0.0000	0.0002	0.0000	0.0003	0.0001	0.0147	0.0076	0.6119	0.4825	0.0005	0.1861	0.5421	0.0197	0.0001
58	0.0341	0.0000	0.0002	0.0000	0.0003	0.0000	0.0149	0.0087	0.6122	0.4838	0.0024	0.1886	0.5532	0.0066	0.0001
59	0.0340	0.0000	0.0002	0.0000	0.0002	0.0000	0.0150	0.0098	0.6134	0.4836	0.0042	0.1924	0.5567	0.0028	0.0001
60	0.0338	0.0000	0.0002	0.0000	0.0002	0.0000	0.0152	0.0110	0.6153	0.4825	0.0059	0.1979	0.5530	0.0011	0.0046
61	0.0337	0.0000	0.0001	0.0000	0.0002	0.0000	0.0153	0.0122	0.6174	0.4810	0.0072	0.2054	0.5456	0.0003	0.0001
62	0.0335	0.0000	0.0001	0.0000	0.0002	0.0000	0.0155	0.0135	0.6198	0.4792	0.0084	0.2141	0.5127	0.0142	0.0053
63	0.0333	0.0000	0.0001	0.0000	0.0001	0.0000	0.0156	0.0148	0.6223	0.4770	0.0093	0.2231	0.4332	0.0843	0.0008
64	0.0331	0.0000	0.0001	0.0000	0.0001	0.0000	0.0158	0.0161	0.6248	0.4747	0.0100	0.2558	0.3095	0.1711	0.0004
65	0.0328	0.0000	0.0000	0.0000	0.0001	0.0000	0.0160	0.0175	0.6273	0.4722	0.0107	0.3931	0.0858	0.2529	0.0002
66	0.0326	0.0001	0.0000	0.0000	0.0001	0.0000	0.0161	0.0188	0.6298	0.4696	0.0112	0.4135	0.0001	0.3137	0.0002
67	0.0323	0.0001	0.0000	0.0000	0.0001	0.0000	0.0163	0.0202	0.6323	0.4668	0.0116	0.3488	0.0255	0.3485	0.0001
68	0.0320	0.0001	0.0000	0.0000	0.0001	0.0000	0.0165	0.021[illegible]	0.6346	0.4640	0.0120	0.2966	0.0522	0.3696	0.0001
69	0.0317	0.0001	0.0000	0.0000	0.0001	0.0000	0.0167	0.0231	0.6369	0.4610	0.0123	0.2611	0.0700	0.3830	0.0001
70	0.0314	0.0001	0.0000	0.0000	0.0001	0.0000	0.0169	0.0245	0.6392	0.4580	0.0126	0.2363	0.0817	0.3917	0.0000
71	0.0310	0.0000	0.0000	0.0000	0.0001	0.0000	0.0171	0.0259	0.6413	0.4550	0.0128	0.2184	0.0897	0.3973	0.0000
72	0.0307	0.0000	0.0000	0.0000	0.0001	0.0000	0.0173	0.0273	0.6434	0.4519	0.0130	0.2049	0.0954	0.4007	0.0000
73	0.0303	0.0000	0.0000	0.0000	0.0000	0.0000	0.0175	0.0287	0.6454	0.4487	0.0131	0.1945	0.0995	0.4027	0.0000
74	0.0299	0.0000	0.0000	0.0000	0.0000	0.0000	0.0178	0.0301	0.6473	0.4455	0.0133	0.1862	0.1026	0.4036	0.0000
75	0.0295	0.0000	0.0000	0.0000	0.0000	0.0000	0.0180	0.0315	0.6491	0.4423	0.0134	0.1795	0.1049	0.4036	0.0000
76	0.0291	0.0000	0.0000	0.0000	0.0000	0.0000	0.0182	0.0329	0.6508	0.4391	0.0135	0.1740	0.1067	0.4029	0.0000
77	0.0287	0.0000	0.0000	0.0000	0.0000	0.0000	0.0185	0.0342	0.6525	0.4359	0.0135	0.1694	0.1081	0.4018	0.0000
78	0.0282	0.0000	0.0000	0.0000	0.0000	0.0000	0.0188	0.0356	0.6540	0.4326	0.0136	0.1655	0.1092	0.4002	0.0000
79	0.0278	0.0000	0.0000	0.0000	0.0000	0.0000	0.0190	0.0369	0.6555	0.4294	0.0136	0.1621	0.1100	0.3983	0.0000
80	0.0273	0.0000	0.0000	0.0000	0.0000	0.0000	0.0193	0.0382	0.6569	0.4261	0.0137	0.1592	0.1106	0.3960	0.0000
81	0.0268	0.0000	0.0000	0.0000	0.0000	0.0000	0.0196	0.0395	0.6583	0.4229	0.0137	0.1567	0.1111	0.3935	0.0000
82	0.0264	0.0000	0.0000	0.0000	0.0000	0.0000	0.0199	0.0407	0.6595	0.4196	0.0137	0.1545	0.1115	0.3908	0.0000
83	0.0259	0.0000	0.0000	0.0000	0.0000	0.0000	0.0202	0.0419	0.6607	0.4164	0.0137	0.1525	0.1117	0.3878	0.0000
84	0.0254	0.0000	0.0000	0.0000	0.0000	0.0000	0.0206	0.0431	0.6619	0.4132	0.0137	0.1507	0.1119	0.3847	0.0000
85	0.0249	0.0000	0.0000	0.0000	0.0000	0.0000	0.0209	0.0443	0.6629	0.4100	0.0137	0.1492	0.1120	0.3814	0.0000
86	0.0244	0.0000	0.0000	0.0000	0.0000	0.0000	0.0213	0.0454	0.6639	0.4068	0.0137	0.1477	0.1121	0.3779	0.0000
87	0.0238	0.0000	0.0000	0.0000	0.0000	0.0000	0.0216	0.0465	0.6649	0.4036	0.0137	0.1464	0.1121	0.3743	0.0000
88	0.0233	0.0000	0.0000	0.0000	0.0000	0.0000	0.0220	0.0476	0.6657	0.4004	0.0137	0.1453	0.1120	0.3705	0.0000
89	0.0227	0.0000	0.0000	0.0000	0.0000	0.0000	0.0224	0.0487	0.6665	0.3973	0.0136	0.1442	0.1120	0.3666	0.0000
90	0.0222	0.0000	0.0000	0.0000	0.0000	0.0000	0.0228	0.0497	0.6673	0.3942	0.0136	0.1432	0.1119	0.3626	0.0000
91	0.0216	0.0000	0.0000	0.0000	0.0000	0.0000	0.0232	0.0507	0.6680	0.3911	0.0136	0.1423	0.1117	0.3584	0.0000
92	0.0211	0.0000	0.0000	0.0000	0.0000	0.0000	0.0237	0.0516	0.6686	0.3880	0.0136	0.1415	0.1116	0.3541	0.0000

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

Z	A1-F10	A1-F11	A1-F12	A1-F13	A1-F14	A1-F15	B1-D1	B1-D2	B1-D3	B1-D4	B1-D5	B1-D6	B1-D7	B1-D8	B1-D9
22	0.1037	0.0159	0.0580	0.0408	0.0339	0.0031	0.0014	0.0509	0.0244	0.0010	0.0000	0.0073	0.0981	0.5755	0.0020
23	0.0904	0.0189	0.0602	0.0412	0.0340	0.0030	0.0012	0.0494	0.0260	0.0011	0.0000	0.0058	0.0948	0.5960	0.0026
24	0.0760	0.0219	0.0619	0.0419	0.0338	0.0029	0.0009	0.0480	0.0275	0.0012	0.0000	0.0047	0.0910	0.6146	0.0032
25	0.0619	0.0248	0.0634	0.0430	0.0334	0.0029	0.0005	0.0467	0.0290	0.0013	0.0000	0.0038	0.0868	0.6315	0.0038
26	0.0489	0.0277	0.0645	0.0445	0.0326	0.0028	0.0002	0.0456	0.0304	0.0013	0.0000	0.0032	0.0825	0.6469	0.0043
27	0.0378	0.0305	0.0655	0.0462	0.0316	0.0027	0.0000	0.0444	0.0317	0.0013	0.0000	0.0027	0.0780	0.6611	0.0047
28	0.0287	0.0332	0.0663	0.0483	0.0304	0.0026	0.0000	0.0434	0.0327	0.0012	0.0000	0.0024	0.0734	0.6740	0.0049
29	0.0216	0.0357	0.0671	0.0506	0.0289	0.0025	0.0000	0.0424	0.0337	0.0011	0.0000	0.0022	0.0689	0.6859	0.0051
30	0.0161	0.0381	0.0678	0.0530	0.0272	0.0024	0.0001	0.0416	0.0345	0.0010	0.0000	0.0020	0.0644	0.6968	0.0052
31	0.0119	0.0403	0.0684	0.0557	0.0253	0.0023	0.0002	0.0410	0.0352	0.0009	0.0001	0.0019	0.0600	0.7068	0.0051
32	0.0089	0.0423	0.0690	0.0584	0.0233	0.0022	0.0002	0.0405	0.0358	0.0008	0.0001	0.0018	0.0556	0.7160	0.0050
33	0.0066	0.0442	0.0695	0.0612	0.0213	0.0021	0.0002	0.0402	0.0364	0.0007	0.0001	0.0018	0.0514	0.7245	0.0049
34	0.0048	0.0459	0.0700	0.0640	0.0192	0.0020	0.0002	0.0400	0.0369	0.0006	0.0001	0.0017	0.0472	0.7323	0.0048
35	0.0035	0.0475	0.0705	0.0667	0.0172	0.0019	0.0002	0.0398	0.0376	0.0004	0.0001	0.0017	0.0432	0.7394	0.0046
36	0.0025	0.0490	0.0710	0.0693	0.0152	0.0018	0.0002	0.0398	0.0018	0.0367	0.0000	0.0017	0.0393	0.7460	0.0045
37	0.0000	0.0520	0.0714	0.0718	0.0134	0.0017	0.0002	0.0397	0.0007	0.0033	0.0352	0.0018	0.0355	0.7519	0.0042
38	0.0509	0.0017	0.0718	0.0740	0.0117	0.0016	0.0002	0.0397	0.0006	0.0003	0.0390	0.0018	0.0318	0.7573	0.0039
39	0.0520	0.0010	0.0722	0.0761	0.0102	0.0015	0.0001	0.0397	0.0005	0.0002	0.0400	0.0019	0.0283	0.7620	0.0035
40	0.0528	0.0005	0.0727	0.0779	0.0088	0.0015	0.0001	0.0398	0.0004	0.0002	0.0411	0.0019	0.0249	0.7662	0.0031
41	0.0534	0.0729	0.0002	0.0796	0.0076	0.0014	0.0001	0.0399	0.0004	0.0002	0.0425	0.0020	0.0217	0.7698	0.0028
42	0.0539	0.0732	0.0000	0.0810	0.0066	0.0013	0.0001	0.0399	0.0003	0.0002	0.0442	0.0021	0.0185	0.7727	0.0026
43	0.0541	0.0734	0.0004	0.0817	0.0057	0.0012	0.0001	0.0400	0.0003	0.0002	0.0463	0.0021	0.0155	0.7748	0.0024
44	0.0542	0.0736	0.0371	0.0459	0.0049	0.0012	0.0001	0.0401	0.0002	0.0002	0.0492	0.0021	0.0126	0.7760	0.0023
45	0.0541	0.0737	0.0769	0.0069	0.0042	0.0011	0.0001	0.0402	0.0002	0.0002	0.0531	0.0019	0.0098	0.7760	0.0022
46	0.0537	0.0738	0.0816	0.0028	0.0036	0.0010	0.0001	0.0402	0.0002	0.0003	0.0591	0.0010	0.0070	0.7745	0.0021
47	0.0531	0.0739	0.0833	0.0017	0.0031	0.0010	0.0000	0.0403	0.0001	0.0003	0.0054	0.0620	0.0041	0.7708	0.0021
48	0.0523	0.0739	0.0842	0.0012	0.0027	0.0009	0.0000	0.0404	0.0001	0.0004	0.0042	0.0741	0.0010	0.7635	0.0020
49	0.0511	0.0739	0.0848	0.0009	0.0023	0.0008	0.0000	0.0403	0.0000	0.0007	0.0040	0.0866	0.0030	0.7497	0.0020
50	0.0497	0.0738	0.0852	0.0007	0.0020	0.0008	0.0000	0.0010	0.0387	0.0014	0.0041	0.0361	0.0813	0.7221	0.0020
51	0.0478	0.0737	0.0855	0.0006	0.0017	0.0007	0.0000	0.0003	0.0358	0.0051	0.0043	0.0133	0.1671	0.6593	0.0020
52	0.0456	0.0736	0.0856	0.0005	0.0015	0.0007	0.0000	0.0002	0.0083	0.0329	0.0044	0.0073	0.3380	0.4944	0.0021
53	0.0428	0.0734	0.0857	0.0004	0.0013	0.0006	0.0000	0.0002	0.0012	0.0402	0.0047	0.0044	0.6396	0.1955	0.0021
54	0.0395	0.0732	0.0856	0.0003	0.0011	0.0006	0.0000	0.0001	0.0004	0.0412	0.0049	0.0027	0.7943	0.0422	0.0023
55	0.0356	0.0729	0.0855	0.0003	0.0010	0.0006	0.0000	0.0001	0.0002	0.0416	0.0051	0.0015	0.8293	0.0077	0.0025
56	0.0309	0.0726	0.0853	0.0002	0.0009	0.0005	0.0000	0.0001	0.0001	0.0419	0.0054	0.0008	0.8362	0.0021	0.0017
57	0.0255	0.0723	0.0851	0.0002	0.0008	0.0005	0.0000	0.0001	0.0001	0.0422	0.0057	0.0003	0.8365	0.0031	0.0004
58	0.0192	0.0719	0.0848	0.0002	0.0007	0.0005	0.0000	0.0001	0.0000	0.0424	0.0060	0.0001	0.8348	0.0035	0.0016
59	0.0102	0.0715	0.0844	0.0002	0.0006	0.0004	0.0000	0.0001	0.0000	0.0427	0.0063	0.0000	0.8324	0.0040	0.0029
60	0.0001	0.0711	0.0840	0.0001	0.0005	0.0004	0.0000	0.0001	0.0000	0.0430	0.0066	0.0001	0.8301	0.0043	0.0041
61	0.0000	0.0707	0.0835	0.0001	0.0005	0.0004	0.0000	0.0001	0.0000	0.0433	0.0069	0.0004	0.8302	0.0020	0.0007
62	0.0000	0.0701	0.0830	0.0001	0.0004	0.0004	0.0000	0.0000	0.0000	0.0436	0.0072	0.0008	0.7663	0.0634	0.0003
63	0.0000	0.0696	0.0824	0.0001	0.0004	0.0003	0.0000	0.0000	0.0000	0.0439	0.0076	0.0013	0.2671	0.5610	0.0002
64	0.0000	0.0690	0.0817	0.0001	0.0003	0.0003	0.0000	0.0000	0.0000	0.0442	0.0079	0.0019	0.0323	0.7936	0.0002
65	0.0000	0.0684	0.0811	0.0001	0.0003	0.0003	0.0000	0.0000	0.0000	0.0446	0.0082	0.0026	0.0073	0.8165	0.0001
66	0.0000	0.0678	0.0804	0.0001	0.0002	0.0003	0.0000	0.0000	0.0000	0.0450	0.0086	0.0033	0.0022	0.8194	0.0001
67	0.0000	0.0671	0.0796	0.0001	0.0002	0.0003	0.0000	0.0000	0.0000	0.0454	0.0089	0.0041	0.0006	0.8188	0.0001
68	0.0000	0.0665	0.0788	0.0001	0.0002	0.0002	0.0000	0.0000	0.0000	0.0458	0.0093	0.0049	0.0000	0.8172	0.0001
69	0.0000	0.0657	0.0780	0.0001	0.0002	0.0002	0.0000	0.0000	0.0000	0.0462	0.0096	0.0053	0.0002	0.8152	0.0001
70	0.0000	0.0650	0.0771	0.0000	0.0002	0.0002	0.0000	0.0000	0.0000	0.0467	0.0099	0.0047	0.0017	0.8130	0.0001
71	0.0000	0.0642	0.0763	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0472	0.0102	0.0035	0.0040	0.8107	0.0001
72	0.0000	0.0634	0.0753	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0477	0.0060	0.0070	0.0061	0.8083	0.0001
73	0.0000	0.0626	0.0744	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0482	0.0019	0.0104	0.0081	0.8059	0.0001
74	0.0000	0.0617	0.0734	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0488	0.0011	0.0112	0.0096	0.8034	0.0001
75	0.0000	0.0609	0.0723	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0494	0.0008	0.0116	0.0109	0.8010	0.0000
76	0.0000	0.0600	0.0713	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0500	0.0006	0.0119	0.0122	0.7985	0.0000
77	0.0000	0.0590	0.0702	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0506	0.0005	0.0123	0.0134	0.7960	0.0000
78	0.0000	0.0581	0.0691	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0513	0.0004	0.0126	0.0146	0.7935	0.0000
79	0.0000	0.0571	0.0680	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0520	0.0003	0.0129	0.0158	0.7910	0.0000
80	0.0000	0.0561	0.0668	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0527	0.0002	0.0132	0.0169	0.7885	0.0000
81	0.0000	0.0551	0.0657	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0535	0.0002	0.0135	0.0180	0.7860	0.0000
82	0.0000	0.0541	0.0644	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0542	0.0002	0.0138	0.0191	0.7835	0.0000
83	0.0000	0.0531	0.0632	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0551	0.0002	0.0141	0.0201	0.7811	0.0000
84	0.0000	0.0520	0.0620	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0559	0.0001	0.0143	0.0212	0.7786	0.0000
85	0.0000	0.0509	0.0607	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0568	0.0001	0.0146	0.0222	0.7761	0.0000
86	0.0000	0.0498	0.0594	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0577	0.0001	0.0148	0.0232	0.7736	0.0000
87	0.0000	0.0487	0.0581	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0587	0.0001	0.0151	0.0242	0.7712	0.0000
88	0.0000	0.0475	0.0568	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0596	0.0001	0.0153	0.0251	0.7687	0.0000
89	0.0000	0.0464	0.0554	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0607	0.0001	0.0155	0.0261	0.7663	0.0000
90	0.0000	0.0452	0.0541	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0617	0.0001	0.0157	0.0270	0.7638	0.0000
91	0.0000	0.0440	0.0527	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0628	0.0001	0.0159	0.0279	0.7614	0.0000
92	0.0000	0.0428	0.0513	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0640	0.0001	0.0161	0.0287	0.7590	0.0000

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TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

Z	B1-D10	B1-D11	B1-D12	B1-D13	B1-D14	B1-D15	B1-E1	B1-E2	B1-E3	B1-E4	B1-E5	B1-E6	B1-E7	B1-E8	B1-E9
22	0.0031	0.0181	0.0727	0.0254	0.0004	0.0003	0.0031	0.0096	0.0783	0.0014	0.0191	0.0062	0.0931	0.0731	0.1581
23	0.0040	0.0134	0.0782	0.0279	0.0004	0.0003	0.0033	0.0078	0.0796	0.0017	0.0233	0.0059	0.0803	0.0667	0.1648
24	0.0111	0.0027	0.0830	0.0306	0.0005	0.0004	0.0033	0.0064	0.0807	0.0021	0.0260	0.0056	0.0685	0.0630	0.1712
25	0.0098	0.0005	0.0870	0.0337	0.0005	0.0004	0.0031	0.0054	0.0816	0.0024	0.0269	0.0055	0.0581	0.0616	0.1769
26	0.0064	0.0008	0.0900	0.0371	0.0006	0.0004	0.0028	0.0046	0.0823	0.0026	0.0264	0.0054	0.0494	0.0617	0.1817
27	0.0041	0.0008	0.0918	0.0411	0.0006	0.0005	0.0024	0.0040	0.0829	0.0028	0.0248	0.0051	0.0422	0.0627	0.1853
28	0.0024	0.0006	0.0925	0.0455	0.0006	0.0005	0.0021	0.0036	0.0833	0.0030	0.0227	0.0046	0.0362	0.0644	0.1876
29	0.0013	0.0004	0.0921	0.0505	0.0005	0.0005	0.0018	0.0032	0.0836	0.0030	0.0203	0.0040	0.0313	0.0662	0.1884
30	0.0006	0.0001	0.0907	0.0559	0.0004	0.0006	0.0015	0.0030	0.0838	0.0031	0.0180	0.0034	0.0272	0.0681	0.1879
31	0.0003	0.0000	0.0884	0.0619	0.0003	0.0006	0.0012	0.0027	0.0839	0.0030	0.0157	0.0028	0.0237	0.0699	0.1857
32	0.0001	0.0000	0.0852	0.0684	0.0002	0.0007	0.0010	0.0025	0.0840	0.0029	0.0137	0.0023	0.0206	0.0716	0.1821
33	0.0000	0.0003	0.0813	0.0751	0.0001	0.0007	0.0009	0.0024	0.0839	0.0028	0.0119	0.0018	0.0178	0.0732	0.1770
34	0.0000	0.0007	0.0768	0.0819	0.0000	0.0007	0.0007	0.0023	0.0839	0.0027	0.0103	0.0015	0.0154	0.0745	0.1705
35	0.0000	0.0015	0.0719	0.0884	0.0002	0.0008	0.0006	0.0022	0.0838	0.0025	0.0090	0.0012	0.0131	0.0757	0.1628
36	0.0000	0.0023	0.0669	0.0940	0.0011	0.0008	0.0005	0.0021	0.0836	0.0024	0.0078	0.0010	0.0111	0.0767	0.1541
37	0.0001	0.0032	0.0621	0.0978	0.0036	0.0008	0.0004	0.0020	0.0835	0.0022	0.0068	0.0008	0.0093	0.0776	0.1446
38	0.0003	0.0039	0.0577	0.0982	0.0090	0.0009	0.0003	0.0019	0.0833	0.0021	0.0059	0.0007	0.0076	0.0783	0.1345
39	0.0005	0.0044	0.0538	0.0941	0.0185	0.0009	0.0003	0.0019	0.0831	0.0020	0.0052	0.0006	0.0061	0.0790	0.1240
40	0.0007	0.0047	0.0506	0.0858	0.0317	0.0010	0.0002	0.0018	0.0829	0.0019	0.0046	0.0006	0.0048	0.0794	0.1133
41	0.0008	0.0049	0.0479	0.0761	0.0459	0.0010	0.0002	0.0018	0.0826	0.0017	0.0041	0.0005	0.0037	0.0798	0.1026
42	0.0008	0.0049	0.0457	0.0672	0.0586	0.0010	0.0002	0.0017	0.0824	0.0017	0.0037	0.0005	0.0027	0.0801	0.0921
43	0.0008	0.0048	0.0439	0.0603	0.0690	0.0011	0.0001	0.0017	0.0821	0.0016	0.0034	0.0005	0.0018	0.0802	0.0818
44	0.0008	0.0046	0.0425	0.0552	0.0771	0.0011	0.0001	0.0016	0.0818	0.0016	0.0031	0.0005	0.0012	0.0803	0.0720
45	0.0007	0.0044	0.0413	0.0515	0.0835	0.0012	0.0001	0.0016	0.0813	0.0018	0.0029	0.0005	0.0006	0.0803	0.0627
46	0.0007	0.0043	0.0404	0.0489	0.0884	0.0013	0.0001	0.0016	0.0805	0.0022	0.0028	0.0006	0.0003	0.0802	0.0539
47	0.0006	0.0041	0.0396	0.0470	0.0924	0.0013	0.0001	0.0016	0.0784	0.0039	0.0029	0.0007	0.0001	0.0800	0.0457
48	0.0006	0.0039	0.0390	0.0456	0.0955	0.0014	0.0001	0.0016	0.0084	0.0731	0.0031	0.0008	0.0000	0.0798	0.0383
49	0.0005	0.0037	0.0385	0.0446	0.0980	0.0015	0.0001	0.0016	0.0001	0.0800	0.0040	0.0011	0.0001	0.0795	0.0315
50	0.0005	0.0036	0.0381	0.0439	0.0999	0.0015	0.0000	0.0004	0.0013	0.0759	0.0073	0.0017	0.0003	0.0792	0.0253
51	0.0004	0.0034	0.0378	0.0435	0.1015	0.0016	0.0000	0.0002	0.0015	0.0142	0.0670	0.0036	0.0007	0.0788	0.0198
52	0.0004	0.0033	0.0376	0.0432	0.1027	0.0017	0.0000	0.0002	0.0015	0.0001	0.0530	0.0315	0.0011	0.0785	0.0149
53	0.0003	0.0031	0.0374	0.0430	0.1036	0.0018	0.0000	0.0002	0.0002	0.0014	0.0024	0.0822	0.0018	0.0783	0.0105
54	0.0003	0.0030	0.0372	0.0428	0.1043	0.0020	0.0000	0.0002	0.0000	0.0013	0.0001	0.0848	0.0025	0.0786	0.0060
55	0.0003	0.0029	0.0371	0.0428	0.1047	0.0021	0.0000	0.0002	0.0000	0.0003	0.0009	0.0851	0.0034	0.0795	0.0001
56	0.0002	0.0028	0.0370	0.0428	0.1049	0.0023	0.0000	0.0002	0.0001	0.0001	0.0011	0.0853	0.0043	0.0107	0.0674
57	0.0002	0.0027	0.0369	0.0429	0.1050	0.0025	0.0000	0.0002	0.0001	0.0000	0.0011	0.0855	0.0053	0.0052	0.0704
58	0.0002	0.0026	0.0368	0.0430	0.1049	0.0027	0.0000	0.0001	0.0001	0.0000	0.0011	0.0857	0.0065	0.0026	0.0708
59	0.0001	0.0025	0.0368	0.0431	0.1046	0.0029	0.0000	0.0001	0.0001	0.0000	0.0012	0.0860	0.0077	0.0011	0.0701
60	0.0003	0.0024	0.0368	0.0433	0.1041	0.0032	0.0000	0.0001	0.0001	0.0000	0.0012	0.0863	0.0090	0.0001	0.0654
61	0.0049	0.0023	0.0367	0.0434	0.1035	0.0036	0.0000	0.0001	0.0001	0.0000	0.0012	0.0867	0.0104	0.0000	0.0359
62	0.0064	0.0022	0.0367	0.0436	0.1027	0.0040	0.0000	0.0001	0.0001	0.0000	0.0012	0.0871	0.0119	0.0004	0.0015
63	0.0068	0.0026	0.0367	0.0438	0.1017	0.0046	0.0000	0.0001	0.0001	0.0000	0.0012	0.0876	0.0134	0.0008	0.0002
64	0.0061	0.0041	0.0367	0.0439	0.1005	0.0052	0.0000	0.0001	0.0001	0.0000	0.0012	0.0882	0.0152	0.0006	0.0000
65	0.0032	0.0075	0.0367	0.0441	0.0990	0.0061	0.0000	0.0001	0.0000	0.0000	0.0012	0.0888	0.0164	0.0009	0.0004
66	0.0028	0.0085	0.0367	0.0443	0.0972	0.0073	0.0000	0.0001	0.0000	0.0000	0.0012	0.0894	0.0001	0.0190	0.0010
67	0.0026	0.0091	0.0367	0.0445	0.0949	0.0088	0.0000	0.0001	0.0000	0.0000	0.0012	0.0901	0.0001	0.0205	0.0016
68	0.0025	0.0096	0.0367	0.0447	0.0919	0.0109	0.0000	0.0001	0.0000	0.0000	0.0011	0.0909	0.0002	0.0222	0.0022
69	0.0024	0.0100	0.0367	0.0449	0.0880	0.0139	0.0000	0.0001	0.0000	0.0000	0.0011	0.0917	0.0002	0.0239	0.0021
70	0.0023	0.0104	0.0366	0.0451	0.0827	0.0183	0.0000	0.0000	0.0000	0.0000	0.0011	0.0925	0.0002	0.0258	0.0011
71	0.0023	0.0107	0.0366	0.0453	0.0750	0.0250	0.0000	0.0000	0.0000	0.0000	0.0011	0.0934	0.0002	0.0277	0.0000
72	0.0022	0.0109	0.0366	0.0455	0.0641	0.0348	0.0000	0.0000	0.0000	0.0000	0.0011	0.0944	0.0002	0.0107	0.0192
73	0.0022	0.0112	0.0366	0.0457	0.0505	0.0474	0.0000	0.0000	0.0000	0.0000	0.0011	0.0954	0.0002	0.0005	0.0309
74	0.0022	0.0113	0.0366	0.0459	0.0365	0.0602	0.0000	0.0000	0.0000	0.0000	0.0011	0.0965	0.0002	0.0001	0.0329
75	0.0021	0.0115	0.0365	0.0461	0.0249	0.0706	0.0000	0.0000	0.0000	0.0000	0.0011	0.0976	0.0001	0.0001	0.0348
76	0.0021	0.0117	0.0365	0.0462	0.0167	0.0775	0.0000	0.0000	0.0000	0.0000	0.0011	0.0988	0.0001	0.0001	0.0366
77	0.0021	0.0118	0.0365	0.0464	0.0113	0.0816	0.0000	0.0000	0.0000	0.0000	0.0011	0.1000	0.0001	0.0001	0.0384
78	0.0020	0.0119	0.0364	0.0466	0.0078	0.0838	0.0000	0.0000	0.0000	0.0000	0.0011	0.1013	0.0001	0.0001	0.0402
79	0.0020	0.0120	0.0364	0.0468	0.0055	0.0847	0.0000	0.0000	0.0000	0.0000	0.0011	0.1026	0.0001	0.0001	0.0420
80	0.0020	0.0121	0.0363	0.0470	0.0040	0.0848	0.0000	0.0000	0.0000	0.0000	0.0011	0.1041	0.0001	0.0001	0.0438
81	0.0020	0.0122	0.0362	0.0471	0.0030	0.0844	0.0000	0.0000	0.0000	0.0000	0.0011	0.1055	0.0001	0.0001	0.0455
82	0.0019	0.0123	0.0362	0.0473	0.0022	0.0836	0.0000	0.0000	0.0000	0.0000	0.0011	0.1071	0.0001	0.0001	0.0473
83	0.0019	0.0123	0.0361	0.0475	0.0017	0.0826	0.0000	0.0000	0.0000	0.0000	0.0011	0.1087	0.0001	0.0001	0.0491
84	0.0019	0.0124	0.0360	0.0477	0.0013	0.0814	0.0000	0.0000	0.0000	0.0000	0.0011	0.1104	0.0001	0.0001	0.0508
85	0.0018	0.0124	0.0360	0.0478	0.0010	0.0801	0.0000	0.0000	0.0000	0.0000	0.0011	0.1121	0.0001	0.0001	0.0526
86	0.0018	0.0124	0.0359	0.0480	0.0008	0.0786	0.0000	0.0000	0.0000	0.0000	0.0011	0.1140	0.0001	0.0001	0.0543
87	0.0018	0.0125	0.0358	0.0482	0.0006	0.0771	0.0000	0.0000	0.0000	0.0000	0.0011	0.1158	0.0001	0.0001	0.0560
88	0.0018	0.0125	0.0357	0.0483	0.0005	0.0755	0.0000	0.0000	0.0000	0.0000	0.0011	0.1176	0.0001	0.0001	0.0577
89	0.0017	0.0125	0.0356	0.0485	0.0004	0.0739	0.0000	0.0000	0.0000	0.0000	0.0011	0.1199	0.0001	0.0001	0.0593
90	0.0017	0.0125	0.0355	0.0487	0.0003	0.0722	0.0000	0.0000	0.0000	0.0000	0.0010	0.1220	0.0001	0.0001	0.0610
91	0.0017	0.0126	0.0354	0.0488	0.0003	0.0705	0.0000	0.0000	0.0000	0.0000	0.0010	0.1242	0.0000	0.0001	0.0626
92	0.0016	0.0126	0.0353	0.0490	0.0002	0.0687	0.0000	0.0000	0.0000	0.0000	0.0010	0.1265	0.0000	0.0001	0.0643

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

Z	B1-E10	B1-E11	B1-E12	B1-E13	B1-E14	B1-E15	B1-E16	B1-E17	B1-E18	B1-E19	C1-I1	C1-I2	C1-I3	C1-I4	C1-I5
22	0.8934	0.6764	0.0000	0.0011	0.0088	0.0250	0.0991	0.0480	0.0211	0.0038	0.0000	0.0000	0.0000	0.0000	0.0014
23	0.8672	0.7565	0.0000	0.0010	0.0102	0.0287	0.0967	0.0506	0.0240	0.0037	0.0000	0.0000	0.0000	0.0000	0.0014
24	0.8423	0.8273	0.0000	0.0008	0.0116	0.0318	0.0939	0.0532	0.0272	0.0037	0.0000	0.0000	0.0000	0.0000	0.0015
25	0.8229	0.8863	0.0000	0.0006	0.0129	0.0343	0.0910	0.0559	0.0308	0.0037	0.0000	0.0000	0.0000	0.0000	0.0015
26	0.8114	0.9326	0.0000	0.0005	0.0141	0.0360	0.0882	0.0588	0.0347	0.0036	0.0000	0.0000	0.0000	0.0000	0.0015
27	0.8087	0.9666	0.0000	0.0003	0.0151	0.0368	0.0856	0.0618	0.0391	0.0036	0.0000	0.0000	0.0000	0.0000	0.0015
28	0.8144	0.9892	0.0000	0.0002	0.0157	0.0368	0.0831	0.0649	0.0438	0.0035	0.0000	0.0001	0.0000	0.0000	0.0015
29	0.8277	1.0020	0.0000	0.0001	0.0161	0.0361	0.0808	0.0682	0.0490	0.0035	0.0000	0.0001	0.0000	0.0000	0.0015
30	0.8476	1.0067	0.0000	0.0001	0.0161	0.0347	0.0787	0.0716	0.0546	0.0035	0.0000	0.0001	0.0000	0.0000	0.0016
31	0.8727	1.0051	0.0000	0.0000	0.0157	0.0327	0.0768	0.0750	0.0605	0.0034	0.0000	0.0001	0.0000	0.0000	0.0016
32	0.9019	0.9987	0.0000	0.0000	0.0149	0.0304	0.0750	0.0785	0.0667	0.0034	0.0000	0.0001	0.0000	0.0000	0.0016
33	0.9342	0.9887	0.0000	0.0000	0.0137	0.0278	0.0733	0.0820	0.0731	0.0033	0.0000	0.0001	0.0000	0.0000	0.0016
34	0.9684	0.9764	0.0000	0.0000	0.0122	0.0250	0.0716	0.0854	0.0796	0.0033	0.0000	0.0001	0.0000	0.0000	0.0016
35	1.0039	0.9625	0.0000	0.0001	0.0103	0.0223	0.0699	0.0888	0.0861	0.0033	0.0000	0.0001	0.0000	0.0000	0.0016
36	1.0399	0.9429	0.0051	0.0002	0.0081	0.0196	0.0681	0.0923	0.0924	0.0032	0.0000	0.0001	0.0000	0.0000	0.0016
37	1.0758	0.0000	0.9331	0.0007	0.0055	0.0169	0.0659	0.0959	0.0985	0.0032	0.0000	0.0001	0.0000	0.0000	0.0016
38	1.1111	0.0000	0.9174	0.0023	0.0026	0.0144	0.0632	0.1000	0.1043	0.0031	0.0000	0.0001	0.0000	0.0000	0.0016
39	1.1457	0.0000	0.8863	0.0191	0.0001	0.0121	0.0593	0.1050	0.1098	0.0031	0.0000	0.0001	0.0000	0.0000	0.0016
40	1.1789	0.0001	0.0487	0.8345	0.0067	0.0098	0.0528	0.1126	0.1148	0.0031	0.0000	0.0001	0.0000	0.0000	0.0016
41	1.2107	0.0001	0.0103	0.2669	0.5980	0.0074	0.0387	0.1276	0.1193	0.0030	0.0000	0.0001	0.0000	0.0000	0.0016
42	1.2410	0.0001	0.0062	0.0577	0.7979	0.0049	0.0029	0.1641	0.1234	0.0030	0.0000	0.0001	0.0000	0.0000	0.0016
43	1.2695	0.0001	0.0055	0.0286	0.8153	0.0022	0.0419	0.1256	0.1271	0.0030	0.0000	0.0001	0.0000	0.0000	0.0017
44	1.2964	0.0002	0.0059	0.0177	0.5832	0.2306	0.0692	0.0988	0.1304	0.0029	0.0000	0.0001	0.0000	0.0000	0.0017
45	1.3214	0.0002	0.0069	0.0113	0.0335	0.7729	0.0793	0.0890	0.1332	0.0029	0.0000	0.0001	0.0000	0.0000	0.0017
46	1.3445	0.0003	0.0077	0.0071	0.0160	0.7817	0.0843	0.0840	0.1357	0.0029	0.0001	0.0001	0.0000	0.0000	0.0017
47	1.3659	0.0004	0.0080	0.0046	0.0112	0.7777	0.0873	0.0809	0.1378	0.0028	0.0001	0.0000	0.0000	0.0000	0.0017
48	1.3854	0.0005	0.0079	0.0031	0.0089	0.7716	0.0891	0.0788	0.1396	0.0028	0.0001	0.0000	0.0000	0.0000	0.0017
49	1.4032	0.0006	0.0075	0.0022	0.0073	0.7652	0.0902	0.0772	0.1412	0.0028	0.0001	0.0000	0.0000	0.0000	0.0018
50	1.4193	0.0008	0.0070	0.0017	0.0063	0.7589	0.0907	0.0759	0.1424	0.0027	0.0001	0.0000	0.0000	0.0000	0.0018
51	1.4337	0.0012	0.0065	0.0014	0.0054	0.7529	0.0907	0.0748	0.1434	0.0027	0.0001	0.0000	0.0000	0.0000	0.0019
52	1.4464	0.0016	0.0061	0.0012	0.0048	0.7475	0.0903	0.0738	0.1443	0.0027	0.0000	0.0000	0.0000	0.0000	0.0019
53	1.4578	0.0020	0.0058	0.0010	0.0042	0.7426	0.0893	0.0729	0.1448	0.0026	0.0000	0.0000	0.0000	0.0000	0.0020
54	1.4692	0.0010	0.0056	0.0009	0.0038	0.7384	0.0879	0.0721	0.1453	0.0026	0.0000	0.0000	0.0000	0.0000	0.0020
55	1.4781	0.0019	0.0054	0.0008	0.0034	0.7350	0.0858	0.0713	0.1455	0.0026	0.0000	0.0000	0.0000	0.0000	0.0021
56	0.6497	0.8374	0.0053	0.0008	0.0031	0.7324	0.0830	0.0706	0.1456	0.0025	0.0000	0.0000	0.0000	0.0000	0.0023
57	0.0658	1.4279	0.0053	0.0008	0.0028	0.7308	0.0794	0.0699	0.1455	0.0025	0.0000	0.0000	0.0000	0.0001	0.0024
58	0.0170	1.4824	0.0054	0.0007	0.0025	0.7304	0.0747	0.0692	0.1453	0.0025	0.0000	0.0000	0.0000	0.0001	0.0026
59	0.0077	1.4968	0.0056	0.0007	0.0023	0.7315	0.0687	0.0685	0.1449	0.0024	0.0000	0.0000	0.0000	0.0001	0.0028
60	0.0090	1.5036	0.0059	0.0007	0.0021	0.7343	0.0611	0.0678	0.1444	0.0024	0.0000	0.0000	0.0000	0.0001	0.0031
61	0.0353	1.5095	0.0054	0.0007	0.0020	0.7393	0.0513	0.0671	0.1438	0.0024	0.0000	0.0000	0.0000	0.0001	0.0035
62	0.0669	1.5189	0.0000	0.0007	0.0018	0.7469	0.0392	0.0663	0.1431	0.0023	0.0000	0.0000	0.0000	0.0002	0.0041
63	0.0659	1.1513	0.3707	0.0006	0.0017	0.7573	0.0242	0.0656	0.1423	0.0023	0.0000	0.0000	0.0000	0.0002	0.0049
64	0.0659	0.0704	1.4529	0.0006	0.0016	0.7710	0.0058	0.0649	0.1415	0.0023	0.0000	0.0000	0.0000	0.0003	0.0060
65	0.0650	0.0065	1.5183	0.0006	0.0014	0.7602	0.0119	0.0642	0.1405	0.0023	0.0000	0.0000	0.0000	0.0004	0.0079
66	0.0629	0.0022	1.5243	0.0006	0.0013	0.6390	0.1287	0.0635	0.1394	0.0022	0.0000	0.0000	0.0000	0.0005	0.0111
67	0.0009	0.0623	1.5257	0.0006	0.0013	0.4876	0.2759	0.0627	0.1382	0.0022	0.0000	0.0000	0.0000	0.0008	0.0170
68	0.0001	0.0621	1.5259	0.0006	0.0012	0.3864	0.3730	0.0619	0.1370	0.0022	0.0000	0.0000	0.0000	0.0011	0.0260
69	0.0013	0.0608	1.5255	0.0006	0.0011	0.3256	0.4295	0.0611	0.1356	0.0021	0.0000	0.0000	0.0000	0.0016	0.0347
70	0.0036	0.0596	1.5247	0.0006	0.0010	0.2878	0.4632	0.0603	0.1342	0.0021	0.0000	0.0000	0.0000	0.0026	0.0400
71	0.0058	0.0584	1.5237	0.0006	0.0010	0.2628	0.4840	0.0595	0.1327	0.0021	0.0000	0.0000	0.0000	0.0044	0.0418
72	0.0068	0.0571	1.5224	0.0006	0.0009	0.2453	0.4972	0.0587	0.1312	0.0020	0.0000	0.0000	0.0000	0.0092	0.0391
73	0.0085	0.0559	1.5209	0.0006	0.0009	0.2326	0.5058	0.0578	0.1296	0.0020	0.0000	0.0000	0.0000	0.0203	0.0293
74	0.0099	0.0546	1.5193	0.0006	0.0008	0.2230	0.5111	0.0570	0.1279	0.0020	0.0000	0.0000	0.0000	0.0334	0.0171
75	0.0112	0.0533	1.5176	0.0006	0.0008	0.2156	0.5143	0.0561	0.1262	0.0020	0.0000	0.0000	0.0000	0.0419	0.0094
76	0.0125	0.0520	1.5157	0.0006	0.0007	0.2096	0.5160	0.0552	0.1244	0.0019	0.0000	0.0000	0.0000	0.0464	0.0055
77	0.0138	0.0507	1.5137	0.0006	0.0007	0.2048	0.5165	0.0543	0.1226	0.0019	0.0000	0.0000	0.0000	0.0490	0.0036
78	0.0150	0.0494	1.5116	0.0006	0.0007	0.2009	0.5161	0.0533	0.1207	0.0019	0.0000	0.0000	0.0000	0.0508	0.0025
79	0.0162	0.0480	1.5095	0.0006	0.0006	0.1976	0.5150	0.0524	0.1187	0.0018	0.0000	0.0000	0.0000	0.0521	0.0018
80	0.0174	0.0467	1.5072	0.0006	0.0006	0.1948	0.5134	0.0514	0.1167	0.0018	0.0000	0.0000	0.0000	0.0531	0.0014
81	0.0185	0.0453	1.5049	0.0006	0.0006	0.1924	0.5113	0.0505	0.1147	0.0018	0.0000	0.0000	0.0000	0.0541	0.0011
82	0.0195	0.0440	1.5025	0.0006	0.0006	0.1904	0.5088	0.0495	0.1126	0.0017	0.0000	0.0000	0.0000	0.0550	0.0009
83	0.0205	0.0426	1.5000	0.0006	0.0005	0.1886	0.5060	0.0484	0.1105	0.0017	0.0000	0.0000	0.0000	0.0559	0.0008
84	0.0215	0.0412	1.4975	0.0006	0.0005	0.1870	0.5029	0.0474	0.1084	0.0017	0.0000	0.0000	0.0000	0.0568	0.0006
85	0.0224	0.0398	1.4950	0.0006	0.0005	0.1856	0.4996	0.0464	0.1062	0.0016	0.0000	0.0000	0.0000	0.0577	0.0006
86	0.0233	0.0384	1.4924	0.0006	0.0005	0.1844	0.4961	0.0453	0.1039	0.0016	0.0000	0.0000	0.0000	0.0587	0.0005
87	0.0241	0.0370	1.4898	0.0006	0.0004	0.1833	0.4923	0.0442	0.1017	0.0016	0.0000	0.0000	0.0000	0.0596	0.0004
88	0.0249	0.0356	1.4871	0.0006	0.0004	0.1823	0.4884	0.0431	0.0994	0.0016	0.0000	0.0000	0.0000	0.0606	0.0004
89	0.0256	0.0342	1.4845	0.0006	0.0004	0.1814	0.4843	0.0420	0.0971	0.0015	0.0000	0.0000	0.0000	0.0616	0.0003
90	0.0262	0.0328	1.4818	0.0006	0.0004	0.1805	0.4800	0.0409	0.0947	0.0015	0.0000	0.0000	0.0000	0.0626	0.0003
91	0.0268	0.0314	1.4790	0.0006	0.0004	0.1798	0.4756	0.0397	0.0923	0.0015	0.0000	0.0000	0.0000	0.0637	0.0003
92	0.0273	0.0300	1.4763	0.0005	0.0004	0.1791	0.4710	0.0386	0.0899	0.0014	0.0000	0.0000	0.0000	0.0648	0.0002

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$
See page 31 for Explanation of Tables

Z	C1-I6	C1-I7	C1-I8	C1-I9	C1-I10	C1-I11	C1-I12	C1-I13	C1-I14	C1-J1	C1-J2	C1-J3	C1-J4	C1-J5	C1-J6
22	0.0003	0.0027	0.0512	0.0169	0.0002	0.0231	0.4596	0.5144	0.0413	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
23	0.0003	0.0037	0.0510	0.0158	0.0003	0.0303	0.4514	0.5404	0.0430	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
24	0.0003	0.0052	0.0505	0.0145	0.0003	0.0393	0.4403	0.5643	0.0446	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
25	0.0003	0.0071	0.0497	0.0132	0.0003	0.0505	0.4266	0.5861	0.0462	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
26	0.0003	0.0095	0.0484	0.0118	0.0003	0.0645	0.4102	0.6057	0.0477	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
27	0.0003	0.0123	0.0466	0.0103	0.0003	0.0815	0.3911	0.6231	0.0491	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002
28	0.0003	0.0156	0.0445	0.0089	0.0003	0.1020	0.3692	0.6382	0.0504	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002
29	0.0003	0.0192	0.0420	0.0075	0.0003	0.1263	0.3445	0.6508	0.0517	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002
30	0.0002	0.0229	0.0394	0.0061	0.0003	0.1547	0.3169	0.6611	0.0530	0.0000	0.0002	0.0001	0.0001	0.0000	0.0003
31	0.0002	0.0266	0.0368	0.0048	0.0003	0.1872	0.2866	0.6688	0.0542	0.0000	0.0002	0.0001	0.0000	0.0000	0.0003
32	0.0002	0.0301	0.0342	0.0036	0.0003	0.2235	0.2540	0.6740	0.0553	0.0000	0.0003	0.0001	0.0000	0.0000	0.0003
33	0.0002	0.0332	0.0319	0.0026	0.0003	0.2632	0.2196	0.6768	0.0564	0.0000	0.0003	0.0000	0.0000	0.0000	0.0004
34	0.0002	0.0360	0.0298	0.0017	0.0002	0.3054	0.1842	0.6774	0.0575	0.0000	0.0003	0.0000	0.0000	0.0000	0.0005
35	0.0001	0.0383	0.0280	0.0010	0.0002	0.3488	0.1490	0.6757	0.0585	0.0000	0.0004	0.0000	0.0000	0.0000	0.0006
36	0.0001	0.0403	0.0265	0.0005	0.0002	0.3921	0.1151	0.6722	0.0594	0.0000	0.0004	0.0000	0.0000	0.0000	0.0007
37	0.0001	0.0418	0.0252	0.0002	0.0001	0.4338	0.0839	0.6671	0.0603	0.0000	0.0004	0.0000	0.0000	0.0000	0.0011
38	0.0001	0.0431	0.0241	0.0000	0.0001	0.4724	0.0566	0.6607	0.0611	0.0000	0.0004	0.0000	0.0000	0.0000	0.0015
39	0.0001	0.0441	0.0233	0.0000	0.0001	0.5068	0.0340	0.6532	0.0619	0.0000	0.0004	0.0000	0.0000	0.0000	0.0016
40	0.0001	0.0448	0.0226	0.0001	0.0000	0.5359	0.0169	0.6449	0.0626	0.0000	0.0004	0.0000	0.0000	0.0000	0.0015
41	0.0001	0.0454	0.0222	0.0004	0.0000	0.5593	0.0056	0.6360	0.0633	0.0000	0.0004	0.0000	0.0000	0.0001	0.0013
42	0.0001	0.0457	0.0219	0.0009	0.0000	0.5764	0.0004	0.6269	0.0638	0.0000	0.0004	0.0000	0.0000	0.0003	0.0011
43	0.0001	0.0460	0.0219	0.0002	0.0014	0.5867	0.0015	0.6176	0.0643	0.0000	0.0004	0.0000	0.0000	0.0006	0.0006
44	0.0003	0.0460	0.0220	0.0001	0.0025	0.5892	0.0096	0.6084	0.0648	0.0000	0.0004	0.0000	0.0000	0.0009	0.0003
45	0.0006	0.0458	0.0225	0.0002	0.0041	0.5823	0.0259	0.5993	0.0651	0.0000	0.0004	0.0000	0.0000	0.0009	0.0002
46	0.0426	0.0037	0.0232	0.0004	0.0070	0.5630	0.0526	0.5904	0.0654	0.0000	0.0004	0.0000	0.0000	0.0009	0.0002
47	0.0461	0.0003	0.0240	0.0010	0.0131	0.5256	0.0931	0.5819	0.0655	0.0000	0.0003	0.0000	0.0000	0.0009	0.0001
48	0.0462	0.0001	0.0111	0.0163	0.0327	0.4577	0.1494	0.5737	0.0656	0.0000	0.0003	0.0000	0.0000	0.0008	0.0001
49	0.0461	0.0000	0.0002	0.0312	0.1573	0.1486	0.3396	0.5659	0.0655	0.0000	0.0003	0.0000	0.0000	0.0008	0.0001
50	0.0460	0.0000	0.0000	0.0385	0.3012	0.3035	0.0429	0.5586	0.0653	0.0000	0.0003	0.0000	0.0000	0.0007	0.0001
51	0.0459	0.0000	0.0001	0.0532	0.2174	0.4162	0.0079	0.5517	0.0650	0.0000	0.0003	0.0000	0.0000	0.0007	0.0001
52	0.0458	0.0000	0.0002	0.0940	0.1142	0.4925	0.0021	0.5452	0.0646	0.0000	0.0003	0.0000	0.0000	0.0007	0.0001
53	0.0457	0.0000	0.0003	0.2876	0.0026	0.4196	0.0005	0.5392	0.0639	0.0000	0.0003	0.0000	0.0000	0.0006	0.0001
54	0.0455	0.0000	0.0005	0.1584	0.4876	0.0712	0.0001	0.5337	0.0631	0.0000	0.0002	0.0000	0.0000	0.0006	0.0002
55	0.0454	0.0000	0.0006	0.0707	0.6459	0.0072	0.0000	0.5287	0.0621	0.0000	0.0002	0.0000	0.0000	0.0006	0.0002
56	0.0452	0.0000	0.0008	0.0371	0.6922	0.0004	0.0001	0.5242	0.0609	0.0000	0.0002	0.0000	0.0000	0.0006	0.0002
57	0.0451	0.0000	0.0010	0.0196	0.7156	0.0001	0.0002	0.5202	0.0594	0.0000	0.0002	0.0000	0.0000	0.0005	0.0002
58	0.0449	0.0000	0.0012	0.0098	0.7298	0.0007	0.0003	0.5167	0.0575	0.0000	0.0002	0.0000	0.0000	0.0005	0.0002
59	0.0447	0.0015	0.0000	0.0043	0.7393	0.0015	0.0005	0.5138	0.0553	0.0000	0.0002	0.0000	0.0000	0.0005	0.0003
60	0.0444	0.0017	0.0000	0.0014	0.7458	0.0021	0.0006	0.5115	0.0527	0.0000	0.0002	0.0000	0.0000	0.0005	0.0003
61	0.0441	0.0020	0.0000	0.0002	0.7504	0.0026	0.0008	0.5099	0.0496	0.0000	0.0002	0.0000	0.0000	0.0005	0.0004
62	0.0436	0.0023	0.0000	0.0001	0.7538	0.0031	0.0009	0.5090	0.0460	0.0000	0.0001	0.0000	0.0000	0.0004	0.0005
63	0.0429	0.0026	0.0007	0.0092	0.7468	0.0034	0.0011	0.5090	0.0416	0.0000	0.0001	0.0000	0.0000	0.0004	0.0007
64	0.0418	0.0029	0.0016	0.7573	0.0006	0.0037	0.0012	0.5099	0.0364	0.0000	0.0001	0.0000	0.0000	0.0004	0.0010
65	0.0401	0.0032	0.0029	0.7589	0.0001	0.0039	0.0013	0.5118	0.0303	0.0000	0.0001	0.0000	0.0000	0.0004	0.0015
66	0.0369	0.0036	0.0045	0.7597	0.0001	0.0041	0.0014	0.5149	0.0232	0.0000	0.0001	0.0000	0.0000	0.0004	0.0028
67	0.0310	0.0039	0.0061	0.7602	0.0001	0.0043	0.0015	0.5192	0.0149	0.0000	0.0001	0.0000	0.0000	0.0004	0.0104
68	0.0220	0.0043	0.0078	0.7604	0.0001	0.0044	0.0016	0.5244	0.0058	0.0000	0.0001	0.0000	0.0000	0.0004	0.0383
69	0.0130	0.0046	0.0095	0.7604	0.0001	0.0045	0.0017	0.5263	0.0000	0.0000	0.0001	0.0000	0.0000	0.0004	0.0611
70	0.0070	0.0050	0.0112	0.7602	0.0001	0.0046	0.0018	0.5107	0.0118	0.0000	0.0001	0.0000	0.0000	0.0003	0.0736
71	0.0038	0.0054	0.0129	0.7598	0.0001	0.0047	0.0019	0.4649	0.0539	0.0000	0.0001	0.0000	0.0000	0.0003	0.0806
72	0.0022	0.0058	0.0145	0.7593	0.0001	0.0047	0.0020	0.4014	0.1139	0.0000	0.0001	0.0000	0.0000	0.0003	0.0851
73	0.0012	0.0062	0.0162	0.7587	0.0001	0.0048	0.0021	0.3418	0.1699	0.0000	0.0001	0.0000	0.0000	0.0003	0.0882
74	0.0007	0.0066	0.0177	0.7580	0.0001	0.0048	0.0022	0.2954	0.2129	0.0000	0.0001	0.0000	0.0000	0.0003	0.0906
75	0.0004	0.0070	0.0192	0.7573	0.0001	0.0049	0.0022	0.2614	0.2435	0.0000	0.0001	0.0000	0.0000	0.0003	0.0926
76	0.0003	0.0074	0.0206	0.7564	0.0001	0.0049	0.0023	0.2365	0.2649	0.0000	0.0001	0.0000	0.0000	0.0003	0.0944
77	0.0002	0.0078	0.0220	0.7555	0.0001	0.0049	0.0024	0.2181	0.2799	0.0000	0.0000	0.0000	0.0000	0.0003	0.0962
78	0.0001	0.0082	0.0233	0.7545	0.0001	0.0049	0.0025	0.2041	0.2905	0.0000	0.0000	0.0000	0.0000	0.0003	0.0978
79	0.0001	0.0086	0.0246	0.7535	0.0001	0.0049	0.0025	0.1932	0.2980	0.0000	0.0000	0.0000	0.0000	0.0003	0.0995
80	0.0000	0.0090	0.0258	0.7524	0.0001	0.0049	0.0026	0.1846	0.3032	0.0000	0.0000	0.0000	0.0000	0.0003	0.1011
81	0.0000	0.0095	0.0269	0.7512	0.0001	0.0049	0.0026	0.1776	0.3068	0.0000	0.0000	0.0000	0.0000	0.0003	0.1028
82	0.0000	0.0099	0.0280	0.7500	0.0001	0.0049	0.0027	0.1719	0.3091	0.0000	0.0000	0.0000	0.0000	0.0003	0.1046
83	0.0000	0.0103	0.0290	0.7488	0.0001	0.0049	0.0027	0.1671	0.3104	0.0000	0.0000	0.0000	0.0000	0.0003	0.1063
84	0.0000	0.0107	0.0300	0.7475	0.0001	0.0049	0.0028	0.1631	0.3110	0.0000	0.0000	0.0000	0.0000	0.0003	0.1081
85	0.0000	0.0111	0.0309	0.7462	0.0001	0.0049	0.0028	0.1597	0.3110	0.0000	0.0000	0.0000	0.0000	0.0003	0.1100
86	0.0000	0.0114	0.0318	0.7449	0.0001	0.0049	0.0029	0.1567	0.3105	0.0000	0.0000	0.0000	0.0000	0.0003	0.1119
87	0.0000	0.0118	0.0326	0.7435	0.0001	0.0048	0.0029	0.1541	0.3096	0.0000	0.0000	0.0000	0.0000	0.0003	0.1139
88	0.0000	0.0122	0.0334	0.7421	0.0001	0.0048	0.0030	0.1519	0.3083	0.0000	0.0000	0.0000	0.0000	0.0003	0.1160
89	0.0000	0.0126	0.0342	0.7407	0.0001	0.0048	0.0030	0.1499	0.3068	0.0000	0.0000	0.0000	0.0000	0.0003	0.1181
90	0.0000	0.0130	0.0349	0.7392	0.0001	0.0048	0.0031	0.1481	0.3049	0.0000	0.0000	0.0000	0.0000	0.0003	0.1203
91	0.0000	0.0133	0.0356	0.7378	0.0001	0.0048	0.0031	0.1466	0.3029	0.0000	0.0000	0.0000	0.0000	0.0003	0.1225
92	0.0000	0.0137	0.0362	0.7363	0.0001	0.0047	0.0032	0.1451	0.3007	0.0000	0.0000	0.0000	0.0000	0.0003	0.1249

TABLE III. Electric Dipole Oscillator Strengths f, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

Z	C1-J7	C1-J8	C1-J9	C1-J10	C1-J11	C1-J12	C1-J13	C1-J14	C1-J15	C1-J16	C1-J17	C1-J18	C1-J19
22	0.0029	0.0002	0.0116	0.0791	0.0526	0.0014	0.0078	0.0229	0.0769	0.9578	0.8778	0.0435	0.0814
23	0.0028	0.0003	0.0154	0.0742	0.0535	0.0016	0.0123	0.0273	0.0895	0.9522	0.8885	0.0656	0.0849
24	0.0027	0.0003	0.0199	0.0685	0.0544	0.0017	0.0183	0.0305	0.1046	0.9435	0.8867	0.0943	0.0884
25	0.0025	0.0004	0.0249	0.0622	0.0554	0.0018	0.0262	0.0283	0.1266	0.9320	0.8730	0.1292	0.0917
26	0.0024	0.0005	0.0301	0.0556	0.0565	0.0019	0.0358	0.0115	0.1655	0.9177	0.8487	0.1688	0.0949
27	0.0023	0.0005	0.0353	0.0489	0.0577	0.0019	0.0470	0.0033	0.1990	0.9004	0.8163	0.2111	0.0980
28	0.0022	0.0005	0.0402	0.0425	0.0590	0.0019	0.0597	0.0269	0.2052	0.8793	0.7782	0.2535	0.1011
29	0.0021	0.0005	0.0448	0.0365	0.0604	0.0019	0.0734	0.0407	0.2276	0.8532	0.7370	0.2938	0.1041
30	0.0020	0.0005	0.0488	0.0309	0.0618	0.0018	0.0878	0.0460	0.2661	0.8210	0.6949	0.3302	0.1070
31	0.0019	0.0005	0.0524	0.0259	0.0632	0.0017	0.1024	0.0470	0.3178	0.7817	0.6537	0.3615	0.1099
32	0.0017	0.0005	0.0554	0.0215	0.0646	0.0015	0.1169	0.0457	0.3805	0.7350	0.6151	0.3867	0.1126
33	0.0016	0.0005	0.0580	0.0177	0.0660	0.0013	0.1311	0.0433	0.4519	0.6820	0.5804	0.4056	0.1153
34	0.0015	0.0005	0.0603	0.0144	0.0673	0.0011	0.1447	0.0404	0.5284	0.6247	0.5509	0.4177	0.1179
35	0.0013	0.0005	0.0622	0.0115	0.0686	0.0009	0.1576	0.0374	0.6059	0.5662	0.5277	0.4230	0.1204
36	0.0011	0.0004	0.0638	0.0091	0.0699	0.0007	0.1696	0.0347	0.6808	0.5094	0.5116	0.4214	0.1228
37	0.0007	0.0004	0.0652	0.0072	0.0712	0.0005	0.1806	0.0324	0.7502	0.4566	0.5031	0.4128	0.1251
38	0.0002	0.0004	0.0664	0.0056	0.0726	0.0003	0.1908	0.0305	0.8124	0.4093	0.5026	0.3974	0.1274
39	0.0000	0.0005	0.0674	0.0043	0.0741	0.0001	0.1999	0.0292	0.8668	0.3677	0.5097	0.3754	0.1295
40	0.0000	0.0004	0.0684	0.0032	0.0759	0.0000	0.2079	0.0283	0.9135	0.3319	0.5239	0.3476	0.1315
41	0.0001	0.0696	0.0000	0.0024	0.0780	0.0000	0.2149	0.0281	0.9532	0.3012	0.5440	0.3150	0.1334
42	0.0001	0.0702	0.0000	0.0019	0.0806	0.0001	0.2206	0.0283	0.9867	0.2751	0.5682	0.2792	0.1352
43	0.0002	0.0709	0.0000	0.0014	0.0839	0.0005	0.2249	0.0291	1.0146	0.2528	0.5947	0.2422	0.1368
44	0.0002	0.0715	0.0004	0.0006	0.0876	0.0021	0.2273	0.0303	1.0376	0.2338	0.6210	0.2060	0.1383
45	0.0002	0.0720	0.0004	0.0004	0.0236	0.0741	0.2270	0.0321	1.0562	0.2175	0.6456	0.1723	0.1398
46	0.0003	0.0725	0.0003	0.0003	0.0003	0.1103	0.2218	0.0343	1.0707	0.2035	0.6670	0.1423	0.1410
47	0.0003	0.0730	0.0002	0.0003	0.0000	0.1356	0.2052	0.0370	1.0814	0.1914	0.6847	0.1166	0.1422
48	0.0003	0.0735	0.0001	0.0003	0.0004	0.2047	0.1457	0.0400	1.0877	0.1809	0.6987	0.0950	0.1432
49	0.0004	0.0740	0.0000	0.0002	0.0008	0.3619	0.0005	0.0434	1.0888	0.1717	0.7092	0.0773	0.1441
50	0.0004	0.0745	0.0000	0.0002	0.0014	0.3271	0.0535	0.0464	1.0823	0.1636	0.7167	0.0629	0.1449
51	0.0005	0.0749	0.0000	0.0002	0.0021	0.3076	0.1339	0.0196	1.0611	0.1564	0.7217	0.0513	0.1456
52	0.0005	0.0753	0.0000	0.0002	0.0029	0.2975	0.0671	0.1653	1.0038	0.1501	0.7248	0.0420	0.1461
53	0.0006	0.0758	0.0000	0.0001	0.0038	0.2909	0.0703	0.3670	0.8157	0.1445	0.7262	0.0345	0.1465
54	0.0007	0.0762	0.0000	0.0007	0.0042	0.2856	0.0768	0.9017	0.2885	0.1395	0.7264	0.0284	0.1468
55	0.0008	0.0766	0.0000	0.0059	0.0000	0.2803	0.0847	1.1565	0.0389	0.1349	0.7256	0.0235	0.1470
56	0.0009	0.0770	0.0001	0.0071	0.0133	0.2632	0.0922	1.1935	0.0031	0.1309	0.7241	0.0195	0.1471
57	0.0011	0.0774	0.0001	0.0083	0.2664	0.0027	0.1033	1.2007	0.0001	0.1272	0.7220	0.0162	0.1470
58	0.0013	0.0778	0.0001	0.0097	0.2599	0.1124	0.0032	1.2004	0.0023	0.1238	0.7194	0.0135	0.1469
59	0.0016	0.0781	0.0002	0.0111	0.2508	0.1265	1.0348	0.1653	0.0052	0.1208	0.7164	0.0113	0.1466
60	0.0020	0.0783	0.0002	0.0126	0.2401	0.1414	1.1964	0.0007	0.0078	0.1180	0.7132	0.0095	0.1462
61	0.0025	0.0784	0.0002	0.0142	0.2275	0.1577	1.1941	0.0002	0.0100	0.1154	0.7097	0.0079	0.1457
62	0.0033	0.0782	0.0002	0.0159	0.2130	0.1758	1.1913	0.0001	0.0118	0.1131	0.7060	0.0067	0.1451
63	0.0044	0.0777	0.0003	0.0176	0.1964	0.1959	1.1884	0.0002	0.0132	0.1109	0.7021	0.0056	0.1445
64	0.0061	0.0764	0.0003	0.0193	0.1779	0.2179	1.1854	0.0004	0.0143	0.1090	0.6981	0.0047	0.1437
65	0.0090	0.0738	0.0004	0.0211	0.1576	0.2414	1.1823	0.0007	0.0149	0.1071	0.6939	0.0039	0.1428
66	0.0141	0.0682	0.0004	0.0230	0.1362	0.2660	1.1791	0.0014	0.0151	0.1054	0.6897	0.0033	0.1419
67	0.0184	0.0572	0.0005	0.0248	0.1143	0.2908	1.1758	0.0030	0.0142	0.1039	0.6854	0.0028	0.1408
68	0.0085	0.0400	0.0006	0.0267	0.0931	0.3150	1.1724	0.0060	0.0118	0.1024	0.6809	0.0023	0.1397
69	0.0026	0.0240	0.0006	0.0287	0.0733	0.3375	1.1689	0.0096	0.0086	0.1010	0.6764	0.0019	0.1385
70	0.0009	0.0140	0.0008	0.0306	0.0559	0.3576	1.1653	0.0127	0.0060	0.0997	0.6719	0.0016	0.1372
71	0.0003	0.0082	0.0013	0.0326	0.0411	0.3749	1.1617	0.0147	0.0043	0.0986	0.6672	0.0014	0.1359
72	0.0001	0.0041	0.0021	0.0345	0.0291	0.3893	1.1580	0.0161	0.0032	0.0974	0.6625	0.0011	0.1344
73	0.0012	0.0004	0.0028	0.0365	0.0198	0.4009	1.1542	0.0170	0.0026	0.0964	0.6576	0.0009	0.1329
74	0.0005	0.0000	0.0028	0.0384	0.0128	0.4101	1.1504	0.0176	0.0021	0.0954	0.6528	0.0008	0.1313
75	0.0001	0.0000	0.0023	0.0404	0.0078	0.4172	1.1465	0.0181	0.0018	0.0945	0.6478	0.0006	0.1297
76	0.0000	0.0000	0.0019	0.0423	0.0043	0.4226	1.1425	0.0185	0.0015	0.0936	0.6428	0.0005	0.1280
77	0.0000	0.0000	0.0015	0.0442	0.0021	0.4268	1.1386	0.0188	0.0014	0.0928	0.6376	0.0004	0.1262
78	0.0000	0.0000	0.0013	0.0461	0.0007	0.4299	1.1345	0.0190	0.0012	0.0920	0.6324	0.0003	0.1244
79	0.0000	0.0000	0.0011	0.0480	0.0001	0.4322	1.1305	0.0192	0.0011	0.0913	0.6272	0.0003	0.1225
80	0.0000	0.0000	0.0009	0.0499	0.0000	0.4340	1.1264	0.0193	0.0010	0.0906	0.6218	0.0002	0.1205
81	0.0000	0.0000	0.0008	0.0517	0.0003	0.4352	1.1222	0.0194	0.0009	0.0900	0.6164	0.0002	0.1185
82	0.0000	0.0000	0.0007	0.0535	0.0009	0.4361	1.1181	0.0195	0.0009	0.0893	0.6108	0.0001	0.1164
83	0.0000	0.0000	0.0006	0.0553	0.0016	0.4368	1.1139	0.0196	0.0008	0.0887	0.6052	0.0001	0.1143
84	0.0000	0.0000	0.0005	0.0571	0.0025	0.4372	1.1097	0.0196	0.0008	0.0882	0.5995	0.0001	0.1121
85	0.0000	0.0000	0.0004	0.0588	0.0035	0.4375	1.1055	0.0197	0.0007	0.0876	0.5937	0.0000	0.1099
86	0.0000	0.0000	0.0004	0.0605	0.0045	0.4377	1.1013	0.0197	0.0007	0.0871	0.5878	0.0000	0.1076
87	0.0000	0.0000	0.0003	0.0622	0.0056	0.4378	1.0970	0.0197	0.0006	0.0866	0.5818	0.0000	0.1053
88	0.0000	0.0000	0.0003	0.0638	0.0067	0.4378	1.0927	0.0197	0.0006	0.0861	0.5757	0.0000	0.1030
89	0.0000	0.0000	0.0003	0.0654	0.0077	0.4378	1.0884	0.0197	0.0006	0.0856	0.5695	0.0000	0.1006
90	0.0000	0.0000	0.0002	0.0669	0.0088	0.4377	1.0841	0.0196	0.0005	0.0852	0.5632	0.0000	0.0981
91	0.0000	0.0000	0.0002	0.0685	0.0098	0.4377	1.0798	0.0196	0.0005	0.0847	0.5568	0.0000	0.0957
92	0.0000	0.0000	0.0002	0.0700	0.0108	0.4376	1.0755	0.0196	0.0005	0.0843	0.5503	0.0000	0.0932

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 − B1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	5.84	7.04-2	6.18-2	5.12-2	4.09-2	3.34-2	2.98-2
26	12.7	4.45-2	3.91-2	3.25-2	2.63-2	2.18-2	1.98-2
30	24.4	3 05-2	2 69-2	2.25-2	1.83-2	1.54-2	1.41-2
34	42.8	2 22-2	1 96-2	1.65-2	1.35-2	1.15-2	1.06-2
38	70 4	1.69-2	1.49-2	1.26-2	1.03-2	8.87-3	8.25-3
42	109.8	1.32-2	1.17-2	9.88-3	8.19-3	7.06-3	6.62-3
46	164.4	1 06-2	9 41-3	7.97-3	6.63-3	5.75-3	5.43-3
50	238.0	8 65-3	7.71-3	6.55-3	5.47-3	4.77-3	4.54-3
54	335.0	7 19-3	6.42-3	5.47-3	4.58-3	4.01-3	3.86-3
58	460.7	6.05-3	5.41-3	4.62-3	3.89-3	3.42-3	3.32-3
62	621.2	5.14-3	4.61-3	3.95-3	3.33-3	2 95-3	2.88-3
66	823.6	4.41-3	3.97-3	3.41-3	2.88-3	2.56-3	2.52-3
70	1076.3	3.81-3	3.44-3	2.96-3	2.51-3	2.24-3	2 22-3
74	1389.1	3.32-3	2 99-3	2 59-3	2.20-3	1.97-3	1.96-3
78	1773.7	2.90-3	2 62-3	2.27-3	1.94-3	1.75-3	1.75-3
82	2244.1	2 54-3	2.31-3	2.00-3	1.72-3	1.55-3	1.56-3
87	2978.3	2.17-3	1.97-3	1.72-3	1.48-3	1.34-3	1.37-3
92	3913.7	1.86-3	1.69-3	1.48-3	1.28-3	1.17-3	1.20-3

A1 − C1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	103.9	4.33-1	4.73-1	5.22-1	5.89-1	6.70-1	7.60-1
26	134.3	3.00-1	3.25-1	3.63-1	4.05-1	4.74-1	5.40-1
30	170.0	2.17-1	2.35-1	2.65-1	2.96-1	3.52-1	4.01-1
34	213.0	1.63-1	1.77-1	2.02-1	2.26-1	2.71-1	3.09-1
38	265.9	1.27-1	1.38-1	1.58-1	1.77-1	2.13-1	2.44-1
42	331.5	1.01-1	1.09-1	1.23-1	1.39-1	1.65-1	1.86-1
46	413.3	8.21-2	8.85-2	1.01-1	1.13-1	1.35-1	1.53-1
50	515.1	6.80-2	7.40-2	8.46-2	9.55-2	1.16-1	1.34-1
54	641.7	5.71-2	6.21-2	7.07-2	7.97-2	9.64-2	1.12-1
58	798.5	4.85-2	5.27-2	5.97-2	6.72-2	8.13-2	9.48-2
62	991.6	4.16-2	4.51-2	5.09-2	5.71-2	6.91-2	8.07-2
66	1228.5	3.60-2	3.90-2	4.38-2	4.90-2	5.92-2	6.92-2
70	1517.7	3.14-2	3.40-2	3.79-2	4.23-2	5.11-2	5.98-2
74	1869.3	2.74-2	2.97-2	3.29-2	3.68-2	4.44-2	5.19-2
78	2295.1	2.39-2	2.60-2	2.87-2	3.21-2	3.86-2	4.53-2
82	2809.2	2.09-2	2.27-2	2.50-2	2.80-2	3.37-2	3.98-2
87	3601.7	1.75-2	1.90-2	2.09-2	2.37-2	2.85-2	3.41-2
92	4598.8	1.45-2	1.56-2	1.73-2	1.98-2	2.41-2	2.94-2

B1 − C1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	98.1	2.18-1	2.37-1	2.62-1	2.97-1	3.38-1	3.83-1
26	121.6	1 50-1	1.63-1	1.83-1	2.05-1	2.41-1	2.74-1
30	145.6	1.08-1	1.17-1	1.34-1	1.51-1	1.81-1	2.06-1
34	170.2	8.07-2	8.87-2	1.03-1	1.17-1	1.41-1	1.61-1
38	195.5	6.25-2	6.95-2	8.17-2	9.30-2	1.13-1	1.29-1
42	221.7	4.97-2	5.60-2	6.64-2	7.60-2	9.24-2	1.06-1
46	248.9	4.04-2	4.61-2	5.50-2	6.31-2	7.69-2	8.80-2
50	277.2	3.34-2	3.86-2	4.63-2	5.32-2	6.48-2	7.43-2
54	306.7	2.80-2	3.27-2	3.94-2	4.53-2	5.52-2	6.34-2
58	337.7	2.37-2	2.80-2	3.38-2	3.89-2	4.75-2	5.46-2
62	370.4	2.02-2	2.41-2	2.92-2	3.37-2	4.11-2	4.73-2
66	404.9	1.74-2	2.09-2	2.54-2	2.93-2	3.58-2	4.12-2
70	441.4	1.51-2	1.82-2	2.22-2	2.56-2	3.14-2	3.60-2
74	480.2	1.32-2	1.60-2	1.95-2	2.25-2	2.75-2	3.17-2
78	521.4	1 16-2	1.40-2	1.71-2	1.98-2	2.43-2	2.79-2
82	565.1	1.02-2	1.23-2	1.51-2	1.75-2	2.14-2	2.47-2
87	623.4	8.74-3	1.06-2	1.29-2	1.50-2	1.84-2	2.12-2
92	685.0	7.52-3	9.10-3	1.10-2	1.29-2	1.58-2	1.84-2

A1 − D1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	499.6	1.10-3	9.52-4	7.53-4	5.46-4	3.76-4	2.94-4
26	780.2	9.85-4	9.18-4	8.53-4	8.48-4	9.69-4	1.23-3
30	1120.3	9.18-4	9.29-4	1.00-3	1.21-3	1.64-3	2.25-3
34	1518.4	7.67-4	7.99-4	9.01-4	1.15-3	1.61-3	2.24-3
38	1974.1	6.21-4	6.53-4	7.48-4	9.67-4	1.37-3	1.92-3
42	2487.0	5 08-4	5.35-4	6.16-4	8.01-4	1.14-3	1.61-3
46	3056.1	4.22-4	4.45-4	5.14-4	6.70-4	9.58-4	1.37-3
50	3680.7	3.57-4	3.77-4	4.36-4	5.70-4	8.18-4	1.17-3
54	4359.7	3.07-4	3.25-4	3.78-4	4.95-4	7.11-4	1.03-3
58	5091.7	2.69-4	2.86-4	3.33-4	4.39-4	6.31-4	9.14-4
62	5875.1	2.40-4	2.56-4	3.00-4	4.03-4	5.71-4	8.28-4
66	6708.2	2.18-4	2.33-4	2.75-4	3.72-4	5.27-4	7.65-4
70	7588.6	2.01-4	2.17-4	2.58-4	3.47-4	4.97-4	7.20-4
74	8513.8	1.89-4	2.07-4	2.47-4	3.32-4	4.78-4	6.91-4
78	9480.6	1.82-4	2.00-4	2.41-4	3.24-4	4.67-4	6.75-4
82	10485.1	1.79-4	1.97-4	2.42-4	3.23-4	4.65-4	6.72-4
87	11786.5	1.79-4	2.00-4	2.45-4	3.28-4	4.72-4	6.83-4
92	13127.8	1.85-4	2.09-4	2.54-4	3.41-4	4.88-4	7.10-4

A1 − D2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	503.5	1.71-3	2.18-3	3.09-3	4.76-3	7.32-3	1.07-2
26	785.9	1.10-3	1.38-3	1.95-3	3.03-3	4.57-3	6.66-3
30	1132.0	6.68-4	8.06-4	1.09-3	1.61-3	2.47-3	3.56-3
34	1543.8	4.55-4	5.27-4	6.82-4	9.80-4	1.48-3	2.13-3
38	2023.0	3.40-4	3.85-4	4.86-4	6.84-4	1.03-3	1.47-3
42	2571.4	2.70-4	3.03-4	3.78-4	5.25-4	7.89-4	1.13-3
46	3191.5	2.31-4	2.60-4	3.24-4	4.49-4	6.78-4	9.70-4
50	3880.1	1.70-3	1.57-3	1.45-3	1.43-3	1.57-3	1.90-3
54	4600.0	1 70-3	1.62-3	1.59-3	1.67-3	1.95-3	2.44-3
58	5381.5	1.62-3	1.58-3	1.59-3	1.73-3	2.06-3	2.60-3
62	6225.0	1.54-3	1.52-3	1.56-3	1.73-3	2.08-3	2.66-3
66	7130.7	1.45-3	1.45-3	1 50-3	1.69-3	2.06-3	2.65-3
70	8099.0	1.36-3	1.37-3	1.44-3	1.62-3	2.00-3	2.58-3
74	9130.3	1.27-3	1.28-3	1.36-3	1.55-3	1.92-3	2.48-3
78	10224.8	1.18-3	1.20-3	1.28-3	1.46-3	1.83-3	2.37-3
82	11383.0	1 10-3	1.12-3	1.20-3	1.38-3	1.73-3	2.26-3
87	12920.9	1.00-3	1.03-3	1.10-3	1.28-3	1.61-3	2.12-3
92	14559.8	9.20-4	9.44-4	1.02-3	1.18-3	1.50-3	1.99-3

A1 − D3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	521.9	1.01-3	1.10-3	1.31-3	1.75-3	2.49-3	3.54-3
26	811.7	3.80-4	4.06-4	4.75-4	6.26-4	8.82-4	1.25-3
30	1170.3	1.36-4	1.44-4	1.65-4	2.12-4	2.98-4	4.16-4
34	1601.4	6.11-5	6.42-5	7.30-5	9.30-5	1.29-4	1.78-4
38	2088.5	2.21-3	1.86-3	1.45-3	1.11-3	9.64-4	1.00-3
42	2624.6	1.99-3	1.73-3	1.46-3	1.27-3	1.26-3	1.43-3
46	3221.8	1.86-3	1.69-3	1.52-3	1.45-3	1.57-3	1.87-3
50	3886.0	4.22-4	4.95-4	6.35-4	8.82-4	1.31-3	1.82-3
54	4628.2	4.44-3	4.81-3	5.52-3	6.76-3	8.68-3	1.13-2
58	5418.5	3.81-3	4.11-3	4.70-3	5.73-3	7.34-3	9.59-3
62	6273.0	3.27-3	3.53-3	4.03-3	4.90-3	6.29-3	8.24-3
66	7192.5	2.83-3	3.05-3	3.48-3	4.24-3	5.45-3	7.15-3
70	8177.7	2.47-3	2.66-3	3.04-3	3.70-3	4.76-3	6.27-3
74	9229.7	2.18-3	2.35-3	2.67-3	3.26-3	4.21-3	5.54-3
78	10349.1	1.93-3	2.08-3	2.37-3	2.89-3	3.75-3	4.95-3
82	11537.1	1.72-3	1.86-3	2.12-3	2.59-3	3.36-3	4.46-3
87	13119.9	1.51-3	1.63-3	1.86-3	2.27-3	2.96-3	3.96-3
92	14813.5	1.33-3	1.44-3	1.64-3	2.02-3	2.64-3	3.58-3

A1 − D4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	551.4	5.36-3	4.26-3	2.93-3	1.67-3	7.86-4	3.31-4
26	845.0	4.22-3	3.35-3	2.30-3	1.31-3	6.25-4	2.75-4
30	1198.9	3.25-3	2.60-3	1.82-3	1.09-3	6.08-4	3.85-4
34	1613.4	2.60-3	2.12-3	1.54-3	1.04-3	7.25-4	6.27-4
38	2098.7	8.22-3	8.84-3	1.00-2	1.21-2	1.53-2	1.95-2
42	2637.8	7.16-3	7.72-3	8.79-3	1.06-2	1.35-2	1.72-2
46	3238.8	6.12-3	6.60-3	7.52-3	9.11-3	1.15-2	1.48-2
50	3902.6	5.05-3	5.43-3	6.15-3	7.41-3	9.32-3	1.20-2
54	4659.7	1.59-4	1.51-4	1.46-4	1.53-4	1.73-4	2.41-4
58	5514.2	1.13-4	1.13-4	1.20-4	1.45-4	2.00-4	2.88-4
62	6455.3	9.65-5	9.77-5	1.06-4	1.30-4	1.88-4	2.66-4
66	7488.1	8.41-5	8.53-5	9.25-5	1.14-4	1.59-4	2.34-4
70	8618.8	7.41-5	7.48-5	8.10-5	9.95-5	1.39-4	2.03-4
74	9854.6	6.58-5	6.63-5	7.13-5	8.71-5	1.22-4	1.77-4
78	11204.1	5.91-5	5.93-5	6.32-5	7.66-5	1.06-4	1.54-4
82	12677.2	5.36-5	5.34-5	5.65-5	6.78-5	9.32-5	1.35-4
87	14711.0	4.79-5	4.74-5	4.96-5	5.87-5	7.98-5	1.16-4
92	16986.1	4.33-5	4.26-5	4.40-5	5.12-5	6.89-5	1.01-4

A1 − D5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	554.8	7.73-3	7.47-3	7.47-3	8.11-3	9.71-3	1.22-2
26	849.5	9.42-3	9.69-3	1.05-2	1.22-2	1.51-2	1.92-2
30	1204.9	9.66-3	1.02-2	1.13-2	1.35-2	1.69-2	2.14-2
34	1621.2	9.12-3	9.75-3	1.10-2	1.32-2	1.67-2	2.11-2
38	2109.2	1.51-5	1.37-5	1.25-5	1.28-5	1.58-5	2.13-5
42	2698.4	1.65-5	1.63-5	1.69-5	1.98-5	2.59-5	3.50-5
46	3374.2	3.93-5	3.99-5	4.27-5	5.01-5	6.38-5	8.39-5
50	4107.9	2.89-4	2.28-4	1.55-4	8.89-5	4.43-5	2.35-5
54	4924.4	2.41-4	1.90-4	1.29-4	7.31-5	3.49-5	1.67-5
58	5831.7	2.03-4	1.61-4	1.09-4	6.13-5	2.84-5	1.23-5
62	6836.0	1.74-4	1.38-4	9.35-5	5.24-5	2.39-5	9.72-6
66	7944.9	1.50-4	1.19-4	8.10-5	4.56-5	2.09-5	8.40-6
70	9167.0	1.30-4	1.04-4	7.12-5	4.06-5	1.92-5	8.47-6
74	10487.0	7.42-4	8.67-4	1.09-3	1.48-3	2.10-3	2.96-3
78	11895.3	4.25-4	4.98-4	6.34-4	8.69-4	1.25-3	1.78-3
82	13431.4	3.17-4	3.71-4	4.72-4	6.49-4	9.39-4	1.35-3
87	15552.6	2.49-4	2.90-4	3.68-4	5.07-4	7.37-4	1.07-3
92	17927.8	2.09-4	2.42-4	3.05-4	4.18-4	6.10-4	9.01-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 – D6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	556.9	5.21-3	4.77-3	4.37-3	4.31-3	4.81-3	5.83-3
26	854.8	2.01-3	1.73-3	1.43-3	1.23-3	1.22-3	1.39-3
30	1218.5	1.10-3	9.04-4	6.82-4	4.99-4	4.11-4	4.18-4
34	1649.9	7.52-4	6.06-4	4.36-4	2.89-4	2.04-4	1.82-4
38	2151.3	5.63-4	4.49-4	3.15-4	1.97-4	1.24-4	9.76-5
42	2725.7	4.40-4	3.49-4	2.42-4	1.46-4	8.42-5	5.93-5
46	3377.0	3.53-4	2.80-4	1.94-4	1.17-4	6.66-5	4.62-5
50	4136.9	5.63-3	6.34-3	7.57-3	9.56-3	1.25-2	1.63-2
54	4956.7	5.92-3	6.67-3	7.98-3	1.01-2	1.32-2	1.74-2
58	5866.1	5.06-3	5.72-3	6.85-3	8.68-3	1.14-2	1.51-2
62	6872.0	4.36-3	4.92-3	5.91-3	7.51-3	9.90-3	1.32-2
66	7980.6	3.77-3	4.28-3	5.15-3	6.57-3	8.71-3	1.17-2
70	9188.6	2.58-3	2.96-3	3.63-3	4.74-3	6.44-3	8.82-3
74	10512.7	1.15-4	9.21-5	6.42-5	3.80-5	2.00-5	1.16-5
78	11994.0	1.00-4	8.06-5	5.63-5	3.33-5	1.72-5	9.43-6
82	13625.2	8.85-5	7.16-5	5.05-5	3.05-5	1.65-5	1.00-5
87	15901.6	7.60-5	6.20-5	4.45-5	2.78-5	1.62-5	1.12-5
92	18481.0	6.56-5	5.41-5	3.96-5	2.57-5	1.62-5	1.27-5

A1 – D7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	567.3	4.26-2	4.79-2	5.73-2	7.25-2	9.48-2	1.23-1
26	868.8	3.09-2	3.48-2	4.15-2	5.23-2	6.81-2	8.81-2
30	1235.5	2.26-2	2.54-2	3.04-2	3.81-2	4.96-2	6.37-2
34	1669.6	1.69-2	1.91-2	2.28-2	2.86-2	3.71-2	4.76-2
38	2173.8	1.31-2	1.48-2	1.76-2	2.22-2	2.88-2	3.70-2
42	2750.9	1.05-2	1.18-2	1.41-2	1.78-2	2.31-2	2.98-2
46	3404.4	8.54-3	9.63-3	1.15-2	1.45-2	1.89-2	2.45-2
50	4145.6	1.59-3	1.79-3	2.14-3	2.71-3	3.52-3	4.61-3
54	4996.9	8.71-4	8.79-4	9.25-4	1.05-3	1.29-3	1.66-3
58	5918.0	6.64-4	6.47-4	6.50-4	7.06-4	8.44-4	1.08-3
62	6932.3	5.15-4	5.03-4	5.09-4	5.64-4	6.96-4	9.19-4
66	8024.9	9.26-5	1.01-4	1.23-4	1.69-4	2.55-4	3.87-4
70	9221.2	7.37-4	7.92-4	8.87-4	1.04-3	1.28-3	1.61-3
74	10559.0	2.10-3	2.35-3	2.78-3	3.49-3	4.57-3	6.07-3
78	12039.9	2.02-3	2.27-3	2.71-3	3.42-3	4.53-3	6.05-3
82	13671.4	1.79-3	2.01-3	2.40-3	3.05-3	4.06-3	5.46-3
87	15948.0	1.50-3	1.68-3	2.01-3	2.57-3	3.44-3	4.67-3
92	18527.2	1.23-3	1.39-3	1.66-3	2.13-3	2.87-3	3.97-3

A1 – D8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	572.8	1.88-2	2.07-2	2.43-2	3.04-2	3.95-2	5.12-2
26	877.2	1.22-2	1.34-2	1.55-2	1.92-2	2.48-2	3.19-2
30	1247.1	7.98-3	8.69-3	1.00-2	1.22-2	1.57-2	2.00-2
34	1684.7	5.32-3	5.73-3	6.52-3	7.90-3	1.00-2	1.28-2
38	2192.7	3.61-3	3.84-3	4.31-3	5.16-3	6.52-3	8.29-3
42	2774.3	2.47-3	2.59-3	2.86-3	3.38-3	4.24-3	5.40-3
46	3433.3	1.70-3	1.75-3	1.89-3	2.19-3	2.72-3	3.47-3
50	4174.6	1.11-3	1.11-3	1.16-3	1.31-3	1.60-3	2.05-3
54	5021.4	7.23-5	6.43-5	5.56-5	5.01-5	5.11-5	5.97-5
58	5957.5	1.94-4	2.28-4	2.99-4	4.31-4	6.49-4	9.69-4
62	6948.1	1.11-4	1.19-4	1.41-4	1.91-4	2.86-4	4.32-4
66	8063.1	3.53-4	3.20-4	2.86-4	2.69-4	2.86-4	3.44-4
70	9305.1	2.82-4	2.52-4	2.19-4	1.99-4	2.05-4	2.43-4
74	10674.2	2.26-4	1.98-4	1.66-4	1.42-4	1.39-4	1.60-4
78	12182.9	1.84-4	1.58-4	1.28-4	1.04-4	9.51-5	1.05-4
82	13846.2	1.52-4	1.29-4	1.02-4	7.81-5	6.64-5	6.97-5
87	16170.0	1.21-4	1.02-4	7.84-5	5.67-5	4.40-5	4.27-5
92	18806.4	9.80-5	8.19-5	6.18-5	4.27-5	3.03-5	2.71-5

A1 – D9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	613.6	4.20-4	3.74-4	3.27-4	3.06-4	3.28-4	4.08-4
26	927.0	4.57-4	4.41-4	4.50-4	5.16-4	6.75-4	9.29-4
30	1306.3	4.55-4	4.71-4	5.24-4	6.57-4	9.10-4	1.27-3
34	1753.5	3.58-4	3.60-4	3.85-4	4.61-4	6.16-4	8.45-4
38	2269.9	2.13-4	1.89-4	1.61-4	1.42-4	1.44-4	1.71-4
42	2855.7	3.56-4	4.14-4	5.31-4	7.50-4	1.11-3	1.60-3
46	3513.7	3.53-4	4.22-4	5.57-4	8.03-4	1.20-3	1.75-3
50	4247.5	3.07-4	3.67-4	4.86-4	7.03-4	1.05-3	1.55-3
54	5060.8	2.53-4	3.02-4	3.98-4	5.74-4	8.62-4	1.28-3
58	6003.0	5.47-6	4.84-6	4.21-6	3.96-6	4.43-6	5.80-6
62	7072.0	2.93-4	3.74-4	5.28-4	8.02-4	1.25-3	1.89-3
66	8204.8	2.39-4	3.05-4	4.33-4	6.62-4	1.04-3	1.58-3
70	9452.9	1.93-4	2.47-4	3.51-4	5.40-4	8.51-4	1.30-3
74	10826.9	1.54-4	1.97-4	2.82-4	4.37-4	6.95-4	1.07-3
78	12339.5	1.23-4	1.57-4	2.24-4	3.50-4	5.63-4	8.70-4
82	14005.6	9.69-5	1.23-4	1.77-4	2.78-4	4.52-4	7.03-4
87	16331.9	7.18-5	9.04-5	1.29-4	2.05-4	3.38-4	5.34-4
92	18970.7	5.33-5	6.58-5	9.29-5	1.48-4	2.47-4	4.05-4

A1 – D10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	616.3	2.81-4	2.83-4	3.13-4	3.96-4	5.55-4	7.95-4
26	930.9	1.51-3	2.04-3	3.05-3	4.80-3	7.59-3	1.13-2
30	1310.4	1.41-3	1.89-3	2.79-3	4.34-3	6.79-3	9.96-3
34	1756.9	1.30-3	1.73-3	2.53-3	3.91-3	6.07-3	8.83-3
38	2273.1	1.21-3	1.60-3	2.33-3	3.57-3	5.51-3	8.01-3
42	2863.7	8.52-4	1.10-3	1.56-3	2.37-3	3.62-3	5.28-3
46	3532.0	6.62-4	8.46-4	1.19-3	1.80-3	2.74-3	4.02-3
50	4281.8	5.38-4	6.86-4	9.65-4	1.45-3	2.22-3	3.29-3
54	5117.8	4.41-4	5.62-4	7.92-4	1.19-3	1.83-3	2.74-3
58	6045.7	3.62-4	4.61-4	6.50-4	9.85-4	1.52-3	2.29-3
62	7107.5	3.37-6	3.95-6	5.20-6	7.59-6	1.16-5	1.76-5
66	8282.7	7.46-5	6.74-5	5.91-5	5.37-5	5.65-5	7.10-5
70	9537.6	6.48-5	5.82-5	5.03-5	4.45-5	4.53-5	5.58-5
74	10918.6	5.67-5	5.07-5	4.33-5	3.73-5	3.69-5	4.44-5
78	12438.3	5.00-5	4.45-5	3.75-5	3.16-5	3.02-5	3.54-5
82	14111.8	4.44-5	3.93-5	3.28-5	2.70-5	2.48-5	2.82-5
87	16447.7	3.88-5	3.41-5	2.81-5	2.24-5	1.96-5	2.14-5
92	19096.6	3.42-5	3.00-5	2.45-5	1.89-5	1.56-5	1.63-5

A1 – D11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	617.0	1.33-3	1.78-3	2.66-3	4.26-3	6.83-3	1.03-2
26	932.2	1.31-4	1.15-4	9.87-5	8.64-5	8.58-5	1.01-4
30	1317.0	1.34-4	1.31-4	1.35-4	1.53-4	1.99-4	2.70-4
34	1772.6	1.73-4	1.73-4	1.82-4	2.13-4	2.80-4	3.82-4
38	2299.9	2.04-4	2.01-4	2.07-4	2.37-4	3.05-4	4.14-4
42	2899.8	1.93-4	1.86-4	1.85-4	2.02-4	2.52-4	3.37-4
46	3576.0	1.67-4	1.58-4	1.52-4	1.59-4	1.91-4	2.53-4
50	4332.9	1.41-4	1.32-4	1.23-4	1.24-4	1.45-4	1.90-4
54	5175.7	1.19-4	1.10-4	1.01-4	9.85-5	1.11-4	1.45-4
58	6110.3	1.01-4	9.24-5	8.33-5	7.91-5	8.71-5	1.12-4
62	7143.6	8.62-5	7.83-5	6.94-5	6.42-5	6.87-5	8.72-5
66	8346.7	5.93-7	5.48-7	5.07-7	5.05-7	5.86-7	7.95-7
70	9734.5	2.23-7	2.09-7	2.02-7	2.19-7	2.77-7	3.97-7
74	11288.3	1.09-7	1.02-7	9.91-8	1.07-7	1.36-7	1.97-7
78	13028.5	5.82-8	5.53-8	5.31-8	5.71-8	7.29-8	1.06-7
82	14979.1	3.24-8	3.15-8	3.08-8	3.23-8	4.15-8	6.12-8
87	17758.0	1.74-8	1.64-8	1.57-8	1.66-8	2.16-8	3.24-8
92	20981.9	9.69-9	8.89-9	8.30-9	8.82-9	1.16-8	1.79-8

A1 – D12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	623.4	1.05-3	1.44-3	2.21-3	3.61-3	5.85-3	8.88-3
26	940.5	5.60-4	7.38-4	1.08-3	1.69-3	2.68-3	4.01-3
30	1326.5	2.83-4	3.49-4	4.82-4	7.20-4	1.11-3	1.63-3
34	1784.5	1.34-4	1.55-4	2.00-4	2.85-4	4.27-4	6.17-4
38	2319.3	4.56-5	5.11-5	6.35-5	8.81-5	1.30-4	1.87-4
42	2937.0	1.40-5	1.55-5	1.89-5	2.59-5	3.82-5	5.54-5
46	3643.3	4.98-6	5.43-6	6.54-6	8.94-6	1.32-5	1.94-5
50	4444.9	2.09-6	2.24-6	2.66-6	3.61-6	5.36-6	7.95-6
54	5349.9	9.89-7	1.04-6	1.22-6	1.64-6	2.44-6	3.66-6
58	6367.6	5.11-7	5.31-7	6.11-7	8.10-7	1.22-6	1.83-6
62	7508.9	2.82-7	2.88-7	3.26-7	4.26-7	6.48-7	9.76-7
66	8786.6	1.63-7	1.64-7	1.83-7	2.36-7	3.56-7	5.45-7
70	10215.8	9.71-8	9.73-8	1.07-7	1.36-7	2.05-7	3.15-7
74	11814.1	5.99-8	5.93-8	6.40-8	8.06-8	1.24-7	1.88-7
78	13602.3	3.77-8	3.71-8	3.94-8	4.91-8	7.52-8	1.15-7
82	15605.4	2.41-8	2.36-8	2.47-8	3.05-8	4.65-8	7.13-8
87	18457.6	1.42-8	1.37-8	1.41-8	1.72-8	2.61-8	4.04-8
92	21766.1	8.41-9	8.06-9	8.18-9	9.88-9	1.48-8	2.35-8

A1 – D13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	646.9	4.44-4	4.31-4	4.40-4	5.10-4	6.86-4	9.84-4
26	967.8	2.72-4	2.64-4	2.68-4	3.06-4	4.06-4	5.75-4
30	1357.2	1.49-4	1.42-4	1.39-4	1.51-4	1.92-4	2.62-4
34	1819.7	6.62-5	6.07-5	5.51-5	5.35-5	6.10-5	7.90-5
38	2360.8	2.65-5	2.29-5	1.80-5	1.32-5	9.79-6	8.78-6
42	2983.7	2.25-5	2.07-5	1.82-5	1.61-5	1.50-5	1.57-5
46	3693.6	1.58-5	1.50-5	1.43-5	1.42-5	1.51-5	1.77-5
50	4498.5	9.53-6	9.30-6	9.20-6	9.60-6	1.08-5	1.32-5
54	5406.9	5.62-6	5.57-6	5.66-6	6.12-6	7.10-6	9.01-6
58	6428.3	3.33-6	3.34-6	3.46-6	3.83-6	4.53-6	5.91-6
62	7573.6	1.99-6	2.01-6	2.11-6	2.39-6	2.83-6	3.81-6
66	8855.7	1.20-6	1.22-6	1.29-6	1.48-6	1.83-6	2.43-6
70	10289.5	7.28-7	7.47-7	7.95-7	9.17-7	1.15-6	1.53-6
74	11892.6	4.50-7	4.60-7	4.90-7	5.68-7	6.98-7	9.65-7
78	13686.1	2.78-7	2.83-7	3.02-7	3.51-7	4.36-7	6.03-7
82	15694.8	1.73-7	1.75-7	1.85-7	2.16-7	2.70-7	3.74-7
87	18554.7	9.54-8	9.59-8	1.01-7	1.16-7	1.46-7	2.04-7
92	21871.7	5.26-8	5.22-8	5.42-8	6.13-8	7.75-8	1.11-7

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leq Z \leq 92$

See page 31 for Explanation of Tables

A1 - D14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	651.3	4.78-4	4.33-4	3.74-4	3.11-4	2.65-4	2.54-4
26	973.8	3.17-4	2.90-4	2.56-4	2.23-4	2.08-4	2.17-4
30	1364.3	2.06-4	1.91-4	1.72-4	1.57-4	1.54-4	1.69-4
34	1826.9	1.29-4	1.21-4	1.12-4	1.06-4	1.10-4	1.26-4
38	2367.0	7.28-5	6.96-5	6.64-5	6.62-5	7.27-5	8.72-5
42	2993.7	2.74-5	2.62-5	2.50-5	2.51-5	2.81-5	3.44-5
46	3715.0	1.00-5	9.46-6	8.88-6	8.67-6	9.44-6	1.15-5
50	4537.7	4.31-6	4.05-6	3.76-6	3.60-6	3.84-6	4.62-6
54	5470.6	2.08-6	1.95-6	1.81-6	1.72-6	1.81-6	2.17-6
58	6524.4	1.10-6	1.03-6	9.57-7	9.14-7	9.67-7	1.16-6
62	7711.5	6.22-7	5.91-7	5.53-7	5.38-7	5.78-7	7.02-7
66	9045.7	3.87-7	3.73-7	3.56-7	3.61-7	3.99-7	4.97-7
70	10540.6	2.82-7	2 81-7	2.79-7	3.02-7	3.59-7	4.69-7
74	12200.8	2.55-7	2.60-7	2.74-7	3.27-7	4.28-7	5.89-7
78	14035.1	1.75-7	1.68-7	1.83-7	2.24-7	3.02-7	4.23-7
82	16079.5	1.09-7	9.75-8	1.07-7	1.29-7	1.75-7	2.45-7
87	18986.1	4.93-8	4 93-8	5.25-8	6.21-8	8.30-8	1.17-7
92	22355.6	2.52-8	2.48-8	2.52-8	2.84-8	3.68-8	5.25-8

A1 - D15

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
710.7	4.17-5	4.35-5	4.29-5	5.02-5	6.45-5	8.57-5
1047.8	3.50-5	3.59-5	3.77-5	4.51-5	6.00-5	8.08-5
1454.6	2.55-5	2.79-5	3.02-5	3.65-5	4.87-5	6.54-5
1934.7	1.81-5	1.99-5	2.28-5	2.74-5	3.67-5	4.93-5
2492.4	1.25-5	1.38-5	1.64-5	1.96-5	2.63-5	3.55-5
3133.0	8.43-6	9.36-6	1.12-5	1.35-5	1.82-5	2.46-5
3862.4	5.57-6	6.20-6	7.38-6	9.00-6	1.22-5	1.66-5
4687.8	3.62-6	4.03-6	4.73-6	5.86-6	7.94-6	1.09-5
5617.6	2.32-6	2.57-6	2.98-6	3.72-6	5.06-6	7.03-6
6661.4	1.46-6	1.62-6	1.84-6	2.31-6	3.16-6	4.42-6
7830.7	9.07-7	1.00-6	1.11-6	1.40-6	1.92-6	2.70-6
9139.4	5.44-7	5.96-7	6.40-7	8.02-7	1.11-6	1.57-6
10606.8	2.93-7	3.15-7	3.19-7	3.96-7	5.45-7	7.75-7
12266.7	1.03-7	9.22-8	8.48-8	8.92-8	1.11-7	1.52-7
14155.9	4.96-8	4.09-8	3.18-8	2.22-8	1.50-8	1.16-8
16292.7	3.31-8	2.80-8	2.16-8	1.49-8	8.73-9	4.78-9
19357.6	2.03-8	1.77-8	1.40-8	9.86-9	6.15-9	3.81-9
22938.4	1.26-8	1.11-8	8.88-9	6.35-9	4.09-9	2.69-9

A1 - E1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	497.1	4.37-3	4.93-3	6.18-3	8.65-3	1.26-2	1.80-2
26	774.0	3.55-3	4.26-3	5.74-3	8.56-3	1.29-2	1.86-2
30	1109.8	2.65-3	3 21-3	4.37-3	6.51-3	9.96-3	1.44-2
34	1504.0	2.00-3	2.42-3	3.30-3	4.92-3	7.53-3	1.08-2
38	1956.1	1.56-3	1.89-3	2.56-3	3.80-3	5.83-3	8.41-3
42	2465.2	1.26-3	1.51-3	2.05-3	3.03-3	4.65-3	6.75-3
46	3030.8	1.04-3	1.24-3	1.68-3	2.49-3	3.82-3	5.58-3
50	3651.7	8.75-4	1.05-3	1.42-3	2.10-3	3.22-3	4.74-3
54	4326.8	7.53-4	9.02-4	1.22-3	1.81-3	2.78-3	4.11-3
58	5054.9	6.60-4	7.93-4	1.08-3	1.60-3	2.45-3	3.64-3
62	5834.3	5.91-4	7.13-4	9.69-4	1.47-3	2.21-3	3.29-3
66	6663.2	5.40-4	6.55-4	8.93-4	1.35-3	2.04-3	3.03-3
70	7539.3	5.05-4	6.16-4	8.42-4	1.27-3	1.92-3	2.84-3
74	8460.1	4.84-4	5.95-4	8.13-4	1.21-3	1.85-3	2.72-3
78	9422.3	4.76-4	5.85-4	8.02-4	1.19-3	1.81-3	2.66-3
82	10422.0	4.83-4	5.90-4	8.15-4	1.19-3	1.80-3	2.65-3
87	11717.2	4.99-4	6.14-4	8.37-4	1.22-3	1.83-3	2.69-3
92	13052.0	5.36-4	6.60-4	8.85-4	1.27-3	1.89-3	2.80-3

A1 - E2

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
500.8	3.90-3	5.09-3	7.41-3	1.16-2	1.79-2	2.62-2
782.6	1.88-3	2.23-3	2.96-3	4.43-3	6.51-3	9.41-3
1128.6	1.16-3	1.29-3	1.58-3	2.17-3	3.18-3	4.52-3
1540.0	8.22-4	8.80-4	1.03-3	1.35-3	1.94-3	2.73-3
2018.6	6.26-4	6.59-4	7.52-4	9.63-4	1.37-3	1.91-3
2566.5	5.07-4	5.30-4	6.00-4	7.60-4	1.08-3	1.50-3
3186.1	4.47-4	4.72-4	5.40-4	6.89-4	9.84-4	1.37-3
3876.4	2.12-3	1.77-3	1.37-3	1.04-3	8.98-4	9.44-4
4596.1	1.95-3	1.60-3	1.19-3	8.28-4	6.08-4	5.45-4
5377.1	1.70-3	1.40-3	1.05-3	7.49-4	5.70-4	5.31-4
6220.2	1.50-3	1.24-3	9.44-4	6.86-4	5.39-4	5.20-4
7125.5	1.34-3	1.11-3	8.54-4	6.31-4	5.11-4	5.07-4
8093.4	1.20-3	1.00-3	7.77-4	5.84-4	4.85-4	4.92-4
9124.3	1.09-3	9.14-4	7.12-4	5.43-4	4.60-4	4.75-4
10218.6	9.91-4	8.35-4	6.55-4	5.06-4	4.37-4	4.58-4
11376.6	9.08-4	7.67-4	6.06-4	4.72-4	4.14-4	4.40-4
12914.4	8.19-4	6.95-4	5.52-4	4.35-4	3.87-4	4.19-4
14553.2	7.45-4	6.33-4	5.06-4	4.03-4	3.63-4	4.00-4

A1 - E3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	509.5	2.13-3	1.83-3	1.41-3	9.41-4	5.22-4	2.55-4
26	793.4	1.32-3	1.15-3	9.03-4	6.60-4	4.42-4	3.50-4
30	1141.1	9.20-4	8.20-4	6.90-4	5.77-4	5.38-4	5.96-4
34	1554.2	6.90-4	6.34-4	5.68-4	5.36-4	5.87-4	7.24-4
38	2034.4	5.46-4	5.14-4	4.85-4	4.95-4	5.92-4	7.64-4
42	2583.8	4.54-4	4.37-4	4.32-4	4.69-4	5.95-4	7.88-4
46	3204.8	4.23-4	4.18-4	4.33-4	4.98-4	6.67-4	8.97-4
50	3880.5	6.43-4	6.32-4	6.53-4	7.55-4	1.02-3	1.36-3
54	4632.4	4.30-3	4.46-3	4.86-3	5.71-3	7.15-3	9.17-3
58	5419.3	2.35-3	2.29-3	2.30-3	2.49-3	2.95-3	3.69-3
62	6267.8	1.41-3	1.27-3	1.14-3	1.08-3	1.15-3	1.35-3
66	7178.5	9.99-4	8.51-4	6.85-4	5.54-4	4.99-4	5.21-4
70	8151.8	8.26-4	6.91-4	5.36-4	4.07-4	3.37-4	3.28-4
74	9187.9	7.47-4	6.30-4	4.99-4	3.93-4	3.44-4	3.54-4
78	10287.5	7.01-4	6.03-4	4.95-4	4.15-4	3.94-4	4.34-4
82	11450.8	6.67-4	5.84-4	4.96-4	4.39-4	4.43-4	5.10-4
87	12995.3	6.29-4	5 61-4	4.92-4	4.57-4	4.85-4	5.81-4
92	14641.1	5.92-4	5.36-4	4.81-4	4.62-4	5.06-4	6.25-4

A1 - E4

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
550.6	1.19-2	9.54-3	6.64-3	3.92-3	2.02-3	1.05-3
843.8	8.75-3	7.00-3	4.90-3	2.93-3	1.56-3	8.62-4
1197.5	6.54-3	5.25-3	3.69-3	2.24-3	1.24-3	7.34-4
1611.8	5.02-3	4.04-3	2.86-3	1.77-3	1.02-3	6.53-4
2086.6	3.97-3	3.20-3	2.28-3	1.44-3	8.73-4	6.04-4
2622.3	3.22-3	2.61-3	1.88-3	1.21-3	7.72-4	5.77-4
3219.1	2.66-3	2.17-3	1.58-3	1.06-3	7.17-4	5.85-4
3899.8	9.28-4	1.02-3	1.21-3	1.56-3	2.18-3	2.92-3
4647.1	8.44-3	9.57-3	1.16-2	1.48-2	1.98-2	2.62-2
5440.2	1.39-2	1.56-2	1.86-2	2.35-2	3.06-2	4.03-2
6295.6	1.30-2	1.47-2	1.75-2	2.20-2	2.87-2	3.79-2
7216.2	1.19-2	1.33-2	1.59-2	2.01-2	2.62-2	3.47-2
8202.7	1.07-2	1.20-2	1.43-2	1.81-2	2.37-2	3.14-2
9255.9	9.60-3	1.08-2	1.29-2	1.63-2	2.14-2	2.84-2
10376.7	8.63-3	9.72-3	1.16-2	1.47-2	1.94-2	2.57-2
11566.0	7.79-3	8.77-3	1.05-2	1.33-2	1.76-2	2.35-2
13150.6	6.90-3	7.77-3	9.30-3	1.18-2	1.57-2	2.11-2
14846.0	6.14-3	6.93-3	8.30-3	1.06-2	1.41-2	1.93-2

A1 - E5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	556.0	1.81-2	1.81-2	1.89-2	2.14-2	2.62-2	3.30-2
26	851.5	2.18-2	2.30-2	2.55-2	3.03-2	3.80-2	4.83-2
30	1207.8	2.10-2	2.25-2	2.54-2	3.05-2	3.86-2	4.89-2
34	1625.1	1.87-2	2.02-2	2.30-2	2.78-2	3.52-2	4.44-2
38	2103.5	1.58-2	1.71-2	1.95-2	2.36-2	2.99-2	3.78-2
42	2643.4	1.26-2	1.36-2	1.55-2	1.87-2	2.36-2	3.00-2
46	3244.8	9.29-3	9.93-3	1.12-2	1.34-2	1.69-2	2.15-2
50	3908.7	5.60-3	5.83-3	6.35-3	7.39-3	9.04-3	1.15-2
54	4655.3	5.73-3	6.28-3	7.22-3	8.74-3	1.08-2	1.39-2
58	5507.1	2.58-4	2.38-4	2.13-4	1.92-4	1.71-4	2.10-4
62	6447.5	1.88-4	1.73-4	1.56-4	1.47-4	1.55-4	2.00-4
66	7479.6	1.60-4	1.48-4	1.35-4	1.31-4	1.43-4	1.91-4
70	8609.6	1.40-4	1.30-4	1.19-4	1.16-4	1.31-4	1.74-4
74	9844.7	1.25-4	1.16-4	1.06-4	1.04-4	1.19-4	1.56-4
78	11193.5	1.13-4	1.04-4	9.54-5	9.31-5	1.06-4	1.38-4
82	12665.8	1.03-4	9.47-5	8.64-5	8.38-5	9.45-5	1.23-4
87	14698.8	9.26-5	8.51-5	7.71-5	7.39-5	8.23-5	1.07-4
92	16972.9	8.47-5	7.75-5	6.97-5	6.58-5	7.22-5	9.39-5

A1 - E6

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
557.3	5.53-3	4.62-3	3.59-3	2.76-3	2.43-3	2.59-3
855.3	7.21-3	6.89-3	6.76-3	7 18-3	8.45-3	1.05-2
1214.5	1.09-2	1.14-2	1.25-2	1.48-2	1.86-2	2.36-2
1634.3	1.32-2	1.43-2	1.64-2	1 99-2	2.54-2	3.23-2
2114.5	1.40-2	1.54-2	1.79-2	2.21-2	2.82-2	3.60-2
2655.7	1.42-2	1.57-2	1.84-2	2.28-2	2.94-2	3.76-2
3258.2	1.44-2	1.60-2	1.88-2	2.34-2	3.02-2	3.89-2
3923.0	1.45-2	1.62-2	1.91-2	2.38-2	3.06-2	3.98-2
4674.7	4.92-4	4.74-4	4.52-4	4.37-4	4.04-4	4.75-4
5529.8	2.25-4	2.05-4	1.81-4	1.61-4	1.50-4	1.87-4
6471.3	1.83-4	1.68-4	1.50-4	1.40-4	1.47-4	1.88-4
7504.5	1.59-4	1.46-4	1.32-4	1.26-4	1.37-4	1.80-4
8635.5	1.40-4	1.29-4	1.18-4	1.14-4	1.27-4	1.67-4
9871.4	1.25-4	1.15-4	1.05-4	1.03-4	1.16-4	1.52-4
11220.8	1.13-4	1.04-4	9.54-5	9.32-5	1.06-4	1.38-4
12693.7	1.03-4	9.49-5	8.69-5	8.49-5	9.63-5	1.26-4
14727.0	9.28-5	8.55-5	7.81-5	7.59-5	8.58-5	1.12-4
17001.3	8.48-5	7.80-5	7.10-5	6.84-5	7.68-5	1.01-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - E7 | A1 - E8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	558.4	1.76-2	1.87-2	2.10-2	2.54-2	3.22-2	4.10-2	560.7	9.03-3	7.85-3	6.52-3	5.51-3	5.22-3	5.65-3
26	857.3	6.97-3	7.16-3	7.73-3	8.97-3	1.11-2	1.40-2	860.9	5.68-3	4.98-3	4.20-3	3.65-3	3.57-3	3.96-3
30	1221.8	3.57-3	3.50-3	3.56-3	3.91-3	4.68-3	5.78-3	1226.8	3.58-3	3.08-3	2.53-3	2.10-3	1.96-3	2.10-3
34	1653.9	2.29-3	2.17-3	2.10-3	2.20-3	2.54-3	3.09-3	1660.7	2.45-3	2.08-3	1.64-3	1.28-3	1.11-3	1.13-3
38	2156.1	1.66-3	1.53-3	1.44-3	1.45-3	1.64-3	1.97-3	2165.2	1.81-3	1.51-3	1.16-3	8.69-4	7.06-4	6.83-4
42	2731.4	1.27-3	1.17-3	1.07-3	1.05-3	1.16-3	1.40-3	2743.4	1.39-3	1.15-3	8.76-4	6.35-4	4.94-4	4.61-4
46	3383.1	1.02-3	9.24-4	8.35-4	8.07-4	8.83-4	1.06-3	3399.0	1.10-3	9.12-4	6.89-4	4.93-4	3.75-4	3.43-4
50	4115.2	8.35-4	7.54-4	6.75-4	6.45-4	7.00-4	8.46-4	4136.4	8.98-4	7.46-4	5.65-4	4.07-4	3.14-4	2.92-4
54	4932.5	6.97-4	6.27-4	5.58-4	5.29-4	5.72-4	6.93-4	4960.5	8.25-4	7.15-4	5.92-4	5.01-4	4.78-4	5.32-4
58	5840.5	5.89-4	5.29-4	4.69-4	4.43-4	4.78-4	5.82-4	5871.3	1.06-2	1.20-2	1.45-2	1.84-2	2.42-2	3.22-2
62	6845.6	4.93-4	4.40-4	3.87-4	3.60-4	3.84-4	4.67-4	6868.6	6.24-3	7.11-3	8.63-3	1.11-2	1.49-2	2.01-2
66	7946.8	1.23-3	1.39-3	1.69-3	2.21-3	3.02-3	4.18-3	7955.5	3.04-4	2.44-4	1.71-4	1.04-4	5.70-5	3.49-5
70	9121.7	6.03-4	6.73-4	8.08-4	1.05-3	1.45-3	2.04-3	9177.8	3.22-4	2.76-4	2.24-4	1.84-4	1.72-4	1.95-4
74	10404.5	4.35-4	4.79-4	5.68-4	7.35-4	1.02-3	1.43-3	10489.6	9.36-4	1.07-3	1.33-3	1.77-3	2.48-3	3.48-3
78	11804.8	3.53-4	3.85-4	4.52-4	5.81-4	8.06-4	1.14-3	11897.2	5.64-4	6.43-4	7.92-4	1.06-3	1.50-3	2.13-3
82	13333.6	3.02-4	3.27-4	3.80-4	4.86-4	6.73-4	9.52-4	13432.9	4.35-4	4.91-4	6.03-4	8.05-4	1.14-3	1.63-3
87	15445.5	2.58-4	2.77-4	3.19-4	4.05-4	5.60-4	7.97-4	15553.8	3.50-4	3.93-4	4.78-4	6.36-4	9.07-4	1.31-3
92	17811.2	2.27-4	2.41-4	2.75-4	3.46-4	4.78-4	6.90-4	17928.8	2.98-4	3.31-4	4.00-4	5.29-4	7.55-4	1.10-3

A1 - E9 | A1 - E10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	570.6	1.24-1	1.42-1	1.73-1	2.23-1	2.94-1	3.83-1	572.7	2.01-2	2.22-2	2.60-2	3.25-2	4.24-2	5.50-2
26	872.6	8.32-2	9.50-2	1.15-1	1.47-1	1.92-1	2.49-1	876.4	1.99-2	2.23-2	2.65-2	3.33-2	4.34-2	5.62-2
30	1239.3	5.58-2	6.35-2	7.65-2	9.69-2	1.27-1	1.63-1	1245.4	1.61-2	1.80-2	2.14-2	2.69-2	3.49-2	4.49-2
34	1673.4	3.91-2	4.44-2	5.34-2	6.75-2	8.78-2	1.13-1	1682.3	1.12-2	1.25-2	1.47-2	1.83-2	2.37-2	3.04-2
38	2177.8	2.91-2	3.30-2	3.96-2	5.01-2	6.51-2	8.36-2	2189.5	7.27-3	8.01-3	9.36-3	1.16-2	1.50-2	1.92-2
42	2755.3	2.28-2	2.58-2	3.09-2	3.91-2	5.08-2	6.56-2	2770.4	4.61-3	5.02-3	5.79-3	7.10-3	9.10-3	1.17-2
46	3409.1	1.84-2	2.08-2	2.49-2	3.15-2	4.10-2	5.34-2	3428.5	2.92-3	3.13-3	3.54-3	4.28-3	5.45-3	7.03-3
50	4143.3	1.51-2	1.71-2	2.05-2	2.60-2	3.39-2	4.44-2	4168.3	1.87-3	1.96-3	2.17-3	2.58-3	3.25-3	4.20-3
54	4962.4	1.25-2	1.42-2	1.70-2	2.16-2	2.82-2	3.73-2	4994.5	1.23-3	1.25-3	1.34-3	1.55-3	1.93-3	2.49-3
58	5877.2	6.02-4	4.92-4	3.59-4	2.38-4	1.57-4	1.23-4	5897.4	2.16-4	1.89-4	1.61-4	1.42-4	1.48-4	1.88-4
62	6885.8	2.99-3	3.30-3	3.83-3	4.69-3	5.97-3	7.76-3	6893.4	5.06-4	4.14-4	3.03-4	2.00-4	1.31-4	1.01-4
66	7989.9	6.77-3	7.64-3	9.14-3	1.16-2	1.53-2	2.04-2	8016.6	4.29-4	3.51-4	2.57-4	1.71-4	1.14-4	9.04-5
70	9195.9	3.55-3	4.06-3	4.96-3	6.45-3	8.76-3	1.20-2	9223.8	2.76-3	3.04-3	3.54-3	4.33-3	5.54-3	7.21-3
74	10524.5	2.54-4	2.11-4	1.59-4	1.12-4	8.48-5	8.02-5	10565.8	4.57-3	5.13-3	6.10-3	7.69-3	1.01-2	1.35-2
78	12006.3	2.38-4	2.03-4	1.62-4	1.29-4	1.16-4	1.27-4	12047.7	4.16-3	4.68-3	5.59-3	7.08-3	9.39-3	1.26-2
82	13638.0	2.07-4	1.77-4	1.41-4	1.11-4	9.85-5	1.08-4	13679.8	3.63-3	4.09-3	4.89-3	6.22-3	8.29-3	1.12-2
87	15914.9	1.70-4	1.44-4	1.13-4	8.55-5	7.20-5	7.58-5	15957.0	3.02-3	3.40-3	4.07-3	5.19-3	6.96-3	9.47-3
92	18494.6	1.39-4	1.17-4	8.93-5	6.38-5	4.87-5	4.76-5	18536.7	2.49-3	2.80-3	3.36-3	4.30-3	5.80-3	8.02-3

A1 - E11 | A1 - E12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	581.2	3.91-3	3.54-3	3.19-3	3.06-3	3.34-3	4.01-3	607.0	1.55-3	1.30-3	9.73-4	6.30-4	3.38-4	1.57-4
26	890.1	1.47-3	1.29-3	1.08-3	9.39-4	9.38-4	1.08-3	916.8	1.12-3	9.40-4	7.05-4	4.61-4	2.64-4	1.52-4
30	1268.8	5.47-4	4.61-4	3.62-4	2.82-4	2.49-4	2.64-4	1291.4	8.51-4	7.26-4	5.68-4	4.16-4	3.16-4	2.94-4
34	1721.8	2.09-4	1.72-4	1.28-4	8.98-5	6.82-5	6.46-5	1732.1	6.84-4	6.05-4	5.12-4	4.44-4	4.42-4	5.18-4
38	2240.7	5.71-4	5.23-4	4.77-4	4.68-4	5.34-4	6.81-4	2253.8	8.47-5	6.88-5	4.97-5	3.22-5	2.08-5	1.65-5
42	2819.5	4.80-4	4.50-4	4.30-4	4.51-4	5.47-4	7.26-4	2849.8	6.83-4	7.53-4	9.10-4	1.22-3	1.75-3	2.49-3
46	3471.1	4.00-4	3.78-4	3.67-4	3.95-4	4.91-4	6.66-4	3512.3	3.05-4	2.56-4	1.90-4	1.20-4	6.39-5	3.05-5
50	4198.7	3.23-4	3.03-4	2.90-4	3.08-4	3.82-4	5.22-4	4247.8	3.58-4	3.57-4	3.74-4	4.38-4	5.78-4	8.04-4
54	5006.2	2.56-4	2.33-4	2.12-4	2.10-4	2.48-4	3.35-4	5061.4	3.51-4	3.69-4	4.19-4	5.33-4	7.44-4	1.07-3
58	5913.8	8.36-4	8.27-4	8.49-4	9.40-4	1.13-3	1.43-3	5958.5	2.98-4	3.15-4	3.61-4	4.66-4	6.59-4	9.59-4
62	6931.2	5.90-4	5.67-4	5.57-4	5.90-4	6.87-4	8.57-4	6945.1	2.40-4	2.51-4	2.84-4	3.63-4	5.15-4	7.54-4
66	8025.7	1.61-4	1.54-4	1.54-4	1.74-4	2.31-4	3.34-4	8057.6	4.43-4	4.15-4	3.93-4	3.98-4	4.47-4	5.46-4
70	9256.6	3.67-4	3.01-4	2.20-4	1.46-4	9.59-5	7.45-5	9299.4	3.49-4	3.22-4	2.96-4	2.91-4	3.21-4	3.87-4
74	10623.6	3.15-4	2.59-4	1.90-4	1.26-4	8.28-5	6.44-5	10668.3	2.79-4	2.53-4	2.27-4	2.16-4	2.30-4	2.73-4
78	12130.3	2.72-4	2.24-4	1.65-4	1.09-4	7.15-5	5.55-5	12176.9	2.28-4	2.05-4	1.80-4	1.66-4	1.73-4	2.01-4
82	13791.7	2.36-4	1.94-4	1.43-4	9.48-5	6.18-5	4.77-5	13840.1	1.89-4	1.68-4	1.46-4	1.32-4	1.34-4	1.55-4
87	16113.4	1.97-4	1.63-4	1.20-4	7.95-5	5.15-5	3.95-5	16164.1	1.52-4	1.35-4	1.16-4	1.02-4	1.02-4	1.17-4
92	18747.8	1.64-4	1.36-4	1.01-4	6.68-5	4.29-5	3.26-5	18800.6	1.23-4	1.09-4	9.30-5	8.16-5	8.06-5	9.19-5

A1 - E13 | A1 - E14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	611.9	1.53-3	1.58-3	1.76-3	2.24-3	3.16-3	4.53-3	615.0	2.67-3	3.59-3	5.37-3	8.59-3	1.38-2	2.07-2
26	923.6	1.63-3	1.86-3	2.35-3	3.29-3	4.91-3	7.16-3	928.6	2.17-3	2.85-3	4.16-3	6.43-3	1.01-2	1.49-2
30	1300.9	1.57-3	1.86-3	2.44-3	3.50-3	5.25-3	7.59-3	1308.5	1.72-3	2.20-3	3.12-3	4.71-3	7.24-3	1.06-2
34	1746.0	1.36-3	1.62-3	2.14-3	3.08-3	4.60-3	6.60-3	1755.9	1.44-3	1.81-3	2.50-3	3.72-3	5.64-3	8.14-3
38	2261.5	1.08-3	1.27-3	1.65-3	2.36-3	3.50-3	5.01-3	2272.0	1.28-3	1.59-3	2.18-3	3.22-3	4.86-3	7.00-3
42	2858.1	1.25-3	1.57-3	2.18-3	3.25-3	4.93-3	7.15-3	2871.5	7.83-5	8.03-5	8.92-5	1.13-4	1.57-4	2.21-4
46	3520.5	1.32-3	1.70-3	2.40-3	3.61-3	5.50-3	8.06-3	3560.5	5.26-4	6.01-4	7.58-4	1.06-3	1.58-3	2.31-3
50	4266.7	9.91-4	1.25-3	1.75-3	2.62-3	3.99-3	5.90-3	4315.1	4.55-4	5.19-4	6.53-4	9.16-4	1.36-3	2.00-3
54	5100.3	7.58-4	9.49-4	1.31-3	1.96-3	2.99-3	4.45-3	5155.8	3.89-4	4.43-4	5.57-4	7.79-4	1.16-3	1.72-3
58	6026.1	5.99-4	7.47-4	1.03-3	1.54-3	2.35-3	3.53-3	6088.2	3.31-4	3.75-4	4.70-4	6.57-4	9.79-4	1.46-3
62	7050.4	4.80-4	5.96-4	8.21-4	1.23-3	1.88-3	2.84-3	7119.2	2.81-4	3.17-4	3.95-4	5.51-4	8.23-4	1.23-3
66	8181.0	3.86-4	4.78-4	6.57-4	9.84-4	1.52-3	2.31-3	8256.4	2.37-4	2.66-4	3.30-4	4.60-4	6.88-4	1.04-3
70	9426.9	3.11-4	3.83-4	5.27-4	7.91-4	1.23-3	1.88-3	9509.1	2.00-4	2.23-4	2.74-4	3.81-4	5.71-4	8.63-4
74	10798.7	2.50-4	3.07-4	4.20-4	6.34-4	9.95-4	1.52-3	10887.8	1.68-4	1.86-4	2.27-4	3.13-4	4.71-4	7.13-4
78	12309.0	2.01-4	2.44-4	3.34-4	5.06-4	8.00-4	1.23-3	12405.2	1.41-4	1.55-4	1.86-4	2.56-4	3.86-4	5.84-4
82	13972.7	1.61-4	1.94-4	2.64-4	4.00-4	6.39-4	9.87-4	14076.4	1.19-4	1.29-4	1.53-4	2.08-4	3.13-4	4.75-4
87	16295.9	1.22-4	1.45-4	1.95-4	2.95-4	4.76-4	7.46-4	16409.3	9.71-5	1.02-4	1.18-4	1.58-4	2.38-4	3.64-4
92	18931.4	9.42-5	1.09-4	1.42-4	2.14-4	3.47-4	5.62-4	19055.1	8.00-5	8.21-5	9.15-5	1.19-4	1.77-4	2.78-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

	A1 – E15							A1 – E16						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	616.3	1.01-3	1.13-3	1.43-3	2.06-3	3.15-3	4.71-3	618.8	1.91-4	1.85-4	1.81-4	1.87-4	2.12-4	2.59-4
26	931.7	7.62-4	8.22-4	9.93-4	1.35-3	2.02-3	2.96-3	937.2	7.36-5	7.03-5	6.73-5	6.78-5	7.17-5	8.30-5
30	1314.5	6.97-4	7.66-4	9.29-4	1.27-3	1.89-3	2.73-3	1326.3	3.10-5	2.97-5	2.85-5	2.83-5	3.03-5	3.44-5
34	1766.8	6.79-4	7.58-4	9.36-4	1.30-3	1.92-3	2.78-3	1790.3	1.47-5	1.42-5	1.37-5	1.39-5	1.51-5	1.73-5
38	2290.1	6.49-4	7.33-4	9.16-4	1.28-3	1.90-3	2.74-3	2333.9	8.10-6	7.93-6	7.90-6	8.32-6	9.49-6	1.13-5
42	2886.9	5.92-4	6.72-4	8.44-4	1.18-3	1.75-3	2.54-3	2962.7	2.00-5	2.14-5	2.49-5	3.25-5	4.63-5	6.62-5
46	3580.4	1.96-5	1.58-5	1.11-5	6.79-6	3.93-6	2.72-6	3670.8	2.02-5	2.15-5	2.53-5	3.42-5	5.09-5	7.55-5
50	4388.9	9.00-6	7.32-6	5.33-6	3.58-6	2.59-6	2.45-6	4473.3	9.21-6	9.64-6	1.11-5	1.48-5	2.21-5	3.31-5
54	5306.4	4.51-6	3.68-6	2.69-6	1.83-6	1.37-6	1.34-6	5379.4	4.43-6	4.55-6	5.13-6	6.69-6	1.00-5	1.51-5
58	6343.4	2.39-6	1.96-6	1.45-6	1.01-6	8.00-7	8.22-7	6398.5	2.23-6	2.26-6	2.48-6	3.16-6	4.77-6	7.17-6
62	7511.5	1.35-6	1.12-6	8.54-7	6.37-7	6.02-7	6.71-7	7542.5	1.15-6	1.14-6	1.22-6	1.51-6	2.31-6	3.41-6
66	8812.1	8.74-7	7.98-7	7.49-7	8.00-7	1.09-6	1.62-6	8837.3	5.35-7	4.66-7	3.93-7	3.52-7	4.08-7	5.55-7
70	10246.8	4.64-7	4.42-7	4.49-7	5.24-7	7.70-7	1.18-6	10313.7	3.55-7	2.88-7	2.04-7	1.22-7	6.15-8	3.23-8
74	11846.7	2.71-7	2.58-7	2.59-7	2.99-7	4.65-7	6.72-7	11978.0	2.17-7	1.76-7	1.26-7	7.65-8	4.14-8	2.33-8
78	13636.1	1.66-7	1.57-7	1.55-7	1.77-7	2.71-7	3.95-7	13851.1	1.31-7	1.07-7	7.72-8	4.79-8	2.73-8	1.74-8
82	15640.1	1.06-7	9.88-8	9.63-8	1.09-7	1.63-7	2.39-7	15961.0	8.00-8	6.57-8	4.77-8	3.01-8	1.79-8	1.23-8
87	18493.1	6.17-8	5.73-8	5.50-8	6.11-8	8.89-8	1.32-7	18983.9	4.35-8	3.60-8	2.64-8	1.71-8	1.06-8	7.91-9
92	21801.8	3.71-8	3.42-8	3.24-8	3.53-8	4.97-8	7.51-8	22513.7	2.39-8	1.99-8	1.48-8	9.82-9	6.36-9	5.10-9

	A1 – E17							A1 – E18						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	644.4	9.38-4	9.20-4	9.61-4	1.16-3	1.59-3	2.29-3	647.5	9.78-4	1.08-3	1.35-3	1.94-3	3.03-3	4.63-3
26	963.9	6.28-4	6.41-4	7.13-4	9.10-4	1.30-3	1.89-3	969.1	6.41-4	7.13-4	8.90-4	1.26-3	1.94-3	2.92-3
30	1351.2	3.87-4	4.10-4	4.75-4	6.30-4	9.19-4	1.33-3	1359.6	3.90-4	4.31-4	5.32-4	7.43-4	1.13-3	1.66-3
34	1810.1	2.11-4	2.28-4	2.71-4	3.67-4	5.41-4	7.84-4	1823.6	2.12-4	2.32-4	2.82-4	3.90-4	5.83-4	8.55-4
38	2345.9	1.00-4	1.09-4	1.31-4	1.79-4	2.66-4	3.87-4	2366.8	1.03-4	1.12-4	1.34-4	1.84-4	2.73-4	3.99-4
42	2964.7	2.86-5	3.06-5	3.65-5	5.00-5	7.54-5	1.12-4	2995.8	4.70-5	5.07-5	6.03-5	8.20-5	1.21-4	1.78-4
46	3685.2	1.61-6	1.49-6	1.35-6	1.25-6	1.27-6	1.31-6	3717.8	2.14-5	2.30-5	2.71-5	3.66-5	5.40-5	8.00-5
50	4507.5	9.55-7	8.91-7	8.20-7	7.65-7	7.86-7	8.00-7	4540.8	1.01-5	1.07-5	1.26-5	1.68-5	2.49-5	3.72-5
54	5439.7	5.62-7	5.27-7	4.88-7	4.59-7	4.83-7	4.91-7	5474.0	4.95-6	5.23-6	6.07-6	8.06-6	1.19-5	1.80-5
58	6492.9	3.34-7	3.14-7	2.91-7	2.75-7	2.99-7	2.99-7	6528.3	2.53-6	2.65-6	3.05-6	4.03-6	5.96-6	9.08-6
62	7679.6	2.01-7	1.89-7	1.76-7	1.67-7	1.93-7	1.83-7	7716.4	1.35-6	1.40-6	1.60-6	2.08-6	3.10-6	4.73-6
66	9015.0	1.23-7	1.16-7	1.08-7	1.02-7	1.05-7	1.14-7	9053.2	7.48-7	7.69-7	8.65-7	1.12-6	1.65-6	2.54-6
70	10516.3	7.62-8	7.17-8	6.68-8	6.33-8	6.50-8	7.10-8	10556.0	4.28-7	4.39-7	4.83-7	6.13-7	9.03-7	1.39-6
74	12204.2	4.77-8	4.50-8	4.20-8	3.98-8	4.53-8	4.50-8	12245.4	2.56-7	2.57-7	2.76-7	3.45-7	5.09-7	7.81-7
78	14103.1	3.02-8	2.85-8	2.66-8	2.53-8	2.81-8	2.87-8	14145.7	1.55-7	1.54-7	1.62-7	1.98-7	2.89-7	4.43-7
82	16241.8	1.94-8	1.83-8	1.71-8	1.62-8	1.77-8	1.85-8	16285.9	9.66-8	9.45-8	9.72-8	1.16-7	1.67-7	2.55-7
87	19306.5	1.12-8	1.06-8	9.88-9	9.40-9	9.99-9	1.07-8	19352.2	5.50-8	5.29-8	5.27-8	6.03-8	8.47-8	1.30-7
92	22886.4	6.57-9	6.20-9	5.77-9	5.48-9	5.69-9	6.25-9	22933.5	3.23-8	3.05-8	2.94-8	3.21-8	4.34-8	6.76-8

	A1 – E19							A1 – F1						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	764.0	1.48-4	1.40-4	1.33-4	1.34-4	1.49-4	1.78-4	494.5	5.37-3	4.68-3	3.76-3	2.78-3	2.02-3	1.70-3
26	1117.7	9.56-5	9.05-5	8.64-5	8.74-5	9.75-5	1.16-4	770.5	3.67-3	3.24-3	2.68-3	2.14-3	1.83-3	1.87-3
30	1542.5	6.20-5	5.88-5	5.63-5	5.71-5	6.37-5	7.56-5	1105.6	2.68-3	2.40-3	2.05-3	1.76-3	1.68-3	1.89-3
34	2042.7	4.03-5	3.82-5	3.66-5	3.72-5	4.15-5	4.92-5	1499.2	2.04-3	1.85-3	1.63-3	1.47-3	1.51-3	1.79-3
38	2623.3	2.61-5	2.47-5	2.37-5	2.41-5	2.70-5	3.20-5	1950.7	1.61-3	1.48-3	1.32-3	1.23-3	1.33-3	1.62-3
42	3290.3	1.68-5	1.59-5	1.53-5	1.56-5	1.74-5	2.07-5	2459.4	1.31-3	1.20-3	1.09-3	1.04-3	1.16-3	1.45-3
46	4050.9	1.08-5	1.02-5	9.82-6	1.00-5	1.12-5	1.34-5	3024.3	1.08-3	1.00-3	9.15-4	8.91-4	1.01-3	1.28-3
50	4913.1	6.94-6	6.57-6	6.29-6	6.41-6	7.18-6	8.66-6	3644.6	9.16-4	8.48-4	7.81-4	7.70-4	8.83-4	1.14-3
54	5886.6	4.45-6	4.22-6	4.03-6	4.11-6	4.61-6	5.59-6	4319.2	7.87-4	7.30-4	6.77-4	6.74-4	7.82-4	1.02-3
58	6982.7	2.87-6	2.71-6	2.59-6	2.64-6	2.96-6	3.61-6	5046.6	6.87-4	6.39-4	5.96-4	6.00-4	7.02-4	9.25-4
62	8214.2	1.85-6	1.75-6	1.67-6	1.70-6	1.91-6	2.34-6	5825.4	6.09-4	5.68-4	5.33-4	5.53-4	6.40-4	8.48-4
66	9596.4	1.20-6	1.14-6	1.08-6	1.10-6	1.24-6	1.52-6	6653.5	5.47-4	5.12-4	4.84-4	5.03-4	5.92-4	7.88-4
70	11147.2	7.84-7	7.41-7	7.07-7	7.17-7	8.09-7	9.95-7	7528.9	4.99-4	4.69-4	4.47-4	4.67-4	5.58-4	7.44-4
74	12887.4	5.15-7	4.87-7	4.64-7	4.70-7	5.30-7	6.54-7	8448.9	4.61-4	4.36-4	4.19-4	4.41-4	5.34-4	7.15-4
78	14842.0	3.40-7	3.21-7	3.06-7	3.10-7	3.50-7	4.33-7	9410.3	4.32-4	4.11-4	3.99-4	4.25-4	5.20-4	6.98-4
82	17040.5	2.26-7	2.13-7	2.03-7	2.05-7	2.32-7	2.88-7	10409.1	4.12-4	3.93-4	3.89-4	4.16-4	5.14-4	6.93-4
87	20186.9	1.36-7	1.29-7	1.22-7	1.23-7	1.40-7	1.75-7	11703.2	3.94-4	3.81-4	3.80-4	4.14-4	5.16-4	7.03-4
92	23858.6	8.24-8	7.79-8	7.40-8	7.47-8	8.49-8	1.08-7	13036.7	3.85-4	3.77-4	3.80-4	4.21-4	5.30-4	7.28-4

	A1 – F2							A1 – F3						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	509.3	5.12-3	6.12-3	8.16-3	1.20-2	1.80-2	2.60-2	550.0	1.93-2	1.54-2	1.07-2	6.20-3	3.02-3	1.37-3
26	792.9	3.17-3	3.78-3	5.03-3	7.59-3	1.11-2	1.60-2	843.1	1.34-2	1.07-2	7.43-3	4.38-3	2.23-3	1.14-3
30	1140.2	2.15-3	2.55-3	3.36-3	4.87-3	7.34-3	1.05-2	1196.9	9.65-3	7.73-3	5.41-3	3.25-3	1.75-3	9.99-4
34	1552.8	1.58-3	1.85-3	2.42-3	3.48-3	5.25-3	7.50-3	1611.4	7.19-3	5.77-3	4.06-3	2.48-3	1.40-3	8.66-4
38	2032.5	1.24-3	1.45-3	1.88-3	2.70-3	4.07-3	5.79-3	2086.6	5.50-3	4.42-3	3.13-3	1.94-3	1.13-3	7.43-4
42	2581.4	1.06-3	1.24-3	1.61-3	2.30-3	3.47-3	4.93-3	2622.6	4.34-3	3.50-3	2.50-3	1.58-3	9.71-4	6.85-4
46	3201.8	1.07-3	1.26-3	1.64-3	2.33-3	3.51-3	4.96-3	3219.7	3.53-3	2.87-3	2.09-3	1.39-3	9.47-4	7.71-4
50	3877.8	2.94-3	2.39-3	1.75-3	1.18-3	8.17-4	6.72-4	3896.4	2.22-3	2.65-3	3.44-3	4.77-3	6.96-3	9.58-3
54	4597.5	2.55-3	2.12-3	1.62-3	1.19-3	9.51-4	9.17-4	4644.3	2.01-2	2.27-2	2.72-2	3.45-2	4.52-2	5.93-2
58	5378.9	2.28-3	1.93-3	1.53-3	1.22-3	1.08-3	1.14-3	5436.7	1.77-2	1.99-2	2.38-2	3.00-2	3.92-2	5.15-2
62	6222.2	2.07-3	1.79-3	1.49-3	1.27-3	1.22-3	1.37-3	6293.0	1.58-2	1.78-2	2.13-2	2.68-2	3.50-2	4.62-2
66	7127.7	1.92-3	1.70-3	1.46-3	1.32-3	1.35-3	1.57-3	7214.1	1.42-2	1.60-2	1.92-2	2.41-2	3.16-2	4.18-2
70	8095.8	1.80-3	1.62-3	1.44-3	1.36-3	1.46-3	1.74-3	8201.0	1.29-2	1.45-2	1.73-2	2.19-2	2.87-2	3.80-2
74	9126.7	1.69-3	1.55-3	1.42-3	1.39-3	1.54-3	1.87-3	9254.5	1.17-2	1.32-2	1.58-2	1.99-2	2.62-2	3.48-2
78	10221.0	1.60-3	1.49-3	1.40-3	1.40-3	1.59-3	1.97-3	10375.5	1.07-2	1.20-2	1.44-2	1.82-2	2.41-2	3.20-2
82	11378.8	1.52-3	1.43-3	1.36-3	1.40-3	1.62-3	2.03-3	11565.0	9.78-3	1.10-2	1.32-2	1.68-2	2.22-2	2.97-2
87	12916.3	1.42-3	1.35-3	1.32-3	1.39-3	1.63-3	2.07-3	13149.7	8.80-3	9.94-3	1.19-2	1.52-2	2.02-2	2.72-2
92	14554.6	1.33-3	1.28-3	1.27-3	1.35-3	1.62-3	2.09-3	14845.0	7.96-3	9.00-3	1.08-2	1.38-2	1.84-2	2.51-2

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - F4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	556.1	2.43-2	2 55-2	2.82-2	3.36-2	4.25-2	5.42-2
26	852.6	3.60-2	3 97-2	4.65-2	5.76-2	7.42-2	9.52-2
30	1210.0	3.70-2	4.13-2	4.88-2	6.09-2	7.85-2	1.00-1
34	1628.4	3 40-2	3.81-2	4.52-2	5.65-2	7.30-2	9.29-2
38	2107.8	3.04-2	3.41-2	4.05-2	5.06-2	6.53-2	8.33-2
42	2648.8	2.68-2	3.01-2	3.58-2	4.48-2	5.77-2	7.40-2
46	3251.8	2 35-2	2.64-2	3.13-2	3.92-2	5.05-2	6.51-2
50	3917.6	1 95-2	2.18-2	2 58-2	3.21-2	4.11-2	5.32-2
54	4663.9	9.07-3	1.01-2	1.21-2	1.54-2	2.06-2	2.73-2
58	5460.8	1.43-2	1.59-2	1.87-2	2.33-2	3.03-2	3.98-2
62	6320.0	1.26-2	1 40-2	1.64-2	2.05-2	2.66-2	3.51-2
66	7244.1	1 10-2	1.22-2	1.43-2	1.78-2	2.32-2	3.06-2
70	8234.2	9.58-3	1.06-2	1.25-2	1.55-2	2.03-2	2.68-2
74	9290.9	8.39-3	9.29-3	1.09-2	1.36-2	1.78-2	2.36-2
78	10415.4	7.38-3	8.17-3	9.61-3	1.20-2	1.58-2	2.09-2
82	11608.5	6.52-3	7 22-3	8.49-3	1.06-2	1.40-2	1.86-2
87	13197.9	5.62-3	6.23-3	7.33-3	9.18-3	1.21-2	1.63-2
92	14898.4	4.88-3	5.41-3	6.36-3	8.00-3	1.06-2	1.45-2

A1 - F5

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
557.5	1.67-2	1.57-2	1.50-2	1.55-2	1.78-2	2.16-2
855.4	7.09-3	5.71-3	4.05-3	2.56-3	1.58-3	1.15-3
1215.6	1.41-2	1.43-2	1.51-2	1.73-2	2.13-2	2.67-2
1636.9	2.38-2	2.58-2	2.95-2	3.60-2	4.59-2	5.83-2
2119.0	2.68-2	2.95-2	3.43-2	4.23-2	5.43-2	6.93-2
2662.5	2.56-2	2.83-2	3.31-2	4.10-2	5.27-2	6.76-2
3267.9	2.30-2	2.55-2	2.99-2	3.71-2	4.76-2	6.14-2
3936.0	2.03-2	2.25-2	2.63-2	3.26-2	4.18-2	5.43-2
4674.0	7.82-3	8.44-3	9.50-3	1.12-2	1.34-2	1.71-2
5526.0	5.25-4	5.04-4	4.84-4	4.82-4	4.65-4	6.10-4
6466.9	3.25-4	3.14-4	3.09-4	3.32-4	3.96-4	5.48-4
7499.4	2.64-4	2.57-4	2.61-4	2.93-4	3.67-4	5.32-4
8629.8	2.27-4	2.23-4	2.29-4	2.64-4	3.43-4	4.94-4
9865.0	2 00-4	1.97-4	2.03-4	2.36-4	3.15-4	4.49-4
11213.7	1.79-4	1.76-4	1.82-4	2.12-4	2.84-4	4.04-4
12685.9	1.61-4	1.59-4	1.64-4	1.90-4	2.54-4	3.63-4
14718.2	1.44-4	1.41-4	1 45-4	1.67-4	2.22-4	3.19-4
16991.3	1.30-4	1.27-4	1.29-4	1.47-4	1.95-4	2.83-4

A1 - F6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	559.1	1.14-2	1.18-2	1.29-2	1.51-2	1.87-2	2.32-2
26	859.3	7.08-3	7.10-3	7.43-3	8.35-3	1.01-2	1.24-2
30	1225.1	6.20-3	6.35-3	6.82-3	7.86-3	9.65-3	1.20-2
34	1658.5	1.00-2	1.09-2	1.26-2	1.55-2	1.98-2	2.52-2
38	2161.5	1.41-2	1.57-2	1.85-2	2.31-2	2.98-2	3.82-2
42	2737.0	1 14-2	1.26-2	1.48-2	1.84-2	2.38-2	3.06-2
46	3388.8	8.80-3	9.72-3	1.14-2	1.41-2	1.82-2	2.37-2
50	4121.1	7.00-3	7.71-3	9.00-3	1.12-2	1.44-2	1.89-2
54	4938.4	5.75-3	6.33-3	7.38-3	9.18-3	1.19-2	1.56-2
58	5846.2	4.94-3	5.44-3	6.36-3	7.92-3	1.03-2	1.37-2
62	6850.3	4.56-3	5.05-3	5.95-3	7.48-3	9.82-3	1.31-2
66	7944.8	5.37-3	6.21-3	7.69-3	1.02-2	1.40-2	1.93-2
70	9122.3	2.18-3	2.56-3	3.24-3	4.40-3	6.22-3	8.80-3
74	10405.4	1 42-3	1 66-3	2.12-3	2.90-3	4.15-3	5.92-3
78	11805.6	1.09-3	1.27-3	1.62-3	2.23-3	3.21-3	4.60-3
82	13334.0	8.97-4	1.05-3	1.33-3	1.83-3	2.65-3	3.81-3
87	15445.4	7.41-4	8.61-4	1.09-3	1.50-3	2.17-3	3.15-3
92	17810.2	6.32-4	7.31-4	9.20-4	1.26-3	1.83-3	2.70-3

A1 - F7

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
561.7	6.42-2	7.26-2	8.74-2	1.11-1	1.47-1	1.91-1
862.3	4.76-2	5.36-2	6.41-2	8.09-2	1.06-1	1.37-1
1227.5	3.51-2	3.94-2	4.69-2	5.89-2	7.65-2	9.84-2
1660.1	1.77-2	1.95-2	2.29-2	2.83-2	3.65-2	4.66-2
2163.9	4.64-3	4.75-3	5.11-3	5.90-3	7.28-3	9.11-3
2741.9	2.12-3	2.01-3	1.95-3	2.03-3	2.31-3	2.77-3
3397.4	1.47-3	1.36-3	1.26-3	1.25-3	1.36-3	1.60-3
4134.7	1.23-3	1.15-3	1.08-3	1.09-3	1.21-3	1.44-3
4958.7	2.29-3	2.42-3	2.70-3	3.23-3	4.08-3	5.28-3
5868.9	1.28-2	1.45-2	1.75-2	2.23-2	2.95-2	3.93-2
6867.1	9.00-3	1.03-2	1.25-2	1.62-2	2.18-2	2.95-2
7963.9	4.97-4	4.25-4	3.40-4	2.64-4	2.19-4	2.12-4
9184.6	1.81-3	1.92-3	2.14-3	2.56-3	3.26-3	4.28-3
10530.5	1.80-3	1.94-3	2.20-3	2.67-3	3.45-3	4.56-3
12012.0	1.63-3	1.76-3	2.01-3	2.46-3	3.19-3	4.25-3
13643.4	1.45-3	1.56-3	1.79-3	2.19-3	2.87-3	3.83-3
15919.8	1.23-3	1.33-3	1.53-3	1.88-3	2.48-3	3.34-3
18499.1	1.05-3	1.14-3	1.31-3	1.61-3	2.13-3	?.93-3

A1 - F8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	568.2	1.49-2	1.48-2	1.53-2	1.72-2	2.12-2	2.68-2
26	869.3	1.28-2	1.29-2	1.38-2	1.58-2	1.96-2	2.48-2
30	1235.7	8.57-3	8.54-3	8.84-3	9.88-3	1.20-2	1.50-2
34	1670.1	5.49-3	5.28-3	5.22-3	5.55-3	6.52-3	8.01-3
38	2175.1	4.08-3	3.88-3	3.75-3	3.91-3	4.51-3	5.51-3
42	2753.8	4.40-3	4.39-3	4.56-3	5.11-3	6.19-3	7.77-3
46	3409.1	2.12-2	2.39-2	2.85-2	3.60-2	4.69-2	6.10-2
50	4142.8	1.94-2	2.20-2	2.64-2	3.34-2	4.37-2	5.74-2
54	4961.3	1.45-2	1 63-2	1.95-2	2.48-2	3.25-2	4.30-2
58	5875.9	7.99-4	7.30-4	6.66-4	6.46-4	6.97-4	8.23-4
62	6889.8	1.37-3	1.42-3	1.51-3	1.67-3	1.93-3	2.31-3
66	7992.0	6.90-3	7.68-3	9.03-3	1.12-2	1.45-2	1.91-2
70	9214.0	6.83-3	7.64-3	9.07-3	1.14-2	1.49-2	1.98-2
˙4	10560.3	5.98-3	6.71-3	7.98-3	1.01-2	1.33-2	1.77-2
78	12042.2	5.14-3	5.77-3	6.87-3	8.69-3	1.15-2	1.54-2
82	13673.9	4.39-3	4.93-3	5.88-3	7.45-3	9.92-3	1.34-2
87	15950.5	3.59-3	4.02-3	4.80-3	6.10-3	8.17-3	1.11-2
92	18529.5	2.91 3	3.26-3	3.89-3	4.97-3	6.69-3	9.25-3

A1 - F9

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
570.9	1.84-1	2.13-1	2.61-1	3.37-1	4.46-1	5.83-1
873.4	1.35-1	1.55-1	1.89-1	2.42-1	3.18-1	4.14-1
1240.6	9.13-2	1.04-1	1.27-1	1.62-1	2.12-1	2.73-1
1674.9	6.12-2	6.97-2	8.44-2	1.07-1	1.40-1	1.80-1
2179.1	4.25-2	4.84-2	5.83-2	7.40-2	9.65-2	1.24-1
2756.2	2.99-2	3.40-2	4.08-2	5.18-2	6.75-2	8.74-2
3410.5	5.17-3	5.48-3	6.14-3	7.37-3	9.35-3	1.20-2
4148.3	1.32-3	1.10-3	8.31-4	6.03-4	4.77-4	4.65-4
4973.0	1.05-3	8.51-4	6.08-4	3.85-4	2.34-4	1.68-4
5890.2	8.89-4	7.18-4	5.10-4	3.17-4	1.84-4	1.21-4
6892.3	7.98-4	7.55-4	7.19-4	7.20-4	7.81-4	9.07-4
8015.6	4.62-4	4.03-4	3.38-4	2.89-4	2.73-4	2.89-4
9255.6	3.89-4	3.40-4	2.86-4	2.46-4	2.33-4	2.48-4
10622.7	3.31-4	2.90-4	2.45-4	2.12-4	2.03-4	2.18-4
12129.7	2.82-4	2.48-4	2.11-4	1.84-4	1.78-4	1.94-4
13791.4	2.40-4	2.12-4	1.82-4	1.60-4	1.57-4	1.73-4
16113.4	1.97-4	1.75-4	1.51-4	1.35-4	1.34-4	1.51-4
18748.2	1.60-4	1.43-4	1.25-4	1.13-4	1.15-4	1.32-4

A1 - F10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	579.9	2.41-2	2.64-2	3.08-2	3.03-2	4.97-2	6.45-2
26	887.3	8.36-3	9.01-3	1.03-2	1.26-2	1.61-2	2.08-2
30	1264.8	2.24-3	2.36-3	2.61-3	3.10-3	3.91-3	4.96-3
34	1717.6	6.12-4	6.23-4	6.63-4	7.59-4	9.31-4	1.16-3
38	2244.1	1.24-3	1.42-3	1.81-3	2.56-3	3.81-3	5.49-3
42	2822.9	1.04-3	1.20-3	1.54-3	2.18-3	3.26-3	4.72-3
46	3474.6	8.46-4	9.76-4	1.25-3	1.78-3	2.66-3	3.89-3
50	4202.3	6.53-4	7.48-4	9.52-4	1.35-3	2.02-3	2.99-3
54	5009.8	4.57-4	5.08-4	6.30-4	8.82-4	1.32-3	1.98-3
58	5902.0	3.02-4	3.02-4	3.26-4	4.04-4	5.72-4	8.44-4
62	6906.9	7.59-4	6.14-4	4.37-4	2.72-4	1.58-4	1.04-4
66	8030.8	6.53-4	5.29-4	3.77-4	2.35-4	1.36-4	8.84-5
70	9271.0	5.64-4	4.57-4	3.27-4	2.03-4	1.17-4	7.54-5
74	10638.3	4.89-4	3.97-4	2.84-4	1.76-4	1.01-4	6.42-5
78	12145.2	4.25-4	3.46-4	2.47-4	1.54-4	8.69-5	5.43-5
82	13806.8	3.70-4	3.02-4	2.16-4	1.34-4	7.48-5	4.56-5
87	16128.5	3.12-4	2.55-4	1.83-4	1.13-4	6.18-5	3.61-5
92	1876..9	2.63-4	2.15-4	1.55-4	9.50-5	5.08-5	2.80-5

A1 - F11

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
610.4	2.55-3	2.47-3	2.53-3	2.97-3	3.97-3	5.61-3
920.5	2.07-3	2.17-3	2.48-3	3.24-3	4.67-3	6.78-3
1295.0	1.74-3	1.91-3	2.33-3	3.19-3	4.70-3	6.79-3
1735.6	1.48-3	1.67-3	2.10-3	2.93-3	4.35-3	6.26-3
2250.5	1.92-4	1.90-4	1.96-4	2.17-4	2.60-4	3.21-4
2854.6	1.25-3	1.50-3	1.99-3	2.90-3	4.38-3	6.37-3
3521.5	1.05-3	1.26-3	1.66-3	2.42-3	3.64-3	5.33-3
4269.7	8.82-4	1.05-3	1.39-3	2.02-3	3.03-3	4.48-3
5104.2	7.39-4	8.79-4	1.16-3	1.68-3	2.53-3	3.76-3
6030.5	6.18-4	7.33-4	9.64-4	1.40-3	2.11-3	3.16-3
7055.4	5.15-4	6.09-4	7.99-4	1.16-3	1.75-3	2.64-3
8186.6	4.28-4	5.03-4	6.59-4	9.54-4	1.45-3	2.20-3
9433.0	3.54-4	4.14-4	5.40-4	7.82-4	1.20-3	1.82-3
10805.3	2.93-4	3.40-4	4.41-4	6.38-4	9.82-4	1.50-3
12316.1	2.42-4	2.78-4	3.57-4	5.16-4	7.99-4	1.22-3
13980.3	2.00-4	2.27-4	2.88-4	4.14-4	6.44-4	9.87-4
16304.2	1.58-4	1.76-4	2.18-4	3.10-4	4.84-4	7.51-4
18940.3	1.27-4	1.37-4	1.64-4	2.29-4	3.57-4	5.69-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leq Z \leq 92$

See page 31 for Explanation of Tables

A1 – F12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	613.4	3.26-3	3.90-3	5.32-3	8.13-3	1.29-2	1.95-2
26	925.3	2.64-3	3.20-3	4.37-3	6.57-3	1.03-2	1.53-2
30	1303.0	2.16-3	2.61-3	3.54-3	5.25-3	8.09-3	1.19-2
34	1748.7	1.79-3	2.15-3	2.89-3	4.26-3	6.48-3	9.43-3
38	2264.9	1.49-3	1.79-3	2.39-3	3.50-3	5.29-3	7.68-3
42	2869.3	5.14-5	4.51-5	3.79-5	3.19-5	2.88-5	2.87-5
46	3557.7	1.07-3	1.30-3	1.76-3	2.59-3	3.92-3	5.77-3
50	4311.8	9.40-4	1.14-3	1.54-3	2.26-3	3.42-3	5.07-3
54	5151.9	7.98-4	9.67-4	1.30-3	1.91-3	2.90-3	4.33-3
58	6083.8	6.71-4	8.10-4	1.09-3	1.60-3	2.43-3	3.66-3
62	7114.1	5.60-4	6.75-4	9.04-4	1.33-3	2.03-3	3.07-3
66	8250.8	4.65-4	5.58-4	7.46-4	1.10-3	1.69-3	2.57-3
70	9502.8	3.84-4	4.59-4	6.12-4	9.02-4	1.40-3	2.13-3
74	10880.9	3.16-4	3.75-4	4.98-4	7.35-4	1.15-3	1.75-3
78	12397.6	2.60-4	3.05-4	4.03-4	5.95-4	9.32-4	1.43-3
82	14068.1	2.13-4	2.47-4	3.23-4	4.77-4	7.52-4	1.16-3
87	16400.2	1.67-4	1.90-4	2.43-4	3.57-4	5.66-4	8.83-4
92	19045.0	1.32-4	1.46-4	1.82-4	2.62-4	4.17-4	6.72-4

A1 – F13

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
615.8	1.83-3	2.36-3	3.43-3	5.50-3	8.91-3	1.36-2
931.0	1.61-3	2.03-3	2.87-3	4.42-3	6.98-3	1.05-2
1313.8	1.55-3	1.92-3	2.67-3	4.02-3	6.24-3	9.19-3
1765.8	1.51-3	1.86-3	2.55-3	3.81-3	5.83-3	8.50-3
2288.7	1.43-3	1.75-3	2.38-3	3.52-3	5.36-3	7.80-3
2885.2	1.29-3	1.58-3	2.14-3	3.15-3	4.77-3	6.95-3
3581.8	6.66-5	7.62-5	9.19-5	1.21-4	1.69-4	2.35-4
4394.8	2.04-5	2.14-5	2.38-5	2.92-5	3.87-5	5.24-5
5318.6	9.10-6	9.34-6	1.02-5	1.22-5	1.58-5	2.14-5
6364.2	4.51-6	4.59-6	4.93-6	5.84-6	7.56-6	1.02-5
7544.5	2.38-6	2.41-6	2.57-6	3.03-6	3.91-6	5.31-6
8874.6	1.31-6	1.33-6	1.41-6	1.66-6	2.17-6	2.92-6
10372.1	7.48-7	7.56-7	8.06-7	9.47-7	1.24-6	1.68-6
12057.8	4.38-7	4.43-7	4.73-7	5.57-7	7.29-7	9.99-7
13956.0	2.62-7	2.66-7	2.84-7	3.36-7	4.43-7	6.10-7
16095.9	1.59-7	1.62-7	1.74-7	2.07-7	2.74-7	3.81-7
19164.3	8.69-8	8.87-8	9.58-8	1.14-7	1.54-7	2.17-7
22749.5	4.80-8	4.91-8	5.33-8	6.43-8	8.72-8	1.26-7

A1 – F14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	645.6	1.87-3	2.19-3	2.90-3	4.35-3	6.85-3	1.04-2
26	966.8	1.34-3	1.58-3	2.11-3	3.11-3	4.83-3	7.23-3
30	1357.1	8.54-4	1.02-3	1.35-3	1.98-3	3.04-3	4.47-3
34	1820.9	4.75-4	5.68-4	7.52-4	1.10-3	1.66-3	2.42-3
38	2364.2	2.33-4	2.78-4	3.67-4	5.31-4	8.02-4	1.17-3
42	2993.3	1.07-4	1.27-4	1.67-4	2.40-4	3.61-4	5.28-4
46	3715.3	4.86-5	5.72-5	7.47-5	1.07-4	1.61-4	2.37-4
50	4538.2	2.25-5	2.64-5	3.41-5	4.87-5	7.34-5	1.09-4
54	5471.4	1.08-5	1.25-5	1.61-5	2.29-5	3.45-5	5.18-5
58	6525.6	5.33-6	6.14-6	7.77-6	1.11-5	1.67-5	2.54-5
62	7713.6	2.72-6	3.10-6	3.86-6	5.48-6	8.31-6	1.28-5
66	9050.1	1.43-6	1.61-6	1.96-6	2.77-6	4.25-6	6.56-6
70	10552.7	7.69-7	8.18-7	1.01-6	1.43-6	2.20-6	3.41-6
74	12241.8	3.95-7	4.32-7	5.28-7	7.41-7	1.14-6	1.79-6
78	14141.8	2.18-7	2.34-7	2.79-7	3.87-7	6.01-7	9.46-7
82	16281.6	1.24-7	1.29-7	1.49-7	2.03-7	3.15-7	4.99-7
87	19347.3	6.40-8	6.41-8	7.00-8	9.11-8	1.40-7	2.24-7
92	22927.8	3.50-8	3.36-8	3.42-8	4.12-8	6.14-8	1.01-7

A1 – F15

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
764.1	5.40-4	5.74-4	6.44-4	7.77-4	9.95-4	1.29-3
1118.2	3.67-4	3.90-4	4.38-4	5.25-4	6.68-4	8.62-4
1543.6	2.46-4	2.62-4	2.94-4	3.51-4	4.44-4	5.67-4
2044.9	1.63-4	1.74-4	1.95-4	2.33-4	2.93-4	3.72-4
2627.3	1.07-4	1.14-4	1.28-4	1.53-4	1.92-4	2.44-4
3296.9	6.98-5	7.43-5	8.33-5	9.95-5	1.25-4	1.60-4
4061	4.52-5	4.81-5	5.39-5	6.44-5	8.11-5	1.04-4
492[illegible] 3	2.91-5	3.10-5	3.48-5	4.16-5	5.25-5	6.79-5
590[illegible].5	1.88-5	2.00-5	2.24-5	2.69-5	3.40-5	4.43-5
701[illegible].2	1.21-5	1.29-5	1.45-5	1.74-5	2.21-5	2.90-5
8255.7	7.86-6	8.38-6	9.42-6	1.13-5	1.45-5	1.90-5
9651.7	5.12-6	5.46-6	6.15-6	7.42-6	9.52-6	1.26-5
11219.5	3.35-6	3.58-6	4.04-6	4.89-6	6.30-6	8.38-6
12980.4	2.21-6	2.36-6	2.67-6	3.25-6	4.21-6	5.63-6
14959.9	1.46-6	1.57-6	1.78-6	2.17-6	2.83-6	3.80-6
17188.3	9.72-7	1.04-6	1.19-6	1.45-6	1.91-6	2.59-6
20379.7	5.86-7	6.31-7	7.20-7	8.88-7	1.18-6	1.62-6
24106.3	3.54-7	3.81-7	4.37-7	5.44-7	7.31-7	1.02-6

A1 – G1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	549.9	2.70-2	2.15-2	1.49-2	8.56-3	4.04-3	1.68-3
26	843.1	1.76-2	1.40-2	9.62-3	5.49-3	2.57-3	1.06-3
30	1197.3	1.21-2	9.60-3	6.56-3	3.73-3	1.74-3	7.19-4
34	1612.4	8.64-3	6.85-3	4.68-3	2.68-3	1.29-3	5.89-4
38	2088.5	6.26-3	4.99-3	3.48-3	2.10-3	1.17-3	7.21-4
42	2625.3	4.49-3	3.67-3	2.70-3	1.86-3	1.33-3	1.13-3
46	3222.7	3.35-3	2.81-3	2.20-3	1.70-3	1.44-3	1.39-3
50	3880.9	2.67-3	2.28-3	1.85-3	1.52-3	1.37-3	1.39-3
54	4600.4	2.22-3	1.91-3	1.58-3	1.34-3	1.25-3	1.30-3
58	5381.4	1.89-3	1.64-3	1.37-3	1.18-3	1.12-3	1.18-3
62	6224.3	1.64-3	1.42-3	1.20-3	1.04-3	1.00-3	1.07-3
66	7129.4	1.44-3	1.25-3	1.06-3	9.27-4	9.02-4	9.73-4
70	8097.1	1.27-3	1.11-3	9.42-4	8.30-4	8.14-4	8.86-4
74	9127.5	1.14-3	9.94-4	8.45-4	7.48-4	7.39-4	8.11-4
78	10221.2	1.02-3	8.96-4	7.63-4	6.77-4	6.74-4	7.46-4
82	11378.5	9.29-4	8.14-4	6.94-4	6.17-4	6.18-4	6.90-4
87	12915.2	8.30-4	7.27-4	6.21-4	5.54-4	5.58-4	6.31-4
92	14552.7	7.48-4	6.55-4	5.60-4	5.01-4	5.08-4	5.81-4

A1 – G2

ΔE	E'=.008	E'=.04	E'=.10	E'=.	E'=.41	E'=.75
553.8	1.32-2	1.13-2	9.14-3	7.49-3	6.76-3	6.74-3
847.6	9.49-3	8.27-3	6.97-3	6.07-3	5.78-3	5.93-3
1201.9	7.12-3	6.25-3	5.35-3	4.74-3	4.60-3	4.77-3
1616.7	5.58-3	4.90-3	4.19-3	3.71-3	3.60-3	3.74-3
2092.5	4.65-3	4.03-3	3.36-3	2.88-3	2.70-3	2.75-3
2629.9	4.14-3	3.48-3	2.73-3	2.12-3	1.80-3	1.73-3
3229.7	3.65-3	2.99-3	2.22-3	1.56-3	1.15-3	1.00-3
3892.2	3.12-3	2.52-3	1.82-3	1.20-3	8.09-4	6.45-4
4617.9	2.66-3	2.14-3	1.52-3	9.72-4	6.17-4	4.63-4
5407.3	2.28-3	1.83-3	1.29-3	8.08-4	4.95-4	3.58-4
6261.0	1.97-3	1.57-3	1.11-3	6.86-4	4.12-4	2.90-4
7179.6	1.72-3	1.37-3	9.60-4	5.92-4	3.50-4	2.43-4
8164.0	1.51-3	1.21-3	8.42-4	5.17-4	3.03-4	2.09-4
9215.1	1.34-3	1.07-3	7.45-4	4.56-4	2.66-4	1.82-4
10333.6	1.20-3	9.53-4	6.64-4	4.05-4	2.36-4	1.61-4
11520.5	1.08-3	8.56-4	5.96-4	3.63-4	2.11-4	1.45-4
13102.0	9.48-4	7.54-4	5.25-4	3.20-4	1.86-4	1.28-4
14794.3	8.41-4	6.70-4	4.66-4	2.84-4	1.66-4	1.15-4

A1 – G3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	557.3	8.83-3	7.53-3	6.08-3	4.94-3	4.40-3	4.35-3
26	856.7	6.43-3	5.32-3	4.04-3	2.94-3	2.28-3	2.05-3
30	1221.8	4.94-3	4.03-3	2.97-3	2.03-3	1.43-3	1.18-3
34	1654.7	3.88-3	3.15-3	2.29-3	1.51-3	1.00-3	7.79-4
38	2158.2	3.10-3	2.51-3	1.81-3	1.17-3	7.51-4	5.59-4
42	2735.5	2.51-3	2.03-3	1.46-3	9.34-4	5.85-4	4.23-4
46	3390.2	2.06-3	1.66-3	1.19-3	7.58-4	4.67-4	3.32-4
50	4126.7	1.70-3	1.37-3	9.81-4	6.23-4	3.81-4	2.68-4
54	4946.9	9.87-4	7.80-4	5.29-4	2.96-4	1.36-4	5.62-5
58	5855.0	8.38-4	6.63-4	4.50-4	2.53-4	1.16-4	4.72-5
62	6860.0	7.15-4	5.67-4	3.86-4	2.17-4	9.97-5	4.05-5
66	7969.4	6.15-4	4.89-4	3.34-4	1.89-4	8.68-5	3.53-5
70	9191.8	5.32-4	4.24-4	2.91-4	1.65-4	7.62-5	3.10-5
74	10537.5	4.63-4	3.70-4	2.55-4	1.45-4	6.74-5	2.74-5
78	12018.5	4.04-4	3.24-4	2.24-4	1.28-4	5.99-5	2.45-5
82	13649.1	3.54-4	2.85-4	1.98-4	1.14-4	5.36-5	2.20-5
87	15924.4	3.01-4	2.43-4	1.70-4	9.89-5	4.68-5	1.93-5
92	18502.1	2.56-4	2.08-4	1.47-4	8.60-5	4.12-5	1.72-5

A1 – G4

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
565.2	9.81-3	7.83-3	5.42-3	3.20-3	1.68-3	9.38-4
865.9	6.13-3	4.86-3	3.32-3	1.90-3	9.28-4	4.51-4
1231.8	4.16-3	3.28-3	2.23-3	1.25-3	5.89-4	2.62-4
1665.2	3.02-3	2.38-3	1.61-3	8.97-4	4.14-4	1.77-4
2168.4	2.30-3	1.81-3	1.22-3	6.79-4	3.11-4	1.30-4
2744.4	1.81-3	1.42-3	9.59-4	5.34-4	2.44-4	1.01-4
3396.7	1.46-3	1.15-3	7.76-4	4.32-4	1.97-4	8.04-5
4129.3	1.21-3	9.51-4	6.43-4	3.59-4	1.63-4	6.57-5
4949.9	1.44-3	1.16-3	8.31-4	5.25-4	3.17-4	2.19-4
5865.8	1.21-3	9.80-4	7.01-4	4.42-4	2.66-4	1.83-4
6881.1	1.03-3	8.33-4	5.97-4	3.76-4	2.25-4	1.54-4
8003.7	8.79-4	7.14-4	5.12-4	3.23-4	1.92-4	1.31-4
9242.7	7.56-4	6.14-4	4.41-4	2.78-4	1.65-4	1.12-4
10608.9	6.52-4	5.31-4	3.82-4	2.41-4	1.43-4	9.60-5
12114.9	5.64-4	4.60-4	3.31-4	2.09-4	1.23-4	8.27-5
13775.5	4.89-4	3.99-4	2.89-4	1.82-4	1.07-4	7.14-5
16096.3	4.08-4	3.35-4	2.43-4	1.54-4	8.99-5	5.94-5
18729.9	3.41-4	2.80-4	2.04-4	1.29-4	7.55-5	4.94-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - G5

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	568.8	7.23-3	6.01-3	4.65-3	3.57-3	3.04-3	2.95-3
26	870.6	4.83-3	4.06-3	3.22-3	2.57-3	2.26-3	2.24-3
30	1237.9	3.50-3	2.97-3	2.39-3	1.95-3	1.75-3	1.75-3
34	1672.9	2.67-3	2.28-3	1.86-3	1.54-3	1.40-3	1.40-3
38	2178.5	2.11-3	1.81-3	1.48-3	1.24-3	1.13-3	1.14-3
42	2757.8	1.70-3	1.46-3	1.21-3	1.01-3	9.29-4	9.42-4
46	3414.5	1.39-3	1.20-3	9.94-4	8.36-4	7.72-4	7.88-4
50	4152.8	1.15-3	9.99-4	8.28-4	6.99-4	6.48-4	6.66-4
54	4978.0	9.67-4	8.38-4	6.97-4	5.90-4	5.50-4	5.69-4
58	5895.6	8.15-4	7.08-4	5.90-4	5.02-4	4.70-4	4.90-4
62	6912.6	6.92-4	6.03-4	5.04-4	4.30-4	4.04-4	4.25-4
66	8036.8	5.91-4	5.16-4	4.32-4	3.70-4	3.50-4	3.70-4
70	9277.3	5.07-4	4.43-4	3.72-4	3.20-4	3.04-4	3.25-4
74	10644.9	4.36-4	3.82-4	3.22-4	2.78-4	2.66-4	2.86-4
78	12152.1	3.75-4	3.29-4	2.79-4	2.41-4	2.32-4	2.52-4
82	13813.9	3.24-4	2.85-4	2.42-4	2.10-4	2.04-4	2.23-4
87	16135.8	2.69-4	2.37-4	2.02-4	1.77-4	1.73-4	1.92-4
92	18770.2	2.22-4	1.97-4	1.69-4	1.49-4	1.47-4	1.65-4

A1 - G6

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
610.4	3.05-3	2.61-3	2.02-3	1.34-3	7.41-4	3.54-4
921.5	2.09-3	1.78-3	1.36-3	8.91-4	4.84-4	2.27-4
1298.4	1.52-3	1.29-3	9.81-4	6.36-4	3.40-4	1.58-4
1743.3	1.16-3	9.81-4	7.41-4	4.76-4	2.53-4	1.16-4
2258.7	9.10-4	7.70-4	5.79-4	3.70-4	1.95-4	8.94-5
2847.6	7.33-4	6.19-4	4.64-4	2.96-4	1.56-4	7.11-5
3513.7	6.02-4	5.08-4	3.81-4	2.42-4	1.27-4	5.80-5
4261.0	5.03-4	4.24-4	3.18-4	2.02-4	1.06-4	4.84-5
5094.6	4.26-4	3.59-4	2.69-4	1.71-4	9.01-5	4.11-5
6020.1	3.64-4	3.08-4	2.31-4	1.47-4	7.75-5	3.54-5
7044.1	3.15-4	2.66-4	2.00-4	1.28-4	6.76-5	3.09-5
8174.2	2.75-4	2.32-4	1.75-4	1.12-4	5.96-5	2.74-5
9419.6	2.41-4	2.05-4	1.55-4	9.95-5	5.30-5	2.45-5
10790.9	2.14-4	1.82-4	1.38-4	8.91-5	4.77-5	2.21-5
12300.5	1.91-4	1.62-4	1.24-4	8.04-5	4.32-5	2.02-5
13963.6	1.71-4	1.46-4	1.12-4	7.31-5	3.96-5	1.85-5
16285.8	1.51-4	1.30-4	9.95-5	6.56-5	3.58-5	1.69-5
18920.2	1.35-4	1.16-4	8.96-5	5.95-5	3.28-5	1.56-5

A1 - H1

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	552.5	1.82-2	1.43-2	9.66-3	5.45-3	2.66-3	1.34-3
26	846.1	1.27-2	1.00-2	6.83-3	3.99-3	2.12-3	1.26-3
30	1200.5	9.29-3	7.36-3	5.09-3	3.07-3	1.77-3	1.18-3
34	1615.8	7.06-3	5.62-3	3.93-3	2.43-3	1.48-3	1.06-3
38	2092.3	5.53-3	4.41-3	3.11-3	1.97-3	1.25-3	9.38-4
42	2630.5	4.43-3	3.55-3	2.51-3	1.62-3	1.05-3	8.21-4
46	3230.6	3.63-3	2.91-3	2.07-3	1.35-3	8.98-4	7.18-4
50	3893.3	3.03-3	2.43-3	1.74-3	1.14-3	7.73-4	6.30-4
54	4619.0	2.56-3	2.06-3	1.48-3	9.75-4	6.70-4	5.57-4
58	5408.3	2.19-3	1.76-3	1.27-3	8.43-4	5.87-4	4.95-4
62	6261.9	1.90-3	1.53-3	1.10-3	7.36-4	5.18-4	4.43-4
66	7180.5	1.66-3	1.34-3	9.65-4	6.48-4	4.60-4	3.99-4
70	8164.8	1.46-3	1.18-3	8.53-4	5.75-4	4.12-4	3.62-4
74	9215.7	1.30-3	1.05-3	7.59-4	5.14-4	3.71-4	3.30-4
78	10334.1	1.16-3	9.37-4	6.80-4	4.62-4	3.37-4	3.03-4
82	11520.9	1.04-3	8.44-4	6.13-4	4.18-4	3.07-4	2.79-4
87	13102.2	9.22-4	7.45-4	5.42-4	3.71-4	2.76-4	2.55-4
92	14794.1	8.20-4	6.63-4	4.83-4	3.32-4	2.49-4	2.35-4

A1 - H2

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
565.3	1.08-2	9.71-3	8.60-3	7.91-3	7.86-3	8.24-3
866.2	6.88-3	6.22-3	5.56-3	5.19-3	5.22-3	5.50-3
1232.6	4.72-3	4.27-3	3.83-3	3.58-3	3.62-3	3.82-3
1666.9	3.43-3	3.10-3	2.78-3	2.60-3	2.62-3	2.78-3
2171.7	2.60-3	2.35-3	2.10-3	1.96-3	1.98-3	2.10-3
2750.2	2.04-3	1.84-3	1.64-3	1.53-3	1.54-3	1.65-3
3406.1	1.63-3	1.47-3	1.31-3	1.22-3	1.24-3	1.33-3
4143.6	1.33-3	1.20-3	1.07-3	9.96-4	1.01-3	1.09-3
4967.8	1.10-3	9.94-4	8.85-4	8.25-4	8.38-4	9.10-4
5884.5	9.24-4	8.33-4	7.42-4	6.92-4	7.04-4	7.70-4
6900.5	7.81-4	7.04-4	6.27-4	5.85-4	5.98-4	6.58-4
8023.6	6.64-4	5.99-4	5.34-4	4.99-4	5.12-4	5.67-4
9262.9	5.68-4	5.13-4	4.58-4	4.28-4	4.41-4	4.92-4
10629.3	4.88-4	4.41-4	3.94-4	3.69-4	3.82-4	4.29-4
12135.3	4.21-4	3.81-4	3.40-4	3.19-4	3.32-4	3.75-4
13795.7	3.63-4	3.29-4	2.94-4	2.77-4	2.89-4	3.29-4
16115.9	3.02-4	2.74-4	2.46-4	2.31-4	2.43-4	2.80-4
18748.5	2.51-4	2.28-4	2.05-4	1.94-4	2.04-4	2.39-4

A1 - I1

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	519.9	4.20-3	3.61-3	2.84-3	2.05-3	1.44-3	1.12-3
26	804.8	3.55-3	3.10-3	2.53-3	1.96-3	1.56-3	1.38-3
30	1149.7	2.72-3	2.39-3	1.98-3	1.59-3	1.33-3	1.23-3
34	1554.7	2.12-3	1.87-3	1.58-3	1.30-3	1.13-3	1.07-3
38	2019.5	1.72-3	1.54-3	1.33-3	1.13-3	1.03-3	1.02-3
42	2542.7	1.37-3	1.25-3	1.11-3	9.89-4	9.42-4	9.68-4
46	3121.5	1.03-3	9.41-4	8.43-4	7.69-4	7.51-4	7.88-4
50	3755.1	7.99-4	7.32-4	6.57-4	6.03-4	5.94-4	6.29-4
54	4443.1	6.53-4	5.99-4	5.38-4	4.96-4	4.91-4	5.25-4
58	5184.3	5.52-4	5.07-4	4.57-4	4.23-4	4.21-4	4.53-4
62	5977.4	4.78-4	4.40-4	3.98-4	3.69-4	3.70-4	4.01-4
66	6820.7	4.21-4	3.88-4	3.53-4	3.29-4	3.32-4	3.63-4
70	7712.0	3.76-4	3.49-4	3.17-4	2.98-4	3.03-4	[illegible]
74	8648.8	3.40-4	3.16-4	2.89-4	2.74-4	2.80-4	3.11-4
78	9628.2	3.11-4	2.89-4	2.67-4	2.54-4	2.62-4	2.93-4
82	10646.3	2.87-4	2.68-4	2.49-4	2.39-4	2.48-4	2.80-4
87	11966.8	2.62-4	2.46-4	2.30-4	2.23-4	2.35-4	2.69-4
92	13330.0	2.43-4	2.30-4	2.16-4	2.12-4	2.25-4	2.61-4

A1 - I2

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
523.8	3.46-3	3.12-3	2.69-3	2.30-3	2.08-3	2.04-3
811.8	1.93-3	1.70-3	1.42-3	1.16-3	1.01-3	9.62-4
1159.1	1.50-3	1.28-3	1.01-3	7.63-4	5.97-4	5.31-4
1564.9	1.13-3	9.59-4	7.55-4	5.66-4	4.43-4	3.96-4
2029.4	8.24-4	6.87-4	5.18-4	3.59-4	2.49-4	2.01-4
2553.6	6.67-4	5.41-4	3.83-4	2.28-4	1.13-4	5.13-5
3139.7	6.46-4	5.30-4	3.84-4	2.41-4	1.34-4	7.71-5
3787.9	6.02-4	5.01-4	3.74-4	2.51-4	1.62-4	1.16-4
4497.8	5.38-4	4.51-4	3.43-4	2.38-4	1.63-4	1.28-4
5269.5	4.75-4	4.00-4	3.07-4	2.17-4	1.54-4	1.26-4
6103.0	4.20-4	3.55-4	2.74-4	1.96-4	1.42-4	1.19-4
6998.8	3.73-4	3.16-4	2.44-4	1.77-4	1.30-4	1.10-4
7957.0	3.33-4	2.82-4	2.19-4	1.59-4	1.18-4	1.02-4
8978.0	2.99-4	2.54-4	1.98-4	1.44-4	1.08-4	9.39-5
10062.1	2.71-4	2.30-4	1.79-4	1.31-4	9.87-5	8.68-5
11209.8	2.46-4	2.09-4	1.64-4	1.20-4	9.08-5	8.06-5
12734.3	2.20-4	1.88-4	1.47-4	1.08-4	8.22-5	7.38-5
14359.6	1.99-4	1.69-4	1.33-4	9.80-5	7.50-5	6.82-5

A1 - I3

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	524.6	2.11-3	1.74-3	1.25-3	7.68-4	3.92-4	1.80-4
26	812.3	1.36-3	1.11-3	7.95-4	4.78-4	2.39-4	1.08-4
30	1164.9	8.57-4	7.18-4	5.43-4	3.74-4	2.52-4	1.92-4
34	1583.5	6.22-4	5.14-4	3.78-4	2.45-4	1.47-4	9.54-5
38	2069.6	4.81-4	3.95-4	2.87-4	1.80-4	9.96-5	5.60-5
42	2625.1	3.86-4	3.17-4	2.28-4	1.41-4	7.47-5	3.80-5
46	3252.7	3.18-4	2.61-4	1.88-4	1.15-4	5.96-5	2.86-5
50	3955.1	2.67-4	2.19-4	1.58-4	9.65-5	4.96-5	2.30-5
54	4735.9	2.28-4	1.87-4	1.35-4	8.27-5	4.23-5	1.93-5
58	5598.9	1.96-4	1.62-4	1.17-4	7.20-5	3.69-5	1.67-5
62	6548.8	1.72-4	1.42-4	1.03-4	6.35-5	3.27-5	1.48-5
66	7591.0	1.51-4	1.25-4	9.15-5	5.68-5	2.93-5	1.33-5
70	8731.7	1.35-4	1.12-4	8.22-5	5.13-5	2.66-5	1.21-5
74	9978.1	1.21-4	1.01-4	7.45-5	4.68-5	2.45-5	1.12-5
78	11339.1	1.10-4	9.19-5	6.82-5	4.31-5	2.27-5	1.05-5
82	12824.7	1.00-4	8.43-5	6.29-5	4.01-5	2.13-5	9.88-6
87	14876.0	9.04-5	7.63-5	5.74-5	3.70-5	1.99-5	9.34-6
92	17171.2	8.22-5	6.99-5	5.30-5	3.46-5	1.89-5	8.95-6

A1 - I4

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
528.0	2.45-3	2.18-3	1.85-3	1.53-3	1.33-3	1.28-3
818.7	1.53-3	1.41-3	1.20-3	1.01-3	9.03-4	8.83-4
1174.9	1.08-3	9.56-4	8.10-4	6.79-4	6.04-4	5.90-4
1598.7	7.91-4	7.00-4	5.90-4	4.92-4	4.35-4	4.24-4
2092.3	6.08-4	5.37-4	4.51-4	3.73-4	3.29-4	3.21-4
2658.8	4.82-4	4.25-4	3.55-4	2.93-4	2.57-4	2.50-4
3301.6	3.92-4	3.44-4	2.87-4	2.35-4	2.04-4	1.99-4
4024.6	3.25-4	2.85-4	2.36-4	1.92-4	1.66-4	1.61-4
4832.6	2.74-4	2.40-4	1.98-4	1.59-4	1.36-4	1.32-4
5731.0	2.35-4	2.05-4	1.68-4	1.34-4	1.13-4	1.09-4
6726.2	2.06-4	1.79-4	1.46-4	1.15-4	9.47-5	9.00-5
7825.2	1.85-4	1.60-4	1.29-4	9.93-5	7.97-5	7.39-5
9035.0	1.75-4	1.50-4	1.19-4	8.83-5	6.69-5	5.85-5
10345.3	1.63-4	1.36-4	1.01-4	6.57-5	3.78-5	2.16-5
11746.5	1.08-4	8.94-5	6.55-5	4.13-5	2.23-5	1.09-5
13270.2	8.76-5	7.26-5	5.33-5	3.38-5	1.83-5	9.02-6
15373.0	7.39-5	6.15-5	4.55-5	2.90-5	1.58-5	7.87-6
17727.0	6.50-5	5.44-5	4.05-5	2.51-5	1.44-5	7.18-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - I5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	543.9	2.05-3	1.92-3	1.79-3	1.71-3	1.76-3	1.90-3
26	838.5	1.24-3	1.16-3	1.07-3	1.01-3	1.03-3	1.10-3
30	1198.9	8.85-4	8.10-4	7.25-4	6.62-4	6.49-4	6.80-4
34	1627.3	7.04-4	6.34-4	5.52-4	4.84-4	4.55-4	4.64-4
38	2125.9	5.76-4	5.14-4	4.39-4	3.75-4	3.42-4	3.43-4
42	2697.5	4.74-4	4.20-4	3.55-4	2.98-4	2.68-4	2.66-4
46	3345.2	3.94-4	3.47-4	2.92-4	2.43-4	2.16-4	2.13-4
50	4073.2	3.30-4	2.91-4	2.43-4	2.01-4	1.77-4	1.75-4
54	4886.0	2.81-4	2.47-4	2.06-4	1.69-4	1.48-4	1.46-4
58	5789.1	2.44-4	2.14-4	1.78-4	1.44-4	1.26-4	1.24-4
62	6788.3	2.16-4	1.89-4	1.55-4	1.26-4	1.09-4	1.06-4
66	7887.4	1.98-4	1.73-4	1.41-4	1.12-4	9.42-5	9.10-5
70	9078.2	1.25-4	1.06-4	8.39-5	6.32-5	4.98-5	4.56-5
74	10385.2	7.12-5	6.38-5	5.54-5	4.89-5	4.74-5	5.17-5
78	11850.7	9.42-5	8.30-5	6.89-5	5.59-5	4.84-5	4.85-5
82	13470.6	9.19-5	8.04-5	6.58-5	5.16-5	4.26-5	4.10-5
87	15733.3	8.37-5	7.30-5	5.91-5	4.53-5	3.59-5	3.34-5
92	18298.7	7.51-5	6.54-5	5.26-5	3.97-5	3.04-5	2.74-5

A1 - I6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	550.7	1.48-3	1.24-3	9.23-4	5.91-4	3.23-4	1.62-4
26	849.7	7.51-4	6.28-4	4.69-4	3.05-4	1.76-4	1.01-4
30	1216.9	3.60-4	3.01-4	2.25-4	1.48-4	8.85-5	5.47-5
34	1656.0	1.60-4	1.33-4	9.99-5	6.61-5	4.02-5	2.57-5
38	2171.6	6.95-5	5.80-5	4.34-5	2.88-5	1.78-5	1.16-5
42	2769.1	3.20-5	2.67-5	2.01-5	1.34-5	8.41-6	5.67-6
46	3449.0	1.67-4	1.35-4	9.62-5	5.99	3.38-5	1.93-5
50	4175.0	1.43-4	1.15-4	8.11-5	[illegible]	2.72-5	1.45-5
54	4979.8	1.20-4	9.62-5	6.79-5	4.15-5	2.22-5	1.14-5
58	5868.1	9.89-5	7.95-5	5.61-5	3.40-5	1.80-5	8.88-6
62	6845.5	7.80-5	6.27-5	4.41-5	2.66-5	1.39-5	6.66-6
66	7921.4	5.37-5	4.34-5	3.10-5	1.95-5	1.13-5	7.10-6
70	9121.4	8.52-5	7.45-5	6.14-5	4.94-5	4.26-5	4.24-5
74	10459.0	1.06-4	9.32-5	7.69-5	6.17-5	5.27-5	5.20-5
78	11934.7	1.02-4	8.93-5	7.35-5	5.85-5	4.93-5	4.83-5
82	13560.8	9.36-5	8.20-5	6.72-5	5.30-5	4.41-5	4.28-5
87	15830.6	8.29-5	7.26-5	5.93-5	4.63-5	3.78-5	3.62-5
92	18403.3	7.32-5	6.40-5	5.21-5	4.02-5	3.22-5	3.05-5

A1 - I7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	590.5	2.58-4	2.11-4	1.51-4	9.18-5	4.82-5	2.38-5
26	898.2	2.48-4	2.01-4	1.43-4	8.75-5	4.76-5	2.55-5
30	1272.2	2.58-4	2.09-4	1.48-4	9.22-5	5.21-5	3.00-5
34	1712.8	2.51-4	2.03-4	1.44-4	9.01-5	5.17-5	3.06-5
38	2221.2	2.26-4	1.82-4	1.30-4	8.09-5	4.61-5	2.70-5
42	2799.2	1.95-4	1.57-4	1.11-4	6.91-5	3.88-5	2.21-5
46	3454.4	1.41-5	1.15-5	8.18-6	5.06-6	2.77-6	1.49-6
50	4233.5	6.18-6	5.23-6	4.01-6	2.81-6	1.92-6	1.46-6
54	5115.0	3.45-6	2.97-6	2.36-6	1.77-6	1.36-6	1.18-6
58	6108.1	2.27-6	2.07-6	1.83-6	1.63-6	1.55-6	1.61-6
62	7155.7	1.76-4	1.46-4	1.09-4	7.15-5	4.43-5	3.03-5
66	8295.3	1.53-4	1.28-4	9.61-5	6.47-5	4.19-5	3.06-5
70	9550.3	1.34-4	1.13-4	8.57-5	5.90-5	3.97-5	3.07-5
74	10931.5	1.19-4	1.00-4	7.68-5	5.40-5	3.77-5	3.05-5
78	12451.4	1.05-4	8.92-5	6.91-5	4.94-5	3.56-5	2.99-5
82	14124.9	9.32-5	7.96-5	6.22-5	4.53-5	3.35-5	2.90-5
87	16460.7	8.05-5	6.92-5	5.47-5	4.05-5	3.08-5	2.75-5
92	19109.2	6.96-5	6.02-5	4.80-5	3.61-5	2.81-5	2.57-5

A1 - I8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	596.6	2.04-4	1.72-4	1.32-4	9.73-5	[illegible]	6.57-5
26	906.3	1.11-4	9.40-5	7.38-5	5.65-5	4.61-5	4.25-5
30	1284.9	4.94-5	4.26-5	3.48-5	2.86-5	2.54-5	2.50-5
34	1736.2	2.05-5	1.84-5	1.61-5	1.45-5	1.42-5	1.48-5
38	2264.7	1.05-5	9.79-6	9.20-6	9.06-6	9.55-6	1.04-5
42	2875.4	7.32-6	7.13-6	7.10-6	7.44-6	8.22-6	9.25-6
46	3573.9	9.11-6	8.78-6	8.60-6	8.86-6	9.69-6	1.09-5
50	4345.8	2.80-4	2.29-4	1.65-4	1.02-4	5.48-5	2.88-5
54	5188.1	2.38-4	1.96-4	1.42-4	8.98-5	5.07-5	2.95-5
58	6122.6	2.04-4	1.68-4	1.24-4	7.96-5	4.70-5	2.98-5
62	7220.3	9.66-7	7.97-7	5.81-7	3.65-7	1.98-7	1.05-7
66	8377.0	5.31-4	5.88-4	6.82-4	8.25-4	1.01-3	1.24-3
70	9638.7	4.35-4	4.78-4	5.53-4	6.66-4	8.20-4	1.00-3
74	11026.6	3.62-4	3.97-4	4.57-4	5.50-4	6.79-4	8.36-4
78	12553.3	3.05-4	3.34-4	3.83-4	4.61-4	5.71-4	7.07-4
82	14233.8	2.59-4	2.83-4	3.24-4	3.90-4	4.85-4	6.05-4
87	16578.7	2.13-4	2.32-4	2.65-4	3.19-4	3.99-4	5.03-4
92	19236.7	1.76-4	1.91-4	2.18-4	2.63-4	3.31-4	4.24-4

A1 - I9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	621.5	5.89-4	4.82-4	3.47-4	2.15-4	1.17-4	6.26-5
26	934.7	3.22-4	2.61-4	1.86-4	1.14-4	6.19-5	3.26-5
30	1315.9	1.71-4	1.38-4	9.74-5	5.92-5	3.14-5	1.58-5
34	1769.1	8.42-5	6.78-5	4.78-5	2.89-5	1.52-5	7.45-6
38	2299.3	4.02-5	3.26-5	[illegible]	1.49-5	8.72-6	5.37-6
42	2911.8	2.43-5	2.08-5	[illegible]	1.32-5	1.11-5	1.05-5
46	3590.1	3.38-4	2.76-4	1.99-4	1.23-4	6.59-5	3.45-5
50	4367.5	1.87-5	2.00-5	2.25-5	2.63-5	3.12-5	3.67-5
54	5249.5	1.30-3	1.49-3	1.79-3	2.22-3	2.74-3	3.30-3
58	6191.1	8.86-4	9.98-4	1.18-3	1.44-3	1.77-3	2.14-3
62	7234.0	6.68-4	7.44-4	8.71-4	1.06-3	1.30-3	1.58-3
66	8405.4	4.82-4	5.29-4	6.09-4	7.32-4	8.96-4	1.09-3
70	9600.6	4.38-4	4.84-4	5.61-4	6.79-4	8.38-4	1.03-3
74	11085.5	3.91-4	4.34-4	5.05-4	6.14-4	7.64-4	9.44-4
78	12633.2	3.46-4	3.84-4	4.49-4	5.49-4	6.88-4	8.56-4
82	14339.2	3.04-4	3.38-4	3.97-4	4.87-4	6.14-4	7.71-4
87	16723.2	2.57-4	2.87-4	3.37-4	4.16-4	5.29-4	6.72-4
92	19429.4	2.16-4	2.41-4	2.84-4	3.53-4	4.52-4	5.85-4

A1 - I10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	638.8	1.72-3	1.42-3	1.02-3	6.23-4	3.16-4	1.41-4
26	957.6	1.20-3	9.83-4	7.06-4	4.28-4	2.16-4	9.58-5
30	1342.3	8.77-4	7.16-4	5.12-4	3.09-4	1.55-4	6.92-5
34	1795.1	6.65-4	5.42-4	3.87-4	2.34-4	1.18-4	5.27-5
38	2318.5	5.19-4	4.23-4	3.02-4	1.83-4	9.26-5	4.24-5
42	2915.7	4.12-4	3.36-4	2.41-4	1.46-4	7.49-5	3.53-5
46	3612.8	2.59-5	2.67-5	2.86-5	3.22-5	3.74-5	4.33-5
50	4399.4	1.46-3	1.68-3	2.02-3	2.51-3	3.09-3	3.70-3
54	5233.5	2.22-4	1.93-4	1.58-4	1.26-4	1.08-4	1.05-4
58	6201.2	4.93-4	5.23-4	5.77-4	6.68-4	7.94-4	9.46-4
62	7248.8	5.13-4	5.57-4	6.34-4	7.53-4	9.13-4	1.10-3
66	8473.5	1.04-6	1.01-6	9.93-7	1.03-6	1.13-6	1.32-6
70	9872.9	3.97-7	3.49-7	2.91-7	2.39-7	2.11-7	2.12-7
74	11439.2	2.23-7	1.92-7	1.52-7	1.14-7	8.83-8	7.95-8
78	13192.7	1.36-7	1.16-7	9.10-8	6.60-8	4.80-8	4.05-8
82	15157.8	8.60-8	7.35-8	5.73-8	4.11-8	2.92-8	2.40-8
87	17956.8	4.99-8	4.28-8	3.35-8	2.41-8	1.71-8	1.40-8
92	21203.7	2.97-8	2.56-8	2.02-8	1.47-8	1.06-8	8.83-9

A1 - I11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	646.5	1.07-3	9.09-4	6.99-4	4.93-4	3.46-4	2.74-4
26	969.7	9.00-4	7.85-4	6.44-4	5.17-4	4.40-4	4.19-4
30	1360.1	8.87-4	8.22-4	7.53-4	7.12-4	7.21-4	7.70-4
34	1819.3	1.02-3	1.03-3	1.06-3	1.14-3	1.29-3	1.46-3
38	2349.7	1.25-3	1.34-3	1.50-3	1.74-3	2.06-3	2.39-3
42	2954.2	1.45-3	1.61-3	1.88-3	2.26-3	2.73-3	3.21-3
46	3636.6	1.59-3	1.80-3	2.15-3	2.63-3	3.22-3	3.82-3
50	4403.7	2.73-4	2.26-4	1.67-4	1.09-4	6.73-5	4.56-5
54	5266.3	1.01-4	1.07-4	1.18-4	1.36-4	1.61-4	1.90-4
58	6272.4	2.71-6	3.04-6	3.30-6	3.77-6	4.45-6	5.28-6
62	7405.1	6.74-7	6.70-7	6.83-7	7.33-7	8.32-7	9.74-7
66	8672.8	[illegible]	[illegible]	2.42-7	2.41-7	2.58-7	2.94-7
70	10091.3	1.36-7	1.24-7	1.11-7	1.02-7	1.02-7	1.12-7
74	11678.2	7.77-8	6.94-8	5.94-8	5.09-8	4.71-8	4.95-8
78	13454.3	4.76-8	4.19-8	3.48-8	2.81-8	2.42-8	2.42-8
82	15444.2	3.06-8	2.66-8	2.16-8	1.67-8	1.35-8	1.27-8
87	18278.2	1.83-8	1.58-8	1.26-8	9.40-9	7.07-9	6.22-9
92	21566.0	1.13-8	9.74-9	7.71-9	5.59-9	3.98-9	3.26-9

A1 - I12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	652.4	6.67-3	7.84-3	9.72-3	1.23-2	1.55-2	1.84-2
26	976.3	5.31-3	6.19-3	7.59-3	9.54-3	1.18-2	1.40-2
30	1366.4	4.11-3	4.77-3	5.81-3	7.24-3	8.93-3	1.05-2
34	1824.9	3.04-3	3.50-3	4.22-3	5.22-3	6.41-3	7.53-3
38	2354.6	[illegible]	2.35-3	2.80-3	3.42-3	4.17-3	4.89-3
42	2958.5	1.30-3	1.43-3	1.65-3	1.97-3	2.37-3	2.78-3
46	3639.9	6.86-4	7.07-4	7.55-4	8.45-4	9.77-4	1.13-3
50	4410.3	1.84-4	2.10-4	2.51-4	3.08-4	3.78-4	4.52-4
54	5308.9	8.97-6	9.49-6	1.05-5	1.21-5	1.44-5	1.70-5
58	6320.7	2.95-6	2.94-6	3.02-6	3.27-6	3.72-6	4.34-6
62	7455.9	1.37-6	1.33-6	1.30-6	1.34-6	1.47-6	1.70-6
66	8727.1	7.32-7	6.92-7	6.56-7	6.52-7	6.99-7	7.96-7
70	10149.4	4.18-7	3.90-7	3.62-7	3.49-7	3.66-7	4.14-7
74	11740.2	2.50-7	2.31-7	2.11-7	1.99-7	2.05-7	2.29-7
78	13520.3	1.55-7	1.42-7	1.28-7	1.18-7	1.20-7	1.33-7
82	15514.4	9.81-8	8.94-8	7.97-8	7.25-8	7.21-8	7.96-8
87	18354.0	5.72-8	5.19-8	4.57-8	4.07-8	3.96-8	4.33-8
92	21647.8	3.43-8	3.10-8	2.69-8	2.35-8	2.23-8	2.42-8

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - I13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	677 9	1.26-3	1.23-3	1.22-3	1.27-3	1.40-3	1.58-3
26	1009.0	7 02-4	6.69-4	6.40-4	6.39-4	6.80-4	7.51-4
30	1409.5	3.74-4	3 48-4	3.21-4	3.06-4	3.13-4	3.38-4
34	1883.9	1 86-4	1 70-4	1.51-4	1.38-4	1.36-4	1.43-4
38	2437.6	8.82-5	7.89-5	6.82-5	5.97-5	5.63-5	5.78-5
42	3077.0	4.09-5	3.61-5	3.05-5	2.57-5	2.33-5	2.35-5
46	3809.0	1 92-5	1.68-5	1.39-5	1.14-5	1.00-5	9.93-6
50	4641.8	9.24-6	8.03-6	6.57-6	5.29-6	4.55-6	4.44-6
54	5584.8	4.61-6	3.99-6	3.24-6	2.57-6	2.17-6	2.11-6
58	6648.6	2.37-6	2.05-6	1.65-6	1.30-6	1.08-6	1.04-6
62	7845.8	1.24-6	1.07-6	8.57-7	6.65-7	5.49-7	5.26-7
66	9189.4	6.34-7	5.42-7	4.30-7	3.26-7	2.62-7	2.46-7
70	10687 1	2.34-7	1 93-7	1.43-7	9.51-8	6.27-8	4.94-8
74	12342.2	1.06-7	9.02-8	7.14-8	5.48-8	4.61-8	4.70-8
78	14179.9	8.20-8	7.22-8	6.04-8	5.06-8	4.71-8	5.11-8
82	16234.3	5.92-8	5.24-8	4 43-8	3 76-8	3.54-8	3.87-8
87	19156.8	3 76-8	3.33-8	2.81-8	2.37-8	2.21-8	2.43-8
92	22545.1	2.35-8	2 08-8	1.74-8	1.44-8	1.32-8	1.44-8

A1 - I14

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
733.1	5.08-5	4.52-5	3.82-5	3.16-5	2.78-5	2.72-5
1076.7	3.25-5	2.92-5	2.53-5	2.19-5	2.03-5	2.07-5
1490.1	2.11-5	1.91-5	1.68-5	1.50-5	1.43-5	1.49-5
1977.0	1.37-5	1.25-5	1.11-5	1.01-5	9.84-6	1.04-5
2541.7	8.92-6	9.17-6	7.32-6	6.70-6	6.62-6	7.04-6
3189.4	5.78-6	5.30-6	4.77-6	4.40-6	4.38-6	4.70-6
3926.3	3.73-6	3 43-6	3.10-6	2.87-6	2.87-6	3.10-6
4759.4	2.41-6	2.22-6	2.01-6	1.86-6	1.88-6	2.04-6
5697.2	1.57-6	1.45-6	1.31-6	1.22-6	1.23-6	1.35-6
6749.3	1.04-6	9.56-7	8.64-7	8.04-7	8.13-7	8.95-7
7927.4	7.05-7	6.49-7	5.87-7	5.46-7	5.53-7	6.12-7
9246.2	5.08-7	4.68-7	4.24-7	3.95-7	3.99-7	4.44-7
10730.8	4.54-7	4.17-7	3.75-7	3.45-7	3.44-7	3.80-7
12416.6	3.17-7	2.86-7	2.49-7	2.19-7	2.10-7	2.26-7
14324.1	1.62-7	1 64-7	1.41-7	1.23-7	1.16-7	1.25-7
16473.7	1.09-7	9.78-8	8.48-8	7.40-8	7.07-8	7.66-8
19552.8	5.92-8	5.36-8	4.69-8	4 16-8	4.05-8	4.48-8
23147.4	3.31-8	3.02-8	2.68-8	2.43-8	2.42-8	2.75-8

A1 - J1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	517.9	9 47-3	8.04-3	6 15-3	4.18-3	2.61-3	1.71-3
26	800.9	6.55-3	5 57-3	4.30-3	3.02-3	2.03-3	1.50-3
30	1143.2	4.68-3	3.99-3	3.11-3	2.23-3	1.58-3	1.24-3
34	1544.1	3 47-3	2.96-3	2.32-3	1.69-3	1 24-3	1.01-3
38	2003.1	2.66-3	2.28-3	1.79-3	1.32-3	9.92-4	8.35-4
42	2519.6	2.10-3	1.80-3	1.42-3	1.06-3	8.10-4	6.97-4
46	3092.6	1.70-3	1 46-3	1.16-3	8.72-4	6.74-4	5.90-4
50	3721.4	1.41-3	1.21-3	9.63-4	7.30-4	5.71-4	5.07-4
54	4404.8	1.18-3	1.02-3	8.15-4	6.22-4	4.92-4	4.43-4
58	5141.6	1.01-3	8.74-4	7.01-4	5.38-4	4.30-4	3.92-4
62	5930.1	8.78-4	7.59-4	6 12-4	4.73-4	3.82-4	3.52-4
66	6768.8	7 71-4	6.68-4	5.41-4	4.21-4	3.43-4	3.21-4
70	7655.4	6.84-4	5.94-4	4.83-4	3.79-4	3.12-4	2.96-4
74	8587.4	6.12-4	5.34-4	4.36-4	3.45-4	2.88-4	2 75-4
78	9561.8	5.53-4	4.84-4	3 98-4	3.17-4	2.68-4	2.60-4
82	10574.8	5.04-4	4.42-4	3.66-4	2.94-4	2.51-4	2.47-4
87	11888.7	4.53-4	4.00-4	3.33-4	2.71-4	2.35-4	2.36-4
92	13244.9	4.11-4	3.65-4	3.07-4	2.53-4	2.24-4	2.28-4

A1 - J2

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
524.1	6.02-3	5.44-3	4.72-3	4.03-3	3.56-3	3.36-3
812.2	9.57-3	9.46-3	9.38-3	9.41-3	9.60-3	9.88-3
1161.4	1.44-2	1.47-2	1.51-2	1.57-2	1.65-2	1.72-2
1570.8	1.46-2	1.50-2	1.55-2	1.62-2	1.70-2	1.78-2
2040.7	1.33-2	1.36-2	1.41-2	1.48-2	1.55-2	1.63-2
2571.1	1.18-2	1.21-2	1.26-2	1.32-2	1.39-2	1.46-2
3162.3	1.05-2	1.07-2	1.11-2	1.17-2	1.23-2	1.30-2
3814.6	9.32-3	9.57-3	9.95-3	1.05-2	1.11-2	1.18-2
4528.3	8.36-3	8.59-3	8.95-3	9.42-3	9.99-3	1.07-2
5303.5	7.56-3	7.77-3	8.10-3	8.54-3	9.09-3	9.76-3
6140.7	6.88-3	7.08-3	7.38-3	7.80-3	8.33-3	8.99-3
7040.0	6.30-3	6.49-3	6.77-3	7.17-3	7.68-3	8.34-3
8001.9	5.81-3	5.98-3	6.25-3	6.63·3	7.13-3	7.79-3
9026.6	5.39-3	5.54-3	5.80-3	6.16-3	6.65-3	7.32-3
10114.6	5.01-3	5.16-3	5.41-3	5.76-3	6.25-3	6.91-3
11266.3	4.69-3	4 84-3	5.07-3	5.41-3	5.89-3	6.57-3
12796.0	4.34-3	4.49-3	4.71-3	5.04-3	5.52-3	6.21-3
14426.7	4.05-3	4.19-3	4.41-3	4.73-3	5.21-3	5.91-3

A1 - J3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	525.7	1.48-2	1.49-2	1.52-2	1.57-2	1.65-2	1.75-2
26	814.2	7.91-3	7.73-3	7.57-3	7.55-3	7 74-3	8.08-3
30	1164.7	3.14-3	2.72-3	2.21-3	1.73-3	1.41-3	1.29-3
34	1576.2	6.46-3	6.21-3	5.92-3	5.67-3	5.53-3	5.52-3
38	2048.1	9.82-3	9.78-3	9.75-3	9.78-3	9.91-3	1.01-2
42	2580.6	1.12-2	1.13-2	1.14-2	1.16-2	1.19-2	1.23-2
46	3173.8	1.13-2	1.14-2	1.16-2	1.19-2	1.23-2	1.28-2
50	3828.0	1.07-2	1.09-2	1.11-2	1.14-2	1.19-2	1.24-2
54	4543.6	9.87-3	1.00·2	1.03-2	1.06-2	1.11-2	1.17-2
58	5320.8	9.00-3	9.15-3	9.40-3	9.75-3	1.02-2	1.08-2
62	6160.0	8.16-3	8.31-3	8.55-3	8.89-3	9.35-3	9.96-3
66	7061.3	7.41-3	7.55-3	7.78-3	8.11-3	8.56-3	9.18-3
70	8025.3	6.73-3	6.87-3	7.09-3	7.41-3	7.85-3	8.48-3
74	9052.2	6.15-3	6.28-3	6.48-3	6.79-3	7.23-3	7.86-3
78	10142.5	5.63-3	5.75-3	5.95-3	6.25-3	6.68-3	7.32-3
82	11296.4	5.18-3	5.30-3	5.49-3	5.78-3	6.21-3	6.84-3
87	12829.1	4.70-3	4.81-3	4.99-3	5.27-3	5.69-3	6.34-3
92	14462.9	4.29-3	4.39-3	4.57-3	4.84-3	5.26-3	5.91-3

A1 - J4

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
527.1	3.54-3	2.93-3	2.14-3	1.34-3	7.41-4	4.29-4
816.6	3.71-3	3.32-3	2.83-3	2.35-3	2.00-3	1.82-3
1169.8	5.29-3	5.11-3	4.90-3	4.71-3	4.60-3	4.59-3
1588.5	4.20-3	4.07-3	3.92-3	3.80-3	3.73-3	3.73-3
2074.7	2.94-3	2.83-3	2.70-3	2.58-3	2.51-3	2.51-3
2630.4	2.13-3	2.04-3	1.92-3	1.81-3	1.75-3	1.74-3
3258.2	1.61-3	1 53-3	1.42-3	1.33-3	1.27-3	1.26-3
3960.8	1.25-3	1.18-3	1.09-3	1.01-3	9.59-4	9.51-4
4741.8	1.00-3	9.38-4	8.60-4	7.87-4	7.41-4	7.34-4
5605.0	8.13-4	7.58-4	6.90-4	6.25-4	5.84-4	5.77-4
6555.1	6.70-4	6.22-4	5.61-4	5.03-4	4.65-4	4.58-4
7597.4	5.59-4	5.16-4	4.61-4	4.08-4	3 74-4	3.67-4
8738.1	4.70-4	4.32-4	3.82-4	3.34-4	3.02-4	2.95-4
9984.6	3.99-4	3.65-4	3.20-4	2.75-4	2.45-4	2.37-4
11345.5	3.42-4	3.10-4	2.69-4	2.28-4	1.99-4	1.90-4
12831.1	2.95-4	2.66-4	2.28-4	1.90-4	1.62-4	1.52-4
14882.1	2.47-4	2.22-4	1.88-4	1.52-4	1.25-4	1.14-4
17176.9	2.10-4	1.87-4	1.56-4	1.23-4	9.70-5	8.48-5

A1 - J5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	528.2	6.07-3	5.74-3	5.36-3	5.03-3	4.90-3	4.95-3
26	819.4	4.49-3	4.30-3	4.08-3	3.93-3	3.92-3	4.02-3
30	1175.7	3.18-3	3.06-3	2.94-3	2.88-3	2.92-3	3.04-3
34	1599.4	2.41-3	2.33-3	2.26-3	2.24-3	2.29-3	2.41-3
38	2093.0	2.47-3	2.44-3	2.42-3	2.44-3	2.53-3	2.65-3
42	2658.6	1.15-2	1.18-2	1.22-2	1.28-2	1.34-2	1.39-2
46	3291.1	2.28-2	2.35-2	2.45-2	2.57-2	2.69-2	2.82-2
50	3996.8	1.82-2	1.87-2	1.95-2	2.05-2	2.15-2	2.27-2
54	4780.9	1.47-2	1.51-2	1.58-2	1.66-2	1.75-2	1.85-2
58	5647.3	1.22-2	1.25-2	1.31-2	1.37-2	1.45-2	1.55-2
62	6600.8	1.03-2	1.06-2	1.10-2	1.16-2	1.23-2	1.32-2
66	7646.6	8.81-3	9.08-3	9.49-3	1.00-2	1.07-2	1.15-2
70	8791.2	7.68-3	7.91-3	8.26-3	8.74-3	9.35-3	1.01-2
74	10041.7	6.76-3	6.97-3	7.29-3	7.72-3	8.29-3	9.05-3
78	11407.0	6.02-3	6.20-3	6.49-3	6.89-3	7.42-3	8.16-3
82	12897.3	5.40-3	5.57-3	5.83-3	6.20-3	6.71-3	7.42-3
87	14955.0	4.77-3	4.92-3	5.15-3	5.49-3	5.97-3	6.66-3
92	17257.4	4.25-3	4.39-3	4 60-3	4.91-3	5.37-3	6.05-3

A1 - [illegible]

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
536.3	5.37-3	4.79-3	4.05-3	3.30-3	2.75-3	2.48-3
828.1	4.66-3	4.28-3	3.79-3	3.31-3	2.96-3	2.78-3
1184.9	4.30-3	4.04-3	3.71-3	3.39-3	3.15-3	3.04-3
1609.0	5.08-3	4.94-3	4.76-3	4.60-3	4.50-3	4.49-3
2102.1	2.57-2	2.64-2	2.73-2	2.84-2	2.95-2	3.05-2
2662.2	2.00-2	2.06-2	2.14-2	2.24-2	2.34-2	2.44-2
3303.0	1.23-3	1.19-3	1.15-3	1.14-3	1.18-3	1.26-3
4026.1	6.57-4	6.13-4	5.68-4	5.43-4	5.56-4	6.05-4
4834.3	5.09-4	4.71-4	4.30-4	4.06-4	4.15-4	4.56-4
5733.1	4.22-4	3.88-4	3.52-4	3.30-4	3.36-4	3.71-4
6728.6	3.61-4	3.31-4	2.98-4	2.76-4	2.79-4	3.09-4
7827.2	3.62-4	3.33-4	3.00-4	2.76-4	2.75-4	2.99-4
9011.4	2.82-3	2.89-3	3.00-3	3.16-3	3.39-3	3.69-3
10287.1	3.09-3	3.19-3	3.35-3	3.58-3	3.88-3	4.27-3
11677.4	2.88-3	2.98-3	3.14-3	3.36-3	3.67-3	4.07-3
13194.6	2.62-3	2.72-3	2.87-3	3.08-3	3.37-3	3.77-3
15290.2	2.32-3	2.41-3	2.55-3	2.74-3	3.02-3	3.40-3
17636.9	2.06-3	2.14-3	2.26-3	2.44-3	2.70-3	3.08-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - J7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	543.8	1.82-1	1.88-1	1.97-1	2.06-1	2.14-1	2.19-1
26	836.9	1.31-1	1.35-1	1.40-1	1.47-1	1.52-1	1.57-1
30	1193.1	8.81-2	9.09-2	9.47-2	9.90-2	1.03-1	1.06-1
34	1614.6	5.77-2	5.95-2	6.20-2	6.48-2	6.75-2	6.98-2
38	2104.6	1.72-2	1.77-2	1.83-2	1.90-2	1.98-2	2.05-2
42	2670.8	1.40-3	1.26-3	1.08-3	9.07-4	7.81-4	7.20-4
46	3314.1	8.64-4	7.33-4	5.67-4	3.99-4	2.71-4	2.02-4
50	4037.7	7.06-4	5.93-4	4.49-4	3.04-4	1.92-4	1.31-4
54	4846.2	6.10-4	5.13-4	3.88-4	2.62-4	1.65-4	1.11-4
58	5744.8	5.50-4	4.65-4	3.56-4	2.45-4	1.60-4	1.13-4
62	6739.3	5.41-4	4.67-4	3.71-4	2.75-4	2.02-4	1.64-4
66	7833.4	8.21-4	7.70-4	7.08-4	6.53-4	6.24-4	6.34-4
70	9042.0	3.49-4	3.34-4	3.20-4	3.17-4	3.34-4	3.74-4
74	10358.4	4.24-3	4.40-3	4.64-3	4.98-3	5.41-3	5.97-3
78	11757.3	4.02-3	4.18-3	4.43-3	4.78-3	5.23-3	5.82-3
82	13281.3	3.62-3	3.77-3	4.00-3	4.32-3	4.75-3	5.32-3
87	15385.3	3.24-3	3.37-3	3.58-3	3.88-3	4.28-3	4.85-3
92	17741.0	2.93-3	3.05-3	3.25-3	3.52-3	3.92-3	4.47-3

A1 - J8

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
548.1	2.40-2	2.43-2	2.48-2	2.53-2	2.59-2	2.64-2
846.4	3.28-3	3.19-3	3.09-3	3.01-3	2.98-3	2.99-3
1214.7	5.19-4	4.70-4	4.10-4	3.54-4	3.17-4	3.03-4
1657.7	1.21-4	1.02-4	7.83-5	5.60-5	4.06-5	3.35-5
2180.0	5.10-5	4.43-5	3.61-5	2.85-5	2.33-5	2.12-5
2770.7	1.14-2	1.19-2	1.25-2	1.33-2	1.41-2	1.48-2
3415.5	9.62-3	1.00-2	1.05-2	1.12-2	1.19-2	1.26-2
4136.1	8.12-3	8.44-3	8.91-3	9.48-3	1.01-2	1.08-2
4935.9	6.92-3	7.19-3	7.59-3	8.09-3	8.66-3	9.27-3
5819.3	5.94-3	6.18-3	6.54-3	6.98-3	7.49-3	8.07-3
6791.7	5.15-3	5.36-3	5.67-3	6.07-3	6.55-3	7.10-3
7863.3	4.25-3	4.43-3	4.69-3	5.04-3	5.45-3	5.95-3
9057.5	2.06-3	2.11-3	2.19-3	2.31-3	2.47-3	2.69-3
10378.8	3.07-4	2.94-4	2.81-4	2.78-4	2.93-4	3.29-4
11850.3	1.90-4	1.74-4	1.56-4	1.45-4	1.48-4	1.68-4
13471.6	1.66-4	1.52-4	1.35-4	1.24-4	1.26-4	1.43-4
15735.0	1.41-4	1.28-4	1.13-4	1.02-4	1.02-4	1.16-4
18300.8	1.21-4	1.09-4	9.50-5	8.42-5	8.29-5	9.45-5

A1 - J9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	588.1	7.54-3	7.57-3	7.64-3	7.79-3	7.98-3	8.17-3
26	892.6	1.32-2	1.36-2	1.42-2	1.48-2	1.55-2	1.61-2
30	1261.5	1.62-2	1.68-2	1.76-2	1.86-2	1.96-2	2.04-2
34	1696.1	1.56-2	1.62-2	1.70-2	1.80-2	1.90-2	1.99-2
38	2198.4	1.36-2	1.41-2	1.49-2	1.58-2	1.67-2	1.75-2
42	2786.9	5.99-4	6.21-4	6.54-4	6.93-4	7.35-4	7.75-4
46	3449.7	1.07-2	1.11-2	1.18-2	1.25-2	1.34-2	1.42-2
50	4176.1	8.98-3	9.36-3	9.90-3	1.06-2	1.13-2	1.20-2
54	4981.3	7.62-3	7.93-3	8.39-3	8.97-3	9.61-3	1.03-2
58	5869.8	6.53-3	6.80-3	7.20-3	7.70-3	8.28-3	8.94-3
62	6846.5	5.64-3	5.87-3	6.22-3	6.66-3	7.19-3	7.81-3
66	7917.4	4.83-3	5.03-3	5.33-3	5.73-3	6.20-3	6.78-3
70	9091.9	3.86-3	4.02-3	4.27-3	4.59-3	5.00-3	5.49-3
74	10402.3	4.86-4	4.76-4	4.66-4	4.62-4	4.72-4	5.02-4
78	11870.0	2.20-4	1.87-4	1.44-4	9.88-5	6.17-5	4.00-5
82	13490.4	2.07-4	1.75-4	1.32-4	8.59-5	4.75-5	2.40-5
87	15753.5	1.92-4	1.62-4	1.23-4	8.01-5	4.39-5	2.12-5
92	18319.5	1.75-4	1.49-4	1.14-4	7.48-5	4.13-5	2.00-5

A1 - J10

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
593.2	7.70-2	8.07-2	8.58-2	9.17-2	9.72-2	1.01-1
899.6	4.79-2	5.01-2	5.32-2	5.68-2	6.01-2	6.27-2
1272.3	3.05-2	3.19-2	3.38-2	3.61-2	3.82-2	3.99-2
1712.4	2.16-2	2.25-2	2.39-2	2.54-2	2.69-2	2.82-2
2221.1	1.65-2	1.72-2	1.82-2	1.94-2	2.06-2	2.17-2
2800.2	1.27-2	1.32-2	1.40-2	1.49-2	1.58-2	1.67-2
3487.5	1.45-4	1.49-4	1.55-4	1.63-4	1.73-4	1.83-4
4286.2	2.35-5	2.37-5	2.40-5	2.47-5	2.57-5	2.72-5
5193.7	1.32-4	1.14-4	9.10-5	6.97-5	5.58-5	5.10-5
6129.4	4.43-4	3.80-4	3.03-4	2.32-4	1.86-4	1.72-4
7163.3	3.93-4	3.42-4	2.80-4	2.25-4	1.93-4	1.90-4
8303.6	3.50-4	3.09-4	2.60-4	2.18-4	1.96-4	2.01-4
9559.3	3.13-4	2.80-4	2.41-4	2.08-4	1.95-4	2.06-4
10941.1	2.81-4	2.54-4	2.22-4	1.97-4	1.91-4	2.06-4
12461.5	2.52-4	2.30-4	2.04-4	1.85-4	1.84-4	2.02-4
14135.5	2.26-4	2.07-4	1.87-4	1.73-4	1.74-4	1.95-4
16471.9	1.97-4	1.82-4	1.66-4	1.56-4	1.61-4	1.83-4
19120.7	1.71-4	1.59-4	1.47-4	1.40-4	1.47-4	1.70-4

A1 - J11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	621.1	1.79-2	1.87-2	1.98-2	2.11-2	2.24-2	2.34-2
26	933.8	1.06-2	1.11-2	1.17-2	1.25-2	1.32-2	1.38-2
30	1314.0	5.88-3	6.11-3	6.45-3	6.87-3	7.28-3	7.63-3
34	1765.6	2.85-3	2.97-3	3.13-3	3.33-3	3.54-3	3.71-3
38	2293.7	1.23-3	1.27-3	1.34-3	1.43-3	1.52-3	1.60-3
42	2904.1	5.01-4	5.20-4	5.48-4	5.84-4	6.24-4	6.63-4
46	3594.3	6.82-4	5.62-4	4.11-4	2.64-4	1.56-4	9.90-5
50	4351.1	5.85-4	4.87-4	3.66-4	2.50-4	1.67-4	1.26-4
54	5194.4	3.82-4	3.22-4	2.49-4	1.78-4	1.30-4	1.09-4
58	6177.7	8.22-4	8.44-4	8.96-4	1.00-3	1.16-3	1.37-3
62	7221.4	5.51-4	5.36-4	5.31-4	5.52-4	6.11-4	7.06-4
66	8372.4	3.36-4	2.94-4	2.43-4	1.98-4	1.73-4	1.74-4
70	9638.4	2.55-4	2.10-4	1.52-4	9.46-5	5.09-5	2.66-5
74	11029.4	2.73-4	2.44-4	2.11-4	1.84-4	1.74-4	1.86-4
78	12558.1	2.96-4	2.84-4	2.74-4	2.78-4	3.04-4	3.55-4
82	14240.2	2.98-4	2.96-4	3.01-4	3.23-4	3.71-4	4.47-4
87	16586.5	2.79-4	2.83-4	2.97-4	3.30-4	3.91-4	4.81-4
92	19245.7	2.50-4	2.57-4	2.74-4	3.10-4	3.73-4	4.68-4

A1 - J12

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
639.4	3.25-3	2.68-3	1.93-3	1.18-3	6.08-4	2.82-4
958.7	2.33-3	1.91-3	1.37-3	8.33-4	4.24-4	1.94-4
1344.0	1.72-3	1.41-3	1.01-3	6.08-4	3.07-4	1.37-4
1797.4	1.32-3	1.07-3	7.66-4	4.62-4	2.33-4	1.04-4
2321.5	1.03-3	8.44-4	6.04-4	3.68-4	1.90-4	9.14-5
2919.3	8.35-4	6.84-4	4.95-4	3.10-4	1.72-4	9.73-5
3602.8	2.43-4	2.52-4	2.67-4	2.88-4	3.14-4	3.42-4
4383.4	1.38-3	1.47-3	1.63-3	1.88-3	2.23-3	2.62-3
5233.9	1.11-3	1.17-3	1.27-3	1.46-3	1.72-3	2.03-3
6201.7	1.89-3	2.14-3	2.54-3	3.12-3	3.85-3	4.66-3
7244.2	1.77-3	2.01-3	2.41-3	2.98-3	3.70-3	4.51-3
8394.9	1.64-3	1.88-3	2.27-3	2.82-3	3.53-3	4.34-3
9664.6	1.44-3	1.66-3	2.00-3	2.50-3	3.14-3	3.88-3
11065.3	1.19-3	1.36-3	1.64-3	2.04-3	2.58-3	3.21-3
12609.9	9.59-4	1.09-3	1.32-3	1.64-3	2.08-3	2.61-3
14313.4	7.83-4	8.90-4	1.07-3	1.34-3	1.70-3	2.14-3
16694.7	6.19-4	7.01-4	8.40-4	1.05-3	1.35-3	1.72-3
19398.6	4.95-4	5.59-4	6.69-4	8.39-4	1.08-3	1.40-3

A1 - J13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	643.9	2.39-3	2.12-3	1.81-3	1.53-3	1.40-3	1.40-3
26	966.1	2.60-3	2.48-3	2.38-3	2.37-3	2.53-3	2.78-3
30	1354.6	2.76-3	2.78-3	2.89-3	3.15-3	3.57-3	4.04-3
34	1811.4	2.68-3	2.79-3	3.02-3	3.42-3	3.97-3	4.56-3
38	2339.2	2.42-3	2.56-3	2.82-3	3.25-3	3.81-3	4.40-3
42	2941.3	2.08-3	2.21-3	2.46-3	2.85-3	3.36-3	3.90-3
46	3621.6	1.71-3	1.82-3	2.02-3	2.35-3	2.78-3	3.24-3
50	4397.4	1.25-4	1.25-4	1.27-4	1.33-4	1.42-4	1.54-4
54	5259.0	2.09-3	2.36-3	2.79-3	3.42-3	4.19-3	5.03-3
58	6220.9	1.83-5	2.02-5	2.33-5	2.78-5	3.36-5	4.00-5
62	7292.7	3.26-4	2.66-4	1.90-4	1.14-4	5.72-5	2.54-5
66	8453.8	2.82-4	2.31-4	1.65-4	1.00-4	5.15-5	2.44-5
70	9733.5	2.46-4	2.02-4	1.46-4	9.07-5	4.91-5	2.66-5
74	11143.2	2.16-4	1.78-4	1.30-4	8.31-5	4.79-5	2.95-5
78	12695.9	1.91-4	1.58-4	1.17-4	7.66-5	4.70-5	3.21-5
82	14407.3	1.68-4	1.41-4	1.05-4	7.08-5	4.56-5	3.41-5
87	16798.4	1.45-4	1.22-4	9.27-5	6.42-5	4.40-5	3.54-5
92	19512.5	1.24-4	1.05-4	8.14-5	5.79-5	4.16-5	3.58-5

A1 - J14

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
647.2	1.12-3	9.38-4	7.07-4	4.78-4	3.08-4	2.19-4
972.3	1.49-3	1.46-3	1.45-3	1.52-3	1.67-3	1.87-3
1363.9	5.24-3	5.98-3	7.16-3	8.83-3	1.08-2	1.27-2
1824.4	4.44-3	5.04-3	6.00-3	7.36-3	8.98-3	1.05-2
2356.2	3.73-3	4.21-3	4.99-3	6.08-3	7.40-3	8.69-3
2961.7	3.17-3	3.57-3	4.21-3	5.12-3	6.22-3	7.33-3
3644.4	2.72-3	3.05-3	3.60-3	4.38-3	5.34-3	6.32-3
4408.5	2.37-3	2.66-3	3.14-3	3.83-3	4.68-3	5.57-3
5286.3	2.96-4	2.44-4	1.79-4	1.16-4	6.88-5	4.36-5
6240.7	3.79-4	3.09-4	2.21-4	1.34-4	6.95-5	3.35-5
7379.2	2.98-6	3.01-6	3.10-6	3.27-6	3.54-6	3.91-6
8679.8	2.64-6	2.69-6	2.78-6	2.94-6	3.18-6	3.51-6
10118.2	3.19-6	3.28-6	3.43-6	3.67-6	4.00-6	4.44-6
11709.9	1.90-6	1.96-6	2.05-6	2.20-6	2.41-6	2.70-6
13488.0	1.11-6	1.14-6	1.20-6	1.29-6	1.42-6	1.61-6
15479.3	6.70-7	6.89-7	7.23-7	7.80-7	8.66-7	9.87-7
18314.6	3.69-7	3.80-7	3.99-7	4.32-7	4.83-7	5.57-7
21603.1	2.10-7	2.16-7	2.27-7	2.47-7	2.78-7	3.24-7

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - J15

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	648.9	8.78-3	1.02-2	1.26-2	1.59-2	1.98-2	2.35-2
26	973.0	6.53-3	7.62-3	9.34-3	1.17-2	1.45-2	1.72-2
30	1366.9	1.39-3	1.44-3	1.54-3	1.74-3	2.01-3	2.30-3
34	1831.9	1.22-3	1.18-3	1.16-3	1.19-3	1.29-3	1.42-3
38	2368.1	1.09-3	1.01-3	9.18-4	8.62-4	8.71-[illegible]	9.31-4
42	2977.8	8.86-4	7.85-4	6.67-4	5.69-4	5.24-4	5.30-4
46	3664.9	6.99-4	6.00-4	4.78-4	3.68-4	2.99-4	2.76-4
50	4434.5	5.54-4	4.64-4	3.53-4	2.47-4	1.73-4	1.40-4
54	5299.6	2.02-4	1.73-4	1.38-4	1.06-4	8.37-5	7.49-5
58	6306.3	2.27-5	2.27-5	2.28-5	2.35-5	2.47-5	2.66-5
62	7440.3	9.54-6	9.69-6	1.00-5	1.05-5	1.13-5	1.23-5
66	8715.0	3.75-6	3.81-6	3.94-6	4.17-6	4.50-6	4.95-6
70	10166.8	3.14-7	2.92-7	2.69-7	2.54-7	2.57-7	2.77-7
74	11817.9	1.05-7	9.07-8	7.31-8	5.82-8	5.10-8	5.25-8
78	13679.6	7.99-8	7.17-8	6.22-8	5.47-8	5.26-8	5.67-8
82	15778.5	5.64-8	5.17-8	4.64-8	4.26-8	4.26-8	4.70-8
87	18787.7	3.47-8	3.22-8	2.96-8	2.81-8	2.89-8	3.27-8
92	22303.4	2.09-8	1.96-8	1.84-8	1.78-8	1.88-8	2.18-8

A1 - J16

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
655.5	3.54-3	4.01-3	4.79-3	5.91-3	7.30-3	8.63-3
983.6	2.07-3	2.29-3	2.65-3	3.19-3	3.86-3	4.53-3
1381.0	1.11-3	1.18-3	1.31-3	1.53-3	1.81-3	2.10-3
1852.2	4.71-4	4.86-4	5.20-4	5.83-4	6.73-4	7.71-4
2403.1	1.60-4	1.61-4	1.67-4	1.82-4	2.07-4	2.35-4
3040.2	5.36-5	5.35-5	5.47-5	5.87-5	6.60-5	7.49-5
3770.2	2.00-5	1.99-5	2.02-5	2.16-5	2.42-5	2.75-5
4601.1	8.35-6	8.29-6	8.42-6	8.98-6	1.01-5	1.15-5
5542.3	3.80-6	3.78-6	3.85-6	4.11-6	4.63-6	5.35-6
6604.5	1.86-6	1.85-6	1.89-6	2.03-6	2.30-6	2.67-6
7800.5	9.57-7	9.57-7	9.82-7	1.06-6	1.20-6	1.41-6
9145.4	5.15-7	5.16-7	5.32-7	5.76-7	6.59-7	7.79-7
10656.4	2.87-7	2.88-7	2.98-7	3.24-7	3.73-7	4.44-7
12354.2	1.64-7	1.65-7	1.71-7	1.87-7	2.17-7	2.60-7
14263.1	9.58-8	9.68-8	1.01-7	1.10-7	1.28-7	1.55-7
16412.2	5.71-8	5.77-8	6.02-8	6.61-8	7.73-8	9.39-8
19490.0	3.05-8	3.09-8	3.22-8	3.55-8	4.17-8	5.12-8
23083.5	1.67-8	1.69-8	1.76-8	1.94-8	2.28-8	2.83-8

A1 - J17

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	677.4	2.39-3	2.10-3	1.74-3	1.41-3	1.21-3	1.17-3
26	1007.8	1.39-3	1.17-3	8.93-4	6.23-4	4.29-4	3.34-4
30	1407.2	7.86-4	6.52-4	4.83-4	3.18-4	1.96-4	1.32-4
34	1880.5	4.09-4	3.44-4	2.62-4	1.84-4	1.30-4	1.04-4
38	2433.9	2.10-4	1.84-4	1.54-4	1.28-4	1.15-4	1.13-4
42	3073.6	1.15-4	1.07-4	9.92-5	9.50-5	9.78-5	1.06-4
46	3806.4	6.28-5	6.05-5	5.91-5	6.04-5	6.56-5	7.36-5
50	4640.0	3.22-5	3.15-5	3.13-5	3.27-5	3.62-5	4.12-5
54	5583.6	1.64-5	1.61-5	1.61-5	1.69-5	1.89-5	2.17-5
58	6648.2	8.55-6	8.41-6	8.44-6	8.91-6	9.96-6	1.15-5
62	7846.6	4.63-6	4.56-6	4.58-6	4.85-6	5.44-6	6.33-6
66	9193.7	2.60-6	2.56-6	2.58-6	2.74-6	3.08-6	3.61-6
70	10706.8	1.51-6	1.49-6	1.50-6	1.60-6	1.81-6	2.13-6
74	12406.6	8.99-7	8.91-7	9.04-7	9.64-7	1.10-6	1.30-6
78	14317.3	5.50-7	5.47-7	5.57-7	5.96-7	6.83-7	8.16-7
82	16468.0	3.44-7	3.43-7	3.50-7	3.77-7	4.35-7	5.24-7
87	19547.4	1.96-7	1.96-7	2.02-7	2.19-7	2.54-7	3.10-7
92	23142.0	1.14-7	1.15-7	1.19-7	1.30-7	1.52-7	1.88-7

A1 - J18

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
679.0	3.38-3	3.49-3	3.74-3	4.23-3	4.95-3	5.73-3
1009.8	2.15-3	2.24-3	2.43-3	2.76-3	3.23-3	3.74-3
1410.1	1.21-3	1.25-3	1.35-3	1.53-3	1.78-3	2.05-3
1884.3	5.85-4	6.00-4	6.38-4	7.12-4	8.20-4	9.39-4
2438.3	2.41-4	2.42-4	2.51-4	2.73-4	3.10-4	3.53-4
3078.8	8.37-5	8.11-5	7.96-5	8.19-5	8.93-5	1.00-4
3813.3	2.73-5	2.47-5	2.17-5	1.94-5	1.88-5	1.98-5
4650.4	1.05-5	8.85-6	6.84-6	4.95-6	3.67-6	3.15-6
5599.7	4.87-6	3.99-6	2.89-6	1.80-6	9.92-7	5.55-7
6672.2	2.53-6	2.07-6	1.48-6	8.94-7	4.52-7	2.04-7
7881.1	1.40-6	1.15-6	8.32-7	5.15-7	2.77-7	1.47-7
9241.5	8.08-7	6.68-7	4.90-7	3.15-7	1.85-7	1.17-7
10771.3	4.78-7	3.98-7	2.97-7	1.98-7	1.25-7	8.94-8
12491.7	2.90-7	2.43-7	1.84-7	1.26-7	8.47-8	6.58-8
14427.4	1.79-7	1.51-7	1.16-7	8.16-8	5.75-8	4.75-8
16608.0	1.12-7	9.54-8	7.41-8	5.34-8	3.92-8	3.40-8
19732.9	6.39-8	5.48-8	4.32-8	3.20-8	2.45-8	2.23-8
23383.0	3.70-8	3.20-8	2.56-8	1.94-8	1.55-8	1.47-8

A1 - J19

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	734.3	1.64-4	1.53-4	1.38-4	1.24-4	1.14-4	1.10-4
26	1079.7	9.84-5	9.12-5	8.20-5	7.31-5	6.71-5	6.51-5
30	1496.0	6.03-5	5.56-5	4.98-5	4.42-5	4.06-5	3.94-5
34	1987.7	3.72-5	3.42-5	3.05-5	2.70-5	2.47-5	2.41-5
38	2559.7	2.30-5	2.11-5	1.87-5	1.65-5	1.51-5	1.47-5
42	3218.1	1.43-5	1.30-5	1.15-5	1.01-5	9.20-6	8.98-6
46	3969.8	8.85-6	8.07-6	7.10-6	6.19-6	5.62-6	5.49-6
50	4823.1	5.51-6	5.01-6	4.39-6	3.81-6	3.45-6	3.37-6
54	5787.6	3.45-6	3.13-6	2.74-6	2.37-6	2.13-6	2.09-6
58	6874.4	2.18-6	1.98-6	1.72-6	1.48-6	1.33-6	1.31-6
62	8096.7	1.39-6	1.26-6	1.10-6	9.41-7	8.47-7	8.35-7
66	9469.6	8.96-7	8.11-7	7.05-7	6.06-7	5.46-7	5.41-7
70	11010.8	5.84-7	5.28-7	4.59-7	3.95-7	3.57-7	3.57-7
74	12741.4	3.84-7	3.48-7	3.03-7	2.62-7	2.38-7	2.40-7
78	14686.1	2.56-7	2.32-7	2.02-7	1.76-7	1.61-7	1.64-7
82	16874.7	1.71-7	1.56-7	1.37-7	1.19-7	1.11-7	1.14-7
87	20008.6	1.05-7	9.60-8	8.47-8	7.49-8	7.07-8	7.47-8
92	23667.4	6.50-8	5.96-8	5.30-8	4.76-8	4.59-8	4.98-8

A1 - K1

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
517.7	1.48-2	1.24-2	9.26-3	5.94-3	3.24-3	1.62-3
801.3	9.46-3	7.96-3	6.02-3	4.04-3	2.51-3	1.65-3
1144.4	6.50-3	5.62-3	4.52-3	3.47-3	2.76-3	2.45-3
1546.0	4.82-3	4.30-[illegible]	3.70-3	3.19-3	2.93-3	2.94-3
2005.3	3.77-3	3.44-3	3.07-3	2.80-3	2.74-3	2.87-3
2522.0	3.05-3	2.81-3	2.57-3	2.41-3	2.43-3	2.60-3
3095.2	2.53-3	2.35-3	2.17-3	2.08-3	2.13-3	2.31-3
3724.0	2.14-3	2.00-3	1.86-3	1.80-3	1.87-3	2.05-3
4407.4	1.84-3	1.73-3	1.62-3	1.58-3	1.66-3	1.83-3
5144.1	1.61-3	1.52-3	1.43-3	1.41-3	1.48-3	1.66-3
5932.6	1.42-3	1.35-3	1.28-3	1.27-3	1.35-3	1.51-3
6771.2	1.28-3	1.21-3	1.16-3	1.15-3	1.23-3	1.40-3
7657.6	1.16-3	1.11-3	1.06-3	1.06-3	1.14-3	1.30-3
8589.4	1.06-3	1.02-3	9.80-4	9.88-4	1.07-3	1.23-3
9563.5	9.82-4	9.44-4	9.15-4	9.28-4	1.01-3	1.17-3
10576.2	9.16-4	8.84-4	8.62-4	8.80-4	9.66-4	1.13-3
11889.6	8.50-4	8.24-4	8.09-4	8.32-4	9.22-4	1.09-3
13245.2	7.98-4	7.77-4	7.68-4	7.98-4	8.92-4	1.06-3

A1 - K2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	521.3	1.17-2	1.10-2	1.03-2	1.00-2	1.03-2	1.11-2
26	805.6	8.71-3	8.23-3	7.77-3	7.60-3	7.90-3	8.55-3
30	1150.3	6.53-3	6.03-3	5.48-3	5.10-3	5.09-3	5.36-3
34	1555.6	4.91-3	4.40-3	3.81-3	3.32-3	3.09-3	3.13-3
38	2021.3	3.75-3	3.30-3	2.76-3	2.29-3	2.02-3	1.97-3
42	2548.9	2.94-3	2.56-3	2.10-3	1.68-3	1.43-3	1.36-3
46	3136.8	2.37-3	2.05-3	1.66-3	1.30-3	1.08-3	1.01-3
50	3785.9	1.95-3	1.68-3	1.35-3	1.04-3	8.52-4	7.94-4
54	4496.3	1.63-3	1.40-3	1.12-3	8.59-4	6.95-4	6.45-4
58	5268.2	1.39-3	1.19-3	9.45-4	7.23-4	5.81-4	5.39-4
62	6101.9	1.20-3	1.02-3	8.12-4	6.19-4	4.96-4	4.60-4
66	6997.8	1.04-3	8.92-4	7.07-4	5.37-4	4.30-4	3.99-4
70	7956.0	9.20-4	7.86-4	6.23-4	4.72-4	3.77-4	3.51-4
74	8977.0	8.19-4	6.99-4	5.54-4	4.19-4	3.35-4	3.13-4
78	10061.1	7.34-4	6.27-4	4.96-4	3.76-4	3.00-4	2.82-4
82	11208.7	6.63-4	5.66-4	4.48-4	3.39-4	2.72-4	2.56-4
87	12733.1	5.89-4	5.03-4	3.98-4	3.02-4	2.42-4	2.30-4
92	14358.2	5.28-4	4.51-4	3.57-4	2.71-4	2.18-4	2.09-4

A1 - K3

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
525.7	6.98-3	6.56-3	6.10-3	5.84-3	5.95-3	6.36-3
816.3	4.41-3	3.98-3	3.47-3	3.05-3	2.86-3	2.90-3
1172.2	3.12-3	2.76-3	2.32-3	1.92-3	1.68-3	1.63-3
1595.6	2.35-3	2.05-3	1.68-3	1.34-3	1.12-3	1.05-3
2085.1	1.51-3	1.24-3	8.90-4	5.43-4	2.79-4	1.31-4
2641.6	1.20-3	9.84-4	7.07-4	4.31-4	2.21-4	1.02-4
3270.1	9.82-4	8.04-4	5.79-4	3.53-4	1.80-4	8.22-5
3973.4	8.19-4	6.72-4	4.84-4	2.96-4	1.51-4	6.83-5
4754.9	6.95-4	5.71-4	4.13-4	2.53-4	1.29-4	5.82-5
5618.6	5.98-4	4.93-4	3.57-4	2.19-4	1.12-4	5.07-5
6569.0	5.21-4	4.30-4	3.13-4	1.93-4	9.94-5	4.49-5
7611.4	4.59-4	3.80-4	2.78-4	1.72-4	8.91-5	4.03-5
8752.3	4.09-4	3.39-4	2.49-4	1.55-4	8.08-5	3.68-5
9998.7	3.67-4	3.06-4	2.25-4	1.42-4	7.42-5	3.39-5
11359.4	3.32-4	2.78-4	2.06-4	1.30-4	6.88-5	3.17-5
12844.5	3.03-4	2.54-4	1.90-4	1.21-4	6.44-5	2.99-5
14894.8	2.72-4	2.30-4	1.73-4	1.12-4	6.01-5	2.82-5
17188.6	2.47-4	2.10-4	1.60-4	1.04-4	5.69-5	2.70-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leq Z \leq 92$

See page 31 for Explanation of Tables

A1 – K4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	533.0	6.66-3	5.57-3	4.18-3	2.80-3	1.75-3	1.19-3
26	823.5	4.05-3	3.35-3	2.47-3	1.59-3	9.20-4	5.54-4
30	1178.0	2.72-3	2.24-3	1.62-3	1.02-3	5.59-4	3.04-4
34	1597.9	1.97-3	1.62-3	1.17-3	7.24-4	3.87-4	2.00-4
38	2088.9	1.84-3	1.59-3	1.29-3	1.00-3	8.15-4	7.45-4
42	2655.0	1.48-3	1.28-3	1.02-3	7.80-4	6.16-4	5.51-4
46	3297.3	1.22-3	1.05-3	8.33-4	6.25-4	4.83-4	4.23-4
50	4019.8	1.03-3	8.81-4	6.95-4	5.14-4	3.88-4	3.34-4
54	4827.2	8.87-4	7.57-4	5.93-4	4.32-4	3.18-4	2.67-4
58	5724.7	7.85-4	6.68-4	5.19-4	3.72-4	2.65-4	2.15-4
62	6717.8	7.25-4	6.14-4	4.71-4	3.29-4	2.22-4	1.69-4
66	7808.0	7.09-4	5.94-4	4.45-4	2.95-4	1.79-4	1.14-4
70	8984.6	5.12-4	4.23-4	3.09-4	1.95-4	1.06-4	5.28-5
74	10258.5	3.65-4	3.01-4	2.19-4	1.38-4	7.39-5	3.60-5
78	11646.7	2.97-4	2.46-4	1.79-4	1.13-4	6.07-5	2.96-5
82	13161.7	2.56-4	2.12-4	1.56-4	9.83-5	5.32-5	2.60-5
87	15254.0	2.21-4	1.84-4	1.36-4	8.66-5	4.72-5	2.33-5
92	17596.9	1.96-4	1.64-4	1.22-4	7.85-5	4.31-5	2.14-5

A1 – K5

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
536.9	5.65-3	4.98-3	4.14-3	3.38-3	2.94-3	2.85-3
829.6	3.73-3	3.30-3	2.78-3	2.33-3	2.09-3	2.07-3
1187.5	2.69-3	2.39-3	2.04-3	1.75-3	1.61-3	1.62-3
1612.6	2.05-3	1.83-3	1.58-3	1.37-3	1.29-3	1.31-3
2107.6	1.62-3	1.45-3	1.26-3	1.11-3	1.05-3	1.08-3
2675.4	1.31-3	1.18-3	1.03-3	9.06-4	8.63-4	8.96-4
3319.4	1.08-3	9.71-4	8.47-4	7.50-4	7.17-4	7.49-4
4043.6	9.03-4	8.13-4	7.09-4	6.27-4	6.01-4	6.32-4
4852.7	7.66-4	6.89-4	6.01-4	5.31-4	5.08-4	5.37-4
5752.0	6.60-4	5.93-4	5.16-4	4.55-4	4.36-4	4.63-4
6746.7	5.73-4	5.15-4	4.48-4	3.95-4	3.79-4	4.05-4
7837.8	3.64-4	3.26-4	2.84-4	2.53-4	2.47-4	2.69-4
9040.8	2.92-4	2.57-4	2.15-4	1.77-4	1.57-4	1.59-4
10374.0	3.26-4	2.83-4	2.28-4	1.74-4	1.38-4	1.27-4
11844.3	3.16-4	2.73-4	2.17-4	1.61-4	1.21-4	1.06-4
13464.7	2.95-4	2.55-4	2.01-4	1.47-4	1.07-4	8.95-5
15727.5	2.67-4	2.30-4	1.82-4	1.31-4	9.20-5	7.38-5
18293.1	2.41-4	2.08-4	1.64-4	1.17-4	7.99-5	6.17-5

A1 – K6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	585.4	3.43-3	2.80-3	2.00-3	1.21-3	6.26-4	2.96-4
26	888.0	2.22-3	1.79-3	1.27-3	7.63-4	3.94-4	1.85-4
30	1254.9	1.55-3	1.25-3	8.77-4	5.27-4	2.72-4	1.28-4
34	1687.8	1.15-3	9.20-4	6.45-4	3.87-4	2.00-4	9.40-5
38	2188.5	8.82-4	7.07-4	4.95-4	2.98-4	1.54-4	7.23-5
42	2759.1	6.97-4	5.59-4	3.92-4	2.35-4	1.22-4	5.74-5
46	3402.5	5.62-4	4.50-4	3.16-4	1.90-4	9.85-5	4.65-5
50	4121.5	4.56-4	3.66-4	2.57-4	1.55-4	8.03-5	3.81-5
54	4920.0	3.69-4	2.96-4	2.08-4	1.25-4	6.51-5	3.10-5
58	5802.4	2.88-4	2.31-4	1.62-4	9.77-5	5.10-5	2.46-5
62	6775.4	2.01-4	1.62-4	1.14-4	6.92-5	3.74-5	2.00-5
66	7857.1	2.38-4	2.07-4	1.71-4	1.38-4	1.21-4	1.23-4
70	9066.5	3.51-4	3.12-4	2.66-4	2.27-4	2.09-4	2.20-4
74	10402.7	3.32-4	2.96-4	2.52-4	2.14-4	1.98-4	2.08-4
78	11874.6	3.00-4	2.67-4	2.27-4	1.91-4	1.75-4	1.84-4
82	13496.1	2.69-4	2.39-4	2.02-4	1.69-4	1.53-4	1.60-4
87	15759.9	2.34-4	2.07-4	1.74-4	1.44-4	1.28-4	1.33-4
92	18326.0	2.03-4	1.80-4	1.50-4	1.22-4	1.07-4	1.11-4

A1 – K7

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
640.6	4.47-3	3.71-3	2.72-3	1.73-3	9.79-4	5.67-4
960.7	3.40-3	2.80-3	2.03-3	1.26-3	6.85-4	3.65-4
1346.7	2.56-3	2.10-3	1.50-3	9.08-4	4.60-4	2.08-4
1800.8	1.98-3	1.62-3	1.16-3	7.08-4	3.68-4	1.80-4
2325.5	1.60-3	1.32-3	9.77-4	6.44-4	4.01-4	2.75-4
2924.0	1.35-3	1.15-3	9.01-4	6.68-4	5.13-4	4.49-4
3599.7	1.20-3	1.05-3	8.77-4	7.26-4	6.45-4	6.40-4
4356.9	1.08-3	9.76-4	8.61-4	7.75-4	7.53-4	7.96-4
5200.4	9.78-4	9.08-4	8.35-4	7.95-4	8.15-4	8.94-4
6135.9	8.86-4	8.39-4	7.95-4	7.87-4	8.34-4	9.37-4
7170.0	7.99-4	7.68-4	7.44-4	7.56-4	8.21-4	9.37-4
8310.5	7.18-4	6.97-4	6.87-4	7.11-4	7.86-4	9.09-4
9566.3	6.43-4	6.30-4	6.28-4	6.59-4	7.38-4	8.64-4
10948.2	5.74-4	5.66-4	5.70-4	6.04-4	6.85-4	8.08-4
12468.7	5.11-4	5.07-4	5.14-4	5.50-4	6.29-4	7.50-4
14142.8	4.54-4	4.52-4	4.62-4	4.97-4	5.74-4	6.90-4
16479.2	3.91-4	3.91-4	4.02-4	4.36-4	5.07-4	6.18-4
19128.0	3.36-4	5.36-4	3.47-4	3.79-4	4.45-4	5.51-4

A1 – K8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	642.7	4.79-3	4.36-3	3.88-3	3.52-3	3.43-3	3.60-3
26	963.9	4.88-3	4.80-3	4.81-3	5.06-3	5.60-3	6.29-3
30	1351.2	4.91-3	5.06-3	5.42-3	6.07-3	7.00-3	8.01-3
34	1806.8	4.51-3	4.76-3	5.24-3	6.00-3	7.04-3	8.10-3
38	2333.4	3.90-3	4.15-3	4.62-3	5.35-3	6.31-3	7.30-3
42	2934.3	3.25-3	3.48-3	3.88-3	4.50-3	5.33-3	6.20-3
46	3613.3	2.67-3	2.85-3	3.17-3	3.68-3	4.36-3	5.10-3
50	4375.1	2.16-3	2.30-3	2.55-3	2.96-3	3.50-3	4.12-3
54	5224.7	1.75-3	1.85-3	2.03-3	2.34-3	2.77-3	3.28-3
58	6168.3	1.39-3	1.46-3	1.59-3	1.82-3	2.14-3	2.54-3
62	7212.6	1.08-3	1.11-3	1.18-3	1.33-3	1.55-3	1.84-3
66	8365.4	7.40-4	7.28-4	7.31-4	7.73-4	8.70-4	1.02-3
70	9634.1	3.99-4	3.36-4	2.57-4	1.80-4	1.27-4	1.03-4
74	11025.4	3.91-4	3.45-4	2.89-4	2.40-4	2.15-4	2.20-4
78	12553.1	4.27-4	4.05-4	3.84-4	3.81-4	4.11-4	4.74-4
82	14233.8	4.14-4	4.03-4	3.99-4	4.16-4	4.69-4	5.57-4
87	16578.6	3.73-4	3.69-4	3.74-4	4.00-4	4.61-4	5.59-4
92	19236.4	3.26-4	3.25-4	3.33-4	3.61-4	4.21-4	5.20-4

A1 – K9

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
646.9	2.51-3	2.21-3	1.84-3	1.51-3	1.32-3	1.29-3
971.1	8.05-3	9.17-3	1.10-2	1.36-2	1.67-2	1.97-2
1362.6	7.81-3	8.98-3	1.09-2	1.35-2	1.65-2	1.95-2
1823.5	4.56-3	5.01-3	5.76-3	6.87-3	8.25-3	9.60-3
2355.0	3.08-3	3.23-3	3.54-3	4.04-3	4.72-3	5.44-3
2959.9	2.44-3	2.53-3	2.71-3	3.04-3	3.51-3	4.04-3
3641.6	2.06-3	2.13-3	2.27-3	2.54-3	2.94-3	3.40-3
4404.5	1.79-3	1.85-3	1.98-3	2.23-3	2.59-3	3.02-3
5253.6	1.58-3	1.64-3	1.78-3	2.02-3	2.36-3	2.77-3
6194.7	1.42-3	1.49-3	1.63-3	1.87-3	2.21-3	2.62-3
7234.7	1.32-3	1.41-3	1.56-3	1.82-3	2.17-3	2.61-3
8381.8	1.32-3	1.43-3	1.62-3	1.92-3	2.34-3	2.83-3
9647.1	1.37-3	1.52-3	1.77-3	2.14-3	2.65-3	3.25-3
11045.8	1.14-3	1.26-3	1.46-3	1.77-3	2.20-3	2.71-3
12589.8	8.99-4	9.84-4	1.13-3	1.36-3	1.69-3	2.10-3
14293.0	7.37-4	8.02-4	9.16-4	1.10-3	1.37-3	1.71-3
16673.7	5.92-4	6.41-4	7.30-4	8.76-4	1.10-3	1.38-3
19376.8	4.83-4	5.21-4	5.92-4	7.12-4	8.95-4	1.15-3

A1 – K10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	647.5	1.42-2	1.66-2	2.06-2	2.61-2	3.26-2	3.88-2
26	971.4	4.51-3	4.86-3	5.47-3	6.43-3	7.67-3	8.93-3
30	1363.3	1.90-3	1.67-3	1.40-3	1.16-3	1.03-3	1.01-3
34	1825.1	3.43-3	3.63-3	4.00-3	4.59-3	5.40-3	6.22-3
38	2359.0	3.71-3	4.03-3	4.58-3	5.40-3	6.45-3	7.50-3
42	2967.4	3.32-3	3.60-3	4.10-3	4.84-3	5.79-3	6.77-3
46	3653.7	2.80-3	3.04-3	3.44-3	4.06-3	4.86-3	5.71-3
50	4422.4	2.33-3	2.52-3	2.84-3	3.35-3	4.01-3	4.73-3
54	5278.9	1.94-3	2.09-3	2.35-3	2.76-3	3.30-3	3.93-3
58	6229.2	1.62-3	1.73-3	1.95-3	2.28-3	2.74-3	3.28-3
62	7280.4	1.36-3	1.45-3	1.62-3	1.90-3	2.29-3	2.75-3
66	8440.9	1.15-3	1.22-3	1.37-3	1.60-3	1.93-3	2.33-3
70	9720.0	9.72-4	1.04-3	1.15-3	1.35-3	1.63-3	1.99-3
74	11129.1	8.29-4	8.81-4	9.80-4	1.15-3	1.39-3	1.70-3
78	12681.2	7.08-4	7.52-4	8.35-4	9.77-4	1.19-3	1.47-3
82	14392.0	6.07-4	6.43-4	7.13-4	8.35-4	1.02-3	1.27-3
87	16782.4	5.02-4	5.30-4	5.87-4	6.88-4	8.48-4	1.06-3
92	19495.8	4.14-4	4.37-4	4.83-4	5.67-4	7.03-4	8.95-4

A1 – K11

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
650.4	1.32-3	1.24-3	1.16-3	1.13-3	1.18-3	1.28-3
977.6	4.67-4	4.01-4	3.20-4	2.45-4	1.96-4	1.78-4
1375.7	1.67-4	1.38-4	1.03-4	6.74-5	4.17-5	2.82-5
1849.0	6.15-5	5.05-5	3.65-5	2.27-5	1.23-5	6.66-6
2402.8	2.47-5	2.02-5	1.45-5	8.91-6	4.68-6	2.33-6
3043.1	1.09-5	8.95-6	6.45-6	3.98-6	2.11-6	1.08-6
3777.1	5.40-6	4.45-6	3.24-6	2.06-6	1.17-6	6.85-7
4613.0	3.11-6	2.61-6	1.99-6	1.38-6	9.46-7	7.39-7
5560.4	2.47-6	2.19-6	1.86-6	1.57-6	1.42-6	1.44-6
6629.6	3.69-6	3.56-6	3.47-6	3.54-6	3.86-6	4.41-6
7830.5	4.77-6	4.78-6	4.92-6	5.34-6	6.11-6	7.20-6
9177.8	3.12-6	3.15-6	3.27-6	3.57-6	4.12-6	4.90-6
10690.6	1.82-6	1.84-6	1.90-6	2.08-6	2.41-6	2.88-6
12389.8	1.06-6	1.07-6	1.11-6	1.21-6	1.40-6	1.68-6
14300.0	6.33-7	6.34-7	6.54-7	7.12-7	8.29-7	1.00-6
16450.2	3.83-7	3.83-7	3.94-7	4.28-7	4.99-7	6.08-7
19529.1	2.09-7	2.08-7	2.14-7	2.32-7	2.71-7	3.34-7
23123.2	1.16-7	1.16-7	1.18-7	1.28-7	1.50-7	1.87-7

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 - K12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	676.4	3.91-3	3.73-3	3.57-3	3.57-3	3.81-3	4.21-3
26	1006.2	2.67-3	2.62-3	2.63-3	2.76-3	3.05-3	3.44-3
30	1405.1	1.79-3	1.82-3	1.90-3	2.09-3	2.38-3	2.71-3
34	1877.6	1.10-3	1.14-3	1.23-3	1.40-3	1.62-3	1.86-3
38	2429.4	5.82-4	6.11-4	6.69-4	7.64-4	8.96-4	1.04-3
42	3067.1	2.72-4	2.86-4	3.13-4	3.58-4	4.21-4	4.89-4
46	3798.0	1.21-4	1.27-4	1.38-4	1.58-4	1.86-4	2.17-4
50	4630.1	5.43-5	5.66-5	6.14-5	6.99-5	8.20-5	9.63-5
54	5573.0	2.46-5	2.56-5	2.76-5	3.13-5	3.68-5	4.34-5
58	6638.3	9.68-6	1.01-5	1.09-5	1.24-5	1.46-5	1.74-5
62	7841.8	2.14-6	2.23-6	2.40-6	2.73-6	3.23-6	3.87-6
66	9199.3	5.94-7	6.03-7	6.33-7	7.01-7	8.18-7	9.78-7
70	10726.9	2.50-7	2.48-7	2.51-7	2.69-7	3.07-7	3.66-7
74	12445.2	1.27-7	1.24-7	1.22-7	1.27-7	1.43-7	1.69-7
78	14378.9	7.11-8	6.82-8	6.60-8	6.71-8	7.42-8	8.75-8
82	16557.7	4.16-8	3.96-8	3.78-8	3.78-8	4.13-8	4.87-8
87	19680.5	2.22-8	2.10-8	1.98-8	1.95-8	2.11-8	2.50-8
92	23328.8	1.22-8	1.15-8	1.07-8	1.05-8	1.13-8	1.35-8

A1 - K13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	678.9	6.07-3	6.43-3	7.13-3	8.28-3	9.88-3	1.16-2
26	1009.7	3.87-3	4.08-3	4.49-3	5.17-3	6.11-3	7.10-3
30	1409.6	2.18-3	2.27-3	2.46-3	2.79-3	3.25-3	3.75-3
34	1883.7	1.05-3	1.07-3	1.14-3	1.26-3	1.45-3	1.66-3
38	2437.8	4.57-4	4.60-4	4.76-4	5.17-4	5.87-4	6.68-4
42	3078.6	1.98-4	1.97-4	2.02-4	2.17-4	2.44-4	2.78-4
46	3813.4	9.00-5	8.95-5	9.12-5	9.78-5	1.10-4	1.26-4
50	4650.6	4.34-5	4.32-5	4.42-5	4.76-5	5.39-5	6.22-5
54	5599.6	2.20-5	2.20-5	2.26-5	2.45-5	2.79-5	3.25-5
58	6671.9	1.16-5	1.17-5	1.21-5	1.32-5	1.51-5	1.78-5
62	7880.4	6.37-6	6.41-6	6.65-6	7.29-6	8.44-6	1.00-5
66	9240.5	3.59-6	3.62-6	3.77-6	4.16-6	4.84-6	5.79-6
70	10770.1	2.07-6	2.09-6	2.19-6	2.42-6	2.84-6	3.43-6
74	12490.1	1.22-6	1.23-6	1.29-6	1.44-6	1.70-6	2.06-6
78	14425.5	7.29-7	7.40-7	7.77-7	8.66-7	1.03-6	1.26-6
82	16605.7	4.43-7	4.50-7	4.73-7	5.29-7	6.34-7	7.84-7
87	19730.2	2.42-7	2.46-7	2.59-7	2.90-7	3.50-7	4.39-7
92	23379.9	1.34-7	1.36-7	1.43-7	1.61-7	1.96-7	2.50-7

A1 - L1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	520.7	1.34-2	1.11-2	8.12-3	5.15-3	2.90-3	1.65-3
26	805.4	9.17-3	7.60-3	5.63-3	3.69-3	2.26-3	1.51-3
30	1150.7	6.68-3	5.57-3	4.18-3	2.84-3	1.88-3	1.40-3
34	1556.4	5.08-3	4.25-3	3.23-3	2.26-3	1.58-3	1.26-3
38	2022.7	3.98-3	3.34-3	2.56-3	1.83-3	1.33-3	1.11-3
42	2549.7	3.19-3	2.69-3	2.07-3	1.50-3	1.12-3	9.65-4
46	3137.6	2.62-3	2.21-3	1.71-3	1.25-3	9.56-4	8.40-4
50	3786.6	2.18-3	1.84-3	1.44-3	1.06-3	8.20-4	7.32-4
54	4496.9	1.85-3	1.56-3	1.22-3	9.08-4	7.09-4	6.42-4
58	5268.7	1.58-3	1.34-3	1.05-3	7.86-4	6.19-4	5.67-4
62	6102.3	1.37-3	1.17-3	9.14-4	6.86-4	5.45-4	5.04-4
66	6998.0	1.21-3	1.02-3	8.03-4	6.05-4	4.83-4	4.51-4
70	7956.1	1.06-3	9.05-4	7.12-4	5.38-4	4.32-4	4.07-4
74	8977.0	9.49-4	8.06-4	6.35-4	4.82-4	3.89-4	3.69-4
78	10060.9	8.51-4	7.24-4	5.71-4	4.34-4	3.52-4	3.37-4
82	11208.4	7.69-4	6.54-4	5.17-4	3.94-4	3.21-4	3.10-4
87	12732.7	6.82-4	5.81-4	4.60-4	3.51-4	2.89-4	2.82-4
92	14357.5	6.09-4	5.19-4	4.12-4	3.16-4	2.61-4	2.59-4

A1 - L2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	534.1	1.03-2	9.88-3	9.60-3	9.72-3	1.04-2	1.15-2
26	826.2	6.44-3	6.21-3	6.06-3	6.18-3	6.67-3	7.37-3
30	1183.5	4.35-3	4.19-3	4.08-3	4.16-3	4.49-3	4.96-3
34	1608.2	3.13-3	3.00-3	2.91-3	2.95-3	3.17-3	3.51-3
38	2102.7	2.35-3	2.24-3	2.16-3	2.18-3	2.34-3	2.59-3
42	2670.0	1.82-3	1.73-3	1.66-3	1.66-3	1.78-3	1.98-3
46	3313.5	1.45-3	1.38-3	1.31-3	1.31-3	1.39-3	1.56-3
50	4037.2	1.18-3	1.12-3	1.06-3	1.05-3	1.11-3	1.25-3
54	4845.9	9.77-4	9.19-4	8.65-4	8.51-4	9.03-4	1.02-3
58	5744.9	8.18-4	7.66-4	7.17-4	7.01-4	7.42-4	8.39-4
62	6740.7	6.92-4	6.45-4	6.00-4	5.82-4	6.14-4	6.97-4
66	7840.7	5.90-4	5.48-4	5.07-4	4.88-4	5.12-4	5.83-4
70	9053.6	5.07-4	4.69-4	4.31-4	4.11-4	4.29-4	4.89-4
74	10389.5	4.38-4	4.04-4	3.68-4	3.48-4	3.61-4	4.12-4
78	11860.7	3.81-4	3.50-4	3.16-4	2.96-4	3.04-4	3.47-4
82	13481.2	3.33-4	3.05-4	2.73-4	2.52-4	2.57-4	2.93-4
87	15743.6	2.83-4	2.57-4	2.28-4	2.07-4	2.08-4	2.37-4
92	18308.0	2.41-4	2.18-4	1.91-4	1.70-4	1.68-4	1.93-4

A1 - L3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	641.3	6.98-3	5.96-3	4.69-3	3.48-3	2.65-3	2.29-3
26	961.3	5.33-3	4.65-3	3.82-3	3.07-3	2.63-3	2.52-3
30	1347.1	4.26-3	3.81-3	3.28-3	2.86-3	2.68-3	2.73-3
34	1801.0	3.56-3	3.28-3	2.98-3	2.78-3	2.80-3	2.97-3
38	2325.5	3.10-3	2.94-3	2.81-3	2.79-3	2.95-3	3.23-3
42	2923.7	2.77-3	2.71-3	2.69-3	2.80-3	3.07-3	3.44-3
46	3599.2	2.51-3	2.51-3	2.57-3	2.77-3	3.12-3	3.56-3
50	4356.0	2.27-3	2.31-3	2.43-3	2.68-3	3.07-3	3.55-3
54	5199.1	2.06-3	2.12-3	2.26-3	2.54-3	2.95-3	3.45-3
58	6134.1	1.85-3	1.92-3	2.08-3	2.36-3	2.77-3	3.28-3
62	7167.8	1.65-3	1.73-3	1.89-3	2.17-3	2.57-3	3.07-3
66	8307.7	1.48-3	1.56-3	1.71-3	1.98-3	2.36-3	2.84-3
70	9562.9	1.31-3	1.39-3	1.54-3	1.79-3	2.15-3	2.60-3
74	10944.1	1.16-3	1.24-3	1.38-3	1.61-3	1.95-3	2.38-3
78	12463.7	1.03-3	1.10-3	1.23-3	1.44-3	1.76-3	2.16-3
82	14136.8	9.09-4	9.72-4	1.09-3	1.29-3	1.58-3	1.96-3
87	16471.8	7.74-4	8.30-4	9.34-4	1.11-3	1.37-3	1.72-3
92	19119.1	6.57-4	7.06-4	7.96-4	9.50-4	1.19-3	1.51-3

A1 - L4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	644.5	1.39-2	1.47-2	1.63-2	1.88-2	2.23-2	2.59-2
26	965.6	1.18-2	1.27-2	1.44-2	1.69-2	2.02-2	2.35-2
30	1352.7	9.61-3	1.04-2	1.19-2	1.40-2	1.67-2	1.94-2
34	1808.1	7.65-3	8.32-3	9.45-3	1.12-2	1.33-2	1.54-2
38	2334.7	6.04-3	6.55-3	7.42-3	8.74-3	1.04-2	1.21-2
42	2935.6	4.76-3	5.13-3	5.79-3	6.80-3	8.09-3	9.43-3
46	3614.8	3.76-3	4.04-3	4.53-3	5.30-3	6.30-3	7.37-3
50	4376.7	3.01-3	3.21-3	3.58-3	4.16-3	4.94-3	5.82-3
54	5226.6	2.43-3	2.58-3	2.86-3	3.31-3	3.93-3	4.65-3
58	6170.5	1.99-3	2.10-3	2.31-3	2.67-3	3.18-3	3.78-3
62	7215.4	1.65-3	1.73-3	1.90-3	2.19-3	2.60-3	3.11-3
66	8369.4	1.38-3	1.44-3	1.58-3	1.82-3	2.16-3	2.60-3
70	9642.1	1.16-3	1.22-3	1.33-3	1.52-3	1.82-3	2.20-3
74	11044.5	9.89-4	1.03-3	1.12-3	1.29-3	1.54-3	1.88-3
78	12589.7	8.46-4	8.81-4	9.57-4	1.10-3	1.32-3	1.61-3
82	14293.3	7.27-4	7.56-4	8.19-4	9.40-4	1.13-3	1.40-3
87	16674.4	6.03-4	6.26-4	6.78-4	7.78-4	9.45-4	1.18-3
92	19377.7	5.01-4	5.20-4	5.62-4	6.46-4	7.90-4	9.99-4

A1 - L5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	647.1	1.38-2	1.60-2	1.95-2	2.45-2	3.06-2	3.63-2
26	971.3	9.87-3	1.12-2	1.35-2	1.67-2	2.05-2	2.41-2
30	1363.3	7.93-3	8.92-3	1.05-2	1.28-2	1.56-2	1.83-2
34	1825.0	6.84-3	7.62-3	8.90-3	1.07-2	1.30-2	1.52-2
38	2358.4	5.94-3	6.57-3	7.62-3	9.14-3	1.10-2	1.29-2
42	2966.0	5.06-3	5.57-3	6.44-3	7.70-3	9.28-3	1.09-2
46	3651.4	4.25-3	4.68-3	5.38-3	6.43-3	7.75-3	9.14-3
50	4419.3	3.57-3	3.91-3	4.49-3	5.36-3	6.47-3	7.68-3
54	5274.9	2.99-3	3.28-3	3.76-3	4.49-3	5.43-3	6.49-3
58	6224.4	2.53-3	2.76-3	3.16-3	3.78-3	4.58-3	5.51-3
62	7274.9	2.14-3	2.34-3	2.68-3	3.20-3	3.89-3	4.70-3
66	8434.6	1.82-3	1.99-3	2.27-3	2.72-3	3.32-3	4.04-3
70	9713.0	1.55-3	1.69-3	1.94-3	2.32-3	2.84-3	3.48-3
74	11121.2	1.33-3	1.45-3	1.66-3	1.99-3	2.45-3	3.01-3
78	12672.5	1.14-3	1.24-3	1.42-3	1.70-3	2.11-3	2.62-3
82	14382.5	9.80-4	1.06-3	1.22-3	1.46-3	1.82-3	2.28-3
87	16771.8	8.11-4	8.81-4	1.01-3	1.21-3	1.52-3	1.93-3
92	19484.0	6.71-4	7.28-4	8.32-4	1.01-3	1.27-3	1.63-3

A1 - L6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	676.4	8.79-3	9.53-3	1.08-2	1.29-2	1.56-2	1.83-2
26	1006.3	5.83-3	6.31-3	7.16-3	8.48-3	1.02-2	1.19-2
30	1405.4	3.49-3	3.77-3	4.27-3	5.04-3	6.02-3	7.01-3
34	1878.7	1.83-3	1.97-3	2.23-3	2.62-3	3.12-3	3.63-3
38	2432.0	8.51-4	9.15-4	1.03-3	1.20-3	1.43-3	1.67-3
42	3072.1	3.74-4	4.01-4	4.49-4	5.25-4	6.25-4	7.31-4
46	3806.4	1.66-4	1.77-4	1.98-4	2.31-4	2.75-4	3.23-4
50	4643.1	7.64-5	8.14-5	9.07-5	1.06-4	1.26-4	1.49-4
54	5591.8	3.70-5	3.93-5	4.37-5	5.10-5	6.10-5	7.28-5
58	6663.7	1.87-5	1.99-5	2.21-5	2.58-5	3.10-5	3.72-5
62	7871.8	9.91-6	1.05-5	1.17-5	1.36-5	1.64-5	1.99-5
66	9231.5	5.43-6	5.76-6	6.39-6	7.48-6	9.06-6	1.10-5
70	10760.6	3.07-6	3.26-6	3.62-6	4.24-6	5.16-6	6.33-6
74	12480.2	1.79-6	1.89-6	2.10-6	2.47-6	3.02-6	3.74-6
78	14415.1	1.06-6	1.13-6	1.25-6	1.47-6	1.81-6	2.26-6
82	16594.9	6.43-7	6.81-7	7.57-7	8.92-7	1.11-6	1.39-6
87	19718.7	3.51-7	3.72-7	4.14-7	4.89-7	6.11-7	7.79-7
92	23367.7	1.96-7	2.07-7	2.30-7	2.73-7	3.44-7	4.46-7

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

A1 – M1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	640.3	8.81-3	7.23-3	5.20-3	3.15-3	1.59-3	7.05-4
26	959.9	6.08-3	4.97-3	3.55-3	2.14-3	1.07-3	4.75-4
30	1345.5	4.41-3	3.59-3	2.56-3	1.54-3	7.68-4	3.40-4
34	1799.5	3.32-3	2.70-3	1.92-3	1.15-3	5.74-4	2.53-4
38	2324.8	2.58-3	2.10-3	1.49-3	8.91-4	4.44-4	1.96-4
42	2924.5	2.05-3	1.67-3	1.18-3	7.08-4	3.52-4	1.56-4
46	3602.5	1.67-3	1.35-3	9.60-4	5.74-4	2.86-4	1.26-4
50	4363.3	1.37-3	1.12-3	7.92-4	4.74-4	2.36-4	1.04-4
54	5212.0	1.15-3	9.34-4	6.63-4	3.97-4	1.98-4	8.74-5
58	6154.7	9.71-4	7.90-4	5.61-4	3.37-4	1.68-4	7.42-5
62	7198.4	8.29-4	6.74-4	4.80-4	2.88-4	1.44-4	6.35-5
66	8351.1	7.12-4	5.80-4	4.13-4	2.49-4	1.24-4	5.49-5
70	9622.5	6.15-4	5.02-4	3.58-4	2.16-4	1.08-4	4.78-5
74	11023.5	5.35-4	4.37-4	3.13-4	1.89-4	9.46-5	4.19-5
78	12567.4	4.67-4	3.82-4	2.74-4	1.66-4	8.32-5	3.69-5
82	14269.6	4.08-4	3.35-4	2.41-4	1.46-4	7.35-5	3.26-5
87	16648.8	3.47-4	2.85-4	2.06-4	1.25-4	6.32-5	2.81-5
92	19350.2	2.95-4	2.43-4	1.76-4	1.08-4	5.46-5	2.43-5

B1 – D1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	493.8	8.82-4	7.74-4	6.41-4	5.24-4	4.53-4	4.67-4
26	767.5	3.68-4	3.16-4	2.44-4	1.65-4	1.10-4	7.94-5
30	1096.0	1.16-4	1.00-4	7.71-5	5.39-5	3.54-5	2.63-5
34	1475.7	3.81-5	3.41-5	2.84-5	2.38-5	2.21-5	2.45-5
38	1903.9	1.43-5	1.31-5	1.14-5	1.04-5	1.08-5	1.30-5
42	2377.3	5.99-6	5.53-6	4.93-6	4.63-6	5.00-6	6.21-6
46	2892.0	2.75-6	2.54-6	2.31-6	2.17-6	2.35-6	2.98-6
50	3443.1	1.35-6	1.26-6	1.14-6	1.07-6	1.13-6	1.47-6
54	4025.1	7.10-7	6.56-7	5.94-7	5.52-7	5.63-7	7.54-7
58	4631.5	3.90-7	3.59-7	3.23-7	2.97-7	2.83-7	3.98-7
62	5254.5	2.24-7	2.05-7	1.82-7	1.85-7	1.45-7	2.16-7
66	5885.3	1.33-7	1.21-7	1.06-7	9.46-8	7.92-8	1.20-7
70	6513.3	8.15-8	7.31-8	6.37-8	5.63-8	4.63-8	6.82-8
74	7126.0	5.09-8	4.54-8	3.91-8	3.41-8	2.81-8	3.93-8
78	7708.5	3.28-8	2.89-8	2.46-8	2.10-8	1.73-8	2.30-8
82	8243.1	2.16-8	1.87-8	1.57-8	1.32-8	1.08-8	1.36-8
87	8810.9	1.28-8	1.11-8	9.23-9	7.55-9	6.15-9	7.22-9
92	9217.9	7.13-9	6.63-9	5.51-9	4.46-9	3.63-9	3.98-9

B1 – D2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	497.7	1.68-3	2.33-3	3.58-3	5.77-3	9.07-3	1.33-2
26	773.2	1.04-3	1.40-3	2.11-3	3.40-3	5.27-3	7.73-3
30	1107.7	7.50-4	9.68-4	1.40-3	2.18-3	3.39-3	4.93-3
34	1501.1	5.65-4	7.15-4	1.02-3	1.56-3	2.43-3	3.51-3
38	1952.7	4.43-4	5.57-4	7.89-4	1.21-3	1.88-3	2.72-3
42	2461.7	3.59-4	4.50-4	6.38-4	9.75-4	1.52-3	2.21-3
46	3027.4	2.98-4	3.74-4	5.30-4	8.10-4	1.26-3	1.85-3
50	3642.4	1.10-5	1.28-5	1.63-5	2.24-5	3.20-5	4.46-5
54	4265.4	3.32-6	3.47-6	3.80-6	4.46-6	5.59-6	7.19-6
58	4921.3	1.87-6	1.93-6	2.10-6	2.44-6	3.02-6	3.86-6
62	5604.4	1.09-6	1.13-6	1.22-6	1.41-6	1.75-6	2.23-6
66	6307.9	6.55-7	6.77-7	7.31-7	8.39-7	1.04-6	1.33-6
70	7023.8	4.00-7	4.13-7	4.46-7	5.12-7	6.34-7	8.09-7
74	7742.4	2.48-7	2.56-7	2.77-7	3.18-7	3.94-7	5.02-7
78	8452.7	1.57-7	1.62-7	1.75-7	2.01-7	2.49-7	3.17-7
82	9141.0	1.00-7	1.03-7	1.11-7	1.29-7	1.59-7	2.04-7
87	9945.4	5.84-8	6.03-8	6.49-8	7.50-8	9.30-8	1.20-7
92	10649.9	3.47-8	3.56-8	3.86-8	4.46-8	5.53-8	7.17-8

B1 – D3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	516.0	1.59-3	1.75-3	2.14-3	2.93-3	4.24-3	6.05-3
26	799.1	1.29-3	1.43-3	1.74-3	2.46-3	3.44-3	4.91-3
30	1146.0	1.04-3	1.15-3	1.39-3	1.88-3	2.74-3	3.89-3
34	1558.6	8.34-4	9.17-4	1.11-3	1.50-3	2.18-3	3.08-3
38	2018.3	3.84-5	3.79-5	3.84-5	4.19-5	4.95-5	6.06-5
42	2515.0	1.86-5	1.84-5	1.89-5	2.06-5	2.43-5	2.97-5
46	3057.6	9.43-6	9.33-6	9.48-6	1.02-5	1.18-5	1.43-5
50	3648.4	2.40-4	3.01-4	4.27-4	6.54-4	1.02-3	1.50-3
54	4293.6	3.09-6	[illegible]	4.12-6	5.74-6	8.56-6	1.27-5
58	4958.3	7.82-7	[illegible]	6.37-7	6.59-7	8.10-7	1.13-6
62	5652.4	3.77-7	[illegible]	2.66-7	4.14-7	2.52-7	3.29-7
66	6369.7	2.04-7	1.73-7	1.39-7	9.93-8	1.20-7	1.51-7
70	7102.5	1.18-7	1.00-7	8.16-8	6.65-8	7.22-8	9.07-8
74	7841.8	7.23-8	6.24-8	5.25-8	4.64-8	5.08-8	6.44-8
78	8577.0	4.68-8	4.14-8	3.65-8	3.47-8	3.94-8	5.06-8
82	9295.0	3.19-8	2.93-8	2.59-8	2.76-8	3.26-8	4.24-8
87	10144.3	2.15-8	2.05-8	2.03-8	2.20-8	2.70-8	3.57-8
92	10903.5	1.55-8	1.57-8	1.61-8	1.83-8	2.31-8	3.09-8

B1 – D4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	545.5	2.18-3	1.79-3	1.32-3	8.88-4	6.04-4	4.98-4
26	832.3	6.49-4	5.57-4	4.52-4	3.67-4	3.33-4	3.54-4
30	1174.6	2.11-4	1.91-4	1.72-4	1.62-4	1.70-4	1.97-4
34	1570.6	8.16-5	7.67-5	7.26-5	7.28-5	8.02-5	9.44-5
38	2028.5	3.13-5	2.73-5	2.29-5	2.04-5	2.13-5	2.55-5
42	2528.1	1.44-5	1.27-5	1.09-5	1.01-5	1.11-5	1.36-5
46	3074.6	7.79-6	7.30-6	7.10-6	7.80-6	9.94-6	1.33-5
50	3664.9	1.13-5	1.30-5	1.68-5	2.41-5	3.63-5	5.28-5
54	4325.1	2.18-4	2.74-4	3.89-4	5.97-4	9.29-4	1.38-3
58	5054.0	1.94-4	2.44-4	3.48-4	5.34-4	8.31-4	1.24-3
62	5834.7	1.74-4	2.21-4	3.15-4	5.00-4	7.53-4	1.12-3
66	6665.3	1.60-4	2.04-4	2.91-4	4.56-4	6.96-4	1.04-3
70	7543.5	1.50-4	1.92-4	2.75-4	4.26-4	6.55-4	9.73-4
74	8466.8	1.45-4	1.87-4	2.66-4	4.09-4	6.28-4	9.31-4
78	9431.9	1.44-4	1.84-4	2.63-4	4.00-4	6.14-4	9.07-4
82	10435.1	1.47-4	1.87-4	2.68-4	3.99-4	6.10-4	9.00-4
87	11735.4	1.53-4	1.95-4	2.75-4	4.08-4	6.17-4	9.12-4
92	13076.1	1.66-4	2.11-4	2.90-4	4.25-4	6.39-4	9.45-4

B1 – D5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	549.0	1.33-3	1.06-3	7.41-4	4.32-4	2.08-4	9.04-5
26	836.8	4.55-4	3.64-4	2.53-4	1.47-4	7.11-5	3.11-5
30	1180.6	1.69-4	1.35-4	9.40-5	5.56-5	2.86-5	1.52-5
34	1578.5	6.94-5	5.64-5	4.08-5	2.67-5	1.77-5	1.44-5
38	2038.9	6.83-4	7.50-4	9.07-4	1.22-3	1.79-3	2.52-3
42	2588.8	6.02-4	6.70-4	8.18-4	1.11-3	1.63-3	2.30-3
46	3210.0	6.54-4	7.42-4	9.24-4	1.26-3	1.86-3	2.60-3
50	3870.2	9.30-4	7.68-4	5.76-4	4.04-4	3.00-4	2.74-4
54	4589.8	8.04-4	6.69-4	5.09-4	3.68-4	2.86-4	2.75-4
58	5371.4	7.08-4	5.94-4	4.60-4	3.44-4	2.82-4	2.84-4
62	6215.4	6.31-4	5.34-4	4.21-4	3.27-4	2.81-4	2.94-4
66	7122.1	5.70-4	4.87-4	3.92-4	3.13-4	2.82-4	3.05-4
70	8091.8	5.20-4	4.48-4	3.66-4	3.02-4	2.81-4	3.11-4
74	9099.1	2.81-5	2.57-5	2.35-5	2.27-5	2.48-5	3.02-5
78	10123.2	6.77-6	6.36-6	6.05-6	6.17-6	7.02-6	8.76-6
82	11189.4	2.59-6	2.50-6	2.53-6	2.60-6	3.06-6	3.89-6
87	12577.0	1.08-6	1.07-6	1.09-6	1.19-6	1.45-6	1.89-6
92	14017.9	5.59-7	5.77-7	5.90-7	6.68-7	8.39-7	1.13-6

B1 – D6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	551.1	3.98-3	3.48-3	2.93-3	2.52-3	2.45-3	2.73-3
26	842.2	3.42-3	2.83-3	2.12-3	1.47-3	1.07-3	9.52-4
30	1194.2	2.66-3	2.17-3	1.57-3	1.02-3	6.54-4	4.99-4
34	1607.2	2.05-3	1.67-3	1.20-3	7.67-4	4.74-4	3.45-4
38	2081.1	1.62-3	1.31-3	9.48-4	6.08-4	3.79-4	2.79-4
42	2616.1	1.31-3	1.07-3	7.73-4	5.02-4	3.21-4	2.46-4
46	3212.9	1.06-3	8.63-4	6.19-4	3.91-4	2.33-4	1.59-4
50	3899.2	1.14-3	1.06-3	1.01-3	1.06-3	1.29-3	1.64-3
54	4622.1	7.43-4	6.06-4	4.43-4	2.94-4	2.01-4	1.67-4
58	5405.9	6.01-4	4.81-4	3.34-4	1.95-4	9.57-5	4.22-5
62	6251.4	5.22-4	4.21-4	2.98-4	1.84-4	1.01-4	6.07-5
66	7157.8	4.68-4	3.86-4	2.69-4	2.01-4	1.46-4	1.32-4
70	8113.3	2.53-4	2.18-4	1.78-4	1.45-4	1.34-4	1.46-4
74	9124.9	4.77-4	4.14-4	3.43-4	2.90-4	2.77-4	3.13-4
78	10221.9	4.40-4	3.86-4	3.25-4	2.81-4	2.76-4	3.17-4
82	11383.2	4.09-4	3.60-4	3.07-4	2.70-4	2.71-4	3.16-4
87	12926.0	3.74-4	3.32-4	2.86-4	2.57-4	2.63-4	3.12-4
92	14571.0	3.43-4	3.06-4	2.67-4	2.43-4	2.52-4	3.05-4

B1 – D7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	561.5	1.44-2	1.52-2	1.69-2	2.02-2	2.55-2	3.27-2
26	856.1	9.25-3	9.55-3	1.03-2	1.20-2	1.48-2	1.88-2
30	1211.2	5.99-3	6.03-3	6.31-3	7.08-3	8.58-3	1.07-2
34	1626.9	3.94-3	3.85-3	3.87-3	4.18-3	4.92-3	6.03-3
38	2103.5	2.63-3	2.48-3	2.37-3	2.42-3	2.73-3	3.28-3
42	2641.2	1.77-3	1.60-3	1.43-3	1.34-3	1.40-3	1.63-3
46	3240.3	1.20-3	1.03-3	8.29-4	6.61-4	5.79-4	6.07-4
50	3907.9	8.82-4	9.99-4	1.23-3	1.63-3	2.33-3	3.19-3
54	4662.3	1.15-2	1.32-2	1.61-2	2.06-2	2.73-2	3.61-2
58	5457.8	1.13-2	1.29-2	1.56-2	1.98-2	2.60-2	3.43-2
62	6311.7	9.27-3	1.06-2	1.27-2	1.62-2	2.12-2	2.80-2
66	7202.1	5.01-5	4.82-5	4.76-5	5.07-5	5.97-5	7.52-5
70	8146.0	2.08-4	1.72-4	1.28-4	8.90-5	6.52-5	5.90-5
74	9171.1	4.15-4	3.60-4	2.97-4	2.48-4	2.36-4	2.65-4
78	10267.8	4.22-4	3.76-4	3.26-4	2.95-4	3.04-4	3.59-4
82	11429.4	4.13-4	3.76-4	3.38-4	3.22-4	3.49-4	4.24-4
87	12972.4	3.98-4	3.70-4	3.45-4	3.43-4	3.87-4	4.83-4
92	14617.2	3.82-4	3.60-4	3.45-4	3.34-4	4.10-4	5.25-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - D8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	567.0	5.90-2	6.80-2	8.35-2	1.08-1	1.43-1	1.86-1
26	864.6	4.68-2	5 38-2	6.55-2	8.37-2	1 10-1	1.42-1
30	1222.8	3.75-2	4.29-2	5 21-2	6.62-2	8.65-2	1.11-1
34	1642.0	3.05-2	3.48-2	4.21-2	5.34-2	6.95-2	8.90-2
38	2122.5	2.52-2	2 87-2	3.46-2	4.39-2	5.69-2	7 30-2
42	2664.7	2.11-2	2.39-2	2.89-2	3.65-2	4.73-2	6.09-2
46	3269.1	1.77-2	2.02-2	2.42-2	3.06-2	3.96-2	5.12-2
50	3936.9	1.46-2	1.65-2	1.97-2	2.48-2	3.19-2	4.14-2
54	4686.8	1.93-3	2.05-3	2.25-3	2.57-3	2.93-3	3.67-3
58	5497.3	6.18-5	6.70-5	7 66-5	9.29-5	1.17-4	1 53-4
62	6327.6	7.62-4	8.66-4	1.04-3	1.32-3	1.74-3	2 30-3
66	7240.3	8.79-3	9.99-3	1.20-2	1.53-2	2.01-2	2.67-2
70	8229.8	7 79-3	8.86-3	1.07-2	1.36-2	1.79-2	2.38-2
74	9286.3	6.92-3	7.87-3	9.50-3	1.21-2	1.60-2	2.12-2
78	10410.8	6.18-3	7 03-3	8.49-3	1.08-2	1.43-2	1 91-2
82	11604.1	5.55-3	6.31-3	7.63-3	9.73-3	1.29-2	1.73-2
87	13194.4	4.88-3	5.56-3	6.73-3	8.60-3	1.15-2	1.55-2
92	14896.4	4 32-3	4.93-3	5.97-3	7.66-3	1.03-2	1.40-2

B1 - D9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	607 8	4 38-4	3.98-4	3.52-4	3.22-4	3.36-4	4.08-4
26	914.3	2.52-4	2.54-4	2.70-4	3.19-4	4.22-4	5.80-4
30	1282.0	1.62-4	1.76-4	2.06-4	2.67-4	3.72-4	5.16-4
34	1710.8	1.11-4	1 23-4	1.48-4	1.94-4	2.72-4	3.74-4
38	2199.7	8.41-5	9.04-5	1.05-4	1.34-4	1.83-4	2.49-4
42	2746.1	5.08-5	5.39-5	6.14-5	7.70-5	1.04-4	1.41-4
46	3349 5	3.59-5	3.84-5	4.41-5	5.55-5	7.45-5	1.01-4
50	4009.8	2.96-5	3.19-5	3.69-5	4.66-5	6.22-5	8.43-5
54	4726.2	2.79-5	3.04-5	3.56-5	4.53-5	6.10-5	8.30-5
58	5542.8	3.19-4	3.04-4	2.85-4	2.74-4	2.51-4	3.17-4
62	6451.4	1.63-6	1.83-6	2.26-6	3.08-6	4.56-6	6.60-6
66	7382.0	1.07-6	1.18-6	1.41-6	1.81-6	2.46-6	3.34-6
70	8377.6	7.95-7	8.52-7	9.80-7	1.21-6	1.59-6	2.12-6
74	9439.1	5.96-7	6.15-7	6.89-7	8.18-7	1 05-6	1.38-6
78	10567.4	4.55-7	4 61-7	4.91-7	5.62-7	7.01-7	9.09-7
82	11763.6	3.46-7	3.50-7	3.54-7	3.89-7	4.70-7	6.00-7
87	13356.3	2.66-7	2.52-7	2.40-7	2.46-7	2.82-7	3.53-7
92	15060.8	2.02-7	1.82-7	1.63-7	1.52-7	1.62-7	1.96-7

B1 - D10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	610.5	6.06-4	5.42-4	4.82-4	4.60-4	4.96-4	6.17-4
26	918.2	2.42-4	2.63-4	3.12-4	4.14-4	5.94-4	8.48-4
30	1286.1	8.21-5	7.33-5	6.32-5	5 68-5	5.89-5	7.07-5
34	1714.2	3.41-5	2.80-5	2.01-5	1.23-5	6.26-6	2.88-6
38	2202.8	9.37-6	9.26-6	9.61-6	1.10-5	1.40-5	1.84-5
42	2754.1	1 19-5	1.40-5	1.78-5	2.42-5	3.37-5	4.62-5
46	3367.9	9.09-6	1.06-5	1.32-5	1.77-5	2.43-5	3.31-5
50	4044.1	6.13-6	7 01-6	8.58-6	1.13-5	1.52-5	2.05-5
54	4783.1	4.17-6	4.68-6	5.58-6	7.12-6	9.36-6	1.25-5
58	5585.5	3 21-6	3.47-6	3.95-6	4.74-6	5.88-6	7.63-6
62	6486.9	2.11-4	1.98-4	1.85-4	1.82-4	1.90-4	2.56-4
66	7459 9	2.04-5	2.36-5	2.92-5	3.84-5	5.30-5	7.24-5
70	8462.3	1.80-5	2.06-5	2.52-5	3.26-5	4.40-5	5.95-5
74	9530.8	1.57-5	1.79-5	2.18-5	2.82-5	3.78-5	5.11-5
78	10666.2	1.37-5	1.56-5	1.90-5	2.45-5	3.29-5	4.44-5
82	11869 8	1 20-5	1.37-5	1.67-5	2.14-5	2.88-5	3.90-5
87	13472.2	1 01-5	1.15-5	1.40-5	1.81-5	2.44-5	3.32-5
92	15186.6	8.40-6	9.60-6	1.17-5	1.51-5	2.04-5	2.81-5

B1 - D11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	611.1	5.85-4	7.09-4	9.58-4	1.43-3	2.21-3	3.27-3
26	919.6	4.31-4	3.65-4	2.87-4	2.13-4	1.61-4	1.48-4
30	1292.7	2.91-4	2.45-4	1.83-4	1.21-4	6.98-5	4.09-5
34	1729.9	1.83-4	1.59-4	1.28-4	9.88-5	8.09-5	7.91-5
38	2229.6	1.32-4	1.32-4	1.39-4	1.60-4	2.03-4	2.66-4
42	2790.2	9.64-5	1.05-4	1.23-4	1.55-4	2.07-4	2.78-4
46	3411.9	6.88-5	7.69-5	9.20-5	1.18-4	1.59-4	2.13-4
50	4095.3	5.08-5	5.72-5	6.89-5	8.87-5	1.18-4	1.59-4
54	4841.1	3.92-5	4.44-5	5.35-5	6.86-5	9.10-5	1.22-4
58	5650.1	3.17-5	3.58-5	4.31-5	5.50-5	7.24-5	9.71-5
62	6523.0	2.70-5	3.03-5	3.60-5	4.54-5	5.85-5	7 81-5
66	7523.9	1.73-4	1.63-4	1.54-4	1.56-4	1.75-4	2.38-4
70	8659.2	1.48-4	1 40-4	1.34-4	1.39-4	1.65-4	2.25-4
74	9900.5	1.30-4	1.23-4	1.19-4	1.25-4	1.52-4	2.07-4
78	11256.3	1.16-4	1.10-4	1.07-4	1.13-4	1.38-4	1.89-4
82	12737.0	1.05-4	9.98-5	9.63-5	1.02-4	1.25-4	1.71-4
87	14782.4	9.42-5	8.92-5	8.57-5	9.03-5	1.11-4	1.52-4
92	17071.9	8.54-5	8.06-5	7.71-5	8.05-5	9.83-5	1.36-4

B1 - D12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	617.6	1.53-3	2.11-3	3.23-[illegible]	[illegible]2-3	8.38-3	1.26-2
26	927 9	1.59-3	2.12-3	3.13-3	[illegible]85-3	7.59-3	1.12-2
30	1302.2	1 37-3	1.78-3	2.54-3	3.83-3	5.85-3	8.47-3
34	1741.8	1.04-3	1.30-3	1.79-3	2.63-3	3 92-3	5.59-3
38	2249.1	7 36-4	8.82-4	1.16-3	1.64-3	2.39-3	3.38-3
42	2827.3	5 40-4	6.24-4	7.89-4	1.09-3	1.56-3	2.20-3
46	3479.1	4.26-4	4.83-4	5.97-4	8.08-4	1.15-3	1.62-3
50	4207.2	3 53-4	3.96-4	4.84-4	6.47-4	9.15-4	1.30-3
54	5015.3	3.01-4	3.36-4	4.07-4	5.41-4	7.62-4	1.08-3
58	5907.4	2.62-4	2.90-4	3.50-4	4.62-4	6.50-4	9.27-4
62	6888.3	2.30-4	2.54-4	3.05-4	4.01-4	5.64-4	8.05-4
66	7963.8	2.04-4	2.25-4	2.68-4	3.51-4	4.93-4	7.05-4
70	9140.5	1.82-4	2.00-4	2.37-4	3.10-4	4.35-4	6.20-4
74	10426.2	1.64-4	1.79-4	2.11-4	2.75-4	3.85-4	5.49-4
78	11830.2	1.48-4	1.61-4	1.89-4	2.44-4	3.42-4	4.87-4
82	13363.3	1 34-4	1.45-4	1.69-4	2.18-4	3.05-4	4.35-4
87	15482.0	1 20-4	1.29-4	1.49-4	1.90-4	2.65-4	3.79-4
92	17856.1	1.08-4	1.15-4	1.31-4	1.66-4	2.30-4	3.34-4

B1 - D13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	641.1	4.73-4	6.12-4	9.06-4	1.48-3	2.45-3	3.81-3
26	955.1	5.25-4	6.94-4	1.03-3	1.65-3	2.67-3	4.08-3
30	1332.9	6.37-4	8.44-4	1.25-3	1.97-3	3.12-3	4.65-3
34	1777.0	7.81-4	1.03-3	1.50-3	2.33-3	3.65-3	5.36-3
38	2290.5	8.37-4	1.08-3	1.54-3	2.34-3	3.60-3	5.23-3
42	2874.0	5.87-4	7.16-4	9.63-4	1.40-3	2.09-3	3.01-3
46	3529.4	4.22-4	4.94-4	6.33-4	8.87-4	1.29-3	1.85-3
50	4260.8	3.47-4	3.98-4	5.00-4	6.87-4	9.92-4	1.42-3
54	5072.3	3.00-4	3.41-4	4.24-4	5.78-4	8.30-4	1.19-3
58	5968.1	2.65-4	3.00-4	3.71-4	5.03-4	7.21-4	1.04-3
62	6953.1	2.37-4	2.67-4	3.29-4	4.45-4	6.37-4	9.20-4
66	8032.9	2.13-4	2.40-4	2.95-4	3.97-4	5.69-4	8.22-4
70	9214.2	1.94-4	2.17-4	2.66-4	3.57-4	5.12-4	7.38-4
74	10504.8	1.76-4	1 98-4	2.41-4	3.23-4	4.62-4	6.66-4
78	11914.0	1.61-4	1.80-4	2.19-4	2.93-4	4.19-4	6.04-4
82	13452.8	1.49-4	1.65-4	2.00-4	2.67-4	3.82-4	5.51-4
87	15579.1	1.35-4	1.49-4	1.79-4	2.38-4	3.41-4	4.95-4
92	17951.7	1.23-4	1.36-4	1.62-4	2.14-4	3.06-4	4.50-4

B1 - D14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	645.5	3.41-4	3.03-4	2.56-4	2.11-4	1.78-4	1.69-4
26	961.1	2.78-4	2.47-4	2.09-4	1.71-4	1.52-4	1.51-4
30	1340.0	2.33-4	2.05-4	1.68-4	1.33-4	1.08-4	9.97-5
34	1784.2	1.92-4	1.63-4	1.25-4	8.51-5	5.22-5	3.29-5
38	2296.8	1.95-4	1.91-4	1.98-4	2.35-4	3.20-4	4.53-4
42	2884.0	4.18-4	5.23-4	7.27-4	1.09-3	1.68-3	2.47-3
46	3550.8	5 01-4	6.41-4	9.09-4	1.38-3	2.12-3	3.14-3
50	4300.0	4.74-4	6.08-4	8.62-4	1.31-3	2.02-3	3.00-3
54	5136.0	4.16-4	5.35-4	7.59-4	1.15-3	1.78-3	2.66-3
58	6064.2	3.54-4	4.54-4	6.45-4	9.81-4	1.52-3	2.29-3
62	7090.9	2.93-4	3.76-4	5.35-4	8.16-4	1.27-3	1.93-3
66	8222.9	2.34-4	3.01-4	4.29-4	6.58-4	1.03-3	1.57-3
70	9465.3	1.68-4	2.16-4	3.09-4	4.77-4	7.53-4	1.15-3
74	10812.9	6.22-5	7.99-5	1.15-4	1.79-4	2.85-4	4.40-4
78	12262.9	1.15-5	1.46-5	2.07-5	3.24-5	5.24-5	8.13-5
82	13837.5	3.25-6	3.89-6	5.27-6	8.09-6	1.30-5	2.04-5
87	16010.5	1.24-6	1.32-6	1.57-6	2.19-6	3.36-6	5.20-6
92	18445.6	7.66-7	7.38-7	7.49-7	8.67-7	1.15-6	1.72-6

B1 - D15

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	704.9	2.18-5	2.28-5	2.51-5	2.99-5	3.91-5	5.26-5
26	1035.2	2.25-5	2.20-5	2.49-5	3.03-5	4.16-5	5.68-5
30	1430.3	1.91-5	2.11-5	2.34-5	2.97-5	4.05-5	5.52-5
34	1892.0	1.65-5	1.86-5	2.17-5	2.80-5	3.85-5	5.25-5
38	2422.2	1.46-5	1.67-5	2.01-5	2.63-5	3.65-5	5.01-5
42	3023.3	1.32-5	1.52-5	1.88-5	2.50-5	3.50-5	4.86-5
46	3698.2	1.22-5	1.43-5	1.80-5	2.43-5	3.43-5	4.82-5
50	4450.2	1.17-5	1.38-5	1.76-5	2.42-5	3.47-5	4.95-5
54	5283.0	1.17-5	1.40-5	1.81-5	2.53-5	3.68-5	5.32-5
58	6201.2	1.24-5	1.51-5	1.99-5	2.83-5	4.17-5	6.11-5
62	7210.1	1.46-5	1.80-5	2.42-5	3.52-5	5.27-5	7.83-5
66	8316.6	2.06-5	2.58-5	3.53-5	5.25-5	8.01-5	1.20-4
70	9531.5	4.08-5	5.15-5	7.24-5	1.10-4	1.71-4	2.60-4
74	10878.8	1.07-4	1.37-4	1.95-4	3.01-4	4.77-4	7.31-4
78	12383.8	1.24-4	1.59-4	2.28-4	3.56-4	5.70-4	8.79-4
82	14050.7	1.04-4	1.33-4	1.92-4	3.02-4	4.90-4	7.60-4
87	16382.0	7.80-5	9.95-5	1.44-4	2.28-4	3.75-4	5.92-4
92	19028.5	5.72-5	7.21-5	1.03-4	1.66-4	2.77-4	4.52-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - E1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	491.2	6.64-4	6.25-4	5 93-4	6.06-4	7.01-4	8.93-4
26	761.4	1.74-4	1.80-4	2.02-4	2.56-4	3.54-4	4.94-4
30	1095.5	5.31-5	5.71-5	6 79-5	9.12-5	1.32-4	1.87-4
34	1461.3	1.86-5	2.01-5	2.41-5	3.27-5	4.78-5	6.79-5
38	1885.8	7 34-6	7.81-6	9.31-6	1.25-5	1.82-5	2.60-5
42	2355.6	3.20-6	3.34-6	3.92-6	5.15-6	7.43-6	1.07-5
46	2866.6	1 51-6	1.55-6	1.78-6	2.30-6	3.28-6	4.75-6
50	3414.0	7.61-7	7 68-7	8.65-7	1.11-6	1.56-6	2.27-6
54	3992.2	4.02-7	4.01-7	4.45-7	5.66-7	7.95-7	1.16-6
58	4594.7	2.21-7	2.19-7	2.41-7	3.07-7	4.31-7	6.28-7
62	5213.7	1.25-7	1.24-7	1.37-7	1.52-7	2.47-7	3.60-7
66	5840.4	7 34-8	7.31-8	8.11-8	7.56-8	1.50-7	2.17-7
70	6464.0	4.46-8	4.48-8	5.05-8	5.61-8	9.56-8	1.38-7
74	7072.2	2.81-8	2.94-8	3.30-8	4.02-8	6.40-8	9.21-8
78	7650.1	1.87-8	1.96-8	2.29-8	2.95-8	4.49-8	6.43-8
82	8180.0	1.36-8	1.41-8	1 07-8	2.22-8	3.28-8	4.67-8
87	8741.6	9.38-9	1 02-8	1.13-8	1.64-8	2.35-8	3.31-8
92	9142.0	7.34-9	7.22-9	9.53-9	1.27-8	1.77-8	2.47-8

B1 - E2

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
494.9	1.68-3	1.61-3	1.58-3	1.70-3	2.05-3	2.68-3
769.9	1.22-3	1.10-3	9.52-4	8.29-4	8.01-4	9.14-4
1104.3	8.78-4	7.76-4	6.41-4	5.07-4	4.31-4	4.40-4
1497.3	6.57-4	5.74-4	4.65-4	3.52-4	2.79-4	2.66-4
1948.4	5.10-4	4.44-4	3.54-4	2.62-4	1.99-4	1.82-4
2456.9	4.08-4	3.54-4	2.81-4	2.05-4	1.51-4	1.35-4
3021.9	3.35-4	2.90-4	2.29-4	1.65-4	1.20-4	1.06-4
3638.7	4.54-5	4.08-5	3.48-5	2.92-5	2.63-5	2.74-5
4261.5	7.54-6	7.60-6	7.92-6	8.77-6	1.03-5	1.27-5
4916.9	4.37-6	4.47-6	4.74-6	5.37-6	6.45-6	8.10-6
5599.6	2.58-6	2.66-6	2.85-6	3.28-6	3.95-6	4.99-6
6302.7	1.56-6	1.61-6	1.73-6	1.95-6	2.43-6	3.08-6
7018.1	9.58-7	9.91-7	1.07-6	1.22-6	1.51-6	1.92-6
7736.5	6.00-7	6.21-7	6.73-7	7.72-7	9.54-7	1.21-6
8446.5	3.83-7	3.97-7	4.30-7	4.95-7	6.12-7	7.79-7
9134.6	2.48-7	2.57-7	2.72-7	3.21-7	3.97-7	5.07-7
9938.8	1.47-7	1.52-7	1.64-7	1.90-7	2.36-7	3.02-7
10643.2	8.87-8	9.07-8	9.90-8	1.14-7	1.42-7	1.83-7

B1 - E3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	503.7	3.08-3	3.98-3	5.75-3	8.93-3	1.38-2	2.01-2
26	780.7	2.13-3	2.74-3	3.95-3	6.16-3	9.43-3	1.38-2
30	1116.8	1.54-3	1.97-3	2.82-3	4.35-3	6.75-3	9.78-3
34	1511.5	1 16-3	1.47-3	2.10-3	3.24-3	5.03-3	7.27-3
38	1964.2	9.02-4	1.14-3	1.63-3	2 50-3	3.89-3	5.63-3
42	2474.2	7.22-4	9.11-4	1.30-3	1.99-3	3.09-3	4 51-3
46	3040.6	5.84-4	7.35-4	1.04-3	1.60-3	2.49-3	3.66-3
50	3642.9	2.46-4	2.12-4	1.66-4	1.18-4	8.49-5	7.45-5
54	4297.8	9.61-6	8.89-6	8.14-6	7.71-6	7.66-6	8.62-6
58	4959.0	4.16-6	4.17-6	4.32-6	4.75-6	5.51-6	6.75-6
62	5647 3	2.21-6	2.23-6	2 34-6	2.70-6	3 13-6	3.91-6
66	6355.7	1.21-6	1.21-6	1.27-6	1.37-6	1.70-6	2.14-6
70	7076.5	6.80-7	6.78-7	7 02-7	7.68-7	9.33-7	1.17-6
74	7800.1	3.95-7	3.91-7	4.01-7	4.37-7	5.25-7	6.59-7
78	8515.4	2.36-7	2.32-7	2.35-7	2.54-7	3.03-7	3.78-7
82	9208.8	1 43-7	1.40-7	1 36-7	1.50-7	1.77-7	2.21-7
87	10019.8	7.86-8	7.56-8	7.42-8	7.88-8	9.22-8	1.15-7
92	10731.1	4.36-8	4.11-8	4.00-8	4.16-8	4.80-8	6.00-8

B1 - E4

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
544.8	3.11-3	2.54-3	1.85-3	1.22-3	7.98-4	6.37-4
831.2	1.17-3	1.00-3	8.08-4	6.54-4	5.99-4	6.47-4
1173.2	4.84-4	4.43-4	4.03-4	3.91-4	4.28-4	5.11-4
1569.0	2.23-4	2.15-4	2.14-4	2.29-4	2.71-4	3.34-4
2016.4	1.10-4	1.10-4	1.16-4	1.31-4	1.61-4	2.03-4
2512.7	5.80-5	6.01-5	6.58-5	7.79-5	9.88-5	1.27-4
3054.9	3.91-5	4.30-5	5.11-5	6.59-5	8.97-5	1.21-4
3662.2	4.66-4	5.85-4	8.28-4	1.27-3	1.98-3	2.93-3
4312.5	9.30-5	8.11-5	6.62-5	5.29-5	4.74-5	5.26-5
4980.0	4.28-6	3.64-6	2.92-6	2.34-6	2.06-6	2.18-6
5675.1	2.38-6	2.13-6	1.85-6	4.84-7	1.65-6	1.84-6
6393.4	1.48-6	1.37-6	1.27-6	1.17-6	1.33-6	1.55-6
7127.4	9.42-7	8.94-7	8.60-7	8.46-7	9.82-7	1.18-6
7868.0	6.05-7	5.84-7	5.76-7	5.94-7	6.96-7	8.48-7
8604.5	3.92-7	3.84-7	3.86-7	4.10-7	4.85-7	5.97-7
9324.0	2.58-7	2.54-7	2.44-7	2.82-7	3.36-7	4.17-7
10175.0	1.55-7	1.55-7	1.57-7	1.77-7	2.13-7	2.68-7
10936.0	9.49-8	9.12-8	9.97-8	1.13-7	1.36-7	1.74-7

B1 - E5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	550.2	4.18-3	4.03-3	4.00-3	4.30-3	5 13-3	6.42-3
26	838.8	2.52-3	2.68-3	3.01-3	3.63-3	4.63-3	5.94-3
30	1183.5	1.17-3	1.26-3	1.45-3	1.77-3	2.27-3	2.91-3
34	1582.3	4.99-4	5.42-4	6.24-4	7.66-4	9.87-4	1.26-3
38	2033.3	2.18-4	2.37-4	2.75-4	3.40-4	4.40-4	5.67-4
42	2533.7	1.01-4	1.11-4	1.31-4	1.64-4	2.14-4	2.79-4
46	3080.7	5.26-5	5.92-5	7.16-5	9.24-5	1.25-4	1.66-4
50	3671.0	6.05-5	7.44-5	1.00-4	1.45-4	2.14-4	3.04-4
54	4320.7	1.53-4	1.31-4	9.92-5	6.47-5	3.64-5	2.00-5
58	5046.9	2.09-4	1.79-4	1.39-4	9.69-5	6.60-5	5.36-5
62	5826.9	1.84-4	1.58-4	1.23-4	8.62-5	5.83-5	4.77-5
66	6656.8	1.65-4	1 41-4	1.09-4	7.62-5	5.18-5	4.21-5
70	7534.3	1.49-4	1.27-4	9.85-5	6.86-5	4.64-5	3.76-5
74	8456.9	1.36-4	1.16-4	8.97-5	6.24-5	4.22-5	3.40-5
78	9421.3	1.25-4	1.07-4	8.26-5	5.75-5	3.87-5	3.11-5
82	10423.8	1.16-4	9.94-5	7.68-5	5.34-5	3.59-5	2.87-5
87	11723.2	1.08-4	9.19-5	7.10-5	4.93-5	3.30-5	2.64-5
92	13062.9	1.01-4	8.61-5	6.64-5	4.60-5	3.08-5	2.46-5

B1 - E6

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
551.5	4.04-3	3.41-3	2.70-3	2.18-3	2.03-3	2.25-3
842.6	1.95-3	1.67-3	1.37-3	1.16-3	1.14-3	1.30-3
1190.2	8.22-4	7.11-4	5.92-4	5.12-4	5.11-4	5.84-4
1591.5	2.98-4	2.55-4	2.09-4	1.76-4	1.71-4	1.93-4
2044.3	1.11-4	9.52-5	7.74-5	6.46-5	6.25-5	7.05-5
2546.0	4.75-5	4.12-5	3.45-5	3.04-5	3.12-5	3.68-5
3094.1	2.45-5	2.24-5	2.07-5	2.11-5	2.48-5	3.17-5
3685.3	2.19-5	2.36-5	2.78-5	3.65-5	5.14-5	7.22-5
4340.1	4.42-4	5.59-4	7.96-4	1.22-3	1.90-3	2.82-3
5069.5	3.87-4	4.90-4	6.98-4	1.07-3	1.67-3	2.49-3
5850.8	3.45-4	4.38-4	6.26-4	9.96-4	1.50-3	2.23-3
6681.7	3.16-4	4.02-4	5.76-4	9.02-4	1.38-3	2.05-3
7560.2	2.96-4	3.79-4	5.42-4	8.40-4	1.29-3	1.92-3
8483.6	2.85-4	3.67-4	5.23-4	8.04-4	1.24-3	1.83-3
9448.7	2.82-4	3.62-4	5.16-4	7.86-4	1.21-3	1.79-3
10451.6	2.88-4	3.66-4	5.26-4	7.85-4	1.20-3	1.77-3
11751.4	3.00-4	3.83-4	5.39-4	8.02-4	1.21-3	1.80-3
13091.3	3.26-4	4.14-4	5.71-4	8.38-4	1.26-3	1.86-3

B1 - E7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	552.6	1.58-2	1.61-2	1.72-2	1.98-2	2.45-2	3.12-2
26	844.6	9.11-3	8.55-3	8.12-3	8.26-3	9.39-3	1.15-2
30	1197.5	5.65-3	5.02-3	4.36-3	3.95-3	4.07-3	4.70-3
34	1611.2	3.78-3	3.24-3	2.62-3	2.13-3	1.96-3	2.11-3
38	2085.9	2.66-3	2.20-3	1.67-3	1.21-3	9.47-4	9.08-4
42	2621.7	1.96-3	1.58-3	1.13-3	7.20-4	4.50-4	3.39-4
46	3218.9	1.51-3	1.20-3	8.29-4	4.81-4	2.37-4	1.14-4
50	3877.5	1.23-3	9.78-4	6.73-4	3.89-4	1.89-4	8.71-5
54	4597.9	1.05-3	8.49-4	6.03-4	3.80-4	2.31-4	1.70-4
58	5380.3	9.41-4	7.76-4	5.82-4	4.14-4	3.18-4	3.06-4
62	6225.0	8.71-4	7.39-4	5.89-4	4.70-4	4.22-4	4.61-4
66	7124.0	3.60-5	2.85-5	1.96-5	1.17-5	6.86-6	4.86-6
70	8046.4	5.09-6	4.59-6	4.12-6	4.03-6	4.49-6	5.67-6
74	9016.7	2.26-6	2.14-6	2.09-6	2.24-6	2.69-6	3.50-6
78	10032.7	1.24-6	1.20-6	1.22-6	1.36-6	1.69-6	2.24-6
82	11091.6	7.63-7	7.57-7	8.16-7	8.97-7	1.13-6	1.52-6
87	12470.0	4.72-7	4.75-7	5.07-7	5.80-7	7.43-7	1.01-6
92	13901.2	3.21-7	3.33-7	3.48-7	4.05-7	5.23-7	7.18-7

B1 - E8

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
554.9	1.23-2	1.25-2	1.34-2	1.55-2	1.93-2	2.46-2
848.2	7.92-3	7.88-3	8.18-3	9.17-3	1.12-2	1.41-2
1202.5	6.21-3	6.22-3	6.50-3	7.32-3	8.94-3	1.12-2
1618.0	5.04-3	5.08-3	5.35-3	6.07-3	7.42-3	9.28-3
2095.0	4.13-3	4.17-3	4.41-3	5.02-3	6.15-3	7.70-3
2633.8	3.41-3	3.45-3	3.65-3	4.16-3	5.09-3	6.41-3
3234.8	2.84-3	2.87-3	3.03-3	3.45-3	4.23-3	5.35-3
3898.7	2.38-3	2.40-3	2.53-3	2.88-3	3.53-3	4.49-3
4625.9	2.01-3	2.03-3	2.15-3	2.45-3	3.00-3	3.85-3
5411.1	7.09-4	5.74-4	4.15-4	2.74-4	1.88-4	1.63-4
6248.0	3.12-4	2.47-4	1.70-4	9.73-5	5.07-5	2.79-5
7132.7	8.16-4	7.15-4	6.07-4	5.34-4	5.38-4	6.30-4
8102.5	8.01-4	7.19-4	6.35-4	5.93-4	6.32-4	7.62-4
9101.8	1.00-5	8.05-6	5.59-6	3.62-6	2.71-6	2.78-6
10125.1	2.44-6	2.03-6	1.53-6	1.19-6	1.18-6	1.46-6
11190.9	1.18-6	9.25-7	7.20-7	8.11-7	1.02-6	1.42-6
12578.2	5.48-7	5.23-7	5.28-7	6.60-7	9.23-7	1.34-6
14018.9	3.60-7	3.57-7	4.33-7	5.76-7	8.36-7	1.24-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 – E9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	564.8	2.02-2	2.19-2	2.52-2	3.11-2	4.00-2	5.16-2
26	859.9	1.63-2	1.77-2	2.03-2	2.47-2	3.16-2	4.06-2
30	1215.0	1.29-2	1.38-2	1.57-2	1.89-2	2.40-2	3.05-2
34	1630.7	9.41-3	9.98-3	1.12-2	1.33-2	1.67-2	2.11-2
38	2107.6	6.35-3	6.61-3	7.23-3	8.46-3	1.05-2	1.32-2
42	2645.6	4.02-3	4.07-3	4.29-3	4.87-3	5.94-3	7.46-3
46	3245.0	2.46-3	2.38-3	2.36-3	2.53-3	2.98-3	3.70-3
50	3905.7	1.50-3	1.36-3	1.23-3	1.17-3	1.27-3	1.53-3
54	4627.8	9.47-4	7.86-4	5.98-4	4.40-4	3.58-4	3.62-4
58	5417.0	1.66-3	1.66-3	1.72-3	1.93-3	2.36-3	3.02-3
62	6265.2	2.89-4	2.34-4	1.70-4	1.15-4	8.04-5	7.26-5
66	7167.1	4.82-4	3.83-4	2.66-4	1.59-4	8.74-5	5.55-5
70	8120.6	1.63-4	1.34-4	9.88-5	6.80-5	5.03-5	4.64-5
74	9136.7	7.73-4	7.10-4	6.52-4	6.38-4	7.10-4	8.74-4
78	10234.2	7.45-4	6.97-4	6.59-4	6.70-4	7.68-4	9.62-4
82	11396.0	7.21-4	6.86-4	6.64-4	6.95-4	8.15-4	1.03-3
87	12939.3	6.95-4	6.72-4	6.67-4	7.16-4	8.58-4	1.11-3
92	14584.6	6.71-4	6.57-4	6.64-4	7.29-4	8.86-4	1.16-3

B1 – E10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	566.9	8.99-2	1.04-1	1.28-1	1.65-1	2.19-1	2.86-1
26	863.7	5.79-2	6.65-2	8.11-2	1.04-1	1.36-1	1.77-1
30	1221.1	4.50-2	5.15-2	6.25-2	7.96-2	1.04-1	1.34-1
34	1639.5	3.97-2	4.54-2	5.49-2	6.98-2	9.10-2	1.17-1
38	2119.3	3.63-2	4.14-2	5.00-2	6.35-2	8.26-2	1.06-1
42	2660.8	3.31-2	3.77-2	4.55-2	5.77-2	7.50-2	9.67-2
46	3264.4	2.98-2	3.40-2	4.10-2	5.19-2	6.75-2	8.75-2
50	3930.6	2.67-2	3.03-2	3.65-2	4.63-2	6.03-2	7.86-2
54	4659.9	2.37-2	2.69-2	3.24-2	4.11-2	5.35-2	7.02-2
58	5437.2	2.54-4	2.82-4	3.31-4	4.13-4	5.35-4	7.04-4
62	6272.8	1.40-3	1.40-3	1.44-3	1.61-3	1.96-3	2.52-3
66	7193.8	1.18-3	1.17-3	1.20-3	1.34-3	1.63-3	2.10-3
70	8148.5	3.11-4	2.54-4	1.88-4	1.31-4	1.00-4	9.84-5
74	9178.0	4.50-4	3.82-4	3.05-4	2.46-4	2.29-4	2.57-4
78	10275.6	4.49-4	3.92-4	3.31-4	2.92-4	2.99-4	3.55-4
82	11437.8	4.36-4	3.89-4	3.43-4	3.20-4	3.45-4	4.22-4
87	12981.4	4.13-4	3.76-4	3.43-4	3.35-4	3.77-4	4.72-4
92	14626.7	3.86-4	3.57-4	3.32-4	3.34-4	3.84-4	4.92-4

B1 – E11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	575.4	6.92-2	7.88-2	9.56-2	1.22-1	1.62-1	2.11-1
26	877.4	6.66-2	7.57-2	9.14-2	1.16-1	1.53-1	1.98-1
30	1244.5	5.31-2	6.02-2	7.23-2	9.15-2	1.19-1	1.54-1
34	1679.1	3.95-2	4.46-2	5.34-2	6.74-2	8.77-2	1.13-1
38	2170.4	1.18-5	1.01-5	8.12-6	6.28-6	5.19-6	4.98-6
42	2709.8	1.13-5	1.05-5	9.62-6	9.22-6	9.73-6	1.12-5
46	3306.9	1.44-5	1.42-5	1.44-5	1.56-5	1.82-5	2.22-5
50	3961.1	2.49-5	2.60-5	2.84-5	3.31-5	4.07-5	5.15-5
54	4671.6	2.69-5	2.75-5	2.92-5	3.34-5	4.07-5	5.16-5
58	5453.6	2.08-2	2.36-2	2.84-2	3.60-2	4.70-2	6.19-2
62	6310.6	1.86-2	2.12-2	2.55-2	3.23-2	4.23-2	5.59-2
66	7202.8	6.23-5	6.19-5	6.34-5	6.86-5	8.16-5	1.01-4
70	8181.3	1.02-3	1.01-3	1.03-3	1.14-3	1.39-3	1.79-3
74	9235.8	8.73-4	8.55-4	8.66-4	9.51-4	1.15-3	1.48-3
78	10358.2	7.45-4	7.24-4	7.25-4	7.88-4	9.50-4	1.22-3
82	11549.7	6.36-4	6.11-4	6.05-4	6.48-4	7.77-4	9.98-4
87	13137.8	5.21-4	4.94-4	4.78-4	5.02-4	5.95-4	7.65-4
92	14837.8	4.27-4	3.97-4	3.74-4	3.82-4	4.44-4	5.73-4

B1 – E12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	6[illegible].2	2.52-4	2.11-4	1.57-4	1.01-4	5.37-5	2.54-5
26	[illegible]04.2	9.82-5	8.16-5	6.00-5	3.76-5	1.97-5	9.23-6
30	1[illegible]67.1	3.90-5	3.22-5	2.34-5	1.45-5	7.49-6	3.53-6
34	1689.3	1.88-5	1.57-5	1.18-5	7.93-6	5.11-6	3.73-6
38	2183.6	2.92-2	3.28-2	3.92-2	4.93-2	6.42-2	8.26-2
42	2740.2	9.64-5	1.10-4	1.36-4	1.81-4	2.51-4	3.43-4
46	3348.2	8.74-5	1.02-4	1.28-4	1.75-4	2.47-4	3.45-4
50	4010.1	6.90-5	8.04-5	1.02-4	1.38-4	1.95-4	2.72-4
54	4726.8	5.07-5	5.87-5	7.36-5	9.90-5	1.38-4	1.93-4
58	5498.3	4.82-5	5.52-5	6.82-5	9.03-5	1.25-4	1.72-4
62	6324.5	1.42-5	1.20-5	9.41-6	5.98-6	5.81-6	5.65-6
66	7234.8	1.65-2	1.88-2	2.26-2	2.87-2	3.76-2	4.99-2
70	8224.1	1.47-2	1.67-2	2.02-2	2.56-2	3.37-2	4.47-2
74	9280.4	1.32-2	1.50-2	1.81-2	2.29-2	3.03-2	4.03-2
78	10404.8	1.18-2	1.35-2	1.62-2	2.07-2	2.74-2	3.65-2
82	11598.1	1.07-2	1.22-2	1.47-2	1.87-2	2.49-2	3.33-2
87	13188.5	9.46-3	1.08-2	1.30-2	1.66-2	2.22-2	3.00-2
92	14890.6	8.43-3	9.61-3	1.16-2	1.49-2	2.00-2	2.74-2

B1 – E13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	606.1	3.90-4	3.40-4	2.78-4	2.27-4	2.05-4	2.28-4
26	911.0	1.49-4	1.30-4	1.05-4	8.39-5	7.17-5	7.65-5
30	1276.6	7.37-5	6.45-5	5.33-5	4.17-5	3.40-5	3.16-5
34	1703.2	5.61-5	5.22-5	4.74-5	4.31-5	4.09-5	4.15-5
38	2191.2	1.65-4	1.74-4	1.91-4	2.19-4	2.61-4	3.15-4
42	2748.5	1.06-3	1.23-3	1.53-3	2.01-3	2.72-3	3.63-3
46	3356.3	1.02-4	1.19-4	1.48-4	1.97-4	2.70-4	3.65-4
50	4029.1	2.79-5	3.15-5	3.78-5	4.81-5	6.34-5	8.38-5
54	4765.7	1.64-5	1.81-5	2.11-5	2.61-5	3.35-5	4.37-5
58	5565.9	1.24-5	1.36-5	1.57-5	1.92-5	2.44-5	3.16-5
62	6429.8	1.03-5	1.12-5	1.29-5	1.54-5	1.99-5	2.59-5
66	7358.2	8.82-6	9.62-6	1.11-5	1.34-5	1.72-5	2.24-5
70	8351.6	7.75-6	8.45-6	9.74-6	1.19-5	1.52-5	1.99-5
74	9410.9	6.89-6	7.54-6	8.70-6	1.06-5	1.37-5	1.79-5
78	10536.9	6.15-6	6.74-6	7.81-6	9.60-6	1.24-5	1.63-5
82	11730.7	5.48-6	6.02-6	6.94-6	8.62-6	1.12-5	1.48-5
87	13320.3	4.65-6	5.11-6	5.95-6	7.38-6	9.65-6	1.29-5
92	15021.4	3.76-6	4.12-6	4.82-6	6.00-6	7.88-6	1.07-5

B1 – E14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	609.2	7.83-4	7.72-4	8.07-4	9.40-4	1.23-3	1.70-3
26	915.9	6.45-4	6.69-4	7.51-4	9.44-4	1.31-3	1.85-3
30	1284.2	4.46-4	4.82-4	5.69-4	7.50-4	1.07-3	1.52-3
34	1713.2	2.36-4	2.57-4	3.09-4	4.15-4	6.02-4	8.57-4
38	2201.7	8.68-5	8.09-5	7.77-5	8.44-5	1.08-4	1.49-4
42	2761.9	2.10-2	2.35-2	2.79-2	3.50-2	4.54-2	5.85-2
46	3396.3	1.69-4	2.01-4	2.60-4	3.60-4	5.12-4	7.15-4
50	4077.5	5.07-5	6.02-5	7.82-5	1.10-4	1.59-4	2.26-4
54	4821.2	2.72-5	3.20-5	4.11-5	5.73-5	8.27-5	1.19-4
58	5628.0	1.68-5	1.95-5	2.48-5	3.42-5	4.91-5	7.04-5
62	6498.6	1.12-5	1.29-5	1.61-5	2.21-5	3.15-5	4.50-5
66	7433.6	7.93-6	9.02-6	1.12-5	1.51-5	2.13-5	3.03-5
70	8433.8	5.87-6	6.62-6	8.08-6	1.08-5	1.52-5	2.14-5
74	9500.0	4.51-6	5.03-6	6.07-6	8.00-6	1.12-5	1.57-5
78	10633.1	3.57-6	3.93-6	4.70-6	6.12-6	8.49-6	1.19-5
82	11834.3	2.88-6	3.15-6	3.73-6	4.79-6	6.61-6	9.21-6
87	13433.7	2.23-6	2.42-6	2.83-6	3.60-6	4.94-6	6.89-6
92	15145.1	1.74-6	1.88-6	2.16-6	2.73-6	3.72-6	5.23-6

B1 – E15

Z	ΔE	E'=.009	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	610.5	9.69-4	1.08-3	1.32-3	1.85-3	2.82-3	4.22-3
26	919.0	7.98-4	9.41-4	1.25-3	1.85-3	2.88-3	4.31-3
30	1290.2	5.53-4	6.66-4	9.02-4	1.34-3	2.08-3	3.06-3
34	1724.0	3.21-4	3.84-4	5.15-4	7.62-4	1.17-3	1.71-3
38	2219.8	1.57-4	1.84-4	2.41-4	3.52-4	5.36-4	7.82-4
42	2777.3	5.67-5	5.94-5	6.96-5	9.45-5	1.41-4	2.08-4
46	3416.2	1.69-2	1.88-2	2.23-2	2.79-2	3.62-2	4.70-2
50	4151.3	1.35-2	1.51-2	1.78-2	2.24-2	2.91-2	3.80-2
54	4971.8	1.10-2	1.23-2	1.45-2	1.82-2	2.37-2	3.13-2
58	5883.2	9.13-3	1.02-2	1.20-2	1.52-2	1.98-2	2.63-2
62	6890.9	7.72-3	8.63-3	1.03-2	1.29-2	1.71-2	2.28-2
66	7989.3	4.46-3	5.09-3	6.23-3	8.13-3	1.11-2	1.52-2
70	9171.5	1.32-3	1.54-3	1.95-3	2.64-3	3.73-3	5.28-3
74	10458.9	8.35-4	9.78-4	1.24-3	1.70-3	2.44-3	3.48-3
78	11864.0	6.51-4	7.61-4	9.67-4	1.33-3	1.91-3	2.75-3
82	13398.1	5.47-4	6.37-4	8.07-4	1.11-3	1.60-3	2.31-3
87	15517.5	4.60-4	5.34-4	6.73-4	9.24-4	1.34-3	1.95-3
92	17891.9	3.98-4	4.59-4	5.76-4	7.89-4	1.15-3	1.69-3

B1 – E16

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	613.0	2.38-3	3.02-3	4.35-3	6.87-3	1.10-2	1.68-2
26	924.6	1.83-3	2.23-3	3.05-3	4.57-3	7.11-3	1.06-2
30	1302.0	1.40-3	1.65-3	2.18-3	3.15-3	4.79-3	6.98-3
34	1747.5	1.09-3	1.26-3	1.61-3	2.28-3	3.39-3	4.89-3
38	2263.7	8.44-4	9.51-4	1.18-3	1.63-3	2.39-3	3.43-3
42	2853.0	3.76-4	3.23-4	2.56-4	1.93-4	1.55-4	1.56-4
46	3506.7	7.22-4	8.39-4	1.07-3	1.50-3	2.20-3	3.17-3
50	4235.7	6.34-4	7.40-4	9.52-4	1.34-3	1.97-3	2.86-3
54	5044.8	5.16-4	6.00-4	7.69-4	1.08-3	1.60-3	2.35-3
58	5938.3	3.75-4	4.29-4	5.43-4	7.61-4	1.13-3	1.68-3
62	6921.9	2.13-4	2.21-4	2.51-4	3.27-4	4.78-4	7.17-4
66	8014.5	2.23-3	2.36-3	2.62-3	3.07-3	3.78-3	4.79-3
70	9238.4	4.35-3	4.78-3	5.55-3	6.86-3	8.90-3	1.18-2
74	10590.2	4.00-3	4.41-3	5.15-3	6.41-3	8.39-3	1.12-2
78	12079.0	3.49-3	3.85-3	4.50-3	5.62-3	7.39-3	9.89-3
82	13718.9	3.01-3	3.32-3	3.88-3	4.86-3	6.42-3	8.63-3
87	16008.4	2.48-3	2.73-3	3.21-3	4.02-3	5.34-3	7.25-3
92	18603.8	2.03-3	2.24-3	2.63-3	3.30-3	4.42-3	6.09-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - E17

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	638.6	1.14-3	1.43-3	2.01-3	3.14-3	5.01-3	7.62-3
26	951.3	1.15-3	1.41-3	1.95-3	2.94-3	4.58-3	6.83-3
30	1326.9	1.14-3	1.40-3	1.90-3	2.81-3	4.29-3	6.26-3
34	1767.4	1.13-3	1.37-3	1.84-3	2.68-3	4.04-3	5.82-3
38	2275.6	1.08-3	1.31-3	1.75-3	2.55-3	3.81-3	5.46-3
42	2855.1	1.28-3	1.61-3	2.23-3	3.32-3	5.02-3	7.29-3
46	3521.0	6.82-4	7.91-4	1.01-3	1.43-3	2.12-3	3.07-3
50	4269.8	5.42-4	6.18-4	7.79-4	1.09-3	1.60-3	2.33-3
54	5105.1	4.45-4	5.03-4	6.28-4	8.70-4	1.28-3	1.88-3
58	6032.7	3.68-4	4.14-4	5.13-4	7.08-4	1.04-3	1.54-3
62	7059.1	3.06-4	3.42-4	4.21-4	5.79-4	8.52-4	1.27-3
66	8192.2	2.55-4	2.83-4	3.46-4	4.74-4	7.00-4	1.04-3
70	9441.0	2.13-4	2.34-4	2.84-4	3.87-4	5.73-4	8.57-4
74	10816.4	1.77-4	1.93-4	2.32-4	3.15-4	4.67-4	6.99-4
78	12331.0	1.48-4	1.60-4	1.89-4	2.55-4	3.78-4	5.67-4
82	13999.8	1.24-4	1.32-4	1.54-4	2.05-4	3.04-4	4.57-4
87	16330.9	1.00-4	1.04-4	1.18-4	1.54-4	2.28-4	3.46-4
92	18976.4	8.16-5	8.27-5	9.02-5	1.14-4	1.67-4	2.60-4

B1 - E18

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	641.7	7.44-4	8.05-4	9.77-4	1.37-3	2.11-3	3.19-3
26	956.5	7.42-4	8.58-4	1.12-3	1.64-3	2.54-3	3.82-3
30	1335.3	8.08-4	9.74-4	1.32-3	1.96-3	3.05-3	4.51-3
34	1780.9	8.89-4	1.09-3	1.51-3	2.26-3	3.49-3	5.12-3
38	2296.6	9.24-4	1.15-3	1.59-3	2.39-3	3.68-3	5.38-3
42	2886.2	8.91-4	1.11-3	1.54-3	2.31-3	3.55-3	5.22-3
46	3553.7	8.12-4	1.01-3	1.40-3	2.11-3	3.23-3	4.77-3
50	4303.1	7.14-4	8.90-4	1.23-3	1.85-3	2.83-3	4.22-3
54	5139.4	6.13-4	7.64-4	1.06-3	1.59-3	2.44-3	3.66-3
58	6068.1	5.19-4	6.46-4	8.94-4	1.34-3	2.07-3	3.13-3
62	7095.8	4.35-4	5.40-4	7.47-4	1.12-3	1.74-3	2.65-3
66	8230.4	3.61-4	4.47-4	6.19-4	9.33-4	1.46-3	2.22-3
70	9480.7	2.97-4	3.67-4	5.08-4	7.68-4	1.21-3	1.85-3
74	10857.6	2.43-4	2.99-4	4.13-4	6.27-4	9.91-4	1.52-3
78	12373.6	1.97-4	2.42-4	3.32-4	5.07-4	8.07-4	1.25-3
82	14043.8	1.60-4	1.94-4	2.65-4	4.06-4	6.51-4	1.01-3
87	16376.6	1.23-4	1.46-4	1.98-4	3.02-4	4.90-4	7.71-4
92	19023.5	9.50-5	1.10-4	1.46-4	2.21-4	3.61-4	5.88-4

B1 - E19

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	758.2	2.95-4	3.21-4	3.71-4	4.58-4	5.96-4	7.82-4
26	1105.0	2.20-4	2.40-4	2.76-4	3.38-4	4.36-4	5.65-4
30	1518.2	1.66-4	1.81-4	2.08-4	2.54-4	3.25-4	4.16-4
34	1999.9	1.27-4	1.39-4	1.59-4	1.94-4	2.47-4	3.15-4
38	2553.0	9.92-5	1.08-4	1.24-4	1.50-4	1.91-4	2.44-4
42	3180.7	7.82-5	8.50-5	9.75-5	1.19-4	1.51-4	1.93-4
46	3886.7	6.24-5	6.78-5	7.77-5	9.46-5	1.20-4	1.55-4
50	4675.4	5.02-5	5.46-5	6.26-5	7.62-5	9.69-5	1.25-4
54	5552.0	4.07-5	4.43-5	5.08-5	6.19-5	7.89-5	1.03-4
58	6522.5	3.32-5	3.61-5	4.14-5	5.06-5	6.46-5	8.45-5
62	7593.6	2.72-5	2.96-5	3.40-5	4.15-5	5.33-5	7.00-5
66	8773.6	2.24-5	2.44-5	2.80-5	3.42-5	4.41-5	5.81-5
70	10071.9	1.84-5	2.01-5	2.31-5	2.83-5	3.65-5	4.83-5
74	11499.6	1.52-5	1.65-5	1.90-5	2.34-5	3.03-5	4.02-5
78	13069.9	1.25-5	1.36-5	1.57-5	1.93-5	2.51-5	3.34-5
82	14798.5	1.03-5	1.12-5	1.29-5	1.59-5	2.08-5	2.78-5
87	17211.3	7.97-6	8.69-6	1.00-5	1.24-5	1.63-5	2.20-5
92	19948.6	6.13-6	6.68-6	7.73-6	9.59-6	1.27-5	1.74-5

B1 - F1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	488.7	4.75-4	4.09-4	3.16-4	2.11-4	1.15-4	5.48-5
26	757.8	1.91-4	1.64-4	1.26-4	8.30-5	4.50-5	2.12-5
30	1081.3	7.63-5	6.54-5	5.00-5	3.26-5	1.75-5	8.19-6
34	1456.5	3.12-5	2.66-5	2.03-5	1.31-5	7.02-6	3.27-6
38	1880.5	1.34-5	1.14-5	8.64-6	5.57-6	2.96-6	1.38-6
42	2349.7	6.06-6	5.16-6	3.90-6	2.50-6	1.33-6	6.17-7
46	2860.2	2.92-6	2.48-6	1.87-6	1.19-6	6.33-7	2.94-7
50	3407.0	1.48-6	1.26-6	9.44-7	6.03-7	3.19-7	1.48-7
54	3984.6	7.89-7	6.68-7	5.01-7	3.19-7	1.69-7	7.87-8
58	4586.4	4.39-7	3.71-7	2.78-7	1.77-7	9.34-8	4.36-8
62	5204.8	2.54-7	2.14-7	1.61-7	1.02-7	5.37-8	2.50-8
66	5830.7	1.52-7	1.28-7	9.58-8	6.07-8	3.19-8	1.49-8
70	6453.7	9.40-8	7.91-8	5.90-8	3.73-8	1.96-8	9.10-9
74	7061.1	5.96-8	5.01-8	3.73-8	2.36-8	1.23-8	5.71-9
78	7638.2	3.88-8	3.25-8	2.42-8	1.53-8	7.96-9	3.67-9
82	8167.1	2.58-8	2.16-8	1.60-8	1.01-8	5.25-9	2.41-9
87	8727.6	1.59-8	1.33-8	9.80-9	6.16-9	3.20-9	1.45-9
92	9126.7	1.01-8	8.36-9	6.16-9	3.86-9	2.00-9	0.00+0

B1 - F2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	503.5	2.37-3	2.04-3	1.58-3	1.05-3	5.76-4	2.73-4
26	780.2	1.66-3	1.42-3	1.09-3	7.18-4	3.89-4	1.83-4
30	1115.9	1.23-3	1.05-3	8.02-4	5.23-4	2.80-4	1.31-4
34	1510.1	9.37-4	8.01-4	6.10-4	3.95-4	2.11-4	9.79-5
38	1962.3	7.38-4	6.30-4	4.78-4	3.08-4	1.63-4	7.57-5
42	2471.8	5.95-4	5.07-4	3.84-4	2.46-4	1.30-4	6.02-5
46	3037.7	4.88-4	4.15-4	3.14-4	2.01-4	1.06-4	4.90-5
50	3640.2	7.36-6	6.02-6	4.40-6	2.89-6	1.84-6	1.32-6
54	4262.9	3.30-6	2.65-6	1.90-6	1.24-6	8.07-7	6.26-7
58	4918.7	1.73-6	1.39-6	9.88-7	6.42-7	4.25-7	3.38-7
62	5601.6	9.45-7	7.56-7	5.38-7	3.51-7	2.35-7	1.90-7
66	6304.9	5.35-7	4.28-7	3.04-7	1.99-7	1.34-7	1.11-7
70	7020.5	3.14-7	2.50-7	1.78-7	1.16-7	7.94-8	6.66-8
74	7738.9	1.89-7	1.51-7	1.07-7	7.02-8	4.84-8	4.12-8
78	8448.9	1.18-7	9.36-8	6.63-8	4.35-8	3.03-8	2.62-8
82	9136.8	7.48-8	5.94-8	4.21-8	2.77-8	1.94-8	1.71-8
87	9940.7	4.38-8	3.48-8	2.46-8	1.62-8	1.15-8	1.03-8
92	10644.6	2.65-8	2.09-8	1.48-8	9.73-9	6.98-9	6.40-9

B1 - F3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	544.2	2.88-3	2.30-3	1.60-3	9.36-4	4.68-4	2.26-4
26	830.5	1.10-3	8.77-4	6.10-4	3.62-4	1.89-4	1.02-4
30	1172.6	4.21-4	3.36-4	2.35-4	1.42-4	7.79-5	4.66-5
34	1568.6	1.67-4	1.33-4	9.32-5	5.71-5	3.28-5	2.13-5
38	2016.3	6.91-5	5.52-5	3.88-5	2.41-5	1.44-5	9.85-6
42	2513.0	3.05-5	2.43-5	1.71-5	1.07-5	6.54-6	4.68-6
46	3055.5	1.54-5	1.23-5	8.60-6	5.36-6	3.27-6	2.36-6
50	3658.7	3.98-4	3.38-4	2.55-4	1.63-4	8.59-5	3.95-5
54	4309.7	1.48-5	1.25-5	9.38-6	6.06-6	3.34-6	1.73-6
58	4976.5	2.79-6	2.28-6	1.66-6	1.06-6	6.25-7	4.00-7
62	5672.4	1.32-6	1.06-6	7.59-7	4.80-7	2.90-7	1.99-7
66	6391.3	7.32-7	5.86-7	4.14-7	2.60-7	1.58-7	1.11-7
70	7125.8	4.32-7	3.44-7	2.42-7	1.51-7	9.13-8	6.49-8
74	7866.7	2.63-7	2.09-7	1.46-7	9.05-8	5.45-8	3.87-8
78	8603.4	1.65-7	1.30-7	9.07-8	5.57-8	3.31-8	2.33-8
82	9323.0	1.05-7	8.29-8	5.73-8	3.49-8	2.05-8	1.42-8
87	10174.1	6.11-8	4.80-8	3.29-8	1.98-8	1.13-8	7.69-9
92	10935.1	3.62-8	2.83-8	1.93-8	1.14-8	6.36-9	4.17-9

B1 - F4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	550.3	3.44-3	2.72-3	1.85-3	1.08-3	5.67-4	3.33-4
26	840.0	1.14-3	8.95-4	6.03-4	3.46-4	1.81-4	1.07-4
30	1185.7	3.96-4	3.08-4	2.06-4	1.17-4	6.04-5	3.56-5
34	1585.6	1.50-4	1.16-4	7.78-5	4.45-5	2.36-5	1.46-5
38	2037.6	6.16-5	4.79-5	3.22-5	1.87-5	1.03-5	6.72-6
42	2539.2	2.81-5	2.19-5	1.48-5	8.72-6	4.94-6	3.36-6
46	3087.6	1.52-5	1.20-5	8.20-6	4.88-6	2.77-6	1.87-6
50	3679.9	1.93-5	1.58-5	1.14-5	6.98-6	3.75-6	2.04-6
54	4329.3	1.03-4	8.79-5	6.64-5	4.25-5	2.26-5	1.04-5
58	5000.6	4.81-6	3.92-6	2.80-6	1.69-6	8.57-7	3.88-7
62	5699.4	2.14-6	1.71-6	1.19-6	6.95-7	3.39-7	1.49-7
66	6421.3	1.15-6	9.10-7	6.26-7	3.61-7	1.73-7	7.52-8
70	7158.9	6.50-7	5.15-7	3.52-7	2.02-7	9.60-8	4.12-8
74	7903.1	3.82-7	3.02-7	2.06-7	1.17-7	5.54-8	2.37-8
78	8643.3	2.29-7	1.81-7	1.23-7	6.99-8	3.29-8	1.40-8
82	9366.4	1.40-7	1.11-7	7.51-8	4.25-8	2.00-8	8.47-9
87	10222.5	7.74-8	6.09-8	4.12-8	2.33-8	1.09-8	4.62-9
92	10988.5	4.33-8	3.40-8	2.30-8	1.30-8	6.06-9	2.56-9

B1 - F5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	551.7	3.65-3	2.86-3	1.91-3	1.06-3	5.01-4	2.44-4
26	842.8	2.43-3	1.92-3	1.31-3	7.64-4	4.02-4	2.33-4
30	1191.3	1.19-3	9.39-4	6.42-4	3.72-4	1.92-4	1.05-4
34	1594.1	4.53-4	3.57-4	2.43-4	1.39-4	6.81-5	3.36-5
38	2048.8	1.69-4	1.33-4	9.02-5	5.09-5	2.43-5	1.12-5
42	2552.9	6.87-5	5.40-5	3.64-5	2.04-5	9.57-6	4.23-6
46	3103.8	3.13-5	2.46-5	1.65-5	9.23-6	4.27-6	1.84-6
50	3698.3	1.85-5	1.46-5	9.90-6	5.64-6	2.62-6	1.11-6
54	4339.4	2.49-4	2.10-4	1.57-4	9.93-5	5.19-5	2.37-5
58	5065.8	3.08-4	2.61-4	1.96-4	1.24-4	6.53-5	2.99-5
62	5846.3	2.73-4	2.31-4	1.73-4	1.10-4	5.77-5	2.64-5
66	6676.6	2.44-4	2.07-4	1.55-4	9.82-5	5.14-5	2.35-5
70	7534.5	2.21-4	1.36-4	1.39-4	8.85-5	4.63-5	2.11-5
74	8477.2	2.01-4	1.70-4	1.27-4	8.06-5	4.21-5	1.92-5
78	9441.6	1.85-4	1.56-4	1.17-4	7.42-5	3.87-5	1.76-5
82	10443.9	1.72-4	1.45-4	1.09-4	6.89-5	3.59-5	1.63-5
87	11742.6	1.59-4	1.34-4	1.00-4	6.35-5	3.31-5	1.50-5
92	13081.3	1.49-4	1.25-4	9.35-5	5.92-5	3.09-5	1.39-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

	B1 - F6							B1 - F7						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	553.3	6.37-3	5.11-3	3.63-3	2.30-3	1.44-3	1.06-3	555.9	8.57-3	7.71-3	6.81-3	6.19-3	6.03-3	6.21-3
26	846.6	4.85-3	3.87-3	2.70-3	1.66-3	7.71-4	6.51-4	849.7	4.70-3	4.25-3	3.80-3	3.52-3	3.50-3	3.65-3
30	1200.8	3.71-3	2.94-3	2.02-3	1.19-3	6.37-4	3.69-4	1203.2	2.63-3	2.41-3	2.22-3	2.14-3	2.22-3	2.37-3
34	1615.8	2.93-3	2.30-3	1.55-3	8.65-4	3.94-4	1.59-4	1617.4	1.74-3	1.62-3	1.53-3	1.54-3	1.64-3	1.80-3
38	2091.3	2.04-3	1.65-3	1.20-3	8.02-4	5.52-4	4.48-4	2093.6	1.60-3	1.40-3	1.19-3	1.05-3	1.02-3	1.06-3
42	2627.4	1.49-3	1.24-3	9.49-4	7.11-4	5.78-4	5.42-4	2632.2	1.43-3	1.21-3	9.65-4	7.76-4	6.86-4	6.81-4
46	3224.7	1.17-3	9.86-4	7.75-4	6.06-4	5.20-4	5.09-4	3233.2	1.22-3	1.02-3	8.01-4	6.22-4	5.30-4	5.15-4
50	3883.4	9.62-4	8.13-4	6.48-4	5.18-4	4.57-4	4.37-4	3897.1	1.06-3	8.81-4	6.86-4	5.27-4	4.44-4	4.30-4
54	4603.7	8.08-4	6.85-4	5.50-4	4.47-4	4.02-4	4.09-4	4624.1	9.81-4	8.30-4	6.61-4	5.26-4	4.59-4	4.55-4
58	5386.0	6.88-4	5.86-4	4.75-4	3.91-4	3.57-4	3.68-4	5408.7	6.98-4	5.82-4	4.52-4	3.46-4	2.91-4	2.85-4
62	6229.8	5.88-4	5.03-4	4.12-4	3.44-4	3.20-4	3.35-4	6246.5	4.29-4	3.50-4	2.60-4	1.85-4	1.42-4	1.32-4
66	7122.0	1.72-4	1.54-4	1.37-4	1.27-4	1.31-4	1.44-4	7141.0	4.08-4	3.34-4	2.49-4	1.80-4	1.42-4	1.34-4
70	8047.0	1.81-5	1.64-5	1.47-5	1.39-5	1.44-5	1.61-5	8109.3	4.58-4	3.87-4	3.09-4	2.49-4	2.25-4	2.34-4
74	9017.5	5.48-6	4.92-6	4.37-6	4.08-6	4.22-6	4.74-6	9142.6	4.15-4	3.52-4	2.84-4	2.32-4	2.14-4	2.26-4
78	10033.5	2.32-6	2.08-6	1.83-6	1.70-6	1.75-6	1.97-6	10239.9	3.75-4	3.19-4	2.58-4	2.13-4	1.99-4	2.12-4
82	11092.0	1.17-6	1.04-6	9.14-7	8.40-7	8.61-7	9.73-7	11401.3	3.41-4	2.91-4	2.36-4	1.96-4	1.84-4	1.99-4
87	12469.8	5.83-7	5.16-7	4.48-7	4.06-7	4.13-7	4.68-7	12944.2	3.05-4	2.60-4	2.12-4	1.78-4	1.69-4	1.85-4
92	13900.2	3.25-7	2.86-7	2.46-7	2.20-7	2.21-7	2.52-7	14589.1	2.75-4	2.35-4	1.93-4	1.62-4	1.56-4	1.73-4

	B1 - F8							B1 - F9						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	562.4	3.80-3	3.13-3	2.37-3	1.74-3	1.40-3	1.31-3	565.1	4.47-3	3.65-3	2.68-3	1.83-3	1.30-3	1.09-3
26	856.7	3.34-3	2.74-3	2.06-3	1.49-3	1.15-3	1.04-3	860.7	3.32-3	2.73-3	2.05-3	1.46-3	1.11-3	9.80-4
30	1211.4	3.04-3	2.49-3	1.85-3	1.30-3	9.69-4	8.39-4	1216.2	2.63-3	2.16-3	1.63-3	1.17-3	9.06-4	8.12-4
34	1627.4	2.56-3	2.09-3	1.54-3	1.06-3	7.59-4	6.37-4	1632.2	2.05-3	1.70-3	1.29-3	9.42-4	7.45-4	6.82-4
38	2104.8	2.09-3	1.69-3	1.23-3	8.30-4	5.75-4	4.68-4	2108.9	1.59-3	1.32-3	1.02-3	7.65-4	6.29-4	5.94-4
42	2644.2	1.73-3	1.39-3	9.93-4	6.37-4	4.06-4	3.04-4	2646.6	1.22-3	1.02-3	8.12-4	6.48-4	5.71-4	5.68-4
46	3244.9	1.33-3	1.05-3	7.18-4	4.21-4	2.23-4	1.28-4	3246.3	1.07-3	9.18-4	7.50-4	6.28-4	5.81-4	5.96-4
50	3905.2	9.24-4	7.47-4	5.45-4	3.72-4	2.69-4	2.33-4	3910.6	1.05-3	8.65-4	6.59-4	4.87-4	3.91-4	3.66-4
54	4626.7	6.75-4	5.35-4	3.74-4	2.37-4	1.54-4	1.23-4	4638.4	9.00-4	7.40-4	5.57-4	4.05-4	3.17-4	2.93-4
58	5415.6	7.04-4	5.72-4	4.22-4	2.97-4	2.25-4	2.04-4	5430.0	7.71-4	6.33-4	4.76-4	3.45-4	2.70-4	2.50-4
62	6269.2	3.15-4	2.77-4	2.38-4	2.10-4	2.04-4	2.18-4	6271.7	5.21-4	4.14-4	2.91-4	1.84-4	1.19-4	9.46-5
66	7169.2	4.77-4	4.03-4	3.21-4	2.58-4	2.31-4	2.37-4	7192.8	5.72-4	4.68-4	3.49-4	2.51-4	1.95-4	1.82-4
70	8138.7	4.56-4	3.83-4	3.02-4	2.38-4	2.10-4	2.15-4	8180.3	5.13-4	4.20-4	3.14-4	2.25-4	1.75-4	1.63-4
74	9172.5	4.11-4	3.45-4	2.70-4	2.12-4	1.87-4	1.92-4	9234.9	4.63-4	3.79-4	2.82-4	2.01-4	1.55-4	1.45-4
78	10270.1	3.71-4	3.10-4	2.43-4	1.90-4	1.67-4	1.73-4	10357.6	4.21-4	3.44-4	2.55-4	1.81-4	1.38-4	1.29-4
82	11431.9	3.36-4	2.81-4	2.20-4	1.72-4	1.51-4	1.57-4	11549.3	3.85-4	3.14-4	2.32-4	1.63-4	1.23-4	1.14-4
87	12974.9	3.00-4	2.51-4	1.95-4	1.52-4	1.34-4	1.41-4	13137.8	3.49-4	2.84-4	2.08-4	1.44-4	1.06-4	9.70-5
92	14619.5	2.70-4	2.25-4	1.75-4	1.36-4	1.20-4	1.26-4	14838.2	3.19-4	2.59-4	1.88-4	1.28-4	9.14-5	8.14-5

	B1 - F10							B1 - F11						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	574.1	7.05-3	5.80-3	4.33-3	3.04-3	2.25-3	1.93-3	604.6	1.38-4	1.19-4	9.27-5	6.36-5	3.80-5	2.16-5
26	874.6	6.30-3	5.22-3	3.96-3	2.88-3	2.24-3	2.01-3	907.8	4.77-5	4.12-5	3.26-5	2.35-5	1.61-5	1.18-5
30	1240.5	5.47-3	4.56-3	3.51-3	2.62-3	2.09-3	1.92-3	1270.7	2.37-5	2.07-5	1.68-5	1.31-5	1.05-5	9.27-6
34	1674.8	4.54-3	3.79-3	2.94-3	2.21-3	1.79-3	1.66-3	1692.8	1.59-5	1.40-5	1.18-5	9.90-6	8.85-6	8.61-6
38	2173.9	1.50-5	1.26-5	9.89-6	7.42-6	5.84-6	5.21-6	2180.2	3.69-3	3.09-3	2.40-3	1.82-3	1.48-3	1.38-3
42	2713.3	1.23-5	1.07-5	9.08-6	7.79-6	7.24-6	7.34-6	2745.0	3.93-6	3.78-6	3.71-6	3.83-6	4.15-6	4.56-6
46	3310.4	1.27-5	1.12-5	9.54-6	8.36-6	7.98-6	8.26-6	3357.3	3.10-6	2.95-6	2.86-6	2.92-6	3.16-6	3.48-6
50	3964.6	1.50-5	1.32-5	1.13-5	1.00-5	9.70-6	1.02-5	4032.1	2.56-6	2.43-6	2.34-6	2.40-6	2.59-6	2.88-6
54	4675.2	2.12-5	1.86-5	1.60-5	1.42-5	1.39-5	1.47-5	4769.6	2.15-6	2.04-6	1.97-6	2.01-6	2.19-6	2.45-6
58	5441.8	4.01-5	.50-5	2.96-5	2.58-5	2.48-5	2.63-5	5570.3	1.83-6	1.74-6	1.68-6	1.73-6	1.88-6	2.13-6
62	6286.4	6.63-4	5.43-4	4.12-4	3.01-4	2.39-4	2.25-4	6434.8	1.58-6	1.50-6	1.45-6	1.50-6	1.65-6	1.88-6
66	7208.0	5.76-4	4.74-4	3.58-4	2.63-4	2.10-4	2.00-4	7363.7	1.38-6	1.31-6	1.27-6	1.32-6	1.46-6	1.68-6
70	8195.7	5.03-4	4.14-4	3.14-4	2.32-4	1.88-4	1.82-4	8357.7	1.22-6	1.16-6	1.13-6	1.18-6	1.32-6	1.52-6
74	9250.4	4.41-4	3.64-4	2.78-4	2.07-4	1.71-4	1.68-4	9417.4	1.08-6	1.03-6	1.01-6	1.06-6	1.19-6	1.39-6
78	10373.1	3.88-4	3.22-4	2.47-4	1.87-4	1.57-4	1.57-4	10544.0	9.63-7	9.20-7	9.05-7	9.55-7	1.09-6	1.28-6
82	11564.8	3.43-4	2.85-4	2.20-4	1.69-4	1.46-4	1.49-4	11738.3	8.62-7	8.25-7	8.14-7	8.65-7	9.92-7	1.18-6
87	13152.9	2.94-4	2.46-4	1.93-4	1.51-4	1.34-4	1.42-4	13328.6	7.46-7	7.16-7	7.11-7	7.61-7	8.83-7	1.07-6
92	14852.9	2.52-4	2.12-4	1.69-4	1.37-4	1.26-4	1.38-4	15030.3	6.34-7	6.10-7	6.09-7	6.59-7	7.73-7	9.48-7

	B1 - F12							B1 - F13						
Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	607.6	1.56-5	1.50-5	1.47-5	1.53-5	1.68-5	1.84-5	610.0	1.19-3	1.01-3	7.78-4	5.17-4	2.89-4	1.43-4
26	912.7	1.10-5	1.06-5	1.06-5	1.11-5	1.21-5	1.32-5	918.4	7.47-4	6.35-4	4.84-4	3.17-4	1.74-4	8.44-5
30	1278.7	8.05-6	7.77-6	7.66-6	7.93-6	8.58-6	9.35-6	1289.5	4.36-4	3.70-4	2.80-4	1.82-4	9.85-5	4.76-5
34	1706.0	6.05-6	5.80-6	5.66-6	5.81-6	6.25-6	6.80-6	1723.1	2.30-4	1.95-4	1.47-4	9.52-5	5.16-5	2.52-5
38	2194.6	4.64-6	4.40-6	4.25-6	4.31-6	4.60-6	5.01-6	2218.5	1.12-4	9.48-5	7.18-5	4.68-5	2.61-5	1.36-5
42	2757.6	2.99-3	2.51-3	1.95-3	1.48-3	1.20-3	1.12-3	2775.5	7.00-5	6.00-5	4.69-5	3.34-5	2.29-5	1.72-5
46	3393.5	6.71-5	5.53-5	4.10-5	2.75-5	1.82-5	1.39-5	3417.6	2.43-3	2.04-3	1.59-3	1.21-3	9.88-4	9.28-4
50	4074.2	1.90-5	1.57-5	1.14-5	7.26-6	4.14-6	2.46-6	4157.2	2.04-3	1.72-3	1.34-3	1.02-3	8.33-4	7.85-4
54	4817.3	9.47-6	7.79-6	5.68-6	3.57-6	1.99-6	1.13-6	4984.0	1.71-3	1.44-3	1.12-3	8.55-4	7.01-4	6.65-4
58	5623.5	5.38-6	4.42-6	3.21-6	2.01-6	1.12-6	6.46-7	5904.0	1.44-3	1.21-3	9.50-4	7.24-4	5.95-4	5.68-4
62	6493.5	3.33-6	2.72-6	1.97-6	1.24-6	6.95-7	4.12-7	6923.9	1.23-3	1.03-3	8.09-4	6.17-4	5.09-4	4.88-4
66	7428.0	2.19-6	1.79-6	1.29-6	8.08-7	4.61-7	2.84-7	8051.8	1.05-3	8.84-4	6.93-4	5.30-4	4.38-4	4.23-4
70	8427.5	1.53-6	1.24-6	8.92-7	5.59-7	3.23-7	2.07-7	9296.9	8.98-4	7.59-4	5.97-4	4.57-4	3.79-4	3.68-4
74	9493.1	1.12-6	9.05-7	6.46-7	4.05-7	2.37-7	1.57-7	10670.0	7.73-4	6.55-4	5.16-4	3.96-4	3.29-4	3.22-4
78	10625.5	8.50-7	6.85-7	4.87-7	3.04-7	1.80-7	1.23-7	12183.9	6.67-4	5.66-4	4.47-4	3.44-4	2.87-4	2.82-4
82	11826.1	6.67-7	5.36-7	3.79-7	2.36-7	1.41-7	9.91-8	13853.9	5.77-4	4.90-4	3.88-4	2.99-4	2.51-4	2.48-4
87	13424.6	5.09-7	4.07-7	2.87-7	1.78-7	1.07-7	7.70-8	16188.7	4.81-4	4.10-4	3.25-4	2.51-4	2.12-4	2.12-4
92	15135.1	3.96-7	3.16-7	2.21-7	1.36-7	8.21-8	6.01-8	18839.5	4.00-4	3.42-4	2.73-4	2.11-4	1.79-4	1.81-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - F14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	639.8	8.91-4	7.64-4	5.88-4	3.91-4	2.16-4	1.05-4
26	954.2	7.38-4	6.28-4	4.79-4	3.13-4	1.70-4	8.11-5
30	1332.8	6.65-4	5.64-4	4.26-4	2.76-4	1.48-4	6.99-5
34	1778.2	6.15-4	5.20-4	3.92-4	2.51-4	1.34-4	6.28-5
38	2293.9	5.58-4	4.71-4	3.53-4	2.26-4	1.20-4	5.59-5
42	2883.6	4.91-4	4.14-4	3.09-4	1.97-4	1.04-4	4.86-5
46	3551.1	4.23-4	3.56-4	2.66-4	1.69-4	8.94-5	4.17-5
50	4300.6	3.63-4	3.06-4	2.29-4	1.45-4	7.67-5	3.58-5
54	5136.8	3.12-4	2.63-4	1.96-4	1.25-4	6.62-5	3.09-5
58	6065.4	2.70-4	2.27-4	1.70-4	1.08-4	5.75-5	2.69-5
62	7093.0	2.35-4	1.98-4	1.48-4	9.48-5	5.05-5	2.37-5
66	8227.3	2.05-4	1.74-4	1.31-4	8.36-5	4.47-5	2.11-5
70	9477.4	1.81-4	1.53-4	1.15-4	7.44-5	3.99-5	1.89-5
74	10854.0	1.61-4	1.36-4	1.03-4	6.67-5	3.59-5	1.71-5
78	12369.7	1.43-4	1.22-4	9.26-5	6.03-5	3.26-5	1.56-5
82	14039.5	1.29-4	1.10-4	8.38-5	5.48-5	2.99-5	1.44-5
87	16371.7	1.14-4	9.72-5	7.46-5	4.92-5	2.71-5	1.31-5
92	19017.8	1.01-4	8.70-5	6.71-5	4.46-5	2.48-5	1.21-5

B1 - F15

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	758.3	8.85-5	7.68-5	6.23-5	4.88-5	4.01-5	3.65-5
26	1105.5	5.97-5	5.15-5	4.16-5	3.24-5	2.66-5	2.43-5
30	1519.3	4.20-5	3.62-5	2.91-5	2.27-5	1.86-5	1.71-5
34	2002.2	3.07-5	2.64-5	2.11-5	1.65-5	1.36-5	1.25-5
38	2557.0	2.31-5	1.98-5	1.58-5	1.23-5	1.02-5	9.48-6
42	3187.3	1.77-5	1.52-5	1.21-5	9.49-6	7.87-6	7.36-6
46	3896.9	1.38-5	1.19-5	9.50-6	7.43-6	6.19-6	5.82-6
50	4690.6	1.10-5	9.41-6	7.54-6	5.91-6	4.94-6	4.68-6
54	5573.9	8.81-6	7.55-6	6.06-6	4.75-6	3.98-6	3.80-6
58	6553.0	7.14-6	6.12-6	4.92-6	3.86-6	3.25-6	3.12-6
62	7635.1	5.83-6	5.00-6	4.02-6	3.16-6	2.67-6	2.58-6
66	8828.9	4.78-6	4.11-6	3.30-6	2.60-6	2.20-6	2.14-6
70	10144.2	3.94-6	3.39-6	2.73-6	2.15-6	1.82-6	1.79-6
74	11592.6	3.25-6	2.80-6	2.26-6	1.78-6	1.51-6	1.49-6
78	13187.8	2.69-6	2.32-6	1.87-6	1.48-6	1.26-6	1.25-6
82	14946.2	2.22-6	1.91-6	1.55-6	1.22-6	1.05-6	1.04-6
87	17404.1	1.73-6	1.50-6	1.22-6	9.64-7	8.27-7	8.32-7
92	20196.4	1.35-6	1.17-6	9.50-7	7.55-7	6.49-7	6.60-7

B1 - C1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	544.1	2.02-3	1.58-3	1.06-3	5.86-4	2.67-4	1.13-4
26	830.5	8.23-4	6.43-4	4.29-4	2.36-4	1.09-4	4.86-5
30	1173.0	3.35-4	2.60-4	1.73-4	9.49-5	4.39-5	2.01-5
34	1569.7	1.38-4	[illegible]	7.04-5	3.81-5	1.73-5	7.57-6
38	2018.2	5.65-5	[illegible]	2.84-5	1.51-5	6.48-6	2.49-6
42	2515.6	2.17-5	1.67-5	[illegible]	5.83-6	2.59-6	1.10-6
46	3058.5	8.32-6	6.40-6	4.32-6	2.46-6	1.30-6	7.85-7
50	3643.2	3.60-6	2.82-6	1.93-6	1.17-6	7.06-7	5.17-7
54	4265.8	1.73-6	1.37-6	9.55-7	6.04-7	3.94-7	3.15-7
58	4921.2	9.05-7	7.18-7	5.06-7	3.29-7	2.25-7	1.90-7
62	5603.8	5.00-7	3.98-7	2.83-7	1.87-7	1.32-7	1.15-7
66	6306.6	2.89-7	2.31-7	1.65-7	1.11-7	8.01-8	7.17-8
70	7021.8	1.73-7	1.39-7	9.94-8	6.74-8	4.98-8	4.55-8
74	7739.7	1.07-7	8.58-8	6.18-8	4.23-8	3.18-8	2.96-8
78	8449.1	6.82-8	5.46-8	3.94-8	2.72-8	2.07-8	1.96-8
82	9136.5	4.44-8	3.55-8	2.57-8	1.79-8	1.38-8	1.33-8
87	9939.6	2.67-8	2.14-8	1.55-8	1.08-8	8.53-9	8.38-9
92	10642.7	1.65-8	1.32-8	9.59-9	6.75-9	5.39-9	5.42-9

B1 - C2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	548.0	1.49-3	1.24-3	9.59-4	7.20-4	5.83-4	5.39-4
26	835.0	4.30-4	3.70-4	3.05-4	2.55-4	2.32-4	2.32-4
30	1177.6	1.39-4	1.22-4	1.04-4	9.14-5	8.74-5	8.98-5
34	1574.0	5.11-5	4.54-5	3.96-5	3.58-5	3.52-5	3.67-5
38	2022.3	2.35-5	2.08-5	1.80-5	1.61-5	1.57-5	1.64-5
42	2520.3	1.43-5	1.22-5	9.87-6	8.15-6	7.43-6	7.52-6
46	3065.5	8.76-6	7.23-6	5.53-6	4.19-6	3.50-6	3.39-6
50	3654.6	4.95-6	4.03-6	3.00-6	2.17-6	1.72-6	1.62-6
54	4283.3	2.75-6	2.22-6	1.63-6	1.15-6	8.94-7	8.33-7
58	4947.1	1.55-6	1.25-6	9.09-7	6.36-7	4.88-7	4.54-7
62	5640.4	8.94-7	7.17-7	5.21-7	3.62-7	2.77-7	2.59-7
66	6356.8	5.29-7	4.23-7	3.06-7	2.13-7	1.63-7	1.54-7
70	7088.8	3.20-7	2.56-7	1.85-7	1.28-7	9.90-8	9.39-8
74	7827.2	1.98-7	1.58-7	1.14-7	7.93-8	6.16-8	5.90-8
78	8561.4	1.25-7	9.97-8	7.19-8	5.00-8	3.91-8	3.80-8
82	9278.5	8.04-8	6.40-8	4.61-8	3.22-8	2.54-8	2.49-8
87	10126.5	4.73-8	3.76-8	2.70-8	1.89-8	1.51-8	1.51-8
92	10884.3	2.84-8	2.25-8	1.62-8	1.13-8	9.16-9	9.35-9

B1 - C3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	551.5	7.31-3	5.88-3	4.16-3	2.62-3	1.61-3	1.16-3
26	844.1	5.50-3	4.37-3	3.03-3	1.80-3	9.89-4	6.05-4
30	1197.4	4.11-3	3.25-3	2.23-3	1.30-3	6.77-4	3.79-4
34	1612.0	3.14-3	2.48-3	1.69-3	9.74-4	4.94-4	2.63-4
38	2088.0	2.46-3	1.94-3	1.32-3	7.54-4	3.77-4	1.95-4
42	2625.8	1.97-3	1.55-3	1.05-3	5.99-4	2.96-4	1.50-4
46	3226.0	1.61-3	1.27-3	8.57-4	4.87-4	2.38-4	1.17-4
50	3889.0	1.34-3	1.05-3	7.09-4	3.98-4	1.89-4	8.71-5
54	4612.3	1.10-3	9.93-4	8.93-4	8.44-4	8.65-4	9.44-4
58	5394.8	9.48-4	8.59-4	7.75-4	7.36-4	7.59-4	8.35-4
62	6239.4	8.27-4	7.50-4	6.78-4	6.45-4	6.69-4	7.41-4
66	7146.6	7.29-4	6.62-4	5.98-4	5.70-4	5.94-4	6.63-4
70	8116.5	6.48-4	5.88-4	5.32-4	5.08-4	[illegible]	5.99-4
74	9149.6	5.81-4	5.27-4	4.77-4	4.57-4	4.61-4	5.44-4
78	10246.4	5.24-4	4.76-4	4.31-4	4.13-4	4.37-4	4.99-4
82	11407.1	4.76-4	4.32-4	3.91-4	3.76-4	4.00-4	4.60-4
87	12948.8	4.25-4	3.86-4	3.50-4	3.37-4	3.60-4	4.19-4
92	14592.1	3.83-4	3.48-4	3.15-4	3.04-4	3.27-4	3.85-4

B1 - C4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	559.4	6.61-3	6.17-3	5.81-3	5.76-3	6.08-3	6.56-3
26	853.2	4.93-3	4.58-3	4.29-3	4.23-3	4.43-3	4.77-3
30	1207.5	3.74-3	3.45-3	3.20-3	3.12-3	3.24-3	3.48-3
34	1622.5	2.90-3	2.66-3	2.44-3	2.35-3	2.42-3	2.59-3
38	2098.2	2.30-3	2.10-3	1.91-3	1.82-3	1.87-3	2.00-3
42	2634.8	1.86-3	1.69-3	1.53-3	1.46-3	1.49-3	1.60-3
46	3232.5	1.54-3	1.39-3	1.26-3	1.20-3	1.23-3	1.32-3
50	3891.6	1.29-3	1.17-3	1.06-3	1.01-3	1.04-3	1.13-3
54	4615.3	1.13-3	8.94-4	6.09-4	3.52-4	1.81-4	9.93-5
58	5405.6	9.71-4	7.63-4	5.17-4	2.95-4	1.47-4	7.52-5
62	6260.5	8.40-4	6.60-4	4.47-4	2.54-4	1.25-4	6.30-5
66	7180.9	7.34-4	5.77-4	3.90-4	2.21-4	1.08-4	5.39-5
70	8167.4	6.47-4	5.08-4	3.43-4	1.94-4	9.46-5	4.67-5
74	9221.1	5.74-4	4.51-4	3.04-4	1.72-4	8.34-5	4.09-5
78	10342.8	5.14-4	4.03-4	2.72-4	1.53-4	7.41-5	3.59-5
82	11533.5	4.62-4	3.63-4	2.45-4	1.38-4	6.61-5	3.18-5
87	13120.7	4.08-4	3.20-4	2.16-4	1.21-4	5.79-5	2.74-5
92	14819.9	3.63-4	2.85-4	1.92-4	1.07-4	5.10-5	2.38-5

B1 - C5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	563.0	4.95-3	4.02-3	2.98-3	2.13-3	1.67-3	1.55-3
26	858.0	3.53-3	2.91-3	2.23-3	1.70-3	1.45-3	1.42-3
30	1213.6	2.64-3	2.21-3	1.76-3	1.42-3	1.29-3	1.31-3
34	1630.2	2.04-3	1.74-3	1.42-3	1.21-3	1.15-3	1.19-3
38	2108.3	1.61-3	1.39-3	1.17-3	1.02-3	1.00-3	1.06-3
42	2648.1	1.30-3	1.13-3	9.65-4	8.67-4	8.66-4	9.27-4
46	3250.3	1.07-3	9.38-4	8.08-4	7.37-4	7.46-4	8.08-4
50	3915.2	8.97-4	7.87-4	6.83-4	6.30-4	6.44-4	7.05-4
54	4643.4	7.60-4	6.69-4	5.84-4	5.43-4	5.60-4	6.18-4
58	5435.4	6.52-4	5.75-4	5.04-4	4.72-4	4.90-4	5.46-4
62	6292.1	5.65-4	4.99-4	4.39-4	4.14-4	4.33-4	4.86-4
66	7214.0	4.94-4	4.38-4	3.86-4	3.66-4	3.86-4	4.36-4
70	8202.1	4.36-4	3.87-4	3.42-4	3.26-4	3.46-4	3.93-4
74	9257.1	3.87-4	3.44-4	3.05-4	2.92-4	3.13-4	3.60-4
78	10380.0	3.46-4	3.08-4	2.74-4	2.64-4	2.85-4	3.30-4
82	11571.8	3.11-4	2.77-4	2.48-4	2.40-4	2.61-4	3.05-4
87	13160.2	2.74-4	2.45-4	2.20-4	2.14-4	2.35-4	2.79-4
92	14860.3	2.43-4	2.18-4	1.96-4	1.93-4	2.14-4	2.58-4

B1 - C6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	604.6	3.55-5	2.82-5	1.93-5	1.09-5	4.98-6	2.00-6
26	908.8	2.53-5	2.00-5	1.36-5	7.63-6	3.47-6	1.39-6
30	1274.1	1.86-5	1.47-5	9.97-6	5.56-6	2.52-6	1.01-6
34	1700.6	1.42-5	1.12-5	7.56-6	4.20-6	1.90-6	7.64-7
38	2188.4	1.12-5	8.77-6	5.91-6	3.28-6	1.48-6	5.97-7
42	2738.0	8.96-6	7.04-6	4.73-6	2.62-6	1.19-6	4.79-7
46	3349.5	7.33-6	5.75-6	3.87-6	2.14-6	9.71-7	3.94-7
50	4023.4	6.11-6	4.79-6	3.21-6	1.78-6	8.09-7	3.31-7
54	4760.0	5.16-6	4.05-6	2.72-6	1.50-6	6.85-7	2.83-7
58	5559.9	4.42-6	3.46-6	2.32-6	1.29-6	5.89-7	2.46-7
62	6423.5	3.83-6	3.00-6	2.01-6	1.12-6	5.13-7	2.17-7
66	7351.4	3.36-6	2.63-6	1.77-6	9.82-7	4.53-7	1.95-7
70	8344.3	2.98-6	2.33-6	1.57-6	8.72-7	4.04-7	1.77-7
74	9403.0	2.66-6	2.08-6	1.40-6	7.80-7	3.64-7	1.63-7
78	10528.4	2.39-6	1.87-6	1.26-6	7.03-7	3.31-7	1.50-7
82	11721.5	2.15-6	1.69-6	1.14-6	6.36-7	3.01-7	1.40-7
87	13310.2	1.89-6	1.48-6	9.96-7	5.59-7	2.66-7	1.26-7
92	15010.2	1.63-6	1.28-6	8.59-7	4.82-7	2.31-7	1.11-7

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 – H1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	546.7	1.61-3	1.27-3	8.60-4	4.79-4	2.18-4	8.70-5
26	833.5	6.08-4	4.79-4	3.23-4	1.80-4	8.13-5	3.25-5
30	1176.2	2.28-4	1.79-4	1.20-4	6.68-5	3.02-5	1.21-5
34	1573.0	8.87-5	6.95-5	4.67-5	2.58-5	1.17-5	4.66-6
38	2022.1	3.67-5	2.87-5	1.92-5	1.06-5	4.78-6	1.92-6
42	2520.8	1.62-5	1.27-5	8.47-6	4.66-6	2.10-6	8.41-7
46	3066.5	7.62-6	5.95-6	3.97-6	2.19-6	9.83-7	3.94-7
50	3655.7	3.80-6	2.96-6	1.97-6	1.08-6	4.87-7	1.95-7
54	4284.4	1.99-6	1.55-6	1.03-6	5.65-7	2.53-7	1.01-7
58	4948.1	1.09-6	8.45-7	5.61-7	3.07-7	1.38-7	5.51-8
62	5641.4	6.17-7	4.80-7	3.18-7	1.74-7	7.78-8	3.11-8
66	6357.7	3.63-7	2.81-7	1.86-7	1.02-7	4.54-8	1.81-8
70	7089.5	2.20-7	1.70-7	1.12-7	6.12-8	2.73-8	1.09-8
74	7827.9	1.37-7	1.06-7	6.97-8	3.78-8	1.68-8	6.70-9
78	8562.0	8.69-8	6.71-8	4.41-8	2.39-8	1.06-8	4.22-9
82	9278.8	5.65-8	4.35-8	2.85-8	1.54-8	6.82-9	2.71-9
87	10126.6	3.38-8	2.59-8	1.70-8	9.11-9	4.02-9	1.60-9
92	10884.1	2.07-8	1.58-8	1.03-8	5.51-9	2.42-9	0.00+0

B1 – H2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	559.4	9.84-3	7.79-3	5.29-3	2.96-3	1.35-3	5.39-4
26	853.5	7.07-3	5.57-3	3.77-3	2.10-3	9.55-4	3.83-4
30	1208.3	5.25-3	4.13-3	2.79-3	1.55-3	7.03-4	2.82-4
34	1624.2	4.00-3	3.15-3	2.12-3	1.18-3	5.33-4	2.14-4
38	2101.5	3.13-3	2.46-3	1.66-3	9.18-4	4.15-4	1.67-4
42	2640.6	2.51-3	1.97-3	1.32-3	7.33-4	3.32-4	1.33-4
46	3241.9	2.05-3	1.61-3	1.08-3	5.98-4	2.71-4	1.09-4
50	3905.9	1.71-3	1.34-3	8.98-4	4.97-4	2.25-4	9.03-5
54	4633.2	1.44-3	1.13-3	7.57-4	4.19-4	1.89-4	7.61-5
58	5424.3	1.23-3	9.65-4	6.47-4	3.58-4	1.62-4	6.50-5
62	6279.9	1.06-3	8.35-4	5.59-4	3.09-4	1.40-4	5.62-5
66	7200.8	9.30-4	7.29-4	4.89-4	2.70-4	1.22-4	4.90-5
70	8187.7	8.20-4	6.42-4	4.30-4	2.38-4	1.07-4	4.31-5
74	9241.5	7.28-4	5.70-4	3.82-4	2.11-4	9.53-5	3.82-5
78	10363.2	6.50-4	5.09-4	3.41-4	1.88-4	8.51-5	3.41-5
82	11553.7	5.85-4	4.58-4	3.07-4	1.69-4	7.64-5	3.07-5
87	13140.3	5.16-4	4.04-4	2.70-4	1.49-4	6.74-5	2.71-5
92	14838.5	4.59-4	3.59-4	2.40-4	1.33-4	5.99-5	2.41-5

B1 – I1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	514.[illegible]	1.77-3	1.55-3	1.25-3	9.21-4	6.49-4	4.82-4
26	792.1	6.05-4	5.66-4	5.14-4	4.60-4	4.17-4	3.92-4
30	1125.4	2.53-4	2.48-4	2.41-4	2.34-4	2.30-4	2.28-4
34	1512.0	1.19-4	1.19-4	1.18-4	1.17-4	1.18-4	1.19-4
38	1949.3	5.78-5	5.75-5	5.72-5	5.71-5	5.74-5	5.82-5
42	2433.0	2.54-5	2.48-5	2.40-5	2.34-5	2.31-5	2.32-5
46	2957.3	1.00-5	9.50-6	8.84-6	8.22-6	7.82-6	7.73-6
50	3517.5	4.39-6	4.08-6	3.70-6	3.33-6	3.08-6	3.00-6
54	4109.5	2.16-6	1.99-6	1.77-6	1.57-6	1.43-6	1.38-6
58	4724.1	1.14-6	1.05-6	9.30-7	8.15-7	7.37-7	7.11-7
62	5356.9	6.40-7	5.86-7	5.18-7	4.52-7	4.07-7	3.93-7
66	5997.9	3.73-7	3.41-7	3.01-7	2.62-7	2.36-7	2.28-7
70	6636.7	2.25-7	2.06-7	1.82-7	1.58-7	1.42-7	1.38-7
74	7261.0	1.40-7	1.28-7	1.13-7	9.83-8	8.84-8	8.60-8
78	7856.0	8.88-8	8.15-8	7.20-8	6.27-8	5.65-8	5.52-8
82	8404.3	5.77-8	5.30-8	4.69-8	4.09-8	3.69-8	3.63-8
87	8991.3	3.45-8	3.18-8	2.82-8	2.47-8	2.24-8	2.21-8
92	9420.1	2.11-8	1.95-6	1.74-8	1.53-8	1.40-8	1.39-8

B1 – I2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	518.0	3.27-3	2.98-3	2.60-3	2.18-3	1.83-3	1.62-3
26	799.2	1.27-3	1.07-3	8.16-4	5.50-4	3.39-4	2.14-4
30	1134.8	1.79-4	1.47-4	1.07-4	6.68-5	3.65-5	1.99-5
34	1522.2	6.00-5	4.96-5	3.65-5	2.35-5	1.38-5	8.51-6
38	1959.1	2.36-5	2.03-5	1.61-5	1.21-5	9.07-6	7.52-6
42	2444.0	1.42-5	1.35-5	1.27-5	1.19-5	1.15-5	1.14-5
46	2975.6	1.03-5	1.03-5	1.04-5	1.05-5	1.07-5	1.10-5
50	3550.2	6.48-6	6.57-6	6.71-6	6.89-6	7.12-6	7.42-6
54	4163.2	3.89-6	3.96-6	4.06-6	4.20-6	4.36-6	4.57-6
58	4809.3	2.33-6	2.38-6	2.45-6	2.53-6	2.64-6	2.79-6
62	5482.5	1.42-6	1.45-6	1.49-6	1.55-6	1.62-6	1.72-6
66	6175.9	8.79-7	8.97-7	9.24-7	9.61-7	1.01-6	1.08-6
70	6881.7	5.56-7	5.67-7	5.85-7	6.08-7	6.40-7	6.86-7
74	7590.1	3.58-7	3.66-7	3.77-7	3.93-7	4.14-7	4.47-7
78	8290.0	2.35-7	2.40-7	2.48-7	2.58-7	2.73-7	2.96-7
82	8967.8	1.57-7	1.61-7	1.65-7	1.72-7	1.83-7	2.00-7
87	9758.7	9.72-8	9.90-8	1.02-7	1.06-7	1.13-7	1.24-7
92	10449.6	6.13-8	6.24-8	6.42-8	6.70-8	7.15-8	7.91-8

B1 – I3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	518.8	1.75-3	1.50-3	1.17-3	8.31-4	5.68-4	4.19-4
26	799.6	1.64-3	1.44-3	1.17-3	8.81-4	6.50-4	5.13-4
30	1140.6	1.54-3	1.31-3	1.00-3	6.87-4	4.31-4	2.78-4
34	1540.8	1.06-3	8.86-4	6.63-4	4.34-4	2.51-4	1.42-4
38	1999.3	7.61-4	6.34-4	4.68-4	2.98-4	1.64-4	8.52-5
42	2515.5	5.74-4	4.76-4	3.49-4	2.19-4	1.17-4	5.76-5
46	3088.5	4.49-4	3.72-4	2.71-4	1.69-4	8.92-5	4.24-5
50	3717.4	3.62-4	2.99-4	2.18-4	1.35-4	7.08-5	3.31-5
54	4401.3	2.99-4	2.47-4	1.80-4	1.11-4	5.80-5	2.68-5
58	5138.7	2.51-4	2.08-4	1.51-4	9.35-5	4.86-5	2.24-5
62	5928.3	2.15-4	1.78-4	1.29-4	8.00-5	4.16-5	1.91-5
66	6768.2	1.86-4	1.54-4	1.12-4	6.94-5	3.60-5	1.65-5
70	7656.4	1.63-4	1.35-4	9.84-5	6.10-5	3.17-5	1.45-5
74	8590.3	1.44-4	1.20-4	8.73-5	5.42-5	2.81-5	1.29-5
78	9567.0	1.29-4	1.07-4	7.81-5	4.86-5	2.53-5	1.16-5
82	10582.7	1.15-4	9.60-5	7.04-5	4.39-5	2.28-5	1.05-5
87	11900.5	1.02-4	8.49-5	6.25-5	3.91-5	2.03-5	9.33-6
92	13261.2	9.08-5	7.58-5	5.59-5	3.51-5	1.83-5	8.41-6

B1 – I4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	522.2	2.12-3	1.91-3	1.63-3	1.35-3	1.13-3	1.02-3
26	806.1	1.81-3	1.64-3	1.42-3	1.19-3	1.02-3	9.29-4
30	1150.6	1.54-3	1.40-3	1.22-3	1.04-3	9.04-4	8.32-4
34	1555.9	1.27-3	1.16-3	1.02-3	8.70-4	7.63-4	7.08-4
38	2022.1	1.04-3	9.50-4	8.31-4	7.15-4	6.29-4	5.86-4
42	2549.2	8.54-4	7.77-4	6.79-4	5.83-4	5.13-4	4.79-4
46	3137.4	7.03-4	6.38-4	5.56-4	4.76-4	4.18-4	3.91-4
50	3786.9	5.82-4	5.26-4	4.57-4	3.89-4	3.40-4	3.18-4
54	4498.0	4.84-4	4.36-4	3.76-4	3.18-4	2.76-4	2.58-4
58	5270.8	4.04-4	3.62-4	3.10-4	2.59-4	2.23-4	2.07-4
62	6105.6	3.35-4	2.99-4	2.53-4	2.07-4	1.75-4	1.61-4
66	7002.4	2.71-4	2.39-4	1.97-4	1.57-4	1.27-4	1.14-4
70	7959.7	2.04-4	1.76-4	1.40-4	1.04-4	7.70-5	6.36-5
74	8957.4	7.11-5	6.28-5	5.22-5	4.19-5	3.45-5	3.14-5
78	9974.4	2.88-5	2.86-5	2.87-5	2.91-5	3.03-5	3.26-5
82	11028.1	1.14-5	1.15-5	1.18-5	1.22-5	1.29-5	1.41-5
87	12397.4	4.21-6	4.27-6	4.37-6	4.55-6	4.86-6	5.37-6
92	13817.0	1.78-6	1.81-6	1.85-6	1.93-6	2.08-6	2.32-6

B1 – I5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	538.1	2.93-2	3.02-2	3.14-2	3.27-2	3.38-2	3.46-2
26	825.8	2.10-2	2.16-2	2.24-2	2.33-2	2.41-2	2.47-2
30	1174.5	1.95-2	2.01-2	2.08-2	2.17-2	2.25-2	2.31-2
34	1584.6	1.92-2	1.97-2	2.05-2	2.14-2	2.23-2	2.30-2
38	2055.7	1.82-2	1.88-2	1.95-2	2.04-2	2.13-2	2.21-2
42	2587.8	1.66-2	1.72-2	1.79-2	1.88-2	1.96-2	2.05-2
46	3181.0	1.49-2	1.54-2	1.61-2	1.69-2	1.77-2	1.85-2
50	3835.5	1.32-2	1.37-2	1.43-2	1.50-2	[illegible]58-2	1.67-2
54	4551.4	1.18-2	1.21-2	1.27-2	1.34-2	1.41-2	1.50-2
58	5328.9	1.04-2	1.08-2	1.13-2	1.19-2	1.26-2	1.34-2
62	6167.8	9.14-3	9.45-3	9.90-3	1.05-2	1.11-2	1.19-2
66	7064.6	7.17-3	7.42-3	7.78-3	8.24-3	8.79-3	9.49-3
70	8002.9	1.59-3	1.64-3	1.72-3	1.82-3	1.95-3	2.12-3
74	8997.3	4.20-4	4.12-4	4.03-4	4.00-4	4.08-4	4.32-4
78	10078.6	2.61-4	2.41-4	2.16-4	1.93-4	1.80-4	1.81-4
82	11228.6	2.10-4	1.90-4	1.65-4	1.42-4	1.26-4	1.24-4
87	12757.7	1.73-4	1.54-4	1.31-4	1.08-4	9.30-5	8.93-5
92	14388.7	1.46-4	1.29-4	1.07-4	8.64-5	7.19-5	6.73-5

B1 – I6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	544.9	7.80-2	8.04-2	8.38-2	8.75-2	9.07-2	9.30-2
26	837.1	5.25-2	5.41-2	5.62-2	5.86-2	6.08-2	6.24-2
30	1192.6	3.42-2	3.52-2	3.65-2	3.80-2	3.94-2	4.05-2
34	1613.2	2.19-2	2.25-2	2.32-2	2.41-2	2.50-2	2.58-2
38	2101.4	1.43-2	1.46-2	1.51-2	1.57-2	1.62-2	1.68-2
42	2659.4	9.79-3	9.98-3	1.03-2	1.06-2	1.10-2	1.14-2
46	3284.8	4.98-3	4.16-3	3.13-3	2.13-3	1.41-3	1.06-3
50	3937.3	4.34-4	4.49-4	4.71-4	4.98-4	5.28-4	5.38-4
54	4645.1	3.91-4	4.03-4	4.25-4	4.49-4	4.76-4	5.06-4
58	5407.9	4.12-4	4.26-4	4.47-4	4.72-4	5.01-4	5.36-4
62	6224.9	5.93-4	6.13-4	6.42-4	6.79-4	7.23-4	7.76-4
66	7098.6	1.64-3	1.70-3	1.78-3	1.89-3	2.02-3	2.18-3
70	8046.1	6.46-3	6.68-3	7.01-3	7.44-3	7.98-3	8.67-3
74	9071.2	7.05-3	7.30-3	7.66-3	8.15-3	8.77-3	9.59-3
78	10162.6	6.64-3	6.88-3	7.23-3	7.71-3	8.33-3	9.17-3
82	11318.8	6.19-3	6.41-3	6.75-3	7.21-3	7.83-3	8.68-3
87	12855.1	5.68-3	5.89-3	6.21-3	6.65-3	7.26-3	8.12-3
92	14493.3	5.24-3	5.44-3	5.75-3	6.17-3	6.78-3	7.66-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - I7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	584.7	1.95-3	1.83-3	1.69-3	1.56-3	1.48-3	1.45-3
26	885.6	2.79-3	2.81-3	2.84-3	2.90-3	2.98-3	3.05-3
30	1247.9	3.55-3	3.66-3	3.81-3	4.00-3	4.18-3	4.34-3
34	1670.1	3.00-3	3.11-3	3.26-3	3.44-3	3.62-3	3.77-3
38	2151.0	1.99-3	2.06-3	2.17-3	2.29-3	2.41-3	2.52-3
42	2689.5	1.31-3	1.36-3	1.43-3	1.51-3	1.59-3	1.67-3
46	3290.3	7.93-3	8.09-3	8.34-3	8.64-3	9.00-3	9.38-3
50	3995.8	5.62-3	5.71-3	5.85-3	6.04-3	6.28-3	6.57-3
54	4780.4	4.42-3	4.48-3	4.59-3	4.74-3	4.93-3	5.19-3
58	5647.8	3.59-3	3.65-3	3.73-3	3.85-3	4.02-3	4.24-3
62	6535.1	1.95-7	1.62-7	1.20-7	7.75-8	4.44-8	2.52-8
66	7472.4	1.63-7	1.42-7	1.14-7	8.70-8	6.64-8	5.59-8
70	8475.0	1.37-7	1.23-7	1.05-7	8.69-8	7.41-8	6.91-8
74	9543.7	1.17-7	1.08-7	9.54-8	8.37-8	7.61-8	7.49-8
78	10679.2	1.01-7	9.41-8	8.62-8	7.88-8	7.49-8	7.62-8
82	11882.9	8.64-8	8.22-8	7.71-8	7.27-8	7.13-8	7.44-8
87	13485.1	7.11-8	6.88-8	6.61-8	6.42-8	6.47-8	6.91-8
92	15199.2	5.78-8	5.67-8	5.54-8	5.50-8	5.67-8	6.17-8

B1 - I8

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
590.8	3.52-2	3.68-2	3.91-2	4.17-2	4.42-2	4.60-2
893.7	2.07-2	2.16-2	2.28-2	2.43-2	2.57-2	2.67-2
1260.5	1.10-2	1.15-2	1.20-2	1.28-2	1.35-2	1.40-2
1693.5	5.80-3	5.99-3	6.26-3	6.60-3	6.94-3	7.23-3
2194.5	3.38-3	3.47-3	3.60-3	3.77-3	3.96-3	4.13-3
2765.7	2.20-3	2.24-3	2.32-3	2.41-3	2.53-3	2.64-3
3409.7	1.55-3	1.57-3	1.61-3	1.67-3	1.75-3	1.83-3
4108.1	5.19-6	4.89-6	4.53-6	4.23-6	4.07-6	4.08-6
4853.5	5.67-7	4.67-7	3.41-7	2.14-7	1.17-7	6.02-8
5662.4	3.33-7	2.81-7	2.14-7	1.47-7	9.53-8	6.59-8
6599.7	3.00-3	3.05-3	3.11-3	3.21-3	3.36-3	3.57-3
7554.2	1.51-6	1.40-6	1.28-6	1.17-6	1.11-6	1.13-6
8563.4	4.21-7	3.63-7	2.90-7	2.20-7	1.70-7	1.49-7
9638.8	2.30-7	1.95-7	1.52-7	1.09-7	7.85-8	6.36-8
10781.2	1.41-7	1.20-7	9.33-8	6.72-8	4.80-8	3.88-8
11991.8	8.91-8	7.62-8	5.98-8	4.35-8	3.15-8	2.58-8
13603.1	5.09-8	4.37-8	3.44-8	2.52-8	1.84-8	1.52-8
15326.7	2.87-8	2.46-8	1.93-8	1.38-8	9.79-9	7.84-9

B1 - I9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	615.7	1.43-2	1.50-2	1.60-2	1.72-2	1.83-2	1.92-2
26	922.1	1.26-2	1.32-2	1.41-2	1.51-2	1.60-2	1.67-2
30	1291.6	1.20-2	1.25-2	1.33-2	1.42-2	1.51-2	1.58-2
34	1726.4	1.15-2	1.20-2	1.27-2	1.36-2	1.44-2	1.51-2
38	2229.1	1.06-2	1.10-2	1.17-2	1.25-2	1.33-2	1.40-2
42	2802.2	9.33-3	9.75-3	1.03-2	1.10-2	1.18-2	1.25-2
46	3426.0	2.88-5	2.99-5	3.15-5	3.34-5	3.55-5	3.76-5
50	4129.8	1.19-3	1.20-3	1.23-3	1.27-3	1.33-3	1.40-3
54	4914.9	1.15-4	1.19-4	1.25-4	1.33-4	1.42-4	1.51-4
58	5730.9	1.26-5	1.29-5	1.32-5	1.37-5	1.44-5	1.53-5
62	6613.4	1.00-6	8.65-7	6.94-7	5.29-7	4.14-7	3.62-7
66	7582.6	8.21-6	8.47-6	8.86-6	9.38-6	1.00-5	1.09-5
70	8605.3	5.96-6	6.16-6	6.46-6	6.86-6	7.38-6	8.05-6
74	9697.7	4.26-6	4.41-6	4.64-6	4.94-6	5.34-6	5.86-6
78	10861.1	3.12-6	3.23-6	3.40-6	3.63-6	3.94-6	4.35-6
82	12097.2	2.32-6	2.40-6	2.53-6	2.71-6	2.95-6	3.29-6
87	13747.6	1.62-6	1.68-6	1.78-6	1.91-6	2.09-6	2.35-6
92	15519.5	1.14-6	1.19-6	1.25-6	1.35-6	1.49-6	1.69-6

B1 - I10

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
633.0	3.43-5	2.82-5	2.04-5	1.24-5	6.35-6	2.88-6
945.0	1.48-5	1.21-5	8.73-6	5.33-6	2.73-6	1.27-6
1318.0	6.49-6	5.32-6	3.84-6	2.37-6	1.25-6	6.21-7
1752.4	3.04-6	2.52-6	1.87-6	1.22-6	7.35-7	4.64-7
2248.3	2.17-6	1.96-6	1.71-6	1.47-6	1.30-6	1.23-6
2806.1	4.33-5	4.51-5	4.76-5	5.07-5	5.39-5	5.69-5
3448.6	8.08-3	8.45-3	8.96-3	9.58-3	1.02-2	1.09-2
4161.7	7.39-4	7.70-4	8.16-4	8.71-4	9.31-4	9.93-4
4918.9	2.21-4	2.25-4	2.32-4	2.41-4	2.54-4	2.69-4
5741.0	3.45-5	3.56-5	3.71-5	3.91-5	4.16-5	4.45-5
6628.2	1.86-5	1.93-5	2.01-5	2.13-5	2.28-5	2.45-5
7650.7	2.56-3	2.59-3	2.65-3	2.74-3	2.87-3	3.07-3
8797.7	2.21-3	2.24-3	2.29-3	2.37-3	2.49-3	2.68-3
10051.4	1.93-3	1.96-3	2.00-3	2.08-3	2.19-3	2.37-3
11420.6	1.71-3	1.73-3	1.77-3	1.84-3	1.95-3	2.12-3
12915.8	1.53-3	1.55-3	1.59-3	1.65-3	1.75-3	1.92-3
14981.3	1.35-3	1.36-3	1.40-3	1.45-3	1.55-3	1.71-3
17293.7	1.20-3	1.21-3	1.24-3	1.29-3	1.39-3	1.54-3

B1 - I11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	640.7	7.22-4	5.95-4	4.30-4	2.63-4	1.34-4	6.04-5
26	957.1	4.14-4	3.39-4	2.44-4	1.49-4	7.56-5	3.41-5
30	1335.8	2.17-4	1.77-4	1.27-4	7.72-5	3.92-5	1.78-5
34	1776.6	9.62-5	7.85-5	5.62-5	3.40-5	1.72-5	7.70-6
38	2279.5	3.51-5	2.87-5	2.07-5	1.28-5	6.80-6	3.45-6
42	2844.5	1.65-5	1.50-5	1.32-5	1.15-5	1.04-5	9.99-6
46	3472.4	6.76-5	7.04-5	7.45-5	7.96-5	8.51-5	9.04-5
50	4166.0	3.78-5	3.72-5	3.66-5	3.65-5	3.71-5	3.84-5
54	4931.7	5.94-4	5.92-4	5.95-4	6.05-4	6.27-4	6.59-4
58	5813.2	6.84-4	6.85-4	6.92-4	7.08-4	7.38-4	7.82-4
62	6784.6	5.72-4	5.71-4	5.75-4	5.88-4	6.13-4	6.52-4
66	7850.0	4.80-4	4.78-4	4.79-4	4.89-4	5.10-4	5.45-4
70	9016.1	4.06-4	4.03-4	4.03-4	4.11-4	4.28-4	4.60-4
74	10290.4	3.47-4	3.44-4	3.43-4	3.48-4	3.63-4	3.92-4
78	11682.2	2.98-4	2.95-4	2.93-4	2.96-4	3.09-4	3.35-4
82	13202.2	2.58-4	2.54-4	2.52-4	2.54-4	2.65-4	2.88-4
87	15302.6	2.16-4	2.12-4	2.09-4	[illegible].10-4	2.19-4	2.39-4
92	17656.0	1.82-4	1.78-4	1.74-4	1.74-4	1.81-4	1.98-4

B1 - I12

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
646.6	1.30-4	1.07-4	7.85-5	4.92-5	2.66-5	1.37-5
963.7	8.55-5	7.11-5	5.13-5	3.14-5	1.62-5	7.56-6
1342.0	6.6[illegible]-5	5.43-5	3.90-5	2.37-5	1.21-5	5.52-6
1782.2	5.42-5	4.45-5	3.22-5	2.00-5	1.08-5	5.61-6
2284.4	4.24-5	3.52-5	2.61-5	1.72-5	1.04-5	6.75-6
2848.8	3.07-5	2.61-5	2.03-5	1.47-5	1.05-5	8.32-6
3475.7	2.21-5	1.95-5	1.62-5	1.30-5	1.07-5	9.63-6
4172.6	6.28-3	6.57-3	6.97-3	7.46-3	7.99-3	8.53-3
4974.3	6.12-3	6.39-3	6.79-3	7.28-3	7.82-3	8.39-3
5860.5	5.36-3	5.60-3	5.94-3	6.38-3	6.88-3	7.43-3
6835.3	4.71-3	4.92-3	5.23-3	5.62-3	6.08-3	6.60-3
7904.3	4.17-3	4.36-3	4.63-3	4.99-3	5.41-3	5.92-3
9074.1	3.72-3	3.88-3	4.13-3	4.46-3	4.86-3	5.35-3
10352.3	3.34-3	3.49-3	3.71-3	4.01-3	4.39-3	4.86-3
11748.1	3.02-3	3.15-3	3.36-3	3.64-3	3.99-3	4.45-3
13272.4	2.74-3	2.87-3	3.06-3	3.32-3	3.66-3	4.11-3
15378.5	2.45-3	2.57-3	2.74-3	2.98-3	3.30-3	3.74-3
17737.8	2.22-3	2.32-3	2.47-3	2.69-3	3.00-3	3.43-3

B1 - I13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	672.1	8.57-4	7.11-4	5.21-4	3.29-4	1.81-4	9.65-5
26	996.3	6.90-4	5.69-4	4.13-4	2.57-4	1.38-4	7.05-5
30	1385.2	5.87-4	4.81-4	3.47-4	2.14-4	1.13-4	5.56-5
34	1841.2	5.09-4	4.16-4	2.99-4	1.83-4	9.48-5	4.55-5
38	2367.4	4.39-4	3.58-4	2.57-4	1.56-4	8.02-5	3.77-5
42	2967.3	3.74-4	3.05-4	2.18-4	1.32-4	6.76-5	3.13-5
46	3644.8	3.16-4	2.58-4	1.84-4	1.12-4	5.68-5	2.61-5
50	4404.2	2.67-4	2.18-4	1.56-4	9.44-5	4.80-5	2.19-5
54	5250.2	2.26-4	1.85-4	1.32-4	8.02-5	4.07-5	1.85-5
58	6188.4	1.92-4	1.57-4	1.13-4	6.84-5	3.47-5	1.57-5
62	7225.2	1.63-4	1.33-4	9.58-5	5.83-5	2.95-5	1.33-5
66	8366.6	1.35-4	1.11-4	7.97-5	4.85-5	2.46-5	1.10-5
70	9611.8	8.13-5	6.67-5	4.80-5	[illegible].92-5	1.49-5	6.71-6
74	10954.4	1.53-5	1.27-5	9.33-6	5.98-6	3.46-6	2.10-6
78	12407.8	4.76-6	4.07-6	3.19-6	2.32-6	1.69-6	1.41-6
82	13992.3	2.59-6	2.28-6	1.90-6	1.53-6	1.28-6	1.19-6
87	16181.2	1.69-6	1.54-6	1.34-6	1.15-6	1.03-6	1.02-6
92	18635.2	1.28-6	1.19-6	1.06-6	9.44-7	8.75-7	8.88-7

B1 - I14

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
727.3	6.63-5	6.29-5	5.85-5	5.40-5	5.04-5	4.86-5
1064.0	4.34-5	4.08-5	3.74-5	3.39-5	3.12-5	2.97-5
1465.8	3.03-5	2.83-5	2.57-5	2.30-5	2.09-5	1.98-5
1934.3	2.22-5	2.06-5	1.86-5	1.65-5	1.49-5	1.40-5
2471.5	1.69-5	1.57-5	1.40-5	1.23-5	1.11-5	1.04-5
3079.8	1.34-5	1.23-5	1.10-5	9.59-6	8.52-6	7.99-6
3762.1	1.10-5	1.01-5	8.90-6	7.69-6	6.77-6	6.33-6
4521.8	9.36-6	8.54-6	7.47-6	6.38-6	5.55-6	5.15-6
5362.6	8.42-6	7.62-6	6.58-6	5.51-6	4.69-6	4.30-6
6289.1	8.21-6	7.34-6	6.21-6	5.05-6	4.16-6	3.72-6
7306.8	9.27-6	8.14-6	6.67-6	5.16-6	3.99-6	3.39-6
8423.3	1.41-5	1.21-5	9.42-6	6.73-6	4.64-6	3.49-6
9655.5	4.86-5	4.05-5	2.99-5	1.92-5	1.08-5	6.01-6
11028.7	9.84-5	8.13-5	5.92-5	3.67-5	1.92-5	9.14-6
12551.9	9.52-5	7.87-5	5.74-5	3.55-5	1.85-5	8.58-6
14231.6	8.56-5	7.09-5	5.18-5	3.22-5	1.67-5	7.74-6
16577.2	7.40-5	6.16-5	4.52-5	2.82-5	1.47-5	6.81-6
19237.4	6.40-5	5.34-5	3.94-5	2.48-5	1.30-5	6.03-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - J1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	512.1	1.38-3	1.18-3	9.06-4	6.15-4	3.80-4	2.42-4
26	788.3	4.34-4	3.71-4	2.88-4	2.04-4	1.39-4	1.04-4
30	1118.9	1.47-4	1.26-4	9.99-5	7.37-5	5.45-5	4.50-5
34	1501.4	5.49-5	4.74-5	3.80-5	2.89-5	2.27-5	1.98-5
38	1932.9	2.23-5	1.93-5	1.57-5	1.22-5	9.93-6	9.04-6
42	2409.9	9.72-6	8.47-6	6.93-6	5.51-6	4.57-6	4.29-6
46	2928.5	4.53-6	3.96-6	3.27-6	2.63-6	2.24-6	2.13-6
50	3483.7	2.24-6	1.96-6	1.63-6	1.32-6	1.14-6	1.11-6
54	4070.2	1.16-6	1.02-6	8.51-7	6.99-7	6.11-7	5.98-7
58	4681.3	6.30-7	5.56-7	4.66-7	3.85-7	3.40-7	3.36-7
62	5309.6	3.56-7	3.15-7	2.65-7	2.20-7	1.96-7	1.96-7
66	5946.0	2.08-7	1.84-7	1.56-7	1.30-7	1.17-7	1.18-7
70	6580.1	1.25-7	1.11-7	9.44-8	7.95-8	7.18-8	7.28-8
74	7199.6	7.74-8	6.90-8	5.88-8	4.98-8	4.52-8	4.62-8
78	7789.7	4.91-8	4.38-8	3.75-8	3.19-8	2.91-8	3.00-8
82	8332.8	3.17-8	2.84-8	2.44-8	2.08-8	1.91-8	1.98-8
87	8913.1	1.89-8	1.70-8	1.46-8	1.26-8	1.16-8	1.21-8
92	9334.9	1.15-8	1.04-8	8.99-9	7.75-9	7.18-9	7.55-9

B1 - J2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	518.3	3.23-3	2.78-3	2.20-3	1.64-3	1.26-3	1.08-3
26	799.5	1.69-3	1.46-3	1.19-3	9.25-4	7.51-4	6.82-4
30	1137.1	6.48-4	5.62-4	4.56-4	3.54-4	2.86-4	2.58-4
34	1528.1	2.22-4	1.93-4	1.58-4	1.24-4	1.03-4	9.43-5
38	1970.4	8.27-5	7.24-5	5.97-5	4.81-5	4.09-5	3.87-5
42	2461.4	3.43-5	3.02-5	2.51-5	2.06-5	1.79-5	1.74-5
46	2998.1	1.56-5	1.38-5	1.16-5	9.62-6	8.54-6	8.41-6
50	3577.0	7.68-6	6.80-6	5.75-6	4.83-6	4.34-6	4.34-6
54	4193.7	4.03-6	3.58-6	3.04-6	2.58-6	2.34-6	2.37-6
58	4843.3	2.23-6	1.99-6	1.70-6	1.45-6	1.33-6	1.35-6
62	5520.1	1.30-6	1.16-6	9.91-7	8.51-7	7.87-7	8.08-7
66	6217.2	7.82-7	6.99-7	6.02-7	5.20-7	4.84-7	5.01-7
70	6926.6	4.87-7	4.37-7	3.78-7	3.29-7	3.08-7	3.21-7
74	7638.8	3.13-7	2.82-7	2.45-7	2.14-7	2.02-7	2.12-7
78	8342.5	2.06-7	1.86-7	1.63-7	1.43-7	1.36-7	1.44-7
82	9024.3	1.39-7	1.26-7	1.11-7	9.80-8	9.39-8	1.00-7
87	9820.4	8.76-8	7.97-8	7.04-8	6.29-8	6.09-8	6.58-8
92	10516.7	5.66-8	5.18-8	4.60-8	4.15-8	4.06-8	4.43-8

B1 - J3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	519.9	4.81-3	4.09-3	3.11-3	2.07-3	1.21-3	6.92-4
26	801.5	1.89-3	1.59-3	1.21-3	8.16-4	5.17-4	3.53-4
30	1140.4	7.13-4	5.97-4	4.52-4	3.13-4	2.14-4	1.65-4
34	1533.5	3.21-4	2.67-4	2.00-4	1.35-4	8.65-5	6.10-5
38	1977.9	1.41-4	1.17-4	8.75-5	5.82-5	3.64-5	2.45-5
42	2470.9	6.20-5	5.17-5	3.86-5	2.57-5	1.61-5	1.08-5
46	3009.6	2.86-5	2.39-5	1.79-5	1.20-5	7.51-6	5.09-6
50	3590.3	1.40-5	1.17-5	8.76-6	5.90-6	3.75-6	2.59-6
54	4209.0	7.19-6	6.02-6	4.54-6	3.08-6	1.99-6	1.41-6
58	4860.6	3.89-6	3.26-6	2.48-6	1.70-6	1.12-6	8.12-7
62	5539.4	2.19-6	1.85-6	1.41-6	9.80-7	6.60-7	4.94-7
66	6238.5	1.28-6	1.09-6	8.37-7	5.89-7	4.07-7	3.15-7
70	6950.0	7.78-7	6.62-7	5.14-7	3.68-7	2.62-7	2.10-7
74	7664.4	4.85-7	4.15-7	3.25-7	2.38-7	1.74-7	1.45-7
78	8370.3	3.10-7	2.67-7	2.12-7	1.58-7	1.20-7	1.03-7
82	9054.4	2.03-7	1.76-7	1.41-7	1.08-7	8.43-8	7.58-8
87	9853.5	1.23-7	1.07-7	8.78-8	6.90-8	5.64-8	5.30-8
92	10552.9	7.60-8	6.72-8	5.61-8	4.55-8	3.89-8	3.80-8

B1 - J4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	521.3	3.15-3	2.70-3	2.12-3	1.51-3	1.05-3	8.13-4
26	804.0	3.37-3	2.92-3	2.28-3	1.64-3	1.15-3	8.82-4
30	1145.5	2.74-3	2.39-3	1.95-3	1.51-3	1.20-3	1.05-3
34	1545.7	1.93-3	1.71-3	1.43-3	1.17-3	1.01-3	9.60-4
38	2004.4	1.42-3	1.26-3	1.08-3	9.09-4	8.17-4	8.04-4
42	2520.8	1.10-3	9.81-4	8.44-4	7.26-4	6.68-4	6.71-4
46	3094.0	8.80-4	7.90-4	6.84-4	5.96-4	5.56-4	5.68-4
50	3723.2	7.27-4	6.55-4	5.70-4	5.01-4	4.72-4	4.88-4
54	4407.2	6.14-4	5.54-4	4.84-4	4.29-4	4.08-4	4.25-4
58	5144.8	5.28-4	4.77-4	4.19-4	3.73-4	3.57-4	3.76-4
62	5934.5	4.61-4	4.17-4	3.67-4	3.29-4	3.17-4	3.36-4
66	6774.6	4.07-4	3.70-4	3.27-4	2.94-4	2.85-4	3.04-4
70	7662.8	3.64-4	3.31-4	2.94-4	2.65-4	2.59-4	2.78-4
74	8596.8	3.28-4	3.00-4	2.67-4	2.42-4	2.38-4	2.57-4
78	9573.4	2.99-4	2.73-4	2.44-4	2.23-4	2.20-4	2.40-4
82	10589.1	2.74-4	2.51-4	2.25-4	2.07-4	2.05-4	2.26-4
87	11906.5	2.49-4	2.29-4	2.06-4	1.90-4	1.91-4	2.12-4
92	13266.9	2.28-4	2.10-4	1.90-4	1.77-4	1.79-4	2.01-4

B1 - J5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	522.4	4.58-3	4.61-3	4.76-3	5.12-3	5.75-3	6.46-3
26	806.8	2.54-3	2.53-3	2.58-3	2.76-3	3.08-3	3.47-3
30	1151.4	1.77-3	1.70-3	1.65-3	1.66-3	1.78-3	1.97-3
34	1556.6	1.45-3	1.35-3	1.25-3	1.19-3	1.22-3	1.31-3
38	2022.7	1.24-3	1.15-3	1.04-3	9.67-4	9.65-4	1.02-3
42	2548.9	1.31-3	1.20-3	1.09-3	9.98-4	9.79-4	1.03-3
46	3127.0	9.44-4	8.38-4	7.10-4	5.97-4	5.34-4	5.27-4
50	3759.2	7.41-4	6.56-4	5.53-4	4.63-4	4.12-4	4.09-4
54	4446.3	6.15-4	5.46-4	4.62-4	3.89-4	3.51-4	3.52-4
58	5187.1	5.25-4	4.67-4	3.98-4	3.38-4	3.09-4	3.14-4
62	5980.2	4.56-4	4.07-4	3.49-4	3.00-4	2.78-4	2.86-4
66	6823.8	4.02-4	3.61-4	3.12-4	2.71-4	2.54-4	2.65-4
70	7715.9	3.59-4	3.24-4	2.82-4	2.48-4	2.36-4	2.49-4
74	8653.9	3.24-4	2.94-4	2.58-4	2.30-4	2.22-4	2.37-4
78	9634.9	2.96-4	2.70-4	2.39-4	2.16-4	2.11-4	2.29-4
82	10655.3	2.73-4	2.50-4	2.24-4	2.05-4	2.03-4	2.23-4
87	11979.4	2.50-4	2.31-4	2.09-4	1.94-4	1.97-4	2.20-4
92	13347.4	2.31-4	2.15-4	1.98-4	1.87-4	1.93-4	2.19-4

B1 - J6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	530.4	2.45-3	2.16-3	1.81-3	1.48-3	1.29-3	1.26-3
26	815.5	1.92-3	1.68-3	1.38-3	1.11-3	9.54-4	9.13-4
30	1160.6	1.64-3	1.43-3	1.16-3	9.10-4	7.51-4	6.97-4
34	1566.3	1.42-3	1.22-3	9.65-4	7.24-4	5.59-4	4.87-4
38	2031.8	1.23-3	1.01-3	7.38-4	4.58-4	2.39-4	1.11-4
42	2552.5	6.29-4	5.10-4	3.59-4	2.11-4	1.02-4	4.26-5
46	3138.9	6.45-4	5.71-4	4.85-4	4.15-4	3.84-4	3.94-4
50	3788.5	5.89-4	5.25-4	4.51-4	3.92-4	3.69-4	3.84-4
54	4499.7	5.14-4	4.59-4	3.94-4	3.43-4	3.24-4	3.38-4
58	5272.9	4.48-4	4.00-4	3.44-4	2.99-4	2.82-4	2.96-4
62	6108.0	3.91-4	3.49-4	3.01-4	2.63-4	2.50-4	2.65-4
66	7004.4	3.29-4	2.98-4	2.63-4	2.37-4	2.35-4	2.56-4
70	7936.2	4.59-5	4.39-5	4.25-5	4.36-5	4.83-5	5.66-5
74	8899.3	7.78-6	7.42-6	7.15-6	7.30-6	8.09-6	9.51-6
78	9905.2	2.66-6	2.54-6	2.47-6	2.53-6	2.83-6	3.35-6
82	10952.6	1.33-6	1.28-6	1.24-6	1.27-6	1.42-6	1.69-6
87	12314.6	7.76-7	7.42-7	7.16-7	7.27-7	8.06-7	9.59-7
92	13726.9	5.58-7	5.31-7	5.08-7	5.10-7	5.59-7	6.65-7

B1 - J7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	538.0	2.88-3	2.66-3	2.41-3	2.22-3	2.19-3	2.29-3
26	824.3	2.06-3	1.85-3	1.60-3	1.39-3	1.28-3	1.29-3
30	1168.8	1.64-3	1.46-3	1.23-3	1.03-3	9.12-4	8.90-4
34	1571.9	1.31-3	1.16-3	9.86-4	8.34-4	7.53-4	7.47-4
38	2034.3	9.57-4	8.83-4	8.07-4	7.64-4	7.79-4	8.41-4
42	2561.2	8.79-4	7.81-4	6.66-4	5.69-4	5.24-4	5.31-4
46	3149.9	7.44-4	6.55-4	5.50-4	4.60-4	4.12-4	4.11-4
50	3800.0	6.27-4	5.51-4	4.61-4	3.83-4	3.41-4	3.41-4
54	4511.6	5.32-4	4.67-4	3.90-4	3.23-4	2.88-4	2.89-4
58	5284.6	4.54-4	3.98-4	3.32-4	2.75-4	2.45-4	2.47-4
62	6118.8	3.85-4	3.37-4	2.80-4	2.29-4	2.02-4	2.03-4
66	7010.6	3.00-4	2.57-4	2.04-4	1.55-4	1.24-4	1.14-4
70	7966.8	3.25-4	2.79-4	2.23-4	1.71-4	1.38-4	1.29-4
74	8970.6	4.28-5	4.06-5	3.88-5	3.93-5	4.34-5	5.10-5
78	9985.2	4.01-6	3.56-6	3.04-6	2.66-6	2.59-6	2.86-6
82	11039.2	1.11-6	9.30-7	7.11-7	5.11-7	3.91-7	3.64-7
87	12409.7	4.69-7	3.80-7	2.70-7	1.62-7	8.46-8	4.55-8
92	13831.1	3.32-7	2.78-7	2.11-7	1.47-7	1.05-7	9.01-8

B1 - J8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	542.3	4.41-3	3.88-3	3.21-3	2.59-3	2.18-3	2.05-3
26	833.7	3.94-3	3.53-3	3.03-3	2.62-3	2.41-3	2.43-3
30	1190.4	3.34-3	3.01-3	2.62-3	2.30-3	2.17-3	2.22-3
34	1614.9	2.72-3	2.45-3	2.14-3	1.88-3	1.78-3	1.83-3
38	2109.8	2.20-3	1.98-3	1.72-3	1.51-3	1.42-3	1.46-3
42	2661.0	2.26-5	1.98-5	1.65-5	1.36-5	1.19-5	1.14-5
46	3251.4	1.45-5	1.27-5	1.06-5	8.72-6	7.61-6	7.39-6
50	3898.9	1.20-5	1.06-5	8.90-6	7.46-6	6.67-6	6.63-6
54	4601.3	1.15-5	1.02-5	8.74-6	7.47-6	6.87-6	7.00-6
58	5359.1	1.35-5	1.21-5	1.05-5	9.15-6	8.65-6	9.05-6
62	6171.1	2.18-5	1.97-5	1.73-5	1.55-5	1.51-5	1.62-5
66	7040.5	6.91-5	6.27-5	5.56-5	5.08-5	5.06-5	5.53-5
70	7982.2	2.32-4	2.09-4	1.83-4	1.65-4	1.62-4	1.76-4
74	8991.0	2.93-4	2.50-4	1.96-4	1.45-4	1.11-4	9.92-5
78	10078.2	2.66-4	2.29-4	1.85-4	1.44-4	1.19-4	1.15-4
82	11229.5	2.42-4	2.09-4	1.68-4	1.30-4	1.07-4	1.03-4
87	12759.4	2.19-4	1.88-4	1.49-4	1.13-4	9.06-5	8.54-5
92	14390.8	2.00-4	1.71-4	1.34-4	9.89-5	7.58-5	6.89-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 − J9

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	582.3	8.10-4	6.63-4	4.76-4	2.91-4	1.53-4	7.48-5
26	880.0	3.19-4	2.60-4	1.87-4	1.16-4	6.41-5	3.49-5
30	1237.2	1.20-4	9.85-5	7.22-5	4.71-5	2.89-5	1.89-5
34	1653.4	5.20-5	4.34-5	3.28-5	2.28-5	1.57-5	1.20-5
38	2128.2	2.66-5	2.24-5	1.72-5	1.24-5	9.07-6	7.45-6
42	2677.3	1.74-3	1.56-3	1.35-3	1.17-3	1.10-3	1.13-3
46	3285.6	5.24-5	4.51-5	3.64-5	2.88-5	2.43-5	2.31-5
50	3938.4	1.89-5	1.62-5	1.30-5	1.02-5	8.62-6	8.22-6
54	4646.7	1.09-5	9.57-6	7.98-6	6.67-6	6.04-6	6.12-6
58	5409.5	8.10-6	7.27-6	6.35-6	5.69-6	5.55-6	5.93-6
62	6225.9	7.72-6	7.11-6	6.48-6	6.13-6	6.30-6	6.99-6
66	7094.5	1.05-5	9.86-6	9.20-6	8.98-6	9.51-6	1.08-5
70	8016.7	2.73-5	2.55-5	2.39-5	2.34-5	2.49-5	2.85-5
74	9014.5	2.20-4	2.01-4	1.81-4	1.69-4	1.72-4	1.93-4
78	10097.8	2.36-4	2.14-4	1.91-4	1.76-4	1.78-4	2.00-4
82	11248.3	2.16-4	1.97-4	1.77-4	1.64-4	1.68-4	1.90-4
87	12778.0	1.91-4	1.76-4	1.59-4	1.50-4	1.57-4	1.81-4
92	14409.5	1.70-4	1.57-4	1.44-4	1.39-4	1.49-4	1.76-4

B1 − J10

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
587.4	4.96-4	4.07-4	2.96-4	1.91-4	1.17-4	7.74-5
887.0	4.30-4	3.49-4	2.49-4	1.56-4	8.95-5	5.36-5
1247.9	3.04-4	2.45-4	1.73-4	1.06-4	5.89-5	3.27-5
1669.7	1.72-4	1.38-4	9.71-5	5.94-5	3.24-5	1.75-5
2150.8	8.36-5	6.72-5	4.76-5	2.95-5	1.67-5	9.74-6
2690.6	8.33-5	7.19-5	5.86-5	4.71-5	4.07-5	3.96-5
3323.3	1.44-3	1.29-3	1.11-3	9.63-4	9.01-4	9.27-4
4048.6	1.22-3	1.09-3	9.35-4	8.05-4	7.48-4	7.70-4
4859.1	7.79-4	6.93-4	5.92-4	5.06-4	4.67-4	4.80-4
5669.2	3.32-7	2.70-7	1.92-7	1.15-7	5.86-8	2.77-8
6542.7	2.10-7	1.70-7	1.21-7	7.27-8	3.67-8	1.68-8
7480.7	1.39-7	1.13-7	8.04-8	4.82-8	2.41-8	1.08-8
8484.0	9.58-8	7.80-8	5.54-8	3.32-8	1.65-8	7.24-9
9553.2	6.77-8	5.52-8	3.93-8	2.35-8	1.17-8	5.14-9
10689.4	4.88-8	3.98-8	2.84-8	1.71-8	8.63-9	3.94-9
11893.5	3.56-8	2.92-8	2.10-8	1.28-8	6.62-9	3.28-9
13496.3	2.44-8	2.01-8	1.46-8	9.11-9	5.01-9	2.85-9
15210.7	1.69-8	1.40-8	1.03-8	6.67-9	3.98-9	2.65-9

B1 − J11

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	615.3	8.89-4	7.29-4	5.27-4	3.29-4	1.83-4	1.03-4
26	921.2	6.85-4	5.37-4	3.94-4	2.49-4	1.40-4	8.01-5
30	1289.7	5.93-4	4.80-4	3.42-4	2.13-4	1.20-4	6.89-5
34	1722.8	5.39-4	4.35-4	3.10-4	1.93-4	1.08-4	6.18-5
38	2223.4	4.87-4	3.93-4	2.79-4	1.73-4	9.74-5	5.52-5
42	2794.4	4.27-4	3.44-4	2.45-4	1.52-4	8.55-5	4.83-5
46	3430.1	8.10-6	6.55-6	4.65-6	2.84-6	1.50-6	7.45-7
50	4113.4	1.23-6	9.98-7	7.09-7	4.27-7	2.16-7	9.77-8
54	4859.8	2.60-4	2.31-4	1.96-4	1.67-4	1.53-4	1.56-4
58	5717.5	4.34-6	4.24-6	4.20-6	4.37-6	4.81-6	5.48-6
62	6600.9	2.69-6	2.61-6	2.57-6	2.67-6	2.94-6	3.37-6
66	7549.6	1.92-6	1.86-6	1.83-6	1.89-6	2.08-6	2.39-6
70	8563.1	1.35-6	1.30-6	1.28-6	1.31-6	1.45-6	1.67-6
74	9641.5	8.71-7	8.43-7	8.26-7	8.49-7	9.37-7	1.09-6
78	10786.0	5.44-7	5.26-7	5.16-7	5.31-7	5.87-7	6.84-7
82	11998.2	3.39-7	3.28-7	3.22-7	3.31-7	3.67-7	4.30-7
87	13610.9	1.91-7	1.85-7	1.81-7	1.86-7	2.07-7	2.44-7
92	15335.7	1.10-7	1.06-7	1.03-7	1.06-7	1.18-7	1.41-7

B1 − J12

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
633.6	2.66-4	2.19-4	1.58-4	9.70-5	5.03-5	2.40-5
946.1	1.06-4	8.68-5	6.27-5	3.87-5	2.06-5	1.05-5
1319.7	4.15-5	3.40-5	2.45-5	1.53-5	8.33-6	4.56-6
1754.7	1.66-5	1.36-5	9.79-6	6.11-6	3.40-6	1.93-6
2251.2	6.91-6	5.65-6	4.07-6	2.54-6	1.42-6	8.22-7
2809.7	3.44-6	2.80-6	2.01-6	1.26-6	7.26-7	4.41-7
3438.7	3.58-4	2.89-4	2.06-4	1.28-4	7.17-5	4.05-5
4145.7	2.13-5	1.82-5	1.47-5	1.18-5	1.01-5	9.77-6
4899.3	5.93-6	5.65-6	5.43-6	5.48-6	5.92-6	6.68-6
5741.5	7.71-6	6.33-6	4.61-6	2.98-6	1.84-6	1.31-6
6623.6	1.98-6	1.78-6	1.55-6	1.37-6	1.31-6	1.39-6
7572.1	8.11-7	7.28-7	6.31-7	5.53-7	5.23-7	5.49-7
8589.3	3.04-7	2.64-7	2.15-7	1.70-7	1.41-7	1.34-7
9677.5	1.50-7	1.26-7	9.49-8	6.42-8	4.13-8	2.94-8
10837.7	1.03-7	8.57-8	6.32-8	4.07-8	2.36-8	1.42-8
12071.4	7.93-8	6.58-8	4.86-8	3.14-8	1.84-8	1.15-8
13719.1	5.79-8	4.81-8	3.56-8	2.32-8	1.38-8	9.03-9
15488.6	4.20-8	3.49-8	2.59-8	1.69-8	1.02-8	6.73-9

B1 − J13

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	638.1	1.57-3	1.33-3	1.03-3	7.40-4	5.39-4	4.46-4
26	953.4	7.33-4	6.50-4	5.52-4	4.70-4	4.29-4	4.31-4
30	1330.3	3.39-4	3.17-4	2.96-4	2.86-4	2.95-4	3.19-4
34	1768.7	1.55-4	1.51-4	1.50-4	1.55-4	1.69-4	1.88-4
38	2269.0	7.29-5	7.26-5	7.41-5	7.93-5	8.86-5	9.98-5
42	2831.7	3.64-5	3.66-5	3.78-5	4.10-5	4.63-5	5.25-5
46	3457.4	2.31-5	2.27-5	2.29-5	2.42-5	2.69-5	3.04-5
50	4159.7	3.02-4	2.46-4	1.78-4	1.16-4	7.10-5	4.72-5
54	4924.4	9.67-6	8.93-6	8.12-6	7.60-6	7.63-6	8.23-6
58	5760.7	8.90-4	7.90-4	6.71-4	5.68-4	5.19-4	5.32-4
62	6672.1	5.43-6	5.52-6	5.80-6	6.40-6	7.37-6	8.65-6
66	7631.0	2.77-6	2.81-6	2.95-6	3.24-6	3.74-6	4.40-6
70	8658.2	1.54-6	1.57-6	1.64-6	1.80-6	2.08-6	2.47-6
74	9755.3	8.98-7	9.11-7	9.54-7	1.05-6	1.22-6	1.45-6
78	10923.8	5.39-7	5.48-7	5.75-7	6.35-7	7.40-7	8.85-7
82	12165.2	3.32-7	3.38-7	3.56-7	3.94-7	4.61-7	5.56-7
87	13822.8	1.86-7	1.90-7	2.01-7	2.24-7	2.64-7	3.21-7
92	15602.6	1.07-7	1.10-7	1.16-7	1.30-7	1.55-7	1.91-7

B1 − J14

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
641.4	2.42-3	2.00-3	1.45-3	8.97-4	4.74-4	2.36-4
959.7	1.62-3	1.40-3	1.12-3	8.69-4	7.05-4	6.46-4
1339.6	5.69-4	4.98-4	4.12-4	3.36-4	2.93-4	2.83-4
1781.7	2.80-4	2.30-4	1.67-4	1.05-4	5.96-5	3.46-5
2285.9	1.40-4	1.14-4	8.23-5	5.07-5	2.71-5	1.41-5
2852.1	6.96-5	5.84-5	4.45-5	3.13-5	2.20-5	1.76-5
3480.3	3.48-5	3.02-5	2.46-5	1.95-5	1.64-5	1.56-5
4170.9	1.75-5	1.56-5	1.33-5	1.15-5	1.06-5	1.08-5
4951.7	1.17-4	9.89-5	7.75-5	5.86-5	4.68-5	4.26-5
5780.5	1.13-5	1.09-5	1.05-5	1.06-5	1.14-5	1.29-5
6758.6	7.81-4	6.89-4	5.78-4	4.80-4	4.29-4	4.34-4
7857.0	6.79-4	5.92-4	4.86-4	3.89-4	3.30-4	3.23-4
9042.9	3.80-4	3.19-4	2.43-4	1.68-4	1.13-4	8.63-5
10322.0	2.35-4	1.95-4	1.44-4	9.21-5	5.26-5	2.99-5
11715.9	1.90-4	1.57-4	1.15-4	7.27-5	3.99-5	2.06-5
13237.3	1.65-4	1.37-4	1.00-4	6.34-5	3.45-5	1.73-5
15339.0	1.44-4	1.20-4	8.83-5	5.62-5	3.07-5	1.53-5
17693.1	1.28-4	1.07-4	7.99-5	5.13-5	2.82-5	1.41-5

B1 − J15

Z	ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
22	643.1	2.22-3	2.32-3	2.53-3	2.89-3	3.40-3	3.93-3
26	960.4	1.22-3	1.08-3	9.22-4	7.86-4	7.19-4	7.22-4
30	1342.6	1.15-3	9.65-4	7.37-4	5.20-4	3.68-4	2.95-4
34	1789.2	7.15-4	6.54-4	5.87-4	5.41-4	5.36-4	5.65-4
38	2297.9	3.71-4	3.63-4	3.63-4	3.80-4	4.19-4	4.68-4
42	2868.2	1.67-4	1.68-4	1.75-4	1.91-4	2.17-4	2.46-4
46	3500.7	7.33-5	7.43-5	7.77-5	8.51-5	9.69-5	1.11-4
50	4196.8	3.62-5	3.55-5	3.54-5	3.72-5	4.11-5	4.66-5
54	4965.0	1.69-4	1.36-4	9.61-5	5.87-5	3.13-5	1.58-5
58	5846.0	2.26-4	1.84-4	1.32-4	8.39-5	4.92-5	3.04-5
62	6819.7	1.91-4	1.56-4	1.15-4	7.68-5	5.02-5	3.71-5
66	7892.2	1.70-4	1.45-4	1.16-4	9.16-5	7.83-5	7.75-5
70	9091.6	3.67-4	3.29-4	2.85-4	2.49-4	2.37-4	2.54-4
74	10430.1	4.25-4	3.78-4	3.21-4	2.72-4	2.49-4	2.61-4
78	11907.5	3.99-4	3.53-4	2.98-4	2.47-4	2.22-4	2.29-4
82	13536.5	3.63-4	3.21-4	2.68-4	2.19-4	1.93-4	1.97-4
87	15812.1	3.20-4	2.82-4	2.34-4	1.88-4	1.61-4	1.62-4
92	18393.4	2.82-4	2.47-4	2.04-4	1.61-4	1.35-4	1.34-4

B1 − J16

ΔE	E′=.008	E′=.04	E′=.10	E′=.21	E′=.41	E′=.75
649.7	9.11-3	1.07-2	1.32-2	1.66-2	2.08-2	2.47-2
970.9	7.09-3	8.18-3	9.94-3	1.24-2	1.53-2	1.81-2
1356.7	4.94-3	5.58-3	6.63-3	8.12-3	9.90-3	1.16-2
1809.5	3.14-3	3.41-3	3.88-3	4.58-3	5.46-3	6.34-3
2332.9	2.02-3	2.09-3	2.23-3	2.50-3	2.89-3	3.30-3
2930.5	1.43-3	1.42-3	1.44-3	1.54-3	1.72-3	1.94-3
3606.1	1.09-3	1.06-3	1.04-3	1.08-3	1.17-3	1.32-3
4363.5	8.70-4	8.35-4	8.10-4	8.21-4	8.86-4	9.94-4
5207.7	7.18-4	6.86-4	6.60-4	6.64-4	7.12-4	8.02-4
6144.3	6.06-4	5.78-4	5.54-4	5.56-4	5.97-4	6.74-4
7180.0	5.19-4	4.95-4	4.75-4	4.76-4	5.13-4	5.83-4
8322.5	4.49-4	4.29-4	4.12-4	4.15-4	4.48-4	5.13-4
9581.1	3.91-4	3.74-4	3.61-4	3.65-4	3.96-4	4.56-4
10966.3	3.43-4	3.29-4	3.18-4	3.23-4	3.53-4	4.09-4
12491.0	3.02-4	2.90-4	2.82-4	2.87-4	3.16-4	3.69-4
14170.1	2.66-4	2.57-4	2.50-4	2.56-4	2.83-4	3.34-4
16514.5	2.28-4	2.21-4	2.16-4	2.22-4	2.48-4	2.96-4
19173.5	1.96-4	1.90-4	1.86-4	1.93-4	2.17-4	2.63-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - J17

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	671.6	2.39-3	2.49-3	2.71-3	3.09-3	3.64-3	4.23-3
26	995.2	2 46-3	2.64-3	2.98-3	3.50-3	4.18-3	4.88-3
30	1382.9	2.70-3	2.95-3	3.38-3	4.02-3	4.83-3	5.63-3
34	1837.8	2.66-3	2.89-3	3.30-3	3.91-3	4.68-3	5.44-3
38	2363.6	2.06-3	2 18-3	2.41-3	2.77-3	3.26-3	3.77-3
42	2964.0	1.19-3	1.15-3	1.14-3	1.18-3	1.28-3	1.44-3
46	3642.3	6.63-4	5.55-4	4.22-4	2.94-4	2.05-4	1.63-4
50	4402.3	5.54-4	4.60-4	3.42-4	2.28-4	1.46-4	1.04-4
54	5249.0	5.63-4	5.03-4	4.32-4	3.75-4	3.51-4	3.65-4
58	6188.0	5.67-4	5.33-4	5.01-4	4.89-4	5.14-4	5.75-4
62	7226.1	5.49-4	5.33-4	5.25-4	5.43-4	5.99-4	6.90-4
66	8370.9	5.16-4	5.11-4	5.19-4	5.54-4	6.26-4	7.34-4
70	9631.6	4.75-4	4.77-4	4.93-4	5.36-4	6.18-4	7.33-4
74	11018.8	4.31-4	4.37-4	4.57-4	5.05-4	5.88-4	7.05-4
78	12545.2	3.88-4	3.96-4	4.18-4	4.65-4	5.48-4	6.63-4
82	14225.9	3.46-4	3.55-4	3.77-4	4.23-4	5.02-4	6.13-4
87	16571.9	2.98-4	3.06-4	3.27-4	3.69-4	4.43-4	5.48-4
92	19232.0	2 54-4	2.62-4	2.81-4	3.19-4	3.85-4	4.84-4

B1 - J18

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
673.1	3.42-3	3.69-3	4.17-3	4.94-3	5.96-3	6.99-3
997.2	2.95-3	3.15-3	3.51-3	4.09-3	4.86-3	5.66-3
1385.8	2.74-3	2.92-3	3.25-3	3.77-3	4.46-3	5.17-3
1841.6	2.85-3	3.09-3	3.51-3	4.14-3	4.94-3	5.73-3
2368.1	3.20-3	3.56-3	4.14-3	4.99-3	6.04-3	7.06-3
2969.1	3.53-3	4.00-3	4.75-3	5.82-3	7.10-3	8.38-3
3649.1	3.42-3	3.91-3	4.69-3	5.78-3	7.09-3	8.43-3
4412.8	2.94-3	3.36-3	4.03-3	4.98-3	6.13-3	7.33-3
5265.1	2.42-3	2.76-3	3.30-3	4.08-3	5.03-3	6.05-3
6212.0	1.98-3	2.26-3	2.69-3	3.32-3	4.11-3	4.97-3
7260.5	1.64-3	1.86-3	2.21-3	2.73-3	3.38-3	4.12-3
8418.7	1.36-3	1.54-3	1.83-3	2.26-3	2.82-3	3.46-3
9696.1	1.14-3	1.29-3	1.54-3	1.90-3	2.37-3	2.92-3
11103.9	9.65-4	1.09-3	1.30-3	1.60-3	2.01-3	2.50-3
12655.3	8.19-4	9.24-4	1.10-3	1.36-3	1.72-3	2.15-3
14365.9	6.98-4	7.86-4	9.36-4	1.16-3	1.47-3	1.85-3
16757.3	5.73-4	6.45-4	7.68-4	9.56-4	1.22-3	1.56-3
19473.0	4.71-4	5.30-4	6.31-4	7.89-4	1.02-3	1.32-3

B1 - J19

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	728.5	5.70-5	5.07-5	4.28-5	3.54-5	3.10-5	3.03-5
26	1067.0	3.95-5	3.55-5	3.07-5	2.65-5	2.45-5	2.49-5
30	1471.7	2 86-5	2.59-5	2.28-5	2.02-5	1.93-5	2.00-5
34	1945.0	2 14-5	1.95-5	1.73-5	1.56-5	1.52-5	1.60-5
38	2489.5	1.64-5	1.50-5	1.34-5	1.23-5	1.21-5	1.29-5
42	3108.4	1.28-5	1.18-5	1.06-5	9.82-6	9.78-6	1.05-5
46	3805.6	1.02-5	9.43-6	8.54-6	7.94-6	7.98-6	8.63-6
50	4585.4	8.30-6	7.66-6	6.96-6	6.51-6	6.57-6	7.17-6
54	5453.0	6.82-6	6.31-6	5.75-6	5.39-6	5.47-6	6.01-6
58	6414.2	5.68-6	5.26-6	4.80-6	4.51-6	4.60-6	5.08-6
62	7476.1	4.78-6	4.43-6	4.04-6	3.81-6	3.90-6	4.33-6
66	8646.7	4 06-6	3.76-6	3.44-6	3.25-6	3.33-6	3.72-6
70	9935.5	3.47-6	3.22-6	2.95-6	2.78-6	2.86-6	3.22-6
74	11353.5	2.98-6	2.77-6	2.54-6	2.40-6	2.48-6	2.80-6
78	12914.0	2.58-6	2.40-6	2.20-6	2.08-6	2.15-6	2.45-6
82	14632.7	2.23-6	2 08-6	1.91-6	1.80-6	1.87-6	2.14-6
87	17033.0	1.86-6	1.73-6	1.59-6	1.50-6	1.56-6	1.80-6
92	19757.4	1.54-6	1.43-6	1.31-6	1.24-6	1.28-6	1.49-6

B1 - K1

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
511.9	1.10-3	9.02-4	6.49-4	3.93-4	1.96-4	8.59-5
788.7	4.39-4	3.60-4	2.59-4	1.60-4	8.58-5	4.58-5
1120.1	1.70-4	1.41-4	1.06-4	7.17-5	4.75-5	3.58-5
1503.2	6.53-5	5.56-5	4.37-5	3.28-5	2.57-5	2.30-5
1935.1	2.65-5	2.30-5	1.87-5	1.49-5	1.27-5	1.22-5
2412.3	1.16-5	1.02-5	8.46-6	6.99-6	6.21-6	6.15-6
2931.0	5.46-6	4.81-6	4.06-6	3.43-6	3.13-6	3.16-6
3486.3	2.73-6	2.42-6	2.06-6	1.77-6	1.64-6	1.68-6
4072.8	1.44-6	1.28-6	1.10-6	9.59-7	9.02-7	9.34-7
4683.9	7.99-7	7.15-7	6.18-7	5.44-7	5.17-7	5.40-7
5312.1	4.61-7	4.14-7	3.61-7	3.21-7	3.08-7	3.25-7
5948.4	2.76-7	2.49-7	2.19-7	1.97-7	1.91-7	2.03-7
6582.3	1.71-7	1.55-7	1.37-7	1.24-7	1.22-7	1.31-7
7201.6	1.09-7	9.94-8	8.87-8	8.12-8	8.06-8	8.73-8
7791.4	7.14-8	6.54-8	5.89-8	5.45-8	5.46-8	5.98-8
8334.2	4.79-8	4.41-8	4.01-8	3.75-8	3.80-8	4.20-8
8914.0	2.99-8	2.78-8	2.55-8	2.42-8	2.49-8	2.78-8
9335.2	1.93-8	1.80-8	1.68-8	1.61-8	1.68-8	1.90-8

B1 - K2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	515.5	1 25-3	1.15-3	1.02-3	9.27-4	9.00-4	9.32-4
26	793.0	4.24-4	3.98-4	3.72-4	3.60-4	3.72-4	4.00-4
30	1125.9	1.61-4	1.49-4	1.37-4	1.30-4	1.32-4	1.41-4
34	1512.9	6.76-5	6.10-5	5.36-5	4.80-5	4.63-5	4.81-5
38	1951.6	2.99-5	2.64-5	2.25-5	1.93-5	1.78-5	1.81-5
42	2439.2	1.37-5	1.20-5	1.00-5	8.39-6	7.58-6	7.61-6
46	2972.7	6.60-6	5.75-6	4.76-6	3.92-6	3.49-6	3.49-6
50	3548.2	3.32-6	2.88-6	2.37-6	1.94-6	1.72-6	1.72-6
54	4161.7	1.75-6	1.51-6	1.24-6	1.01-6	8.91-7	8.93-7
58	4808.0	9.54-7	8.26-7	6.75-7	5.49-7	4.85-7	4.88-7
62	5481.4	5.40-7	4.67-7	3.82-7	3.10-7	2.75-7	2.77-7
66	6174.9	3.16-7	2.73-7	2.23-7	1.82-7	1.61-7	1.64-7
70	6880.7	1.90-7	1.65-7	1.35-7	1.09-7	9.74-8	9.96-8
74	7589.1	1.17-7	1.02-7	8.32-8	6.79-8	6.06-8	6.24-8
78	8289.0	7.41-8	6.42-8	5.27-8	4.31-8	3.87-8	4.01-8
82	8966.7	4.78-8	4.14-8	3.40-8	2.79-8	2.52-8	2.64-8
87	9757.6	2.82-8	2.45-8	2 02-8	1.67-8	1.52-8	1.60-8
92	10448.3	1.71-8	1.49-8	1.23-8	1.02-8	9.36-9	1.00-8

B1 - K3

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
519.9	5.26-3	4.47-3	3.47-3	2.51-3	1.82-3	1.49-3
803.6	3.67-3	3.06-3	2.30-3	1.56-3	1.02-3	7.34-4
1147.9	2.65-3	2.19-3	1.62-3	1.07-3	6.59-4	4.44-4
1552.9	1.99-3	1.64-3	1.21-3	7.89-4	4.83-4	3.22-4
2014.8	1.91-3	1.84-3	1.80-3	1.83-3	1.98-3	2.19-3
2532.0	1.54-3	1.48-3	1.44-3	1.46-3	1.58-3	1.75-3
3105.9	1.28-3	1.23-3	1.19-3	1.21-3	1.31-3	1.46-3
3735.7	1.08-3	1.04-3	1.01-3	1.03-3	1.11-3	1.25-3
4420.3	9.33-4	8.98-4	8.74-4	8.92-4	9.68-4	1.09-3
5158.4	8.17-4	7.88-4	7.69-4	7.87-4	8.57-4	9.73-4
5948.4	7.26-4	7.01-4	6.86-4	7.04-4	7.71-4	8.80-4
6788.6	6.53-4	6.32-4	6.21-4	6.39-4	7.03-4	8.07-4
7677.0	5.94-4	5.77-4	5.68-4	5.88-4	6.49-4	7.50-4
8610.9	5.46-4	5.31-4	5.26-4	5.46-4	6.06-4	7.04-4
9587.3	5.07-4	4.95-4	4.91-4	5.13-4	5.72-4	6.70-4
10602.5	4.75-4	4.65-4	4.64-4	4.86-4	5.46-4	6.43-4
11919.3	4.42-4	4.35-4	4.36-4	4.61-4	5.21-4	6.20-4
13278.6	4.17-4	4.12-4	4.16-4	4.42-4	5.03-4	6.06-4

B1 - K4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	527.2	6.21-3	6.17-3	6.26-3	6.66-3	7.40-3	8.29-3
26	810.9	4.39-3	4.32-3	4.33-3	4.55-3	5.01-3	5.59-3
30	1153.7	3.21-3	3.12-3	3.09-3	3.20-3	3.48-3	3.87-3
34	1555.2	2.42-3	2.34-3	2.29-3	2.34-3	2.52-3	2.79-3
38	2018.7	1.53-3	1.25-3	9.04-4	5.69-4	3.22-4	1.89-4
42	2545.3	1.22-3	9.95-4	7.19-4	4.53-4	2.56-4	1.51-4
46	3133.1	9.89-4	8.08-4	5.83-4	3.65-4	2.05-4	1.19-4
50	3782.1	8.19-4	6.68-4	4.81-4	3.00-4	1.67-4	9.54-5
54	4492.6	6.87-4	5.60-4	4.03-4	2.50-4	1.37-4	7.66-5
58	5264.5	5.80-4	4.72-4	3.38-4	2.09-4	1.13-4	6.06-5
62	6097.2	4.81-4	3.91-4	2.79-4	1.70-4	8.90-5	4.46-5
66	6985.2	3.18-4	2.57-4	1.83-4	1.09-4	5.48-5	2.42-5
70	7909.4	6.60-5	5.40-5	3.91-5	2.48-5	1.42-5	8.71-6
74	8870.7	1.51-5	1.26-5	9.55-6	6.69-6	4.74-6	3.93-6
78	9874.6	5.45-6	4.65-6	3.68-6	2.81-6	2.28-6	2.17-6
82	10919.7	2.54-6	2.21-6	1.83-6	1.50-6	1.34-6	1.37-6
87	12278.4	1.21-6	1.08-6	9.33-7	8.24-7	7.99-7	8.75-7
92	13686.9	6.64-7	6.08-7	5.48-7	5.13-7	5.26-7	6.01-7

B1 - K5

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
531.1	3.88-3	3.46-3	2.97-3	2.54-3	2.35-3	2.37-3
817.0	2.87-3	2.63-3	2.36-3	2.17-3	2.16-3	2.29-3
1163.2	2.23-3	2.09-3	1.94-3	1.87-3	1.95-3	2.12-3
1569.9	1.77-3	1.68-3	1.60-3	1.58-3	1.69-3	1.86-3
2037.4	1.42-3	1.36-3	1.31-3	1.32-3	1.43-3	1.59-3
2565.8	1.16-3	1.11-3	1.08-3	1.10-3	1.20-3	1.35-3
3155.2	9.58-4	9.21-4	8.98-4	9.22-4	1.01-3	1.15-3
3806.0	8.02-4	7.73-4	7.56-4	7.80-4	8.60-4	9.82-4
4518.1	6.79-4	6.56-4	6.43-4	6.67-4	7.39-4	8.50-4
5291.8	5.80-4	5.60-4	5.52-4	5.75-4	6.41-4	7.42-4
6126.2	4.87-4	4.73-4	4.68-4	4.90-4	5.51-4	6.43-4
7015.0	2.88-4	2.71-4	2.55-4	2.54-4	2.74-4	3.15-4
7965.5	3.51-4	2.93-4	2.22-4	1.56-4	1.11-4	9.32-5
8986.1	3.46-4	2.85-4	2.09-4	1.37-4	8.56-5	6.04-5
10072.1	3.16-4	2.59-4	1.89-4	1.22-4	7.28-5	4.81-5
11222.7	2.86-4	2.35-4	1.71-4	1.09-4	6.39-5	4.07-5
12752.0	2.54-4	2.08-4	1.51-4	9.60-5	5.54-5	3.43-5
14383.1	2.27-4	1.86-4	1.35-4	8.52-5	4.86-5	2.94-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - K6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	579.6	4.29-5	3.51-5	2.52-5	1.52-5	7.58-6	3.32-6
26	875.3	3.03-5	2.47-5	1.76-5	1.05-5	5.24-6	2.28-6
30	1230.6	2.30-5	1.87-5	1.33-5	7.93-6	3.93-6	1.72-6
34	1645.1	1.87-5	1.52-5	1.07-5	6.42-6	3.19-6	1.41-6
38	2118.2	1.62-5	1.31-5	9.29-6	5.56-6	2.79-6	1.27-6
42	2649.5	1.49-5	1.21-5	8.58-6	5.17-6	2.64-6	1.27-6
46	3238.3	1.48-5	1.20-5	8.54-6	5.21-6	2.76-6	1.44-6
50	3883.9	1.60-5	1.30-5	9.36-6	5.83-6	3.26-6	1.91-6
54	4585.4	1.96-5	1.61-5	1.17-5	7.58-6	4.60-6	3.10-6
58	5342.1	2.94-5	2.44-5	1.83-5	1.25-5	8.53-6	6.77-6
62	6154.8	6.37-5	5.41-5	4.26-5	3.24-5	2.61-5	2.47-5
66	7034.2	2.99-4	2.77-4	2.55-4	2.46-4	2.59-4	2.94-4
70	7991.3	3.83-4	3.65-4	3.52-4	3.59-4	3.98-4	4.65-4
74	9014.9	3.52-4	3.38-4	3.29-4	3.39-4	3.79-4	4.48-4
78	10102.5	3.19-4	3.06-4	2.99-4	3.10-4	3.50-4	4.16-4
82	11254.1	2.90-4	2.79-4	2.73-4	2.84-4	3.22-4	3.86-4
87	12784.3	2.59-4	2.49-4	2.44-4	2.55-4	2.91-4	3.53-4
92	14416.0	2.33-4	2.24-4	2.20-4	2.31-4	2.65-4	3.26-4

B1 - K7

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
634.8	8.54-4	7.04-4	5.12-4	3.20-4	1.74-4	9.31-5
948.0	2.66-4	2.20-4	1.61-4	1.04-4	6.13-5	3.86-5
1322.4	8.20-5	6.82-5	5.11-5	3.46-5	2.29-5	1.72-5
1758.0	2.78-5	2.35-5	1.82-5	1.32-5	1.00-5	8.63-6
2255.3	1.08-5	9.32-6	7.54-6	5.98-6	5.09-6	4.87-6
2814.3	4.68-6	4.31-6	3.66-6	3.14-6	2.94-6	3.01-6
3435.6	2.53-6	2.28-6	2.03-6	1.86-6	1.84-6	1.97-6
4119.2	1.46-6	1.34-6	1.23-6	1.18-6	1.22-6	1.34-6
4865.8	9.06-7	8.49-7	7.98-7	7.87-7	8.35-7	9.35-7
5675.7	5.94-7	5.63-7	5.38-7	5.41-7	5.85-7	6.63-7
6549.4	4.04-7	3.86-7	3.74-7	3.81-7	4.17-7	4.77-7
7487.7	2.82-7	2.72-7	2.66-7	2.73-7	3.02-7	3.48-7
8491.1	2.01-7	1.95-7	1.92-7	1.99-7	2.22-7	2.58-7
9560.4	1.46-7	1.42-7	1.40-7	1.47-7	1.65-7	1.93-7
10696.6	1.07-7	1.05-7	1.04-7	1.10-7	1.24-7	1.46-7
11900.3	7.93-8	7.78-8	7.80-8	8.26-8	9.39-8	1.12-7
13503.6	5.51-8	5.43-8	5.49-8	5.87-8	6.73-8	8.11-8
15218.1	3.86-8	3.83-8	3.91-8	4.22-8	4.89-8	5.97-8

B1 - K8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	636.9	1.45-3	1.21-3	9.00-4	5.95-4	3.70-4	2.52-4
26	951.2	6.25-4	5.23-4	3.95-4	2.71-4	1.83-4	1.39-4
30	1326.9	2.37-4	2.00-4	1.54-4	1.11-4	8.18-5	6.85-5
34	1764.1	8.95-5	7.64-5	6.04-5	4.57-5	3.62-5	3.25-5
38	2263.1	3.65-5	3.15-5	2.55-5	2.02-5	1.70-5	1.61-5
42	2824.6	1.64-5	1.43-5	1.19-5	9.77-6	8.65-6	8.53-6
46	3449.1	8.05-6	7.13-6	6.08-6	5.22-6	4.85-6	4.97-6
50	4137.4	4.35-6	3.92-6	3.45-6	3.10-6	3.02-6	3.21-6
54	4890.1	2.60-6	2.40-6	2.19-6	2.07-6	2.12-6	2.32-6
58	5708.1	1.77-6	1.67-6	1.59-6	1.59-6	1.70-6	1.92-6
62	6592.0	1.43-6	1.40-6	1.40-6	1.47-6	1.64-6	1.89-6
66	7542.6	1.54-6	1.57-6	1.64-6	1.82-6	2.10-6	2.47-6
70	8558.9	2.24-6	2.35-6	2.57-6	2.94-6	3.48-6	4.15-6
74	9637.6	2.10-6	2.23-6	2.47-6	2.86-6	3.43-6	4.13-6
78	10781.0	1.42-6	1.51-6	1.68-6	1.95-6	2.35-6	2.84-6
82	11991.8	9.28-7	9.88-7	1.10-6	1.28-6	1.54-6	1.88-6
87	13603.1	5.51-7	5.87-7	6.52-7	7.60-7	9.22-7	1.13-6
92	15326.4	3.34-7	3.55-7	3.94-7	4.60-7	5.60-7	6.98-7

B1 - K9

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
641.1	4.37-3	4.20-3	4.08-3	4.13-3	4.46-3	4.94-3
958.5	2.33-3	2.28-3	2.27-3	2.37-3	2.61-3	2.92-3
1338.3	9.63-4	7.98-4	5.91-4	3.90-4	2.43-4	1.67-4
1780.7	8.86-4	8.81-4	8.97-4	9.57-4	1.07-3	1.20-3
2284.8	5.53-4	5.82-4	6.38-4	7.29-4	8.52-4	9.80-4
2850.2	2.77-4	2.96-4	3.30-4	3.83-4	4.51-4	5.23-4
3477.4	1.33-4	1.43-4	1.60-4	1.86-4	2.20-4	2.57-4
4166.8	6.52-5	7.00-5	7.85-5	9.15-5	1.09-4	1.27-4
4919.0	3.31-5	3.55-5	3.98-5	4.65-5	5.52-5	6.50-5
5734.5	1.74-5	1.87-5	2.09-5	2.44-5	2.91-5	3.44-5
6614.1	9.31-6	9.99-6	1.12-5	1.31-5	1.56-5	1.86-5
7558.9	4.72-6	5.06-6	5.67-6	6.63-6	7.94-6	9.51-6
8571.8	1.53-6	1.64-6	1.83-6	2.14-6	2.57-6	3.10-6
9658.0	2.36-7	2.40-7	2.53-7	2.82-7	3.32-7	4.00-7
10817.7	6.81-8	6.00-8	5.13-8	4.60-8	4.70-8	5.43-8
12050.9	4.06-8	3.34-8	2.51-8	1.82-8	1.52-8	1.62-8
13698.1	2.89-8	2.40-8	1.84-8	1.38-8	1.20-8	1.32-8
15466.9	2.16-8	1.84-8	1.48-8	1.21-8	1.16-8	1.34-8

B1 - K10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	641.7	1.97-3	1.71-3	1.39-3	1.08-3	8.91-4	8.26-4
26	958.7	2.66-3	2.57-3	2.53-3	2.60-3	2.82-3	3.14-3
30	1339.0	2.68-3	2.90-3	3.26-3	3.83-3	4.55-3	5.26-3
34	1782.4	1.31-3	1.39-3	1.53-3	1.75-3	2.05-3	2.35-3
38	2288.7	5.85-4	6.01-4	6.38-4	7.09-4	8.14-4	9.28-4
42	2857.7	2.72-4	2.78-4	2.93-4	3.23-4	3.69-4	4.22-4
46	3489.5	1.31-4	1.34-4	1.42-4	1.58-4	1.81-4	2.08-4
50	4184.8	6.55-5	6.76-5	7.22-5	8.07-5	9.32-5	1.08-4
54	4944.3	3.42-5	3.56-5	3.83-5	4.31-5	5.01-5	5.85-5
58	5769.0	1.86-5	1.95-5	2.11-5	2.39-5	2.80-5	3.25-5
62	6659.9	1.05-5	1.11-5	1.20-5	1.37-5	1.61-5	1.91-5
66	7618.1	6.15-6	6.47-6	7.08-6	8.12-6	9.59-6	1.14-5
70	8644.7	3.69-6	3.90-6	4.28-6	4.92-6	5.85-6	7.00-6
74	9741.3	2.27-6	2.40-6	2.65-6	3.05-6	3.64-6	4.38-6
78	10909.1	1.42-6	1.51-6	1.67-6	1.93-6	2.31-6	2.80-6
82	12150.0	9.09-7	9.65-7	1.07-6	1.24-6	1.49-6	1.82-6
87	13806.8	5.29-7	5.62-7	6.23-7	7.24-7	8.77-7	1.08-6
92	15585.8	3.13-7	3.33-7	3.69-7	4.30-7	5.23-7	6.53-7

B1 - K11

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
644.6	1.37-2	1.57-2	1.88-2	2.34-2	2.89-2	3.42-2
965.0	9.34-3	1.03-2	1.20-2	1.44-2	1.74-2	2.04-2
1351.3	6.01-3	6.40-3	7.12-3	8.26-3	9.75-3	1.13-2
1806.2	4.00-3	4.13-3	4.41-3	4.92-3	5.68-3	6.48-3
2332.5	2.82-3	2.83-3	2.92-3	3.16-3	3.56-3	4.03-3
2933.5	2.08-3	2.04-3	2.04-3	2.14-3	2.37-3	2.66-3
3613.0	1.57-3	1.51-3	1.46-3	1.49-3	1.60-3	1.79-3
4375.4	1.18-3	1.11-3	1.03-3	9.99-4	1.04-3	1.15-3
5225.8	8.51-4	7.58-4	6.49-4	5.62-4	5.27-4	5.48-4
6169.4	5.85-4	4.77-4	3.40-4	2.05-4	1.04-4	4.71-5
7210.0	7.41-4	6.99-4	6.60-4	6.51-4	6.91-4	7.79-4
8355.0	8.67-4	8.80-4	9.22-4	1.02-3	1.18-3	1.40-3
9615.3	8.52-4	8.85-4	9.56-4	1.09-3	1.29-3	1.55-3
11002.0	7.93-4	8.34-4	9.14-4	1.05-3	1.27-3	1.54-3
12527.9	7.22-4	7.64-4	8.45-4	9.84-4	1.19-3	1.46-3
14208.2	6.48-4	6.90-4	7.68-4	9.01-4	1.10-3	1.37-3
16553.5	5.61-4	5.99-4	6.71-4	7.93-4	9.81-4	1.23-3
19213.2	4.80-4	5.14-4	5.79-4	6.89-4	8.60-4	1.10-3

B1 - K12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	670.6	6.20-3	6.96-3	8.25-3	1.01-2	1.25-2	1.48-2
26	993.5	5.41-3	6.02-3	7.03-3	8.52-3	1.04-2	1.22-2
30	1380.8	4.60-3	5.04-3	5.78-3	6.89-3	8.29-3	9.66-3
34	1834.8	3.70-3	3.96-3	4.43-3	5.16-3	6.11-3	7.07-3
38	2359.1	2.92-3	3.06-3	3.32-3	3.78-3	4.41-3	5.07-3
42	2957.5	2.41-3	2.50-3	2.68-3	3.00-3	3.48-3	4.00-3
46	3633.8	2.11-3	2.19-3	2.35-3	2.65-3	3.08-3	3.57-3
50	4392.5	1.93-3	2.02-3	2.21-3	2.52-3	2.96-3	3.46-3
54	5238.4	1.84-3	1.96-3	2.18-3	2.53-3	3.01-3	3.56-3
58	6178.0	1.76-3	1.91-3	2.16-3	2.55-3	3.07-3	3.68-3
62	7221.3	1.32-3	1.40-3	1.56-3	1.82-3	2.18-3	2.61-3
66	8376.5	9.47-4	9.80-4	1.05-3	1.19-3	1.40-3	1.68-3
70	9651.6	7.45-4	7.58-4	7.97-4	8.86-4	1.04-3	1.24-3
74	11057.4	6.12-4	6.17-4	6.41-4	7.03-4	8.19-4	9.82-4
78	12606.8	5.14-4	5.14-4	5.30-4	5.77-4	6.71-4	8.08-4
82	14315.7	4.37-4	4.35-4	4.45-4	4.82-4	5.61-4	6.78-4
87	16704.9	3.60-4	3.56-4	3.63-4	3.91-4	4.55-4	5.56-4
92	19418.8	2.98-4	2.94-4	2.97-4	3.20-4	3.73-4	4.61-4

B1 - K13

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
673.1	3.88-3	4.03-3	4.34-3	4.93-3	5.78-3	6.70-3
997.0	3.90-3	4.15-3	4.62-3	5.38-3	6.39-3	7.43-3
1385.3	4.32-3	4.72-3	5.39-3	6.41-3	7.69-3	8.97-3
1840.9	4.85-3	5.38-3	6.26-3	7.55-3	9.13-3	1.07-2
2367.5	4.98-3	5.58-3	6.56-3	7.95-3	9.65-3	1.13-2
2968.9	4.64-3	5.21-3	6.14-3	7.47-3	9.09-3	1.07-2
3649.2	4.05-3	4.55-3	5.37-3	6.54-3	7.96-3	9.43-3
4412.9	3.43-3	3.85-3	4.54-3	5.52-3	6.74-3	8.03-3
5265.0	2.87-3	3.21-3	3.78-3	4.60-3	5.63-3	6.75-3
6211.7	2.39-3	2.68-3	3.14-3	3.82-3	4.68-3	5.65-3
7259.9	2.00-3	2.23-3	2.61-3	3.18-3	3.91-3	4.75-3
8417.7	1.68-3	1.87-3	2.19-3	2.66-3	3.28-3	4.01-3
9694.8	1.42-3	1.57-3	1.84-3	2.24-3	2.78-3	3.41-3
11102.3	1.20-3	1.33-3	1.56-3	1.90-3	2.36-3	2.92-3
12653.4	1.02-3	1.13-3	1.32-3	1.62-3	2.02-3	2.52-3
14363.7	8.73-4	9.67-4	1.13-3	1.38-3	1.74-3	2.18-3
16754.6	7.18-4	7.95-4	9.28-4	1.14-3	1.44-3	1.83-3
19470.0	5.92-4	6.55-4	7.64-4	9.41-4	1.20-3	1.55-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

B1 - L1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	514.9	1.18-3	9.68-4	6.99-4	4.28-4	2.19-4	9.80-5
26	792.8	4.50-4	3.68-4	2.64-4	1.60-4	8.09-5	3.59-5
30	1126.3	1.71-4	1.39-4	9.91-5	5.98-5	3.00-5	1.33-5
34	1513.7	6.69-5	5.44-5	3.86-5	2.32-5	1.16-5	5.10-6
38	1952.5	2.78-5	2.25-5	1.60-5	9.57-6	4.77-6	2.09-6
42	2440.1	1.23-5	9.94-6	7.04-6	4.21-6	2.09-6	9.16-7
46	2973.5	5.77-6	4.67-6	3.30-6	1.97-6	9.79-7	4.28-7
50	3548.9	2.87-6	2.32-6	1.64-6	9.76-7	4.85-7	2.12-7
54	4162.3	1.50-6	1.21-6	8.54-7	5.09-7	2.53-7	1.10-7
58	4808.5	8.16-7	6.59-7	4.65-7	2.77-7	1.37-7	6.00-8
62	5481.7	4.62-7	3.73-7	2.63-7	1.57-7	7.78-8	3.40-8
66	6175.2	2.71-7	2.19-7	1.54-7	9.18-8	4.56-8	1.99-8
70	6880.8	1.63-7	1.32-7	9.29-8	5.53-8	2.75-8	1.20-8
74	7589.1	1.01-7	8.15-8	5.74-8	3.42-8	1.70-8	7.43-9
78	8288.8	6.38-8	5.15-8	3.63-8	2.17-8	1.08-8	4.70-9
82	8966.4	4.12-8	3.32-8	2.34-8	1.40-8	6.95-9	3.04-9
87	9757.1	2.44-8	1.97-8	1.39-8	8.29-9	4.12-9	1.80-9
92	10447.6	1.47-8	[illegible]19-8	8.41-9	5.02-9	2.50-9	1.09-9

B1 - L2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	528.3	6.69-3	5.50-3	3.98-3	2.45-3	1.25-3	5.61-4
26	813.5	4.69-3	3.84-3	2.76-3	1.68-3	8.50-4	3.78-4
30	1159.2	3.44-3	2.81-3	2.01-3	1.21-3	6.12-4	2.70-4
34	1565.5	2.61-3	2.12-3	1.51-3	9.12-4	4.57-4	2.01-4
38	2032.5	2.04-3	1.66-3	1.18-3	7.07-4	3.53-4	1.55-4
42	2560.4	1.63-3	1.32-3	9.38-4	5.63-4	2.81-4	1.23-4
46	3149.4	1.33-3	1.08-3	7.64-4	4.58-4	2.28-4	1.00-4
50	3799.6	1.11-3	8.95-4	6.35-4	3.80-4	1.89-4	8.30-5
54	4511.3	9.33-4	7.56-4	5.36-4	3.21-4	1.60-4	7.01-5
58	5284.7	7.98-4	6.47-4	4.58-4	2.75-4	1.37-4	6.00-5
62	6120.1	6.91-4	5.60-4	3.97-4	2.38-4	1.19-4	5.21-5
66	7017.9	6.05-4	4.90-4	3.48-4	2.08-4	1.04-4	4.57-5
70	7978.3	5.34-4	4.33-4	3.07-4	1.84-4	9.21-5	4.04-5
74	9001.7	4.74-4	3.85-4	2.73-4	1.64-4	8.22-5	3.61-5
78	10088.5	4.25-4	3.45-4	2.45-4	1.48-4	7.38-5	3.25-5
82	11239.2	3.83-4	3.11-4	2.21-4	1.33-4	6.68-5	2.94-5
87	12768.0	3.39-4	2.75-4	1.96-4	1.18-4	5.94-5	2.62-5
92	14398.1	3.02-4	2.46-4	1.75-4	1.06-4	5.33-5	2.35-5

B1 - L3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	635.5	5.72-4	4.68-4	3.35-4	2.02-4	1.01-4	4.47-5
26	948.6	1.93-4	1.57-4	1.12-4	6.70-5	3.32-5	1.46-5
30	1322.8	6.78-5	5.50-5	3.88-5	2.30-5	1.13-5	4.95-6
34	1758.3	2.57-5	2.07-5	1.46-5	8.57-6	4.20-6	1.82-6
38	2255.3	1.05-5	8.46-6	5.91-6	3.46-6	1.68-6	7.26-7
42	2814.1	4.61-6	3.69-6	2.57-6	1.49-6	7.20-7	3.10-7
46	3435.0	2.13-6	1.70-6	1.18-6	6.81-7	3.27-7	1.40-7
50	4118.3	1.03-6	8.22-7	5.67-7	3.26-7	1.55-7	6.60-8
54	4864.5	5.21-7	4.14-7	2.85-7	1.63-7	7.72-8	3.27-8
58	5673.9	2.74-7	2.17-7	1.49-7	8.49-8	4.00-8	1.68-8
62	6547.2	1.49-7	1.18-7	8.07-8	4.59-8	2.15-8	8.99-9
66	7484.9	8.37-8	6.63-8	4.52-8	2.56-8	1.20-8	4.98-9
70	8487.6	4.81-8	3.81-8	2.60-8	1.47-8	6.83-9	2.83-9
74	9556.2	2.82-8	2.23-8	1.52-8	8.57-9	3.98-9	1.65-9
78	10691.6	1.66-8	1.32-8	8.96-9	5.05-9	2.35-9	0.00+0
82	11894.8	9.80-9	7.76-9	5.28-9	2.98-9	1.38-9	0.00+0
87	13496.2	4.95-9	3.92-9	2.67-9	1.51-9	0.00+0	0.00+0
92	15209.1	2.38-9	1.89-9	1.29-9	0.00+0	0.00+0	0.00+0

B1 - L4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	638.7	2.39-4	1.97-4	1.43-4	8.75-5	4.46-5	2.00-5
26	952.9	6.49-5	5.33-5	3.85-5	2.35-5	1.20-5	5.38-6
30	1328.4	1.72-5	1.42-5	1.02-5	6.27-6	3.21-6	1.44-6
34	1765.4	4.78-6	3.94-6	2.87-6	1.77-6	9.14-7	4.15-7
38	2264.4	1.46-6	1.21-6	8.91-7	5.59-7	2.93-7	1.34-7
42	2826.0	5.58-7	4.67-7	3.46-7	2.19-7	1.16-7	5.32-8
46	3450.6	3.02-7	2.51-7	1.85-7	1.17-7	6.13-8	2.80-8
50	4139.0	2.15-7	1.78-7	1.29-7	8.02-8	4.14-8	1.87-8
54	4892.0	1.73-7	1.42-7	1.02-7	6.23-8	3.17-8	1.41-8
58	5710.3	1.43-7	1.17-7	8.33-8	5.05-8	2.54-8	1.12-8
62	6594.8	1.18-7	9.60-8	6.84-8	4.12-8	2.07-8	9.10-9
66	7546.6	9.69-8	7.87-8	5.59-8	3.36-8	1.68-8	7.39-9
70	8566.8	7.88-8	6.40-8	4.55-8	2.73-8	1.36-8	5.99-9
74	9656.7	6.37-8	5.17-8	3.67-8	2.21-8	1.10-8	4.83-9
78	10817.6	5.11-8	4.15-8	2.95-8	1.77-8	8.85-9	3.88-9
82	12051.3	4.07-8	3.31-8	2.35-8	1.42-8	7.07-9	3.11-9
87	13698.8	3.03-8	2.46-8	1.75-8	1.06-8	5.30-9	2.33-9
92	15467.7	2.23-8	1.81-8	1.29-8	7.80-9	3.92-9	1.72-9

B1 - L5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	641.3	3.31-3	2.72-3	1.96-3	1.19-3	6.01-4	2.68-4
26	958.6	2.22-3	1.82-3	1.30-3	7.85-4	3.94-4	1.75-4
30	1339.0	1.33-3	1.08-3	7.70-4	4.62-4	2.31-4	1.02-4
34	1782.3	6.95-4	5.65-4	4.01-4	2.40-4	1.20-4	5.27-5
38	2288.1	3.26-4	2.64-4	1.87-4	1.12-4	5.54-5	2.44-5
42	2856.3	1.46-4	1.18-4	8.34-5	4.96-5	2.45-5	1.08-5
46	3487.2	6.63-5	5.35-5	3.77-5	2.23-5	1.10-5	4.82-6
50	4181.6	3.14-5	2.53-5	1.78-5	1.05-5	5.16-6	2.25-6
54	4940.3	1.57-5	1.26-5	8.85-6	5.21-6	2.55-6	1.11-6
58	5764.2	8.25-6	6.63-6	4.63-6	2.72-6	1.32-6	5.72-7
62	6654.3	4.54-6	3.64-6	2.54-6	1.48-6	7.18-7	3.09-7
66	7611.8	2.60-6	2.08-6	1.45-6	8.43-7	4.06-7	1.74-7
70	8637.7	1.55-6	1.24-6	8.57-7	4.97-7	2.38-7	1.02-7
74	9733.4	9.47-7	7.57-7	5.24-7	3.02-7	1.44-7	6.11-8
78	10900.4	5.96-7	4.76-7	3.29-7	1.89-7	8.97-8	3.78-8
82	12140.5	3.84-7	3.07-7	2.11-7	1.21-7	5.72-8	2.40-8
87	13796.2	2.28-7	1.82-7	1.25-7	7.14-8	3.36-8	1.40-8
92	15574.0	1.38-7	1.10-7	7.57-8	4.32-8	2.02-8	8.39-9

B1 - L6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	670.6	2.81-3	2.32-3	1.68-3	1.03-3	5.25-4	2.36-4
26	993.6	2.32-3	1.90-3	1.37-3	8.34-4	4.22-4	1.89-4
30	1381.1	2.08-3	1.70-3	1.22-3	7.37-4	3.71-4	1.65-4
34	1835.9	1.91-3	1.56-3	1.11-3	6.70-4	3.36-4	1.49-4
38	2361.7	1.71-3	1.39-3	9.92-4	5.97-4	2.99-4	1.33-4
42	2962.5	1.48-3	1.21-3	8.57-4	5.15-4	2.58-4	1.14-4
46	3642.2	1.26-3	1.02-3	7.27-4	4.36-4	2.18-4	9.66-5
50	4405.4	1.06-3	8.63-4	6.14-4	3.69-4	1.84-4	8.16-5
54	5257.2	8.99-4	7.31-4	5.20-4	3.12-4	1.56-4	6.91-5
58	6203.5	7.65-4	6.23-4	4.43-4	2.67-4	1.33-4	5.90-5
62	7251.3	6.55-4	5.34-4	3.80-4	2.29-4	1.15-4	5.07-5
66	8408.7	5.65-4	4.60-4	3.29-4	1.98-4	9.91-5	4.39-5
70	9685.4	4.89-4	3.99-4	2.85-4	1.72-4	8.64-5	3.82-5
74	11092.4	4.25-4	3.48-4	2.49-4	1.50-4	7.56-5	3.35-5
78	12643.0	3.71-4	3.04-4	2.18-4	1.32-4	6.65-5	2.95-5
82	14352.8	3.25-4	2.67-4	1.92-4	1.16-4	5.88-5	2.61-5
87	16743.1	2.76-4	2.27-4	1.64-4	1.00-4	5.05-5	2.25-5
92	19457.7	2.35-4	1.94-4	1.40-4	8.60-5	4.36-5	1.95-5

C1 - D1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	395.0	8.87-6	7.64-6	6.03-6	4.40-6	3.19-6	2.56-6
26	645.3	9.29-6	8.37-6	7.23-6	6.17-6	5.43-6	5.08-6
30	949.6	9.48-6	8.82-6	8.04-6	7.37-6	6.97-6	6.83-6
34	1304.7	7.61-6	7.17-6	6.67-6	6.28-6	6.08-6	6.06-6
38	1707.4	5.42-6	5.13-6	4.82-6	4.59-6	4.49-6	4.51-6
42	2154.5	3.66-6	3.48-6	3.28-6	3.14-6	3.09-6	3.13-6
46	2641.8	2.42-6	2.30-6	2.17-6	2.08-6	2.06-6	2.09-6
50	3164.4	1.58-6	1.50-6	1.42-6	1.36-6	1.34-6	1.37-6
54	3716.5	1.03-6	9.75-7	9.19-7	8.80-7	8.71-7	8.92-7
58	4291.4	6.72-7	6.36-7	5.97-7	5.70-7	5.63-7	5.78-7
62	4881.2	4.42-7	4.17-7	3.90-7	3.70-7	3.65-7	3.75-7
66	5476.6	2.93-7	2.75-7	2.56-7	2.42-7	2.37-7	2.44-7
70	6066.7	1.96-7	1.84-7	1.70-7	1.59-7	1.55-7	1.60-7
74	6638.6	1.33-7	1.24-7	1.14-7	1.06-7	1.03-7	1.06-7
78	7177.0	9.12-8	8.45-8	7.69-8	7.08-8	6.84-8	7.04-8
82	7663.4	6.32-8	5.83-8	5.26-8	4.80-8	4.59-8	4.72-8
87	8164.0	4.07-8	3.74-8	3.34-8	3.00-8	2.84-8	2.91-8
92	8493.4	2.67-8	2.44-8	2.16-8	1.91-8	1.79-8	1.82-8

C1 - D2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	399.0	6.90-6	6.19-6	5.28-6	4.36-6	3.70-6	3.35-6
26	650.9	5.29-6	4.83-6	4.26-6	3.71-6	3.33-6	3.16-6
30	961.3	2.99-6	2.69-6	2.31-6	1.95-6	1.71-6	1.59-6
34	1330.1	1.87-6	1.67-6	1.41-6	1.16-6	9.89-7	9.10-7
38	1756.2	1.35-6	1.21-6	1.03-6	8.55-7	7.37-7	6.86-7
42	2239.0	1.05-6	9.46-7	8.22-7	7.04-7	6.25-7	5.95-7
46	2777.2	8.31-7	7.60-7	6.72-7	5.90-7	5.38-7	5.21-7
50	3363.8	9.12-7	8.60-7	7.95-7	7.36-7	6.99-7	6.94-7
54	3956.8	6.12-7	5.81-7	5.43-7	5.08-7	4.88-7	4.88-7
58	4581.3	4.39-7	4.18-7	3.93-7	3.70-7	3.58-7	3.61-7
62	5231.1	3.07-7	2.94-7	2.76-7	2.61-7	2.53-7	2.57-7
66	5899.2	2.12-7	2.02-7	1.90-7	1.79-7	1.74-7	1.77-7
70	6577.1	1.44-7	1.37-7	1.29-7	1.21-7	1.18-7	1.20-7
74	7255.1	9.77-8	9.27-8	8.65-8	8.09-8	7.81-8	7.99-8
78	7921.2	6.58-8	6.22-8	5.76-8	5.34-8	5.13-8	5.25-8
82	8561.3	4.43-8	4.17-8	3.83-8	3.51-8	3.34-8	3.41-8
87	9298.4	2.71-8	2.52-8	2.29-8	2.06-8	1.93-8	1.96-8
92	9925.4	1.66-8	1.53-8	1.36-8	1.20-8	1.10-8	1.10-8

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - D3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	417.3	8.87-5	8.45-5	7.94-5	7.49-5	7.21-5	7.10-5
26	676.8	4.53-5	4.31-5	4.07-5	[illegible]	3.78-5	3.76-5
30	999.6	2.45-5	2.33-5	2.21-5	2.11-5	2.06-5	2.07-5
34	1387.6	1.44-5	1.36-5	1.28-5	1.23-5	1.20-5	1.21-5
38	1821.8	1.69-6	1.50-6	1.26-6	1.03-6	8.69-7	7.88-7
42	2292.2	1.33-6	1.22-6	1.07-6	9.33-7	8.36-7	7.94-7
46	2807.5	1.04-6	9.68-7	8.78-7	7.92-7	7.36-7	7.17-7
50	3369.7	4.12-7	3.62-7	2.99-7	2.39-7	1.98-7	1.81-7
54	3985.0	1.90-6	1.91-6	1.92-6	1.94-6	1.99-6	2.06-6
58	4618.3	1.26-6	1.26-6	1.28-6	1.30-6	1.33-6	1.39-6
62	5279.1	7.91-7	7.94-7	8.02-7	8.16-7	8.41-7	8.83-7
66	5960.9	4.95-7	4.97-7	5.01-7	5.10-7	5.27-7	5.57-7
70	6655.9	3.10-7	3.12-7	3.14-7	3.20-7	3.31-7	3.51-7
74	7354.5	1.95-7	1.96-7	1.98-7	2.01-7	2.08-7	2.22-7
78	8045.5	1.24-7	1.24-7	1.25-7	1.27-7	1.32-7	1.41-7
82	8715.4	7.85-8	7.85-8	7.88-8	[illegible]	8.33-8	8.98-8
87	9497.3	4.47-8	4.45-8	4.46-8	4.52-8	4.71-8	5.10-8
92	10179.0	2.54-8	2.52-8	2.51-8	2.54-8	2.65-8	2.88-8

C1 - D4

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
446.8	1.11-5	9.17-6	6.65-6	4.10-6	2.14-6	1.02-6
710.1	5.77-6	4.79-6	3.53-6	2.28-6	1.33-6	8.05-7
1028.3	3.46-6	2.93-6	2.25-6	1.58-6	1.08-6	8.13-7
1399.6	2.41-6	2.10-6	1.70-6	1.31-6	1.03-6	8.87-7
1832.0	1.16-5	1.17-5	1.17-5	1.19-5	1.20-5	1.22-5
2305.3	8.26-6	8.31-6	8.38-6	8.49-6	8.64-6	8.84-6
2824.5	5.48-6	5.52-6	5.58-6	5.66-6	5.79-6	5.95-6
3386.3	3.69-6	3.73-6	3.78-6	3.85-6	3.96-6	4.10-6
4016.5	9.05-7	8.85-7	8.64-7	8.50-7	8.53-7	8.80-7
4713.9	6.50-7	6.34-7	6.16-7	6.05-7	6.08-7	6.30-7
5461.4	5.29-7	5.19-7	5.08-7	5.02-7	5.09-7	5.32-7
6256.5	4.36-7	4.29-7	4.23-7	4.21-7	4.30-7	4.54-7
7096.9	3.57-7	3.53-7	3.50-7	3.51-7	3.61-7	3.83-7
7979.5	2.90-7	2.88-7	2.86-7	2.88-7	2.98-7	3.20-7
8900.5	2.34-7	2.32-7	2.31-7	2.34-7	2.44-7	2.63-7
9855.5	1.86-7	1.85-7	1.85-7	1.88-7	1.96-7	2.13-7
11088.5	1.39-7	1.38-7	1.38-7	1.40-7	1.47-7	1.61-7
12351.6	1.02-7	1.01-7	1.01-7	1.02-7	1.08-7	1.19-7

C1 - D5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	450.3	1.75-5	1.68-5	1.57-5	1.47-5	1.38-5	1.34-5
26	714.6	2.10-5	2.06-5	2.02-5	1.98-5	1.95-5	1.94-5
30	1034.3	2.02-5	2.01-5	2.00-5	1.99-5	1.99-5	2.00-5
34	1407.5	1.67-5	1.67-5	1.67-5	1.68-5	1.69-5	1.71-5
38	1842.4	1.01-5	9.55-6	8.98-6	8.57-6	8.42-6	8.51-6
42	2366.0	6.49-6	6.09-6	5.66-6	5.33-6	5.21-6	5.27-6
46	2959.9	3.94-6	3.61-6	3.24-6	2.95-6	2.81-6	2.83-6
50	3591.6	5.23-7	4.40-7	3.34-7	2.30-7	1.50-7	1.07-7
54	4281.3	3.76-7	3.23-7	2.56-7	1.90-7	1.41-7	1.15-7
58	5031.4	2.82-7	[illegible]	2.06-7	1.64-7	1.34-7	1.19-7
62	5842.1	2.21-7	2.00-7	1.73-7	1.47-7	1.29-7	1.22-7
66	6713.3	1.81-7	1.67-7	1.51-7	1.35-7	1.24-7	1.23-7
70	7645.2	1.49-7	1.41-7	1.31-7	1.22-7	1.17-7	1.19-7
74	8611.8	1.38-4	1.14-4	8.36-5	5.23-5	2.76-5	1.32-5
78	9591.7	1.28-4	1.06-4	7.79-5	4.87-5	2.56-5	1.21-5
82	10609.7	1.16-4	9.62-5	7.06-5	4.42-5	2.32-5	1.09-5
87	11930.0	1.02-4	8.52-5	6.27-5	3.93-5	2.06-5	9.63-6
92	13293.4	9.10-5	7.60-5	5.61-5	3.53-5	1.85-5	8.61-6

C1 - D6

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
452.3	8.38-6	7.14-6	5.53-6	3.88-6	2.61-6	1.92-6
719.9	5.88-6	4.84-6	3.51-6	2.18-6	1.17-6	6.06-7
1047.9	4.05-6	3.30-6	2.36-6	1.43-6	7.14-7	3.14-7
1436.1	2.68-6	2.19-6	1.56-6	9.45-7	4.75-7	2.11-7
1884.6	1.76-6	1.44-6	1.03-6	6.34-7	3.30-7	1.60-7
2393.3	1.16-6	9.55-7	6.96-7	4.41-7	2.47-7	1.39-7
2962.7	8.41-7	7.11-7	5.49-7	3.89-7	2.69-7	2.05-7
3620.6	4.87-6	4.70-6	4.48-6	4.26-6	4.12-6	4.11-6
4313.5	5.67-6	5.26-6	4.75-6	4.23-6	3.86-6	3.72-6
5065.8	4.61-6	4.07-6	3.38-6	2.68-6	[illegible]	1.87-6
5878.1	5.22-6	4.41-6	3.36-6	2.28-6	1.43-6	9.47-7
6749.0	9.42-6	7.81-6	5.73-6	3.59-6	1.70-6	9.10-7
7666.7	7.84-5	6.50-5	4.75-5	2.97-5	1.57-5	7.50-6
8637.6	1.45-7	1.36-7	1.24-7	1.13-7	1.06-7	1.07-7
9690.4	1.07-7	1.04-7	1.01-7	9.88-8	9.95-8	1.05-7
10803.6	9.13-8	9.00-8	8.85-8	8.81-8	9.03-8	9.68-8
12279.1	7.43-8	7.38-8	7.35-8	7.42-8	7.72-8	8.39-8
13846.5	5.90-8	5.89-8	5.92-8	6.03-8	6.35-8	6.98-8

C1 - D7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	462.8	2.62-4	2.62-4	2.62-4	2.62-4	2.61-4	2.60-4
26	733.8	1.64-4	1.64-4	1.65-4	1.65-4	1.65-4	1.66-4
30	1064.8	1.02-4	1.02-4	1.02-4	1.02-4	1.03-4	1.04-4
34	1455.9	6.28-5	6.28-5	6.29-5	6.31-5	6.35-5	6.42-5
38	1907.1	3.90-5	3.88-5	3.87-5	3.87-5	3.90-5	3.95-5
42	2418.5	2.43-5	2.40-5	2.38-5	2.36-5	2.36-5	2.40-5
46	2990.1	1.55-5	1.51-5	1.47-5	1.44-5	1.42-5	1.44-5
50	3629.2	[illegible]	6.15-6	5.46-6	4.83-6	4.44-6	4.33-6
54	4353.7	1.27-5	1.29-5	1.32-5	1.36-5	1.41-5	1.48-5
58	5117.8	1.71-5	1.75-5	1.81-5	1.88-5	1.98-5	2.09-5
62	5938.4	3.09-5	2.91-5	2.70-5	2.50-5	2.39-5	2.40-5
66	6793.3	1.79-4	1.49-4	1.09-4	6.88-5	3.74-5	1.93-5
70	7699.4	8.65-5	7.17-5	5.25-5	3.30-5	1.77-5	8.81-6
74	8683.8	7.84-6	6.48-6	4.73-6	2.93-6	1.53-6	7.25-7
78	9736.3	1.70-6	1.40-6	1.03-6	6.41-7	3.44-7	1.77-7
82	10849.8	6.97-7	5.97-7	4.68-7	3.40-7	2.47-7	2.04-7
87	12325.5	4.53-7	4.21-7	3.82-7	3.47-7	3.33-7	3.47-7
92	13892.7	4.33-7	4.25-7	4.19-7	4.20-7	4.39-7	4.85-7

C1 - D8

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
468.3	1.91-5	1.80-5	1.66-5	1.52-5	1.41-5	1.36-5
742.3	2.05-5	2.01-5	1.95-5	1.90-5	1.87-5	1.86-5
1076.5	2.24-5	2.24-5	2.24-5	2.25-5	2.26-5	2.29-5
1471.0	2.39-5	2.41-5	2.45-5	2.49-5	2.54-5	2.60-5
1926.0	2.46-5	2.50-5	2.56-5	2.64-5	2.71-5	2.79-5
2441.9	2.48-5	2.53-5	2.60-5	2.69-5	2.78-5	2.88-5
3019.0	2.45-5	2.51-5	2.59-5	2.69-5	2.80-5	2.92-5
3658.2	2.48-5	2.54-5	2.63-5	2.74-5	2.87-5	3.01-5
4378.2	1.37-5	1.35-5	1.33-5	1.33-5	1.36-5	1.41-5
5157.3	2.53-4	2.09-4	1.54-4	9.71-5	5.31-5	2.76-5
5954.2	1.99-4	1.64-4	1.20-4	7.44-5	3.90-5	1.84-5
6831.6	1.47-5	1.49-5	1.51-5	1.55-5	1.62-5	1.72-5
7783.2	1.30-5	1.33-5	1.38-5	1.45-5	1.54-5	1.66-5
8799.0	1.17-5	1.21-5	1.26-5	1.33-5	1.42-5	1.55-5
9879.3	1.06-5	1.09-5	1.14-5	1.21-5	1.30-5	1.42-5
11024.5	9.57-6	9.87-6	1.03-5	1.10-5	1.18-5	1.31-5
12547.5	8.36-6	8.63-6	9.05-6	9.64-6	1.05-5	1.17-5
14171.9	7.20-6	7.44-6	7.82-6	8.35-6	9.13-6	1.03-5

C1 - D9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	509.0	2.00-3	1.69-3	1.30-3	8.93-4	5.80-4	4.02-4
26	792.0	1.82-3	1.66-3	1.44-3	1.24-3	1.08-3	1.00-3
30	1135.7	2.11-3	[illegible]	1.93-3	1.84-3	1.78-3	1.76-3
34	1539.7	1.98-3	1.94-3	1.89-3	1.85-3	1.84-3	1.85-3
38	2003.2	6.92-4	6.15-4	5.24-4	4.33-4	3.67-4	3.35-4
42	2523.3	5.01-4	[illegible]	3.04-4	1.92-4	1.05-4	5.57-5
46	3099.4	4.47-4	3.74-4	2.80-4	1.85-4	1.11-4	6.84-5
50	3731.1	3.69-4	3.08-4	2.29-4	1.50-4	8.82-5	5.28-5
54	4417.6	3.02-4	2.52-4	1.86-4	1.20-4	6.84-5	3.88-5
58	5202.7	5.68-6	5.63-6	5.61-6	5.67-6	5.87-6	6.20-6
62	6078.1	2.28-3	2.32-3	2.38-3	2.47-3	2.58-3	2.74-3
66	6973.3	2.09-3	2.13-3	2.19-3	2.28-3	2.39-3	2.56-3
70	7931.0	1.92-3	1.95-3	2.01-3	2.09-3	2.21-3	2.38-3
74	8951.8	1.76-3	1.80-3	1.85-3	1.93-3	2.05-3	2.23-3
78	10035.9	1.63-3	1.66-3	1.72-3	1.80-3	1.92-3	2.10-3
82	11183.9	1.52-3	1.55-3	1.60-3	1.68-3	1.80-3	1.98-3
87	12709.4	1.39-3	1.43-3	1.48-3	1.56-3	1.68-3	1.87-3
92	14336.3	1.29-3	1.32-3	1.37-3	1.45-3	1.58-3	1.77-3

C1 - D10

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
511.7	2.34-3	2.12-3	1.83-3	1.53-3	1.31-3	1.19-3
796.0	[illegible]	5.98-3	5.87-3	5.75-3	5.68-3	5.67-3
1139.7	[illegible]	5.24-3	5.14-3	5.04-3	4.99-3	4.98-3
1543.2	4.45-3	4.39-3	4.30-3	4.23-3	4.19-3	4.20-3
2006.4	4.79-3	4.79-3	4.79-3	4.82-3	4.87-3	4.96-3
2531.3	4.21-3	4.24-3	4.30-3	4.38-3	4.48-3	4.61-3
3117.7	3.64-3	3.68-3	3.75-3	3.83-3	3.95-3	4.09-3
3765.4	3.21-3	3.26-3	3.32-3	3.41-3	3.53-3	3.68-3
4474.6	2.86-3	2.91-3	2.97-3	3.06-3	3.18-3	3.34-3
5245.5	2.57-3	2.61-3	2.68-3	2.77-3	2.89-3	3.05-3
6113.6	5.68-5	5.88-5	6.17-5	6.53-5	6.97-5	7.48-5
7051.1	6.64-3	6.86-3	7.19-3	7.60-3	8.10-3	8.74-3
8015.7	6.09-3	6.29-3	6.59-3	6.99-3	7.48-3	8.12-3
9043.4	5.60-3	5.79-3	6.07-3	6.45-3	6.93-3	7.58-3
10134.8	5.17-3	5.35-3	5.62-3	5.98-3	6.45-3	7.10-3
11290.1	4.79-3	4.96-3	5.22-3	5.56-3	6.03-3	6.68-3
12825.2	4.39-3	4.55-3	4.79-3	5.12-3	5.58-3	6.24-3
14462.1	4.04-3	4.19-3	4.42-3	4.74-3	5.20-3	5.87-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - D11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	512.4	4.50-3	4.32-3	4.07-3	3.82-3	3 63-3	3.54-3
26	797.3	1.74-3	1 58-3	1.38-3	1.18-3	1.03-3	9.54-4
30	1146.3	2.66-3	2.59-3	2.50-3	2.43-3	2.39-3	2.39-3
34	1558.9	4.97-3	5.03-3	5.11-3	5.23-3	5.36-3	5.48-3
38	2033.2	8.09-3	8.29-3	8.58-3	8.91-3	9.25-3	9.57-3
42	2567.4	9.60-3	9.88-3	1.03-2	1.07-2	1.12-2	1.16-2
46	3161.7	9.76-3	1.01-2	1.05-2	1.10-2	1.15-2	1.20-2
50	3816.6	9.32-3	9.61-3	1.00-2	1.05-2	1.11-2	1.16-2
54	4532.6	8.65-3	8.93-3	9.32-3	9.80-3	1.03-2	1.09-2
58	5310.1	7.94-3	8.19-3	8.56-3	9.02-3	9.54-3	1.02-2
62	6149.7	7.24-3	7.47-3	7.82-3	8.25-3	8.77-3	9.39-3
66	7115.2	4.26-6	4.30-6	4.38-6	4.51-6	4.71-6	5.02-6
70	8212.6	4.62-7	3.98-7	3.25-7	2.65-7	2.34-7	2.35-7
74	9413.1	6.99-7	6.49-7	5.94-7	5.57-7	5.54-7	5.91-7
78	10724.9	7 62-7	7.20-7	6.76-7	6.50-7	6.60-7	7.12-7
82	12157.4	7 45-7	7.10-7	6.73-7	6.52-7	6.67-7	7.26-7
87	14135.4	6.85-7	6.55-7	6.24-7	6.08-7	6.25-7	6.86-7
92	16347.4	6.11-7	5.86-7	5.60-7	5.47-7	5.65-7	6.24-7

C1 - D12

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
518.9	4.01-2	4.08-2	4.18-2	4.28-2	4.37-2	4.43-2
805.6	2.25-2	2.28-2	2.34-2	2.39-2	2.45-2	2.49-2
1155.8	1.39-2	1.42-2	1.45-2	1.49-2	1.53-2	1.56-2
1570.7	8.73-3	8.89-3	9.11-3	9.37-3	9.63-3	9.88-3
2052.6	4.56-3	4.61-3	4.69-3	4.79-3	4.92-3	5.05-3
2604.5	2.37-3	2.37-3	2.37-3	2.39-3	2.43-3	2.49-3
3229.0	1.43-3	1.41-3	1.39-3	1.38-3	1.39-3	1.42-3
3928.6	9.77-4	9.54-4	9.27-4	9.06-4	9.02-4	9.20-4
4706.7	7.24-4	7.01-4	6.73-4	6.50-4	6.42-4	6.54-4
5567.3	5.65-4	5.43-4	5.17-4	4.95-4	4.85-4	4.94-4
6515.0	4.57-4	4.37-4	4.13-4	3.92-4	3.82-4	3.90-4
7555.1	3.79-4	3.61-4	3.39-4	3.20-4	3.10-4	3.16-4
8693.9	3.20-4	3.04-4	2.84-4	2.66-4	2.57-4	2.62-4
9938.9	2.75-4	2.60-4	2.42-4	2.25-4	2.16-4	2.21-4
11298.7	2.38-4	2.25-4	2.08-4	1.93-4	1.84-4	1.89-4
12783.7	2.08-4	1.96-4	1.81-4	1.66-4	1.59-4	1.62-4
14835.1	1.78-4	1.67-4	1.53-4	1.40-4	1.32-4	1.35-4
17131.6	1.53-4	1.44-4	1.31-4	1.18-4	1.11-4	1.13-4

C1 - D13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	542.4	1.30-3	1.07-3	7 69-4	4.60-4	2.24-4	9.60-5
26	832 9	9.34-4	7.73-4	5.65-4	3.56-4	1.98-4	1.13-4
30	1186.5	9.16-4	7.97-4	6.44-4	4.92-4	3.78-4	3.19-4
34	1605.9	1.74-3	1.68-3	1.60-3	1.53-3	1.48-3	1.47-3
38	2094.1	6.57-3	6.71-3	6.92-3	7.16-3	7.41-3	7.66-3
42	2651.3	1.38-2	1.42-2	1.48-2	1.55-2	1.62-2	1.69-2
46	3279.3	1 27-2	1.31-2	1.36-2	1.43-2	1.50-2	1.57-2
50	3982.2	1.03-2	1 06-2	1.10-2	1.16-2	1.22-2	1.29-2
54	4763.8	8.29-3	8.55-3	8.92-3	9.38-3	9.90-3	1.05-2
58	5628.1	6.81-3	7.03-3	7 34-3	7.72-3	8.18-3	8.72-3
62	6579.7	5.71-3	5.88-3	6.15-3	6.48-3	6.88-3	7.38-3
66	7624.1	4.86-3	5.01-3	5.24-3	5.53-3	5.90-3	6.36-3
70	8767.6	4.20-3	4.33-3	4.53-3	4.79-3	5.13-3	5.57-3
74	10017.5	3.67-3	3.79-3	3.97-3	4.20-3	4.52-3	4.94-3
78	11382.5	3.25-3	3.36-3	3.51-3	3.73-3	4.02-3	4.43-3
82	12873.2	2 91-3	3.00-3	3.14-3	3.34-3	3.62-3	4.01-3
87	14932.2	2.55-3	2.64-3	2 76-3	2.95-3	3.21-3	3.58-3
92	17237.2	2 27-3	2.34-3	2.46-3	2.63-3	2.87-3	3.24-3

C1 - D14

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
546.7	1.04-1	1.08-1	1.13-1	1.18-1	1.22-1	1.25-1
838.8	7.18-2	7.41-2	7.73-2	8.08-2	8.40-2	8.63-2
1193.7	5.08-2	5.24-2	5.46-2	5.71-2	5.94-2	6.12-2
1613.1	3.54-2	3.65-2	3.80-2	3.98-2	4.14-2	4.28-2
2100.3	2.02-2	2.08-2	2.16-2	2.25-2	2.35-2	2.44-2
2661.2	5.76-3	5.85-3	5.98-3	6.14-3	6.34-3	6.56-3
3300.7	1.96-3	1.93-3	1.90-3	1.83-3	1.89-3	1.93-3
4021.3	1.03-3	9.87-4	9.32-4	8.82-4	8.54-4	8.57-4
4827.4	6.98-4	6.54-4	5.99-4	5.46-4	5.12-4	5.05-4
5724.2	5.50-4	5.10-4	4.60-4	4.11-4	3.79-4	3.71-4
6717.6	4.90-4	4.55-4	4.10-4	3.68-4	3.40-4	3.35-4
7814.2	5.08-4	4.78-4	4.42-4	4.08-4	3.89-4	3.93-4
9018.7	7.10-4	6.90-4	6.68-4	6.54-4	6.59-4	6.93-4
10325.6	1.43-3	1.45-3	1.48-3	1.54-3	1.63-3	1.78-3
11731.5	1.69-3	1.73-3	1.79-3	1.90-3	2.05-3	2.26-3
13257.8	1.58-3	1.63-3	1.70-3	1.80-3	1.96-3	2.18-3
15363.5	1.42-3	1.46-3	1.53-3	1.64-3	1.79-3	2.01-3
17721.1	1.28-3	1.32-3	1.39-3	1.48-3	1.63-3	1.85-3

C1 - D15

Z	Δ E	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	606.2	1.95-2	2.01-2	2.11-2	2.22-2	2.34-2	2.43-2
26	912.9	1.39-2	1.43-2	1.50-2	1.58-2	1.66-2	1.73-2
30	1284.0	1.05-2	1 08-2	1.13-2	1.19-2	1.23-2	1.30-2
34	1721.0	8.18-3	8.44-3	8.83-3	9.31-3	9.80-3	1.02-2
38	2225.7	6.60-3	6.81-3	7.12-3	7.51-3	7.92-3	8.30-3
42	2800.5	5.44-3	5.61-3	5.87-3	6.19-3	6.55-3	6.89-3
46	3448.1	4.56-3	4.71-3	4.92-3	5.20-3	5.51-3	5.83-3
50	4171.5	3.88-3	4.00-3	4.19-3	4.43-3	4.70-3	5.00-3
54	4974.4	3.33-3	3.43-3	3.59-3	3.81-3	4.05-3	4.33-3
58	5861.1	2.87-3	2.96-3	3.11-3	3.29-3	3.52-3	3.79-3
62	6836.8	2.48-3	2.56-3	2.68-3	2.85-3	3.06-3	3.31-3
66	7907.8	2 10-3	2.17-3	2.28-3	2.43-3	2.62-3	2.85-3
70	9084.9	1.61-3	1.66-3	1.75-3	1.87-3	2.03-3	2.23-3
74	10391.5	6.43-4	6.61-4	6.90-4	7.33-4	7.92-4	8.72-4
78	11852.3	1.88-4	1.79-4	1.69-4	1.60-4	1.58-4	1.65-4
82	13471.1	1.19-4	1.05-4	8.76-5	6.91-5	5.49-5	4.83-5
87	15735.1	9.80-5	8.44-5	6.60-5	4.62-5	2.97-5	2.00-5
92	18304.0	8.77-5	7.51-5	5.79-5	3.91-5	2.31-5	1.31-5

C1 - E1

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
392.5	1.01-5	8.38-6	6.11-6	3.81-6	2.08-6	1.19-6
639.1	5.49-6	4.60-6	3.47-6	2.36-6	1.59-6	1.22-6
939.2	3.42-6	2.90-6	2.27-6	1.67-6	1.28-6	1.12-6
1290.3	2.25-6	1.93-6	1.55-6	1.20-6	9.91-7	9.26-7
1689.3	1.50-6	1.31-6	1.07-6	8.61-7	7.43-7	7.19-7
2132.8	1.02-6	8.90-7	7.40-7	6.12-7	5.44-7	5.39-7
2616.5	6.90-7	6.08-7	5.12-7	4.32-7	3.94-7	3.97-7
3135.3	4.70-7	4.17-7	3.55-7	3.05-7	2.83-7	2.89-7
3683.6	3.22-7	2.87-7	2.47-7	2.15-7	2.02-7	2.10-7
4254.6	2.22-7	1.99-7	1.72-7	1.52-7	1.45-7	1.52-7
4840.4	1.54-7	1.38-7	1.21-7	1.08-7	1.04-7	1.10-7
5431.6	1.07-7	9.72-8	8.58-8	7.73-8	7.54-8	8.04-8
6017.4	7.58-8	6.89-8	6.13-8	5.58-8	5.49-8	5.91-8
6584.9	5.40-8	4.94-8	4.42-8	4.06-8	4.03-8	4.38-8
7118.7	3.89-8	3.57-8	3.22-8	2.98-8	2.99-8	3.27-8
7600.3	2.83-8	2.61-8	2.37-8	2.21-8	2.23-8	2.46-8
8094.7	1.93-8	1.79-8	1.64-8	1.54-8	1.57-8	1.75-8
8417.5	1.34-8	1.25-8	1.15-8	1.09-8	1.12-8	1.25-8

C1 - E2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	396.2	8.97-6	7.41-6	5.35-6	3.24-6	1.66-6	8.31-7
26	647.7	6.42-6	5.24-6	3.72-6	2.20-6	1.08-6	5.02-7
30	957.9	4.42-6	3.59-6	2.52-6	1.48-6	7.09-7	3.13-7
34	1326.3	3.09-6	2.50-6	1.75-6	1.02-6	4.84-7	2.08-7
38	1751.9	2.22-6	1.80-6	1.26-6	7.29-7	3.45-7	1.47-7
42	2234.1	1.65-6	1.33-6	9.32-7	5.41-7	2.57-7	1.09-7
46	2771.8	1.27-6	1.03-6	7.20-7	4.19-7	2.00-7	8.55-8
50	3360.0	1.04-6	8.72-7	6.62-7	4.69-7	3.45-7	3.02-7
54	3952.9	4.82-7	4.07-7	3.17-7	2.38-7	1.92-7	1.82-7
58	4576.9	3.11-7	2.63-7	2.07-7	1.56-7	1.28-7	1.23-7
62	5226.3	2.07-7	1.76-7	1.39-7	1.06-7	8.84-8	8.62-8
66	5893.9	1.40-7	1.20-7	9.54-8	7.42-8	6.26-8	6.20-8
70	6571.5	9.68-8	8.31-8	6.68-8	5.28-8	4.54-8	4.56-8
74	7249.2	6.79-8	5.86-8	4.77-8	3.83-8	3.36-8	3.43-8
78	7915.0	4.84-8	4.21-8	3.46-8	2.83-8	2.54-8	2.64-8
82	8554.9	3.50-8	3.07-8	2.56-8	2.14-8	1.95-8	2.06-8
87	9291.9	2.39-8	2.12-8	1.80-8	1.54-8	1.45-8	1.56-8
92	9918.7	1.67-8	1.49-8	1.29-8	1.13-8	1.09-8	1.20-8

C1 - E3

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
405.0	1.48-5	1.42-5	1.37-5	1.36-5	1.42-5	1.52-5
658.5	9.30-6	8.93-6	8.63-6	8.62-6	9.04-6	9.73-6
970.5	6.21-6	5.96-6	5.77-6	5.79-6	6.11-6	6.61-6
1340.5	4.35-6	4.19-6	4.07-6	4.11-6	4.37-6	4.76-6
1767.7	3.18-6	3.07-6	3.00-6	3.06-6	3.28-6	3.60-6
2251.4	2.40-6	2.34-6	2.30-6	2.36-6	2.55-6	2.83-6
2790.5	1.92-6	1.87-6	1.85-6	1.91-6	2.08-6	2.32-6
3364.2	6.99-7	5.67-7	4.02-7	2.41-7	1.26-7	6.80-8
3989.2	2.27-6	2.19-6	2.14-6	2.18-6	2.37-6	2.66-6
4619.0	1.99-6	1.95-6	1.95-6	2.04-6	2.25-6	2.55-6
5273.9	1.55-6	1.53-6	1.54-6	1.63-6	1.80-6	2.06-6
5947.0	1.13-6	1.12-6	1.13-6	1.20-6	1.34-6	1.53-6
6629.9	7.93-7	7.88-7	7.99-7	8.48-7	9.46-7	1.09-6
7312.8	5.48-7	5.45-7	5.53-7	5.86-7	6.55-7	7.58-7
7983.9	3.76-7	3.73-7	3.78-7	4.01-7	4.48-7	5.21-7
8629.1	2.57-7	2.55-7	2.58-7	2.72-7	3.05-7	3.55-7
9372.8	1.60-7	1.58-7	1.59-7	1.67-7	1.87-7	2.19-7
10006.6	9.95-8	9.79-8	9.79-8	1.02-7	1.14-7	1.34-7

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leq Z \leq 92$

See page 31 for Explanation of Tables

C1 – E4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	446.1	2.30-5	1.89-5	1.37-5	8.56-6	4.64-6	2.47-6
26	708.9	1.26-5	1.04-5	7.57-6	4.85-6	2.87-6	1.84-6
30	1026.9	7 19-6	5.94-6	4.38-6	2.91-6	1.88-6	1.39-6
34	1398.0	4.27-6	3.54-6	2.64-6	1.81-6	1.24-6	..01-6
38	1819.9	2.61-6	2.17-6	1.63-6	1.14-6	8.17-7	6.96-7
42	2289.9	1.60-6	1.34-6	1.01-6	7.13-7	5.26-7	4.61-7
46	2804.8	9.31-7	7.72-7	5.80-7	4.05-7	2.93-7	2.55-7
50	3383.5	1.24-6	1.20-6	1.18-6	1.22-6	1.33-6	1.50-6
54	4004.0	2.33-6	2.31-6	2.34-6	2.47-6	2.72-6	3.05-6
58	4640.0	1.35-6	1.40-6	1.50-6	1.66-6	1.89-6	2.16-6
62	5301.7	6.48-7	6.73-7	7.20-7	8.00-7	9.13-7	1.05-6
66	5984.6	3.23-7	3.35-7	3.58-7	3.98-7	4.55-7	5.26-7
70	6680.8	1.70-7	1.76-7	1.87-7	2.08-7	2.38-7	2.76-7
74	7380.7	9.47-8	9 76-8	1.04-7	1.14-7	1.31-7	1.53-7
78	8073.1	5.58-8	5.72-8	6.04-8	6.65-8	7.61-8	8.93-8
82	8744.3	3.44-8	3.51-8	3.69-8	4.04-8	4.62-8	5.45-8
87	9528.1	1.99-8	2.01-8	2.10-8	2.28-8	2.61-8	3.10-8
92	10211.5	1.20-8	1.21-8	1.25-8	1.36-8	1.55-8	1.85-8

C1 – E5

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
451.4	1.13-5	9.45-6	7.14-6	5.00-6	3.67-6	3.26-6
716.6	7.90-6	6.60-6	5.07-6	3.82-6	3.27-6	3.39-6
1037.1	5.85-6	4.90-6	3.81-6	2.96-6	2.64-6	2.80-6
1411.3	4.68-6	4.02-6	3.27-6	2.72-6	2.56-6	2.74-6
1836.8	3.95-6	3.50-6	3.01-6	2.70-6	2.68-6	2.91-6
2310.9	3 47-6	3.17-6	2.88-6	2.74-6	2.83-6	3.11-6
2830.5	3 18-6	3.00-6	2.84-6	2.83-6	3.01-6	3.35-6
3392.3	3.25-6	3.18-6	3.18-6	3.32-6	3.65-6	4.10-6
4012.1	1.33-6	1.33-6	1.35-6	1.43-6	1.57-6	1.76-6
4706.8	5.99-7	4.92-7	3.58-7	2.27-7	1.32-7	8.40-8
5453.5	4.97-7	4.08-7	2.96-7	1.85-7	1.04-7	6.19-8
6248.0	4.16-7	3.43-7	2.49-7	1.57-7	8.94-8	5.41-8
7087.7	3.51-7	2.90-7	2 13-7	1.36-7	7.92-8	4.99-8
7969.6	2.98-7	2.47-7	1.83-7	1.19-7	7.14-8	4.73-8
8889.9	2.55-7	2.12-7	1.58-7	1.05-7	6.52-8	4.55-8
9844.2	2.18-7	1.83-7	1.38-7	9.31-8	6.01-8	4.43-8
11076.2	1.81-7	1.53-7	1.17-7	8.09-8	5.48-8	4.30-8
12338.5	1.50-7	1.28-7	9.91-8	7.05-8	5.01-8	4.17-8

C1 – E6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	452.8	1.42-5	1.41-5	1.43-5	1.50-5	1.63-5	1.78-5
26	720.3	2.47-5	2.48-5	2.56-5	2.74-5	3.02-5	3.33-5
30	1043.9	3.03-5	3.07-5	3.20-5	3.46-5	3.85-5	4.26-5
34	1420.5	2.68-5	2 73-5	2.86-5	3.11-5	3.48-5	3.86-5
38	1847.8	1.98-5	2.02-5	2.13-5	2.32-5	2.60-5	2.90-5
42	2323.3	1.32-5	1.35-5	1.43-5	1.56-5	1.76-5	1.97-5
46	2843.9	8.12-6	8.34-6	8.83-6	9.69-6	1.09-5	1.23-5
50	3406.7	4.37-6	4.50-6	4.76-6	5.24-6	5.91-6	6.68-6
54	4031.5	9.04-7	8.74-7	8.55-7	8.75-7	9.49-7	1.07-6
58	4729.5	8.52-7	8.40-7	8.46-7	8.93-7	9.91-7	1.13-6
62	5477.4	7.15-7	7.09-7	7.19-7	7.65-7	8.56-7	9.83-7
66	6273.0	5.98-7	5.95-7	6.07-7	6.49-7	7.30-7	8.45-7
70	7113.6	5.02-7	5.02-7	5.14-7	5.52-7	6.24-7	7.27-7
74	7996.2	4.25-7	4.25-7	4.37-7	4.71-7	5.35-7	6.27-7
78	8917.2	3.62-7	3.63-7	3.74-7	4.04-7	4.61-7	5.44-7
82	9872.0	3.09-7	3.11-7	3.21-7	3.48-7	3.99-7	4.74-7
87	11104.4	2.56-7	2.58-7	2.67-7	2.91-7	3.35-7	4.01-7
92	12366.8	2.13-7	2.15-7	2.23-7	2.44-7	2.82-7	3.41-7

C1 – E7

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
453.9	1.55-5	1.43-5	1.31-5	1.26-5	1.32-5	1.45-5
722.4	1.01-5	9.06-6	7.85-6	6.91-6	6.59-6	6.82-6
1051.1	6.20-6	5.40-6	4.45-6	3.60-6	3.12-6	3.03-6
1440.2	3.75-6	3.21-6	2.54-6	1.93-6	1.54-6	1.40-6
1889.4	2.26-6	1.90-6	1.46-6	1.05-6	7.64-7	6.38-7
2399.0	1.38-6	1.14-6	8.54-7	5.75-7	3.75-7	2.77-7
2968.8	8.57-7	7.05-7	5.13-7	3.25-7	1.87-7	1.14-7
3598.9	5.58-7	4.55-7	3.25-7	1.97-7	1.01-7	4.81-8
4289.4	3.93-7	3.20-7	2.28-7	1.36-7	6.73-8	2.92-8
5040.3	3.21-7	2.63-7	1.90-7	1.17-7	6.30-8	3.38-8
5851.7	2.99-7	2.49-7	1.86-7	1.25-7	8.04-8	5.89-8
6715.2	3.35-4	2.80-4	2.08-4	1.36-4	8.08-5	5.04-5
7599.8	3.24-4	2.71-4	2.03-4	1.34-4	8.12-5	5.26-5
8529.3	2.89-4	2.43-4	1.82-4	1.21-4	7.46-5	4.96-5
9501.2	2.60-4	2.18-4	1.65-4	1.10-4	6.86-5	4.66-5
10511.9	2.34-4	1.97-4	1.49-4	1.01-4	6.34-5	4.39-5
11823.0	2.08-4	1.76-4	1.34-4	9.08-5	5.80-5	4.11-5
13176.7	1.86-4	1.58-4	1.21-4	8.26-5	5.35-5	3.88-5

C1 – E8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	456.2	1.42-5	1.18-5	8.72-6	5.85-6	4.03-6	3.42-6
26	726.0	8.24-6	6.80-6	5.01-6	3.34-6	2.28-6	1.91-6
30	1056.2	4.66-6	3.83-6	2.80-6	1.84-6	1.22-6	9.92-7
34	1447.0	3.27-6	2.73-6	2.08-6	1.48-6	1.10-6	9.76-7
38	1898.5	2.55-6	2.17-6	1.70-6	1.29-6	1.04-6	9.74-7
42	2411.0	2.06-6	1.77-6	1.42-6	1.10-6	9.18-7	8.76-7
46	2984.7	1.70-6	1.46-6	1.18-6	9.24-7	7.75-7	7.43-7
50	3620.0	1.42-6	1.22-6	9.84-7	7.72-7	6.46-7	6.19-7
54	4317.3	1.16-6	1.00-6	8.14-7	6.51-7	5.59-7	5.48-7
58	5071.1	1.54-5	1.27-5	9.29-6	5.82-6	3.16-6	1.65-6
62	5874.7	2.01-4	1.67-4	1.23-4	7.77-5	4.29-5	2.30-5
66	6723.9	2.17-5	1.82-5	1.38-5	9.41-6	6.12-6	4.40-6
70	7655.9	2.71-7	2.31-7	1.80-7	1.30-7	9.49-8	7.89-8
74	8614.4	3.50-4	3.39-4	3.33-4	3.42-4	3.76-4	4.36-4
78	9593.6	3.33-4	3.23-4	3.18-4	3.29-4	3.64-4	4.24-4
82	10611.3	3.13-4	3.04-4	3.01-4	3.12-4	3.48-4	4.08-4
87	11931.3	2.91-4	2.84-4	2.83-4	2.96-4	3.32-4	3.93-4
92	13294.4	2.73-4	2.69-4	2.69-4	2.83-4	3.20-4	3.84-4

C1 – E9

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
466.1	2.31-5	2.05-5	1.72-5	1.42-5	1.25-5	1.21-5
737.7	1.84-5	1.67-5	1.47-5	1.32-5	1.27-5	1.30-5
1068.6	1.05-5	9.35-6	7.95-6	6.75-6	6.15-6	6.14-6
1459.7	5.77-6	4.87-6	3.75-6	2.70-6	1.99-6	1.69-6
1911.1	4.12-6	3.38-6	2.43-6	1.51-6	8.30-7	4.80-7
2422.8	3.82-6	3.13-6	2.24-6	1.37-6	7.14-7	3.64-7
2994.8	4.19-6	3.44-6	2.50-6	1.56-6	8.60-7	4.81-7
3627.0	5.25-6	4.33-6	3.17-6	2.01-6	1.14-6	6.61-7
4319.3	7.91-6	6.53-6	4.78-6	3.01-6	1.68-6	9.29-7
5077.0	1.14-6	9.73-7	7.63-7	5.65-7	4.33-7	3.83-7
5891.9	2.33-4	1.96-4	1.50-4	1.04-4	6.97-5	5.25-5
6758.4	2.99-5	2.74-5	2.47-5	2.28-5	2.27-5	2.47-5
7674.0	2.57-4	2.49-4	2.43-4	2.50-4	2.75-4	3.16-4
8649.4	2.13-6	2.04-6	1.97-6	1.99-6	2.15-6	2.47-6
9702.7	1.92-7	1.76-7	1.59-7	1.46-7	1.46-7	1.60-7
10816.3	7.23-8	6.38-8	5.33-8	4.37-8	3.83-8	3.85-8
12292.3	3.55-8	3.03-8	2.37-8	1.71-8	1.25-8	1.05-8
13860.2	2.12-8	1.78-8	1.34-8	8.87-9	5.41-9	3.55-9

C1 – E10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	468.1	2.14-5	1.77-5	1.33-5	9.30-6	6.84-6	5.94-6
26	741.5	1.57-5	1.34-5	1.09-5	8.73-6	7.70-6	7.64-6
30	1074.8	9.54-6	8.16-6	6.56-6	5.23-6	4.56-6	4.49-6
34	1468.5	5.68-6	4.77-6	3.69-6	2.75-6	2.21-6	2.04-6
38	1922.8	3.61-6	2.97-6	2.21-6	1.52-6	1.08-6	9.00-7
42	2438.0	2.49-6	2.03-6	1.47-6	9.48-7	5.94-7	4.31-7
46	3014.2	1.89-6	1.53-6	1.09-6	6.76-7	3.84-7	2.40-7
50	3652.0	1.69-6	1.37-6	9.71-7	5.86-7	3.08-7	1.66-7
54	4351.3	1.36-6	1.11-6	7.86-7	4.76-7	2.53-7	1.36-7
58	5097.1	4.82-4	4.02-4	3.00-4	1.98-4	1.20-4	7.76-5
62	5899.5	8.53-7	6.94-7	4.97-7	3.09-7	1.76-7	1.11-7
66	6785.1	3.22-6	3.16-6	3.16-6	3.33-6	3.73-6	4 33-6
70	7701.9	1.44-4	1.38-4	1.34-4	1.36-4	1.47-4	1.68-4
74	8690.6	1.31-5	1.25-5	1.19-5	1.18-5	1.26-5	1.44-5
78	9744.1	3.81-6	3.62-6	3.43-6	3.38-6	3.59-6	4.08-6
82	10858.1	1.74-6	1.65-6	1.57-6	1.55-6	1.65-6	1.89-6
87	12334.4	8.72-7	8.32-7	7.96-7	7.91-7	8.48-7	9.81-7
92	13902.2	5.21-7	4.99-7	4.80-7	4.80-7	5.21-7	6.11-7

C1 – E11

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
476.7	3.40-4	3.51-4	3.72-4	4.09-4	4.59-4	5.09-4
755.1	2.03-4	2.11-4	2.26-4	2.50-4	2.82-4	3.14-4
1098.2	1.30-4	1.35-4	1.46-4	1.62-4	1.84-4	2.05-4
1508.0	9.35-5	9.77-5	1.05-4	1.18-4	1.34-4	1.50-4
1974.0	1.52-3	1.26-3	9.36-4	6.00-4	3.34-4	1.78-4
2487.0	1.13-3	9.45-4	7.00-4	4.50-4	2.55-4	1.42-4
3056.8	8.84-4	7.37-4	5.46-4	3.53-4	2.04-4	1.19-4
3682.4	7.12-4	5.93-4	4.41-4	2.87-4	1.68-4	1.01-4
4363.0	5.86-4	4.89-4	3.64-4	2.38-4	1.42-4	8.87-5
5113.6	6.82-6	5.80-6	4.51-6	3.24-6	2.30-6	1.84-6
5937.3	1.44-6	1.23-6	9.77-7	7.29-7	5.56-7	4.83-7
6794.1	4.22-4	4.06-4	3.94-4	4.01-4	4.36-4	4.97-4
7734.7	6.98-7	5.84-7	4.40-7	3.02-7	2.03-7	1.58-7
8748.4	6.41-7	5.37-7	4.08-7	2.83-7	1.94-7	1.54-7
9826.7	5.89-7	4.94-7	3.74-7	2.58-7	1.75-7	1.37-7
10970.1	5.42-7	4.54-7	3.43-7	2.35-7	1.58-7	1.22-7
12490.9	4.87-7	4.08-7	3.08-7	2.10-7	1.38-7	1.04-7
14113.3	4.31-7	3.61-7	2.72-7	1.84-7	1.20-7	8.94-8

TABLE IV. Collision Strengths Ω Given as a Function of *Z* and Scattered Electron Energy *E'* in Units of Z_{eff}^2 Rydbergs, 22 ≤ *Z* ≤ 92
See page 31 for Explanation of Tables

C1 - E12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	502.5	8.20-3	6.99-3	5.32-3	3.49-3	1.93-3	9.54-4
26	781.9	4.98-3	4.21-3	3.17-3	2.05-3	1.12-3	5.49-4
30	1120.7	3.17-3	2.66-3	1.99-3	1.27-3	6.96-4	3.43-4
34	1518.3	2.13-3	1.78-3	1.32-3	8.46-4	4.64-4	2.36-4
38	1987.1	9.68-5	1.01-4	1.09-4	1.22-4	1.38-4	1.56-4
42	2517.4	1.17-3	1.05-3	9.04-4	7.82-4	7.22-4	7.26-4
46	3098.0	1.02-3	9.57-4	8.95-4	8.65-4	8.91-4	9.67-4
50	3731.4	7.89-4	7.52-4	7.21-4	7.21-4	7.67-4	8.52-4
54	4418.2	6.51-4	6.22-4	5.99-4	6.03-4	6.46-4	7.24-4
58	5158.2	5.57-4	5.34-4	5.16-4	5.21-4	5.61-4	6.33-4
62	5951.1	4.87-4	4.67-4	4.52-4	4.59-4	4.96-4	5.63-4
66	6826.0	1.83-6	1.67-6	1.49-6	1.36-6	1.33-6	1.43-6
70	7777.5	5.74-7	4.86-7	3.75-7	2.66-7	1.89-7	1.54-7
74	8793.1	4.15-7	3.44-7	2.55-7	1.65-7	9.72-8	6.03-8
78	9873.3	3.40-7	2.80-7	2.04-7	1.28-7	6.94-8	3.62-8
82	11018.5	2.87-7	2.37-7	1.72-7	1.06-7	5.58-8	2.67-8
87	12541.5	2.34-7	1.93-7	1.40-7	8.62-8	4.46-8	2.05-8
92	14166.1	1.84-7	1.52-7	1.10-7	6.82-8	3.53-8	1.63-8

C1 - E13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	507.4	3.84-3	3.28-3	2.56-3	1.85-3	1.34-3	1.09-3
26	788.7	2.61-3	2.26-3	1.81-3	1.38-3	1.09-3	9.65-4
30	1130.2	1.98-3	1.72-3	1.39-3	1.08-3	8.80-4	8.01-4
34	1532.2	1.59-3	1.38-3	1.12-3	8.84-4	7.28-4	6.70-4
38	1994.8	1.30-3	1.14-3	9.33-4	7.44-4	6.23-4	5.83-4
42	2525.7	7.70-4	6.82-4	5.80-4	4.96-4	4.58-4	4.67-4
46	3106.2	6.08-4	4.99-4	3.62-4	2.28-4	1.29-4	7.67-5
50	3750.4	5.94-4	4.88-4	3.55-4	2.23-4	1.24-4	6.92-5
54	4457.2	5.38-4	4.47-4	3.33-4	2.20-4	1.37-4	9.34-5
58	5225.8	4.77-4	3.98-4	3.00-4	2.03-4	1.32-4	9.68-5
62	6056.5	4.22-4	3.53-4	2.67-4	1.84-4	1.23-4	9.29-5
66	6949.5	3.75-4	3.15-4	2.39-4	1.65-4	1.12-4	8.69-5
70	7905.0	3.35-4	2.82-4	2.15-4	1.49-4	1.02-4	8.04-5
74	8923.6	3.02-4	2.54-4	1.94-4	1.35-4	9.35-5	7.43-5
78	10005.4	2.73-4	2.30-4	1.76-4	1.23-4	8.57-5	6.88-5
82	11151.0	2.49-4	2.10-4	1.61-4	1.13-4	7.88-5	6.39-5
87	12673.4	2.23-4	1.88-4	1.44-4	1.02-4	7.14-5	5.85-5
92	14296.9	2.02-4	1.70-4	1.31-4	9.23-5	6.51-5	5.39-5

C1 - E14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	510.5	2.91-3	2.39-3	1.72-3	1.04-3	5.21-4	2.37-4
26	793.6	2.01-3	1.65-3	1.19-3	7.23-4	3.75-4	1.86-4
30	1137.8	1.53-3	1.28-3	9.70-4	6.71-4	4.60-4	3.59-4
34	1542.2	1.22-3	1.06-3	8.57-4	6.77-4	5.69-4	5.38-4
38	2005.3	9.74-4	8.62-4	7.31-4	6.21-4	5.70-4	5.74-4
42	2539.1	3.60-5	3.23-5	2.78-5	2.40-5	2.20-5	2.20-5
46	3146.2	7.73-4	7.37-4	7.08-4	7.10-4	7.61-4	8.49-4
50	3798.8	6.24-4	5.92-4	5.65-4	5.64-4	6.03-4	6.75-4
54	4512.6	5.18-4	4.89-4	4.65-4	4.62-4	4.94-4	5.56-4
58	5283.0	4.38-4	4.13-4	3.91-4	3.87-4	4.14-4	4.69-4
62	6125.3	3.76-4	3.54-4	3.34-4	3.31-4	3.55-4	4.03-4
66	7024.9	3.28-4	3.08-4	2.90-4	2.87-4	3.08-4	3.53-4
70	7987.2	2.89-4	2.71-4	2.55-4	2.52-4	2.71-4	3.12-4
74	9012.6	2.57-4	2.41-4	2.27-4	2.24-4	2.42-4	2.80-4
78	10101.6	2.30-4	2.16-4	2.03-4	2.01-4	2.17-4	2.53-4
82	11254.7	2.08-4	1.95-4	1.84-4	1.82-4	1.97-4	2.31-4
87	12786.8	1.85-4	1.74-4	1.63-4	1.61-4	1.76-4	2.09-4
92	14420.6	1.66-4	1.56-4	1.46-4	1.45-4	1.59-4	1.91-4

C1 - E15

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	511.8	3.74-3	3.50-3	3.23-3	3.07-3	3.10-3	3.30-3
26	796.7	2.78-3	2.66-3	2.55-3	2.53-3	2.68-3	2.92-3
30	1143.9	2.13-3	2.06-3	2.02-3	2.05-3	2.21-3	2.43-3
34	1553.0	1.64-3	1.59-3	1.56-3	1.59-3	1.72-3	1.90-3
38	2023.4	1.25-3	1.21-3	1.18-3	1.19-3	1.29-3	1.43-3
42	2554.5	9.63-4	9.22-4	8.90-4	8.96-4	9.62-4	1.07-3
46	3166.1	1.71-5	1.64-5	1.58-5	1.58-5	1.67-5	1.83-5
50	3872.6	1.75-5	1.74-5	1.76-5	1.86-5	2.04-5	2.28-5
54	4663.3	1.60-5	1.57-5	1.57-5	1.64-5	1.78-5	1.99-5
58	5543.2	1.60-5	1.53-5	1.46-5	1.43-5	1.49-5	1.64-5
62	6517.6	2.38-5	2.11-5	1.79-5	1.49-5	1.30-5	1.28-5
66	7580.6	1.80-4	1.49-4	1.09-4	6.83-5	3.56-5	1.64-5
70	8724.9	2.59-4	2.15-4	1.58-4	9.93-5	5.24-5	2.47-5
74	9971.6	2.39-4	2.00-4	1.48-4	9.33-5	4.95-5	2.36-5
78	11332.5	2.18-4	1.83-4	1.36-4	8.63-5	4.61-5	2.20-5
82	12818.4	1.99-4	1.68-4	1.25-4	8.02-5	4.31-5	2.05-5
87	14870.5	1.80-4	1.52-4	1.15-4	7.40-5	4.01-5	1.92-5
92	17167.4	1.64-4	1.39-4	1.06-4	6.91-5	3.79-5	1.82-5

C1 - E16

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	514.2	4.03-3	3.93-3	3.88-3	3.99-3	4.33-3	4.80-3
26	802.3	2.67-3	2.53-3	2.41-3	2.37-3	2.49-3	2.72-3
30	1155.7	1.89-3	1.76-3	1.61-3	1.53-3	1.55-3	1.65-3
34	1576.5	1.42-3	1.29-3	1.16-3	1.06-3	1.04-3	1.10-3
38	2067.2	1.10-3	1.00-3	8.82-4	7.92-4	7.64-4	7.96-4
42	2630.2	8.91-4	8.10-4	7.20-4	6.53-4	6.37-4	6.71-4
46	3256.5	6.63-4	5.55-4	4.20-4	2.89-4	1.94-4	1.47-4
50	3957.0	5.47-4	4.55-4	3.38-4	2.22-4	1.37-4	9.13-5
54	4736.2	4.61-4	3.82-4	2.82-4	1.82-4	1.06-4	6.53-5
58	5598.2	3.93-4	3.26-4	2.40-4	1.53-4	8.72-5	5.06-5
62	6548.6	3.31-4	2.75-4	2.03-4	1.30-4	7.34-5	4.19-5
66	7605.8	1.32-4	1.11-4	8.48-5	5.86-5	3.92-5	2.95-5
70	8791.8	1.81-5	1.66-5	1.49-5	1.37-5	1.36-5	1.48-5
74	10102.8	8.58-6	8.36-6	8.27-6	8.56-6	9.49-6	1.10-5
78	11547.5	5.84-6	5.85-6	6.02-6	6.50-6	7.46-6	8.87-6
82	13139.3	4.43-6	4.50-6	4.71-6	5.19-6	6.05-6	7.29-6
87	15361.4	3.30-6	3.38-6	3.58-6	3.98-6	4.71-6	5.75-6
92	17879.3	2.51-6	2.57-6	2.73-6	3.07-6	3.66-6	4.54-6

C1 - E17

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	539.9	4.44-3	4.04-3	3.58-3	3.22-3	3.11-3	3.21-3
26	829.0	2.88-3	2.58-3	2.24-3	1.97-3	1.85-3	1.88-3
30	1180.5	1.96-3	1.73-3	1.45-3	1.21-3	1.08-3	1.05-3
34	1596.4	1.40-3	1.20-3	9.66-4	7.49-4	6.09-4	5.58-4
38	2079.2	1.04-3	8.75-4	6.72-4	4.78-4	3.42-4	2.77-4
42	2632.3	7.98-4	6.55-4	4.73-4	2.91-4	1.52-4	7.41-5
46	3270.9	7.09-4	6.27-4	5.30-4	4.45-4	4.01-4	4.03-4
50	3991.2	5.91-4	5.22-4	4.40-4	3.69-4	3.31-4	3.33-4
54	4796.6	4.98-4	4.39-4	3.69-4	3.06-4	2.73-4	2.73-4
58	5692.6	4.25-4	3.74-4	3.12-4	2.57-4	2.27-4	2.27-4
62	6685.7	3.66-4	3.22-4	2.67-4	2.18-4	1.90-4	1.90-4
66	7783.4	3.18-4	2.79-4	2.31-4	1.87-4	1.61-4	1.60-4
70	8994.4	2.79-4	2.44-4	2.01-4	1.61-4	1.38-4	1.36-4
74	10329.1	2.46-4	2.15-4	1.77-4	1.40-4	1.18-4	1.16-4
78	11799.5	2.18-4	1.91-4	1.56-4	1.23-4	1.02-4	9.88-5
82	13420.2	1.95-4	1.70-4	1.39-4	1.08-4	8.86-5	8.47-5
87	15684.0	1.70-4	1.48-4	1.20-4	9.29-5	7.45-5	7.01-5
92	18251.9	1.49-4	1.30-4	1.05-4	8.03-5	6.29-5	5.82-5

C1 - E18

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	543.0	2.59-3	2.12-3	1.52-3	9.14-4	4.50-4	2.02-4
26	834.2	1.73-3	1.42-3	1.01-3	6.00-4	2.95-4	1.33-4
30	1189.0	1.27-3	1.04-3	7.34-4	4.32-4	2.07-4	8.65-5
34	1609.8	1.01-3	8.20-4	5.82-4	3.46-4	1.69-4	7.39-5
38	2100.1	8.37-4	6.87-4	4.96-4	3.08-4	1.69-4	9.45-5
42	2663.4	7.13-4	5.92-4	4.38-4	2.88-4	1.77-4	1.23-4
46	3303.5	6.12-4	5.13-4	3.89-4	2.68-4	1.82-4	1.41-4
50	4024.4	5.28-4	4.47-4	3.44-4	2.45-4	1.76-4	1.45-4
54	4830.8	4.58-4	3.89-4	3.03-4	2.21-4	1.64-4	1.41-4
58	5728.0	3.98-4	3.40-4	2.67-4	1.97-4	1.49-4	1.31-4
62	6722.5	3.49-4	2.99-4	2.36-4	1.75-4	1.34-4	1.19-4
66	7821.6	3.07-4	2.64-4	2.09-4	1.56-4	1.20-4	1.07-4
70	9034.1	2.72-4	2.34-4	1.86-4	1.39-4	1.06-4	9.50-5
74	10370.2	2.42-4	2.08-4	1.66-4	1.24-4	9.44-5	8.42-5
78	11842.1	2.17-4	1.87-4	1.48-4	1.10-4	8.39-5	7.43-5
82	13464.2	1.95-4	1.68-4	1.33-4	9.90-5	7.46-5	6.55-5
87	15729.6	1.71-4	1.48-4	1.18-4	8.68-5	6.45-5	5.60-5
92	18299.0	1.51-4	1.31-4	1.04-4	7.64-5	5.60-5	4.80-5

C1 - E19

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	659.4	1.20-2	1.24-2	1.32-2	1.48-2	1.72-2	1.99-2
26	982.7	9.03-3	9.33-3	9.98-3	1.12-2	1.30-2	1.49-2
30	1371.8	6.95-3	7.18-3	7.71-3	8.66-3	1.00-2	1.15-2
34	1828.9	5.46-3	5.66-3	6.08-3	6.83-3	7.90-3	9.04-3
38	2356.6	4.38-3	4.54-3	4.88-3	5.49-3	6.36-3	7.30-3
42	2957.9	3.57-3	3.71-3	3.99-3	4.49-3	5.21-3	6.00-3
46	3636.6	2.96-3	3.07-3	3.30-3	3.73-3	4.33-3	5.02-3
50	4396.8	2.47-3	2.57-3	2.77-3	3.13-3	3.64-3	4.25-3
54	5243.5	2.09-3	2.17-3	2.34-3	2.65-3	3.09-3	3.63-3
58	6182.4	1.78-3	1.85-3	1.99-3	2.26-3	2.65-3	3.13-3
62	7220.3	1.52-3	1.58-3	1.71-3	1.94-3	2.28-3	2.71-3
66	8364.9	1.31-3	1.37-3	1.47-3	1.67-3	1.98-3	2.37-3
70	9625.3	1.14-3	1.18-3	1.27-3	1.45-3	1.72-3	2.07-3
74	11012.2	9.85-4	1.02-3	1.11-3	1.26-3	1.50-3	1.82-3
78	12538.4	8.57-4	8.90-4	9.63-4	1.10-3	1.31-3	1.60-3
82	14218.8	7.46-4	7.75-4	8.38-4	9.57-4	1.15-3	1.41-3
87	16564.4	6.27-4	6.52-4	7.05-4	8.07-4	9.76-4	1.21-3
92	19224.1	5.28-4	5.48-4	5.93-4	6.80-4	8.28-4	1.04-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - F1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	390.0	1.76-5	1.46-5	1.05-5	6.46-6	3.42-6	1.84-6
26	635.6	1 05-5	8.70-6	6.36-6	4.07-6	2.42-6	1.61-6
30	935.0	6.57-6	5.46-6	4.07-6	2.74-6	1.82-6	1.40-6
34	1285.5	4.20-6	3.51-6	2.67-6	1.87-6	1.34-6	1.13-6
38	1684.0	2.71-6	2.28-6	1.76-6	1.27-6	9.62-7	8.45-7
42	2126.9	1.76-6	1.49-6	1.16-6	8.56-7	6.68-7	6.06-7
46	2610.0	1.15-6	9.73-7	7.61-7	5.71-7	4.55-7	4.21-7
50	3128.3	7.52-7	6.38-7	5.01-7	3.79-7	3.06-7	2.87-7
54	3676.0	4.94-7	4.19-7	3.30-7	2.51-7	2.05-7	1.94-7
58	4246.4	3.27-7	2.77-7	2.18-7	1.67-7	1.37-7	1.30-7
62	4831.4	2 17-7	1.85-7	1.45-7	1.11-7	9.14-8	8.78-8
66	5422.0	1.46-7	1.24-7	9.75-8	7.44-8	6.14-8	5.93-8
70	6007.1	9.86-8	8.37-8	6.59-8	5.02-8	4.15-8	4.02-8
74	6573.7	6.73-8	5.71-8	4.49-8	3.42-8	2.82-8	2.75-8
7E	7106.7	4.64-8	3.93-8	3.08-8	2.34-8	1.93-8	1.89-8
82	7587.5	3.22-8	2.73-8	2.14-8	1.62-8	1.33-8	1.31-8
87	8080.7	2.06-8	1.75-8	1.36-8	1.03-8	8.40-9	8.30-9
92	8402.2	1.34-8	1.13-8	8.80-9	6.58-9	5.35-9	5.28-9

C1 - F2

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
404.8	2.12-5	2.02-5	1.93-5	1.89-5	1.94-5	2.06-5
658.0	1.31-5	1.24-5	1.17-5	1.13-5	1.16-5	1.23-5
969.5	8.49-6	7.92-6	7.34-6	7.00-6	7.10-6	7.53-6
1339.0	5.68-6	5.24-6	4.77-6	4.46-6	4.46-6	4.71-6
1765.8	3.90-6	3.56-6	3.18-6	2.92-6	2.87-6	3.01-6
2249.0	2.75-6	2.48-6	2.17-6	1.95-6	1.88-6	1.96-6
2787.5	2.02-6	1.79-6	1.54-6	1.33-6	1.25-6	1.28-6
3361.5	9.73-7	8.41-7	6.88-7	5.58-7	4.92-7	4.93-7
3954.4	5.82-7	5.09-7	4.24-7	3.55-7	3.25-7	3.34-7
4578.6	3.75-7	3.32-7	2.83-7	2.46-7	2.34-7	2.46-7
5228.3	2.49-7	2.23-7	1.96-7	1.76-7	1.72-7	1.85-7
5896.1	1.70-7	1.54-7	1.38-7	1.28-7	1.29-7	1.41-7
6573.9	1.18-7	1.09-7	9.96-8	9.45-8	9.74-8	1.08-7
7251.6	8.40-8	7.85-8	7.31-8	7 10-8	7.45-8	8.38-8
7917.4	6.10-8	5.76-8	5.46-8	5.40-8	5.75-8	6.55-8
8557.2	4.51-8	4.30-8	4.14-8	4.16-8	4.49-8	5.17-8
9293.7	3.16-8	3.05-8	2.98-8	3.04-8	3.33-8	3.87-8
9920.1	2.27-8	2.21-8	2.18-8	2.26-8	2.50-8	2.93-8

C1 - F3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	445.3	3.53-5	2.90-5	2.10-5	1.30-5	6.87-6	3.45-6
26	708.2	1.98-5	1.62-5	1.18-5	7.37-6	4.12-6	2.37-6
30	1026.2	1.13-5	9.27-6	6.77-6	4.37-6	2.64-6	1.76-6
34	1397.6	6.53-6	5.39-6	4.00-6	2.68-6	1.77-6	1.33-6
38	1819.8	3.83-6	3.19-6	2.41-6	1.69-6	1.21-6	1.00-6
42	2290.2	2.28-6	1.91-6	1.48-6	1.08-6	8.28-7	7.41-7
46	2805.4	1.33-6	1.13-6	8.87-7	6.72-7	5.45-7	5.12-7
50	3380.1	1.34-6	1.15-6	9.32-7	7.37-7	6.24-7	6.03-7
54	4001.2	5.43-7	4.63-7	3.71-7	2.96-7	2.60-7	2.61-7
58	4636.5	2.93-7	2.51-7	2.05-7	1.69-7	1.56-7	1.63-7
62	5299.1	1.79-7	1.53-7	1.24-7	1.03-7	9.45-8	9.93-8
66	5982.6	1.12-7	9.53-8	7.71-8	6.29-8	5.73-8	6.01-8
70	6679.1	7.11-8	6.05-8	4.84-8	3.89-8	3.50-8	3.64-8
74	7379.4	4.61-8	3.90-8	3.09-8	2.44-8	2.15-8	2.21-8
78	8071.9	3.03-8	2.55-8	2.00-8	1.55-8	1.33-8	1.35-8
82	8743.3	2.03-8	1.70-8	1.31-8	9.95-9	8.34-9	8.37-9
87	9527.1	1.25-8	1.04-8	7.95-9	5.86-9	4.74-9	4.65-9
92	10210.6	7.87-9	6.51-9	4.92-9	3.54-9	2.75-9	2.64-9

C1 - F4

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
451.6	7.12-6	6.78-6	6.46-6	6.35-6	6.59-6	7.09-6
717.7	6.34-6	5.46-6	4.46-6	3.69-6	3.45-6	3.65-6
1039.4	4.97-6	4.07-6	3.04-6	2.21-6	1.85-6	1.90-6
1414.6	3.67-6	3.03-6	2.30-6	1.72-6	1.48-6	1.54-6
1841.1	2.55-6	2.14-6	1.68-6	1.33-6	1.21-6	1.28-6
2316.4	1.67-6	1.42-6	1.15-6	9.54-7	8.98-7	9.58-7
2837.5	1.05-6	9.02-7	7.44-7	6.36-7	6.14-7	6.64-7
3401.3	6.01-7	5.24-7	4.44-7	3.95-7	3.98-7	4.43-7
4020.7	5.30-6	5.26-6	5.31-6	5.59-6	6.14-6	6.90-6
4660.6	5.42-6	5.54-6	5.82-6	6.36-6	7.17-6	8.18-6
5326.1	3.64-6	3.72-6	3.91-6	4.28-6	4.84-6	5.56-6
6012.6	2.43-6	2.48-6	2.61-6	2.86-6	3.24-6	3.73-6
6712.3	1.63-6	1.66-6	1.74-6	1.91-6	2.17-6	2.51-6
7415.8	1.09-6	1.12-6	1.17-6	1.28-6	1.45-6	1.69-6
8111.8	7.39-7	7.53-7	7.89-7	8.60-7	9.80-7	1.15-6
8786.8	5.03-7	5.11-7	5.34-7	5.82-7	6.64-7	7.79-7
9575.4	3.12-7	3.17-7	3.30-7	3.59-7	4.10-7	4.84-7
10264.0	1.96-7	1.98-7	2.05-7	2.23-7	2.54-7	3.02-7

C1 - F5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	453.0	2.52-5	2.18-5	1.78-5	1.43-5	1.25-5	1.24-5
26	720.5	3.35-5	3.20-5	3.08-5	3.09-5	3.26-5	3.53-5
30	1044.9	4.64-5	4.66-5	4.79-5	5.11-5	5.63-5	6.20-5
34	1423.1	4.71-5	4.81-5	5.04-5	5.48-5	6.11-5	6.77-5
38	1852.3	3.78-5	3.88-5	4.09-5	4.48-5	5.02-5	5.59-5
42	2330.1	2.73-5	2.81-5	2.97-5	3.25-5	3.66-5	4.09-5
46	2853.6	1.88-5	1.94-5	2.05-5	2.25-5	2.54-5	2.86-5
50	3419.7	1.27-5	1.31-5	1.39-5	1.53-5	1.73-5	1.96-5
54	4030.8	4.03-6	4.21-6	4.56-6	5.12-6	5 87-6	6.73-6
58	4725.7	9.20-7	8.72-7	8.31-7	8.24-7	8.73-7	9.70-7
62	5472.9	6.60-7	6.13-7	5.65-7	5.40-7	5.56-7	6.13-7
66	6267.9	5.05-7	4.66-7	4.26-7	4.02-7	4.11-7	4.53-7
70	7107.9	3.97-7	3.66-7	3.33-7	3.15-7	3.22-7	3.56-7
74	7989.9	3.17-7	2.93-7	2.68-7	2.54-7	2.61-7	2.91-7
78	8910.2	2.57-7	2.38-7	2.19-7	2.09-7	2.17-7	2.45-7
82	9864.2	2.11-7	1.97-7	1.82-7	1.76-7	1.85-7	2.10-7
87	11095.6	1.67-7	1.57-7	1.48-7	1.45-7	1.54-7	1.77-7
92	12356.9	1.35-7	1.28-7	1.21-7	1.21-7	1.30-7	1.53-7

C1 - F6

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
454.5	7.75-6	6.49-6	4.92-6	3.47-6	2.59-6	2.35-6
724.3	6.37-6	5.36-6	4.11-6	2.94-6	2.19-6	1.91-6
1054.4	5.05-6	4.44-6	3.71-6	3.08-6	2.75-6	2.73-6
1444.8	5.60-6	5.58-6	5.69-6	6.04-6	6.66-6	7.40-6
1894.8	6.38-6	6.82-6	7.57-6	8.69-6	1.01-5	1.15-5
2404.6	4.95-6	5.27-6	5.84-6	6.70-6	7.80-6	8.95-6
2974.5	4.14-6	4.34-6	4.73-6	5.36-6	6.22-6	7.16-6
3604.7	4.02-6	4.14-6	4.42-6	4.93-6	5.68-6	6.56-6
4295.2	4.70-6	4.77-6	4.98-6	5.46-6	6.23-6	7.19-6
5045.9	7.29-6	7.26-6	7.43-6	7.97-6	8.99-6	1.04-5
5856.4	1.93-5	1.89-5	1.89-5	1.99-5	2.21-5	2.54-5
6713.2	4.43-4	4.28-4	4.18-4	4.29-4	4.70-4	5.38-4
7600.4	5.65-4	5.47-4	5.36-4	5.52-4	6.06-4	6.98-4
8530.2	5.34-4	5.18-4	5.10-4	5.27-4	5.83-4	6.76-4
9502.0	5.00-4	4.86-4	4.81-4	5.00-4	5.57-4	6.50-4
10512.4	4.70-4	4.59-4	4.57-4	4.77-4	5.34-4	6.29-4
11822.8	4.39-4	4.31-4	4.32-4	4.54-4	5.12-4	6.10-4
13175.7	4.15-4	4.09-4	4.12-4	4.37-4	4.97-4	5.98-4

C1 - F7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	457.1	4.56-5	4.93-5	5.53-5	6.40-5	7.47-5	8.48-5
26	727.4	4.11-5	4.47-5	5.06-5	5.88-5	6.85-5	7.76-5
30	1056.9	2.71-5	2.95-5	3.33-5	3.86-5	4.49-5	5.09-5
34	1446.4	1.19-5	1.26-5	1.40-5	1.59-5	1.84-5	2.08-5
38	1897.2	3.81-6	3.68-6	3.59-6	3.64-6	3.88-6	4.23-6
42	2409.5	1.99-6	1.80-6	1.59-6	1.43-6	1.38-6	1.44-6
46	2983.1	1.36-6	1.22-6	1.06-6	9.30-7	8.82-7	9.14-7
50	3618.4	1.13-6	1.04-6	9.36-7	8.68-7	8.68-7	9.33-7
54	4315.6	2.94-6	2.86-6	2.83-6	2.94-6	3.21-6	3.63-6
58	5068.7	4.03-5	3.86-5	3.73-5	3.78-5	4.08-5	4.60-5
62	5873.2	2.06-4	1.98-4	1.92-4	1.95-4	2.12-4	2.40-4
66	6732.3	1.32-4	1.27-4	1.22-4	1.24-4	1.34-4	1.53-4
70	7662.7	7.64-6	7.20-6	6.79-6	6.67-6	7.08-6	8.01-6
74	8655.3	1.81-6	1.67-6	1.53-6	1.44-6	1.49-6	1.66-6
78	9708.4	6.88-7	6.22-7	5.50-7	4.98-7	4.92-7	5.39-7
82	10821.7	3.34-7	2.96-7	2.52-7	2.17-7	2.04-7	2.17-7
87	12297.3	1.68-7	1.46-7	1.19-7	9.50-8	8.25-8	8.38-8
92	13864.6	1.00-7	8.51-8	6.68-8	5.01-8	3.98-8	3.79-8

C1 - F8

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
463.6	2.67-6	2.28-6	1.80-6	1.34-6	1.04-6	9.37-7
734.4	3.50-6	3.10-6	2.64-6	2.27-6	2.14-6	2.23-6
1065.1	4.51-6	4.29-6	4.11-6	4.13-6	4.43-6	4.92-6
1456.3	4.97-6	4.89-6	4.91-6	5.18-6	5.75-6	6.46-6
1908.4	4.48-6	4.39-6	4.39-6	4.61-6	5.10-6	5.73-6
2421.4	3.57-6	3.30-6	3.04-6	2.90-6	2.99-6	3.26-6
2994.8	8.80-6	7.77-6	6.56-6	5.53-6	4.99-6	4.98-6
3626.5	1.39-5	1.30-5	1.22-5	1.19-5	1.24-5	1.36-5
4318.2	1.85-5	1.75-5	1.66-5	1.64-5	1.72-5	1.92-5
5075.6	8.60-7	7.12-7	5.30-7	3.60-7	2.47-7	2.02-7
5895.9	4.13-4	3.95-4	3.82-4	3.87-4	4.20-4	4.77-4
6760.5	6.68-5	6.41-5	6.23-5	6.35-5	6.92-5	7.91-5
7692.1	1.32-5	1.27-5	1.23-5	1.25-5	1.37-5	1.57-5
8685.1	4.57-6	4.38-6	4.24-6	4.30-6	4.69-6	5.40-6
9738.7	2.07-6	1.97-6	1.89-6	1.90-6	2.06-6	2.38-6
10852.3	1.10-6	1.04-6	9.83-7	9.74-7	1.05-6	1.21-6
12327.9	5.78-7	5.39-7	5.00-7	4.83-7	5.10-7	5.87-7
13895.0	3.43-7	3.15-7	2.85-7	2.67-7	2.74-7	3.13-7

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 – F9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	466.4	4.28-5	4.04-5	3.77-5	3.58-5	3.55-5	3.66-5
26	738.4	3.65-5	3.58-5	3.53-5	3.58-5	3.77-5	4.05-5
30	1069.9	2.69-5	2.66-5	2.67-5	2.76-5	2.95-5	3.20-5
34	1461.2	1.88-5	1.85-5	1.85-5	1.90-5	2.04-5	2.22-5
38	1912.4	1.46-5	1.42-5	1.41-5	1.45-5	1.57-5	1.71-5
42	2423.8	1.30-5	1.29-5	1.29-5	1.35-5	1.47-5	1.64-5
46	2996.2	7.21-6	7.70-6	8.58-6	9.94-6	1.17-5	1.36-5
50	3631.9	3.61-6	3.80-6	4.15-6	4.76-6	5.60-6	6.55-6
54	4329.8	2.88-6	2.99-6	3.22-6	3.65-6	4.28-6	5.03-6
58	5090.0	2.15-6	2.17-6	2.27-6	2.50-6	2.89-6	3.39-6
62	5898.4	7.41-5	7.17-5	7.03-5	7.24-5	7.94-5	9.07-5
66	6784.0	3.92-7	3.68-7	3.[illegible]-7	3.40-7	3.62-7	4.11-7
70	7733.7	2.73-7	2.51-7	2.28-7	2.16-7	2.24-7	2.53-7
74	8747.6	2.16-7	1.98-7	1.80-7	1.71-7	1.79-7	2.03-7
78	9826.1	1.74-7	1.60-7	1.47-7	1.40-7	1.48-7	1.70-7
82	10969.7	1.39-7	1.28-7	1.16-7	1.14-7	1.22-7	1.42-7
87	12490.9	1.00-7	9.34-8	6.68-8	8.48-8	9.17-8	1.08-7
92	14113.7	6.66-8	6.22-8	5.80-8	5.71-8	6.23-8	7.45-8

C1 – F10

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
475.4	4.77-4	4.83-4	5.03-4	5.44-4	6.06-4	6.70-4
752.3	2.64-4	2.67-4	2.77-4	2.99-4	3.33-4	3.70-4
1094.2	1.46-4	1.46-4	1.51-4	1.62-4	1.80-4	2.00-4
1503.8	8.69-5	8.65-5	8.81-5	9.38-5	1.04-4	1.15-4
1977.4	1.77-3	1.65-3	1.53-3	1.48-3	1.52-3	1.65-3
2490.5	1.45-3	1.36-3	1.28-3	1.25-3	1.31-3	1.43-3
3060.3	1.21-3	1.14-3	1.08-3	1.07-3	1.13-3	1.25-3
368[illegible].0	1.03-3	9.74-4	9.30-4	9.26-4	9.86-4	1.10-3
4366.6	8.81-4	8.39-4	8.05-4	8.08-4	8.66-4	9.7[illegible]-4
5101.8	7.50-4	7.17-4	6.92-4	6.99-4	7.54-4	8.51-4
5913.0	1.50-6	1.35-6	1.19-6	1.08-6	1.09-6	1.20-6
6799.2	1.43-6	1.38-6	1.36-6	1.41-6	1.58-6	1.85-6
7749.1	1.31-6	1.27-6	1.26-6	1.33-6	1.50-6	1.77-6
8763.1	1.18-6	1.15-6	1.15-6	1.21-6	1.37-6	1.63-6
9841.7	1.08-6	1.05-6	1.04-6	1.10-6	1.25-6	1.49-6
10985.1	9.84-7	9.55-7	9.47-7	9.98-7	1.14-6	1.37-6
12506.0	8.77-7	8.50-7	8.41-7	8.87-7	1.02-6	1.24-6
14128.4	7.72-7	7.46-7	7.38-7	7.78-7	8.97-7	1.10-6

C1 – F11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	505.9	5.91-3	5.16-3	4.22-3	3.36-3	2.80-3	2.60-3
26	785.5	3.99-3	3.57-3	3.09-3	2.68-3	2.49-3	2.52-3
30	1124.3	2.91-3	2.66-3	2.38-3	2.18-3	2.14-3	2.24-3
34	1521.8	2.24-3	2.07-3	1.89-3	1.79-3	1.81-3	1.93-3
38	1983.8	6.60-5	6.57-5	6.68-5	7.11-5	7.88-5	8.78-5
42	2522.2	1.19-3	1.13-3	1.09-3	1.09-3	1.18-3	1.31-3
46	3107.2	9.72-4	9.23-4	8.83-4	8.87-4	9.56-4	1.07-3
50	3753.4	8.08-4	7.66-4	7.33-4	7.36-4	7.95-4	8.97-4
54	4461.0	6.84-4	6.48-4	6.19-4	6.22-4	6.73-4	7.64-4
58	5230.3	5.87-4	5.56-4	5.31-4	5.34-4	5.79-4	6.62-4
62	6061.5	5.10-4	4.83-4	4.61-4	4.64-4	5.05-4	5.80-4
66	6955.0	4.48-4	4.24-4	4.05-4	4.08-4	4.45-4	5.15-4
70	7911.1	3.97-4	3.76-4	3.59-4	3.62-4	3.97-4	4.61-4
74	8930.1	3.54-4	3.36-4	3.21-4	3.24-4	3.56-4	4.17-4
78	10012.5	3.19-4	3.02-4	2.89-4	2.92-4	3.23-4	3.80-4
82	11158.6	2.89-4	2.74-4	2.62-4	2.65-4	2.94-4	3.49-4
87	12681.6	2.58-4	2.44-4	2.34-4	2.37-4	2.64-4	3.18-4
92	14305.8	2.32-4	2.19-4	2.10-4	2.14-4	2.40-4	2.92-4

C1 – F12

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
508.8	5.71-3	5.55-3	5.47-3	5.62-3	6.10-3	6.76-3
790.4	3.77-3	3.65-3	3.58-3	3.68-3	3.99-3	4.43-3
1132.4	2.65-3	2.55-3	2.48-3	2.52-3	2.73-3	3.02-3
1534.9	1.95-3	1.87-3	1.81-3	1.83-3	1.97-3	2.18-3
1998.1	1.50-3	1.43-3	1.38-3	1.39-3	1.49-3	1.66-3
2536.9	5.70-5	5.36-5	5.06-5	5.00-5	5.28-5	5.78-5
3143.4	9.50-4	7.74-4	5.57-4	3.46-4	1.91-4	1.08-4
3795.5	8.03-4	6.57-4	4.77-4	3.03-4	1.77-4	1.10-4
4508.7	6.84-4	5.62-4	4.11-4	2.67-4	1.63-4	1.10-4
5283.5	5.89-4	4.85-4	3.57-4	2.35-4	1.49-4	1.06-4
6120.2	5.12-4	4.23-4	3.13-4	2.09-4	1.35-4	1.00-4
7019.2	4.49-4	3.72-4	2.77-4	1.86-4	1.23-4	9.38-5
7980.9	3.98-4	3.29-4	2.46-4	1.67-4	1.12-4	8.72-5
9005.7	3.54-4	2.94-4	2.20-4	1.50-4	1.02-4	8.10-5
10094.1	3.18-4	2.64-4	1.98-4	1.36-4	9.35-5	7.52-5
11246.4	2.87-4	2.39-4	1.80-4	1.24-4	8.58-5	7.00-5
12777.6	2.54-4	2.12-4	1.60-4	1.11-4	7.75-5	6.42-5
14410.6	2.27-4	1.89-4	1.43-4	9.98-5	7.03-5	5.92-5

C1 – F13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	511.3	5.38-3	4.80-3	4.11-3	3.51-3	3.21-3	3.21-3
26	796.1	3.49-3	3.00-3	2.41-3	1.86-3	1.50-3	1.37-3
30	1143.2	2.44-3	2.04-3	1.55-3	1.07-3	7.32-4	5.69-4
34	1552.0	1.81-3	1.49-3	1.08-3	6.76-4	3.80-4	2.22-4
38	2022.0	1.42-3	1.15-3	8.17-4	4.89-4	2.44-4	1.09-4
42	2552.7	1.13-3	9.19-4	6.53-4	3.92-4	1.97-4	8.90-5
46	3167.5	3.20-5	3.05-5	2.92-5	2.88-5	3.00-5	3.27-5
50	3878.5	2.02-5	2.01-5	2.04-5	2.16-5	2.40-5	2.72-5
54	4675.5	1.58-5	1.57-5	1.60-5	1.70-5	1.90-5	2.18-5
58	5564.0	1.26-5	1.25-5	1.27-5	1.36-5	1.53-5	1.76-5
62	6550.6	1.02-5	1.02-5	1.03-5	1.10-5	1.24-5	1.44-5
66	7643.1	8.39-6	8.30-6	8.40-6	8.95-6	1.01-5	1.18-5
70	8850.2	6.92-6	6.83-6	6.90-6	7.34-6	8.33-6	9.80-6
74	10182.6	5.74-6	5.65-6	5.69-6	6.05-6	6.88-6	8.16-6
78	11652.5	4.78-6	4.70-6	4.72-6	5.00-6	5.70-6	6.80-6
82	13274.3	3.99-6	3.91-6	3.92-6	4.14-6	4.73-6	5.69-6
87	15541.7	3.20-6	3.13-6	3.11-6	3.28-6	3.75-6	4.56-6
92	18115.0	2.57-6	2.50-6	2.48-6	2.60-6	2.98-6	3.66-6

C1 – F14

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
541.1	6.79-3	6.33-3	5.86-3	5.59-3	5.70-3	6.09-3
831.9	4.56-3	4.29-3	4.03-3	3.93-3	4.09-3	4.43-3
1186.4	3.26-3	3.10-3	2.96-3	2.94-3	3.12-3	3.41-3
1607.2	2.42-3	2.32-3	2.24-3	2.26-3	2.43-3	2.68-3
2097.5	1.84-3	1.77-3	1.72-3	1.74-3	1.88-3	2.09-3
2660.8	1.43-3	1.37-3	1.33-3	1.35-3	1.46-3	1.63-3
3301.0	1.13-3	1.08-3	1.04-3	1.06-3	1.14-3	1.28-3
4021.9	9.16-4	8.71-4	8.35-4	8.39-4	9.03-4	1.02-3
4828.2	7.53-4	7.13-4	6.79-4	6.77-4	7.26-4	8.21-4
5725.4	6.27-4	5.91-4	5.59-4	5.53-4	5.90-4	6.71-4
6719.7	5.28-4	4.96-4	4.65-4	4.56-4	4.85-4	5.53-4
7818.6	4.49-4	4.20-4	3.91-4	3.80-4	4.02-4	4.59-4
9030.8	3.85-4	3.58-4	3.31-4	3.18-4	3.35-4	3.83-4
10366.7	3.32-4	3.07-4	2.82-4	2.68-4	2.80-4	3.21-4
11838.2	2.88-4	2.66-4	2.41-4	2.27-4	2.35-4	2.69-4
13459.9	2.51-4	2.30-4	2.07-4	1.93-4	1.98-4	2.27-4
15724.7	2.13-4	1.94-4	1.73-4	1.58-4	1.60-4	1.83-4
18293.3	1.82-4	1.64-4	1.44-4	1.29-4	1.28-4	1.47-4

C1 – F15

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	659.6	1.80-2	1.85-2	1.98-2	2.22-2	2.58-2	2.98-2
26	983.2	1.35-2	1.40-2	1.49-2	1.68-2	1.95-2	2.24-2
30	1373.0	1.04-2	1.07-2	1.15-2	1.29-2	1.50-2	1.72-2
34	1831.2	8.15-3	8.44-3	9.07-3	1.02-2	1.18-2	1.35-2
38	2360.6	6.53-3	6.77-3	7.28-3	8.19-3	9.50-3	1.09-2
42	2964.5	5.32-3	5.52-3	5.94-3	6.69-3	7.77-3	8.96-3
46	3646.8	4.39-3	4.56-3	4.91-3	5.54-3	6.45-3	7.49-3
50	4412.0	3.67-3	3.81-3	4.11-3	4.64-3	5.42-3	6.33-3
54	5265.3	3.09-3	3.21-3	3.47-3	3.93-3	4.60-3	5.41-3
58	6212.9	2.63-3	2.73-3	2.95-3	3.35-3	3.93-3	4.66-3
62	7261.8	2.25-3	2.33-3	2.52-3	2.87-3	3.38-3	4.04-3
66	8420.2	1.93-3	2.01-3	2.17-3	2.47-3	2.93-3	3.52-3
70	9697.6	1.66-3	1.73-3	1.87-3	2.14-3	2.55-3	3.07-3
74	11105.2	1.44-3	1.50-3	1.62-3	1.86-3	2.22-3	2.70-3
78	12656.3	1.25-3	1.30-3	1.41-3	1.61-3	1.94-3	2.37-3
82	14366.6	1.08-3	1.13-3	1.22-3	1.40-3	1.70-3	2.09-3
87	16757.2	9.09-4	9.45-4	1.03-3	1.18-3	1.44-3	1.79-3
92	19471.9	7.61-4	7.91-4	8.60-4	9.93-4	1.22-3	1.54-3

C1 – G1

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
445.4	4.60-5	3.77-5	2.72-5	1.66-5	8.45-6	3.79-6
708.2	2.46-5	2.00-5	1.43-5	8.69-6	4.40-6	1.95-6
1026.7	1.30-5	1.05-5	7.51-6	4.53-6	2.28-6	1.00-6
1398.7	6.69-6	5.43-6	3.86-6	2.32-6	1.16-6	5.11-7
1821.8	3.18-6	2.58-6	1.83-6	1.09-6	5.46-7	2.40-7
2292.9	1.22-6	9.91-7	7.01-7	4.19-7	2.09-7	9.15-8
2808.4	4.21-7	3.40-7	2.41-7	1.44-7	7.14-8	3.13-8
3364.6	1.62-7	1.31-7	9.23-8	5.51-8	2.74-8	1.20-8
3957.2	7.17-8	5.79-8	4.09-8	2.44-8	1.21-8	5.29-9
4581.2	3.52-8	2.84-8	2.01-8	1.20-8	5.93-9	2.59-9
5230.4	1.86-8	1.50-8	1.06-8	6.30-9	3.13-9	1.37-9
5897.9	1.03-8	8.33-9	5.87-9	3.50-9	1.74-9	0.00+0
6575.2	5.95-9	4.80-9	3.38-9	2.02-9	1.00-9	0.00+0
7252.3	3.53-9	2.85-9	2.01-9	1.20-9	0.00+0	0.00+0
7917.6	2.14-9	1.73-9	1.22-9	0.00+0	0.00+0	0.00+0
8556.8	1.33-9	1.07-9	0.00+0	0.00+0	0.00+0	0.00+0
9292.7	0.00+0	0.00+0	0.00+0	0.00+0	0.00+0	0.00+0
9918.2	0.00+0	0.00+0	0.00+0	0.00+0	0.00+0	0.00+0

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - G2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	449.2	1.14-6	9.32-7	6.72-7	4.11-7	2.09-7	9.37-8
26	712.7	5.76-7	4.70-7	3.37-7	2.04-7	1.03-7	4.58-8
30	1031.2	4.34-7	3.53-7	2.52-7	1.52-7	7.64-8	3.37-8
34	1403.0	4.98-7	4.05-7	2.88-7	1.73-7	8.65-8	3.80-8
38	1825.8	7.32-7	5.93-7	4.20-7	2.52-7	1.26-7	5.52-8
42	2297.5	9.33-7	7.55-7	5.34-7	3.20-7	1.59-7	6.98-8
46	2815.4	7.88-7	6.37-7	4.50-7	2.69-7	1.34-7	5.86-8
50	3375.9	5.27-7	4.26-7	3.01-7	1.79-7	8.92-8	3.90-8
54	3974.8	3.28-7	2.65-7	1.87-7	1.11-7	5.53-8	2.42-8
58	4607.0	2.00-7	1.62-7	1.14-7	6.80-8	3.38-8	1.48-8
62	5267.0	1.23-7	9.89-8	6.97-8	4.16-8	2.06-8	9.02-9
66	5948.1	7.55-8	6.10-8	4.30-8	2.56-8	1.27-8	5.56-9
70	6642.1	4.71-8	3.80-8	2.68-8	1.60-8	7.93-9	3.47-9
74	7339.9	2.96-8	2.39-8	1.69-8	1.01-8	5.00-9	2.18-9
78	8030.0	1.89-8	1.52-8	1.07-8	6.40-9	3.18-9	1.39-9
82	8698.9	1.21-8	9.77-9	6.89-9	4.11-9	2.04-9	0.00+0
87	9479.5	7.03-9	5.67-9	4.00-9	2.39-9	1.19-9	0.00+0
92	10159.8	4.11-9	3.32-9	2.35-9	1.40-9	0.00+0	0.00+0

C1 - G3

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
452.8	7.42-6	6.08-6	4.39-6	2.68-6	1.37-6	6.13-7
721.8	8.67-6	7.08-6	5.07-6	3.08-6	1.56-6	6.92-7
1051.1	8.28-6	6.74-6	4.81-6	2.90-6	1.46-6	6.46-7
1440.9	7.26-6	5.90-6	4.20-6	2.53-6	1.27-6	5.58-7
1891.5	6.16-6	5.00-6	3.55-6	2.13-6	1.06-6	4.68-7
2403.1	5.18-6	4.20-6	2.98-6	1.78-6	8.90-7	3.90-7
2975.9	4.35-6	3.52-6	2.50-6	1.50-6	7.46-7	3.27-7
3610.3	3.64-6	2.95-6	2.09-6	1.25-6	6.23-7	2.73-7
4303.7	1.01-7	8.17-8	5.79-8	3.46-8	1.73-8	7.56-9
5054.8	1.12-7	9.05-8	6.41-8	3.84-8	1.91-8	8.38-9
5866.1	9.59-8	7.76-8	5.50-8	3.29-8	1.64-8	7.20-9
6737.8	7.92-8	6.42-8	4.55-8	2.72-8	1.36-8	5.96-9
7669.9	6.46-8	5.23-8	3.71-8	2.23-8	1.11-8	4.87-9
8662.3	5.23-8	4.24-8	3.01-8	1.81-8	9.02-9	3.96-9
9714.9	4.21-8	3.41-8	2.42-8	1.46-8	7.29-9	3.20-9
10827.5	3.37-8	2.74-8	1.95-8	1.17-8	5.86-9	2.58-9
12301.8	2.54-8	2.06-8	1.47-8	8.84-9	4.44-9	1.95-9
13867.6	1.89-8	1.54-8	1.09-8	6.61-9	3.32-9	1.46-9

C1 - G4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	460.6	2.65-8	2.18-8	1.57-8	9.61-9	4.90-9	2.20-9
26	731.0	8.97-8	7.32-8	5.25-8	3.19-8	1.61-8	7.17-9
30	1061.2	1.77-7	1.45-7	1.03-7	6.23-8	3.14-8	1.39-8
34	1451.4	2.47-7	2.01-7	1.43-7	8.59-8	4.31-8	1.90-8
38	1901.7	2.75-7	2.23-7	1.59-7	9.53-8	4.76-8	2.09-8
42	2412.0	2.71-7	2.20-7	1.56-7	9.33-8	4.66-8	2.04-8
46	2982.4	2.53-7	2.05-7	1.45-7	8.70-8	4.34-8	1.90-8
50	3613.0	2.70-7	2.19-7	1.55-7	9.27-8	4.62-8	2.02-8
54	4306.8	3.25-6	2.63-6	1.86-6	1.11-6	5.56-7	2.43-7
58	5065.6	2.78-6	2.25-6	1.60-6	9.56-7	4.76-7	2.09-7
62	5887.2	2.43-6	1.97-6	1.40-6	8.37-7	4.17-7	1.83-7
66	6772.1	2.15-6	1.75-6	1.24-6	7.42-7	3.70-7	1.62-7
70	7720.8	1.93-6	1.56-6	1.11-6	6.65-7	3.32-7	1.46-7
74	8733.7	1.74-6	1.41-6	1.00-6	6.02-7	3.01-7	1.32-7
78	9811.3	1.58-6	1.28-6	9.12-7	5.49-7	2.75-7	1.21-7
82	10953.9	1.45-6	1.17-6	8.35-7	5.03-7	2.52-7	1.11-7
87	12473.8	1.29-6	1.05-6	7.47-7	4.50-7	2.26-7	9.95-8
92	14095.4	1.14-6	9.24-7	6.59-7	3.98-7	2.00-7	8.82-8

C1 - G5

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
464.2	1.33-6	1.09-6	7.87-7	4.82-7	2.46-7	1.10-7
735.7	1.84-6	1.50-6	1.08-6	6.54-7	3.31-7	1.47-7
1067.2	2.06-6	1.68-6	1.20-6	7.24-7	3.64-7	1.61-7
1459.2	2.01-6	1.63-6	1.16-6	6.99-7	3.51-7	1.55-7
1911.8	1.81-6	1.47-6	1.04-6	6.28-7	3.14-7	1.38-7
2425.4	1.57-6	1.28-6	9.06-7	5.43-7	2.71-7	1.19-7
3000.2	1.35-6	1.09-6	7.75-7	4.64-7	2.31-7	1.02-7
3636.5	1.15-6	9.32-7	6.60-7	3.96-7	1.97-7	8.64-8
4334.8	9.84-7	7.97-7	5.64-7	3.38-7	1.68-7	7.38-8
5095.4	8.45-7	6.84-7	4.85-7	2.90-7	1.45-7	6.35-8
5918.7	7.30-7	5.91-7	4.19-7	2.51-7	1.25-7	5.49-8
6805.3	6.35-7	5.14-7	3.65-7	2.19-7	1.09-7	4.78-8
7755.4	5.54-7	4.49-7	3.19-7	1.91-7	9.55-8	4.19-8
8769.7	4.86-7	3.94-7	2.80-7	1.68-7	8.39-8	3.69-8
9848.5	4.26-7	3.45-7	2.45-7	1.48-7	7.38-8	3.25-8
10992.2	3.71-7	3.01-7	2.14-7	1.29-7	6.46-8	2.84-8
12513.3	3.07-7	2.49-7	1.78-7	1.07-7	5.38-8	2.37-8
14135.8	2.43-7	1.98-7	1.41-7	8.53-8	4.29-8	1.89-8

C1 - G6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	505.8	7.86-3	6.47-3	4.68-3	2.88-3	1.47-3	6.63-4
26	786.6	5.13-3	4.20-3	3.02-3	1.84-3	9.34-4	4.16-4
30	1127.8	3.61-3	2.94-3	2.10-3	1.28-3	6.44-4	2.85-4
34	1529.5	2.67-3	2.18-3	1.55-3	9.36-4	4.70-4	2.08-4
38	1992.0	2.06-3	1.67-3	1.19-3	7.17-4	3.59-4	1.58-4
42	2515.2	1.64-3	1.33-3	9.44-4	5.67-4	2.84-4	1.25-4
46	3099.4	1.33-3	1.08-3	7.67-4	4.60-4	2.30-4	1.01-4
50	3744.7	1.11-3	8.96-4	6.36-4	3.81-4	1.90-4	8.35-5
54	4451.5	9.32-4	7.56-4	5.36-4	3.21-4	1.60-4	7.03-5
58	5219.8	7.97-4	6.46-4	4.58-4	2.75-4	1.37-4	6.02-5
62	6050.1	6.90-4	5.59-4	3.97-4	2.38-4	1.19-4	5.21-5
66	6942.7	6.03-4	4.89-4	3.47-4	2.08-4	1.04-4	4.57-5
70	7897.7	5.32-4	4.32-4	3.07-4	1.84-4	9.20-5	4.04-5
74	8915.7	4.73-4	3.84-4	2.73-4	1.64-4	8.20-5	3.61-5
78	9996.9	4.24-4	3.44-4	2.45-4	1.47-4	7.37-5	3.24-5
82	11141.9	3.82-4	3.10-4	2.21-4	1.33-4	6.67-5	2.93-5
87	12663.3	3.38-4	2.75-4	1.96-4	1.18-4	5.93-5	2.61-5
92	14285.7	3.01-4	2.45-4	1.75-4	1.06-4	5.32-5	2.35-5

C1 - I1

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
415.4	1.48-5	1.31-5	1.15-5	8.75-6	8.09-6	7.93-6
669.9	9.28-6	8.34-6	8.37-6	7.00-6	9.00-6	1.03-5
979.1	6.48-6	6.06-6	6.11-6	6.53-6	7.18-6	8.38-6
1341.0	4.78-6	4.52-6	4.43-6	4.98-6	5.41-6	6.25-6
1752.8	3.83-6	3.67-6	3.44-6	4.19-6	4.57-6	5.19-6
2210.2	3.29-6	3.27-6	3.03-6	4.07-6	4.72-6	5.49-6
2707.2	2.48-6	2.56-6	2.46-6	3.45-6	4.25-6	5.12-6
3238.9	1.69-6	1.77-6	1.76-6	2.47-6	3.13-6	3.92-6
3799.9	1.12-6	1.18-6	1.22-6	1.67-6	2.15-6	2.72-6
4384.1	7.37-7	7.78-7	8.30-7	1.11-6	1.43-6	1.83-6
4983.5	4.88-7	5.15-7	5.63-7	7.58-7	9.45-7	1.22-6
5589.1	3.25-7	3.42-7	3.82-7	5.32-7	6.23-7	8.00-7
6190.1	2.18-7	2.29-7	2.59-7	3.40-7	4.09-7	5.25-7
6773.6	1.48-7	9.84-8	1.76-7	2.22-7	2.69-7	3.44-7
7324.6	1.02-7	9.37-8	1.20-7	1.46-7	1.77-7	2.25-7
7824.7	1.79-8	7.06-8	9.31-8	9.62-8	1.16-7	1.47-7
8344.3	4.32-8	4.71-8	5.29-8	5.72-8	6.82-8	8.56-8
8695.6	3.08-8	3.22-8	3.18-8	3.38-8	3.93-8	4.90-8

C1 - I2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	419.2	1.17-5	1.15-5	1.07-5	1.17-5	1.49-5	1.75-5
26	676.9	7.25-6	6.80-6	7.01-6	6.32-6	7.96-6	8.91-6
30	988.5	6.65-6	7.02-6	8.16-6	1.01-5	1.32-5	1.70-5
34	1351.2	5.50-6	5.99-6	7.08-6	9.15-6	1.23-5	1.62-5
38	1762.7	3.63-6	4.05-6	4.93-6	6.47-6	8.98-6	1.22-5
42	2221.2	1.88-6	2.11-6	2.73-6	3.47-6	4.95-6	7.06-6
46	2725.4	1.00-6	1.09-6	1.41-6	1.70-6	2.41-6	3.53-6
50	3271.6	6.25-7	6.56-7	8.13-7	9.78-7	1.35-6	2.00-6
54	3854.7	4.03-7	4.17-7	4.99-7	6.14-7	8.45-7	1.25-6
58	4469.2	2.59-7	2.67-7	3.14-7	4.00-7	5.56-7	8.18-7
62	5109.1	1.65-7	1.71-7	2.02-7	5.45-8	3.77-7	5.54-7
66	5767.2	1.05-7	1.10-7	1.32-7	1.05-7	2.63-7	3.87-7
70	6435.1	6.69-8	7.18-8	8.89-8	9.69-8	1.89-7	2.78-7
74	7102.8	4.37-8	5.28-8	6.24-8	7.99-8	1.40-7	2.05-7
78	7758.5	3.00-8	3.54-8	4.62-8	6.51-8	1.08-7	1.57-7
82	8388.1	2.55-8	2.67-8	1.72-8	5.38-8	8.52-8	1.24-7
87	9111.8	1.75-8	2.12-8	2.57-8	4.38-8	6.66-8	9.65-8
92	9725.1	1.54-8	1.47-8	2.48-6	3.69-8	5.43-8	7.79-8

C1 - I3

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
420.1	5.51-6	4.88-6	4.66-6	4.06-6	4.72-6	5.98-6
677.4	7.29-6	6.85-6	6.53-6	3.16-6	7.58-6	9.71-6
994.3	5.25-6	4.61-6	3.78-6	2.96-6	2.32-6	2.21-6
1369.8	3.25-6	2.80-6	2.19-6	1.56-6	1.01-6	7.95-7
1802.8	2.07-6	1.75-6	1.33-6	8.87-7	4.88-7	3.15-7
2292.7	1.37-6	1.15-6	8.55-7	5.47-7	2.71-7	1.49-7
2838.4	9.39-7	7.83-7	5.79-7	3.66-7	1.76-7	9.72-8
3438.8	6.67-7	5.55-7	4.10-7	2.62-7	1.29-7	8.32-8
4092.7	4.86-7	4.05-7	3.00-7	1.96-7	1.02-7	8.05-8
4798.7	3.61-7	3.00-7	2.25-7	1.52-7	7.99-8	7.97-8
5554.9	2.70-7	2.26-7	1.71-7	1.43-7	3.46-8	7.82-8
6359.4	2.04-7	1.70-7	1.31-7	7.03-8	9.16-8	7.60-8
7209.8	1.54-7	1.29-7	1.01-7	6.58-8	7.87-8	7.35-8
8103.0	1.16-7	9.86-8	7.84-8	5.81-8	5.76-8	7.12-8
9035.5	8.80-8	7.52-8	6.17-8	5.11-8	5.64-8	6.98-8
10003.1	6.74-8	5.81-8	3.35-8	4.58-8	5.40-8	6.95-8
11253.5	4.83-8	4.31-8	3.59-8	4.11-8	5.18-8	6.99-8
12536.7	3.39-8	2.77-8	3.25-8	3.81-8	5.05-8	7.07-8

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - I4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	423.4	6.21-6	6.48-6	6.42-6	7.34-6	9.09-6	1.04-5
26	683.8	6.20-6	6.07-6	6.54-6	4.00-6	8.11-6	9.29-6
30	1004 3	5.50-6	5.37-6	5.46-6	5.86-6	6.44-6	7 48-6
34	1384.9	4.67-6	4.54-6	4.53-6	4.82-6	5 18-6	6.14-6
38	1825.6	3.85-6	3.75-6	3.72-6	3.96-6	4.20-6	5.09-6
42	2326.4	3.13-6	3.05-6	3.03-6	3.24-6	3.41-6	4.26-6
46	2887.3	2 51-6	2.45-6	2.45-6	2.65-6	2.81-6	3.63-6
50	3508.3	2.00-6	1.96-6	1.99-6	2.20-6	2.40-6	3.23-6
54	4189.4	1 61-6	1.59-6	1.66-6	1.92-6	2.24-6	3.17-6
58	4930.8	1.36-6	1.37-6	1.52-6	1.93-6	2.51-6	3.71-6
62	5732.3	1.35-6	1.46-6	1.81-6	9.76-7	3.85-6	5.77-6
66	6593.7	2.13-6	2.55-6	3.56-6	5.18-6	8.67-6	1.33-5
70	7513.1	7 74-6	9.91-6	1.44-5	2.25-5	3.58-5	5.39-5
74	8470.1	9 72-5	1.26-4	1.80-4	2.78-4	4.29-4	6.37-4
78	9442.9	1.41-4	1.82-4	2.59-4	3.96-4	6.07-4	8.97-4
82	10448.5	1 48-4	1.88-4	2.72-4	4.05-4	6.17-4	9.12-4
87	11750.5	1.55-4	1.97-4	2.78-4	4.13-4	6.26-4	9.25-4
92	13092.5	1.67-4	2.13-4	2.93-4	4.30-4	6.46-4	9.56-4

C1 - I5

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
439.4	1.23-4	1.51-4	2.03-4	2.81-4	3.94-4	5.34-4
703.5	7 63-5	9.49-5	1.26-4	1.79-4	2.50-4	3.42-4
1028.2	5.21-5	6.51-5	8.74-5	1.23-4	1.76-4	2.39-4
1413.5	3.84-5	4.82-5	6.51-5	9.18-5	1.31-4	1.79-4
1859.2	2.98-5	3.73-5	5.04-5	7.11-5	1.02-4	1.39-4
2365.0	2.39-5	2.98-5	4.03-5	5.69-5	8.19-5	1.12-4
2930.9	1.98-5	2.46-5	3.34-5	4.72-5	6.83-5	9.39-5
3556.8	1.71-5	2.13-5	2.89-5	4.11-5	5.98-5	8.30-5
4242.9	1.57-5	1.96-5	2.68-5	3 84-5	5.63-5	7.89-5
4988.9	1.60-5	2.02-5	2.77-5	4.02-5	5.95-5	8.44-5
5794.4	2.01-5	2.56-5	3.56-5	5.73-5	7.86-5	1.13-4
6655.9	4.33-5	5.55-5	7.85-5	1.23-4	1.80-4	2.63-4
7556.3	1.32-4	1.69-4	2.42-4	3.74-4	5.68-4	8.39-4
8510.0	5.32-5	6.84-5	9.66-5	1.47-4	2.23-4	3.28-4
9547.1	8.08-6	1.02-5	1.40-5	2.07-5	3.07-5	4.46-5
10648.9	3.16-6	3.88-6	5.46-6	7.45-6	1.09-5	1.57-5
12110.7	1.53-6	1.86-6	2.47-6	3.39-6	4.87-6	6.97-6
13664.2	9.05-7	1.12-6	1.40-6	1.91-6	2.72-6	3.90-6

C1 - I6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	446.1	6.26-5	6.62-5	6.78-5	9.05-5	1.06-4	1.32-4
26	714.8	3.84-5	4.01-5	4.60-5	7.28-5	6.93-5	8.63-5
30	1046.2	2.31-5	2.36-5	2.59-5	3.06-5	3.83-5	4.64-5
34	1442.2	1.37-5	1.35-5	1.39-5	1.57-5	1.97-5	2.28-5
38	1904.9	8.53-6	8.11-6	7.81-6	8.47-6	1.C9-5	1.18-5
42	2436.6	5.90-6	5.59-6	5.26-6	5.92-6	8.19-6	8.95-6
46	3034.7	3.00-4	3.85-4	5.54-4	8.58-4	1.34-3	1.95-3
50	3658.6	2.74-4	3.51-4	5.04-4	7.76-4	1.21-3	1.79-3
54	4336.6	2.32-4	2.97-4	4.26-4	6.57-4	1.02-3	1.52-3
58	5067.8	1.99-4	2.54-4	3.65-4	5.63-4	8.77-4	1.31-3
62	5851.5	1.70-4	2.17-4	3.12-4	4.97-4	7.50-4	1.12-3
66	6689.9	1 27-4	1.63-4	2.35-4	3.69-4	5.65-4	8.44-4
70	7599.5	2.12-5	2 69-5	3.87-5	6.00-5	9.52-5	1.43-4
74	8583.8	2.31-6	2.73-6	3.72-6	5.53-6	9.15-6	1.38-5
78	9631.2	7.37-7	7.61-7	8.81-7	1.14-6	1.79-6	2.55-6
82	10739.1	4.84-7	4.82-7	2.70-7	5.81-7	7.76-7	9.77-7
87	12208.1	3.74-7	3.81-7	3.71-7	4.63-7	5.64-7	6.75-7
92	13768.9	2.87-7	2.64-7	3.33-7	3.92-7	4.77-7	5.86-7

C1 - I7

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
486.0	9.81-4	8.87-4	7.80-4	7.06-4	7.13-4	8.33-4
763.3	7.24-4	7.32-4	7.85-4	9.46-4	1.25-3	1.71-3
1101.5	6.31-4	7.27-4	9.32-4	1.32-3	1.96-3	2.78-3
1499.1	5.61-4	6.95-4	9.64-4	1.45-3	2.22-3	3.19-3
1954.5	4.77-4	6.06-4	8.64-4	1.32-3	2.05-3	2.96-3
2466.8	3.96-4	5.06-4	7.27-4	1.12-3	1.74-3	2.53-3
3040.1	3.17-5	3.81-5	5.25-5	7.49-5	1.15-4	1.69-4
3717.1	3.18-6	2.73-6	2.21-6	1.45-6	2.01-6	1.53-6
4471.9	2.54-6	2.12-6	1.62-6	9.41-7	1.49-6	8.05-7
5307.8	2.45-6	2.02-6	1.49-6	8.14-7	1.40-6	6.00-7
6161.8	5.85-4	4.78-4	3.49-4	2.30-4	1.50-4	1.20-4
7063.7	5.28-4	4.36-4	3.26-4	2.26-4	1.64-4	1.47-4
8028.4	4.82-4	4.03-4	3.08-4	2.25-4	1.78-4	1.74-4
9056.3	4.44-4	3.76-4	2.95-4	2.26-4	1.91-4	1.97-4
10147.8	4.13-4	3.53-4	2.83-4	2.26-4	2.02-4	2.18-4
11303.2	3.86-4	3.33-4	2.73-4	2.26-4	2.11-4	2.35-4
12838.2	3.57-4	3.12-4	2.61-4	2.24-4	2.19-4	2.52-4
14474.8	3.32-4	2.93-4	2.50-4	2.21-4	2.23-4	2.64-4

C1 - I8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	492.0	1.94-3	2.61-3	3.91-3	6.16-3	9.52-3	1.38-2
26	771.4	1.20-3	1.60-3	2 36-3	3.84-3	5.71-3	8.31-3
30	1114.2	7.65-4	9.71-4	1.38-3	2.10-3	3.23-3	4.66-3
34	1522.4	5.09-4	6.11-4	8.18-4	1.20-3	1.82-3	2.59-3
38	1998.0	3.71-4	4.26-4	5.43-4	7.66-4	1.14-3	1.62-3
42	2542.9	2.97-4	3.34-4	4.12-4	5.66-4	8.37-4	1.18-3
46	3159.6	2.76-4	3.07-4	3.73-4	5.04-4	7.41-4	1.03-3
50	3829.4	8.81-4	7.04-4	4.89-4	2.84-4	1.38-4	5.93-5
54	4545.0	7.56-4	6.07-4	4.27-4	2.56-4	1.34-4	7.25-5
58	5322.3	6.59-4	5.34-4	3.81-4	2.38-4	1.40-4	9.40-5
62	6226.4	1.32-6	1.14-6	9.03-7	5.04-7	1.50-6	4.37-7
66	7145.4	4.75-4	3.93-4	2.97-4	2.12-4	1.62-4	1.56-4
70	8116.8	4.78-4	4.16-4	3.46-4	2.96-4	2.87-4	3.29-4
74	9151.4	4.79-4	4.32-4	3.84-4	3.60-4	3.84-4	4.64-4
78	10249.7	4.73-4	4.37-4	4.05-4	4.00-4	4.48-4	5.54-4
82	11412.2	4.61-4	4.33-4	4.12-4	4.21-4	4.85-4	6.09-4
87	12956.2	4.40-4	4.20-4	4.09-4	4.29-4	5.04-4	6.44-4
92	14602.2	4.16-4	4.01-4	3.96-4	4.23-4	5.05-4	6.56-4

C1 - I9

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
517.0	1.40-3	1.50-3	1.73-3	2.23-3	3.09-3	4.30-3
799.8	8.51-4	8.65-4	9.27-4	1.10-3	1.46-3	1.99-3
1145.2	5.34-4	5.08-4	4.84-4	4.97-4	5.81-4	7.41-4
1555.3	3.54-4	3.15-4	2.60-4	2.07-4	1.79-4	1.83-4
2032.6	2.56-4	2.19-4	1.67-4	1.07-4	5.97-5	2.95-5
2579.4	2.14-4	1.85-4	1.46-4	1.04-4	7.98-5	6.81-5
3175.8	1.05-3	8.44-4	5.90-4	3.49-4	1.75-4	8.53-5
3851.1	3.88-4	4.49-4	5.66-4	7.70-4	1.12-3	1.53-3
4606.3	3.16-3	3.39-3	3.84-3	4.64-3	5.93-3	7.68-3
5390.9	7.50-4	6.51-4	5.41-4	4.58-4	4.40-4	4.93-4
6240.0	5.04-4	4.02-4	2.79-4	1.62-4	7.81-5	3.31-5
7173.9	8.40-3	9.54-3	1.15-2	1.46-2	1.91-2	2.53-2
8158.7	7.49-3	8.51-3	1.03-2	1.30-2	1.71-2	2.26-2
9210.3	6.70-3	7.61-3	9.17-3	1.16-2	1.54-2	2.04-2
10329.6	6.02-3	6.84-3	8.25-3	1.05-2	1.39-2	1.85-2
11517.5	5.43-3	6.17-3	7.45-3	9.49-3	1.26-2	1.69-2
13100.7	4.80-3	5.46-3	6.60-3	8.43-3	1.12-2	1.52-2
14795.0	4.27-3	4.87-3	5.89-3	7.55-3	1.01-2	1.38-2

C1 - I10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	534.2	5.99-3	4.83-3	3.39-3	2.01-3	1.01-3	4.88-4
26	822.7	4.01-3	3.22-3	2.26-3	1.35-3	6.88-4	3.45-4
30	1171.7	2.85-3	2.29-3	1.60-3	9.54-4	4.88-4	2.45-4
34	1581.4	2.12-3	1.70-3	1.19-3	7.03-4	3.54-4	1.72-4
38	2051.8	1.63-3	1.31-3	9.11-4	5.34-4	2.63-4	1.19-4
42	2583.3	1.29-3	1.03-3	7.18-4	4.19-4	2.03-4	8.71-5
46	3198.5	2.39-4	2.31-4	2.27-4	2.38-4	2.95-4	3.62-4
50	3883.0	6.44-3	7.13-3	8.35-3	1.04-2	1.33-2	1.72-2
54	4610.3	7.37-3	8.41-3	1.02-2	1.30-2	1.72-2	2.26-2
58	5400.9	1.03-2	1.17-2	1.41-2	1.79-2	2.34-2	3.08-2
62	6254.9	9.41-3	1.07-2	1.29-2	1.63-2	2.13-2	2.82-2
66	7241.9	1.38-6	1.35-6	1.34-6	1.30-6	1.63-6	2.24-6
70	8351.0	1.01-6	9.47-7	8.83-7	7.83-7	9.81-7	1.27-6
74	9564.0	9.32-7	8.70-7	8.10-7	7.42-7	1.06-6	1.16-6
78	10889.2	8.76-7	8.23-7	7.75-7	7.43-7	9.53-7	1.14-6
82	12336.2	8.28-7	7.84-7	7.49-7	7.47-7	9.09-7	1.14-6
87	14334.3	7.73-7	7.39-7	7.16-7	7.38-7	8.71-7	1.12-6
92	16569.2	7.19-7	6.93-7	6.78-7	7.12-7	8.30-7	1.09-6

C1 - I11

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
541.9	3.99-3	4.07-3	4.38-3	5.11-3	6.42-3	8.19-3
834.8	5.93-3	6.47-3	7.50-3	9.23-3	1.19-2	1.52-2
1189.4	9.44-3	1.06-2	1.26-2	1.58-2	2.04-2	2.61-2
1605.6	1.38-2	1.56-2	1.87-2	2.35-2	3.04-2	3.88-2
2083.0	1.67-2	1.90-2	2.28-2	2.87-2	3.70-2	4.73-2
2621.7	1.66-2	1.88-2	2.26-2	2.84-2	3.67-2	4.70-2
3222.3	1.38-2	1.55-2	1.85-2	2.32-2	2.99-2	3.85-2
3887.3	6.10-3	6.85-3	8.15-3	1.02-2	1.32-2	1.72-2
4623.2	2.02-3	2.20-3	2.51-3	3.00-3	3.61-3	4.62-3
5473.2	1.40-4	1.31-4	1.20-4	1.12-4	9.82-5	1.23-4
6411.2	9.40-5	8.70-5	7.96-5	7.62-5	8.05-5	1.05-4
7441.3	7.85-5	7.30-5	6.77-5	6.72-5	7.41-5	1.01-4
8569.5	6.85-5	6.39-5	5.96-5	6.00-5	6.88-5	9.31-5
9803.1	6.10-5	5.69-5	5.32-5	5.36-5	6.27-5	8.38-5
11150.7	5.51-5	5.13-5	4.78-5	4.80-5	5.61-5	7.48-5
12622.5	5.02-5	4.66-5	4.32-5	4.31-5	5.01-5	6.66-5
14655.7	4.53-5	4.19-5	3.86-5	3.80-5	4.36-5	5.77-5
16931.5	4.15-5	3.82-5	3.48-5	3.36-5	3.80-5	5.05-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - I12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	547.9	5.51-2	6.26-2	7.55-2	9.59-2	1.25-1	1.61-1
26	841.4	3.47-2	3.91-2	4.66-2	5.84-2	7.55-2	9.69-2
30	1195.7	2.04-2	2.27-2	2.67-2	3.31-2	4.24-2	5.39-2
34	1611.1	9.88-3	1.08-2	1.23-2	1.50-2	1.90-2	2.39-2
38	2087.9	3.35-3	3.39-3	3.56-3	4.00-3	1.82-3	5.97-3
42	2626.0	9.77-4	7.84-4	5.50-4	3.33-4	1.81-4	1.08-4
46	3225.6	1.78-3	1.81-3	1.92-3	2.20-3	2.70-3	3.43-3
50	3894.0	1.37-3	1.48-3	1.67-3	1.97-3	2.37-3	3.02-3
54	4665.7	1.68-4	1.56-4	1.39-4	1.21-4	1.00-4	1.10-4
58	5520.4	1.15-4	1.04-4	8.78-5	7.08-5	5.58-5	5.90-5
62	6461.9	9.42-5	8.43-5	7.13-5	5.87-5	5.01-5	5.43-5
66	7495.6	8.07-5	7.23-5	6.17-5	5.17-5	4.65-5	5.34-5
70	8627.5	7.07-5	6.36-5	5.48-5	4.69-5	4.46-5	5.21-5
74	9865.0	6.30-5	5.68-5	4.93-5	4.31-5	4.26-5	5.02-5
78	11216.7	5.68-5	5.13-5	4.48-5	3.98-5	4.02-5	4.80-5
82	12692.7	5.17-5	4.68-5	4.11-5	3.70-5	3.77-5	4.56-5
87	14731.5	4.66-5	4.23-5	3.73-5	3.38-5	3.49-5	4.28-5
92	17013.3	4.26-5	3.86-5	3.41-5	3.11-5	3.23-5	4.03-5

C1 - I13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	573.3	5.24-2	5.97-2	7.26-2	9.31-2	1.23-1	1.61-1
26	874.1	4.30-2	4.91-2	5.94-2	7.57-2	9.93-2	1.29-1
30	1238.9	3.45-2	3.93-2	4.75-2	6.03-2	7.89-2	1.02-1
34	1670.2	2.70-2	3.07-2	3.71-2	4.70-2	6.13-2	7.88-2
38	2170.9	2.07-2	2.35-2	2.84-2	3.59-2	4.68-2	6.02-2
42	2744.5	1.58-2	1.79-2	2.16-2	2.73-2	3.56-2	4.60-2
46	3394.7	1.22-2	1.38-2	1.66-2	2.10-2	2.74-2	3.57-2
50	4125.5	9.53-3	1.08-2	1.30-2	1.65-2	2.15-2	2.82-2
54	4941.6	7.62-3	8.63-3	1.04-2	1.32-2	1.72-2	2.28-2
58	5848.4	6.21-3	7.03-3	8.46-3	1.08-2	1.41-2	1.88-2
62	6851.8	5.16-3	5.85-3	7.04-3	8.98-3	1.19-2	1.59-2
66	7957.8	4.35-3	4.94-3	5.97-3	7.65-3	1.02-2	1.37-2
70	9165.2	3.30-3	3.77-3	4.62-3	6.01-3	8.14-3	1.11-2
74	10467.0	1.33-3	1.54-3	1.92-3	2.56-3	3.58-3	5.02-3
78	11876.4	7.39-4	8.54-4	1.07-3	1.44-3	2.05-3	2.91-3
82	13412.7	5.38-4	6.19-4	7.72-4	1.04-3	1.49-3	2.14-3
87	15534.3	4.18-4	4.77-4	5.92-4	7.99-4	1.13-3	1.66-3
92	17910.7	3.48-4	3.94-4	4.85-4	6.54-4	9.41-4	1.38-3

C1 - I14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	628.5	1.64-3	1.76-3	2.11-3	2.92-3	4.41-3	6.59-3
26	941.8	1.30-3	1.43-3	1.76-3	2.45-3	3.68-3	5.46-3
30	1319.5	1.06-3	1.19-3	1.48-3	2.07-3	3.10-3	4.51-3
34	1763.3	8.90-4	1.01-3	1.26-3	1.77-3	2.63-3	3.79-3
38	2275.0	7.57-4	8.60-4	1.08-3	1.51-3	2.24-3	3.23-3
42	2857.0	6.48-4	7.37-4	9.28-4	1.30-3	1.91-3	2.76-3
46	3512.0	5.54-4	6.30-4	7.92-4	1.10-3	1.62-3	2.36-3
50	4243.1	4.70-4	5.33-4	6.67-4	9.27-4	1.36-3	1.99-3
54	5054.0	3.90-4	4.40-4	5.47-4	7.57-4	1.11-3	1.64-3
58	5949.1	3.11-4	3.46-4	4.25-4	5.83-4	8.59-4	1.27-3
62	6933.5	2.27-4	2.45-4	2.92-4	3.93-4	5.77-4	8.61-4
66	8014.6	1.48-4	1.46-4	1.52-4	1.82-4	2.54-4	3.74-4
70	9208.9	4.96-4	5.12-4	5.43-4	5.99-4	6.90-4	8.24-4
74	10541.4	1.89-3	2.09-3	2.46-3	3.04-3	3.94-3	5.18-3
78	12020.5	2.00-3	2.24-3	2.66-3	3.34-3	4.40-3	5.86-3
82	13652.0	1.80-3	2.02-3	2.41-3	3.05-3	4.05-3	5.43-3
87	15930.2	1.52-3	1.70-3	2.04-3	2.59-3	3.46-3	4.69-3
92	18512.9	1.25-3	1.41-3	1.68-3	2.15-3	2.89-3	3.99-3

C1 - J1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	413.4	2.72-5	2.27-5	1.84-5	1.33-5	1.14-5	1.04-5
26	666.0	1.57-5	1.36-5	1.13-5	5.19-6	9.23-6	1.00-5
30	972.5	9.29-6	8.22-6	6.88-6	6.63-6	6.74-6	7.91-6
34	1330.3	5.67-6	5.08-6	4.20-6	4.40-6	4.67-6	5.72-6
38	1736.4	3.52-6	3.18-6	2.57-6	2.88-6	3.13-6	3.96-6
42	2187.1	2.20-6	2.00-6	1.65-6	1.87-6	2.06-6	2.66-6
46	2678.3	1.38-6	1.26-6	1.10-6	1.20-6	1.34-6	1.76-6
50	3205.1	8.65-7	7.89-7	7.16-7	7.67-7	8.67-7	1.15-6
54	3761.6	5.43-7	4.95-7	4.60-7	4.90-7	5.63-7	7.50-7
58	4341.3	3.41-7	3.11-7	2.93-7	3.14-7	3.68-7	4.92-7
62	4936.2	2.15-7	1.97-7	1.88-7	2.54-7	2.44-7	3.27-7
66	5537.2	1.36-7	1.25-7	1.21-7	5.19-8	1.64-7	2.20-7
70	6133.5	8.76-8	8.08-8	7.93-8	6.02-8	1.12-7	1.52-7
74	6712.2	5.72-8	5.32-8	5.34-8	4.98-8	7.94-8	1.08-7
78	7258.2	3.86-8	3.66-8	3.73-8	3.93-8	5.77-8	7.84-8
82	7753.2	2.71-8	2.62-8	9.48-9	3.09-8	4.33-8	5.90-8
87	8266.1	1.89-8	1.87-8	1.72-8	2.36-8	3.17-8	4.32-8
92	8610.5	1.45-8	1.28-8	1.53-8	1.86-8	2.44-8	3.32-8

C1 - J2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	419.6	8.44-6	6.71-6	4.97-6	3.36-6	2.55-6	2.23-6
26	677.3	1.14-5	1.11-5	1.11-5	6.97-6	1.33-5	1.56-5
30	990.7	1.80-5	1.99-5	2.32-5	2.82-5	3.52-5	4.39-5
34	1357.1	1.78-5	2.04-5	2.50-5	3.18-5	4.14-5	5.30-5
38	1773.9	1.43-5	1.67-5	2.09-5	2.70-5	3.58-5	4.65-5
42	2238.6	1.05-5	1.24-5	1.56-5	2.03-5	2.72-5	3.58-5
46	2748.0	7.42-6	8.75-6	1.11-5	1.45-5	1.95-5	2.59-5
50	3298.3	5.13-6	6.06-6	7.66-6	1.01-5	1.36-5	1.82-5
54	3885.1	3.52-6	4.16-6	5.24-6	6.91-6	9.33-6	1.25-5
58	4503.3	2.41-6	2.84-6	3.58-6	4.72-6	6.38-6	8.59-6
62	5146.8	1.66-6	1.95-6	2.45-6	3.28-6	4.36-6	5.89-6
66	5808.5	1.14-6	1.35-6	1.68-6	2.25-6	3.00-6	4.04-6
70	6480.0	7.97-7	9.36-7	1.17-6	1.55-6	2.07-6	2.79-6
74	7151.5	5.61-7	6.59-7	8.17-7	1.08-6	1.45-6	1.95-6
78	7811.1	3.99-7	4.66-7	5.79-7	7.59-7	1.02-6	1.37-6
82	8444.6	2.88-7	3.34-7	4.24-7	5.41-7	7.28-7	9.78-7
87	9173.5	1.95-7	2.25-7	2.79-7	3.60-7	4.84-7	6.52-7
92	9792.2	1.34-7	1.57-7	1.90-7	2.44-7	3.27-7	4.44-7

C1 - J3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	421.1	3.14-5	3.16-5	3.32-5	3.38-5	4.29-5	4.91-5
26	679.3	2.00-5	2.05-5	2.25-5	2.22-5	2.97-5	3.45-5
30	994.0	9.60-6	9.12-6	8.22-6	1.04-5	1.21-5	1.46-5
34	1362.5	6.69-6	5.66-6	2.61-6	4.06-6	3.67-6	3.58-6
38	1781.4	5.38-6	4.53-6	8.34-7	2.94-6	2.30-6	1.66-6
42	2248.1	4.25-6	3.70-6	8.85-7	2.79-6	2.49-6	2.08-6
46	2759.5	3.23-6	2.91-6	1.57-6	2.53-6	2.49-6	2.38-6
50	3311.7	2.39-6	2.21-6	1.69-6	2.14-6	2.21-6	2.29-6
54	3900.4	1.75-6	1.65-6	1.49-6	1.72-6	1.83-6	2.00-6
58	4520.6	1.27-6	1.22-6	1.21-6	1.35-6	1.47-6	1.66-6
62	5166.1	9.25-7	9.06-7	9.57-7	1.89-6	1.16-6	1.34-6
66	5829.8	6.79-7	6.76-7	7.44-7	1.05-6	9.13-7	1.08-6
70	6503.4	5.05-7	5.10-7	5.78-7	7.31-7	7.24-7	8.69-7
74	7177.0	3.80-7	3.76-7	4.52-7	5.41-7	5.80-7	7.05-7
78	7838.9	2.92-7	3.15-7	3.56-7	4.15-7	4.68-7	5.77-7
82	8474.7	2.28-7	2.54-7	3.40-7	3.27-7	3.81-7	4.77-7
87	9206.6	1.71-7	1.94-7	2.28-7	2.50-7	3.00-7	3.81-7
92	9828.4	1.35-7	1.62-7	1.70-7	1.95-7	2.39-7	3.07-7

C1 - J4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	422.6	1.27-5	1.27-5	1.42-5	1.72-5	2.44-5	3.31-5
26	681.7	1.85-5	1.81-5	1.78-5	3.90-6	2.72-5	3.68-5
30	999.1	1.48-5	1.43-5	1.38-5	1.46-5	1.70-5	2.21-5
34	1374.7	8.45-6	8.07-6	7.95-6	8.00-6	8.58-6	1.10-5
38	1807.9	4.75-6	4.50-6	4.47-6	4.40-6	4.51-6	5.87-6
42	2298.0	2.78-6	2.60-6	2.56-6	2.51-6	2.49-6	3.38-6
46	2843.9	1.69-6	1.56-6	1.50-6	1.49-6	1.44-6	2.08-6
50	3444.5	1.06-6	9.69-7	9.14-7	9.26-7	8.73-7	1.37-6
54	4098.6	6.93-7	6.28-7	5.88-7	6.13-7	5.65-7	9.84-7
58	4804.8	4.73-7	4.29-7	4.05-7	4.40-7	3.82-7	7.70-7
62	5561.2	3.40-7	3.12-7	3.02-7	3.37-7	1.35-7	6.49-7
66	6365.8	2.58-7	2.41-7	2.43-7	2.56-7	4.35-7	5.78-7
70	7216.2	2.05-7	1.98-7	2.07-7	2.47-7	3.89-7	5.30-7
74	8109.5	1.71-7	1.70-7	1.86-7	2.34-7	3.00-7	4.95-7
78	9042.0	1.47-7	1.51-7	1.71-7	2.22-7	3.07-7	4.67-7
82	10009.4	1.30-7	1.37-7	1.52-7	2.11-7	2.99-7	4.42-7
87	11259.6	1.16-7	1.25-7	1.48-7	1.98-7	2.82-7	4.13-7
92	12542.4	1.09-7	1.15-7	1.38-7	1.85-7	2.63-7	3.84-7

C1 - J5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	423.7	9.73-6	8.90-6	8.37-6	8.66-6	1.23-5	1.61-5
26	684.5	5.63-6	5.02-6	4.48-6	3.38-6	5.19-6	6.70-6
30	1005.0	3.58-6	2.98-6	2.39-6	1.59-6	1.20-6	1.10-6
34	1385.6	3.03-6	2.50-6	1.94-6	1.13-6	5.96-7	2.81-7
38	1826.3	2.59-6	2.16-6	1.69-6	1.05-6	6.43-7	4.11-7
42	2326.1	5.12-6	5.68-6	6.77-6	9.07-6	1.30-5	1.71-5
46	2876.8	1.07-5	1.32-5	1.75-5	2.52-5	3.70-5	5.01-5
50	3480.5	7.53-6	9.29-6	1.24-5	1.77-5	2.61-5	3.55-5
54	4137.7	5.29-6	6.51-6	8.71-6	1.24-5	1.84-5	2.51-5
58	4847.1	3.82-6	4.70-6	6.29-6	8.94-6	1.34-5	1.82-5
62	5606.9	2.85-6	3.50-6	4.69-6	6.79-6	1.02-5	1.37-5
66	6415.1	2.21-6	2.71-6	3.63-6	5.51-6	7.51-6	1.06-5
70	7269.3	1.78-6	2.18-6	2.91-6	4.27-6	6.01-6	8.52-6
74	8166.6	1.49-6	1.82-6	2.42-6	3.49-6	5.06-6	7.08-6
78	9103.5	1.30-6	1.58-6	2.09-6	2.98-6	4.32-6	6.10-6
82	10075.7	1.17-6	1.42-6	2.04-6	2.64-6	3.83-6	5.43-6
87	11332.5	1.09-6	1.31-6	1.74-6	2.39-6	3.45-6	4.93-6
92	12622.9	1.08-6	1.32-6	1.65-6	2.26-6	3.25-6	4.69-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leq Z \leq 92$

See page 31 for Explanation of Tables

C1 – J6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	431.7	4.36-6	5.20-6	7.12-6	1.06-5	1.59-5	2.25-5
26	693.2	5.06-6	6.39-6	9.32-6	1.52-5	2.24-5	3.22-5
30	1014.3	5.94-6	7.56-6	1.11-5	1.76-5	2.74-5	3.95-5
34	1395.3	7.10-6	9.18-6	1.34-5	2.16-5	3.38-5	4.86-5
38	1835.3	1.99-5	2.60-5	3.66-5	5.65-5	8.58-5	1.19-4
42	2329.8	1.56-5	1.93-5	2.57-5	3.70-5	5.38-5	7.31-5
46	2888.7	3.45-6	3.68-6	4.19-6	5.18-6	6.71-6	9.12-6
50	3509.8	2.56-6	2.66-6	2.94-6	3.52-6	4.42-6	6.09-6
54	4191.2	2.36-6	2.50-6	2.84-6	3.51-6	4.51-6	6.35-6
58	4932.8	2.51-6	2.76-6	3.28-6	4.27-6	5.76-6	8.23-6
62	5734.7	3.50-6	4.04-6	5.12-6	8.52-6	1.02-5	1.46-5
66	6595.6	1.22-5	1.50-5	2.05-5	3.13-5	4.58-5	6.74-5
70	7489.6	2.42-4	3.09-4	4.41-4	6.83-4	1.05-3	1.56-3
74	8412.0	2.75-4	3.51-4	5.02-4	7.71-4	1.18-3	1.75-3
78	9373.8	2.79-4	3.57-4	5.09-4	7.75-4	1.19-3	1.75-3
82	10373.0	2.85-4	3.65-4	5.26-4	7.81-4	1.19-3	1.76-3
87	11667.7	3.02-4	3.85-4	5.41-4	8.03-4	1.21-3	1.79-3
92	13002.4	3.28-4	4.18-4	5.75-4	8.42-4	1.26-3	1.87-3

C1 – J7

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
439.3	2.65-4	3.29-4	4.38-4	6.11-4	8.40-4	1.12-3
702.0	1.42-4	1.74-4	2.29-4	3.42-4	4.38-4	5.86-4
1022.5	7.95-5	9.66-5	1.26-4	1.74-4	2.43-4	3.23-4
1400.9	4.56-5	5.49-5	7.06-5	9.72-5	1.35-4	1.78-4
1837.9	1.39-5	1.50-5	1.69-5	1.97-5	2.38-5	2.90-5
2338.4	4.16-6	4.26-6	4.92-6	6.12-6	8.15-6	1.17-5
2899.8	3.88-6	4.22-6	5.29-6	7.39-6	1.07-5	1.60-5
3521.4	4.03-6	4.55-6	5.93-6	8.68-6	1.31-5	1.96-5
4203.0	4.78-6	5.57-6	7.50-6	1.13-5	1.73-5	2.61-5
4944.5	6.92-6	8.33-6	1.15-5	1.76-5	2.73-5	4.12-5
5745.4	1.38-5	1.71-5	2.41-5	3.73-5	5.80-5	8.70-5
6601.8	5.05-5	6.40-5	9.15-5	1.42-4	2.21-4	3.30-4
7520.1	2.98-6	3.71-6	5.28-6	8.14-6	1.29-5	1.96-5
8483.3	1.09-4	9.29-5	7.08-5	4.72-5	2.87-5	1.92-5
9453.7	1.21-4	1.02-4	7.65-5	4.86-5	2.54-5	1.16-5
10459.6	1.14-4	9.65-5	7.22-5	4.60-5	2.42-5	1.14-5
11762.8	1.06-4	8.94-5	6.69-5	4.25-5	2.26-5	1.07-5
13106.6	9.94-5	8.36-5	6.25-5	3.97-5	2.10-5	9.89-6

C1 – J8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	443.6	7.51-5	6.76-5	6.35-5	6.20-5	5.87-5	6.60-5
26	711.4	5.42-5	5.48-5	6.03-5	7.82-5	8.70-5	1.11-4
30	1044.1	3.78-5	3.90-5	4.37-5	5.27-5	6.70-5	8.58-5
34	1443.9	2.69-5	2.76-5	3.01-5	3.60-5	4.52-5	5.71-5
38	1913.3	2.26-5	2.27-5	2.40-5	2.73-5	3.34-5	4.16-5
42	2438.3	6.86-4	8.45-4	1.18-3	1.78-3	2.74-3	3.97-3
46	3001.2	5.72-4	7.08-4	9.89-4	1.50-3	2.32-3	3.40-3
50	3619.7	4.86-4	6.04-4	8.48-4	1.29-3	2.00-3	2.95-3
54	4292.7	4.20-4	5.25-4	7.39-4	1.13-3	1.75-3	2.59-3
58	5019.1	3.68-4	4.62-4	6.53-4	1.00-3	1.55-3	2.30-3
62	5797.8	3.23-4	4.07-4	5.78-4	9.15-4	1.37-3	2.04-3
66	6631.7	2.52-4	3.18-4	4.52-4	7.08-4	1.07-3	1.59-3
70	7535.6	5.92-5	7.00-5	9.25-5	1.36-4	2.01-4	2.95-4
74	8503.6	4.00-6	3.38-6	2.57-6	1.70-6	1.03-6	7.05-7
78	9546.7	3.85-7	3.44-7	3.01-7	2.70-7	2.59-7	3.23-7
82	10649.9	2.71-7	2.55-7	2.26-7	2.41-7	2.47-7	3.07-7
87	12112.4	2.32-7	2.31-7	2.34-7	2.55-7	2.89-7	3.68-7
92	13666.3	2.05-7	2.11-7	2.26-7	2.59-7	3.13-7	4.12-7

C1 – J9

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
483.5	2.16-3	2.05-3	2.00-3	2.16-3	2.62-3	3.41-3
757.7	1.64-3	1.76-3	2.07-3	2.74-3	3.87-3	5.44-3
1090.9	1.31-3	1.52-3	1.97-3	2.83-3	4.22-3	6.02-3
1482.4	1.04-3	1.25-3	1.69-3	2.51-3	3.81-3	5.45-3
1931.7	8.33-4	1.02-3	1.40-3	2.11-3	3.24-3	4.66-3
2454.5	3.60-5	3.16-5	2.43-5	2.03-5	1.60-5	1.29-5
3035.4	3.31-4	2.82-4	2.15-4	1.41-4	8.23-5	4.80-5
3659.7	2.79-4	2.37-4	1.79-4	1.15-4	6.17-5	2.96-5
4338.1	2.39-4	2.03-4	1.53-4	9.79-5	5.24-5	2.52-5
5069.5	2.08-4	1.76-4	1.33-4	8.58-5	4.69-5	2.44-5
5852.6	1.83-4	1.55-4	1.17-4	7.63-5	4.29-5	2.44-5
6685.8	1.62-4	1.37-4	1.04-4	6.90-5	4.06-5	2.55-5
7570.0	1.38-4	1.18-4	9.08-5	6.22-5	4.02-5	3.02-5
8527.2	3.19-5	3.07-5	3.03-5	3.30-5	4.05-5	5.48-5
9566.4	6.60-6	7.18-6	8.52-6	1.13-5	1.58-5	2.25-5
10668.7	2.76-6	3.12-6	4.08-6	5.26-6	7.51-6	1.08-5
12131.0	1.27-6	1.46-6	1.86-6	2.50-6	3.60-6	5.20-6
13685.1	6.66-7	8.04-7	9.86-7	1.34-6	1.92-6	2.80-6

C1 – J10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	488.7	3.41-3	4.42-3	6.37-3	9.82-3	1.50-2	2.17-2
26	764.7	1.86-3	2.25-3	3.05-3	4.67-3	6.78-3	9.75-3
30	1101.6	1.09-3	1.18-3	1.41-3	1.88-3	2.70-3	3.79-3
34	1498.7	7.08-4	6.89-4	6.96-4	7.81-4	1.00-3	1.33-3
38	1954.4	5.11-4	4.60-4	4.00-4	3.56-4	3.66-4	4.31-4
42	2467.8	3.78-4	3.28-4	2.62-4	1.94-4	1.51-4	1.41-4
46	3073.2	9.15-6	9.34-6	9.76-6	1.23-5	1.56-5	2.01-5
50	3769.9	6.94-6	6.91-6	6.99-6	8.31-6	1.01-5	1.24-5
54	4550.5	3.02-4	2.44-4	1.74-4	1.10-4	6.55-5	4.75-5
58	5329.1	1.09-3	9.15-4	7.09-4	5.35-4	4.47-4	4.59-4
62	6169.3	1.01-3	8.68-4	7.11-4	5.94-4	5.59-4	6.27-4
66	7072.0	9.49-4	8.40-4	7.23-4	6.50-4	6.66-4	7.85-4
70	8037.4	9.04-4	8.20-4	7.37-4	7.02-4	7.60-4	9.22-4
74	9065.9	8.67-4	8.04-4	7.48-4	7.44-4	8.36-4	1.04-3
78	10157.9	8.35-4	7.87-4	7.53-4	7.74-4	8.94-4	1.12-3
82	11313.9	8.04-4	7.69-4	7.52-4	7.93-4	9.36-4	1.19-3
87	12849.3	7.66-4	7.44-4	7.44-4	8.04-4	9.66-4	1.25-3
92	14486.2	7.30-4	7.17-4	7.29-4	8.02-4	9.78-4	1.28-3

C1 – J11

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
516.6	3.19-3	3.66-3	4.61-3	6.42-3	9.33-3	1.32-2
798.9	2.16-3	2.49-3	3.18-3	4.57-3	6.52-3	9.29-3
1143.3	1.58-3	1.85-3	2.39-3	3.38-3	5.00-3	7.09-3
1551.8	1.22-3	1.45-3	1.89-3	2.71-3	4.04-3	5.73-3
2027.0	9.96-4	1.19-3	1.57-3	2.25-3	3.38-3	4.79-3
2571.6	8.92-4	1.07-3	1.41-3	2.02-3	3.04-3	4.30-3
3180.0	1.68-3	1.34-3	9.23-4	5.34-4	2.64-4	1.22-4
3834.7	1.40-3	1.13-3	7.93-4	4.83-4	2.69-4	1.68-4
4551.2	9.20-4	7.56-4	5.61-4	3.89-4	2.85-4	2.58-4
5377.4	4.16-3	4.57-3	5.32-3	6.58-3	8.49-3	1.11-2
6227.5	3.08-3	3.36-3	3.88-3	4.76-3	6.14-3	8.06-3
7140.8	1.89-3	2.01-3	2.27-3	2.74-3	3.51-3	4.60-3
8116.5	9.08-4	9.08-4	9.48-4	1.07-3	1.33-3	1.72-3
9154.2	4.45-4	3.90-4	3.33-4	3.01-4	3.15-4	3.80-4
10254.6	3.09-4	2.44-4	1.68-4	1.00-4	5.65-5	3.83-5
11418.5	2.81-4	2.22-4	1.53-4	8.97-5	4.83-5	3.00-5
12964.0	2.79-4	2.31-4	1.76-4	1.31-4	1.10-4	1.16-4
14611.2	2.80-4	2.41-4	1.98-4	1.69-4	1.68-4	2.00-4

C1 – J12

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	534.9	1.16-2	9.34-3	6.62-3	4.03-3	2.19-3	1.28-3
26	823.8	7.51-3	6.07-3	4.32-3	2.66-3	1.51-3	[illegible]
30	1173.4	5.15-3	4.16-3	2.95-3	1.82-3	1.03-3	6.52-4
34	1583.6	3.69-3	2.97-3	2.09-3	1.26-3	6.82-4	3.96-4
38	2054.7	2.74-3	2.19-3	1.52-3	8.92-4	4.45-4	2.15-4
42	2586.9	2.11-3	1.68-3	1.16-3	6.69-4	3.18-4	1.36-4
46	3188.5	1.07-3	1.29-3	1.71-3	2.42-3	3.59-3	5.02-3
50	3867.0	6.28-3	7.00-3	8.29-3	1.04-2	1.36-2	1.78-2
54	4590.8	5.16-3	5.70-3	6.66-3	8.27-3	1.07-2	1.39-2
58	5401.5	2.28-3	2.36-3	2.56-3	2.99-3	3.72-3	4.80-3
62	6250.3	2.77-3	2.95-3	3.32-3	3.99-3	5.06-3	6.60-3
66	7163.3	3.41-3	3.71-3	4.28-3	5.24-3	6.75-3	8.86-3
70	8142.7	3.90-3	4.31-3	5.03-3	6.23-3	8.09-3	1.07-2
74	9190.1	3.94-3	4.37-3	5.14-3	6.40-3	8.36-3	1.11-2
78	10306.3	3.70-3	4.11-3	4.85-3	6.07-3	7.95-3	1.06-2
82	11491.7	3.40-3	3.78-3	4.47-3	5.60-3	7.37-3	9.82-3
87	13072.2	3.04-3	3.38-3	4.01-3	5.04-3	6.66-3	8.95-3
92	14764.2	2.73-3	3.04-3	3.61-3	4.55-3	6.04-3	8.23-3

C1 – J13

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
539.4	5.21-3	4.43-3	3.55-3	2.90-3	2.73-3	3.02-3
831.2	5.58-3	5.41-3	5.42-3	5.86-3	6.99-3	8.70-3
1183.9	7.01-3	7.34-3	8.10-3	9.56-3	1.20-2	1.51-2
1597.7	7.87-3	8.49-3	9.67-3	1.17-2	1.48-2	1.88-2
2072.5	7.86-3	8.57-3	9.88-3	1.21-2	1.53-2	1.95-2
2608.9	7.29-3	7.98-3	9.23-3	1.13-2	1.44-2	1.83-2
3207.3	6.29-3	6.88-3	7.93-3	9.68-3	1.22-2	1.57-2
3881.1	4.43-4	4.99-4	6.24-4	8.68-4	1.31-3	1.89-3
4615.8	2.09-3	2.09-3	2.18-3	2.45-3	2.98-3	3.79-3
5420.7	6.56-5	7.14-5	8.18-5	9.87-5	1.20-4	1.57-4
6298.8	1.46-2	1.66-2	1.99-2	2.52-2	3.31-2	4.37-2
7222.2	1.29-2	1.46-2	1.75-2	2.22-2	2.91-2	3.86-2
8211.6	1.13-2	1.29-2	1.55-2	1.96-2	2.58-2	3.42-2
9268.0	1.01-2	1.14-2	1.37-2	1.74-2	2.30-2	3.05-2
10392.3	8.97-3	1.02-2	1.22-2	1.55-2	2.06-2	2.74-2
11585.6	8.03-3	9.11-3	1.10-2	1.40-2	1.85-2	2.48-2
13175.9	7.05-3	8.00-3	9.64-3	1.23-2	1.64-2	2.21-2
14878.1	6.22-3	7.06-3	8.52-3	1.09-2	1.46-2	1.99-2

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - J14

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	542.7	5.97-3	5.60-3	5.38-3	5.63-3	6.59-3	8.19-3
26	837.4	3.34-3	2.91-3	2.47-3	2.22-3	2.32-3	2.75-3
30	1193.3	5.17-3	5.05-3	5.08-3	5.51-3	6.54-3	8.05-3
34	1610.7	4.01-3	3.82-3	3.71-3	3.87-3	4.45-3	5.39-3
38	2089.5	2.95-3	2.72-3	2.52-3	2.48-3	2.73-3	3.24-3
42	2629.3	2.35-3	2.15-3	1.96-3	1.90-3	2.06-3	2.44-3
46	3230.2	2.06-3	1.91-3	1.79-3	1.79-3	2.00-3	2.42-3
50	3892.2	1.95-3	1.87-3	1.83-3	1.93-3	2.23-3	2.76-3
54	4643.2	1.20-2	1.39-2	1.70-2	2.20-2	2.96-2	3.92-2
58	5440.4	1.65-2	1.88-2	2.26-2	2.87-2	3.76-2	4.96-2
62	6385.3	7.91-6	7.10-6	6.44-6	5.84-6	7.52-6	6.81-6
66	7448.2	2.88-5	2.71-5	2.62-5	2.70-5	3.04-5	4.18-5
70	8596.3	1.17-4	1.15-4	1.18-4	1.36-4	1.76-4	2.53-4
74	9834.7	1.26-4	1.25-4	1.31-4	1.54-4	2.07-4	2.97-4
78	11184.4	1.16-4	1.16-4	1.21-4	1.44-4	1.95-4	2.80-4
82	12657.7	1.06-4	1.05-4	1.10-4	1.31-4	1.77-4	2.55-4
87	14692.1	9.51-5	9.40-5	9.79-5	1.15-4	1.56-4	2.25-4
92	16968.6	8.60-5	8.47-5	8.75-5	1.02-4	1.37-4	2.00-4

C1 - J15

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
544.4	1.22-2	1 28-2	1.42-2	1.70-2	2.15-2	2.74-2
838.1	1.59-2	1.72-2	1.98-2	2.42-2	3.08-2	3.94-2
1196.3	1.69-2	1.87-2	2.19-2	2.72-2	3.50-2	4.46-2
1618.1	2.38-2	2.68-2	3.21-2	4.02-2	5.20-2	6.63-2
2101.4	2.81-2	3.19-2	3.83-2	4.82-2	6.24-2	7.98-2
2645.4	2.75-2	3.12-2	3.75-2	4.73-2	6.12-2	7.87-2
3250.6	2.48-2	2.81-2	3.37-2	4.26-2	5.51-2	7.12-2
3918.2	2.16-2	2.44-2	2.92-2	3.67-2	4.75-2	6.17-2
4656.4	7.32-3	8.06-3	9.29-3	1.12-2	1.37-2	1.76-2
5506.0	3.81-4	3.69-4	3.60-4	3.63-4	3.43-4	4.54-4
6446.4	2.12-4	2.06-4	2.07-4	2.26-4	2.71-4	3.83-4
7483.5	1.48-4	1 47-4	1.54-4	1.80-4	2.32-4	3.43-4
8644.9	3.48-5	3.57-5	3.99-5	5.08-5	7.14-5	1.07-4
9942.7	7.54-6	8.20-6	9.84-6	1.35-5	2.01-5	3.04-5
11376.1	3.35-6	3.73-6	4.62-6	6.51-6	9.93-6	1.51-5
12956.8	2.02-6	2.26-6	2.81-6	3.98-6	6.12-6	9.29-6
15165.1	1.28-6	1.42-6	1.75-6	2.45-6	3.78-6	5.78-6
17669.0	8.89-7	9.66-7	1.16-6	1.60-6	2.46-6	3.85-6

C1 - J16

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	551.0	1.12-1	1.27-1	1.54-1	1.96-1	2.57-1	3.32-1
26	848.7	7.36-2	8.35-2	1.01-1	1.27-1	1.65-1	2.12-1
30	1210.4	4.77-2	5.41-2	6.49-2	8.16-2	1.06-1	1.35-1
34	1638.5	2.76-2	3.12-2	3.73-2	4.67-2	6.04-2	7.71-2
38	2136.4	1.45-2	1.62-2	1.91-2	2.39-2	3.08-2	3.93-2
42	2707.8	8.03-3	8.88-3	1.04-2	1.29-2	1.65-2	2.12-2
46	3355.9	5.02-3	5.49-3	6.35-3	7.80-3	9.98-3	1.29-2
50	4084.8	3.46-3	3.74-3	4.28-3	5.22-3	6.66-3	8.64-3
54	4899.1	2.54-3	2.73-3	3.10-3	3.75-3	4.79-3	6.23-3
58	5804.2	1.96-3	2.09-3	2.35-3	2.84-3	3.62-3	4.74-3
62	6806.6	1.56-3	1.66-3	1.86-3	2.23-3	2.84-3	3.73-3
66	7913.8	1.27-3	1.35-3	1.50-3	1.80-3	2.30-3	3.03-3
70	9134.5	1.06-3	1.12-3	1.24-3	1.49-3	1.90-3	2.50-3
74	10479.0	8.92-4	9.39-4	1.04-3	1.25-3	1.59-3	2.10-3
78	11959.5	7.59-4	7.99-4	8.85-4	1.06-3	1.35-3	1.79-3
82	13590.5	6.52-4	6.85-4	7.58-4	9.05-4	1.16-3	1.55-3
87	15867.5	5.43-4	5.70-4	6.31-4	7.53-4	9.73-4	1.31-3
92	18449.0	4.55-4	4.78-4	5.29-4	6.32-4	8.21-4	1.12-3

C1 - J17

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
572.9	9.07-2	1.03-1	1.25-1	1.59-1	2.10-1	2.74-1
872.9	6.20-2	7.00-2	8.41-2	1.06-1	1.39-1	1.81-1
1236.6	3.81-2	4.27-2	5.08-2	6.38-2	8.29-2	1.07-1
1666.8	2.37-2	2.63-2	3.10-2	3.85-2	4.98-2	6.39-2
2167.2	1.71-2	1.89-2	2.22-2	2.76-2	3.56-2	4.57-2
2741.2	1.52-2	1.70-2	2.00-2	2.50-2	3.24-2	4.18-2
3392.1	1.43-2	1.61-2	1.91-2	2.40-2	3.12-2	4.06-2
4123.6	1.27-2	1.43-2	1.70-2	2.15-2	2.80-2	3.66-2
4940.4	1.08-2	1.22-2	1.45-2	1.84-2	2.39-2	3.15-2
5848.0	9.10-3	1.03-2	1.22-2	1.55-2	2.02-2	2.68-2
6852.7	7.66-3	8.63-3	1.03-2	1.30-2	1.71-2	2.27-2
7962.1	6.47-3	7.29-3	8.71-3	1.10-2	1.45-2	1.93-2
9184.9	5.48-3	6.17-3	7.37-3	9.34-3	1.23-2	1.65-2
10531.4	4.65-3	5.23-3	6.26-3	7.94-3	1.05-2	1.41-2
12013.7	3.95-3	4.45-3	5.32-3	6.75-3	8.98-3	1.21-2
13646.3	3.36-3	3.78-3	4.52-3	5.75-3	7.68-3	1.04-2
15924.9	2.74-3	3.08-3	3.69-3	4.70-3	6.31-3	8.60-3
18507.5	2.22-3	2.50-3	3.00-3	3.83-3	5.17-3	7.16-3

C1 - J18

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	574.4	6.79-3	6.87-3	7.33-3	8.54-3	1.07-2	1.38-2
26	874.9	1.34-2	1.48-2	1.74-2	2.17-2	2.81-2	3.64-2
30	1239.4	1.82-2	2.05-2	2.45-2	3.08-2	4.00-2	5.15-2
34	1670.6	1.75-2	1.98-2	2.36-2	2.97-2	3.86-2	4.94-2
38	2171.6	1.34-2	1.50-2	1.79-2	2.24-2	2.90-2	3.71-2
42	2746.3	8.14-3	8.97-3	1.05-2	1.29-2	1.66-2	2.12-2
46	3399.0	4.07-3	4.30-3	4.79-3	5.69-3	7.12-3	9.08-3
50	4134.1	2.10-3	2.08-3	2.12-3	2.33-3	2.77-3	3.47-3
54	4956.5	1.28-3	1.18-3	1.09-3	1.06-3	1.16-3	1.40-3
58	5872.0	8.95-4	7.83-4	6.56-4	5.63-4	5.44-4	6.14-4
62	6887.1	6.81-4	5.76-4	4.51-4	3.44-4	2.88-4	2.94-4
66	8009.9	5.45-4	4.52-4	3.38-4	2.35-4	1.70-4	1.52-4
70	9249.5	4.50-4	3.68-4	2.68-4	1.74-4	1.11-4	8.52-5
74	10616.5	3.77-4	3.07-4	2.20-4	1.38-4	7.94-5	5.20-5
78	12123.8	3.20-4	2.60-4	1.85-4	1.13-4	6.08-5	3.47-5
82	13786.3	2.74-4	2.22-4	1.58-4	9.50-5	4.91-5	2.52-5
87	16110.3	2.26-4	1.84-4	1.31-4	7.81-5	3.93-5	1.86-5
92	18748.5	1.87-4	1.52-4	1.09-4	6.51-5	3.24-5	1.48-5

C1 - J19

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
629.8	3.21-3	3.44-3	4.11-3	5.67-3	8.58-3	1.29-2
944.7	2.54-3	2.80-3	3.44-3	4.78-3	7.23-3	1.07-2
1325.4	2.08-3	2.34-3	2.92-3	4.09-3	6.15-3	9.00-3
1774.0	1.75-3	1.99-3	2.51-3	3.53-3	5.28-3	7.66-3
2293.0	1.50-3	1.71-3	2.17-3	3.06-3	4.56-3	6.60-3
2885.6	1.29-3	1.48-3	1.88-3	2.65-3	3.94-3	5.73-3
3555.5	1.11-3	1.28-3	1.62-3	2.29-3	3.40-3	4.98-3
4306.7	9.52-4	1.10-3	1.40-3	1.97-3	2.92-3	4.31-3
5144.4	8.14-4	9.36-4	1.19-3	1.68-3	2.50-3	3.71-3
6074.2	6.93-4	7.95-4	1.01-3	1.42-3	2.13-3	3.18-3
7102.8	5.87-4	6.72-4	8.51-4	1.20-3	1.80-3	2.70-3
8238.0	4.96-4	5.65-4	7.12-4	1.00-3	1.51-3	2.28-3
9488.9	4.17-4	4.72-4	5.92-4	8.33-4	1.26-3	1.90-3
10866.2	3.50-4	3.92-4	4.89-4	6.86-4	1.04-3	1.58-3
12382.5	2.93-4	3.25-4	4.01-4	5.60-4	8.53-4	1.29-3
14053.1	2.46-4	2.69-4	3.27-4	4.54-4	6.92-4	1.05-3
16386.0	1.98-4	2.12-4	2.52-4	3.44-4	5.25-4	8.07-4
19032.9	1.62-4	1.69-4	1.93-4	2.57-4	3.89-4	6.16-4

C1 - K1

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	413.2	4.06-5	3.50-5	2.72-5	1.83-5	1.02-5	4.96-6
26	666.4	2.19-5	1.87-5	1.44-5	9.46-6	5.21-6	2.52-6
30	973.8	1.06-5	8.97-6	6.76-6	4.38-6	2.40-6	1.20-6
34	1332.2	5.13-6	4.27-6	3.16-6	2.03-6	1.13-6	6.07-7
38	1738.6	2.74-6	2.26-6	1.65-6	1.06-6	6.06-7	3.58-7
42	2189.6	1.59-6	1.30-6	9.48-7	6.08-7	3.61-7	2.31-7
46	2680.9	9.77-7	7.95-7	5.76-7	3.71-7	2.27-7	1.55-7
50	3207.7	6.18-7	5.01-7	3.62-7	2.35-7	1.48-7	1.05-7
54	3764.2	3.99-7	3.23-7	2.34-7	1.52-7	9.77-8	7.25-8
58	4343.9	2.63-7	2.12-7	1.53-7	1.00-7	6.56-8	5.02-8
62	4938.7	1.76-7	1.42-7	1.02-7	6.71-8	4.46-8	3.50-8
66	5539.6	1.19-7	9.58-8	6.90-8	4.55-8	3.06-8	2.46-8
70	6135.7	8.17-8	6.57-8	4.73-8	3.13-8	2.13-8	1.74-8
74	6714.2	5.69-8	4.57-8	3.28-8	2.17-8	1.49-8	1.24-8
78	7259.9	4.02-8	3.22-8	2.31-8	1.53-8	1.06-8	8.97-9
82	7754.5	2.88-8	2.30-8	1.64-8	1.09-8	7.58-9	6.52-9
87	8267.0	1.93-8	1.53-8	1.09-8	7.21-9	5.06-9	4.43-9
92	8610.7	1.32-8	1.04-8	7.38-9	4.86-9	3.42-9	3.05-9

C1 - K2

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
416.8	1.09-5	8.51-6	5.74-6	3.27-6	1.62-6	7.99-7
670.7	8.67-6	7.02-6	5.02-6	3.10-6	1.68-6	9.04-7
979.6	7.84-6	6.53-6	4.85-6	3.11-6	1.73-6	9.21-7
1341.9	6.18-6	5.20-6	3.90-6	2.53-6	1.40-6	7.31-7
1755.1	4.27-6	3.60-6	2.70-6	1.75-6	9.68-7	4.99-7
2216.4	2.80-6	2.36-6	1.77-6	1.14-6	6.30-7	3.25-7
2722.5	1.81-6	1.52-6	1.14-6	7.32-7	4.04-7	2.09-7
3269.6	1.16-6	9.74-7	7.28-7	4.68-7	2.59-7	1.34-7
3853.1	7.48-7	6.27-7	4.68-7	3.01-7	1.66-7	8.68-8
4468.0	4.85-7	4.06-7	3.03-7	1.94-7	1.08-7	5.66-8
5108.0	3.17-7	2.65-7	1.98-7	1.27-7	7.03-8	3.72-8
5766.2	2.09-7	1.75-7	1.30-7	8.35-8	4.64-8	2.47-8
6434.1	1.39-7	1.17-7	8.66-8	5.56-8	3.09-8	1.66-8
7101.8	9.38-8	7.83-8	5.82-8	3.74-8	2.08-8	1.12-8
7757.5	6.37-8	5.32-8	3.95-8	2.54-8	1.41-8	7.64-9
8387.0	4.37-8	3.65-8	2.71-8	1.74-8	9.69-9	5.26-9
9110.6	2.77-8	2.30-8	1.71-8	1.10-8	6.12-9	3.33-9
9723.8	1.78-8	1.48-8	1.09-8	7.03-9	3.92-9	2.14-9

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - K3

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	421.1	1.19-5	9.32-6	6.35-6	3.64-6	1.75-6	7.56-7
26	681.3	9.62-6	7.82-6	5.58-6	3.39-6	1.72-6	7.80-7
30	1001.6	7.98-6	6.60-6	4.83-6	3.01-6	1.56-6	7.19-7
34	1381.9	6.75-6	5.65-6	4.18-6	2.64-6	1.39-6	6.43-7
38	1818.4	2.34-6	1.98-6	1.57-6	1.22-6	1.02-6	9.52-7
42	2309.2	1.75-6	1.49-6	1.18-6	9.20-7	7.63-7	7.15-7
46	2855.8	1.34-6	1.14-6	9.11-7	7.09-7	5.87-7	5.50-7
50	3457.1	1.04-6	8.86-7	7.09-7	5.53-7	4.57-7	4.28-7
54	4111.7	8.08-7	6.93-7	5.56-7	4.33-7	3.57-7	3.35-7
58	4818.3	6.34-7	5.45-7	4.38-7	3.41-7	2.81-7	2.63-7
62	5575.1	5.01-7	4.31-7	3.46-7	2.69-7	2.21-7	2.07-7
66	6379.9	3.98-7	3.43-7	2.75-7	2.14-7	1.74-7	1.63-7
70	7230.4	3.17-7	2.73-7	2.19-7	1.69-7	1.37-7	1.28-7
74	8123.5	2.54-7	2.19-7	1.75-7	1.35-7	1.08-7	1.01-7
78	9055.8	2.04-7	1.76-7	1.40-7	1.07-7	8.57-8	7.94-8
82	10022.9	1.64-7	1.41-7	1.13-7	8.55-8	6.76-8	6.23-8
87	11272.3	1.26-7	1.08-7	8.56-8	6.44-8	5.03-8	4.60-8
92	12554.1	9.59-8	8.21-8	6.49-8	4.84-8	3.73-8	3.39-8

C1 - K4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	428.4	1.09-5	8.99-6	6.91-6	5.28-6	4.44-6	4.26-6
26	688.6	6.66-6	5.54-6	4.32-6	3.36-6	2.87-6	2.77-6
30	1007.4	4.37-6	3.66-6	2.87-6	2.24-6	1.92-6	1.85-6
34	1384.2	3.03-6	2.55-6	2.01-6	1.57-6	1.34-6	1.29-6
38	1822.2	5.74-6	4.83-6	3.60-6	2.28-6	1.21-6	5.60-7
42	2322.5	5.26-6	4.44-6	3.33-6	2.12-6	1.12-6	5.22-7
46	2883.0	5.13-6	4.35-6	3.27-6	2.09-6	1.11-6	5.13-7
50	3503.5	5.49-6	4.65-6	3.50-6	2.23-6	1.18-6	5.48-7
54	4184.0	6.64-6	5.63-6	4.23-6	2.70-6	1.43-6	6.60-7
58	4924.4	9.69-6	8.21-6	6.17-6	3.93-6	2.07-6	9.54-7
62	5723.9	1.96-5	1.66-5	1.24-5	7.91-6	4.16-6	1.91-6
66	6576.5	7.26-5	6.14-5	4.60-5	2.92-5	1.53-5	6.99-6
70	7462.7	1.83-4	1.55-4	1.16-4	7.34-5	3.84-5	1.75-5
74	8383.3	1.92-4	1.62-4	1.21-4	7.67-5	4.00-5	1.82-5
78	9343.2	1.81-4	1.53-4	1.14-4	7.25-5	3.78-5	1.72-5
82	10340.0	1.70-4	1.43-4	1.07-4	6.79-5	3.54-5	1.60-5
87	11631.5	1.58-4	1.33-4	9.93-5	6.29-5	3.28-5	1.48-5
92	12962.4	1.48-4	1.25-4	9.29-5	5.88-5	3.07-5	1.38-5

C1 - K5

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	432.4	3.54-6	2.79-6	1.93-6	1.15-6	6.25-7	3.64-7
26	694.7	3.44-6	2.81-6	2.04-6	1.31-6	7.78-7	4.95-7
30	1016.8	3.37-6	2.81-6	2.10-6	1.39-6	8.55-7	5.60-7
34	1398.9	3.20-6	2.69-6	2.04-6	1.37-6	8.52-7	5.61-7
38	1840.9	3.00-6	2.54-6	1.94-6	1.31-6	8.16-7	5.34-7
42	2343.0	2.87-6	2.44-6	1.87-6	1.26-6	7.81-7	5.04-7
46	2905.1	2.88-6	2.45-6	1.88-6	1.27-6	7.72-7	4.85-7
50	3527.3	3.14-6	2.68-6	2.05-6	1.37-6	8.16-7	4.91-7
54	4209.6	3.92-6	3.34-6	2.55-6	1.68-6	9.70-7	5.48-7
58	4951.7	6.15-6	5.24-6	3.97-6	2.58-6	1.43-6	7.48-7
62	5752.8	1.49-5	1.26-5	9.52-6	6.10-6	3.27-6	1.57-6
66	6606.3	8.99-5	7.60-5	5.69-5	3.62-5	1.90-5	8.68-6
70	7518.9	2.78-5	2.34-5	1.75-5	1.11-5	5.80-6	2.64-6
74	8498.8	6.19-6	5.21-6	3.89-6	2.46-6	1.28-6	5.82-7
78	9540.7	2.13-6	1.81-6	1.35-6	8.50-7	4.42-7	2.00-7
82	10643.1	9.54-7	8.00-7	5.95-7	3.75-7	1.95-7	8.81-8
87	12105.0	4.20-7	3.51-7	2.60-7	1.64-7	8.49-8	3.84-8
92	13658.6	2.11-7	1.76-7	1.30-7	8.17-8	4.23-8	1.91-8

C1 - K6

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	480.9	2.75-3	2.36-3	1.82-3	1.20-3	6.53-4	3.08-4
26	753.1	1.78-3	1.52-3	1.17-3	7.62-4	4.11-4	1.92-4
30	1084.3	1.25-3	1.07-3	8.15-4	5.28-4	2.82-4	1.31-4
34	1474.0	9.32-4	7.95-4	6.04-4	3.89-4	2.07-4	9.57-5
38	1921.7	7.25-4	6.17-4	4.67-4	3.00-4	1.59-4	7.31-5
42	2426.7	5.82-4	4.95-4	3.73-4	2.39-4	1.26-4	5.80-5
46	2988.2	4.79-4	4.07-4	3.06-4	1.95-4	1.03-4	4.72-5
50	3605.2	4.02-4	3.40-4	2.56-4	1.63-4	8.57-5	3.93-5
54	4276.8	3.41-4	2.89-4	2.17-4	1.38-4	7.24-5	3.31-5
58	5002.1	2.91-4	2.46-4	1.84-4	1.17-4	6.14-5	2.81-5
62	5781.5	2.36-4	2.00-4	1.50-4	9.48-5	4.97-5	2.27-5
66	6625.5	7.94-5	6.71-5	5.01-5	3.17-5	1.66-5	7.58-6
70	7544.7	8.05-6	6.77-6	5.05-6	3.20-6	1.70-6	8.18-7
74	8527.5	2.02-6	1.70-6	1.27-6	8.15-7	4.53-7	2.49-7
78	9571.0	7.99-7	6.71-7	5.04-7	3.31-7	1.98-7	1.27-7
82	10674.5	3.95-7	3.32-7	2.51-7	1.70-7	1.11-7	8.19-8
87	12137.4	1.95-7	1.64-7	1.26-7	8.95-8	6.40-8	5.42-8
92	13691.5	1.08-7	9.17-8	7.14-8	5.27-8	4.09-8	3.81-8

C1 - K7

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	536.1	1.52-2	1.22-2	8.48-3	4.92-3	2.36-3	9.91-4
26	825.8	8.73-3	6.96-3	4.80-3	2.76-3	1.31-3	5.44-4
30	1176.0	5.36-3	4.25-3	2.91-3	1.66-3	7.77-4	3.21-4
34	1587.0	3.55-3	2.80-3	1.91-3	1.08-3	5.04-4	2.11-4
38	2058.8	2.49-3	1.96-3	1.33-3	7.52-4	3.54-4	1.55-4
42	2591.6	1.83-3	1.44-3	9.73-4	5.52-4	2.67-4	1.27-4
46	3185.4	1.39-3	1.09-3	7.40-4	4.25-4	2.14-4	1.12-4
50	3840.6	1.09-3	8.57-4	5.84-4	3.40-4	1.79-4	1.04-4
54	4557.2	8.81-4	6.94-4	4.75-4	2.81-4	1.55-4	9.78-5
58	5335.7	7.31-4	5.77-4	3.97-4	2.38-4	1.37-4	9.23-5
62	6176.1	6.20-4	4.90-4	3.38-4	2.06-4	1.22-4	8.69-5
66	7078.9	5.34-4	4.23-4	2.94-4	1.81-4	1.10-4	8.16-5
70	8044.5	4.68-4	3.71-4	2.58-4	1.61-4	1.00-4	7.65-5
74	9073.1	4.14-4	3.29-4	2.30-4	1.44-4	9.15-5	7.17-5
78	10165.2	3.70-4	2.94-4	2.06-4	1.30-4	8.39-5	6.71-5
82	11321.1	3.34-4	2.66-4	1.87-4	1.19-4	7.73-5	6.29-5
87	12856.6	2.97-4	2.37-4	1.67-4	1.06-4	7.01-5	5.82-5
92	14493.6	2.67-4	2.13-4	1.50-4	9.62-5	6.40-5	5.39-5

C1 - K8

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	538.2	7.23-3	5.75-3	3.99-3	2.37-3	1.28-3	7.56-4
26	828.9	5.09-3	4.09-3	2.90-3	1.82-3	1.11-3	7.84-4
30	1180.6	3.65-3	2.95-3	2.14-3	1.42-3	9.53-4	7.50-4
34	1593.0	2.72-3	2.21-3	1.63-3	1.11-3	7.91-4	6.58-4
38	2066.7	2.13-3	1.74-3	1.29-3	8.95-4	6.52-4	5.57-4
42	2601.8	1.74-3	1.42-3	1.06-3	7.38-4	5.42-4	4.67-4
46	3199.0	1.46-3	1.19-3	8.86-4	6.20-4	4.56-4	3.94-4
50	3858.7	1.25-3	1.02-3	7.57-4	5.30-4	3.90-4	3.38-4
54	4581.5	1.08-3	8.81-4	6.55-4	4.61-4	3.41-4	2.99-4
58	5368.0	9.37-4	7.70-4	5.77-4	4.10-4	3.09-4	2.76-4
62	6218.7	8.25-4	6.83-4	5.19-4	3.79-4	2.98-4	2.75-4
66	7133.9	7.30-4	6.15-4	4.84-4	3.77-4	3.21-4	3.17-4
70	8112.3	6.17-4	5.42-4	4.62-4	4.06-4	3.94-4	4.24-4
74	9150.3	4.85-4	4.38-4	3.91-4	3.67-4	3.80-4	4.25-4
78	10249.5	4.11-4	3.70-4	3.31-4	3.12-4	3.26-4	3.69-4
82	11412.2	3.63-4	3.26-4	2.91-4	2.73-4	2.86-4	3.26-4
87	12956.1	3.20-4	2.86-4	2.54-4	2.38-4	2.50-4	2.88-4
92	14601.9	2.86-4	2.56-4	2.26-4	2.12-4	2.22-4	2.59-4

C1 - K9

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	542.4	5.66-3	4.62-3	3.43-3	2.43-3	1.85-3	1.66-3
26	836.2	4.41-3	3.81-3	3.15-3	2.66-3	2.45-3	2.47-3
30	1192.0	2.85-3	2.23-3	1.50-3	8.54-4	4.30-4	2.33-4
34	1609.7	1.93-3	1.55-3	1.10-3	7.22-4	4.94-4	4.06-4
38	2088.3	1.51-3	1.28-3	1.04-3	8.53-4	7.77-4	7.86-4
42	2627.4	1.24-3	1.08-3	9.16-4	8.08-4	7.84-4	8.22-4
46	3227.3	1.04-3	9.12-4	7.86-4	7.07-4	6.98-4	7.42-4
50	3888.2	8.77-4	7.73-4	6.68-4	6.03-4	5.98-4	6.39-4
54	4610.4	7.50-4	6.60-4	5.68-4	5.10-4	5.04-4	5.42-4
58	5394.5	6.47-4	5.66-4	4.82-4	4.28-4	4.20-4	4.51-4
62	6240.8	5.61-4	4.85-4	4.05-4	3.50-4	3.37-4	3.60-4
66	7150.2	4.92-4	4.14-4	3.29-4	2.64-4	2.37-4	2.45-4
70	8125.2	4.67-4	3.71-4	2.59-4	1.61-4	1.00-4	7.65-5
74	9170.6	4.84-4	3.78-4	2.53-4	1.39-4	6.31-5	2.55-5
78	10286.3	4.60-4	3.63-4	2.47-4	[illegible]	7.34-5	4.04-5
82	11471.3	4.24-4	3.36-4	2.32-4	1.39-4	7.69-5	4.89-5
87	13031.1	3.79-4	3.02-4	2.11-4	[illegible]	7.53-5	5.22-5
92	14742.4	3.39-4	2.71-4	1.90-4	1.18-4	7.13-5	5.21-5

C1 - K10

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	543.0	4.81-3	4.01-3	3.13-3	2.45-3	2.14-3	2.12-3
26	836.4	3.37-3	2.63-3	1.77-3	1.02-3	5.56-4	3.54-4
30	1192.7	3.15-3	2.82-3	2.47-3	2.26-3	2.24-3	2.34-3
34	1611.3	2.71-3	2.41-3	2.10-3	1.89-3	1.84-3	1.91-3
38	2092.3	2.10-3	1.82-3	1.51-3	1.28-3	1.18-3	1.19-3
42	2634.9	1.59-3	1.36-3	1.11-3	9.11-4	8.18-4	8.16-4
46	3239.4	1.23-3	1.05-3	8.46-4	6.89-4	6.15-4	6.16-4
50	3906.1	9.79-4	8.31-4	6.70-4	5.45-4	4.90-4	4.95-4
54	4635.7	7.99-4	6.78-4	5.47-4	4.47-4	4.05-4	4.14-4
58	5428.9	6.66-4	5.66-4	4.57-4	3.76-4	3.45-4	3.56-4
62	6286.5	5.66-4	4.81-4	3.90-4	3.23-4	2.99-4	3.12-4
66	7209.3	4.87-4	4.15-4	3.37-4	2.81-4	2.62-4	2.77-4
70	8198.1	4.25-4	3.62-4	2.95-4	2.47-4	2.33-4	2.49-4
74	9253.9	3.75-4	3.19-4	2.61-4	2.20-4	2.09-4	2.26-4
78	10377.6	3.33-4	2.84-4	2.33-4	1.97-4	1.89-4	2.06-4
82	11570.3	2.98-4	2.55-4	2.09-4	1.78-4	1.72-4	1.90-4
87	13159.9	2.62-4	2.24-4	1.84-4	1.58-4	1.54-4	1.72-4
92	14861.3	2.32-4	1.99-4	1.64-4	1.41-4	1.39-4	1.58-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - K11

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	545.9	4.83-3	4.41-3	4.06-3	3.97-3	4.17-3	4.52-3
26	842.7	3.64-3	3.31-3	3.01-3	2.89-3	2.98-3	3.19-3
30	1205.0	2.90-3	2.56-3	2.21-3	1.97-3	1.92-3	1.99-3
34	1635.2	2.35-3	2.02-3	1.66-3	1.39-3	1.26-3	1.26-3
38	2136.1	1.91-3	1.62-3	1.29-3	1.02-3	8.80-4	8.51-4
42	2710.7	1.56-3	1.31-3	1.03-3	7.87-4	6.52-4	6.15-4
46	3362.8	1.28-3	1.07-3	8.30-4	6.24-4	5.04-4	4.69-4
50	4096.7	1.05-3	8.78-4	6.77-4	5.04-4	4.01-4	3.71-4
54	4917.2	8.55-4	7.13-4	5.49-4	4.07-4	3.23-4	2.99-4
58	5829.3	6.57-4	5.47-4	4.17-4	3.05-4	2.39-4	2.20-4
62	6836.6	5.14-4	4.18-4	3.02-4	1.98-4	1.31-4	1.03-4
66	7946.2	4.48-4	3.60-4	2.52-4	1.53-4	8.54-5	5.40-5
70	9168.7	3.93-4	3.15-4	2.19-4	1.29-4	6.68-5	3.64-5
74	10514.7	3.44-4	2.76-4	1.92-4	1.12-4	5.57-5	2.77-5
78	11996.5	3.02-4	2.42-4	1.69-4	9.81-5	4.79-5	2.25-5
82	13628.5	2.65-4	2.13-4	1.49-4	8.67-5	4.20-5	1.89-5
87	15906.6	2.25-4	1.82-4	1.28-4	7.48-5	3.61-5	1.59-5
92	18488.7	1.92-4	1.56-4	1.10-4	6.49-5	3.14-5	1.36-5

C1 - K12

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
571.3	6.30-3	5.27-3	4.06-3	3.01-3	2.38-3	2.15-3
871.2	4.27-3	3.54-3	2.67-3	1.91-3	1.44-3	1.26-3
1234.4	3.02-3	2.46-3	1.81-3	1.23-3	8.61-4	7.07-4
1663.8	2.20-3	1.77-3	1.27-3	8.17-4	5.27-4	3.99-4
2162.7	1.69-3	1.35-3	9.47-4	5.86-4	3.50-4	2.43-4
2734.7	1.37-3	1.09-3	7.54-4	4.53-4	2.52-4	1.59-4
3383.7	1.14-3	9.03-4	6.21-4	3.63-4	1.89-4	1.05-4
4113.8	9.66-4	7.65-4	5.23-4	2.99-4	1.43-4	6.95-5
4929.8	8.43-4	6.67-4	4.54-4	2.56-4	1.18-4	4.84-5
5838.0	7.80-4	6.22-4	4.30-4	2.51-4	1.25-4	6.18-5
6847.9	7.11-4	5.79-4	4.20-4	2.73-4	1.74-4	1.30-4
7967.8	6.02-4	4.96-4	3.67-4	2.50-4	1.73-4	1.42-4
9205.0	5.12-4	4.23-4	3.16-4	2.18-4	1.55-4	1.31-4
10570.0	4.39-4	3.64-4	2.73-4	1.90-4	1.36-4	1.16-4
12075.4	3.78-4	3.14-4	2.36-4	1.65-4	1.19-4	1.03-4
13736.0	3.26-4	2.72-4	2.05-4	1.44-4	1.04-4	9.04-5
16058.0	2.72-4	2.27-4	1.72-4	1.21-4	8.81-5	7.70-5
18694.3	2.26-4	1.90-4	1.45-4	1.02-4	7.44-5	6.56-5

C1 - K13

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	574.4	3.82-3	2.90-3	1.84-3	9.20-4	3.51-4	1.11-4
26	874.7	2.63-3	2.00-3	1.27-3	6.39-4	2.49-4	8.24-5
30	1239.0	2.02-3	1.55-3	9.94-4	5.14-4	2.12-4	8.11-5
34	1669.9	1.69-3	1.31-3	8.60-4	4.68-4	2.17-4	1.05-4
38	2171.1	1.44-3	1.13-3	7.71-4	4.49-4	2.42-4	1.47-4
42	2746.2	1.23-3	9.78-4	6.86-4	4.29-4	2.65-4	1.94-4
46	3399.1	1.04-3	8.40-4	6.06-4	4.02-4	2.75-4	2.24-4
50	4134.2	8.81-4	7.21-4	5.33-4	3.70-4	2.71-4	2.35-4
54	4956.5	7.52-4	6.21-4	4.68-4	3.36-4	2.57-4	2.32-4
58	5871.7	6.45-4	5.36-4	4.10-4	3.01-4	2.38-4	2.21-4
62	6886.5	5.55-4	4.64-4	3.58-4	2.68-4	2.16-4	2.05-4
66	8009.0	4.80-4	4.03-4	3.14-4	2.37-4	1.94-4	1.87-4
70	9248.2	4.15-4	3.51-4	2.75-4	2.09-4	1.74-4	1.69-4
74	10614.9	3.60-4	3.05-4	2.40-4	1.85-4	1.55-4	1.52-4
78	12121.9	3.13-4	2.66-4	2.10-4	1.63-4	1.37-4	1.36-4
82	13784.1	2.72-4	2.32-4	1.84-4	1.43-4	1.22-4	1.22-4
87	16107.7	2.28-4	1.95-4	1.56-4	1.22-4	1.04-4	1.06-4
92	18745.5	1.90-4	1.63-4	1.31-4	1.03-4	6.91-5	9.16-5

C1 - L1

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
416.2	1.07-5	7.96-6	4.90-6	2.44-6	1.05-6	5.13-7
670.5	6.41-6	4.81-6	3.04-6	1.62-6	8.21-7	5.20-7
980.0	4.07-6	3.09-6	2.01-6	1.15-6	6.61-7	4.85-7
1342.6	2.67-6	2.04-6	1.36-6	8.16-7	5.13-7	4.09-7
1756.0	1.77-6	1.37-6	9.27-7	5.75-7	3.83-7	3.19-7
2217.3	1.18-6	9.17-7	6.29-7	4.00-7	2.76-7	2.37-7
2723.3	7.87-7	6.14-7	4.25-7	2.75-7	1.94-7	1.70-7
3270.3	5.25-7	4.10-7	2.85-7	1.87-7	1.34-7	[illegible]20-7
3853.7	3.50-7	2.74-7	1.91-7	1.26-7	9.14-8	8.26-8
4468.4	2.34-7	1.83-7	1.28-7	8.46-8	6.18-8	5.64-8
5108.4	1.56-7	1.22-7	8.56-8	5.67-8	4.16-8	3.83-8
5766.4	1.05-7	8.21-8	5.73-8	3.79-8	2.79-8	[illegible]58-8
6434.2	7.06-8	5.52-8	3.85-8	2.54-8	1.87-8	[illegible].74-8
7101.8	4.78-8	3.73-8	2.59-8	1.71-8	1.25-8	1.17-8
7757.4	3.25-8	2.53-8	1.75-8	1.15-8	8.41-9	7.88-9
8386.7	2.21-8	1.72-8	1.19-8	7.71-9	5.63-9	5.29-9
9110.1	1.38-8	1.07-8	7.32-9	4.71-9	3.41-9	3.21-9
9723.1	8.64-9	6.65-9	4.52-9	2.88-9	2.06-9	1.94-9

C1 - L2

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	429.5	1.49-5	1.22-5	9.26-6	6.89-6	5.63-6	5.30-6
26	691.3	9.30-6	7.65-6	5.82-6	4.35-6	3.56-6	3.36-6
30	1012.9	6.07-6	4.98-6	3.77-6	2.79-6	2.26-6	2.12-6
34	1394.5	4.10-6	3.35-6	2.51-6	1.83-6	1.46-6	1.35-6
38	1836.0	2.85-6	2.32-6	1.72-6	1.22-6	9.50-7	8.67-7
42	2337.6	2.03-6	1.64-6	1.20-6	8.35-7	6.28-7	5.61-7
46	2899.2	1.47-6	1.18-6	8.53-7	5.79-7	4.19-7	3.65-7
50	3520.9	1.09-6	8.67-7	6.18-7	4.07-7	2.82-7	2.38-7
54	4202.7	8.13-7	6.46-7	4.54-7	2.91-7	1.92-7	1.55-7
58	4944.6	6.16-7	4.87-7	3.39-7	2.11-7	1.33-7	1.02-7
62	5746.8	4.72-7	3.71-7	2.55-7	1.55-7	9.23-8	6.67-8
66	6609.1	3.64-7	2.85-7	1.94-7	1.15-7	6.5[illegible]-8	4.38-8
70	7531.7	2.82-7	2.20-7	1.49-7	8.62-8	4.63-8	2.89-8
74	8514.4	2.19-7	1.71-7	1.14-7	6.51-8	3.33-8	1.91-8
78	9557.1	1.70-7	1.32-7	8.83-8	4.94-8	2.42-8	1.27-8
82	10659.6	1.32-7	1.03-7	6.82-8	3.77-8	1.78-8	8.46-9
87	12121.0	9.60-8	7.45-8	4.93-8	2.69-8	1.22-8	5.24-9
92	13673.6	6.92-8	5.37-8	3.54-8	1.92-8	8.54-9	3.42-9

C1 - L3

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
536.8	8.80-3	6.98-3	4.81-3	2.83-3	1.52-3	8.91-4
826.3	5.68-3	4.53-3	3.16-3	1.94-3	1.15-3	7.90-4
1176.5	3.96-3	3.18-3	2.27-3	1.47-3	9.61-4	7.46-4
1587.3	2.94-3	2.39-3	1.75-3	1.20-3	8.65-4	7.37-4
2058.8	2.28-3	1.88-3	1.42-3	1.04-3	8.15-4	7.46-4
2591.3	1.84-3	1.54-3	1.20-3	9.25-4	7.83-4	7.55-4
3184.9	1.52-3	1.29-3	1.04-3	8.40-4	7.50-4	7.52-4
3839.7	1.27-3	1.10-3	9.06-4	7.65-4	7.11-4	7.33-4
4555.9	1.09-3	9.49-4	8.00-4	6.96-4	6.66-4	7.02-4
5333.9	9.42-4	8.28-4	7.10-4	6.32-4	6.19-4	6.63-4
6173.9	8.24-4	7.30-4	6.33-4	5.73-4	5.72-4	6.21-4
7076.1	7.28-4	6.48-4	5.67-4	5.20-4	5.26-4	5.79-4
8041.0	6.48-4	5.79-4	5.11-4	4.73-4	[illegible]	5.38-4
9068.9	5.81-4	5.21-4	4.62-4	4.32-4	4.46-4	5.01-4
10160.1	5.24-4	4.71-4	4.20-4	3.95-4	4.12-4	4.67-4
11315.2	4.76-4	4.29-4	3.83-4	3.62-4	3.81-4	4.36-[illegible]
12849.3	4.26-4	3.84-4	3.45-4	3.27-4	3.47-4	4.02-4
14484.6	3.84-4	3.47-4	3.11-4	2.98-4	3.18-4	3.74-4

C1 - L4

Z	ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	540.0	6.07-3	5.40-3	4.77-3	4.46-3	4.57-3	4.90-3
26	830.7	4.26-3	3.93-3	3.68-3	3.67-3	3.92-3	4.28-3
30	1182.0	3.14-3	2.95-3	2.84-3	2.91-3	3.16-3	3.48-3
34	1594.4	2.38-3	2.26-3	2.19-3	2.27-3	2.48-3	2.74-3
38	2068.0	1.86-3	1.76-3	1.70-3	1.76-3	1.92-3	2.13-3
42	2603.2	1.48-3	1.39-3	1.33-3	1.37-3	1.49-3	1.65-3
46	3200.5	1.20-3	1.12-3	1.06-3	1.07-3	1.16-3	1.29-3
50	3860.4	9.94-4	9.15-4	8.54-4	8.53-4	9.19-4	1.03-3
54	4583.4	8.35-4	7.62-4	7.01-4	6.91-4	7.40-4	8.28-4
58	5370.3	7.12-4	6.44-4	5.86-4	5.70-4	6.07-4	6.82-4
62	6221.5	6.14-4	5.52-4	4.97-4	4.79-4	5.08-4	5.72-4
66	7137.9	5.35-4	4.78-4	4.27-4	4.09-4	4.33-4	4.99-4
70	8120.2	4.71-4	4.19-4	3.72-4	3.53-4	3.74-4	4.25-4
74	9169.3	4.18-4	3.70-4	3.27-4	3.09-4	3.28-4	3.74-4
78	10286.1	3.73-4	3.30-4	2.91-4	2.74-4	2.90-4	3.34-4
82	11471.7	3.35-4	2.96-4	2.60-4	2.45-4	2.60-4	3.01-4
87	13051.8	2.95-4	2.60-4	2.28-4	2.15-4	2.29-4	2.68-4
92	14743.2	2.62-4	2.31-4	2.02-4	1.91-4	2.05-4	2.42-4

C1 - L5

ΔE	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
542.6	6.81-3	6.01-3	5.20-3	4.69-3	4.64-3	4.88-3
836.3	4.79-3	4.05-3	3.24-3	2.61-3	2.32-3	2.31-3
1192.6	3.56-3	2.91-3	2.17-3	1.54-3	1.18-3	1.06-3
1611.3	2.77-3	2.21-3	1.55-3	9.73-4	6.10-4	4.55-4
2091.7	2.22-3	1.74-3	1.18-3	6.78-4	3.49-4	1.95-4
2633.5	1.81-3	1.42-3	9.44-4	5.20-4	2.38-4	1.03-4
3237.1	1.50-3	1.17-3	7.79-4	4.26-4	1.89-4	7.46-5
3903.0	1.26-3	9.84-4	6.56-4	3.61-4	1.63-4	6.79-5
4631.8	1.07-3	8.37-4	5.61-4	3.11-4	1.45-4	6.47-5
5424.2	9.20-4	7.21-4	4.85-4	2.72-4	1.31-4	6.34-5
6281.0	7.99-4	6.26-4	4.23-4	2.40-4	1.19-4	6.19-5
7203.0	6.99-4	5.49-4	3.72-4	2.14-4	1.09-4	6.01-5
8191.1	6.17-4	4.85-4	3.30-4	1.91-4	1.00-4	5.81-5
9246.1	5.48-4	4.32-4	2.95-4	1.72-4	9.22-5	5.60-5
10369.0	4.90-4	3.87-4	2.65-4	1.56-4	8.53-5	5.39-5
11550.8	4.41-4	3.49-4	2.39-4	1.42-4	7.92-5	5.18-5
13149.3	3.90-4	3.08-4	2.12-4	1.27-4	7.24-5	4.94-5
14849.6	3.47-4	2.74-4	1.89-4	1.14-4	6.66-5	4.71-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $22 \leqslant Z \leqslant 92$

See page 31 for Explanation of Tables

C1 - L6

Z	Δ E	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	571.9	8.14-3	6.97-3	5.64-3	4.54-3	3.97-3	3.86-3
26	871.4	5.48-3	4.74-3	3.92-3	3.27-3	2.97-3	2.95-3
30	1234.8	3.87-3	3.40-3	2.88-3	2.50-3	2.37-3	2.41-3
34	1664.9	2.84-3	2.52-3	2.20-3	1.98-3	1.94-3	2.02-3
38	2165.3	2.14-3	1.92-3	1.71-3	1.58-3	1.58-3	1.67-3
42	2739.7	1.66-3	1.50-3	1.34-3	1.26-3	1.27-3	1.36-3
46	3392.1	1.32-3	1.20-3	1.08-3	1.01-3	1.03-3	1.11-3
50	4126.8	1.08-3	9.74-4	8.75-4	8.23-4	8.40-4	9.09-4
54	4948.6	8.89-4	8.04-4	7.22-4	6.79-4	6.94-4	7.56-4
58	5863.4	7.43-4	6.72-4	6.03-4	5.67-4	5.81-4	6.37-4
62	6877.9	6.27-4	5.67-4	5.09-4	4.78-4	4.91-4	5.42-4
66	8000.0	5.33-4	4.83-4	4.32-4	4.07-4	4.19-4	4.65-4
70	9238.8	4.56-4	4.13-4	3.70-4	3.48-4	3.60-4	4.02-4
74	10605.0	3.92-4	3.55-4	3.18-4	2.99-4	3.11-4	3.49-4
78	12111.5	3.37-4	3.06-4	2.74-4	2.58-4	2.69-4	3.05-4
82	13773.2	2.91-4	2.64-4	2.37-4	2.23-4	2.34-4	2.67-4
87	16096.1	2.42-4	2.20-4	1.98-4	1.87-4	1.96-4	2.27-4
92	18733.2	2.01-4	1.83-4	1.65-4	1.56-4	1.65-4	1.93-4

C1 - M1

Z	Δ E	E'=.008	E'=.04	E'=.10	E'=.21	E'=.41	E'=.75
22	535.8	1.17-2	9.25-3	6.24-3	3.47-3	[illegible]	6.27-4
26	824.9	7.81-3	6.15-3	4.14-3	[illegible]	[illegible]	4.16-4
30	1174.8	5.56-3	4.36-3	2.93-3	[illegible]	[illegible]	2.94-4
34	1585.8	4.14-3	3.25-3	2.18-3	[illegible]	[illegible]	2.19-4
38	2038.1	3.20-3	2.51-3	[illegible]	[illegible]	[illegible]	[illegible]
42	2592.1	2.55-3	2.00-3	1.34-3	[illegible]	[illegible]	[illegible]
46	3188.2	2.08-3	1.63-3	[illegible]	[illegible]	[illegible]	1.09-4
50	3847.0	1.72-3	1.35-3	9.03-4	[illegible]	[illegible]	9.05-5
54	4568.9	1.45-3	1.14-3	7.61-4	[illegible]	[illegible]	7.62-5
58	5354.5	1.24-3	9.71-4	6.50-4	3.59-4	[illegible]	6.51-5
62	6204.5	1.07-3	8.39-4	5.62-4	3.10-4	[illegible]	5.62-5
66	7119.6	9.36-4	7.32-4	4.90-4	2.71-4	[illegible]	4.90-5
70	8100.6	8.24-4	6.45-4	4.32-4	[illegible]	[illegible]	4.31-5
74	9148.4	7.31-4	5.72-4	3.83-4	2.11-4	[illegible]	[illegible]
78	10263.8	6.53-4	5.11-4	3.42-4	1.89-4	[illegible]	[illegible]
82	[illegible]	5.87-4	4.59-4	3.07-4	[illegible]	[illegible]	3.07-5
87	13026.2	5.18-4	4.05-4	2.71-4	1.49-4	[illegible]	[illegible]
92	14715.7	4.61-4	3.60-4	2.41-4	1.33-4	[illegible]	2.41-5

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RELATIVISTIC DISTORTED-WAVE COLLISION STRENGTHS AND OSCILLATOR STRENGTHS FOR THE 33 Ni-LIKE IONS WITH $60 \leqslant Z \leqslant 92$*

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Relativistic distorted-wave collision strengths are given for the 248 possible transitions from the ground level to the excited levels with n = 4 and 5 in the 33 Ni-like ions with nuclear charge number Z in the range $60 \leqslant Z \leqslant 92$. The calculations were made for the six final, or scattered, electron energies E' = 0.002, 0.01 0.03, 0.07, 0.15, and 0.28, where E' is in units of $Z_{\rm eff}^2$ rydbergs with $Z_{\rm eff} = Z - 22.5$. In addition, the transition energies and electric dipole oscillator strengths are given. To our knowledge the present work is the first comprehensive publication of the results of fully relativistic calculations of the collision strengths for excitation of highly charged Ni-like ions.

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CONTENTS

INTRODUCTION

Recently there has been considerable interest in the development of x-ray lasers using Ni-like ions.[1-5] For this purpose very large values for the nuclear charge Z, roughly $Z \geqslant 60$, are of interest. In the present work, using the rapid relativistic atomic structure and distorted-wave collision strength programs described in Refs. 6 and 7, but with the modifications of the structure program described in the preceding paper,[8] we have calculated the collision strengths for the 248 transitions from the ground level to the excited levels with $n = 4$ and 5 in all 33 Ni-like ions with nuclear charge number Z in the range

$$60 \leqslant Z \leqslant 92. \tag{1}$$

The calculations were made for the six scattered, or final, electron energies

$$E' = 0.002, 0.01, 0.03, 0.07, 0.15, \text{ and } 0.28, \tag{2}$$

where E' is in units of $Z_{\rm eff}^2$ rydbergs with

$$Z_{\rm eff} = Z - 22.5. \tag{3}$$

This range of energies is expected to cover those ordinarily needed for determining the collision rates for applications to very high temperature plasmas. The electric dipole oscillator strengths have also been calculated.

We note that relativistic distorted-wave calculations of collision cross sections for excitation from the ground level to the $n = 4$ levels have been made by Hagelstein[3] for Ni-like gadolinium ($Z = 64$). However, the present results are the first comprehensive fully relativistic calculations of collision strengths for many different Ni-like ions that have been published to our knowledge.

Most of the theory and procedures used in the present calculations are described in detail in Refs. 6 and 7 and were used in making the large-scale calculations of collision strengths and oscillator strengths for Ne-like, Li-like, Na-like, and Cu-like ions in Refs. 9–12. However, we have also used the new options to the atomic structure program described and used in the preceding paper on F-like ions.[8] These options are: (1) to replace the point nuclear charge with a finite nuclear charge having the Fermi charge distribution, which accounts for $Z(r)$ replacing Z in Eq. (4) below; and (2) to include the generalized Breit interaction and the self-energy and vacuum polarization QED corrections perturbatively. Also we include retardation in calculating the electric dipole radiation oscillator strengths. All these new options have mostly small effects in the present case of transitions involving high n values ($n \geqslant 3$).

In the present approach, when treating a given class of transitions, all orbitals one uses, bound and free, are solutions of the Dirac equation with the same relativistic Hartree–Fock–Slater, or Dirac–Fock–Slater, central potential. Hence, all orbitals are automatically orthogonal. In the present case this potential is given in rydbergs by

$$V(r) = -\frac{2Z(r)}{r} + V_c(r) - \left[\frac{24}{\pi}\rho(r)\right]^{1/3}, \tag{4}$$

where

$$V_c(r) = \sum_{n'\kappa'} w_{n'\kappa'} \int_0^\infty \frac{2}{r_>} [P^2_{n'\kappa'}(r_2) + Q^2_{n'\kappa'}(r_2)]dr_2 \quad (5)$$

and

$$\rho(r) = \frac{1}{4\pi r^2} \sum_{n'\kappa'} w_{n'\kappa'}[P^2_{n'\kappa'}(r) + Q^2_{n'\kappa'}(r)]. \quad (6)$$

Here $w_{n'\kappa'}$ is the occupation number of subshell $n'\kappa' = n'l'j'$, the summation is over all occupied subshells, $r_>$ is the greater of r and r_2, and $P_{n'\kappa'}$ and $Q_{n'\kappa'}$ are the so-called large and small components of the radial function of an electron in the $n'\kappa'$ subshell.

In considering a given class of transitions a single mean configuration with fractional occupation numbers for some subshells is used in determining the potential with Eqs. (4)-(6). In the present application to excitation of Ni-like ions to the $n = 4$ and 5 levels, this mean configuration is

$$1s^2_{1/2}2s^2_{1/2}2p^2_{1/2}2p^4_{3/2}3s^{1.9}_{1/2}3p^{1.9}_{1/2}3p^{3.9}_{3/2}3d^{3.9}_{3/2}3d^{5.9}_{5/2}$$
$$\times\, 4s^{0.05}_{1/2}4p^{0.06}_{1/2}4p^{0.06}_{3/2}4d^{0.06}_{3/2}4d^{0.06}_{5/2}4f^{0.06}_{5/2}4f^{0.06}_{7/2}5s^{0.01}_{1/2}5p^{0.01}_{1/2}$$
$$\times\, 5p^{0.01}_{3/2}5d^{0.01}_{3/2}5d^{0.01}_{5/2}5f^{0.01}_{5/2}5f^{0.01}_{7/2}5g^{0.01}_{7/2}5g^{0.01}_{9/2}, \quad (7)$$

where we have weighted the $n = 4$ shell more than the $n = 5$ shell because for the most part the transitions to levels with $n = 4$ are the more important ones. We note that test cases indicate that small changes in the mean occupation numbers within a shell have a very small effect on the results.

It should be noted that these mean configurations are used solely in determining the potential with Eqs. (4)-(6) and that, basically, the calculations are multiconfiguration calculations. In the present case, where the $n = 4$ and 5 levels overlap, we include all mixing among the excited states with $n = 4$ and 5 having the same parity and total J value. Each of these groups of mixed states is designated by a capital letter. A number following a group letter indicates a particular energy level in the group. For example, F2 indicates the next to the lowest energy level in Group F, which consists of all the even parity states that have total J value of the target ion equal to 2 plus one hole in the $n = 3$ shell and one electron in the $n = 4$ or $n = 5$ shell. The jj-coupled state making the dominant contribution to each level for each value of Z in the range given by Eq. (1) is given in Table I. A word should be said about the notation used in that table. First we note that the quite common abbreviations

$$nl^* = nlj, \qquad j = l - 1/2 \quad (8)$$

and

$$nl = nlj, \qquad j = l + 1/2 \quad (9)$$

are used here. Also since a hole in a subshell nlj behaves like a single electron in the subshell in determining the angular momentum state of the ion, we designate such a hole by nlj. In addition, the subscripts indicating J value are put on line and closed subshells are omitted. Some examples are

$$(3d\,4d*)3 = [1s^2_{1/2}2s^2_{1/2}2p^2_{1/2}2p^4_{3/2}3s^2_{1/2}$$
$$\times\, 3p^2_{1/2}3p^4_{3/2}3d^3_{3/2}3d^6_{5/2}4d_{3/2}]_3 \quad (10)$$

and

$$(3s\,5d)2 = [1s^2_{1/2}2s^2_{1/2}2p^2_{1/2}2p^4_{3/2}3s_{1/2}$$
$$\times\, 3p^2_{1/2}3p^4_{3/2}3d^4_{3/2}3d^6_{5/2}5d_{5/2}]_2. \quad (11)$$

In order to give some indication of the accuracy of the present results, we have in Table II compared oscillator strengths (f) and transition energies (ΔE) for transitions between the ground level and the $n = 4$ excited levels in Ni-like ions having $Z = 64$ and 92 with the results given by the recent version of the well-known multiconfiguration Dirac–Fock program of Grant and co-workers[13,14] called GRASP.[15] These entries are labeled "Grant." Also, for $Z = 64$, we have included the results of Hagelstein,[3] labeled "Hagel." One sees that the agreement is generally good.

In Table III the electric dipole oscillator strengths for all allowed transitions from the ground level to the excited levels with $n = 4$ and 5 are given for all 33 values of Z in the range given by Eq. (1). For $Z = 64$ and 92 these values differ slightly from those given in Table II because mixing with the $n = 5$ states was omitted in calculating the values given in Table II and also the different mean configuration

$$1s^2_{1/2}2s^2_{1/2}2p^2_{1/2}2p^4_{3/2}3s^{1.9}_{1/2}3p^{1.9}_{1/2}3p^{3.9}_{3/2}3d^{3.9}_{3/2}3d^{5.9}_{5/2}4s^{0.07}_{1/2}$$
$$\times\, 4p^{0.07}_{1/2}4p^{0.07}_{3/2}4d^{0.07}_{3/2}4d^{0.07}_{5/2}4f^{0.07}_{5/2}4f^{0.08}_{7/2} \quad (12)$$

was used in place of Eq. (7) in determining the potential with Eqs. (4)-(6). The reason for doing this is that it is appropriate to use the same degree of mixing that Hagelstein[3] used in comparing these results with his, that is, to include only the mixing among the $n = 4$ states. For the same reason the GRASP code was also run with mixing with the $n = 5$ states omitted to produce the values given in Table II.

In Table IV, the relativistic distorted-wave collision strengths are given for the 248 transitions from the ground level to the excited levels with $n = 4$ and 5. The results are given for all 33 values of Z in the range covered by Eq. (1) and for the six scattered electron energies E' given by Eq. (2). The relation between the cross section $Q(i\text{-}f)$ and the collision strength $\Omega(i\text{-}f)$ for a transition $i\text{-}f$ is

$$Q(i\text{-}f) = \frac{\pi a_0^2}{k_i^2 g_i}\,\Omega(i\text{-}f), \quad (13)$$

where a_0 is the Bohr radius, g_i is the statistical weight of the initial level (unity in the present case), and k_i is the relativistic wave number of the impact electron. The relation between k_i and the kinetic energy $E_i(\mathrm{Ry})$ of the impact electron is

$$k_i^2 = E_i(\mathrm{Ry})\left[1 + \frac{\alpha^2}{4} E_i(\mathrm{Ry})\right], \qquad (14)$$

where α is the fine structure constant $\alpha = e^2/\hbar c$. Of course, $E_i(\mathrm{Ry})$ is related to the transition energy $\Delta E_{if}(\mathrm{Ry})$ and the scattered electron energy E' in units of Z_{eff}^2 rydbergs by

$$E_i(\mathrm{Ry}) = \Delta E(\mathrm{Ry}) + Z_{\mathrm{eff}}^2 E', \qquad (15)$$

where Z_{eff} is given by Eq. (3).

As in our previous large-scale calculations done in Refs. 8–12, we use the factorization formulation of Bar-Shalom et al.[16] to express the collision strengths in the form

$$\Omega = 8 \sum_{\substack{j_a, j_a' \\ j_{a1}, j_{a1}'}} \sum_{\lambda} B^\lambda(j_a j_a', j_{a1} j_{a1}') Q^\lambda(j_a j_a', j_{a1} j_{a1}'), \qquad (16)$$

where the abbreviations $j_a = n_a l_a j_a$, $j_a' = n_a' l_a' j_a'$, $j_{a1} = n_{a1} l_{a1} j_{a1}$, and $j_{a1}' = n_{a1}' l_{a1}' j_{a1}'$ have been used. Here, j_a and j_{a1} represent orbitals in the initial target ion wave function, while j_a' and j_{a1}' represent orbitals in the final target ion wave function. A convenient feature of Eq. (16) is that the B^λ are functions only of the target ion quantum numbers and mixing coefficients plus λ, while Q^λ contains the radial contribution and depends only on λ and the bound and free orbitals with the summation over the free electron angular momenta l, j, l', and j' performed within it; see, for example, Eqs. (10), (21), and (23) of Ref. 16.

Since the $Z^2 Q^\lambda$ are slowly and smoothly varying functions of Z, it is necessary to make detailed relativistic distorted-wave calculations of them for only a few values of Z and then one can use fits to power series in Z to obtain results for the remaining Z values. In the present application we made detailed relativistic distorted-wave calculations for each of the four values of Z

$$Z = 60, 70, 80, \text{and } 92 \qquad (17)$$

for each of the six scattered electron energies E' given by Eq. (2). In each case the Q^λs were calculated for three impact electron energies E_i in units of Z_{eff}^2 rydbergs. These were $E_i = 0.04 + E'$, $E_i = 0.076 + E'$, and $E_i = 0.112 + E'$, where 0.04 and 0.112 span the range of transition energies in units of Z_{eff}^2 rydbergs for excitation to the $n = 4$ and 5 levels. Next, each Q^λ was fit to the form

$$Z^2 Q^\lambda = a_1^\lambda Z + a_2^\lambda + a_3^\lambda Z^{-1} + a_4^\lambda Z^{-2}. \qquad (18)$$

These results were then used in Eq. (16) to compute the values for the 248 transitions for the 33 values of Z in the range given by Eq. (1). In doing this we obtained the values of the Q^λ for the exact energy of each transition by Lagrange interpolation, except that for optically allowed transitions the interpolation was done on $\ln Q^\lambda$ rather than Q^λ. Numerous test calculations have indicated that the numerical error due to these procedures is usually much less than 1% and the largest error we have ever found is about 3%.

The efficiency of our collision program has now been increased by about a factor of 12 since the calculations in Refs. 9 and 10 were made. Although the time required for the atomic structure calculations for a single Z is still somewhat less than the time required to calculate the Q^λ, the inclusion of the generalized Breit interaction has greatly increased the time for the structure calculations, as noted in Ref. 8. Hence, when they were done for all 33 Z values, while the detailed Q^λ calculations were done for only the four Z values given by Eq. (17), the atomic structure part of the calculations took about 2/3 of the total time. The total CPU time required for the present calculations on a Cray XMP supercomputer at the Lawrence Livermore National Laboratory "Open Computer Facility" was about 6 h. This large value as compared with those for our other calculations, such as those in Ref. 8, occurs because on average the orbitals involved in the present work have higher l values. In future work we expect to increase the efficiency of the atomic structure part.

With regard to the accuracy of the present collision strengths, the only relativistic results available for comparison are those of Ref. 3 for $Z = 64$. In Table II of Ref. 7 we did make a comparison of those results with the results of the present approach (except that the new options discussed at the beginning of the present paper were not used). Generally good agreement was found. Probably the comparisons in Table II for oscillator strengths also give an approximate indication of the accuracy of the present results for collision strengths.

Finally, it should be mentioned that the complete set of present results is on file at the National Energy Research Supercomputer Center at Livermore, California, and is available[17] to those with access to that network; it is also available on magnetic tape by request from the authors.

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EXPLANATION OF TABLES

These tables list data for transitions from the ground level to the excited levels with $n = 4$ and 5. The abbreviations given by Eqs. (8)-(11) are used in designating the transitions. All values of Z in the range $60 \leqslant Z \leqslant 92$ are included.

TABLE I. Labeling of Energy Levels

This table shows the jj-coupled basis state that makes the dominant contribution to each energy level for Z in the range $60 \leqslant Z \leqslant 92$. The table is clarified by a specific example: The jj-coupled basis state making the dominant contribution to each of the energy levels in group L when $Z = 82$ is $(3d_{3/2}4p_{3/2})_0$ for the lowest energy level in the group L1, $(3d_{5/2}4f_{5/2})_0$ for the next higher level L2, $(3p_{3/2}4d_{3/2})_0$ for L3, $(3p_{1/2}4s_{1/2})_0$ for L4, $(3s_{1/2}4p_{1/2})_0$ for L5, $(3d_{3/2}5p_{3/2})_0$ for L6, $(3d_{5/2}5f_{5/2})_0$ for L7, $(3p_{3/2}5d_{3/2})_0$ for L8, $(3p_{1/2}5s_{1/2})_0$ for L9, and $(3s_{1/2}5p_{1/2})_0$ for the highest level in the group L10.

TABLE II. Comparison of Transition Energies and Oscillator Strengths from Various Calculations for $Z = 64$ and $Z = 92$

Transition	Lower level–upper level labeled as described in Table I
ΔE(eV)	Transition energy in eV
f	Electric dipole oscillator strength (dimensionless)
Present	Results from present work
Grant	Results from the GRASP[15] version of the multiconfiguration Dirac–Fock code of Grant et al.[13,14]
Hagel	Relativistic distorted-wave calculations of Hagelstein[3]

TABLE III. Electric Dipole Oscillator Strengths f, $60 \leqslant Z \leqslant 92$

This table gives the (dimensionless) electric dipole oscillator strengths for the allowed transitions from the ground level to the upper level given as column headings. See Table I for the labeling of the upper level.

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

This table gives values for the collision strength from which one can obtain values for the cross section using Eqs. (13), (14), and (15). In the present case the statistical weight $g_i = 2J + 1$ is unity because the value for the total angular momentum quantum number J for the initial level is zero. The fine structure constant α in Eq. (14) has the value 1/137.039. The $Z_{\rm eff}$ in Eq. (15) is given by Eq. (3) and the transition energy ΔE_{if}(Ry) in Eq. (15) is obtained from the corresponding entry in eV given in this table by dividing by the conversion factor 13.60535 eV/Ry. 3.05-3 means 3.05×10^{-3}. Each data block is headed by the relevant transition i–f, with the levels i and f labeled according to Table I.

Z	Nuclear charge number
ΔE	Transition energy in eV
E′	Scattered electron energy in units of $Z_{\rm eff}^2$ Ry, where the effective nuclear charge $Z_{\rm eff}$ is given by $Z - 22.5$ [Eq. (3)]

TABLE I. Labeling of Energy Levels

See page 96 for Explanation of Tables

Level	JJ State Label	JJ State	Dominant JJ State as a Function of Z																																
			60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
A1	1	(3d x6)0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D1	1	(3d 4d)0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D2	2	(3d*4d*)0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
D3	3	(3p 4p)0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
D4	4	(3p*4p*)0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
D5	5	(3s 4s)0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
D6	6	(3d 5d)0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
D7	7	(3d*5d*)0	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
D8	8	(3p 5p)0	8	8	8	8	8	8	8	8	8	8	8	8	8	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
D9	9	(3p*5p*)0	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
D10	10	(3s 5s)0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
E1	1	(3d*4s)1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
E2	2	(3d 4d*)1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
E3	3	(3d 4d)1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
E4	4	(3d*4d*)1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6
E5	5	(3d*4d)1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	4
E6	6	(3p 4p*)1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5
E7	7	(3p 4p)1	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
E8	8	(3p*4p*)1	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	14	14	14	14	14	14	14
E9	9	(3p*4p)1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	14	14	14	14	14	14	14	14	14	14	8	8	8	8	8	8	8
E10	10	(3d*5s)1	10	10	10	10	10	10	11	11	11	11	14	14	14	14	14	14	9	9	9	9	9	9	11	11	11	11	11	11	11	11	11	11	11
E11	11	(3s 4s)1	11	11	11	11	11	11	10	10	14	14	11	11	11	11	11	11	11	11	11	11	11	11	9	9	9	9	9	9	9	10	10	10	10
E12	12	(3d 5d*)1	12	14	14	14	14	14	14	14	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9
E13	13	(3d 5d)1	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
E14	14	(3p 4f*)1	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
E15	15	(3d*5d*)1	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
E16	16	(3d*5d)1	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	17	17	17	17	17
E17	17	(3d 5g*)1	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	16	16
E18	18	(3s 4d*)1	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	19	19
E19	19	(3p 5p*)1	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	18
E20	20	(3p 5p)1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
E21	21	(3p*5p*)1	21	21	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
E22	22	(3p 5f*)1	22	22	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
E23	23	(3p*5p)1	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
E24	24	(3s 5s)1	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
E25	25	(3s 5d*)1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
F1	1	(3d 4s)2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F2	2	(3d*4s)2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
F3	3	(3d 4d*)2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
F4	4	(3d 4d)2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
F5	5	(3d*4d*)2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	7	7
F6	6	(3d*4d)2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	5	5
F7	7	(3p 4p*)2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6
F8	8	(3p 4p)2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
F9	9	(3p*4p)2	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
F10	10	(3d 5s)2	10	10	10	10	10	10	10	10	10	10	10	10	10	14	14	14	9	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
F11	11	(3d*5s)2	11	11	11	11	11	11	11	11	14	14	14	14	14	10	15	15	15	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10
F12	12	(3d 5d*)2	12	14	14	14	14	14	14	14	11	15	15	15	15	15	10	10	10	10	10	10	9	9	9	9	9	9	9	9	9	11	11	11	11
F13	13	(3d 5d)2	13	12	15	15	15	15	15	15	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	9	9	9
F14	14	(3p 4f*)2	14	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
F15	15	(3p 4f)2	15	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
F16	16	(3d*5d*)2	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
F17	17	(3d*5d)2	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	18	18	18	18	18
F18	18	(3d 5g*)2	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	19	19	19	19	19
F19	19	(3d 5g)2	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	17	17	17	17
F20	20	(3d*5g*)2	20	20	20	20	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	20	20
F21	21	(3p*4f*)2	21	21	21	21	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	21	21	21
F22	22	(3s 4d*)2	22	22	22	22	22	22	22	22	22	22	22	22	22	22	32	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	24	24
F23	23	(3s 4d)2	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	24	24	24	22	22
F24	24	(3p 5p*)2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	23	23	23	23
F25	25	(3p 5p)2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
F26	26	(3p 5f*)2	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
F27	27	(3p 5f)2	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
F28	28	(3p*5p)2	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	20	28	28	28	28	28	28	28	28	28	28
F29	29	(3p*5f*)2	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
F30	30	(3s 5d*)2	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
F31	31	(3s 5d)2	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
G1	1	(3d 4s)3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
G2	2	(3d 4d*)3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
G3	3	(3d 4d)3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
G4	4	(3d*4d*)3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
G5	5	(3d*4d)3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
G6	6	(3p 4p)3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
G7	7	(3d 5s)3	7	7	7	7	7	7	7	7	7	7	7	7	7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
G8	8	(3d 5d*)3	8	10	10	10	10	10	11	11	11	11	11	11	11	7	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
G9	9	(3d 5d)3	9	11	11	11	11	11	10	10	10	10	10	10	10	10	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
G10	10	(3p 4f)3	10	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
G11	11	(3p 4f*)3	11	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
G12	12	(3d*5d*)3	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
G13	13	(3d*5d)3	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	14	14	14	14	14
G14	14	(3d 5g*)3	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15	15	15	15	15

TABLE I. Labeling of Energy Levels

See page 96 for Explanation of Tables

Level	JJ State Label	JJ State	Dominant JJ State as a Function of Z: 60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
G15	15	(3d 5g)3	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	13	13	13	13
G16	16	(3d*5g)3	16	16	16	16	19	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	17
G17	17	(3d*5g*)3	17	17	17	18	18	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	16	16	16
G18	18	(3p*4f*)3	18	18	18	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	18	18
G19	19	(3p*4f)3	19	19	19	19	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	19	19	19
G20	20	(3s 4d)3	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
G21	21	(3p 5p)3	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
G22	22	(3p 5f*)3	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
G23	23	(3p 5f)3	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
G24	24	(3p*5f*)3	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
G25	25	(3p*5f)3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
G26	26	(3s 5d)3	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
G27	27	(3s 5g*)3	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
H1	1	(3d 4d*)4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H2	2	(3d 4d)4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
H3	3	(3d*4d)4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
H4	4	(3d 5d*)4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
H5	5	(3d 5d)4	5	4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
H6	6	(3p 4f*)4	6	7	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
H7	7	(3p 4f)4	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
H8	8	(3d*5d)4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9
H9	9	(3d 5g*)4	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	10	10	10	10
H10	10	(3d 5g)4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	8	8	8
H11	11	(3d*5g)4	11	11	11	11	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	11	12	12
H12	12	(3d*5g*)4	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11
H13	13	(3p*4f)4	13	13	13	13	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	13	13	13
H14	14	(3p 5f*)4	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
H15	15	(3p 5f)4	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
H16	16	(3p*5f)4	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
H17	17	(3s 5g*)4	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
H18	18	(3s 5g)4	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
I1	1	(3d 4d)5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
I2	2	(3d 5d)5	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
I3	3	(3p 4f)5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
I4	4	(3d 5g*)5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
I5	5	(3d 5g)5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
I6	6	(3d*5g*)5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
I7	7	(3d*5g)5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
I8	8	(3p 5f)5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
I9	9	(3s 5g)5	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
J1	1	(3d 5g*)6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
J2	2	(3d 5g)6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
J3	3	(3d*5g)6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
K1	1	(3d 5g)7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
L1	1	(3d*4p)0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
L2	2	(3d 4f*)0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
L3	3	(3p*4s)0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
L4	4	(3p 4d*)0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L5	5	(3d*5p)0	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
L6	6	(3s 4p*)0	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
L7	7	(3d 5f*)0	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
L8	8	(3p 5d*)0	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
L9	9	(3p*5s)0	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
L10	10	(3s 5p*)0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
M1	1	(3d*4p*)1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
M2	2	(3d 4p)1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
M3	3	(3d*4p)1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M4	4	(3p 4s)1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
M5	5	(3d 4f*)1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
M6	6	(3d 4f)1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
M7	7	(3d*4f*)1	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
M8	8	(3p*4s)1	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9
M9	9	(3p 4d*)1	9	9	[illegible]	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	10	10	10	10	10	10	10	10	10	10	10
M10	10	(3p 4d)1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	8	8	8	8	8	8	8	8	8	8
M11	11	(3d 5p)1	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	15	15	15	15	15	15	15	15	15	15	11	11	11	11	11	11	11
M12	12	(3d*5p*)1	12	12	12	12	12	12	12	12	12	12	12	14	14	15	15	15	11	11	11	11	11	11	11	11	11	11	15	15	15	15	12	12	12
M13	13	(3d*5p)1	13	13	13	13	13	14	14	14	14	14	14	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15
M14	14	(3p*4d*)1	14	14	14	14	14	13	13	13	13	15	15	15	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13
M15	15	(3s 4p*)1	15	15	15	15	15	15	15	15	15	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	14	14	14	16
M16	16	(3d 5f*)1	16	16	16	16	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	16	16	16	16	16	16	16	16	16	14
M17	17	(3d 5f)1	17	17	18	18	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	18	18	17	17	17	17	17	17	17	17
M18	18	(3s 4p)1	18	18	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	18	18	18	18	18	18	18	18
M19	19	(3d*5f*)1	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
M20	20	(3p 5s)1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
M21	21	(3p 5d*)1	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
M22	22	(3p 5d)1	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
M23	23	(3p*5s)1	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
M24	24	(3p*5d*)1	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
M25	25	(3s 5p*)1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
M26	26	(3s 5p)1	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26

TABLE I. Labeling of Energy Levels

See page 96 for Explanation of Tables

Level	JJ State Label	JJ State	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
			Dominant JJ State as a Function of Z																																
N1	1	(3d 4p*)2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N2	2	(3d*4p*)2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
N3	3	(3d 4p)2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
N4	4	(3d*4p)2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
N5	5	(3p 4s)2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
N6	6	(3d 4f)2	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
N7	7	(3d 4f*)2	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
N8	8	(3d*4f)2	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
N9	9	(3d*4f*)2	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
N10	10	(3p 4d*)2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
N11	11	(3p 4d)2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
N12	12	(3d 5p*)2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
N13	13	(3d 5p)2	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
N14	14	(3d*5p*)2	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
N15	15	(3d*5p)2	15	15	15	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15
N16	16	(3p*4d*)2	16	16	16	16	16	15	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	15	15	15	15	15	16	16	18
N17	17	(3p*4d)2	17	17	17	17	17	17	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	17	17	17	17	17	18	18	16
N18	18	(3d 5f*)2	18	18	18	18	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18	18	18	18	18	18	18	19	19	19
N19	19	(3d 5f)2	19	19	19	20	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	20	19	19	19	19	19	19	17	17	17
N20	20	(3s 4p)2	20	20	20	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20	20
N21	21	(3d*5f)2	21	21	21	21	21	21	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
N22	22	(3d*5f*)2	22	22	22	22	22	22	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
N23	23	(3p 5s)2	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
N24	24	(3s 4f*)2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	25	25	25
N25	25	(3p 5d*)2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	26	26
N26	26	(3p 5d)2	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	24	24
N27	27	(3p 5g*)2	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
N28	28	(3p*5d*)2	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
N29	29	(3p*5d)2	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
N30	30	(3s 5p)2	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
N31	31	(3s 5f*)2	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
O1	1	(3d 4p*)3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
O2	2	(3d 4p)3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
O3	3	(3d*4p)3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
O4	4	(3d 4f*)3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
O5	5	(3d 4f)3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
O6	6	(3d*4f)3	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
O7	7	(3d*4f*)3	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
O8	8	(3p 4d*)3	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
O9	9	(3p 4d)3	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
O10	10	(3d 5p*)3	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
O11	11	(3d 5p)3	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
O12	12	(3d*5p)3	12	12	12	12	12	12	12	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	12	12	12	12	12	12
O13	13	(3p*4d)3	13	13	13	13	13	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	13	13	13	13	13	14	14	14	14
O14	14	(3d 5f*)3	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	15	15	15
O15	15	(3d 5f)3	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	13	13
O16	16	(3d*5f)3	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
O17	17	(3d*5f*)3	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
O18	18	(3s 4f*)3	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	20	20	20	20
O19	19	(3s 4f)3	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	20	18	18	21	21
O20	20	(3p 5d*)3	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	19	21	18	18
O21	21	(3p 5d)3	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	19	19
O22	22	(3p 5g)3	22	22	22	22	22	22	22	22	22	22	22	22	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
O23	23	(3p 5g*)3	23	23	23	23	23	23	23	23	23	23	23	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
O24	24	(3p*5d)3	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
O25	25	(3p*5g*)3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
O26	26	(3s 5f*)3	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
O27	27	(3s 5f)3	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
P1	1	(3d 4p)4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
P2	2	(3d 4f*)4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
P3	3	(3d 4f)4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
P4	4	(3d*4f*)4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
P5	5	(3d*4f)4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
P6	6	(3p 4d)4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
P7	7	(3d 5p)4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
P8	8	(3d 5f*)4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
P9	9	(3d 5f)4	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
P10	10	(3d*5f*)4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
P11	11	(3d*5f)4	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
P12	12	(3s 4f)4	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	13	13	13
P13	13	(3p 5d)4	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12
P14	14	(3p 5g*)4	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
P15	15	(3p 5g)4	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
P16	16	(3p*5g*)4	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
P17	17	(3p*5g)4	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
P18	18	(3s 5f)4	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Q1	1	(3d 4f*)5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Q2	2	(3d 4f)5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Q3	3	(3d*4f)5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Q4	4	(3d 5f*)5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Q5	5	(3d 5f)5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Q6	6	(3d*5f)5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Q7	7	(3p 5g*)5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Q8	8	(3p 5g)5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Q9	9	(3p*5g)5	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
R1	1	(3d 4f)6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
R2	2	(3d 5f)6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
R3	3	(3p 5g)6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

TABLE II. Comparison of Transition Energies and Oscillator Strengths from Various Calculations for Z = 64 and Z = 92

See page 96 for Explanation of Tables

Z=64

Transition	ΔE(eV) Present	ΔE(eV) Grant	ΔE(eV) Hagel	f Present	f Grant	f Hagel
A1 - M1	1136.7	1133.7	1136.9	0.1137	0.1115	0.121
A1 - M2	1151.7	1148.7	1151.8	0.2861	0.2754	0.305
A1 - M3	1182.6	1179.6	1183.5	0.0338	0.0325	0.036
A1 - M4	1377.4	1375.1	1380.4	0.3790	0.3696	0.384
A1 - M5	1395.5	1392.6	1396.2	0.0138	0.0138	0.016
A1 - M6	1413.4	1410.4	1414.4	1.0521	1.0284	1.090
A1 - M7	1455.8	1452.7	1457.7	6.4721	6.3644	6.650
A1 - M8	1526.3	1523.8	1531.4	0.0397	0.0401	0.047
A1 - M9	1612.6	1610.3	1614.8	0.0166	0.0166	0.018
A1 - M10	1625.1	1622.7	1627.6	1.1087	1.0640	1.110
A1 - M14	1764.1	1761.6	1767.9	0.5282	0.5145	0.553
A1 - M15	1792.6	1790.0	1792.4	0.0383	0.0307	0.020
A1 - M16	1840.0	1837.3	1840.0	0.1446	0.1363	0.143

Z=92

Transition	ΔE(eV) Present	ΔE(eV) Grant	f Present	f Grant
A1 - M1	3025.4	3022.8	0.1904	0.1862
A1 - M2	3163.0	3160.5	0.2592	0.2543
A1 - M3	3348.9	3346.3	0.0077	0.0088
A1 - M4	3401.0	3401.9	0.4199	0.4102
A1 - M5	3643.2	3640.9	0.0015	0.0014
A1 - M6	3703.0	3700.7	3.3621	3.3318
A1 - M7	3871.2	3868.8	5.0026	4.9656
A1 - M8	4079.4	4077.5	0.1043	0.1023
A1 - M9	4149.2	4147.2	1.3325	1.3015
A1 - M10	4325.7	4326.4	0.0441	0.0441
A1 - M13	4828.2	4817.6	0.2447	0.2356
A1 - M16	5013.0	5010.7	0.3228	0.3238
A1 - M18	5161.0	5150.2	0.0924	0.0909

TABLE III. Electric Dipole Oscillator Strengths f, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

Z	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
60	0.0962	0.3095	0.0389	0.3909	0.0332	0.7657	6.0861	0.0444	0.0048	1.0109	0.0345	0.0311	0.0001
61	0.1014	0.3039	0.0376	0.3913	0.0230	0.8334	6.1110	0.0447	0.0071	1.0306	0.0333	0.0295	0.0000
62	0.1062	0.2987	0.0364	0.3879	0.0186	0.9035	6.1264	0.0451	0.0098	1.0487	0.0325	0.0280	0.0008
63	0.1107	0.2940	0.0353	0.3840	0.0160	0.9762	6.1333	0.0459	0.0127	1.0653	0.0318	0.0265	0.0089
64	0.1148	0.2897	0.0343	0.3805	0.0141	1.0514	6.1322	0.0467	0.0161	1.0808	0.0313	0.0247	0.1172
65	0.1187	0.2858	0.0334	0.3774	0.0127	1.1290	6.1238	0.0478	0.0197	1.0950	0.0308	0.0227	0.4632
66	0.1223	0.2822	0.0325	0.3749	0.0114	1.2088	6.1088	0.0489	0.0235	1.1083	0.0305	0.0199	0.5400
67	0.1257	0.2789	0.0316	0.3727	0.0103	1.2907	6.0877	0.0503	0.0276	1.1205	0.0302	0.0158	0.5708
68	0.1289	0.2760	0.0308	0.3710	0.0093	1.3744	6.0611	0.0517	0.0320	1.1317	0.0301	0.0094	0.5959
69	0.1319	0.2733	0.0301	0.3697	0.0084	1.4597	6.0295	0.0532	0.0365	1.1420	0.0301	0.0006	0.6183
70	0.1348	0.2708	0.0294	0.3688	0.0075	1.5463	5.9935	0.0548	0.0413	1.1514	0.0305	0.1094	0.5176
71	0.1376	0.2686	0.0287	0.3681	0.0067	1.6339	5.9536	0.0565	0.0464	1.1598	0.0315	0.4084	0.2167
72	0.1402	0.2667	0.0280	0.3678	0.0059	1.7222	5.9101	0.0582	0.0519	1.1671	0.0334	0.4914	0.1146
73	0.1428	0.2649	0.0274	0.3678	0.0052	1.8110	5.8637	0.0599	0.0580	1.1733	0.0369	0.4883	0.0800
74	0.1453	0.2633	0.0268	0.3681	0.0045	1.9001	5.8147	0.0615	0.0649	1.1781	0.0441	0.4519	0.0648
75	0.1478	0.2619	0.0262	0.3686	0.0038	1.9890	5.7636	0.0626	0.0736	1.1813	0.0641	0.3957	0.0553
76	0.1502	0.2606	0.0256	0.3694	0.0032	2.0777	5.7107	0.0619	0.0857	1.1820	0.4159	0.0101	0.0487
77	0.1526	0.2595	0.0251	0.3704	0.0026	2.1658	5.6564	0.0553	0.1070	1.1790	0.3228	0.0749	0.0443
78	0.1550	0.2586	0.0245	0.3717	0.0021	2.2531	5.6010	0.0226	0.1604	1.1695	0.3404	0.0337	0.0417
79	0.1573	0.2578	0.0239	0.3733	0.0016	2.3394	5.5448	0.0069	0.2100	1.1464	0.3498	0.0046	0.0402
80	0.1597	0.2572	0.0233	0.3750	0.0012	2.4246	5.4882	0.0336	0.2562	1.0838	0.3381	0.0007	0.0395
81	0.1620	0.2567	0.0227	0.3771	0.0008	2.5085	5.4313	0.0490	0.5156	0.8188	0.3254	0.0009	0.0394
82	0.1644	0.2563	0.0221	0.3793	0.0005	2.5909	5.3745	0.0588	1.2559	0.0773	0.3093	0.0069	0.0396
83	0.1668	0.2561	0.0214	0.3819	0.0003	2.6717	5.3178	0.0661	1.3344	0.0001	0.2613	0.0464	0.0402
84	0.1693	0.2561	0.0207	0.3846	0.0001	2.7508	5.2615	0.0720	1.3260	0.0108	0.1998	0.1002	0.0412
85	0.1718	0.2561	0.0200	0.3877	0.0000	2.8281	5.2057	0.0770	1.3183	0.0213	0.2927	0.0002	0.0428
86	0.1743	0.2564	0.0191	0.3910	0.0000	2.9035	5.1505	0.0814	1.3136	0.0287	0.0596	0.2263	0.0453
87	0.1769	0.2568	0.0181	0.3947	0.0000	2.9770	5.0962	0.0855	1.3110	0.0341	0.0484	0.2293	0.0501
88	0.1795	0.2573	0.0169	0.3987	0.0002	3.0486	5.0426	0.0892	1.3096	0.0382	0.0432	0.2203	0.0613
89	0.1822	0.2581	0.0155	0.4031	0.0004	3.1181	4.9901	0.0927	1.3089	0.0414	0.0403	0.1707	0.1116
90	0.1850	0.2590	0.0137	0.4081	0.0006	3.1856	4.9385	0.0960	1.3086	0.0439	0.0385	0.1729	0.1092
91	0.1878	0.2601	0.0112	0.4138	0.0010	3.2511	4.8880	0.0991	1.3085	0.0461	0.0373	0.0174	0.2643
92	0.1907	0.2615	0.0079	0.4206	0.0014	3.3146	4.8385	0.1020	1.3086	0.0479	0.0365	0.0227	0.2587

Z	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26
60	0.4976	0.0766	0.0021	0.7423	0.2555	1.4313	0.0457	0.0003	0.3821	0.0058	0.1589	0.0380	0.0608
61	0.5085	0.0686	0.0018	0.8370	0.1188	1.4734	0.0461	0.0011	0.3841	0.0082	0.1605	0.0386	0.0608
62	0.5191	0.0619	0.0011	0.8818	0.0722	1.4721	0.0464	0.0019	0.3865	0.0097	0.1620	0.0393	0.0608
63	0.5231	0.0554	0.0000	0.3992	0.5653	1.4576	0.0467	0.0029	0.3890	0.0107	0.1633	0.0399	0.0608
64	0.4276	0.0486	0.2618	0.0395	0.6774	1.4370	0.0471	0.0040	0.3914	0.0114	0.1644	0.0404	0.0606
65	0.0955	0.0412	0.2584	0.0056	0.7304	1.4139	0.0475	0.0051	0.3937	0.0120	0.1654	0.0410	0.0605
66	0.0337	0.0332	0.2404	0.0037	0.7666	1.3896	0.0479	0.0062	0.3958	0.0124	0.1663	0.0415	0.0603
67	0.0189	0.0252	0.2284	0.0029	0.7953	1.3650	0.0483	0.0074	0.3978	0.0127	0.1670	0.0420	0.0600
68	0.0018	0.0271	0.2200	0.0024	0.8196	1.3405	0.0488	0.0086	0.3996	0.0130	0.1675	0.0425	0.0598
69	0.0031	0.0154	0.2138	0.0020	0.8408	1.3164	0.0493	0.0098	0.4012	0.0132	0.1680	0.0430	0.0594
70	0.0000	0.0128	0.2090	0.0017	0.8597	1.2930	0.0497	0.0110	0.4026	0.0134	0.1683	0.0434	0.0591
71	0.0050	0.0115	0.2053	0.0015	0.8765	1.2702	0.0502	0.0122	0.4039	0.0136	0.1685	0.0439	0.0587
72	0.0251	0.0107	0.2023	0.0013	0.8916	1.2481	0.0507	0.0133	0.4051	0.0137	0.1686	0.0443	0.0582
73	0.0616	0.0101	0.2000	0.0011	0.9050	1.2268	0.0513	0.0145	0.4062	0.0138	0.1686	0.0446	0.0577
74	0.1080	0.0097	0.1983	0.0009	0.9169	1.2064	0.0518	0.0156	0.4071	0.0139	0.1685	0.0450	0.0572
75	0.1551	0.0095	0.1972	0.0008	0.9272	1.1866	0.0524	0.0168	0.4079	0.0140	0.1683	0.0453	0.0566
76	0.1967	0.0093	0.1968	0.0007	0.9359	1.1677	0.0529	0.0178	0.4086	0.0141	0.1680	0.0456	0.0560
77	0.2300	0.0092	0.1973	0.0006	0.9429	1.1495	0.0535	0.0189	0.4092	0.0142	0.1676	0.0459	0.0553
78	0.2564	0.0092	0.1990	0.0006	0.9478	1.1320	0.0541	0.0199	0.4097	0.0142	0.1671	0.0462	0.0546
79	0.2774	0.0092	0.2025	0.0007	0.9501	1.1152	0.0547	0.0209	0.4101	0.0143	0.1666	0.0464	0.0539
80	0.2931	0.0093	0.2089	0.0011	0.9485	1.0991	0.0553	0.0219	0.4105	0.0143	0.1659	0.0467	0.0531
81	0.3049	0.0095	0.2195	0.0034	0.9400	1.0835	0.0560	0.0229	0.4108	0.0144	0.1652	0.0469	0.0523
82	0.3136	0.0098	0.2498	0.0006	0.9165	1.0685	0.0566	0.0238	0.4110	0.0144	0.1644	0.0471	0.0515
83	0.3198	0.0103	0.0071	0.3191	0.8435	1.0540	0.0572	0.0246	0.4111	0.0144	0.1635	0.0472	0.0506
84	0.3244	0.0111	0.0017	0.7220	0.4484	1.0398	0.0578	0.0255	0.4112	0.0145	0.1626	0.0473	0.0496
85	0.3269	0.0125	0.0011	1.1741	0.0000	1.0260	0.0584	0.0263	0.4112	0.0145	0.1615	0.0474	0.0487
86	0.3272	0.0151	0.0010	1.1235	0.0525	1.0124	0.0590	0.0271	0.4112	0.0145	0.1605	0.0475	0.0477
87	0.3227	0.0217	0.0010	1.0954	0.0819	0.9988	0.0595	0.0278	0.4111	0.0145	0.1593	0.0475	0.0466
88	0.2966	0.0497	0.0010	1.0806	0.0975	0.9850	0.0600	0.0285	0.4110	0.0146	0.1581	0.0475	0.0456
89	0.0458	0.3027	0.0011	1.0704	0.1082	0.9704	0.0604	0.0292	0.4108	0.0146	0.1569	0.0475	0.0445
90	0.0001	0.3526	0.0013	1.0606	0.1179	0.9540	0.0607	0.0299	0.4106	0.0146	0.1555	0.0474	0.0433
91	0.0010	0.3617	0.0013	1.0456	0.1306	0.9334	0.0609	0.0305	0.4103	0.0146	0.1542	0.0473	0.0422
92	0.0024	0.0021	0.3987	1.0018	0.1542	0.9013	0.0607	0.0311	0.4099	0.0146	0.1528	0.0472	0.0410

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - D1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1058.3	3.05-3	3.03-3	2.99-3	2.95-3	2.92-3	2.91-3
61	1113.4	3.18-3	3.16-3	3.13-3	3.10-3	3.08-3	3.08-3
62	1169.8	3.31-3	3.30-3	3.28-3	3.26-3	3.25-3	3.26-3
63	1227.5	3.46-3	3.45-3	3.44-3	3.42-3	3.42-3	3.44-3
64	1286.5	3.61-3	3.61-3	3.60-3	3.60-3	3.61-3	3.63-3
65	1346.8	3.77-3	3.77-3	3.77-3	3.77-3	3.79-3	3.82-3
66	1408.5	3.93-3	3.93-3	3.94-3	3.96-3	3.98-3	4.02-3
67	1471.5	4.09-3	4.10-3	4.12-3	4.14-3	4.18-3	4.22-3
68	1535.8	4.26-3	4.27-3	4.30-3	4.33-3	4.38-3	4.43-3
69	1601.4	4.44-3	4.45-3	4.48-3	4.53-3	4.58-3	4.64-3
70	1668.4	4.61-3	4.63-3	4.67-3	4.72-3	4.79-3	4.85-3
71	1736.7	4.79-3	4.81-3	4.86-3	4.92-3	4.99-3	5.07-3
72	1806.2	4.97-3	5.00-3	5.05-3	5.12-3	5.20-3	5.28-3
73	1877.1	5.15-3	5.18-3	5.24-3	5.32-3	5.41-3	5.50-3
74	1949.4	5.33-3	5.36-3	5.43-3	5.51-3	5.61-3	5.71-3
75	2022.9	5.51-3	5.54-3	5.61-3	5.71-3	5.82-3	5.93-3
76	2097.7	5.68-3	5.72-3	5.80-3	5.90-3	6.02-3	6.14-3
77	2173.9	5.86-3	5.90-3	5.98-3	6.09-3	6.22-3	6.35-3
78	2251.3	6.03-3	6.07-3	6.16-3	6.28-3	6.42-3	6.56-3
79	2330.1	6.20-3	6.24-3	6.34-3	6.47-3	6.62-3	6.76-3
80	2410.1	6.36-3	6.41-3	6.51-3	6.64-3	6.80-3	6.96-3
81	2491.5	6.52-3	6.57-3	6.67-3	6.82-3	6.98-3	7.15-3
82	2574.1	6.67-3	6.72-3	6.83-3	6.98-3	7.16-3	7.33-3
83	2658.1	6.81-3	6.87-3	6.99-3	7.15-3	7.33-3	7.51-3
84	2743.4	6.95-3	7.01-3	7.13-3	7.30-3	7.49-3	7.68-3
85	2829.9	7.08-3	7.15-3	7.27-3	7.44-3	7.65-3	7.85-3
86	2917.8	7.21-3	7.27-3	7.40-3	7.58-3	7.79-3	8.01-3
87	3006.9	7.32-3	7.39-3	7.52-3	7.71-3	7.93-3	8.15-3
88	3097.4	7.43-3	7.50-3	7.64-3	7.83-3	8.06-3	8.30-3
89	3189.1	7.53-3	7.60-3	7.75-3	7.94-3	8.18-3	6.43-3
90	3282.1	7.63-3	7.70-3	7.85-3	8.05-3	8.29-3	8.56-3
91	3376.5	7.71-3	7.79-3	7.94-3	8.15-3	8.40-3	8.67-3
92	3472.1	7.79-3	7.87-3	8.02-3	8.23-3	8.49-3	8.78-3

A1 - D2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1103.3	6.62-2	6.69-2	6.83-2	7.00-2	7.15-2	7.24-2
61	1159.8	6.32-2	6.39-2	6.52-2	6.69-2	6.83-2	6.92-2
62	1217.6	6.04-2	6.11-2	6.23-2	6.39-2	6.53-2	6.62-2
63	1276.8	5.78-2	5.84-2	5.96-2	6.11-2	6.24-2	6.34-2
64	1337.4	5.53-2	5.59-2	5.70-2	5.84-2	5.98-2	6.07-2
65	1399.3	5.29-2	5.35-2	5.46-2	5.59-2	5.72-2	5.82-2
66	1462.6	5.07-2	5.12-2	5.23-2	5.36-2	5.48-2	5.57-2
67	1527.3	4.86-2	4.91-2	5.01-2	5.13-2	5.25-2	5.35-2
68	1593.4	4.65-2	4.70-2	4.80-2	4.92-2	5.04-2	5.13-2
69	1660.8	4.46-2	4.51-2	4.60-2	4.72-2	4.83-2	4.92-2
70	1729.7	4.28-2	4.33-2	4.42-2	4.53-2	4.64-2	4.73-2
71	1799.9	4.11-2	4.15-2	4.24-2	4.34-2	4.45-2	4.54-2
72	1871.6	3.94-2	3.99-2	4.07-2	4.17-2	4.27-2	4.36-2
73	1944.6	3.79-2	3.83-2	3.91-2	4.01-2	4.11-2	4.19-2
74	2019.1	3.64-2	3.68-2	3.75-2	3.85-2	3.95-2	4.03-2
75	2095.0	3.50-2	3.53-2	3.60-2	3.70-2	3.79-2	3.87-2
76	2172.2	3.36-2	3.40-2	3.46-2	3.55-2	3.65-2	3.73-2
77	2251.0	3.23-2	3.26-2	3.33-2	3.42-2	3.51-2	3.59-2
78	2331.1	3.10-2	3.14-2	3.20-2	3.28-2	3.37-2	3.45-2
79	2412.7	2.98-2	3.02-2	3.08-2	3.16-2	3.24-2	3.32-2
80	2495.7	2.87-2	2.90-2	2.96-2	3.04-2	3.12-2	3.20-2
81	2580.2	2.76-2	2.79-2	2.85-2	2.92-2	3.01-2	3.08-2
82	2666.2	2.66-2	2.69-2	2.74-2	2.81-2	2.89-2	2.97-2
83	2753.6	2.56-2	2.59-2	2.64-2	2.71-2	2.79-2	2.86-2
84	2842.4	2.46-2	2.49-2	2.54-2	2.61-2	2.68-2	2.76-2
85	2932.8	2.37-2	2.40-2	2.45-2	2.51-2	2.59-2	2.66-2
86	3024.6	2.29-2	2.31-2	2.36-2	2.42-2	2.49-2	2.57-2
87	3117.9	2.20-2	2.22-2	2.27-2	2.33-2	2.41-2	2.48-2
88	3212.6	2.12-2	2.15-2	2.19-2	2.25-2	2.32-2	2.39-2
89	3308.9	2.05-2	2.07-2	2.11-2	2.17-2	2.24-2	2.31-2
90	3406.7	1.97-2	1.99-2	2.04-2	2.09-2	2.16-2	2.23-2
91	3506.0	1.91-2	1.92-2	1.96-2	2.02-2	2.08-2	2.15-2
92	3606.8	1.84-2	1.86-2	1.90-2	1.95-2	2.01-2	2.08-2

A1 - D3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1265.2	3.26-2	3.32-2	3.44-2	3.60-2	3.77-2	3.89-2
61	1325.5	3.20-2	3.26-2	3.37-2	3.53-2	3.69-2	3.81-2
62	1387.1	3.13-2	3.19-2	3.30-2	3.45-2	3.61-2	3.73-2
63	1450.2	3.07-2	3.12-2	3.23-2	3.38-2	3.54-2	3.65-2
64	1514.6	3.00-2	3.05-2	3.16-2	3.30-2	3.46-2	3.57-2
65	1580.5	2.94-2	2.99-2	3.09-2	3.23-2	3.38-2	3.50-2
66	1647.8	2.87-2	2.92-2	3.02-2	3.16-2	3.30-2	3.42-2
67	1716.5	2.81-2	2.85-2	2.95-2	3.08-2	3.23-2	3.34-2
68	1786.6	2.74-2	2.79-2	2.88-2	3.01-2	3.15-2	3.27-2
69	1858.1	2.68-2	2.72-2	2.82-2	2.94-2	3.08-2	3.19-2
70	1931.0	2.62-2	2.66-2	2.75-2	2.88-2	3.01-2	3.12-2
71	2005.4	2.56-2	2.60-2	2.69-2	2.81-2	2.94-2	3.05-2
72	2081.2	2.50-2	2.54-2	2.63-2	2.74-2	2.87-2	2.98-2
73	2158.5	2.44-2	2.48-2	2.57-2	2.68-2	2.81-2	2.91-2
74	2237.2	2.38-2	2.42-2	2.51-2	2.62-2	2.74-2	2.84-2
75	2317.3	2.33-2	2.37-2	2.45-2	2.56-2	2.68-2	2.78-2
76	2398.9	2.28-2	2.31-2	2.39-2	2.50-2	2.62-2	2.72-2
77	2482.0	2.23-2	2.26-2	2.34-2	2.44-2	2.56-2	2.66-2
78	2566.5	2.18-2	2.21-2	2.28-2	2.39-2	2.50-2	2.60-2
79	2652.4	2.13-2	2.16-2	2.23-2	2.33-2	2.45-2	2.54-2
80	2739.9	2.08-2	2.11-2	2.18-2	2.28-2	2.39-2	2.49-2
81	2828.8	2.03-2	2.07-2	2.14-2	2.23-2	2.34-2	2.43-2
82	2919.2	1.99-2	2.02-2	2.09-2	2.18-2	2.29-2	2.38-2
83	3011.1	1.94-2	1.98-2	2.04-2	2.13-2	2.24-2	2.33-2
84	3104.4	1.90-2	1.93-2	2.00-2	2.09-2	2.19-2	2.28-2
85	3199.3	1.86-2	1.89-2	1.95-2	2.04-2	2.14-2	2.24-2
86	3295.7	1.82-2	1.85-2	1.91-2	2.00-2	2.10-2	2.19-2
87	3393.5	1.78-2	1.81-2	1.87-2	1.95-2	2.05-2	2.15-2
88	3492.9	1.74-2	1.77-2	1.83-2	1.91-2	2.01-2	2.10-2
89	3593.8	1.71-2	1.73-2	1.79-2	1.87-2	1.97-2	2.06-2
90	3696.2	1.67-2	1.70-2	1.76-2	1.83-2	1.93-2	2.02-2
91	3800.1	1.64-2	1.66-2	1.72-2	1.80-2	1.89-2	1.98-2
92	3905.6	1.60-2	1.63-2	1.68-2	1.76-2	1.85-2	1.94-2

A1 - D4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1336.1	2.18-2	2.22-2	2.30-2	2.41-2	2.53-2	2.62-2
61	1402.2	2.09-2	2.12-2	2.20-2	2.30-2	2.41-2	2.50-2
62	1470.1	1.99-2	2.03-2	2.10-2	2.20-2	2.30-2	2.39-2
63	1539.9	1.90-2	1.94-2	2.00-2	2.10-2	2.20-2	2.28-2
64	1611.4	1.82-2	1.85-2	1.91-2	2.00-2	2.10-2	2.17-2
65	1684.8	1.73-2	1.76-2	1.82-2	1.91-2	2.00-2	2.08-2
66	1760.1	1.65-2	1.68-2	1.74-2	1.82-2	1.91-2	1.98-2
67	1837.3	1.58-2	1.61-2	1.66-2	1.74-2	1.82-2	1.89-2
68	1916.4	1.51-2	1.54-2	1.59-2	1.66-2	1.74-2	1.81-2
69	1997.5	1.45-2	1.47-2	1.52-2	1.59-2	1.67-2	1.73-2
70	2080.6	1.38-2	1.40-2	1.45-2	1.52-2	1.59-2	1.65-2
71	2165.7	1.32-2	1.35-2	1.39-2	1.45-2	1.52-2	1.58-2
72	2252.8	1.27-2	1.29-2	1.33-2	1.39-2	1.46-2	1.52-2
73	2342.1	1.21-2	1.23-2	1.28-2	1.33-2	1.40-2	1.45-2
74	2433.5	1.16-2	1.18-2	1.22-2	1.28-2	1.34-2	1.39-2
75	2527.0	1.12-2	1.13-2	1.17-2	1.22-2	1.29-2	1.34-2
76	2622.8	1.07-2	1.09-2	1.12-2	1.18-2	1.23-2	1.28-2
77	2720.7	1.03-2	1.04-2	1.08-2	1.13-2	1.18-2	1.23-2
78	2821.0	9.87-3	1.00-2	1.04-2	1.08-2	1.14-2	1.19-2
79	2923.6	9.48-3	9.64-3	9.95-3	1.04-2	1.09-2	1.14-2
80	3028.6	9.11-3	9.26-3	9.57-3	1.00-2	1.05-2	1.10-2
81	3136.0	8.77-3	8.91-3	9.20-3	9.62-3	1.01-2	1.06-2
82	3245.8	8.43-3	8.57-3	8.85-3	9.25-3	9.73-3	1.02-2
83	3358.2	8.12-3	8.25-3	8.52-3	8.91-3	9.37-3	9.78-3
84	3473.1	7.82-3	7.94-3	8.20-3	8.58-3	9.02-3	9.43-3
85	3590.7	7.53-3	7.65-3	7.90-3	8.26-3	8.69-3	9.09-3
86	3710.9	7.26-3	7.37-3	7.62-3	7.96-3	8.38-3	8.77-3
87	3833.9	7.00-3	7.11-3	7.34-3	7.68-3	8.08-3	8.46-3
88	3959.8	6.75-3	6.85-3	7.08-3	7.40-3	7.79-3	8.17-3
89	4088.5	6.51-3	6.61-3	6.83-3	7.14-3	7.52-3	7.89-3
90	4220.1	6.28-3	6.38-3	6.59-3	6.89-3	7.26-3	7.62-3
91	4354.8	6.06-3	6.16-3	6.36-3	6.65-3	7.01-3	7.37-3
92	4492.6	5.85-3	5.94-3	6.13-3	6.41-3	6.77-3	7.12-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - D5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1437.2	8.39-3	8.60-3	9.03-3	9.65-3	1.04-2	1.09-2
61	1506.0	9.05-3	9.27-3	9.72-3	1.04-2	1.11-2	1.17-2
62	1576.6	9.44-3	9.66-3	1.01-2	1.08-2	1.15-2	1.21-2
63	1649.0	9.64-3	9.86-3	1.03-2	1.10-2	1.17-2	1.23-2
64	1723.2	9.71-3	9.93-3	1.04-2	1.10-2	1.18-2	1.24-2
65	1799.3	9.69-3	9.90-3	1.03-2	1.10-2	1.17-2	1.23-2
66	1877.3	9.61-3	9.82-3	1.03-2	1.09-2	1.16-2	1.22-2
67	1957.2	9.48-3	9.69-3	1.01-2	1.07-2	1.14-2	1.20-2
68	2039.1	9.33-3	9.53-3	9.95-3	1.05-2	1.12-2	1.18-2
69	2123.0	9.15-3	9.35-3	9.75-3	1.03-2	1.10-2	1.16-2
70	2208.9	8.95-3	9.15-3	9.54-3	1.01-2	1.08-2	1.13-2
71	2296.9	8.75-3	8.93-3	9.32-3	9.87-3	1.05-2	1.10-2
72	2387.0	8.54-3	8.72-3	9.09-3	9.62-3	1.02-2	1.08-2
73	2479.2	8.32-3	8.50-3	8.86-3	9.38-3	9.98-3	1.05-2
74	2573.5	8.11-3	8.28-3	8.63-3	9.13-3	9.71-3	1.02-2
75	2670.1	7.89-3	8.05-3	8.39-3	8.88-3	9.45-3	9.95-3
76	2768.9	7.67-3	7.83-3	8.16-3	8.64-3	9.19-3	9.68-3
77	2870.1	7.46-3	7.62-3	7.94-3	8.39-3	8.94-3	9.41-3
78	2973.5	7.25-3	7.40-3	7.71-3	8.16-3	8.69-3	9.15-3
79	3079.3	7.05-3	7.19-3	7.49-3	7.92-3	8.44-3	8.89-3
80	3187.6	6.84-3	6.98-3	7.27-3	7.69-3	8.19-3	8.64-3
81	3298.3	6.64-3	6.78-3	7.06-3	7.47-3	7.96-3	8.40-3
82	3411.5	6.45-3	6.58-3	6.85-3	7.25-3	7.73-3	8.16-3
83	3527.3	6.26-3	6.39-3	6.65-3	7.03-3	7.50-3	7.92-3
84	3645.8	6.07-3	6.20-3	6.45-3	6.83-3	7.28-3	7.69-3
85	3766.9	5.89-3	6.01-3	6.26-3	6.62-3	7.06-3	7.47-3
86	3890.8	5.71-3	5.83-3	6.07-3	6.42-3	6.85-3	7.25-3
87	4017.6	5.54-3	5.65-3	5.88-3	6.22-3	6.64-3	7.03-3
88	4147.2	5.37-3	5.47-3	5.70-3	6.03-3	6.44-3	6.83-3
89	4279.8	5.20-3	5.30-3	5.52-3	5.84-3	6.24-3	6.62-3
90	4415.4	5.03-3	5.13-3	5.34-3	5.65-3	6.04-3	6.42-3
91	4554.1	4.87-3	4.96-3	5.17-3	5.47-3	5.85-3	6.22-3
92	4696.1	4.70-3	4.80-3	5.00-3	5.29-3	5.66-3	6.02-3

A1 - D6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1474.3	7.11-3	7.20-3	7.37-3	7.60-3	7.83-3	7.99-3
61	1552.5	7.06-3	7.14-3	7.31-3	7.53-3	7.76-3	7.92-3
62	1632.7	7.03-3	7.11-3	7.28-3	7.49-3	7.72-3	7.88-3
63	1714.8	7.00-3	7.08-3	7.25-3	7.46-3	7.68-3	7.85-3
64	1798.9	6.97-3	7.05-3	7.22-3	7.43-3	7.65-3	7.82-3
65	1884.8	6.94-3	7.02-3	7.18-3	7.39-3	7.62-3	7.79-3
66	1972.7	6.90-3	6.98-3	7.14-3	7.35-3	7.57-3	7.75-3
67	2062.5	6.85-3	6.93-3	7.09-3	7.30-3	7.52-3	7.69-3
68	2154.2	6.79-3	6.87-3	7.03-3	7.24-3	7.46-3	7.64-3
69	2247.9	6.73-3	6.81-3	6.96-3	7.17-3	7.39-3	7.57-3
70	2343.4	6.65-3	6.73-3	6.89-3	7.09-3	7.31-3	7.49-3
71	2440.9	6.58-3	6.65-3	6.81-3	7.01-3	7.23-3	7.41-3
72	2540.3	6.49-3	6.57-3	6.72-3	6.92-3	7.14-3	7.32-3
73	2641.6	6.41-3	6.48-3	6.63-3	6.83-3	7.05-3	7.23-3
74	2744.8	6.31-3	6.39-3	6.54-3	6.73-3	6.95-3	7.13-3
75	2850.0	6.22-3	6.29-3	6.44-3	6.63-3	6.85-3	7.03-3
76	2957.0	6.12-3	6.19-3	6.34-3	6.53-3	6.75-3	6.93-3
77	3066.0	6.03-3	6.10-3	6.24-3	6.43-3	6.64-3	6.83-3
78	3176.9	5.93-3	6.00-3	6.14-3	6.33-3	6.54-3	6.73-3
79	3289.7	5.83-3	5.90-3	6.04-3	6.22-3	6.43-3	6.62-3
80	3404.4	5.73-3	5.80-3	5.94-3	6.12-3	6.33-3	6.52-3
81	3521.1	5.64-3	5.70-3	5.84-3	6.02-3	6.22-3	6.42-3
82	3639.6	5.54-3	5.61-3	5.74-3	5.92-3	6.12-3	6.32-3
83	3760.1	5.45-3	5.51-3	5.64-3	5.82-3	6.02-3	6.22-3
84	3882.5	5.36-3	5.42-3	5.55-3	5.73-3	5.93-3	6.12-3
85	4006.8	5.27-3	5.33-3	5.46-3	5.63-3	5.83-3	6.03-3
86	4133.1	5.18-3	5.24-3	5.37-3	5.54-3	5.74-3	5.94-3
87	4261.3	5.10-3	5.16-3	5.28-3	5.45-3	5.65-3	5.85-3
88	4391.4	5.02-3	5.08-3	5.20-3	5.37-3	5.57-3	5.77-3
89	4523.4	4.94-3	5.00-3	5.12-3	5.29-3	5.49-3	5.69-3
90	4657.3	4.87-3	4.93-3	5.05-3	5.22-3	5.42-3	5.62-3
91	4793.2	4.80-3	4.86-3	4.98-3	5.15-3	5.35-3	5.56-3
92	4930.9	4.74-3	4.80-3	4.92-3	5.08-3	5.28-3	5.49-3

A1 - D7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1500.7	3.09-2	3.13-2	3.22-2	3.33-2	3.43-2	3.50-2
61	1580.1	2.78-2	2.82-2	2.89-2	2.99-2	3.08-2	3.15-2
62	1661.7	2.52-2	2.55-2	2.62-2	2.71-2	2.79-2	2.85-2
63	1745.3	2.29-2	2.32-2	2.38-2	2.46-2	2.54-2	2.60-2
64	1831.0	2.10-2	2.13-2	2.18-2	2.25-2	2.32-2	2.38-2
65	1918.7	1.93-2	1.95-2	2.00-2	2.07-2	2.13-2	2.18-2
66	2008.5	1.78-2	1.80-2	1.85-2	1.90-2	1.96-2	2.01-2
67	2100.4	1.64-2	1.66-2	1.71-2	1.76-2	1.82-2	1.86-2
68	2194.3	1.52-2	1.54-2	1.58-2	1.63-2	1.68-2	1.72-2
69	2290.4	1.42-2	1.43-2	1.47-2	1.51-2	1.56-2	1.60-2
70	2388.5	1.32-2	1.33-2	1.37-2	1.41-2	1.46-2	1.49-2
71	2488.6	1.23-2	1.25-2	1.28-2	1.32-2	1.36-2	1.39-2
72	2590.9	1.15-2	1.17-2	1.19-2	1.23-2	1.27-2	1.30-2
73	2695.2	1.08-2	1.09-2	1.12-2	1.16-2	1.19-2	1.22-2
74	2801.7	1.02-2	1.03-2	1.05-2	1.09-2	1.12-2	1.15-2
75	2910.2	9.57-3	9.68-3	9.92-3	1.02-2	1.06-2	1.09-2
76	3020.9	9.03-3	9.13-3	9.35-3	9.64-3	9.96-3	1.02-2
77	3133.7	8.53-3	8.63-3	8.84-3	9.11-3	9.41-3	9.68-3
78	3248.6	8.08-3	8.17-3	8.37-3	8.63-3	8.91-3	9.17-3
79	3365.6	7.66-3	7.75-3	7.93-3	8.18-3	8.45-3	8.70-3
80	3484.7	7.27-3	7.36-3	7.54-3	7.77-3	8.03-3	8.27-3
81	3606.0	6.92-3	7.00-3	7.17-3	7.39-3	7.64-3	7.88-3
82	3729.5	6.59-3	6.67-3	6.83-3	7.04-3	7.28-3	7.51-3
83	3855.1	6.29-3	6.36-3	6.51-3	6.72-3	6.95-3	7.17-3
84	3982.8	6.01-3	6.08-3	6.22-3	6.42-3	6.64-3	6.86-3
85	4112.7	5.75-3	5.82-3	5.95-3	6.14-3	6.36-3	6.57-3
86	4244.8	5.51-3	5.57-3	5.70-3	5.88-3	6.09-3	6.30-3
87	4379.1	5.28-3	5.34-3	5.47-3	5.64-3	5.84-3	6.05-3
88	4515.5	5.07-3	5.13-3	5.25-3	5.42-3	5.62-3	5.82-3
89	4654.2	4.88-3	4.93-3	5.05-3	5.21-3	5.40-3	5.60-3
90	4795.0	4.69-3	4.75-3	4.86-3	5.01-3	5.20-3	5.40-3
91	4938.1	4.52-3	4.58-3	4.68-3	4.83-3	5.02-3	5.21-3
92	5083.4	4.36-3	4.41-3	4.52-3	4.66-3	4.84-3	5.03-3

A1 - D8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1729.3	9.32-3	9.51-3	9.88-3	1.04-2	1.09-2	1.13-2
61	1814.5	8.93-3	9.10-3	9.46-3	9.94-3	1.05-2	1.08-2
62	1901.7	8.56-3	8.72-3	9.06-3	9.52-3	1.00-2	1.04-2
63	1991.0	8.21-3	8.37-3	8.69-3	9.13-3	9.60-3	9.96-3
64	2082.3	7.88-3	8.03-3	8.34-3	8.76-3	9.22-3	9.56-3
65	2175.8	7.57-3	7.72-3	8.01-3	8.41-3	8.85-3	9.19-3
66	2271.2	7.28-3	7.42-3	7.70-3	8.08-3	8.51-3	8.83-3
67	2368.8	7.00-3	7.14-3	7.41-3	7.77-3	8.18-3	8.50-3
68	2468.4	6.75-3	6.87-3	7.13-3	7.49-3	7.88-3	8.19-3
69	2570.1	6.50-3	6.62-3	6.87-3	7.21-3	7.59-3	7.89-3
70	2673.9	6.27-3	6.39-3	6.63-3	6.95-3	7.32-3	7.61-3
71	2779.7	6.05-3	6.16-3	6.39-3	6.71-3	7.06-3	7.35-3
72	2887.7	5.84-3	5.95-3	6.17-3	6.48-3	6.82-3	7.10-3
73	2997.8	5.65-3	5.75-3	5.97-3	6.26-3	6.59-3	6.86-3
74	3110.0	5.46-3	5.56-3	5.77-3	6.05-3	6.37-3	6.63-3
75	3224.3	5.28-3	5.38-3	5.58-3	5.85-3	6.16-3	6.42-3
76	3340.8	5.11-3	5.21-3	5.40-3	5.67-3	5.96-3	6.22-3
77	3459.3	4.96-3	5.05-3	5.23-3	5.49-3	5.78-3	6.03-3
78	3580.0	4.80-3	4.89-3	5.07-3	5.32-3	5.60-3	5.85-3
79	3702.9	4.66-3	4.74-3	4.92-3	5.16-3	5.43-3	5.67-3
80	3827.9	4.52-3	4.60-3	4.77-3	5.01-3	5.27-3	5.51-3
81	3955.1	4.39-3	4.47-3	4.64-3	4.86-3	5.12-3	5.35-3
82	4084.4	4.26-3	4.34-3	4.50-3	4.72-3	4.97-3	5.20-3
83	4215.9	4.14-3	4.22-3	4.38-3	4.59-3	4.84-3	5.06-3
84	4349.6	4.03-3	4.10-3	4.26-3	4.46-3	4.70-3	4.92-3
85	4485.5	3.92-3	3.99-3	4.14-3	4.34-3	4.58-3	4.80-3
86	4623.5	3.82-3	3.89-3	4.03-3	4.23-3	4.46-3	4.67-3
87	4763.8	3.72-3	3.78-3	3.92-3	4.12-3	4.34-3	4.56-3
88	4906.3	3.62-3	3.69-3	3.82-3	4.01-3	4.23-3	4.44-3
89	5051.0	3.53-3	3.59-3	3.73-3	3.91-3	4.13-3	4.34-3
90	5197.9	3.44-3	3.50-3	3.63-3	3.81-3	4.03-3	4.23-3
91	5347.1	3.36-3	3.42-3	3.54-3	3.72-3	3.93-3	4.14-3
92	5498.5	3.28-3	3.34-3	3.46-3	3.63-3	3.84-3	4.04-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – D9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1821.3	4.78-3	4.87-3	5.05-3	5.30-3	5.58-3	5.79-3
61	1914.3	4.53-3	4.61-3	4.79-3	5.02-3	5.29-3	5.49-3
62	2009.8	4.30-3	4.38-3	4.54-3	4.76-3	5.02-3	5.21-3
63	2107.9	4.08-3	4.16-3	4.31-3	4.52-3	4.76-3	4.95-3
64	2208.6	3.88-3	3.95-3	4.10-3	4.30-3	4.53-3	4.71-3
65	2311.9	3.70-3	3.76-3	3.90-3	4.09-3	4.31-3	4.48-3
66	2417.9	3.52-3	3.59-3	3.72-3	3.90-3	4.11-3	4.27-3
67	2526.7	3.36-3	3.42-3	3.55-3	3.72-3	3.92-3	4.08-3
68	2638.2	3.21-3	3.27-3	3.39-3	3.55-3	3.74-3	3.90-3
69	2752.4	3.07-3	3.13-3	3.24-3	3.40-3	3.58-3	3.73-3
70	2869.6	2.94-3	2.99-3	3.10-3	3.25-3	3.42-3	3.57-3
71	2989.5	2.82-3	2.87-3	2.97-3	3.11-3	3.28-3	3.42-3
72	3112.4	2.70-3	2.75-3	2.85-3	2.98-3	3.14-3	3.28-3
73	3238.3	2.59-3	2.64-3	2.73-3	2.86-3	3.01-3	3.14-3
74	3367.1	2.49-3	2.53-3	2.62-3	2.75-3	2.89-3	3.02-3
75	3499.0	2.39-3	2.43-3	2.52-3	2.64-3	2.78-3	2.90-3
76	3634.1	2.30-3	2.34-3	2.42-3	2.54-3	2.67-3	2.79-3
77	3772.2	2.21-3	2.25-3	2.33-3	2.44-3	2.57-3	2.69-3
78	3913.6	2.13-3	2.17-3	2.24-3	2.35-3	2.48-3	2.59-3
79	4058.3	2.05-3	2.09-3	2.16-3	2.26-3	2.39-3	2.50-3
80	4206.3	1.98-3	2.01-3	2.08-3	2.18-3	2.30-3	2.41-3
81	4357.7	1.91-3	1.94-3	2.01-3	2.10-3	2.22-3	2.32-3
82	4512.5	1.84-3	1.87-3	1.94-3	2.03-3	2.14-3	2.24-3
83	4670.9	1.78-3	1.81-3	1.87-3	1.96-3	2.07-3	2.17-3
84	4832.8	1.72-3	1.75-3	1.81-3	1.89-3	2.00-3	2.10-3
85	4998.5	1.66-3	1.69-3	1.75-3	1.83-3	1.93-3	2.03-3
86	5167.8	1.61-3	1.64-3	1.69-3	1.77-3	1.87-3	1.96-3
87	5341.0	1.56-3	1.58-3	1.64-3	1.71-3	1.81-3	1.90-3
88	5518.2	1.51-3	1.53-3	1.58-3	1.66-3	1.75-3	1.84-3
89	5699.3	1.46-3	1.48-3	1.53-3	1.61-3	1.70-3	1.79-3
90	5884.6	1.41-3	1.44-3	1.48-3	1.56-3	1.64-3	1.73-3
91	6074.0	1.37-3	1.39-3	1.44-3	1.51-3	1.60-3	1.68-3
92	6267.8	1.33-3	1.35-3	1.40-3	1.46-3	1.55-3	1.63-3

A1 – D10

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1959.2	3.29-3	3.37-3	3.53-3	3.76-3	4.02-3	4.23-3
61	2055.7	3.15-3	3.23-3	3.38-3	3.60-3	3.85-3	4.04-3
62	2154.8	3.02-3	3.09-3	3.24-3	3.44-3	3.68-3	3.87-3
63	2256.5	2.90-3	2.96-3	3.10-3	3.30-3	3.53-3	3.71-3
64	2360.9	2.78-3	2.84-3	2.98-3	3.17-3	3.38-3	3.56-3
65	2468.0	2.67-3	2.73-3	2.86-3	3.04-3	3.25-3	3.42-3
66	2577.7	2.57-3	2.62-3	2.74-3	2.92-3	3.12-3	3.28-3
67	2690.3	2.47-3	2.52-3	2.64-3	2.80-3	3.00-3	3.16-3
68	2805.6	2.37-3	2.43-3	2.54-3	2.70-3	2.88-3	3.04-3
69	2923.8	2.29-3	2.34-3	2.44-3	2.60-3	2.78-3	2.92-3
70	3044.9	2.20-3	2.25-3	2.35-3	2.50-3	2.67-3	2.82-3
71	3168.9	2.12-3	2.17-3	2.27-3	2.41-3	2.57-3	2.72-3
72	3295.8	2.05-3	2.09-3	2.19-3	2.32-3	2.48-3	2.62-3
73	3425.8	1.98-3	2.02-3	2.11-3	2.24-3	2.39-3	2.53-3
74	3558.8	1.91-3	1.95-3	2.04-3	2.16-3	2.31-3	2.44-3
75	3695.0	1.84-3	1.88-3	1.97-3	2.09-3	2.23-3	2.36-3
76	3834.3	1.78-3	1.82-3	1.90-3	2.02-3	2.16-3	2.28-3
77	3976.8	1.72-3	1.76-3	1.84-3	1.95-3	2.09-3	2.21-3
78	4122.7	1.67-3	1.70-3	1.78-3	1.89-3	2.02-3	2.14-3
79	4271.8	1.61-3	1.65-3	1.72-3	1.83-3	1.95-3	2.07-3
80	4424.4	1.56-3	1.60-3	1.67-3	1.77-3	1.89-3	2.00-3
81	4580.4	1.51-3	1.55-3	1.61-3	1.71-3	1.83-3	1.94-3
82	4740.0	1.47-3	1.50-3	1.56-3	1.66-3	1.77-3	1.88-3
83	4903.2	1.42-3	1.45-3	1.52-3	1.61-3	1.72-3	1.83-3
84	5070.1	1.38-3	1.41-3	1.47-3	1.56-3	1.67-3	1.77-3
85	5240.8	1.34-3	1.37-3	1.43-3	1.51-3	1.62-3	1.72-3
86	5415.2	1.30-3	1.33-3	1.38-3	1.47-3	1.57-3	1.67-3
87	5593.7	1.26-3	1.29-3	1.34-3	1.42-3	1.53-3	1.62-3
88	5776.1	1.22-3	1.25-3	1.30-3	1.38-3	1.48-3	1.58-3
89	5962.7	1.19-3	1.21-3	1.27-3	1.34-3	1.44-3	1.54-3
90	6153.5	1.15-3	1.18-3	1.23-3	1.31-3	1.40-3	1.49-3
91	6348.7	1.12-3	1.15-3	1.20-3	1.27-3	1.36-3	1.45-3
92	6548.2	1.09-3	1.11-3	1.16-3	1.23-3	1.32-3	1.42-3

A1 – E1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	863.4	5.11-4	4.52-4	3.45-4	2.26-4	1.19-4	5.56-5
61	910.8	4.85-4	4.28-4	3.28-4	2.14-4	1.13-4	5.26-5
62	959.4	4.60-4	4.07-4	3.11-4	2.03-4	1.07-4	4.98-5
63	1009.1	4.38-4	3.87-4	2.96-4	1.93-4	1.02-4	4.72-5
64	1059.9	4.17-4	3.69-4	2.82-4	1.84-4	9.65-5	4.49-5
65	1111.8	3.98-4	3.52-4	2.69-4	1.76-4	9.19-5	4.27-5
66	1164.8	3.80-4	3.36-4	2.58-4	1.68-4	8.76-5	4.07-5
67	1218.8	3.63-4	3.22-4	2.46-4	1.60-4	8.37-5	3.88-5
68	1274.0	3.48-4	3.08-4	2.36-4	1.53-4	8.00-5	3.70-5
69	1330.2	3.34-4	2.95-4	2.26-4	1.47-4	7.65-5	3.54-5
70	1387.4	3.21-4	2.84-4	2.17-4	1.41-4	7.33-5	3.39-5
71	1445.7	3.08-4	2.73-4	2.09-4	1.35-4	7.03-5	3.25-5
72	1504.9	2.97-4	2.62-4	2.01-4	1.30-4	6.75-5	3.12-5
73	1565.2	2.86-4	2.53-4	1.93-4	1.25-4	6.49-5	3.00-5
74	1626.4	2.76-4	2.44-4	1.86-4	1.21-4	6.24-5	2.88-5
75	1688.6	2.66-4	2.35-4	1.80-4	1.16-4	6.01-5	2.77-5
76	1751.8	2.58-4	2.28-4	1.74-4	1.12-4	5.79-5	2.67-5
77	1815.9	2.49-4	2.20-4	1.68-4	1.09-4	5.59-5	2.58-5
78	1880.9	2.41-4	2.13-4	1.63-4	1.05-4	5.40-5	2.49-5
79	1946.8	2.34-4	2.07-4	1.57-4	1.02-4	5.22-5	2.40-5
80	2013.5	2.27-4	2.01-4	1.53-4	9.83-5	5.05-5	2.32-5
81	2081.1	2.21-4	1.95-4	1.48-4	9.53-5	4.89-5	2.25-5
82	2149.5	2.15-4	1.89-4	1.44-4	9.25-5	4.74-5	2.18-5
83	2218.7	2.09-4	1.84-4	1.40-4	8.98-5	4.59-5	2.11-5
84	2288.7	2.04-4	1.80-4	1.36-4	8.73-5	4.46-5	2.04-5
85	2359.4	1.99-4	1.75-4	1.33-4	8.49-5	4.33-5	1.99-5
86	2430.8	1.94-4	1.71-4	1.29-4	8.26-5	4.21-5	1.93-5
87	2502.9	1.89-4	1.67-4	1.26-4	8.04-5	4.09-5	1.87-5
88	2575.6	1.85-4	1.63-4	1.23-4	7.84-5	3.98-5	1.82-5
89	2649.0	1.81-4	1.59-4	1.20-4	7.64-5	3.88-5	1.77-5
90	2722.9	1.77-4	1.56-4	1.17-4	7.46-5	3.78-5	1.73-5
91	2797.4	1.73-4	1.52-4	1.15-4	7.28-5	3.69-5	1.68-5
92	2872.3	1.70-4	1.49-4	1.12-4	7.12-5	3.60-5	1.64-5

A1 – E2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1039.2	2.77-3	2.48-3	1.91-3	1.23-3	6.42-4	3.10-4
61	1092.9	2.60-3	2.32-3	1.79-3	1.15-3	6.00-4	2.90-4
62	1147.9	2.44-3	2.18-3	1.68-3	1.08-3	5.62-4	2.71-4
63	1204.1	2.30-3	2.05-3	1.58-3	1.02-3	5.27-4	2.53-4
64	1261.5	2.17-3	1.93-3	1.48-3	9.54-4	4.95-4	2.38-4
65	1320.2	2.04-3	1.82-3	1.40-3	8.98-4	4.66-4	2.23-4
66	1380.1	1.93-3	1.72-3	1.32-3	8.48-4	4.39-4	2.10-4
67	1441.3	1.83-3	1.63-3	1.25-3	8.01-4	4.14-4	1.98-4
68	1503.7	1.73-3	1.54-3	1.18-3	7.58-4	3.91-4	1.87-4
69	1567.3	1.65-3	1.47-3	1.12-3	7.18-4	3.71-4	1.77-4
70	1632.1	1.57-3	1.39-3	1.06-3	6.82-4	3.51-4	1.67-4
71	1698.2	1.49-3	1.33-3	1.01-3	6.48-4	3.34-4	1.59-4
72	1765.4	1.42-3	1.26-3	9.65-4	6.17-4	3.17-4	1.51-4
73	1833.9	1.36-3	1.21-3	9.20-4	5.88-4	3.02-4	1.43-4
74	1903.6	1.30-3	1.15-3	8.79-4	5.61-4	2.88-4	1.36-4
75	1974.5	1.24-3	1.10-3	8.40-4	5.36-4	2.75-4	1.30-4
76	2046.7	1.19-3	1.06-3	8.04-4	5.13-4	2.63-4	1.24-4
77	2120.0	1.14-3	1.01-3	7.71-4	4.91-4	2.51-4	1.19-4
78	2194.5	1.09-3	9.70-4	7.39-4	4.71-4	2.41-4	1.14-4
79	2270.2	1.05-3	9.32-4	7.10-4	4.52-4	2.31-4	1.09-4
80	2347.0	1.01-3	8.96-4	6.83-4	4.34-4	2.22-4	1.04-4
81	2425.1	9.73-4	8.63-4	6.57-4	4.18-4	2.13-4	1.00-4
82	2504.4	9.38-4	8.31-4	6.33-4	4.02-4	2.05-4	9.65-5
83	2584.8	9.04-4	8.02-4	6.10-4	3.88-4	1.97-4	9.28-5
84	2666.4	8.73-4	7.74-4	5.89-4	3.74-4	1.90-4	8.94-5
85	2749.1	8.44-4	7.48-4	5.69-4	3.61-4	1.84-4	8.62-5
86	2833.0	8.16-4	7.23-4	5.50-4	3.49-4	1.78-4	8.33-5
87	2918.1	7.90-4	7.00-4	5.32-4	3.38-4	1.72-4	8.04-5
88	3004.3	7.65-4	6.78-4	5.15-4	3.27-4	1.66-4	7.78-5
89	3091.7	7.42-4	6.57-4	5.00-4	3.17-4	1.61-4	7.53-5
90	3180.2	7.20-4	6.38-4	4.85-4	3.07-4	1.56-4	7.30-5
91	3269.8	6.99-4	6.20-4	4.71-4	2.98-4	1.51-4	7.08-5
92	3360.5	6.80-4	6.02-4	4.57-4	2.90-4	1.47-4	6.97-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – E3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1048.6	1.63-3	1.44-3	1.09-3	6.70-4	3.24-4	1.43-4
61	1102.9	1.56-3	1.38-3	1.04-3	6.44-4	3.12-4	1.38-4
62	1158.6	1.50-3	1.33-3	1.00-3	6.19-4	3.00-4	1.33-4
63	1215.5	1.44-3	1.28-3	9.61-4	5.95-4	2.89-4	1.29-4
64	1273.8	1.39-3	1.23-3	9.24-4	5.72-4	2.79-4	1.24-4
65	1333.3	1.34-3	1.18-3	8.89-4	5.51-4	2.69-4	1.20-4
66	1394.2	1.29-3	1.14-3	8.56-4	5.31-4	2.60-4	1.16-4
67	1456.3	1.24-3	1.10-3	8.24-4	5.12-4	2.51-4	1.12-4
68	1519.7	1.20-3	1.06-3	7.94-4	4.93-4	2.42-4	1.09-4
69	1584.5	1.15-3	1.02-3	7.66-4	4.76-4	2.34-4	1.05-4
70	1650.5	1.11-3	9.82-4	7.39-4	4.59-4	2.26-4	1.02-4
71	1717.9	1.07-3	9.48-4	7.13-4	4.43-4	2.18-4	9.84-5
72	1786.5	1.04-3	9.15-4	6.88-4	4.28-4	2.11-4	9.53-5
73	1856.4	1.00-3	8.84-4	6.65-4	4.14-4	2.04-4	9.22-5
74	1927.6	9.68-4	8.54-4	6.43-4	4.00-4	1.97-4	8.93-5
75	2000.1	9.36-4	8.26-4	6.22-4	3.87-4	1.91-4	8.65-5
76	2073.9	9.05-4	7.99-4	6.01-4	3.75-4	1.85-4	8.38-5
77	2149.1	8.76-4	7.73-4	5.82-4	3.63-4	1.79-4	8.13-5
78	2225.4	8.48-4	7.48-4	5.63-4	3.51-4	1.74-4	7.88-5
79	2303.1	8.21-4	7.25-4	5.46-4	3.40-4	1.68-4	7.64-5
80	2382.1	7.96-4	7.02-4	5.29-4	3.30-4	1.63-4	7.41-5
81	2462.4	7.71-4	6.81-4	5.13-4	3.20-4	1.58-4	7.20-5
82	2544.0	7.48-4	6.60-4	4.97-4	3.10-4	1.54-4	6.99-5
83	2626.8	7.26-4	6.41-4	4.82-4	3.01-4	1.49-4	6.78-5
84	2711.0	7.04-4	6.22-4	4.68-4	2.92-4	1.45-4	6.59-5
85	2796.4	6.84-4	6.03-4	4.55-4	2.84-4	1.41-4	6.41-5
86	2883.1	6.64-4	5.86-4	4.42-4	2.76-4	1.37-4	6.23-5
87	2971.1	6.45-4	5.70-4	4.29-4	2.69-4	1.33-4	6.06-5
88	3060.4	6.27-4	5.54-4	4.17-4	2.61-4	1.29-4	5.89-5
89	3151.0	6.10-4	5.39-4	4.06-4	2.53-4	1.26-4	5.74-5
90	3242.9	5.94-4	5.24-4	3.95-4	2.47-4	1.22-4	5.58-5
91	3336.1	5.78-4	5.10-4	3.84-4	2.40-4	1.19-4	5.44-5
92	3430.5	5.63-4	4.96-4	3.74-4	2.34-4	1.16-4	5.30-5

A1 – E4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1066.0	1.54-3	1.37-3	1.03-3	6.43-4	3.13-4	1.39-4
61	1121.8	1.46-3	1.29-3	9.76-4	6.07-4	2.96-4	1.32-4
62	1179.0	1.38-3	1.22-3	9.23-4	5.74-4	2.80-4	1.25-4
63	1237.6	1.31-3	1.16-3	8.75-4	5.44-4	2.65-4	1.18-4
64	1297.5	1.24-3	1.10-3	8.30-4	5.16-4	2.52-4	1.12-4
65	1358.9	1.18-3	1.04-3	7.89-4	4.90-4	2.39-4	1.06-4
66	1421.6	1.12-3	9.94-4	7.50-4	4.66-4	2.28-4	1.01-4
67	1485.7	1.07-3	9.48-4	7.15-4	4.44-4	2.17-4	9.64-5
68	1551.3	1.02-3	9.04-4	6.82-4	4.24-4	2.07-4	9.20-5
69	1618.2	9.77-4	8.64-4	6.51-4	4.05-4	1.97-4	8.78-5
70	1686.6	9.35-4	8.26-4	6.23-4	3.87-4	1.89-4	8.40-5
71	1756.3	8.95-4	7.91-4	5.96-4	3.70-4	1.81-4	8.04-5
72	1827.5	8.58-4	7.58-4	5.71-4	3.55-4	1.73-4	7.70-5
73	1900.1	8.23-4	7.28-4	5.48-4	3.40-4	1.66-4	7.39-5
74	1974.1	7.91-4	6.99-4	5.26-4	3.27-4	1.60-4	7.09-5
75	2049.6	7.60-4	6.72-4	5.06-4	3.14-4	1.53-4	6.82-5
76	2126.5	7.31-4	6.46-4	4.87-4	3.02-4	1.48-4	6.56-5
77	2204.8	7.04-4	6.22-4	4.69-4	2.91-4	1.42-4	6.32-5
78	2284.5	6.79-4	5.99-4	4.52-4	2.80-4	1.37-4	6.09-5
79	2365.7	6.5[illegible]-4	5.78-4	4.36-4	2.71-4	1.32-4	5.87-5
80	2448.4	6.32-4	5.58-4	4.20-4	2.61-4	1.27-4	5.67-5
81	2532.5	6.10-4	5.39-4	4.06-4	2.52-4	1.23-4	5.48-5
82	2618.0	5.90-4	5.21-4	3.93-4	2.44-4	1.19-4	5.30-5
83	2705.0	5.71-4	5.05-4	3.80-4	2.36-4	1.15-4	5.[illegible]4-5
84	2793.5	5.53-4	4.89-4	3.68-4	2.29-4	1.12-4	4.98-5
85	2883.5	5.36-4	4.74-4	3.57-4	2.22-4	1.09-4	4.83-5
86	2974.9	5.21-4	4.60-4	3.47-4	2.16-4	1.05-4	4.70-5
87	3067.7	5.06-4	4.47-4	3.37-4	2.10-4	1.03-4	4.57-5
88	3162.0	4.93-4	4.36-4	3.28-4	2.04-4	1.00-4	4.46-5
89	3257.8	4.81-4	4.25-4	3.20-4	2.00-4	9.78-5	4.37-5
90	3354.7	4.70-4	4.16-4	3.13-4	1.95-4	9.61-5	4.31-5
91	3451.7	4.33-4	3.82-4	2.88-4	1.80-4	9.00-5	4.11-5
92	3543.1	2.41-4	2.12-4	1.60-4	1.02-4	5.35-5	2.59-5

A1 – E5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1071.9	1.68-3	1.49-3	1.13-3	7.06-4	3.48-4	1.57-4
61	1128.3	1.61-3	1.43-3	1.08-3	6.78-4	3.35-4	1.52-4
62	1186.1	1.54-3	1.37-3	1.04-3	6.52-4	3.23-4	1.46-4
63	1245.4	1.48-3	1.32-3	9.98-4	6.26-4	3.11-4	1.41-4
64	1306.2	1.43-3	1.27-3	9.60-4	6.02-4	2.99-4	1.36-4
65	1368.3	1.37-3	1.22-3	9.23-4	5.80-4	2.88-4	1.31-4
66	1432.0	1.32-3	1.17-3	8.88-4	5.58-4	2.78-4	1.27-4
67	1497.1	1.27-3	1.13-3	8.55-4	5.38-4	2.68-4	1.23-4
68	1563.6	1.22-3	1.09-3	8.23-4	5.18-4	2.59-4	1.18-4
69	1631.7	1.18-3	1.05-3	7.94-4	5.00-4	2.50-4	1.15-4
70	1701.2	1.14-3	1.01-3	7.65-4	4.82-4	2.41-4	1.11-4
71	1772.2	1.10-3	9.73-4	7.39-4	4.66-4	2.33-4	1.07-4
72	1844.7	1.06-3	9.40-4	7.13-4	4.50-4	2.25-4	1.04-4
73	1918.7	1.02-3	9.08-4	6.89-4	4.35-4	2.18-4	1.00-4
74	1994.2	9.90-4	8.77-4	6.66-4	4.20-4	2.11-4	9.73-5
75	2071.2	9.57-4	8.48-4	6.44-4	4.07-4	2.05-4	9.43-5
76	2149.7	9.26-4	8.21-4	6.24-4	3.94-4	1.98-4	9.15-5
77	2229.8	8.97-4	7.95-4	6.04-4	3.82-4	1.92-4	8.88-5
78	2311.4	8.69-4	7.70-4	5.85-4	3.70-4	1.87-4	8.63-5
79	2394.5	8.42-4	7.47-4	5.68-4	3.59-4	1.81-4	8.38-5
80	2479.2	8.17-4	7.24-4	5.51-4	3.49-4	1.76-4	8.15-5
81	2565.5	7.93-4	7.04-4	5.35-4	3.39-4	1.71-4	7.94-5
82	2653.3	7.71-4	6.84-4	5.20-4	3.30-4	1.67-4	7.74-5
83	2742.6	7.50-4	6.66-4	5.07-4	3.21-4	1.63-4	7.56-5
84	2833.6	7.32-4	6.49-4	4.94-4	3.14-4	1.59-4	7.40-5
85	2926.0	7.16-4	6.35-4	4.84-4	3.07-4	1.56-4	7.28-5
86	3019.9	7.04-4	6.25-4	4.76-4	3.03-4	1.54-4	7.22-5
87	3114.4	6.65-4	5.90-4	4.50-4	2.88-4	1.48-4	7.04-5
88	3203.1	2.91-4	2.57-4	1.95-4	1.27-4	6.77-5	3.35-5
89	3288.3	1.97-4	1.73-4	1.31-4	8.48-5	4.56-5	2.27-5
90	3373.8	1.66-4	1.46-4	1.10-4	7.12-5	3.82-5	1.89-5
91	3461.5	1.75-4	1.54-4	1.16-4	7.38-5	3.80-5	1.80-5
92	3556.8	3.42-4	3.02-4	2.28-4	1.42-4	6.93-5	3.07-5

A1 – E6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1215.6	7.24-4	6.35-4	4.74-4	3.02-4	1.61-4	8.07-5
61	1272.1	6.75-4	5.91-4	4.42-4	2.81-4	1.51-4	7.51-5
62	1329.9	6.30-4	5.52-4	4.12-4	2.63-4	1.41-4	7.01-5
63	1388.8	5.89-4	5.16-4	3.86-4	2.46-4	1.32-4	6.56-5
64	1448.8	5.52-4	4.84-4	3.62-4	2.31-4	1.24-4	6.15-5
65	1510.1	5.19-4	4.54-4	3.40-4	2.17-4	1.16-4	5.77-5
66	1572.4	4.88-4	4.27-4	3.20-4	2.04-4	1.10-4	5.43-5
67	1635.9	4.59-4	4.02-4	3.01-4	1.93-4	1.03-4	5.12-5
68	1700.4	4.33-4	3.79-4	2.84-4	1.82-4	9.77-5	4.83-5
69	1766.1	4.09-4	3.58-4	2.68-4	1.72-4	9.23-5	4.56-5
70	1832.9	3.87-4	3.39-4	2.54-4	1.63-4	8.74-5	4.32-5
71	1900.8	3.66-4	3.21-4	2.40-4	1.54-4	8.27-5	4.09-5
72	1969.7	3.47-4	3.04-4	2.28-4	1.46-4	7.84-5	3.88-5
73	2039.7	3.29-4	2.88-4	2.16-4	1.39-4	7.44-5	3.68-5
74	2110.7	3.12-4	2.73-4	2.05-4	1.32-4	7.06-5	3.49-5
75	2182.7	2.96-4	2.60-4	1.95-4	1.25-4	6.71-5	3.32-5
76	2255.8	2.82-4	2.47-4	1.85-4	1.19-4	6.37-5	3.15-5
77	2327.8	2.67-4	2.34-4	1.76-4	1.13-4	6.05-5	3.00-5
78	2404.9	2.54-4	2.23-4	1.67-4	1.07-4	5.75-5	2.85-5
79	2480.8	2.41-4	2.11-4	1.58-4	1.02-4	5.46-5	2.71-5
80	2557.8	2.29-4	2.00-4	1.50-4	9.66-5	5.17-5	2.57-5
81	2635.6	2.17-4	1.90-4	1.42-4	9.15-5	4.90-5	2.43-5
82	2714.4	2.05-4	1.79-4	1.34-4	8.64-5	4.62-5	2.29-5
83	2794.0	1.93-4	1.69-4	1.26-4	8.12-5	4.34-5	2.15-5
84	2874.5	1.80-4	1.57-4	1.18-4	7.56-5	4.04-5	2.00-5
85	2955.9	1.65-4	1.45-4	1.08-4	6.92-5	3.69-5	1.82-5
86	3038.3	1.48-4	1.29-4	9.64-5	6.14-5	3.24-5	1.58-5
87	3122.6	1.59-4	1.39-4	1.04-4	6.45-5	3.24-5	1.48-5
88	3214.9	5.05-4	4.48-4	3.40-4	2.14-4	1.07-4	4.89-5
89	3313.3	5.72-4	5.07-4	3.86-4	2.44-4	1.23-4	5.68-5
90	3413.8	5.75-4	5.10-4	3.89-4	2.46-4	1.25-4	5.77-5
91	3516.1	5.68-4	5.04-4	3.84-4	2.44-4	1.23-4	5.72-5
92	3620.0	5.57-4	4.94-4	3.76-4	2.39-4	1.21-4	5.63-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

	A1 - E7							A1 - E8						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1249.2	7.12-4	6.25-4	4.70-4	3.02-4	1.62-4	8.01-5	1324.9	5.12-4	4.54-4	3.48-4	2.27-4	1.21-4	5.95-5
61	1308.9	6.76-4	5.94-4	4.47-4	2.87-4	1.54-4	7.63-5	1390.7	4.86-4	4.31-4	3.30-4	2.16-4	1.15-4	5.65-5
62	1370.0	6.43-4	5.65-4	4.25-4	2.74-4	1.47-4	7.28-5	1458.3	4.62-4	4.10-4	3.14-4	2.05-4	1.10-4	5.38-5
63	1432.5	6.13-4	5.38-4	4.06-4	2.62-4	1.41-4	6.95-5	1527.7	4.41-4	3.91-4	3.00-4	1.96-4	1.05-4	5.13-5
64	1496.3	5.84-4	5.13-4	3.87-4	2.50-4	1.35-4	6.64-5	1599.0	4.20-4	3.73-4	2.86-4	1.87-4	1.01-4	4.90-5
65	1561.6	5.57-4	4.90-4	3.70-4	2.39-4	1.29-4	6.35-5	1672.1	4.02-4	3.57-4	2.74-4	1.79-4	9.62-5	4.69-5
66	1628.3	5.32-4	4.68-4	3.54-4	2.29-4	1.24-4	6.08-5	1747.0	3.85-4	3.42-4	2.62-4	1.72-4	9.22-5	4.50-5
67	1696.4	5.09-4	4.48-4	3.39-4	2.20-4	1.19-4	5.83-5	1823.9	3.69-4	3.27-4	2.51-4	1.65-4	8.84-5	4.31-5
68	1766.0	4.87-4	4.29-4	3.24-4	2.11-4	1.14-4	5.59-5	1902.7	3.54-4	3.14-4	2.41-4	1.58-4	8.50-5	4.15-5
69	1836.9	4.67-4	4.11-4	3.11-4	2.02-4	1.09-4	5.36-5	1983.4	3.40-4	3.02-4	2.32-4	1.52-4	8.17-5	3.99-5
70	1909.3	4.48-4	3.94-4	2.99-4	1.94-4	1.05-4	5.15-5	2066.2	3.27-4	2.91-4	2.24-4	1.46-4	7.87-5	3.84-5
71	1983.1	4.30-4	3.78-4	2.87-4	1.87-4	1.01-4	4.96-5	2151.0	3.15-4	2.80-4	2.15-4	1.41-4	7.58-5	3.70-5
72	2058.3	4.13-4	3.63-4	2.76-4	1.80-4	9.71-5	4.77-5	2237.8	3.04-4	2.70-4	2.08-4	1.36-4	7.32-5	3.58-5
73	2135.0	3.97-4	3.50-4	2.66-4	1.73-4	9.35-5	4.59-5	2326.7	2.94-4	2.61-4	2.01-4	1.32-4	7.07-5	3.46-5
74	2213.1	3.82-4	3.36-4	2.56-4	1.67-4	9.01-5	4.43-5	2417.8	2.84-4	2.52-4	1.94-4	1.27-4	6.83-5	3.34-5
75	2292.7	3.68-4	3.24-4	2.47-4	1.61-4	8.69-5	4.27-5	2511.0	2.75-4	2.44-4	1.88-4	1.23-4	6.61-5	3.24-5
76	2373.7	3.54-4	3.13-4	2.38-4	1.56-4	8.39-5	4.12-5	2606.4	2.66-4	2.36-4	1.82-4	1.19-4	6.40-5	3.14-5
77	2456.2	3.42-4	3.02-4	2.30-4	1.50-4	8.10-5	3.98-5	2704.0	2.58-4	2.29-4	1.77-4	1.16-4	6.21-5	3.04-5
78	2540.1	3.30-4	2.91-4	2.22-4	1.45-4	7.83-5	3.85-5	2803.9	2.51-4	2.23-4	1.72-4	1.12-4	6.02-5	2.95-5
79	2625.5	3.19-4	2.81-4	2.15-4	1.41-4	7.57-5	3.73-5	2906.2	2.44-4	2.17-4	1.67-4	1.09-4	5.85-5	2.87-5
80	2712.3	3.08-4	2.72-4	2.08-4	1.36-4	7.33-5	3.60-5	3010.7	2.38-4	2.11-4	1.63-4	1.06-4	5.69-5	2.79-5
81	2800.6	2.98-4	2.63-4	2.01-4	1.32-4	7.09-5	3.49-5	3117.7	2.33-4	2.07-4	1.59-4	1.04-4	5.54-5	2.72-5
82	2890.4	2.88-4	2.55-4	1.95-4	1.28-4	6.87-5	3.38-5	3227.1	2.29-4	2.03-4	1.56-4	1.02-4	5.41-5	2.65-5
83	2981.7	2.79-4	2.47-4	1.89-4	1.24-4	6.67-5	3.28-5	3339.0	2.28-4	2.02-4	1.54-4	1.00-4	5.31-5	2.59-5
84	3074.5	2.71-4	2.39-4	1.83-4	1.20-4	6.47-5	3.18-5	3453.4	2.33-4	2.06-4	1.57-4	1.01-4	5.28-5	2.55-5
85	3168.7	2.62-4	2.32-4	1.78-4	1.17-4	6.28-5	3.09-5	3569.9	2.71-4	2.38-4	1.79-4	1.12-4	5.70-5	2.68-5
86	3264.5	2.55-4	2.25-4	1.73-4	1.13-4	6.10-5	3.00-5	3684.7	5.58-4	4.89-4	3.63-4	2.22-4	1.07-4	4.73-5
87	3361.7	2.47-4	2.19-4	1.68-4	1.10-4	5.93-5	2.92-5	3793.3	6.46-4	5.68-4	4.25-4	2.63-4	1.28-4	5.74-5
88	3460.5	2.40-4	2.12-4	1.63-4	1.07-4	5.76-5	2.83-5	3902.0	6.32-4	5.57-4	4.18-4	2.59-4	1.27-4	5.72-5
89	3560.8	2.33-4	2.06-4	1.58-4	1.04-4	5.61-5	2.75-5	4012.1	6.14-4	5.41-4	4.07-4	2.53-4	1.24-4	5.60-5
90	3662.6	2.27-4	2.01-4	1.54-4	1.01-4	5.46-5	2.68-5	4123.8	5.96-4	5.25-4	3.95-4	2.46-4	1.21-4	5.46-5
91	3765.9	2.20-4	1.95-4	1.50-4	9.86-5	5.31-5	2.61-5	4237.2	5.79-4	5.11-4	3.84-4	2.39-4	1.18-4	5.33-5
92	3870.7	2.14-4	1.90-4	1.46-4	9.60-5	5.[illegible]	2.54-5	4352.2	5.63-4	4.96-4	3.74-4	2.33-4	1.15-4	5.19-5

	A1 - E9							A1 - E10						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1358.6	7.29-4	6.44-4	4.90-4	3.18-4	1.71-4	8.57-5	1390.9	1.79-4	1.58-4	1.19-4	7.73-5	4.04-5	1.88-5
61	1427.5	6.95-4	6.15-4	4.68-4	3.04-4	1.64-4	8.21-5	1466.4	1.73-4	1.52-4	1.15-4	7.45-5	3.90-5	1.81-5
62	1498.4	6.65-4	5.88-4	4.48-4	2.91-4	1.58-4	7.89-5	1543.8	1.66-4	1.46-4	1.11-4	7.17-5	3.75-5	1.74-5
63	1571.4	6.37-4	5.64-4	4.30-4	2.80-4	1.52-4	7.59-5	1623.1	1.60-4	1.41-4	1.07-4	6.90-5	3.60-5	1.67-5
64	1646.5	6.12-4	5.41-4	4.13-4	2.70-4	1.47-4	7.32-5	1704.4	1.5[illegible]-4	1.36-4	1.03-4	6.64-5	3.46-5	1.60-5
65	1723.6	5.89-4	5.21-4	3.98-4	2.60-4	1.42-4	7.07-5	1787.5	1.49-4	1.31-4	9.94-5	6.40-5	3.33-5	1.54-5
66	1802.9	5.67-4	5.02-4	3.84-4	2.52-4	1.37-4	6.85-5	1869.8	2.66-4	2.36-4	1.82-4	1.22-4	6.75-5	3.31-5
67	1884.4	5.48-4	4.85-4	3.72-4	2.44-4	1.33-4	6.64-5	1949.5	2.50-4	2.22-4	1.72-4	1.15-4	6.36-5	3.12-5
68	1968.1	5.30-4	4.70-4	3.60-4	2.37-4	1.29-4	6.45-5	2031.2	2.35-4	2.09-4	1.61-4	1.08-4	5.98-5	2.93-5
69	2054.1	5.14-4	4.56-4	3.50-4	2.30-4	1.26-4	6.29-5	2114.9	2.21-4	1.97-4	1.52-4	1.02-4	5.63-5	2.75-5
70	2142.3	4.99-4	4.43-4	3.40-4	2.24-4	1.23-4	6.14-5	2198.5	1.14-3	1.00-3	7.54-4	4.70-4	2.31-4	1.04-4
71	2232.9	4.86-4	4.32-4	3.32-4	2.19-4	1.20-4	6.00-5	2279.9	1.09-3	9.64-4	7.26-4	4.52-4	2.23-4	1.01-4
72	2325.9	4.75-4	4.22-4	3.25-4	2.15-4	1.18-4	5.89-5	2362.9	1.05-3	9.28-4	6.99-4	4.36-4	2.15-4	9.71-5
73	2421.3	4.66-4	4.14-4	3.19-4	2.11-4	1.16-4	5.80-5	2447.4	1.01-3	8.94-4	6.73-4	4.20-4	2.07-4	9.37-5
74	2519.2	4.59-4	4.08-4	3.14-4	2.08-4	1.14-4	5.72-5	2533.4	9.76-4	8.61-4	6.49-4	4.03-4	2.00-4	9.06-5
75	2619.1	5.41-4	4.78-4	3.63-4	2.34-4	1.23-4	5.97-5	2621.4	8.53-4	7.56-4	5.74-4	3.63-4	1.83-4	8.46-5
76	2709.9	9.10-4	8.02-4	6.04-4	3.76-4	1.85-4	8.37-5	2722.5	4.47-4	3.98-4	3.09-4	2.06-4	1.14-4	5.74-5
77	2800.6	8.79-4	7.76-4	5.84-4	3.64-4	1.80-4	8.13-5	2827.7	4.44-4	3.95-4	3.07-4	2.05-4	1.13-4	5.72-5
78	2892.8	8.50-4	7.50-4	5.65-4	3.52-4	1.74-4	7.87-5	2935.5	4.43-4	3.95-4	3.07-4	2.05-4	1.14-4	5.74-5
79	2986.6	8.21-4	7.24-4	5.46-4	3.41-4	1.68-4	7.62-5	3045.5	4.43-4	3.95-4	3.07-4	2.06-4	1.14-4	5.78-5
80	3082.0	7.93-4	7.00-4	5.28-4	3.30-4	1.63-4	7.38-5	3157.7	4.39-4	3.92-4	3.05-4	2.05-4	1.14-4	5.79-5
81	3179.0	7.66-4	6.77-4	5.10-4	3.19-4	1.58-4	7.16-5	3271.8	4.27-4	3.81-4	2.97-4	2.00-4	1.12-4	5.67-5
82	3277.6	7.40-4	6.53-4	4.93-4	3.08-4	1.53-4	6.93-5	3387.7	4.01-4	3.58-4	2.80-4	1.89-4	1.06-4	5.36-5
83	3377.8	7.12-4	6.29-4	4.75-4	2.98-4	1.48-4	6.72-5	3505.4	3.66-4	3.27-4	2.56-4	1.73-4	9.68-5	4.92-5
84	3479.8	6.79-4	6.01-4	4.54-4	2.86-4	1.42-4	6.49-5	3625.1	3.30-4	2.95-4	2.31-4	1.57-4	8.77-5	4.45-5
85	3583.9	6.15-4	5.45-4	4.15-4	2.63-4	1.33-4	6.12-5	3747.1	2.99-4	2.67-4	2.09-4	1.42-4	7.96-5	4.04-5
86	3693.9	3.02-4	2.71-4	2.14-4	1.43-4	7.77-5	3.83-5	3871.4	2.73-4	2.44-4	1.91-4	1.30-4	7.29-5	3.70-5
87	3814.6	1.90-4	1.71-4	1.35-4	9.20-5	5.12-5	2.59-5	3998.5	2.52-4	2.26-4	1.77-4	1.20-4	6.75-5	3.43-5
88	3939.6	1.81-4	1.62-4	1.27-4	8.59-5	4.75-5	2.40-5	4128.2	2.35-4	2.11-4	1.65-4	1.12-4	6.31-5	3.20-5
89	4067.8	1.77-4	1.58-4	1.24-4	8.32-5	4.58-5	2.31-5	4260.8	2.21-4	1.98-4	1.55-4	1.06-4	5.94-5	3.02-5
90	4198.9	1.73-4	1.55-4	1.21-4	8.12-5	4.46-5	2.24-5	4396.4	2.09-4	1.88-4	1.47-4	1.00-4	5.64-5	2.87-5
91	4333.1	1.70-4	1.52-4	1.19-4	7.94-5	4.36-5	2.19-5	4535.1	1.99-4	1.78-4	1.40-4	9.53-5	5.38-5	2.73-5
92	4470.5	1.67-4	1.49-4	1.16-4	7.77-5	4.26-5	2.14-5	4676.9	1.91-4	1.71-4	1.34-4	9.12-5	5.15-5	2.62-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

	A1 - E11							A1 - E12						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1431.4	4.06-4	3.60-4	2.76-4	1.83-4	1.01-4	5.04-5	1461.8	8.10-4	7.25-4	5.59-4	3.60-4	1.85-4	8.70-5
61	1499.9	3.71-4	3.30-4	2.53-4	1.68-4	9.33-5	4.62-5	1532.4	1.68-3	1.48-3	1.11-3	6.89-4	3.37-4	1.51-4
62	1570.1	3.44-4	3.05-4	2.35-4	1.57-4	8.68-5	4.29-5	1600.6	1.60-3	1.41-3	1.06-3	6.57-4	3.22-4	1.45-4
63	1642.2	3.21-4	2.85-4	2.20-4	1.47-4	8.12-5	4.01-5	1670.2	1.52-3	1.34-3	1.01-3	6.28-4	3.08-4	1.38-4
64	1716.2	3.01-4	2.67-4	2.06-4	1.38-4	7.62-5	3.75-5	1741.3	1.46-3	1.28-3	9.65-4	6.00-4	2.95-4	1.33-4
65	1792.0	2.82-4	2.51-4	1.94-4	1.29-4	7.17-5	3.52-5	1813.8	1.39-3	1.23-3	9.23-4	5.74-4	2.82-4	1.27-4
66	1872.5	1.45-4	1.27-4	9.64-5	6.19-5	3.21-5	1.48-5	1887.8	1.33-3	1.17-3	8.84-4	5.50-4	2.71-4	1.22-4
67	1959.4	1.56-4	1.37-4	1.03-4	6.49-5	3.28-5	1.48-5	1963.3	1.26-3	1.11-3	8.38-4	5.23-4	2.58-4	1.17-4
68	2040.1	1.23-3	1.09-3	8.16-4	5.07-4	2.49-4	1.12-4	2048.3	1.29-4	1.14-4	8.76-5	5.72-5	3.02-5	1.42-5
69	2118.6	1.18-3	1.04-3	7.84-4	4.88-4	2.40-4	1.08-4	2139.0	1.25-4	1.10-4	8.41-5	5.45-5	2.85-5	1.32-5
70	2200.7	2.07-4	1.84-4	1.43-4	9.56-5	5.28-5	2.58-5	2231.6	1.21-4	1.07-4	8.12-5	5.26-5	2.74-5	1.27-5
71	2288.6	1.93-4	1.72-4	1.33-4	8.93-5	4.92-5	2.40-5	2326.0	1.17-4	1.03-4	7.85-5	5.07-5	2.64-5	1.22-5
72	2378.6	1.79-4	1.60-4	1.24-4	8.31-5	4.58-5	2.23-5	2422.4	1.13-4	9.99-5	7.59-5	4.90-5	2.54-5	1.17-5
73	2470.8	1.66-4	1.48-4	1.15-4	7.68-5	4.22-5	2.06-5	2520.7	1.10-4	9.67-5	7.35-5	4.74-5	2.45-5	1.13-5
74	2565.3	1.52-4	1.35-4	1.05-4	7.03-5	3.86-5	1.87-5	2620.8	1.06-4	9.36-5	7.11-5	4.58-5	2.37-5	1.09-5
75	2662.0	1.38-4	1.22-4	9.49-5	6.36-5	3.47-5	1.68-5	2722.8	1.03-4	9.07-5	6.89-5	4.43-5	2.28-5	1.05-5
76	2761.1	1.22-4	1.09-4	8.43-5	5.64-5	3.07-5	1.48-5	2826.6	9.99-5	8.80-5	6.67-5	4.29-5	2.21-5	1.02-5
77	2862.8	1.06-4	9.43-5	7.30-5	4.87-5	2.63-5	1.26-5	2932.3	9.70-5	8.54-5	6.47-5	4.16-5	2.14-5	9.83-6
78	2967.1	8.93-5	7.93-5	6.12-5	4.05-5	2.17-5	1.03-5	3039.9	9.42-5	8.29-5	6.28-5	4.03-5	2.07-5	9.51-6
79	3074.4	7.30-5	6.47-5	4.97-5	3.26-5	1.71-5	7.96-6	3149.3	9.15-5	8.06-5	6.10-5	3.91-5	2.00-5	9.20-6
80	3184.8	6.06-5	5.36-5	4.09-5	2.64-5	1.35-5	6.13-6	3260.6	8.90-5	7.83-5	5.93-5	3.80-5	1.94-5	8.91-6
81	3298.7	5.82-5	5.15-5	3.90-5	2.48-5	1.25-5	5.63-6	3373.7	8.67-5	7.62-5	5.76-5	3.69-5	1.88-5	8.63-6
82	3416.4	7.00-5	6.19-5	4.71-5	3.00-5	1.53-5	7.08-6	3488.7	8.44-5	7.42-5	5.60-5	3.58-5	1.82-5	8.36-6
83	3538.0	9.15-5	8.12-5	6.21-5	4.00-5	2.08-5	9.98-6	3605.4	8.22-5	7.23-5	5.45-5	3.48-5	1.77-5	8.11-6
84	3663.5	1.14-4	1.02-4	7.82-5	5.09-5	2.70-5	1.32-5	3724.0	8.01-5	7.04-5	5.31-5	3.38-5	1.72-5	7.86-6
85	3792.7	1.33-4	1.19-4	9.17-5	6.01-5	3.22-5	1.59-5	3844.4	7.81-5	6.86-5	5.16-5	3.28-5	1.66-5	7.62-6
86	3925.5	1.48-4	1.32-4	1.02-4	6.72-5	3.62-5	1.80-5	3966.7	7.61-5	6.67-5	5.02-5	3.18-5	1.61-5	7.37-6
87	4062.1	1.58-4	1.41-4	1.09-4	7.23-5	3.92-5	1.96-5	4090.7	7.39-5	6.48-5	4.86-5	3.08-5	1.55-5	7.11-6
88	4202.4	1.66-4	1.48-4	1.15-4	7.63-5	4.16-5	2.08-5	4216.4	7.08-5	6.21-5	4.65-5	2.93-5	1.48-5	6.75-6
89	4343.4	9.67-5	8.55-5	6.52-5	4.22-5	2.20-5	1.04-5	4347.1	1.42-4	1.27-4	9.82-5	6.49-5	3.53-5	1.77-5
90	4473.1	7.34-5	6.44-5	4.84-5	3.06-5	1.55-5	7.09-6	4494.6	1.66-4	1.49-4	1.16-4	7.71-5	4.22-5	2.13-5
91	4604.2	7.06-5	6.19-5	4.64-5	2.92-5	1.48-5	6.74-6	4646.5	1.69-4	1.51-4	1.18-4	7.85-5	4.32-5	2.18-5
92	4737.0	6.88-5	6.03-5	4.51-5	2.83-5	1.43-5	6.51-6	4802.5	1.70-4	1.52-4	1.19-4	7.92-5	4.37-5	2.21-5

	A1 - E13							A1 - E14						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1465.1	1.26-3	1.11-3	8.30-4	5.12-4	2.48-4	1.10-4	1466.4	1.10-3	9.69-4	7.33-4	4.58-4	2.26-4	1.02-4
61	1539.4	7.67-4	6.87-4	5.31-4	3.42-4	1.76-4	8.36-5	1543.7	5.70-4	5.05-4	3.83-4	2.38-4	1.16-4	5.13-5
62	1618.8	7.32-4	6.55-4	5.06-4	3.25-4	1.67-4	7.93-5	1623.4	5.50-4	4.88-4	3.69-4	2.30-4	1.12-4	4.96-5
63	1700.2	6.99-4	6.25-4	4.82-4	3.10-4	1.59-4	7.53-5	1705.2	5.30-4	4.70-4	3.56-4	2.21-4	1.08-4	4.79-5
64	1783.4	6.67-4	5.96-4	4.59-4	2.95-4	1.51-4	7.16-5	1788.8	5.11-4	4.53-4	3.43-4	2.13-4	1.04-4	4.63-5
65	1868.5	6.37-4	5.69-4	4.38-4	2.81-4	1.44-4	6.80-5	1874.3	4.92-4	4.36-4	3.30-4	2.05-4	1.00-4	4.47-5
66	1955.5	6.08-4	5.43-4	4.18-4	2.68-4	1.37-4	6.47-5	1961.8	4.75-4	4.20-4	3.18-4	1.98-4	9.65-5	4.32-5
67	2044.4	5.81-4	5.18-4	3.98-4	2.55-4	1.30-4	6.15-5	2051.2	4.58-4	4.05-4	3.07-4	1.91-4	9.31-5	4.17-5
68	2135.2	5.55-4	4.95-4	3.80-4	2.43-4	1.24-4	5.86-5	2142.5	4.41-4	3.91-4	2.96-4	1.84-4	8.99-5	4.03-5
69	2227.8	5.31-4	4.74-4	3.63-4	2.32-4	1.19-4	5.59-5	2235.7	4.26-4	3.77-4	2.85-4	1.78-4	8.68-5	3.90-5
70	2322.4	5.09-4	4.53-4	3.48-4	2.22-4	1.13-4	5.33-5	2330.9	4.11-4	3.64-4	2.75-4	1.71-4	8.39-5	3.77-5
71	2418.8	4.87-4	4.34-4	3.33-4	2.12-4	1.08-4	5.09-5	2427.9	3.97-4	3.51-4	2.66-4	1.66-4	8.11-5	3.65-5
72	2517.1	4.67-4	4.16-4	3.19-4	2.03-4	1.03-4	4.86-5	2526.9	3.84-4	3.40-4	2.57-4	1.60-4	7.84-5	3.53-5
73	2617.3	4.49-4	3.99-4	3.06-4	1.95-4	9.92-5	4.65-5	2627.8	3.71-4	3.28-4	2.48-4	1.55-4	7.59-5	3.42-5
74	2719.4	4.31-4	3.83-4	2.93-4	1.87-4	9.51-5	4.46-5	2730.6	3.59-4	3.18-4	2.40-4	1.49-4	7.34-5	3.31-5
75	2823.4	4.14-4	3.69-4	2.82-4	1.80-4	9.12-5	4.27-5	2835.4	3.47-4	3.07-4	2.32-4	1.45-4	7.11-5	3.21-5
76	2929.2	3.98-4	3.54-4	2.71-4	1.72-4	8.76-5	4.10-5	2942.0	3.36-4	2.97-4	2.24-4	1.40-4	6.89-5	3.11-5
77	3036.9	3.84-4	3.41-4	2.61-4	1.66-4	8.42-5	3.93-5	3050.6	3.26-4	2.88-4	2.17-4	1.36-4	6.68-5	3.01-5
78	3146.4	3.70-4	3.29-4	2.51-4	1.60-4	8.10-5	3.78-5	3161.1	3.16-4	2.79-4	2.11-4	1.31-4	6.48-5	2.92-5
79	3257.9	3.56-4	3.17-4	2.42-4	1.54-4	7.80-5	3.63-5	3273.5	3.06-4	2.70-4	2.04-4	1.27-4	6.28-5	2.83-5
80	3371.2	3.44-4	3.05-4	2.33-4	1.48-4	7.52-5	3.50-5	3387.8	2.96-4	2.62-4	1.98-4	1.24-4	6.10-5	2.75-5
81	3486.3	3.32-4	2.95-4	2.25-4	1.43-4	7.25-5	3.37-5	3504.1	2.88-4	2.54-4	1.92-4	1.20-4	5.92-5	2.67-5
82	3603.4	3.20-4	2.85-4	2.17-4	1.38-4	6.99-5	3.25-5	3622.2	2.79-4	2.47-4	1.86-4	1.16-4	5.75-5	2.59-5
83	3722.3	3.10-4	2.75-4	2.10-4	1.33-4	6.75-5	3.13-5	3742.3	2.71-4	2.40-4	1.81-4	1.13-4	5.58-5	2.52-5
84	3843.0	3.00-4	2.66-4	2.03-4	1.29-4	6.52-5	3.02-5	3864.3	2.63-4	2.33-4	1.76-4	1.10-4	5.42-5	2.45-5
85	3965.6	2.90-4	2.57-4	1.96-4	1.24-4	6.30-5	2.92-5	3988.2	2.56-4	2.26-4	1.71-4	1.07-4	5.27-5	2.38-5
86	4090.1	2.81-4	2.49-4	1.90-4	1.20-4	6.09-5	2.82-5	4114.1	2.49-4	2.20-4	1.66-4	1.04-4	5.12-5	2.31-5
87	4216.4	2.72-4	2.41-4	1.84-4	1.16-4	5.89-5	2.73-5	4241.8	2.42-4	2.14-4	1.61-4	1.01-4	4.98-5	2.25-5
88	4344.6	2.63-4	2.34-4	1.78-4	1.13-4	5.70-5	2.64-5	4371.5	2.35-4	2.08-4	1.57-4	9.80-5	4.85-5	2.19-5
89	4474.6	2.55-4	2.26-4	1.72-4	1.09-4	5.52-5	2.55-5	4503.1	2.29-4	2.02-4	1.53-4	9.53-5	4.72-5	2.13-5
90	4606.5	2.47-4	2.19-4	1.67-4	1.06-4	5.34-5	2.47-5	4636.6	2.23-4	1.97-4	1.48-4	9.28-5	4.59-5	2.07-5
91	4740.2	2.40-4	2.13-4	1.62-4	1.03-4	5.17-5	2.39-5	4772.0	2.17-4	1.91-4	1.44-4	9.03-5	4.47-5	2.02-5
92	4875.8	2.32-4	2.06-4	1.57-4	9.93-5	5.00-5	2.31-5	4909.4	2.11-4	1.86-4	1.41-4	8.79-5	4.35-5	1.97-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – E15

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1486.3	5.65-4	5.03-4	3.84-4	2.41-4	1.19-4	5.33-5
61	1565.9	5.39-4	4.79-4	3.65-4	2.29-4	1.13-4	5.04-5
62	1647.6	5.13-4	4.56-4	3.47-4	2.18-4	1.07-4	4.78-5
63	1731.2	4.89-4	4.34-4	3.30-4	2.07-4	1.01-4	4.54-5
64	1817.0	4.66-4	4.14-4	3.15-4	1.97-4	9.64-5	4.32-5
65	1904.7	4.45-4	3.95-4	3.00-4	1.88-4	9.18-5	4.11-5
66	1994.5	4.25-4	3.77-4	2.86-4	1.79-4	8.75-5	3.92-5
67	2086.4	4.07-4	3.61-4	2.73-4	1.71-4	8.35-5	3.74-5
68	2180.3	3.89-4	3.45-4	2.62-4	1.63-4	7.98-5	3.57-5
69	2276.3	3.73-4	3.31-4	2.51-4	1.56-4	7.63-5	3.41-5
70	2374.4	3.57-4	3.17-4	2.40-4	1.50-4	7.31-5	3.27-5
71	2474.5	3.43-4	3.04-4	2.30-4	1.44-4	7.01-5	3.13-5
72	2576.7	3.29-4	2.92-4	2.21-4	1.38-4	6.73-5	3.00-5
73	2681.0	3.17-4	2.81-4	2.12-4	1.32-4	6.47-5	2.88-5
74	2787.3	3.05-4	2.70-4	2.04-4	1.27-4	6.22-5	2.77-5
75	2895.8	2.93-4	2.60-4	1.97-4	1.22-4	5.99-5	2.67-5
76	3006.3	2.83-4	2.50-4	1.89-4	1.18-4	5.77-5	2.57-5
77	3119.0	2.73-4	2.41-4	1.83-4	1.14-4	5.56-5	2.47-5
78	3233.8	2.63-4	2.33-4	1.76-4	1.10-4	5.37-5	2.39-5
79	3350.7	2.54-4	2.25-4	1.70-4	1.06-4	5.18-5	2.30-5
80	3469.7	2.46-4	2.17-4	1.64-4	1.02-4	5.01-5	2.22-5
81	3590.9	2.37-4	2.10-4	1.59-4	9.90-5	4.84-5	2.15-5
82	3714.2	2.30-4	2.03-4	1.54-4	9.58-5	4.69-5	2.08-5
83	3839.6	2.22-4	1.97-4	1.49-4	9.27-5	4.54-5	2.01-5
84	3967.2	2.15-4	1.91-4	1.44-4	8.98-5	4.40-5	1.95-5
85	4097.0	2.09-4	1.85-4	1.40-4	8.71-5	4.26-5	1.89-5
86	4228.9	2.02-4	1.79-4	1.35-4	8.44-5	4.13-5	1.83-5
87	4363.0	1.97-4	1.74-4	1.31-4	8.20-5	4.01-5	1.78-5
88	4499.3	1.91-4	1.69-4	1.28-4	7.96-5	3.90-5	1.73-5
89	4637.8	1.86-4	1.64-4	1.24-4	7.74-5	3.79-5	1.68-5
90	4778.5	1.81-4	1.60-4	1.21-4	7.53-5	3.69-5	1.64-5
91	4921.4	1.76-4	1.56-4	1.18-4	7.35-5	3.59-5	1.60-5
92	5066.5	1.74-4	1.54-4	1.16-4	7.22-5	3.52-5	1.56-5

A1 – E16

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1489.1	6.25-4	5.57-4	4.26-4	2.69-4	1.35-4	6.12-5
61	1569.0	6.04-4	5.38-4	4.11-4	2.60-4	1.30-4	5.91-5
62	1651.0	5.82-4	5.18-4	3.96-4	2.50-4	1.25-4	5.71-5
63	1735.1	5.60-4	4.99-4	3.81-4	2.41-4	1.20-4	5.51-5
64	1821.2	5.39-4	4.80-4	3.67-4	2.32-4	1.16-4	5.32-5
65	1909.3	5.19-4	4.62-4	3.53-4	2.23-4	1.12-4	5.13-5
66	1999.6	5.00-4	4.45-4	3.40-4	2.15-4	1.08-4	4.95-5
67	2091.9	4.82-4	4.29-4	3.28-4	2.07-4	1.04-4	4.78-5
68	2186.4	4.65-4	4.13-4	3.16-4	2.00-4	1.00-4	4.61-5
69	2282.9	4.48-4	3.99-4	3.04-4	1.93-4	9.65-5	4.45-5
70	2381.5	4.32-4	3.85-4	2.94-4	1.86-4	9.32-5	4.30-5
71	2482.2	4.17-4	3.71-4	2.83-4	1.79-4	9.01-5	4.16-5
72	2585.1	4.03-4	3.58-4	2.74-4	1.73-4	8.70-5	4.02-5
73	2690.1	3.89-4	3.46-4	2.64-4	1.67-4	8.42-5	3.89-5
74	2797.2	3.76-4	3.35-4	2.55-4	1.62-4	8.15-5	3.76-5
75	2906.4	3.64-4	3.24-4	2.47-4	1.57-4	7.88-5	3.64-5
76	3017.8	3.52-4	3.13-4	2.39-4	1.51-4	7.64-5	3.53-5
77	3131.3	3.41-4	3.03-4	2.31-4	1.47-4	7.40-5	3.42-5
78	3247.0	3.30-4	2.93-4	2.24-4	1.42-4	7.17-5	3.31-5
79	3364.9	3.20-4	2.84-4	2.17-4	1.38-4	6.96-5	3.21-5
80	3484.9	3.10-4	2.75-4	2.10-4	1.33-4	6.75-5	3.12-5
81	3607.1	3.01-4	2.67-4	2.04-4	1.30-4	6.55-5	3.03-5
82	3731.6	2.92-4	2.59-4	1.98-4	1.26-4	6.36-5	2.94-5
83	3858.2	2.83-4	2.52-4	1.92-4	1.22-4	6.18-5	2.86-5
84	3987.0	2.75-4	2.44-4	1.86-4	1.19-4	6.01-5	2.78-5
85	4118.1	2.67-4	2.37-4	1.81-4	1.15-4	5.84-5	2.70-5
86	4251.4	2.60-4	2.31-4	1.76-4	1.12-4	5.69-5	2.63-5
87	4386.9	2.55-4	2.26-4	1.72-4	1.09-4	5.53-5	2.55-5
88	4521.0	1.66-4	1.42-4	9.90-5	5.48-5	2.29-5	8.85-6
89	4655.6	1.61-4	1.37-4	9.60-5	5.31-5	2.22-5	8.57-6
90	4792.1	1.57-4	1.34-4	9.36-5	5.18-5	2.17-5	8.38-6
91	4930.6	1.53-4	1.31-4	9.11-5	5.04-5	2.11-5	8.18-6
92	5071.0	1.48-4	1.26-4	8.79-5	4.87-5	2.04-5	7.93-6

A1 – E17

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1538.5	2.37-4	2.00-4	1.35-4	7.12-5	2.75-5	9.79-6
61	1618.9	2.46-4	2.07-4	1.41-4	7.48-5	2.93-5	1.05-5
62	1701.2	2.51-4	2.12-4	1.45-4	7.71-5	3.05-5	1.11-5
63	1785.5	2.54-4	2.14-4	1.47-4	7.85-5	3.13-5	1.14-5
64	1871.7	2.54-4	2.15-4	1.48-4	7.92-5	3.17-5	1.17-5
65	1959.9	2.54-4	2.15-4	1.48-4	7.94-5	3.20-5	1.18-5
66	2050.0	2.52-4	2.14-4	1.47-4	7.93-5	3.21-5	1.19-5
67	2142.0	2.50-4	2.12-4	1.46-4	7.89-5	3.20-5	1.19-5
68	2236.0	2.47-4	2.09-4	1.44-4	7.83-5	3.19-5	1.19-5
69	2331.8	2.43-4	2.07-4	1.43-4	7.75-5	3.16-5	1.19-5
70	2429.7	2.40-4	2.04-4	1.41-4	7.66-5	3.13-5	1.18-5
71	2529.4	2.36-4	2.01-4	1.39-4	7.56-5	3.10-5	1.17-5
72	2631.1	2.32-4	1.97-4	1.37-4	7.45-5	3.06-5	1.15-5
73	2734.7	2.28-4	1.94-4	1.34-4	7.33-5	3.01-5	1.14-5
74	2840.3	2.23-4	1.90-4	1.32-4	7.20-5	2.97-5	1.13-5
75	2947.7	2.19-4	1.86-4	1.29-4	7.07-5	2.92-5	1.11-5
76	3057.1	2.14-4	1.82-4	1.27-4	6.94-5	2.87-5	1.09-5
77	3168.5	2.10-4	1.79-4	1.24-4	6.81-5	2.81-5	1.07-5
78	3281.8	2.05-4	1.75-4	1.21-4	6.67-5	2.76-5	1.05-5
79	3397.0	2.01-4	1.71-4	1.19-4	6.53-5	2.71-5	1.03-5
80	3514.1	1.96-4	1.67-4	1.16-4	6.40-5	2.65-5	1.02-5
81	3633.2	1.92-4	1.63-4	1.14-4	6.26-5	2.60-5	9.96-6
82	3754.2	1.88-4	1.60-4	1.11-4	6.13-5	2.55-5	9.77-6
83	3877.2	1.83-4	1.56-4	1.09-4	6.00-5	2.49-5	9.58-6
84	4002.1	1.79-4	1.53-4	1.06-4	5.86-5	2.44-5	9.38-6
85	4128.9	1.75-4	1.49-4	1.04-4	5.74-5	2.39-5	9.20-6
86	4257.7	1.71-4	1.45-4	1.02-4	5.60-5	2.33-5	9.00-6
87	4388.4	1.65-4	1.41-4	9.83-5	5.45-5	2.29-5	8.91-6
88	4524.7	2.43-4	2.16-4	1.65-4	1.05-4	5.33-5	2.47-5
89	4664.8	2.37-4	2.11-4	1.61-4	1.03-4	5.22-5	2.42-5
90	4807.1	2.31-4	2.05-4	1.57-4	1.00-4	5.08-5	2.36-5
91	4951.7	2.25-4	2.00-4	1.53-4	9.75-5	4.95-5	2.30-5
92	5098.6	2.19-4	1.95-4	1.49-4	9.50-5	4.82-5	2.24-5

A1 – E18

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1634.5	2.97-4	2.63-4	2.01-4	1.31-4	6.94-5	3.29-5
61	1711.3	2.83-4	2.51-4	1.92-4	1.25-4	6.61-5	3.13-5
62	1790.1	2.71-4	2.40-4	1.83-4	1.19-4	6.31-5	2.97-5
63	1871.0	2.59-4	2.29-4	1.75-4	1.14-4	6.02-5	2.83-5
64	1954.1	2.47-4	2.19-4	1.67-4	1.09-4	5.75-5	2.70-5
65	2039.4	2.37-4	2.10-4	1.60-4	1.04-4	5.50-5	2.57-5
66	2126.8	2.27-4	2.01-4	1.54-4	9.99-5	5.26-5	2.46-5
67	2216.6	2.17-4	1.92-4	1.47-4	9.58-5	5.04-5	2.35-5
68	2308.6	2.08-4	1.85-4	1.41-4	9.19-5	4.83-5	2.26-5
69	2403.0	2.00-4	1.77-4	1.36-4	8.82-5	4.63-5	2.16-5
70	2499.8	1.92-4	1.70-4	1.31-4	8.48-5	4.45-5	2.08-5
71	2599.0	1.85-4	1.64-4	1.26-4	8.16-5	4.28-5	2.00-5
72	2700.7	1.78-4	1.58-4	1.21-4	7.86-5	4.12-5	1.92-5
73	2805.0	1.72-4	1.52-4	1.17-4	7.59-5	3.97-5	1.85-5
74	2911.9	1.66-4	1.47-4	1.13-4	7.32-5	3.83-5	1.79-5
75	3021.5	1.61-4	1.42-4	1.09-4	7.08-5	3.70-5	1.72-5
76	3133.8	1.55-4	1.38-4	1.05-4	6.85-5	3.57-5	1.67-5
77	3248.9	1.51-4	1.33-4	1.02-4	6.64-5	3.46-5	1.61-5
78	3366.9	1.46-4	1.30-4	9.93-5	6.44-5	3.35-5	1.57-5
79	3487.8	1.42-4	1.26-4	9.64-5	6.26-5	3.25-5	1.52-5
80	3611.6	1.38-4	1.22-4	9.38-5	6.08-5	3.16-5	1.47-5
81	3738.6	1.34-4	1.19-4	9.12-5	5.92-5	3.07-5	1.43-5
82	3868.8	1.31-4	1.16-4	8.89-5	5.76-5	2.99-5	1.39-5
83	4002.1	1.27-4	1.12[illegible]	8.66-5	5.61-5	2.91-5	1.36-5
84	4138.9	1.24-4	1.10-4	8.44-5	5.47-5	2.83-5	1.32-5
85	4279.0	1.21-4	1.08-4	8.24-5	5.34-5	2.76-5	1.29-5
86	4422.6	1.19-4	1.05-4	8.05-5	5.21-5	2.70-5	1.26-5
87	4569.9	1.16-4	1.03-4	7.87-5	5.09-5	2.63-5	1.23-5
88	4720.9	1.13-4	1.01-4	7.70-5	4.98-5	2.58-5	1.20-5
89	4875.8	1.11-4	9.89-5	7.57-5	4.90-5	2.54-5	1.18-5
90	5034.9	1.13-4	1.01-4	7.70-5	4.98-5	2.59-5	1.21-5
91	5187.9	7.82-5	6.88-5	5.19-5	3.34-5	1.79-5	8.83-6
92	5330.3	7.37-5	6.47-5	4.88-5	3.14-5	1.68-5	8.34-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - E19

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1707.7	2.73-4	2.40-4	1.79-4	1.14-4	6.07-5	3.02-5
61	1791.3	2.58-4	2.26-4	1.69-4	1.07-4	5.73-5	2.85-5
62	1876.8	2.43-4	2.13-4	1.60-4	1.02-4	5.43-5	2.70-5
63	1964.2	2.30-4	2.02-4	1.51-4	9.62-5	5.14-5	2.56-5
64	2053.5	2.18-4	1.91-4	1.43-4	9.13-5	4.88-5	2.43-5
65	2144.8	2.07-4	1.81-4	1.36-4	8.67-5	4.64-5	2.31-5
66	2238.0	1.96-4	1.72-4	1.29-4	8.25-5	4.41-5	2.19-5
67	2333.1	1.87-4	1.64-4	1.23-4	7.86-5	4.20-5	2.09-5
68	2430.2	1.78-4	1.56-4	1.17-4	7.49-5	4.01-5	1.99-5
69	2529.2	1.70-4	1.49-4	1.12-4	7.16-5	3.83-5	1.90-5
70	2630.1	1.62-4	1.42-4	1.07-4	6.84-5	3.66-5	1.82-5
71	2733.0	1.55-4	1.36-4	1.02-4	6.54-5	3.50-5	1.74-5
72	2837.7	1.48-4	1.30-4	9.76-5	6.27-5	3.35-5	1.66-5
73	2944.4	1.42-4	1.24-4	9.35-5	6.01-5	3.21-5	1.59-5
74	3053.0	1.36-4	1.19-4	8.97-5	5.76-5	3.08-5	1.53-5
75	3163.5	1.30-4	1.14-4	8.60-5	5.53-5	2.96-5	1.47-5
76	3276.0	1.25-4	1.10-4	8.26-5	5.32-5	2.84-5	1.41-5
77	3390.3	1.20-4	1.06-4	7.95-5	5.11-5	2.73-5	1.36-5
78	3506.5	1.16-4	1.02-4	7.65-5	4.92-5	2.63-5	1.30-5
79	3624.7	1.11-4	9.78-5	7.36-5	4.74-5	2.53-5	1.26-5
80	3744.7	1.07-4	9.42-5	7.09-5	4.57-5	2.44-5	1.21-5
81	3866.6	1.03-4	9.08-5	6.84-5	4.40-5	2.35-5	1.17-5
82	3990.4	9.98-5	8.76-5	6.60-5	4.25-5	2.27-5	1.13-5
83	4116.1	9.63-5	8.45-5	6.37-5	4.10-5	2.19-5	1.09-5
84	4243.6	9.30-5	8.16-5	6.15-5	3.96-5	2.12-5	1.05-5
85	4373.0	8.98-5	7.88-5	5.94-5	3.82-5	2.05-5	1.02-5
86	4504.3	8.68-5	7.62-5	5.74-5	3.69-5	1.98-5	9.81-6
87	4637.4	8.38-5	7.36-5	5.54-5	3.57-5	1.91-5	9.48-6
88	4772.4	8.08-5	7.10-5	5.34-5	3.44-5	1.84-5	9.15-6
89	4909.2	7.75-5	6.81-5	5.12-5	3.30-5	1.77-5	8.78-6
90	5047.5	7.06-5	6.20-5	4.66-5	3.00-5	1.61-5	7.99-6
91	5197.8	1.01-4	8.96-5	6.86-5	4.43-5	2.30-5	1.07-5
92	5364.8	1.01-4	8.96-5	6.86-5	4.43-5	2.30-5	1.07-5

A1 - E20

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1723.3	2.66-4	2.33-4	1.75-4	1.12-4	5.99-5	2.96-5
61	1808.4	2.54-4	2.23-4	1.67-4	1.07-4	5.75-5	2.84-5
62	1895.4	2.43-4	2.13-4	1.60-4	1.03-4	5.52-5	2.73-5
63	1984.6	2.32-4	2.04-4	1.54-4	9.89-5	5.30-5	2.62-5
64	2075.7	2.23-4	1.95-4	1.47-4	9.50-5	5.10-5	2.52-5
65	2169.0	2.13-4	1.88-4	1.42-4	9.14-5	4.91-5	2.43-5
66	2264.3	2.05-4	1.80-4	1.36-4	8.80-5	4.72-5	2.33-5
67	2361.6	1.97-4	1.73-4	1.31-4	8.47-5	4.55-5	2.25-5
68	2461.1	1.89-4	1.66-4	1.26-4	8.16-5	4.38-5	2.17-5
69	2562.6	1.82-4	1.60-4	1.21-4	7.87-5	4.23-5	2.09-5
70	2666.2	1.75-4	1.54-4	1.17-4	7.59-5	4.08-5	2.01-5
71	2771.9	1.69-4	1.48-4	1.13-4	7.33-5	3.94-5	1.94-5
72	2879.7	1.62-4	1.43-4	1.09-4	7.08-5	3.81-5	1.88-5
73	2989.6	1.57-4	1.38-4	1.05-4	6.85-5	3.68-5	1.82-5
74	3101.6	1.51-4	1.33-4	1.01-4	6.62-5	3.56-5	1.76-5
75	3215.8	1.46-4	1.29-4	9.81-5	6.41-5	3.45-5	1.70-5
76	3332.0	1.41-4	1.25-4	9.49-5	6.21-5	3.34-5	1.65-5
77	3450.4	1.37-4	1.21-4	9.19-5	6.01-5	3.23-5	1.59-5
78	3570.9	1.32-4	1.17-4	8.90-5	5.83-5	3.13-5	1.54-5
79	3693.6	1.28-4	1.13-4	8.63-5	5.65-5	3.04-5	1.50-5
80	3818.4	1.24-4	1.10-4	8.37-5	5.49-5	2.95-5	1.45-5
81	3945.4	1.20-4	1.06-4	8.12-5	5.33-5	2.87-5	1.41-5
82	4074.5	1.17-4	1.03-4	7.88-5	5.18-5	2.78-5	1.37-5
83	4205.9	1.13-4	1.00-4	7.66-5	5.03-5	2.71-5	1.33-5
84	4339.3	1.10-4	9.72-5	7.44-5	4.89-5	2.63-5	1.30-5
85	4475.0	1.07-4	9.45-5	7.24-5	4.76-5	2.56-5	1.26-5
86	4612.9	1.04-4	9.18-5	7.04-5	4.63-5	2.49-5	1.23-5
87	4753.0	1.01-4	8.93-5	6.85-5	4.50-5	2.43-5	1.19-5
88	4895.3	9.82-5	8.69-5	6.67-5	4.38-5	2.36-5	1.16-5
89	5039.8	9.56-5	8.46-5	6.49-5	4.27-5	2.30-5	1.13-5
90	5186.5	9.30-5	8.23-5	6.32-5	4.16-5	2.25-5	1.11-5
91	5335.5	9.06-5	8.02-5	6.16-5	4.05-5	2.19-5	1.08-5
92	5486.7	8.82-5	7.81-5	6.00-5	3.95-5	2.14-5	1.05-5

A1 - E21

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1817.3	2.20-4	1.94-4	1.47-4	9.35-5	4.88-5	2.34-5
61	1909.5	3.51-4	3.09-4	2.31-4	1.43-4	7.07-5	3.21-5
62	2001.1	5.34-4	4.75-4	3.63-4	2.31-4	1.16-4	5.35-5
63	2093.7	5.14-4	4.58-4	3.52-4	2.25-4	1.14-4	5.28-5
64	2188.3	4.91-4	4.38-4	3.37-4	2.16-4	1.10-4	5.08-5
65	2285.0	4.69-4	4.18-4	3.22-4	2.07-4	1.05-4	4.88-5
66	2383.8	4.49-4	4.00-4	3.08-4	1.98-4	1.01-4	4.68-5
67	2484.7	4.30-4	3.84-4	2.95-4	1.89-4	9.68-5	4.49-5
68	2587.7	4.12-4	3.68-4	2.83-4	1.82-4	9.29-5	4.31-5
69	2692.8	3.95-4	3.53-4	2.72-4	1.74-4	8.92-5	4.14-5
70	2800.1	3.80-4	3.39-4	2.61-4	1.68-4	8.57-5	3.98-5
71	2909.5	3.65-4	3.26-4	2.51-4	1.61-4	8.24-5	3.83-5
72	3021.0	3.51-4	3.13-4	2.41-4	1.55-4	7.93-5	3.69-5
73	3134.7	3.38-4	3.02-4	2.32-4	1.49-4	7.63-5	3.55-5
74	3250.5	3.25-4	2.90-4	2.24-4	1.44-4	7.35-5	3.42-5
75	3368.5	3.14-4	2.80-4	2.16-4	1.38-4	7.09-5	3.30-5
76	3488.6	3.02-4	2.70-4	2.08-4	1.34-4	6.84-5	3.18-5
77	3611.0	2.92-4	2.60-4	2.01-4	1.29-4	6.60-5	3.07-5
78	3735.5	2.82-4	2.51-4	1.94-4	1.25-4	6.37-5	2.97-5
79	3862.3	2.72-4	2.43-4	1.87-4	1.20-4	6.16-5	2.87-5
80	3991.2	2.63-4	2.35-4	1.81-4	1.16-4	5.96-5	2.77-5
81	4122.3	2.55-4	2.27-4	1.75-4	1.13-4	5.76-5	2.68-5
82	4255.7	2.46-4	2.20-4	1.69-4	1.09-4	5.58-5	2.60-5
83	4391.3	2.39-4	2.13-4	1.64-4	1.05-4	5.40-5	2.52-5
84	4529.2	2.31-4	2.06-4	1.59-4	1.02-4	5.23-5	2.44-5
85	4669.3	2.24-4	2.00-4	1.54-4	9.91-5	5.07-5	2.36-5
86	4811.7	2.17-4	1.94-4	1.49-4	9.61-5	4.92-5	2.29-5
87	4956.3	2.11-4	1.88-4	1.45-4	9.33-5	4.78-5	2.22-5
88	5103.3	2.05-4	1.83-4	1.41-4	9.06-5	4.64-5	2.16-5
89	5252.5	1.99-4	1.77-4	1.37-4	8.80-5	4.51-5	2.10-5
90	5404.0	1.93-4	1.72-4	1.33-4	8.55-5	4.38-5	2.04-5
91	5557.9	1.88-4	1.67-4	1.29-4	8.31-5	4.26-5	1.98-5
92	5714.0	1.82-4	1.63-4	1.25-4	8.08-5	4.14-5	1.93-5

A1 - E22

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1822.6	5.60-4	5.02-4	3.90-4	2.53-4	1.31-4	6.13-5
61	1911.6	3.93-4	3.55-4	2.81-4	1.88-4	1.01-4	4.88-5
62	2005.9	1.77-4	1.59-4	1.25-4	8.49-5	4.74-5	2.39-5
63	2103.8	1.65-4	1.48-4	1.15-4	7.71-5	4.25-5	2.13-5
64	2204.3	1.59-4	1.42-4	1.10-4	7.34-5	4.02-5	2.00-5
65	2307.5	1.53-4	1.37-4	1.06-4	7.03-5	3.85-5	1.91-5
66	2413.4	1.48-4	1.32-4	1.02-4	6.76-5	3.69-5	1.83-5
67	2522.0	1.42-4	1.27-4	9.81-5	6.50-5	3.55-5	1.76-5
68	2633.4	1.37-4	1.22-4	9.46-5	6.27-5	3.41-5	1.69-5
69	2747.6	1.32-4	1.18-4	9.12-5	6.04-5	3.29-5	1.63-5
70	2864.5	1.27-4	1.14-4	8.80-5	5.83-5	3.17-5	1.57-5
71	2984.4	1.23-4	1.10-4	8.50-5	5.63-5	3.06-5	1.52-5
72	3107.2	1.19-4	1.06-4	8.21-5	5.44-5	2.96-5	1.47-5
73	3232.9	1.15-4	1.02-4	7.94-5	5.26-5	2.86-5	1.42-5
74	3361.6	1.11-4	9.91-5	7.68-5	5.10-5	2.77-5	1.37-5
75	3493.4	1.08-4	9.60-5	7.44-5	4.94-5	2.68-5	1.33-5
76	3628.3	1.04-4	9.30-5	7.21-5	4.79-5	2.60-5	1.29-5
77	3766.3	1.01-4	9.02-5	7.00-5	4.64-5	2.52-5	1.25-5
78	3907.6	9.81-5	8.75-5	6.79-5	4.51-5	2.45-5	1.22-5
79	4052.1	9.52-5	8.50-5	6.60-5	4.38-5	2.38-5	1.18-5
80	4200.0	9.25-5	8.26-5	6.41-5	4.26-5	2.32-5	1.15-5
81	4351.2	8.99-5	8.03-5	6.24-5	4.14-5	2.25-5	1.12-5
82	4505.9	8.75-5	7.81-5	6.07-5	4.03-5	2.19-5	1.09-5
83	4664.1	8.51-5	7.60-5	5.91-5	3.93-5	2.14-5	1.07-5
84	4825.9	8.29-5	7.40-5	5.76-5	3.83-5	2.08-5	1.04-5
85	4991.4	8.08-5	7.22-5	5.61-5	3.73-5	2.03-5	1.02-5
86	5160.6	7.88-5	7.04-5	5.47-5	3.64-5	1.99-5	9.93-6
87	5333.7	7.69-5	6.87-5	5.34-5	3.56-5	1.94-5	9.71-6
88	5510.7	7.50-5	6.70-5	5.22-5	3.47-5	1.90-5	9.50-6
89	5691.7	7.32-5	6.55-5	5.10-5	3.39-5	1.86-5	9.30-6
90	5876.7	7.16-5	6.40-5	4.98-5	3.32-5	1.82-5	9.11-6
91	6066.0	6.99-5	6.26-5	4.87-5	3.24-5	1.78-5	8.93-6
92	6259.6	6.84-5	6.12-5	4.77-5	3.17-5	1.74-5	8.76-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leq Z \leq 92$

See page 96 for Explanation of Tables

A1 − E23

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1833.2	2.61-4	2.30-4	1.75-4	1.13-4	6.11-5	3.06-5
61	1927.5	2.49-4	2.20-4	1.67-4	1.08-4	5.85-5	2.93-5
62	2024.5	2.38-4	2.10-4	1.60-4	1.04-4	5.61-5	2.81-5
63	2124.2	2.28-4	2.01-4	1.53-4	9.96-5	5.39-5	2.70-5
64	2226.6	2.18-4	1.93-4	1.47-4	9.57-5	5.18-5	2.60-5
65	2331.8	2.09-4	1.85-4	1.41-4	9.20-5	4.98-5	2.50-5
66	2439.9	2.01-4	1.77-4	1.36-4	8.86-5	4.80-5	2.41-5
67	2550.7	1.93-4	1.71-4	1.30-4	8.53-5	4.63-5	2.32-5
68	2664.5	1.85-4	1.64-4	1.26-4	8.23-5	4.47-5	2.24-5
69	2781.2	1.78-4	1.58-4	1.21-4	7.94-5	4.31-5	2.17-5
70	2900.9	1.72-4	1.52-4	1.17-4	7.67-5	4.17-5	2.09-5
71	3023.6	1.65-4	1.47-4	1.13-4	7.41-5	4.03-5	2.03-5
72	3149.4	1.60-4	1.42-4	1.09-4	7.17-5	3.90-5	1.96-5
73	3278.4	1.54-4	1.37-4	1.05-4	6.94-5	3.78-5	1.90-5
74	3410.6	1.49-4	1.32-4	1.02-4	6.72-5	3.67-5	1.84-5
75	3546.0	1.44-4	1.28-4	9.85-5	6.52-5	3.56-5	1.79-5
76	3684.7	1.39-4	1.24-4	9.55-5	6.32-5	3.45-5	1.74-5
77	3826.9	1.35-4	1.20-4	9.26-5	6.13-5	3.36-5	1.69-5
78	3972.4	1.31-4	1.16-4	8.98-5	5.96-5	3.26-5	1.64-5
79	4121.5	1.27-4	1.13-4	8.72-5	5.79-5	3.17-5	1.60-5
80	4274.2	1.23-4	1.09-4	8.47-5	5.63-5	3.09-5	1.56-5
81	4430.5	1.19-4	1.06-4	8.23-5	5.47-5	3.01-5	1.52-5
82	4590.5	1.16-4	1.03-4	8.00-5	5.33-5	2.93-5	1.48-5
83	4754.4	1.13-4	1.00-4	7.78-5	5.19-5	2.86-5	1.44-5
84	4922.2	1.09-4	9.75-5	7.58-5	5.06-5	2.79-5	1.41-5
85	5094.0	1.06-4	9.49-5	7.38-5	4.93-5	2.72-5	1.38-5
86	5269.9	1.03-4	9.24-5	7.19-5	4.81-5	2.66-5	1.34-5
87	5449.9	1.01-4	9.00-5	7.01-5	4.69-5	2.60-5	1.32-5
88	5634.2	9.81-5	8.77-5	6.84-5	4.58-5	2.54-5	1.29-5
89	5823.0	9.56-5	8.55-5	6.67-5	4.47-5	2.48-5	1.26-5
90	6016.2	9.32-5	8.34-5	6.51-5	4.37-5	2.43-5	1.23-5
91	6214.1	9.10-5	8.14-5	6.36-5	4.27-5	2.38-5	1.21-5
92	6416.7	8.88-5	7.94-5	6.21-5	4.18-5	2.33-5	1.19-5

A1 − E24

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1956.4	1.68-4	1.49-4	1.15-4	7.68-5	4.29-5	2.14-5
61	2052.8	1.60-4	1.42-4	1.10-4	7.34-5	4.10-5	2.04-5
62	2151.8	1.53-4	1.36-4	1.05-4	7.02-5	3.92-5	1.95-5
63	2253.4	1.46-4	1.30-4	1.00-4	6.73-5	3.76-5	1.87-5
64	2357.7	1.39-4	1.24-4	9.59-5	6.45-5	3.60-5	1.79-5
65	2464.7	1.33-4	1.19-4	9.19-5	6.19-5	3.46-5	1.72-5
66	2574.4	1.28-4	1.14-4	8.82-5	5.94-5	3.32-5	1.65-5
67	2686.8	1.23-4	1.09-4	8.47-5	5.71-5	3.19-5	1.58-5
68	2802.1	1.18-4	1.05-4	8.14-5	5.50-5	3.07-5	1.52-5
69	2920.2	1.13-4	1.01-4	7.84-5	5.29-5	2.95-5	1.46-5
70	3041.1	1.09-4	9.69-5	7.55-5	5.10-5	2.85-5	1.41-5
71	3165.0	1.05-4	9.33-5	7.27-5	4.92-5	2.74-5	1.36-5
72	3291.9	1.01-4	8.99-5	7.01-5	4.75-5	2.65-5	1.31-5
73	3421.8	9.72-5	8.67-5	6.77-5	4.59-5	2.56-5	1.27-5
74	3554.7	9.38-5	8.37-5	6.54-5	4.44-5	2.47-5	1.23-5
75	3690.8	9.06-5	8.09-5	6.32-5	4.29-5	2.39-5	1.19-5
76	3830.0	8.76-5	7.82-5	6.11-5	4.15-5	2.31-5	1.15-5
77	3972.4	8.47-5	7.56-5	5.92-5	4.02-5	2.24-5	1.11-5
78	4118.2	8.19-5	7.32-5	5.73-5	3.90-5	2.17-5	1.08-5
79	4267.2	7.93-5	7.09-5	5.55-5	3.78-5	2.11-5	1.05-5
80	4419.7	7.68-5	6.87-5	5.38-5	3.66-5	2.04-5	1.02-5
81	4575.6	7.45-5	6.66-5	5.22-5	3.55-5	1.98-5	9.87-6
82	4735.1	7.22-5	6.46-5	5.07-5	3.45-5	1.93-5	9.60-6
83	4898.2	7.01-5	6.27-5	4.92-5	3.35-5	1.87-5	9.33-6
84	5065.0	6.80-5	6.08-5	4.77-5	3.25-5	1.82-5	9.09-6
85	5235.6	6.60-5	5.91-5	4.64-5	3.16-5	1.77-5	8.85-6
86	5409.9	6.42-5	5.74-5	4.51-5	3.07-5	1.72-5	8.62-6
87	5588.3	6.23-5	5.58-5	4.38-5	2.99-5	1.68-5	8.40-6
88	5770.6	6.06-5	5.42-5	4.26-5	2.91-5	1.63-5	8.20-6
89	5957.1	5.89-5	5.28-5	4.15-5	2.83-5	1.59-5	7.99-6
90	6147.8	5.73-5	5.13-5	4.03-5	2.75-5	1.55-5	7.80-6
91	6342.8	5.57-5	4.99-5	3.92-5	2.68-5	1.51-5	7.62-6
92	6542.3	5.42-5	4.86-5	3.82-5	2.60-5	1.47-5	7.43-6

A1 − E25

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2052.3	1.40-4	1.24-4	9.34-5	6.00-5	3.14-5	1.48-5
61	2152.8	1.34-4	1.18-4	8.93-5	5.74-5	3.00-5	1.42-5
62	2256.1	1.28-4	1.13-4	8.54-5	5.49-5	2.87-5	1.35-5
63	2362.1	1.23-4	1.08-4	8.18-5	5.26-5	2.75-5	1.29-5
64	2470.9	1.17-4	1.03-4	7.85-5	5.04-5	2.64-5	1.24-5
65	2582.5	1.13-4	9.93-5	7.53-5	4.84-5	2.53-5	1.19-5
66	2697.0	1.08-4	9.53-5	7.23-5	4.65-5	2.43-5	1.14-5
67	2814.4	1.04-4	9.16-5	6.95-5	4.47-5	2.34-5	1.09-5
68	2934.8	9.98-5	8.80-5	6.68-5	4.30-5	2.25-5	1.05-5
69	3058.1	9.60-5	8.47-5	6.43-5	4.14-5	2.16-5	1.01-5
70	3184.6	9.24-5	8.16-5	6.20-5	3.99-5	2.08-5	9.74-6
71	3314.1	8.90-5	7.86-5	5.98-5	3.85-5	2.01-5	9.39-6
72	3446.8	8.59-5	7.58-5	5.77-5	3.72-5	1.94-5	9.06-6
73	3582.7	8.29-5	7.32-5	5.57-5	3.59-5	1.87-5	8.74-6
74	3721.9	8.00-5	7.07-5	5.38-5	3.47-5	1.81-5	8.45-6
75	3864.5	7.73-5	6.83-5	5.20-5	3.35-5	1.74-5	8.16-6
76	4010.4	7.48-5	6.61-5	5.03-5	3.24-5	1.69-5	7.90-6
77	4159.8	7.23-5	6.39-5	4.87-5	3.14-5	1.63-5	7.65-6
78	4312.8	7.00-5	6.19-5	4.72-5	3.04-5	1.58-5	7.41-6
79	4469.4	6.78-5	6.00-5	4.57-5	2.95-5	1.53-5	7.18-6
80	4629.6	6.57-5	5.82-5	4.43-5	2.86-5	1.48-5	6.96-6
81	4793.6	6.38-5	5.64-5	4.30-5	2.78-5	1.44-5	6.75-6
82	4961.5	6.19-5	5.47-5	4.18-5	2.70-5	1.40-5	6.56-6
83	5133.2	6.01-5	5.32-5	4.06-5	2.62-5	1.36-5	6.37-6
84	5309.0	5.84-5	5.17-5	3.94-5	2.54-5	1.32-5	6.19-6
85	5489.0	5.67-5	5.02-5	3.83-5	2.47-5	1.28-5	6.02-6
86	5673.1	5.52-5	4.88-5	3.73-5	2.41-5	1.25-5	5.86-6
87	5861.5	5.37-5	4.75-5	3.63-5	2.34-5	1.21-5	5.70-6
88	6054.4	5.22-5	4.63-5	3.53-5	2.28-5	1.18-5	5.55-6
89	6251.9	5.09-5	4.51-5	3.44-5	2.22-5	1.15-5	5.41-6
90	6454.0	4.96-5	4.39-5	3.35-5	2.16-5	1.12-5	5.28-6
91	6660.9	4.83-5	4.28-5	3.27-5	2.11-5	1.10-5	5.14-6
92	6872.7	4.71-5	4.17-5	3.19-5	2.06-5	1.07-5	5.02-6

A1 − F1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	841.5	2.70-3	2.77-3	2.94-3	3.25-3	3.69-3	4.13-3
61	886.9	2.57-3	2.64-3	2.80-3	3.10-3	3.53-3	4.36-3
62	933.3	2.45-3	2.51-3	2.67-3	2.96-3	3.37-3	4.50-3
63	980.7	2.35-3	2.40-3	2.55-3	2.83-3	3.23-3	4.55-3
64	1029.0	2.24-3	2.30-3	2.45-3	2.71-3	3.09-3	4.54-3
65	1078.4	2.15-3	2.20-3	2.34-3	2.60-3	2.97-3	4.47-3
66	1128.6	2.06-3	2.11-3	2.25-3	2.50-3	2.85-3	4.37-3
67	1179.8	1.98-3	2.03-3	2.16-3	2.40-3	2.74-3	4.23-3
68	1231.8	1.91-3	1.95-3	2.08-3	2.31-3	2.64-3	4.07-3
69	1284.8	1.84-3	1.88-3	2.01-3	2.23-3	2.55-3	3.90-3
70	1338.6	1.77-3	1.82-3	1.94-3	2.15-3	2.46-3	3.72-3
71	1393.2	1.71-3	1.76-3	1.87-3	2.08-3	2.38-3	3.53-3
72	1448.7	1.66-3	1.70-3	1.81-3	2.02-3	2.31-3	3.34-3
73	1504.9	1.61-3	1.65-3	1.76-3	1.95-3	2.24-3	3.16-3
74	1561.9	1.56-3	1.60-3	1.71-3	1.90-3	2.17-3	2.98-3
75	1619.7	1.51-3	1.55-3	1.66-3	1.84-3	2.11-3	2.81-3
76	1678.2	1.47-3	1.51-3	1.61-3	1.79-3	2.06-3	2.65-3
77	1737.3	1.43-3	1.47-3	1.57-3	1.75-3	2.01-3	2.50-3
78	1797.2	1.40-3	1.44-3	1.53-3	1.70-3	1.96-3	2.36-3
79	1857.6	1.37-3	1.40-3	1.50-3	1.66-3	1.91-3	2.23-3
80	1918.7	1.33-3	1.37-3	1.46-3	1.63-3	1.87-3	2.11-3
81	1980.4	1.31-3	1.34-3	1.43-3	1.59-3	1.83-3	2.01-3
82	2042.6	1.28-3	1.31-3	1.40-3	1.56-3	1.79-3	1.92-3
83	2105.3	1.25-3	1.29-3	1.37-3	1.53-3	1.76-3	1.85-3
84	2168.5	1.23-3	1.26-3	1.35-3	1.50-3	1.73-3	1.79-3
85	2232.1	1.21-3	1.24-3	1.33-3	1.48-3	1.70-3	1.74-3
86	2296.2	1.19-3	1.22-3	1.30-3	1.45-3	1.67-3	1.71-3
87	2360.6	1.17-3	1.20-3	1.28-3	1.43-3	1.65-3	1.68-3
88	2425.3	1.15-3	1.18-3	1.26-3	1.41-3	1.62-3	1.67-3
89	2490.3	1.14-3	1.17-3	1.25-3	1.39-3	1.60-3	1.68-3
90	2555.5	1.12-3	1.15-3	1.23-3	1.37-3	1.58-3	1.69-3
91	2620.8	1.11-3	1.14-3	1.21-3	1.35-3	1.56-3	1.72-3
92	2686.3	1.09-3	1.12-3	1.20-3	1.34-3	1.54-3	1.76-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - F2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	864.4	2.14-3	2.17-3	2.26-3	2.45-3	2.74-3	3.03-3
61	911.8	2.02-3	2.05-3	2.13-3	2.30-3	2.57-3	3.13-3
62	960.4	1.91-3	1.93-3	2.01-3	2.17-3	2.43-3	3.16-3
63	[illegible]	1.80-3	1.83-3	1.90-3	2.05-3	2.29-3	3.14-3
64	1060.9	1.71-3	1.73-3	1.80-3	1.94-3	2.16-3	3.08-3
65	[illegible]	[illegible]	1.64-3	1.71-3	1.84-3	2.05-3	2.99-3
66	[illegible]	1.54-3	1.56-3	1.62-3	1.75-3	1.95-3	2.88-3
67	[illegible]	1.47-3	1.49-3	1.54-3	1.66-3	1.85-3	2.76-3
68	[illegible]	1.40-3	1.42-3	1.47-3	1.58-3	1.77-3	2.63-3
69	[illegible]	1.34-3	1.35-3	1.41-3	1.51-3	1.69-3	2.49-3
70	1388.6	1.28-3	1.30-3	1.35-3	1.45-3	1.61-3	2.36-3
71	1446.8	1.23-3	1.24-3	1.29-3	1.39-3	1.55-3	2.22-3
72	1506.1	1.18-3	1.17-3	1.24-3	1.33-3	1.48-3	2.08-3
73	1566.4	1.14-3	1.15-3	1.19-3	1.28-3	1.43-3	1.96-3
74	1627.7	1.10-3	1.11-3	1.15-3	1.23-3	1.37-3	1.83-3
75	1689.9	1.06-3	1.07-3	1.11-3	1.19-3	1.32-3	1.72-3
76	1753.1	1.02-3	1.03-3	1.07-3	1.15-3	1.28-3	1.61-3
77	1817.2	9.88-4	9.98-4	1.03-3	1.11-3	1.23-3	1.51-3
78	1882.2	9.57-4	9.66-4	9.99-4	1.07-3	1.19-3	1.41-3
79	1948.1	9.28-4	9.37-4	9.68-4	1.04-3	1.16-3	1.33-3
80	2014.9	9.01-4	9.09-4	9.40-4	1.01-3	1.12-3	1.25-3
81	2082.5	8.75-4	8.84-4	9.13-4	9.79-4	1.09-3	1.19-3
82	2150.9	8.52-4	8.60-4	8.88-4	9.52-4	1.06-3	1.13-3
83	2220.1	8.30-4	8.37-4	8.65-4	9.27-4	1.04-3	1.08-3
84	2290.1	8.09-4	8.17-4	8.43-4	9.04-4	1.01-3	1.04-3
85	2360.8	7.90-4	7.97-4	8.23-4	8.82-4	9.85-4	1.00-3
86	2432.3	7.71-4	7.79-4	8.04-4	8.62-4	9.62-4	9.74-4
87	2504.4	7.55-4	7.61-4	7.86-4	8.43-4	9.41-4	9.54-4
88	2577.2	7.39-4	7.45-4	7.69-4	8.25-4	9.21-4	9.42-4
89	2650.5	7.24-4	7.30-4	7.53-4	8.08-4	9.02-4	9.36-4
90	2724.5	7.09-4	7.16-4	7.39-4	7.92-4	8.85-4	9.38-4
91	2798.9	6.96-4	7.02-4	7.25-4	7.77-4	8.69-4	9.45-4
92	2873.9	6.84-4	6.90-4	7.12-4	7.64-4	8.53-4	9.59-4

A1 - F3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1044.3	2.29-3	2.08-3	1.68-3	1.25-3	9.27-4	8.06-4
61	1098.1	2.19-3	1.99-3	1.62-3	1.21-3	9.20-4	8.55-4
62	1153.1	2.09-3	1.91-3	1.56-3	1.18-3	9.12-4	8.95-4
63	1209.4	2.01-3	1.83-3	1.50-3	1.15-3	9.04-4	9.27-4
64	1267.0	1.93-3	1.76-3	1.45-3	1.12-3	8.96-4	9.51-4
65	1325.8	1.85-3	1.69-3	1.40-3	1.10-3	8.87-4	9.67-4
66	1385.8	1.78-3	1.63-3	1.36-3	1.07-3	8.77-4	9.76-4
67	1447.0	1.71-3	1.57-3	1.32-3	1.05-3	8.68-4	9.79-4
68	1509.5	1.65-3	1.52-3	1.28-3	1.02-3	8.58-4	9.76-4
69	1573.2	1.59-3	1.47-3	1.24-3	1.00-3	8.48-4	9.68-4
70	1638.2	1.54-3	1.42-3	1.20-3	9.78-4	8.37-4	9.56-4
71	1704.3	1.49-3	1.37-3	1.17-3	9.56-4	8.27-4	9.41-4
72	1771.7	1.44-3	1.33-3	1.13-3	9.36-4	8.17-4	9.22-4
73	1840.3	1.39-3	1.29-3	1.10-3	9.16-4	8.06-4	9.02-4
74	1910.1	1.35-3	1.25-3	1.07-3	8.98-4	7.96-4	8.81-4
75	1981.1	1.31-3	1.21-3	1.05-3	8.80-4	7.86-4	8.59-4
76	2053.3	1.27-3	1.18-3	1.02-3	8.62-4	7.75-4	8.36-4
77	2126.7	1.23-3	1.15-3	9.94-4	8.45-4	7.66-4	8.14-4
78	2201.4	1.20-3	1.11-3	9.70-4	8.29-4	7.56-4	7.92-4
79	2277.2	1.17-3	1.09-3	9.47-4	8.14-4	7.46-4	7.71-4
80	2354.2	1.13-3	1.06-3	9.26-4	7.99-4	7.37-4	7.51-4
81	2432.4	1.10-3	1.03-3	9.05-4	7.84-4	7.28-4	7.33-4
82	2511.7	1.08-3	1.01-3	8.85-4	7.71-4	7.19-4	7.17-4
83	2592.3	1.05-3	9.82-4	8.66-4	7.58-4	7.10-4	7.03-4
84	2674.0	1.02-3	9.59-4	8.49-4	7.46-4	7.02-4	6.91-4
85	2756.9	9.99-4	9.38-4	8.32-4	7.34-4	6.95-4	6.81-4
86	2840.9	9.76-4	9.17-4	8.16-4	7.23-4	6.87-4	6.74-4
87	2926.1	9.55-4	8.98-4	8.01-4	7.13-4	6.81-4	6.70-4
88	3012.5	9.35-4	8.80-4	7.87-4	7.03-4	6.75-4	6.69-4
89	3100.0	9.16-4	8.63-4	7.74-4	6.94-4	6.69-4	6.71-4
90	3188.6	8.98-4	8.47-4	7.62-4	6.86-4	6.64-4	6.76-4
91	3278.4	8.81-4	8.33-4	7.50-4	6.79-4	6.60-4	6.84-4
92	3369.3	8.66-4	8.19-4	7.40-4	6.73-4	6.57-4	6.97-4

A1 - F4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1053.1	4.07-3	4.13-3	4.31-3	4.70-3	5.36-3	6.07-3
61	1107.6	3.90-3	3.96-3	4.14-3	4.51-3	5.15-3	6.19-3
62	1163.4	3.74-3	3.80-3	3.97-3	4.33-3	4.95-3	6.23-3
63	1220.6	3.59-3	3.65-3	3.81-3	4.17-3	4.76-3	6.20-3
64	1279.0	3.45-3	3.50-3	3.67-3	4.00-3	4.58-3	6.12-3
65	1338.7	3.31-3	3.37-3	3.52-3	3.85-3	4.41-3	5.99-3
66	1399.7	3.19-3	3.24-3	3.39-3	3.71-3	4.24-3	5.83-3
67	1462.0	3.07-3	3.11-3	3.26-3	3.57-3	4.09-3	5.64-3
68	1525.6	2.95-3	3.00-3	3.14-3	3.44-3	3.94-3	5.44-3
69	1590.5	2.84-3	2.89-3	3.03-3	3.32-3	3.80-3	5.23-3
70	1656.7	2.74-3	2.78-3	2.92-3	3.20-3	3.67-3	5.00-3
71	1724.2	2.64-3	2.69-3	2.82-3	3.09-3	3.55-3	4.78-3
72	1793.0	2.55-3	2.59-3	2.72-3	2.98-3	3.43-3	4.56-3
73	1863.1	2.46-3	2.51-3	2.63-3	2.88-3	3.31-3	4.34-3
74	1934.5	2.38-3	2.42-3	2.54-3	2.79-3	3.20-3	4.12-3
75	2007.2	2.30-3	2.34-3	2.45-3	2.70-3	3.10-3	3.91-3
76	2081.2	2.23-3	2.26-3	2.37-3	2.61-3	3.00-3	3.72-3
77	2156.4	2.16-3	2.19-3	2.30-3	2.53-3	2.91-3	3.53-3
78	2233.0	2.09-3	2.12-3	2.23-3	2.45-3	2.82-3	3.35-3
79	2310.8	2.02-3	2.06-3	2.16-3	2.37-3	2.74-3	3.19-3
80	2390.0	1.96-3	1.99-3	2.09-3	2.30-3	2.65-3	3.04-3
81	2470.4	1.90-3	1.93-3	2.03-3	2.23-3	2.57-3	2.90-3
82	2552.2	1.84-3	1.87-3	1.97-3	2.16-3	2.50-3	2.78-3
83	2635.2	1.79-3	1.82-3	1.91-3	2.10-3	2.43-3	2.65-3
84	2719.5	1.74-3	1.77-3	1.85-3	2.04-3	2.36-3	2.57-3
85	2805.1	1.69-3	1.71-3	1.80-3	1.99-3	2.30-3	2.48-3
86	2892.0	1.64-3	1.67-3	1.75-3	1.93-3	2.23-3	2.41-3
87	2980.2	1.59-3	[illegible]	1.70-3	1.88-3	2.17-3	2.34-3
88	3069.6	[illegible]	1.58-3	1.66-3	1.83-3	2.11-3	2.29-3
89	3160.4	[illegible]	1.53-3	1.61-3	1.78-3	2.06-3	2.25-3
90	3252.4	1.47-3	1.49-3	1.57-3	1.73-3	2.00-3	2.23-3
91	3345.8	1.43-3	1.45-3	1.53-3	1.68-3	1.95-3	2.21-3
92	3440.4	1.39-3	1.41-3	1.49-3	1.64-3	1.90-3	2.20-3

A1 - F5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1070.6	2.74-3	2.78-3	2.90-3	3.17-3	3.63-3	4.13-3
61	1126.5	2.60-3	2.64-3	2.75-3	3.01-3	3.44-3	4.14-3
62	1183.8	2.48-3	2.51-3	2.62-3	2.86-3	3.27-3	4.10-3
63	1242.5	2.36-3	2.39-3	2.50-3	2.72-3	3.12-3	4.03-3
64	1302.6	2.25-3	2.28-3	2.38-3	2.60-3	2.97-3	3.93-3
65	1364.0	2.15-3	2.18-3	2.27-3	2.48-3	2.84-3	3.81-3
66	1426.9	2.06-3	2.08-3	2.18-3	2.37-3	2.71-3	3.68-3
67	1491.1	1.97-3	2.00-3	2.08-3	2.27-3	2.60-3	3.54-3
68	1556.8	1.89-3	1.91-3	1.99-3	2.17-3	2.49-3	3.39-3
69	1623.9	1.81-3	1.84-3	1.91-3	2.08-3	2.39-3	3.24-3
70	1692.3	1.74-3	1.76-3	1.84-3	2.00-3	2.29-3	3.08-3
71	1762.2	1.68-3	1.70-3	1.77-3	1.92-3	2.20-3	2.93-3
72	1833.5	1.61-3	1.63-3	1.70-3	1.85-3	2.12-3	2.79-3
73	1906.2	1.55-3	1.57-3	1.64-3	1.78-3	2.04-3	2.65-3
74	1980.4	1.50-3	1.52-3	1.58-3	1.72-3	1.97-3	2.51-3
75	2055.9	1.45-3	1.46-3	1.52-3	1.66-3	1.91-3	2.39-3
76	2132.9	1.40-3	1.41-3	1.47-3	1.60-3	1.84-3	2.26-3
77	2211.4	1.35-3	1.37-3	1.42-3	1.55-3	1.78-3	2.15-3
78	2291.2	1.31-3	1.33-3	1.38-3	1.50-3	1.73-3	2.05-3
79	2372.6	1.27-3	1.28-3	1.34-3	1.46-3	1.68-3	1.95-3
80	2455.3	1.23-3	1.25-3	1.30-3	1.42-3	1.63-3	1.87-3
81	2539.6	1.20-3	1.21-3	1.26-3	1.38-3	1.59-3	1.79-3
82	2625.2	1.17-3	1.18-3	1.23-3	1.35-3	1.55-3	1.73-3
83	2712.4	1.14-3	1.15-3	1.20-3	1.31-3	1.51-3	1.67-3
84	2801.0	1.11-3	1.13-3	1.18-3	1.29-3	1.49-3	1.63-3
85	2891.0	1.09-3	1.11-3	1.16-3	1.27-3	1.47-3	1.60-3
86	2982.5	1.08-3	1.10-3	1.15-3	1.26-3	1.46-3	1.58-3
87	3075.5	1.08-3	1.10-3	1.15-3	1.27-3	1.46-3	1.60-3
88	3169.9	1.10-3	1.12-3	1.18-3	1.30-3	1.51-3	1.65-3
89	3265.7	1.17-3	1.19-3	1.26-3	1.40-3	1.63-3	1.80-3
90	3362.4	1.39-3	1.43-3	1.54-3	1.73-3	2.03-3	2.28-3
91	3456.3	1.88-3	1.96-3	2.14-3	2.45-3	2.90-3	3.31-3
92	3544.[illegible]	1.58-3	1.64-3	1.79-3	2.05-3	2.41-3	2.80-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - F6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1075.2	2.48-3	2.34-3	2.11-3	1.89-3	1.81-3	1.88-3
61	1131.8	2.35-3	2.22-3	1.99-3	1.78-3	1.71-3	1.86-3
62	1189.7	2.23-3	2.10-3	1.89-3	1.69-3	1.61-3	1.82-3
63	1249.1	2.12-3	2.00-3	1.79-3	1.60-3	1.52-3	1.77-3
64	1310.0	2.02-3	1.90-3	1.70-3	1.51-3	1.44-3	1.71-3
65	1372.3	1.92-3	1.81-3	1.62-3	1.44-3	1.36-3	1.64-3
66	1436.0	1.83-3	1.73-3	1.54-3	1.36-3	1.29-3	1.57-3
67	1501.3	1.75-3	1.65-3	1.47-3	1.30-3	1.23-3	1.50-3
68	1567.9	1.67-3	1.57-3	1.40-3	1.23-3	1.17-3	1.42-3
69	1636.1	1.60-3	1.50-3	1.33-3	1.18-3	1.11-3	1.35-3
70	1705.7	1.53-3	1.44-3	1.28-3	1.12-3	1.06-3	1.27-3
71	1776.8	1.47-3	1.38-3	1.22-3	1.07-3	1.01-3	1.20-3
72	1849.4	1.41-3	1.32-3	1.17-3	1.02-3	9.61-4	1.13-3
73	1923.5	1.35-3	1.26-3	1.12-3	9.79-4	9.18-4	1.06-3
74	1999.2	1.29-3	1.21-3	1.07-3	9.37-4	8.77-4	1.00-3
75	2076.3	1.24-3	1.17-3	1.03-3	8.97-4	8.38-4	9.39-4
76	2154.9	1.20-3	1.12-3	9.86-4	8.59-4	8.01-4	8.82-4
77	2235.1	1.15-3	1.08-3	9.46-4	8.23-4	7.66-4	8.28-4
78	2316.8	1.11-3	1.03-3	9.08-4	7.88-4	7.32-4	7.77-4
79	2400.0	1.06-3	9.94-4	8.72-4	7.55-4	6.99-4	7.28-4
80	2484.8	1.02-3	9.56-4	8.37-4	7.22-4	6.66-4	6.83-4
81	2571.2	9.85-4	9.19-4	8.02-4	6.90-4	6.34-4	6.39-4
82	2659.1	9.47-4	8.82-4	7.68-4	6.57-4	6.01-4	5.96-4
83	2748.6	9.09-4	8.44-4	7.32-4	6.22-4	5.65-4	5.51-4
84	2839.6	8.68-4	8.05-4	6.93-4	5.82-4	5.21-4	5.01-4
85	2932.3	8.20-4	7.56-4	6.43-4	5.29-4	4.60-4	4.32-4
86	3026.3	7.42-4	6.75-4	5.54-4	4.26-4	3.38-4	2.96-4
87	3119.6	6.63-4	6.19-4	5.42-4	4.65-4	4.23-4	4.14-4
88	3204.7	1.02-3	1.04-3	1.10-3	1.22-3	1.40-3	1.54-3
89	3289.3	9.71-4	9.95-4	1.06-3	1.17-3	1.35-3	1.50-3
90	3375.1	7.22-4	7.32-4	7.63-4	8.30-4	9.44-4	1.05-3
91	3465.8	2.06-4	1.80-4	1.34-4	8.36-5	4.65-5	3.12-5
92	3564.5	4.74-4	4.61-4	4.47-4	4.50-4	4.90-4	5.56-4

A1 - F7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1216.7	2.43-3	2.50-3	2.70-3	3.05-3	3.59-3	4.14-3
61	1273.3	2.35-3	2.42-3	2.61-3	2.96-3	3.48-3	4.16-3
62	1331.0	2.27-3	2.34-3	2.53-3	2.87-3	3.37-3	4.15-3
63	1389.9	2.20-3	2.27-3	2.45-3	2.78-3	3.27-3	4.12-3
64	1450.0	2.13-3	2.20-3	2.38-3	2.70-3	3.17-3	4.07-3
65	1511.2	2.07-3	2.14-3	2.31-3	2.62-3	3.08-3	4.00-3
66	1573.5	2.01-3	2.08-3	2.25-3	2.55-3	3.00-3	3.92-3
67	1636.9	1.95-3	2.02-3	2.19-3	2.48-3	2.92-3	3.83-3
68	1701.5	1.90-3	1.97-3	2.13-3	2.41-3	2.84-3	3.73-3
69	1767.2	1.85-3	1.91-3	2.07-3	2.35-3	2.77-3	3.63-3
70	1834.0	1.81-3	1.87-3	2.02-3	2.29-3	2.70-3	3.52-3
71	1901.8	1.76-3	1.82-3	1.97-3	2.24-3	2.63-3	3.41-3
72	1970.7	1.72-3	1.78-3	1.93-3	2.19-3	2.57-3	3.30-3
73	2040.7	1.68-3	1.74-3	1.88-3	2.14-3	2.51-3	3.18-3
74	2111.7	1.64-3	1.70-3	1.84-3	2.09-3	2.46-3	3.07-3
75	2183.7	1.61-3	1.66-3	1.80-3	2.05-3	2.40-3	2.97-3
76	2256.7	1.57-3	1.63-3	1.77-3	2.00-3	2.35-3	2.87-3
77	2330.8	1.54-3	1.60-3	1.73-3	1.96-3	2.31-3	2.77-3
78	2405.8	1.51-3	1.56-3	1.70-3	1.93-3	2.26-3	2.68-3
79	2481.7	1.48-3	1.54-3	1.66-3	1.89-3	2.22-3	2.59-3
80	2558.6	1.45-3	1.51-3	1.63-3	1.85-3	2.18-3	2.51-3
81	2636.4	1.43-3	1.48-3	1.60-3	1.82-3	2.14-3	2.44-3
82	2715.1	1.40-3	1.46-3	1.58-3	1.79-3	2.10-3	2.37-3
83	2794.7	1.38-3	1.43-3	1.55-3	1.76-3	2.07-3	2.32-3
84	2875.2	1.36-3	1.41-3	1.53-3	1.74-3	2.05-3	2.27-3
85	2956.5	1.35-3	1.40-3	1.52-3	1.73-3	2.04-3	2.25-3
86	3038.8	1.36-3	1.41-3	1.54-3	1.76-3	2.08-3	2.30-3
87	3124.3	1.37-3	1.40-3	1.48-3	1.64-3	1.90-3	2.08-3
88	3220.4	9.18-4	8.82-4	8.23-4	7.84-4	8.02-4	8.31-4
89	3319.4	8.35-4	7.92-4	7.19-4	6.58-4	6.49-4	6.63-4
90	3420.1	7.91-4	7.47-4	6.71-4	6.04-4	5.86-4	6.00-4
91	3522.5	7.59-4	7.14-4	6.38-4	5.69-4	5.47-4	5.66-4
92	3626.6	7.31-4	6.87-4	6.12-4	5.43-4	5.18-4	5.44-4

A1 - F8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1253.0	1.66-3	1.73-3	1.90-3	2.21-3	2.67-3	3.14-3
61	1312.8	1.60-3	1.66-3	1.83-3	2.13-3	2.57-3	3.12-3
62	1374.0	1.53-3	1.60-3	1.76-3	2.05-3	2.48-3	3.08-3
63	1436.5	1.48-3	1.54-3	1.70-3	1.98-3	2.39-3	3.03-3
64	1500.5	1.42-3	1.48-3	1.64-3	1.91-3	2.30-3	2.97-3
65	1565.9	1.37-3	1.43-3	1.58-3	1.84-3	2.22-3	2.90-3
66	1632.7	1.32-3	1.38-3	1.52-3	1.78-3	2.15-3	2.82-3
67	1700.9	1.28-3	1.33-3	1.47-3	1.72-3	2.08-3	2.74-3
68	1770.6	1.23-3	1.29-3	1.42-3	1.66-3	2.01-3	2.65-3
69	1841.6	1.19-3	1.25-3	1.38-3	1.60-3	1.94-3	2.56-3
70	1914.1	1.15-3	1.21-3	1.33-3	1.55-3	1.88-3	2.47-3
71	1988.0	1.12-3	1.17-3	1.29-3	1.50-3	1.82-3	2.37-3
72	2063.3	1.08-3	1.13-3	1.25-3	1.46-3	1.76-3	2.28-3
73	2140.1	1.05-3	1.09-3	1.21-3	1.41-3	1.71-3	2.19-3
74	2218.3	1.02-3	1.06-3	1.17-3	1.37-3	1.65-3	2.10-3
75	2298.0	9.86-4	1.03-3	1.14-3	1.33-3	1.60-3	2.01-3
76	2379.1	9.56-4	9.99-4	1.10-3	1.29-3	1.56-3	1.93-3
77	2461.6	9.28-4	9.70-4	1.07-3	1.25-3	1.51-3	1.85-3
78	2545.7	9.02-4	9.42-4	1.04-3	1.21-3	1.47-3	1.77-3
79	2631.1	8.76-4	9.15-4	1.01-3	1.18-3	1.43-3	1.70-3
80	2718.1	8.51-4	8.90-4	9.83-4	1.15-3	1.39-3	1.63-3
81	2806.5	8.28-4	8.65-4	9.56-4	1.11-3	1.35-3	1.57-3
82	2896.4	8.05-4	8.42-4	9.30-4	1.08-3	1.31-3	1.51-3
83	2987.8	7.84-4	8.19-4	9.05-4	1.06-3	1.28-3	1.46-3
84	3080.6	7.63-4	7.97-4	8.81-4	1.03-3	1.24-3	1.41-3
85	3175.0	7.43-4	7.77-4	8.58-4	1.00-3	1.21-3	1.37-3
86	3270.9	7.24-4	7.57-4	8.36-4	9.75-4	1.18-3	1.33-3
87	3368.2	7.05-4	7.37-4	8.15-4	9.50-4	1.15-3	1.30-3
88	3467.1	6.88-4	7.19-4	7.94-4	9.27-4	1.12-3	1.27-3
89	3567.5	6.71-4	7.01-4	7.75-4	9.04-4	1.09-3	1.25-3
90	3669.3	6.54-4	6.84-4	7.56-4	8.82-4	1.07-3	1.23-3
91	3772.8	6.39-4	6.68-4	7.38-4	8.60-4	1.04-3	1.22-3
92	3877.7	6.23-4	6.52-4	7.20-4	8.40-4	1.02-3	1.21-3

A1 - F9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1359.8	1.56-3	1.59-3	1.67-3	1.86-3	2.17-3	2.53-3
61	1428.8	1.50-3	1.53-3	1.62-3	1.80-3	2.11-3	2.49-3
62	1499.9	1.44-3	1.47-3	1.55-3	1.73-3	2.03-3	2.42-3
63	1572.9	1.37-3	1.40-3	1.49-3	1.66-3	1.95-3	2.34-3
64	1648.1	1.32-3	1.35-3	1.43-3	1.60-3	1.87-3	2.27-3
65	1725.4	1.26-3	1.29-3	1.37-3	1.53-3	1.80-3	2.19-3
66	1804.8	1.21-3	1.24-3	1.32-3	1.48-3	1.74-3	2.12-3
67	1886.4	1.17-3	1.20-3	1.27-3	1.43-3	1.68-3	2.06-3
68	1970.2	1.13-3	1.16-3	1.23-3	1.38-3	1.63-3	1.99-3
69	2056.4	1.10-3	1.13-3	1.20-3	1.35-3	1.59-3	1.95-3
70	2144.8	1.07-3	1.10-3	1.17-3	1.32-3	1.56-3	1.91-3
71	2235.6	1.06-3	1.09-3	1.16-3	1.31-3	1.55-3	1.89-3
72	2328.8	1.06-3	1.09-3	1.17-3	1.32-3	1.57-3	1.91-3
73	2424.5	1.09-3	1.13-3	1.21-3	1.37-3	1.64-3	1.99-3
74	2522.6	1.21-3	1.25-3	1.35-3	1.54-3	1.84-3	2.23-3
75	2622.4	1.64-3	1.67-3	1.77-3	1.97-3	2.32-3	2.78-3
76	2714.9	1.31-3	1.18-3	9.55-4	7.15-4	5.43-4	4.90-4
77	2805.8	1.17-3	1.05-3	8.19-4	5.64-4	3.67-4	2.78-4
78	2898.3	1.10-3	9.75-4	7.50-4	4.98-4	2.97-4	2.01-4
79	2992.2	1.04-3	9.18-4	6.99-4	4.52-4	2.53-4	1.53-4
80	3087.8	9.85-4	8.69-4	6.57-4	4.17-4	2.22-4	1.21-4
81	3184.9	9.39-4	8.28-4	6.22-4	3.90-4	1.99-4	9.92-5
82	3283.7	8.99-4	7.91-4	5.93-4	3.68-4	1.82-4	8.49-5
83	3384.0	8.63-4	7.59-4	5.68-4	3.51-4	1.72-4	7.70-5
84	3486.0	8.32-4	7.32-4	5.48-4	3.39-4	1.66-4	7.46-5
85	3589.5	8.04-4	7.08-4	5.31-4	3.30-4	1.64-4	7.71-5
86	3694.8	7.80-4	6.88-4	5.18-4	3.25-4	1.67-4	8.38-5
87	3801.6	7.59-4	6.70-4	5.08-4	3.23-4	1.72-4	9.42-5
88	3910.1	7.41-4	6.56-4	5.00-4	3.24-4	1.81-4	1.08-4
89	4020.3	7.25-4	6.44-4	4.95-4	3.27-4	1.92-4	1.25-4
90	4132.1	7.11-4	6.34-4	4.91-4	3.32-4	2.05-4	1.44-4
91	4245.7	7.00-4	6.26-4	4.90-4	3.39-4	2.20-4	1.65-4
92	4360.9	6.90-4	6.19-4	4.90-4	3.48-4	2.37-4	1.89-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – F10

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1367.9	5.72-4	5.68-4	5.73-4	6.05-4	6.74-4	7.57-4
61	1441.4	5.25-4	5.19-4	5.19-4	5.41-4	5.97-4	6.70-4
62	1516.6	4.95-4	4.88-4	4.85-4	5.04-4	5.54-4	6.22-4
63	1593.6	4.70-4	4.64-4	4.61-4	4.77-4	5.23-4	5.89-4
64	1672.4	4.50-4	4.43-4	4.40-4	4.55-4	4.99-4	5.62-4
65	1752.9	4.32-4	4.25-4	4.23-4	4.37-4	4.79-4	5.41-4
66	1835.2	4.16-4	4.10-4	4.07-4	4.21-4	4.62-4	5.22-4
67	1919.1	4.02-4	3.97-4	3.94-4	4.08-4	4.48-4	5.07-4
68	2004.9	3.91-4	3.85-4	3.83-4	3.98-4	4.37-4	4.95-4
69	2092.3	3.81-4	3.76-4	3.75-4	3.90-4	4.29-4	4.86-4
70	2181.4	3.74-4	3.70-4	3.70-4	3.85-4	4.25-4	4.83-4
71	2272.3	3.72-4	3.69-4	3.69-4	3.86-4	4.27-4	4.86-4
72	2364.8	3.76-4	3.71-4	3.69-4	3.84-4	4.23-4	4.80-4
73	2452.1	1.35-3	1.21-3	9.42-4	6.44-4	4.08-4	2.98-4
74	2538.4	1.25-3	1.11-3	8.54-4	5.63-4	3.26-4	2.07-4
75	2627.0	1.04-3	9.38-4	7.52-4	5.41-4	3.72-4	3.00-4
76	2726.3	3.69-3	3.91-3	4.43-3	5.28-3	6.47-3	7.79-3
77	2823.3	1.45-2	1.54-2	1.76-2	2.10-2	2.57-2	3.05-2
78	2916.8	1.46-2	1.55-2	1.76-2	2.10-2	2.57-2	3.04-2
79	3011.6	1.42-2	1.51-2	1.72-2	2.04-2	2.50-2	2.95-2
80	3107.9	1.39-2	1.48-2	1.67-2	1.99-2	2.43-2	2.87-2
81	3205.8	1.35-2	1.44-2	1.63-2	1.94-2	2.37-2	2.78-2
82	3305.4	1.32-2	1.40-2	1.59-2	1.89-2	2.31-2	2.71-2
83	3406.6	1.29-2	1.37-2	1.55-2	1.85-2	2.25-2	2.64-2
84	3509.4	1.26-2	1.34-2	1.52-2	1.80-2	2.20-2	2.57-2
85	3613.9	1.23-2	1.31-2	1.48-2	1.76-2	2.14-2	2.50-2
86	3720.1	1.20-2	1.28-2	1.44-2	1.71-2	2.09-2	2.44-2
87	3828.0	1.17-2	1.25-2	1.41-2	1.67-2	2.04-2	2.38-2
88	3937.5	1.14-2	1.22-2	1.38-2	1.63-2	1.99-2	2.33-2
89	4048.8	1.12-2	1.19-2	1.34-2	1.59-2	1.94-2	2.28-2
90	4161.8	1.09-2	1.16-2	1.31-2	1.55-2	1.90-2	2.23-2
91	4276.5	1.07-2	1.13-2	1.28-2	1.52-2	1.85-2	2.19-2
92	4392.9	1.04-2	1.10-2	1.25-2	1.48-2	1.81-2	2.15-2

A1 – F11

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1391.2	3.70-4	3.52-4	3.25-4	3.04-4	3.01-4	3.15-4
61	1466.7	3.65-4	3.49-4	3.23-4	3.05-4	3.04-4	3.21-4
62	1544.2	3.58-4	3.42-4	3.19-4	3.02-4	3.03-4	3.22-4
63	1623.5	3.50-4	3.35-4	3.14-4	2.99-4	3.01-4	3.22-4
64	1704.7	3.42-4	3.29-4	3.09-4	2.96-4	3.00-4	3.22-4
65	1787.8	3.37-4	3.24-4	3.07-4	2.96-4	3.01-4	3.25-4
66	1872.9	3.38-4	3.26-4	3.11-4	3.02-4	3.11-4	3.38-4
67	1959.8	3.61-4	3.51-4	3.39-4	3.36-4	3.52-4	3.87-4
68	2044.0	1.95-3	1.78-3	1.48-3	1.17-3	9.62-4	9.16-4
69	2122.6	1.80-3	1.64-3	1.35-3	1.03-3	8.13-4	7.48-4
70	2202.7	1.68-3	1.52-3	1.24-3	9.33-4	7.08-4	6.32-4
71	2284.3	1.58-3	1.42-3	1.15-3	8.44-4	6.17-4	5.32-4
72	2367.4	1.48-3	1.34-3	1.07-3	7.83-4	5.61-4	4.74-4
73	2459.0	4.71-4	4.76-4	4.96-4	5.39-4	6.14-4	7.07-4
74	2554.4	1.16-2	1.24-2	1.40-2	1.67-2	2.04-2	2.42-2
75	2643.1	1.48-2	1.58-2	1.79-2	2.13-2	2.60-2	3.10-2
76	2733.8	1.20-2	1.28-2	1.44-2	1.71-2	2.09-2	2.47-2
77	2834.4	8.68-4	8.81-4	9.16-4	9.87-4	1.10-3	1.23-3
78	2942.8	4.46-4	4.37-4	4.25-4	4.24-4	4.45-4	4.88-4
79	3054.5	4.25-4	4.15-4	4.02-4	4.00-4	4.22-4	4.66-4
80	3164.1	2.14-4	2.03-4	1.85-4	1.70-4	1.67-4	1.75-4
81	3271.3	2.21-4	2.14-4	2.03-4	1.99-4	2.09-4	2.29-4
82	3380.0	2.21-4	2.14-4	2.05-4	2.04-4	2.18-4	2.40-4
83	3490.3	2.18-4	2.12-4	2.04-4	2.05-4	2.19-4	2.43-4
84	3602.1	2.15-4	2.09-4	2.02-4	2.03-4	2.18-4	2.42-4
85	3715.3	2.12-4	2.06-4	1.99-4	2.01-4	2.17-4	2.41-4
86	3830.1	2.08-4	2.03-4	1.96-4	1.98-4	2.14-4	2.38-4
87	3946.3	2.05-4	2.00-4	1.94-4	1.95-4	2.12-4	2.35-4
88	4064.0	2.02-4	1.96-4	1.90-4	1.93-4	2.09-4	2.32-4
89	4183.1	1.98-4	1.93-4	1.88-4	1.90-4	2.06-4	2.30-4
90	4303.7	1.95-4	1.90-4	1.85-4	1.87-4	2.03-4	2.27-4
91	4425.6	1.92-4	1.87-4	1.82-4	1.84-4	2.00-4	2.24-4
92	4548.8	1.89-4	1.84-4	1.79-4	1.81-4	1.97-4	2.21-4

A1 – F12

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1463.3	8.86-4	7.82-4	5.87-4	3.67-4	1.90-4	1.05-4
61	1535.1	2.91-3	2.70-3	2.31-3	1.93-3	1.71-3	1.71-3
62	1603.5	2.81-3	2.61-3	2.25-3	1.90-3	1.70-3	1.71-3
63	1673.3	2.64-3	2.45-3	2.10-3	1.76-3	1.56-3	1.56-3
64	1744.5	2.47-3	2.29-3	1.95-3	1.62-3	1.41-3	1.40-3
65	1817.1	2.32-3	2.13-3	1.81-3	1.48-3	1.27-3	1.25-3
66	1891.3	2.16-3	1.99-3	1.67-3	1.35-3	1.13-3	1.09-3
67	1966.9	2.01-3	1.84-3	1.53-3	1.21-3	9.86-4	9.35-4
68	2048.6	3.63-4	3.57-4	3.51-4	3.56-4	3.78-4	4.19-4
69	2136.1	1.74-2	1.86-2	2.12-2	2.54-2	3.11-2	3.72-2
70	2216.7	1.71-2	1.82-2	2.08-2	2.49-2	3.05-2	3.65-2
71	2298.9	1.66-2	1.78-2	2.02-2	2.42-2	2.97-2	3.55-2
72	2382.5	1.62-2	1.73-2	1.97-2	2.35-2	2.88-2	3.44-2
73	2467.8	1.57-2	1.67-2	1.91-2	2.27-2	2.78-2	3.33-2
74	2555.0	4.05-3	4.30-3	4.88-3	5.81-3	7.14-3	8.55-3
75	2652.4	1.95-4	1.85-4	1.70-4	1.61-4	1.65-4	1.81-4
76	2751.5	2.32-4	2.24-4	2.15-4	2.15-4	2.30-4	2.56-4
77	2852.3	2.43-4	2.38-4	2.32-4	2.35-4	2.56-4	2.88-4
78	2954.7	2.51-4	2.46-4	2.44-4	2.52-4	2.79-4	3.16-4
79	3058.7	2.73-4	2.73-4	2.78-4	2.99-4	3.42-4	3.94-4
80	3169.3	4.88-4	4.92-4	5.08-4	5.50-4	6.29-4	7.25-4
81	3286.8	4.77-4	4.79-4	4.91-4	5.27-4	5.98-4	6.85-4
82	3407.5	4.69-4	4.71-4	4.83-4	5.19-4	5.89-4	6.74-4
83	3531.3	4.60-4	4.62-4	4.74-4	5.10-4	5.79-4	6.62-4
84	3658.3	4.50-4	4.52-4	4.64-4	4.99-4	5.68-4	6.48-4
85	3788.6	4.40-4	4.43-4	4.54-4	4.88-4	5.56-4	6.35-4
86	3922.2	4.32-4	4.34-4	4.45-4	4.79-4	5.45-4	6.22-4
87	4059.3	4.28-4	4.30-4	4.41-4	4.74-4	5.40-4	6.16-4
88	4199.9	4.39-4	4.41-4	4.52-4	4.85-4	5.51-4	6.30-4
89	4341.4	4.04-4	4.03-4	4.08-4	4.29-4	4.77-4	5.40-4
90	4473.0	2.07-4	2.02-4	1.95-4	1.93-4	2.03-4	2.23-4
91	4604.4	1.75-4	1.69-4	1.61-4	1.56-4	1.61-4	1.76-4
92	4737.2	1.62-4	1.56-4	1.48-4	1.42-4	1.46-4	1.58-4

A1 – F13

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1467.4	1.12-3	1.08-3	1.02-3	9.82-4	1.02-3	1.12-3
61	1541.3	9.55-4	8.91-4	7.75-4	6.55-4	5.84-4	5.82-4
62	1613.9	2.06-2	2.21-2	2.54-2	3.06-2	3.78-2	4.47-2
63	1684.1	2.00-2	2.14-2	2.46-2	2.97-2	3.66-2	4.34-2
64	1755.7	1.95-2	2.09-2	2.40-2	2.89-2	3.56-2	4.23-2
65	1828.8	1.91-2	2.04-2	2.34-2	2.81-2	3.46-2	4.12-2
66	1903.4	1.86-2	1.99-2	2.28-2	2.74-2	3.37-2	4.02-2
67	1979.5	1.82-2	1.94-2	2.22-2	2.67-2	3.28-2	3.92-2
68	2057.0	1.77-2	1.89-2	2.16-2	2.59-2	3.18-2	3.81-2
69	2139.4	2.86-4	2.81-4	2.79-4	2.91-4	3.28-4	3.80-4
70	2232.0	2.05-4	1.92-4	1.70-4	1.49-4	1.37-4	1.39-4
71	2326.4	2.17-4	2.05-4	1.85-4	1.68-4	1.61-4	1.67-4
72	2422.8	2.18-4	2.06-4	1.89-4	1.73-4	1.68-4	1.77-4
73	2521.1	2.15-4	2.04-4	1.87-4	1.73-4	1.69-4	1.79-4
74	2621.2	2.10-4	2.00-4	1.84-4	1.71-4	1.68-4	1.78-4
75	2723.2	2.05-4	1.95-4	1.80-4	1.68-4	1.66-4	1.75-4
76	2827.1	2.00-4	1.90-4	1.76-4	1.64-4	1.62-4	1.72-4
77	2932.8	1.94-4	1.85-4	1.71-4	1.60-4	1.58-4	1.68-4
78	3040.4	1.89-4	1.80-4	1.67-4	1.56-4	1.54-4	1.63-4
79	3149.8	1.84-4	1.75-4	1.62-4	1.51-4	1.50-4	1.59-4
80	3261.1	1.78-4	1.70-4	1.57-4	1.47-4	1.46-4	1.54-4
81	3374.2	1.73-4	1.65-4	1.52-4	1.42-4	1.41-4	1.49-4
82	3489.2	1.67-4	1.60-4	1.47-4	1.38-4	1.36-4	1.44-4
83	3606.0	1.62-4	1.54-4	1.42-4	1.33-4	1.31-4	1.39-4
84	3724.6	1.56-4	1.49-4	1.37-4	1.27-4	1.26-4	1.33-4
85	3845.0	1.49-4	1.42-4	1.30-4	1.21-4	1.19-4	1.25-4
86	3967.3	1.41-4	1.33-4	1.22-4	1.12-4	1.10-4	1.15-4
87	4091.4	1.28-4	1.21-4	1.09-4	9.89-5	9.53-5	9.92-5
88	4217.4	1.00-4	9.29-5	8.08-5	6.93-5	6.28-5	6.31-5
89	4347.9	1.19-4	1.14-4	1.09-4	1.08-4	1.17-4	1.32-4
90	4493.8	2.99-4	2.99-4	3.05-4	3.25-4	3.70-4	4.27-4
91	4645.7	3.16-4	3.16-4	3.22-4	3.44-4	3.91-4	4.52-4
92	4801.8	3.14-4	3.14-4	3.20-4	3.41-4	3.87-4	4.49-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

	A1 - F14							A1 - F15						
Z	ΔE	E'= 002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	Δ E	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1468.6	3 61-3	3.46-3	3.23-3	3.07-3	3.14-3	3.38-3	1478.0	2.08-2	2.24-2	2.58-2	3.12-2	3.88-2	4.59-2
61	1545.0	1 67-2	1 78-2	2.03-2	2.43-2	2.99-2	3.52-2	1545.7	5.18-3	5.53-3	6.36-3	7.71-3	9.66-3	1.15-2
62	1620 7	7 35-4	6.62-4	5.26-4	3.72-4	2.53-4	2.03-4	1625.3	8.33-4	8.06-4	7.67-4	7.50-4	7.92-4	8.78-4
63	1702.0	7.15-4	6.45-4	5.16-4	3.71-4	2.61-4	2.17-4	1707.1	8.95-4	8.75-4	8.50-4	8.52-4	9.17-4	1.03-3
64	1785.3	6.86-4	6.19-4	4.96-4	3.58-4	2.55-4	2.15-4	1790.8	8.90-4	8.73-4	8.52-4	8.61-4	9.32-4	1.04-3
65	1870.4	6.58-4	5.94-4	4.77-4	3.46-4	2.48-4	2.11-4	1876.4	8.69-4	8.53-4	8.36-4	8.46-4	9.18-4	1.03-3
66	1957 5	6.32-4	5.71-4	4.59-4	3.34-4	2.42-4	2.08-4	1964.0	8.43-4	8.28-4	8.12-4	8.24-4	8.96-4	1.01-3
67	2046.4	6.06-4	5.48-4	4.42-4	3.23-4	2.36-4	2.04-4	2053.4	8.15-4	8.01-4	7.86-4	7.99-4	8.69-4	9.79-4
68	2137.3	5.83-4	5.27-4	4.26-4	3.13-4	2.30-4	2.01-4	2144.8	7.87-4	7.74-4	7.60-4	7.73-4	8.41-4	9.48-4
69	2230.0	5.61-4	5.08-4	4.10-4	3.03-4	2.25-4	1.98-4	2238.1	7.60-4	7.47-4	7.34-4	7.46-4	8.14-4	9.17-4
70	2324.6	5.40-4	4.89-4	3.96-4	2.94-4	2.19-4	1.94-4	2333.3	7.33-4	7.21-4	7.08-4	7.21-4	7.86-4	8.87-4
71	2421.1	5.20-4	4.71-4	3.82-4	2.85-4	2.14-4	1.91-4	2430.4	7.08-4	6.96-4	6.84-4	6.96-4	7.60-4	8.58-4
72	2519.4	5.01-4	4.54-4	3.69-4	2.76-4	2.09-4	1.87-4	2529.5	6.83-4	6.72-4	6.60-4	6.72-4	7.34-4	8.29-4
73	2619 7	4.83-4	4.38-4	3.57-4	2.68-4	2.04-4	1.84-4	2630.4	6.60-4	6.49-4	6.38-4	6.50-4	7.10-4	8.01-4
74	2721 8	4.66-4	4.23-4	3.45-4	2.60-4	2.00-4	1.80-4	2733.3	6.38-4	6.27-4	6.16-4	6.28-4	6.86-4	7.75-4
75	2825.8	4.50-4	4.09-4	3.33-4	2.52-4	1.95-4	1.77-4	2838.1	6.16-4	6.06-4	5.95-4	6.07-4	6.64-4	7.50-4
76	2931.6	4.35-4	3.95-4	3.23-4	2.45-4	1.90-4	1.73-4	2944.8	5.96-4	5.86-4	5.76-4	5.87-4	6.42-4	7.25-4
77	3039.4	4.20-4	3.82-4	3.13-4	2.38-4	1.86-4	1.70-4	3053.5	5.77-4	5.67-4	5.57-4	5.68-4	6.22-4	7.02-4
78	3149.0	4.07-4	3.70-4	3.03-4	2.31-4	1.81-4	1.67-4	3164.0	5.58-4	5.48-4	5.39-4	5.50-4	[illegible].02-4	6.80-4
79	3260.5	3.94-4	3.58-4	2.93-4	2.24-4	1.77-4	1.63-4	3276.5	5.41-4	5.31-4	5.21-4	5.32-4	5.83-4	6.59-4
80	3373.8	3.81-4	3.47-4	2.84-4	2.18-4	1.73-4	1.60-4	3390.9	5.24-4	5.14-4	5.05-4	5.16-4	5.65-4	6.39-4
81	3489.0	3.69-4	3.36-4	2.76-4	2.12-4	1.69-4	1.56-4	3507.2	5.07-4	4.98-4	4.89-4	5.00-4	5.48-4	6.19-4
82	36[illegible].1	3.58-4	3.26-4	2.68-4	2.07-4	1.65-4	1.53-4	3625.5	4.92-4	4.83-4	4.74-4	4.85-4	5.32-4	6.01-4
83	3725.0	3.47-4	3.16-4	2.60-4	2.01-4	1.61-4	1.50-4	3745.6	4.77-4	4.69-4	4.60-4	4.70-4	5.16-4	5.83-4
84	3845.8	3.37-4	3.07-4	2.53-4	1.96-4	1.57-4	1.47-4	3867.7	4.63-4	4.55-4	4.47-4	4.56-4	5.01-4	5.67-4
85	3968.5	3.27-4	2.98-4	2.46-4	1.90-4	1.54-4	1.44-4	3991.7	4.50-4	4.42-4	4.34-4	4.43-4	4.87-4	5.51-4
86	4093.0	3.17-4	2.89-4	2.39-4	1.86-4	1.50-4	1.41-4	4117.6	4.37-4	4.29-4	4.21-4	4.31-4	4.73-4	5.36-4
87	4219.4	3.08-4	2.81-4	2.32-4	1.81-4	1.47-4	1.38-4	4245.4	4.25-4	4.17-4	4.09-4	4.19-4	4.60-4	5.21-4
88	4347.6	3.00-4	2.73-4	2.26-4	1.77-4	1.44-4	1.36-4	4375 1	4.13-4	4.05-4	3.98-4	4.07-4	4.48-4	5.07-4
89	4477.7	2.92-4	2.66-4	2.20-4	1.72-4	1.40-4	1.33-4	4506.8	4.02-4	3.94-4	3.87-4	3.96-4	4.36-4	4.94-4
90	4609.6	2.84-4	2.59-4	2.15-4	1.68-4	1.38-4	1.31-4	4640.4	3.91-4	3.84-4	3.77-4	3.85-4	4.24-4	4.82-4
91	4743.3	2.76-4	2.52-4	2.09-4	1.64-4	1.35-4	1.29-4	4775.9	3.81-4	3.74-4	3.67-4	3.76-4	4.13-4	4.70-4
92	4878.9	2.69-4	2.46-4	2.04-4	1.61-4	1.33-4	1.27-4	4913.3	3.71-4	3.64-4	3.58-4	3 66-4	4.03-4	4.59-4

	A1 - F16							A1 - F17						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	Δ E	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1488.0	9.66-4	9.59-4	9.61-4	1.00-3	1.11-3	1.26-3	1490.5	6.79-4	6.05-4	4.65-4	3.06-4	1.80-4	1.22-4
61	1567.7	8.09-4	7.95-4	7.81-4	7.96-4	8.68-4	9.73-4	1570.4	6.88-4	6.18-4	4.87-4	3.40-4	2.27-4	1.80-4
62	1649.4	7 45-4	7.30-4	7.13-4	7.21-4	7.82-4	8.76-4	1652.5	6.75-4	6.08-4	4.85-4	3.46-4	2.42-4	2.01-4
63	1733.1	7.01-4	6.86-4	6.68-4	6.73-4	7.29-4	8.16-4	1736.6	6.54-4	5.90-4	4.73-4	3.42-4	2.44-4	2.07-4
64	1818.9	6.65-4	6.50-4	6.33-4	6.37-4	6.88-4	7.71-4	1822.7	6.30-4	5.70-4	4.58-4	3.33-4	2.41-4	2.07-4
65	1906.7	6.34-4	6.20-4	6.03-4	6.06-4	6.55-4	7.33-4	1910.9	6.06-4	5.48-4	4.41-4	3.22-4	2.35-4	2.03-4
66	1996.6	6.06-4	5.93-4	5.76-4	5.79-4	6.26-4	7.01-4	2001.2	5.82-4	5.27-4	4.24-4	3.11-4	2.28-4	1.97-4
67	2088.5	5.81-4	5.68-4	5.52-4	5.55-4	6.00-4	6.73-4	2093.6	5.59-4	5.06-4	4.08-4	2.99-4	2.19-4	1.91-4
68	2182.5	5.58-4	5.45-4	5.30-4	5.33-4	5.77-4	6.47-4	2188.1	5.37-4	4.86-4	3.91-4	2.87-4	2.11-4	1.84-4
69	2278.5	5.36-4	5.24-4	5.10-4	5.13-4	5.55-4	6.23-4	2284.7	5.16-4	4.67-4	3.76-4	2.76-4	2.03-4	1.77-4
70	2376.6	5.16-4	5.05-4	4.91-4	4.94-4	5.35-4	6.01-4	2383.3	4.96-4	4.48-4	3.61-4	2.65-4	1.94-4	1.69-4
71	2476.8	4.97-4	4.86-4	4.73-4	4.76-4	5.16-4	5.80-4	2484.1	4.76-4	4.31-4	3.47-4	2.54-4	1.86-4	1.62-4
72	2579.0	4.79-4	4.69-4	4.56-4	4.59-4	4.98-4	5.60-4	2587.0	4.58-4	4.14-4	3.33-4	2.44-4	1.79-4	1.56-4
73	2683.4	4.62-4	4.52-4	4.40-4	4.43-4	4.81-4	5.41-4	2692.0	4.41-4	3.98-4	3.20-4	2.34-4	1.72-4	1.49-4
74	2789.8	4.46-4	4.36-4	4.24-4	4.27-4	4.64-4	5.23-4	2799.2	4.25-4	3.84-4	3.08-4	2.25-4	1.65-4	1.44-4
75	2898.3	4.30-4	4.20-4	4.09-4	4.12-4	4.48-4	5.04-4	2908.5	4.10-4	3.70-4	2.97-4	2.17-4	1.59-4	1.38-4
76	3008.9	4.14-4	4.05-4	3.94-4	3.97-4	4.31-4	4.86-4	3019.9	3.96-4	3.57-4	2.87-4	2.10-4	1.54-4	1.34-4
77	3121.6	3.99-4	3.90-4	3.79-4	3.82-4	4.15-4	4.67-4	3133.5	3.82-4	3.45-4	2.77-4	2.03-4	1.49-4	1.30-4
78	3236.5	3.84-4	3.75-4	3.65-4	3.67-4	3.99-4	4.49-4	3249.2	3.70-4	3.34-4	2.68-4	1.97-4	1.45-4	1.26-4
79	3353.4	3.70-4	3.61-4	3.50-4	3.53-4	3.83-4	4.32-4	3367.1	3.58-4	3.23-4	2.60-4	1.91-4	1.41-4	1.23-4
80	3472.5	3.56-4	3.47-4	3.37-4	3.39-4	3.67-4	4.14-4	3487.2	3.47-4	3.13-4	2.52-4	1.86-4	1.38-4	1.21-4
81	3593.7	3.42-4	3.34-4	3.23-4	3.25-4	3.52-4	3.97-4	3609.5	3.37-4	3.04-4	2.45-4	1.81-4	1.35-4	1.19-4
82	3717.1	3.29-4	3.21-4	3.10-4	3.11-4	3.38-4	3.80-4	3733.9	3.27-4	2.96-4	2.39-4	1.77-4	1.32-4	1.17-4
83	3842.6	3.17-4	3.09-4	2.98-4	2.98-4	3.23-4	3.64-4	3860.6	3.18-4	2.88-4	2.32-4	1.73-4	1.30-4	1.15-4
84	3970.2	3.05-4	2.97-4	2.86-4	2.86-4	3.09-4	3.48-4	3989.5	3.10-4	2.80-4	2.27-4	1.69-4	1.28-4	1.14-4
85	4100.1	2.93-4	2.85-4	2.74-4	2.74-4	2.96-4	3.33-4	4120.6	3.02-4	2.73-4	2.22-4	1.66-4	1.26-4	1.13-4
86	4232.1	2.82-4	2.74-4	2.63-4	2.62-4	2.82-4	3.18-4	4253.9	2.96-4	2.68-4	2.18-4	1.63-4	1.25-4	1.13-4
87	4366.2	2.71-4	2.63-4	2.52-4	2.51-4	2.70-4	3.04-4	4389.4	2.86-4	2.55-4	1.99-4	1.38-4	9.43-5	7.77-5
88	4502.6	2.60-4	2.53-4	2.41-4	2.39-4	2.57-4	2.89-4	4522.5	1.92-4	1.63-4	1.14-4	6.39-5	3.01-5	1.67-5
89	4641.1	2.50-4	2.42-4	2.30-4	2.27-4	2.43-4	2.73-4	4657.1	1.86-4	1.58-4	1.11-4	6.42-5	3.26-5	2.06-5
90	4781.8	2.38-4	2.30-4	2.18-4	2.14-4	2.28-4	2.56-4	4793.7	1.81-4	1.55-4	1.10-4	6.47-5	3.50-5	2.43-5
91	4924.8	2.25-4	2.17-4	2.04-4	1.98-4	2.09-4	2.34-4	4932.2	1.78-4	1.52-4	1.09-4	6.56-5	3.77-5	2.83-5
92	5069.9	2.06-4	1.97-4	1.82-4	1.73-4	1.80-4	2.00-4	5072.6	1.75-4	1.50-4	1.09-4	6.79-5	4.21-5	3.42-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - F18

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1538.8	4.36-4	3.99-4	3.43-4	3.10-4	3.31-4	3.86-4
61	1619.2	4.47-4	4.07-4	3.48-4	3.10-4	3.25-4	3.72-4
62	1701.6	4.48-4	4.06-4	3.42-4	2.98-4	3.05-4	3.44-4
63	1785.9	4.42-4	3.98-4	3.30-4	2.79-4	2.78-4	3.07-4
64	1872.2	4.31-4	3 86-4	3.14-4	2.57-4	2.46-4	2.67-4
65	1960.4	4.19-4	3.72-4	2.96-4	2.32-4	2.12-4	2.24-4
66	2050.5	4.06-4	3.57-4	2.77-4	2.07-4	1.77-4	1.81-4
67	2142.6	3.94-4	3.44-4	2.60-4	1.83-4	1.44-4	1.40-4
68	2236.5	3 84-4	3.32-4	2.45-4	1.61-4	1.14-4	1.02-4
69	2332.5	3.77-4	3.24-4	2.34-4	1.45-4	8.94-5	7.13-5
70	2430.3	3.75-4	3.21-4	2.28-4	1.35-4	7.31-5	4.98-5
71	2530.1	3.75-4	3.20-4	2.26-4	1.31-4	6.55-5	3.89-5
72	2631.8	3.74-4	3.20-4	2.26-4	1.31-4	6.39-5	3.60-5
73	2735.4	3.67-4	3.14-4	2.22-4	1.29-4	6.30-5	3.52-5
74	2841 0	3.52-4	3.01-4	2.13-4	1.23-4	5.93-5	3.23-5
75	2948.6	3.32-4	2.84-4	2.00-4	1.14-4	5.33-5	2.76-5
76	3058.0	3.12-4	2.66-4	1.86-4	1.04-4	4.73-5	2.30-5
77	3169.5	2.92-4	2.49-4	1.73-4	9.64-5	4.24-5	1.95-5
78	3282.8	2.76-4	2.34-4	1.63-4	8.97-5	3.86-5	1.69-5
79	3398.1	2.61-4	2.22-4	1.54-4	8.41-5	3.56-5	1.49-5
80	3515.3	2.49-4	2.11-4	1.46-4	7.95-5	3.31-5	1.34-5
81	3634.4	2.38-4	2.02-4	1.39-4	7.56-5	3.12-5	1.23-5
82	3755.5	2.28-4	1.94-4	1.33-4	7.24-5	2.98-5	1.17-5
83	3878.5	2.20-4	1.86-4	1.28-4	6.98-5	2.90-5	1.18-5
84	4003.4	2.12-4	1.80-4	1.24-4	6.78-5	2.88-5	1.25-5
85	4130.3	2.05-4	1.74-4	1.20-4	6.64-5	2.93-5	1.39-5
86	4259.1	1.98-4	1.68-4	1.17-4	6.58-5	3.08-5	1.67-5
87	4390.0	1.98-4	1 74-4	1.32-4	9.18-5	6.65-5	5.98-5
88	4527.2	1.49-3	1.61-3	1.89-3	2.36-3	3.06-3	3.80-3
89	4662.2	1.49-3	1.63-3	1.94-3	2.47-3	3.24-3	4.06-3
90	4799.0	1.48-3	1.61-3	1.92-3	2.45-3	3.21-3	4.02-3
91	4937.8	1 47-3	1.60-3	1.91-3	2.42-3	3.18-3	3.98-3
92	5078.6	1.46-3	1.59-3	1.89-3	2.41-3	3.15-3	3.95-3

A1 - F19

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.4	1.39-3	1.55-3	1.91-3	2.52-3	3.41-3	4.29-3
61	1619.9	1.48-3	1.64-3	2.01-3	2.65-3	3.58-3	4.45-3
62	1702.4	1.52-3	1.69-3	2.07-3	2.72-3	3.66-3	4.51-3
63	1786.8	1.54-3	1.71-3	2.09-3	2.74-3	3.68-3	4.51-3
64	1873.2	1.54-3	1.70-3	2.08-3	2.72-3	3.64-3	4.46-3
65	1961.5	1.51-3	1.66-3	2.03-3	2.65-3	3.56-3	4.35-3
66	2051.7	1.46-3	1.60-3	1.96-3	2.55-3	3.42-3	4.18-3
67	2143.8	1.38-3	1.52-3	1.85-3	2.42-3	3.24-3	3.96-3
68	2237.9	1.29-3	1.42-3	1.72-3	2.24-3	3.01-3	3.69-3
69	2333.9	1.18-3	1.29-3	1.57-3	2.04-3	2.74-3	3.37-3
70	2431.8	1.06-3	1.16-3	1.40-3	1.83-3	2.46-3	3.03-3
71	2531.7	9.52-4	1.04-3	1.26-3	1.63-3	2.20-3	2.72-3
72	2633.5	8.77-4	9.56-4	1.15-3	1.50-3	2.01-3	2.50-3
73	2737.3	8.50-4	9.25-4	1.11-3	1.44-3	1.94-3	2.41-3
74	2843.0	8.77-4	9.55-4	1.15-3	1.49-3	1.99-3	2.49-3
75	2950.6	9.50-4	1.04-3	1.24-3	1.61-3	2.15-3	2.69-3
76	3060.3	1.05-3	1.15-3	1.38-3	1.78-3	2.37-3	2.96-3
77	3171.8	1.16-3	1.26-3	1.52-3	1.96-3	2.60-3	3.25-3
78	3285.3	1.25-3	1.37-3	1.65-3	2.12-3	2.81-3	3.51-2
79	3400.8	1.33-3	1.46-3	1.75-3	2.25-3	2.98-3	3.72-3
80	3518.2	1.40-3	1.53-3	1.83-3	2.35-3	3.11-3	3.88-3
81	3637.5	1.44-3	1.58-3	1.89-3	2.42-3	3.19-3	3.99-3
82	3758.8	1.48-3	1.61-3	1.93-3	2.47-3	3.25-3	4.07-3
83	3882.0	1.50-3	1.63-3	1.95-3	2.50-3	3.29-3	4.11-3
84	4007.1	1.51-3	1.64-3	1.97-3	2.51-3	3.30-3	4.13-3
85	4134.2	1.51-3	1.65-3	1.97-3	2.51-3	3.30-3	4.14-3
86	4263.3	1.51-3	1.64-3	1.97-3	2.51-3	3.29-3	4.12-3
87	4394.3	1.50-3	1.64-3	1.95-3	2.49-3	3.27-3	4.09-3
88	4527.4	2.83-4	2.74-4	2.65-4	2.73-4	3.17-4	3.86-4
89	4667.4	2.60-4	2.35-4	1.89-4	1.39-4	1.03-4	9.11-5
90	4809.8	2.57-4	2.32-4	1.88-4	1.40-4	1.06-4	9.51-5
91	4954.4	2.51-4	2.28-4	1.85-4	1.38-4	1.05-4	9.51-5
92	5101.3	2.45-4	2.22-4	1.81-4	1.36-4	1.04-4	9.42-5

A1 - F20

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1560.9	4.26-3	4.61-3	5.43-3	6.81-3	8.81-3	1.08-2
61	1642.9	5.17-3	5.58-3	6.55-3	8.17-3	1.05-2	1.27-2
62	1726.6	6.77-3	7.29-3	8.51-3	1.05-2	1.34-2	1.61-2
63	1811.4	9.15-3	9.82-3	1.14-2	1.40-2	1.77-2	2.10-2
64	1896.7	1.10-2	1.17-2	1.35-2	1.65-2	2.07-2	2.45-2
65	1982.8	1.13-2	1.21-2	1.39-2	1.68-2	2.10-2	2.48-2
66	2070.5	1 10-2	1.18-2	1.35-2	1.63-2	2.04-2	2.40-2
67	2160.1	1.07-2	1.14-2	1.30-2	1.57-2	1.96-2	2.31-2
68	2251.8	1.03-2	1.10-2	1.26-2	1.52-2	1.89-2	2.24-2
69	2345.8	1.00-2	1.07-2	1.23-2	1.48-2	1.84-2	2.17-2
70	2442.2	9.77-3	1.04-2	1.19-2	1.44-2	1.79-2	2.12-2
71	2541.0	9.52-3	1.02-2	1.16-2	1.41-2	1.75-2	2.08-2
72	2642.3	9.26-3	9.88-3	1.13-2	1.37-2	1.70-2	2.02-2
73	2746.0	8.97-3	9.58-3	1.10-2	1.32-2	1.65-2	1.96-2
74	2852.4	8.65-3	9.23-3	1.06-2	1.28-2	1.59-2	1.89-2
75	2961.4	8.30-3	8.86-3	1.01-2	1.22-2	1.52-2	1.81-2
76	3073.1	7.94-3	8.47-3	9.66-3	1.16-2	1.44-2	1.72-2
77	3187.6	7.59-3	8.08-3	9.20-3	1.10-2	1.37-2	1.64-2
78	3304.9	7.25-3	7.72-3	8.77-3	1.05-2	1.30-2	1.56-2
79	3425.1	6.94-3	7.38-3	8.38-3	1.00-2	1.24-2	1.49-2
80	3548.4	6.66-3	7.08-3	8.03-3	9.61-3	1.19-2	1.42-2
81	3674.8	6.41-3	6.81-3	7.71-3	9.22-3	1.14-2	1.37-2
82	3804.2	6.18-3	6.56-3	7.43-3	8.88-3	1.10-2	1.32-2
83	3937.0	5.98-3	6.34-3	7.18-3	8.58-3	1.06-2	1.28-2
84	4073.0	5.80-3	6.16-3	6.97-3	8.32-3	1.03-2	1.24-2
85	4212.3	5.65-3	6.00-3	6.79-3	8.11-3	1.00-2	1.21-2
86	4355.1	5.53-3	5.87-3	6.64-3	7.95-3	9.86-3	1.1'-2
87	4501.2	5.44-3	5.78-3	6.55-3	7.84-3	9.74-3	1.18-2
88	4650.6	5.37-3	5.70-3	6.47-3	7.77-3	9.68-3	1.17-2
89	4802.7	5.15-3	5.48-3	6.24-3	7.53-3	9.42-3	1.15-2
90	4955.5	4.28-3	4.57-3	5.24-3	6.37-3	8.03-3	9.83-3
91	5107.4	2.99-3	3.20-3	3.69-3	4.53-3	5.77-3	7.11-3
92	5259.2	2.17-3	2.33-3	2.70-3	3.34-3	4.28-3	5.30-3

A1 - F21

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1584.8	8.65-3	9.18-3	1.04-2	1.24-2	1.52-2	1.80-2
61	1661.6	7.42-3	7.86-3	8.87-3	1.05-2	1.29-2	1.51-2
62	1740.8	5.51-3	5.82-3	6.53-3	7.69-3	9.34-3	1.09-2
63	1823.1	2.84-3	2.97-3	3.28-3	3.78-3	4.51-3	5.19-3
64	1909.1	7.42-4	7.55-4	7.90-4	8.58-4	9.67-4	1.08-3
65	1998.6	1.29-4	1.22-4	1.14-4	1.17-4	1.37-4	1.57-4
66	2090.8	1.49-4	1.56-4	1.82-4	2.44-4	3.52-4	4.41-4
67	2185.4	2.89-4	3.12-4	3.78-4	5.06-4	7.09-4	8.78-4
68	2282.3	4.23-4	4.60-4	5.57-4	7.37-4	1.01-3	1.25-3
69	2381.4	5.32-4	5.79-4	7.00-4	9.18-4	1.25-3	1.54-3
70	2482.7	6.18-4	6.73-4	8.10-4	1.06-3	1.43-3	1.75-3
71	2586.1	6.87-4	7.48-4	8.98-4	1.17-3	1.57-3	1.93-3
72	2691.6	7.46-4	8.11-4	9.72-4	1.26-3	1.68-3	2.08-3
73	2799.3	8.00-4	8.69-4	1.04-3	1.34-3	1.79-3	2.21-3
74	2909.0	8.54-4	9.28-4	1.11-3	1.42-3	1.90-3	2.35-3
75	3020.9	9.01-4	9.79-4	1.17-3	1.50-3	1.99-3	2.46-3
76	3134.7	9.00-4	9.77-4	1.16-3	1.49-3	1.98-3	2.46-3
77	3250.4	9.29-4	1.01-3	1.20-3	1.53-3	2.03-3	2.53-3
78	3368.6	9.62-4	1.04-3	1.24-3	1.58-3	2.09-3	2.61-3
79	3489.6	8.61-4	9.34-4	1.11-3	1.42-3	1.88-3	2.36-3
80	3613.1	7.36-4	7.99-4	9.52-4	1.22-3	1.62-3	2.04-3
81	3738.8	7.57-4	8.21-4	9.78-4	1.25-3	1.66-3	2.10-3
82	3866.5	6.91-4	7.50-4	8.94-4	1.15-3	1.53-3	1.93-3
83	3996.3	6.07-4	6.59-4	7.86-4	1.01-3	1.35-3	1.71-3
84	4128.3	5.22-4	5.68-4	6.79-4	8.75-4	1.17-3	1.49-3
85	4262.6	4.32-4	4.70-4	5.63-4	7.30-4	9.82-4	1.26-3
86	4399.3	3.29-4	3.58-4	4.31-4	5.62-4	7.63-4	9.84-4
87	4538.4	2.07-4	2.25-4	2.72-4	3.59-4	4.96-4	6.47-4
88	4680.3	8.39-5	8.86-5	1.04-4	1.38-4	1.96-4	2.63-4
89	4825.6	1.14-4	1.11-4	1.08-4	1.08-4	1.17-4	1.29-4
90	4976.4	8.03-4	8.31-4	8.97-4	1.01-3	1.19-3	1.38-3
91	5134.6	1.93-3	2.02-3	2.24-3	2.60-3	3.14-3	3.74-3
92	5299.2	2.60-3	2.74-3	3.05-3	3.58-3	4.37-3	5.23-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – F22

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1635.2	9.41-4	9.57-4	1.01-3	1.14-3	1.37-3	1.63-3
61	1712.0	9.17-4	9.34-4	9.91-4	1.12-3	1.34-3	1.58-3
62	1790.9	8.93-4	9.11-4	9.70-4	1.10-3	1.32-3	1.54-3
63	1871.9	8.69-4	8.88-4	9.48-4	1.08-3	1.29-3	1.50-3
64	1955.0	8.45-4	8.64-4	9.24-4	1.05-3	1.27-3	1.46-3
65	2040.2	8.20-4	8.40-4	9.00-4	1.02-3	1.23-3	1.42-3
66	2127.8	7.95-4	8.15-4	8.74-4	9.95-4	1.20-3	1.39-3
67	2217.5	7.69-4	7.89-4	8.47-4	9.65-4	1.16-3	1.35-3
68	2309.6	7.42-4	7.61-4	8.18-4	9.31-4	1.12-3	1.30-3
69	2404.0	7.13-4	7.32-4	7.86-4	8.95-4	1.08-3	1.25-3
70	2500.9	6.82-4	6.99-4	7.50-4	8.53-4	1.03-3	1.19-3
71	2600.1	6.46-4	6.63-4	7.10-4	8.05-4	9.68-4	1.13-3
72	2701.9	6.06-4	6.20-4	6.61-4	7.47-4	8.95-4	1.04-3
73	2806.3	5.56-4	5.67-4	6.02-4	6.75-4	8.04-4	9.37-4
74	2913.3	4.96-4	5.04-4	5.29-4	5.87-4	6.91-4	8.04-4
75	3023.1	4.36-4	4.39-4	4.56-4	4.98-4	5.78-4	6.70-4
76	3135.9	4.16-4	4.20-4	4.35-4	4.74-4	5.50-4	6.38-4
77	3251.6	3.62-4	3.62-4	3.69-4	3.94-4	4.49-4	5.18-4
78	3370.0	2.97-4	2.93-4	2.91-4	3.01-4	3.33-4	3.78-4
79	3490.7	3.62-4	3.64-4	3.74-4	4.05-4	4.67-4	5.44-4
80	3614.1	4.45-4	4.54-4	4.82-4	5.41-4	6.44-4	7.66-4
81	3740.5	3.77-4	3.82-4	3.98-4	4.37-4	5.12-4	6.03-4
82	3870.5	3.90-4	3.96-4	4.16-4	4.61-4	5.44-4	6.46-4
83	4003.8	4.13-4	4.21-4	4.47-4	5.02-4	5.99-4	7.16-4
84	4140.4	4.26-4	4.36-4	4.66-4	5.27-4	6.33-4	7.62-4
85	4280.6	4.32-4	4.43-4	4.74-4	5.40-4	6.51-4	7.85-4
86	4424.2	4.32-4	4.44-4	4.77-4	5.45-4	6.58-4	7.96-4
87	4571.5	4.33-4	4.45-4	4.78-4	5.47-4	6.62-4	8.02-4
88	4722.4	4.36-4	4.49-4	4.83-4	5.52-4	6.69-4	8.11-4
89	4877.2	4.56-4	4.69-4	5.05-4	5.78-4	6.99-4	8.46-4
90	5036.3	5.59-4	5.74-4	6.14-4	6.95-4	8.30-4	9.92-4
91	5187.4	3.66-4	3.69-4	3.82-4	4.12-4	4.69-4	5.41-4
92	5330.3	2.75-4	2.75-4	2.78-4	2.94-4	3.27-4	3.71-4

A1 – F23

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1642.4	1.90-3	2.03-3	2.35-3	2.91-3	3.72-3	4.57-3
61	1719.9	1.85-3	1.96-3	2.29-3	2.83-3	3.62-3	4.37-3
62	1799.5	1.80-3	1.93-3	2.23-3	2.75-3	3.51-3	4.20-3
63	1881.2	1.76-3	1.88-3	2.17-3	2.67-3	3.40-3	4.04-3
64	1965.2	1.71-3	1.83-3	2.11-3	2.59-3	3.30-3	3.90-3
65	2051.4	1.66-3	1.77-3	2.05-3	2.51-3	3.19-3	3.77-3
66	2139.8	1.61-3	1.72-3	1.99-3	2.43-3	3.09-3	3.65-3
67	2230.6	1.56-3	1.67-3	1.93-3	2.35-3	2.99-3	3.53-3
68	2323.8	1.52-3	1.62-3	1.87-3	2.28-3	2.90-3	3.42-3
69	2419.3	1.47-3	1.57-3	1.81-3	2.20-3	2.80-3	3.32-3
70	2517.4	1.43-3	1.52-3	1.75-3	2.13-3	2.71-3	3.21-3
71	2617.9	1.38-3	1.47-3	1.69-3	2.06-3	2.61-3	3.11-3
72	2721.0	1.34-3	1.43-3	1.64-3	1.99-3	2.53-3	3.02-3
73	2826.8	1.29-3	1.38-3	1.58-3	1.93-3	2.44-3	2.92-3
74	2935.3	1.25-3	1.33-3	1.53-3	1.86-3	2.36-3	2.84-3
75	3046.5	1.21-3	1.29-3	1.48-3	1.80-3	2.28-3	2.75-3
76	3160.5	1.17-3	1.25-3	1.43-3	1.74-3	2.20-3	2.66-3
77	3277.4	1.13-3	1.21-3	1.38-3	1.68-3	2.12-3	2.58-3
78	3397.3	1.09-3	1.17-3	1.33-3	1.62-3	2.05-3	2.50-3
79	3520.2	1.06-3	1.13-3	1.29-3	1.56-3	1.98-3	2.41-3
80	3646.2	1.02-3	1.09-3	1.24-3	1.51-3	1.91-3	2.34-3
81	3775.4	9.85-4	1.05-3	1.20-3	1.45-3	1.84-3	2.26-3
82	3907.9	9.49-4	1.01-3	1.15-3	1.40-3	1.77-3	2.18-3
83	4043.7	9.14-4	9.72-4	1.11-3	1.35-3	1.71-3	2.10-3
84	4183.0	8.80-4	9.35-4	1.07-3	1.29-3	1.64-3	2.03-3
85	4325.8	8.44-4	8.97-4	1.02-3	1.24-3	1.57-3	1.95-3
86	4472.3	8.07-4	8.57-4	9.75-4	1.18-3	1.50-3	1.86-3
87	4622.5	7.44-4	7.89-4	8.96-4	1.09-3	1.38-3	1.72-3
88	4773.0	1.94-4	1.89-4	1.82-4	1.79-4	1.86-4	2.02-4
89	4910.0	1.90-4	1.87-4	1.83-4	1.85-4	1.97-4	2.17-4
90	5048.4	7.23-5	6.72-5	5.85-5	5.05-5	4.66-5	4.77-5
91	5200.7	2.44-4	2.50-4	2.68-4	3.07-4	3.77-4	4.62-4
92	5367.1	3.00-4	3.09-4	3.32-4	3.81-4	4.66-4	5.68-4

A1 – F24

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1708.2	5.67-4	5.65-4	5.70-4	6.02-4	6.71-4	7.57-4
61	1791.8	5.50-4	5.48-4	5.54-4	5.84-4	6.52-4	7.31-4
62	1877.2	5.33-4	5.31-4	5.37-4	5.67-4	6.33-4	7.07-4
63	1964.6	5.16-4	5.15-4	5.22-4	5.51-4	6.14-4	6.85-4
64	2054.0	5.01-4	5.00-4	5.07-4	5.35-4	5.97-4	6.64-4
65	2145.3	4.86-4	4.85-4	4.92-4	5.20-4	5.80-4	6.44-4
66	2238.5	4.72-4	4.71-4	4.78-4	5.05-4	5.63-4	6.26-4
67	2333.6	4.58-4	4.58-4	4.65-4	4.91-4	5.48-4	6.09-4
68	2430.7	4.45-4	4.45-4	4.52-4	4.78-4	5.33-4	5.93-4
69	2529.7	4.33-4	4.32-4	4.40-4	4.65-4	5.19-4	5.77-4
70	2630.6	4.21-4	4.21-4	4.28-4	4.52-4	5.05-4	5.63-4
71	2733.5	4.10-4	4.10-4	4.17-4	4.41-4	4.92-4	5.49-4
72	2838.2	3.99-4	3.99-4	4.06-4	4.29-4	4.79-4	5.36-4
73	2944.9	3.89-4	3.89-4	3.96-4	4.18-4	4.67-4	5.23-4
74	3053.5	3.79-4	3.79-4	3.86-4	4.08-4	4.56-4	5.11-4
75	3164.0	3.70-4	3.70-4	3.76-4	3.98-4	4.45-4	4.99-4
76	3276.5	3.61-4	3.61-4	3.67-4	3.88-4	4.34-4	4.87-4
77	3390.8	3.52-4	3.52-4	3.58-4	3.79-4	4.23-4	4.76-4
78	3507.0	3.44-4	3.44-4	3.50-4	3.70-4	4.13-4	4.66-4
79	3625.2	3.35-4	3.36-4	3.41-4	3.61-4	4.04-4	4.55-4
80	3745.2	3.28-4	3.28-4	3.33-4	3.53-4	3.94-4	4.45-4
81	3867.1	3.20-4	3.20-4	3.25-4	3.45-4	3.85-4	4.35-4
82	3990.9	3.12-4	3.13-4	3.18-4	3.36-4	3.76-4	4.25-4
83	4116.6	3.05-4	3.05-4	3.10-4	3.29-4	3.67-4	4.15-4
84	4244.2	2.98-4	2.98-4	3.03-4	3.21-4	3.58-4	4.06-4
85	4373.6	2.91-4	2.91-4	2.96-4	3.14-4	3.51-4	3.97-4
86	4504.9	2.86-4	2.86-4	2.92-4	3.10-4	3.47-4	3.94-4
87	4638.1	3.04-4	3.07-4	3.18-4	3.44-4	3.92-4	4.50-4
88	4776.7	8.04-4	8.55-4	9.75-4	1.18-3	1.50-3	1.86-3
89	4934.7	7.41-4	7.87-4	8.96-4	1.09-3	1.38-3	1.72-3
90	5096.8	7.07-4	7.50-4	8.54-4	1.04-3	1.32-3	1.64-3
91	5263.2	6.77-4	7.19-4	8.18-4	9.93-4	1.26-3	1.56-3
92	5434.0	6.52-4	6.91-4	7.87-4	9.55-4	1.21-3	1.50-3

A1 – F25

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1724.8	4.05-4	4.05-4	4.15-4	4.49-4	5.17-4	5.97-4
61	1809.9	3.91-4	3.91-4	4.01-4	4.34-4	5.00-4	5.74-4
62	1897.0	3.76-4	3.77-4	3.87-4	4.20-4	4.84-4	5.53-4
63	1986.2	3.63-4	3.64-4	3.74-4	4.06-4	4.69-4	5.33-4
64	2077.4	3.50-4	3.51-4	3.62-4	3.93-4	4.53-4	5.15-4
65	2170.7	3.38-4	3.40-4	3.50-4	3.80-4	4.39-4	4.97-4
66	2266.0	3.27-4	3.28-4	3.38-4	3.68-4	4.25-4	4.81-4
67	2363.4	3.16-4	3.17-4	3.27-4	3.56-4	4.11-4	4.66-4
68	2462.9	3.05-4	3.07-4	3.17-4	3.45-4	3.98-4	4.51-4
69	2564.5	2.95-4	2.97-4	3.07-4	3.34-4	3.86-4	4.38-4
70	2668.2	2.85-4	2.87-4	2.97-4	3.23-4	3.74-4	4.25-4
71	2773.9	2.76-4	2.78-4	2.88-4	3.13-4	3.62-4	4.12-4
72	2881.8	2.67-4	2.69-4	2.79-4	3.04-4	3.51-4	4.01-4
73	2991.7	2.59-4	2.61-4	2.70-4	2.94-4	3.41-4	3.89-4
74	3103.8	2.51-4	2.53-4	2.62-4	2.86-4	3.30-4	3.79-4
75	3218.0	2.43-4	2.45-4	2.54-4	2.77-4	3.20-4	3.68-4
76	3334.3	2.36-4	2.38-4	2.46-4	2.69-4	3.11-4	3.58-4
77	3452.7	2.29-4	2.31-4	2.39-4	2.61-4	3.02-4	3.48-4
78	3573.3	2.22-4	2.24-4	2.32-4	2.53-4	2.93-4	3.39-4
79	3696.0	2.16-4	2.18-4	2.25-4	2.46-4	2.84-4	3.29-4
80	3820.8	2.10-4	2.11-4	2.19-4	2.39-4	2.76-4	3.20-4
81	3947.9	2.03-4	2.05-4	2.12-4	2.32-4	2.68-4	3.11-4
82	4077.1	1.98-4	1.99-4	2.06-4	2.25-4	2.60-4	3.03-4
83	4208.4	1.92-4	1.93-4	2.00-4	2.18-4	2.53-4	2.94-4
84	4342.0	1.86-4	1.88-4	1.94-4	2.12-4	2.45-4	2.86-4
85	4477.7	1.81-4	1.82-4	1.88-4	2.05-4	2.37-4	2.77-4
86	4615.6	1.76-4	1.77-4	1.83-4	1.99-4	2.30-4	2.68-4
87	4755.8	1.70-4	1.71-4	1.77-4	1.93-4	2.23-4	2.60-4
88	4898.1	1.65-4	1.66-4	1.71-4	1.86-4	2.15-4	2.51-4
89	5042.7	1.59-4	1.60-4	1.65-4	1.79-4	2.07-4	2.41-4
90	5189.5	1.53-4	1.54-4	1.58-4	1.71-4	1.97-4	2.30-4
91	5338.5	1.46-4	1.46-4	1.50-4	1.62-4	1.86-4	2.16-4
92	5489.8	1.37-4	1.37-4	1.39-4	1.49-4	1.70-4	1.97-4

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TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 − F26

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1823.6	9.61-4	8.91-4	7.61-4	6.20-4	5.22-4	4.96-4
61	1912.0	8.85-4	8.16-4	6.89-4	5.48-4	4.45-4	4.09-4
62	2002.5	8.22-4	7.55-4	6.32-4	4.92-4	3.87-4	3.47-4
63	2095.1	7.66-4	7.02-4	5.82-4	4.46-4	3.40-4	2.96-4
64	2189.8	7.16-4	6.54-4	5.38-4	4.04-4	3.00-4	2.53-4
65	2286.5	6.70-4	6.10-4	4.98-4	3.68-4	2.64-4	2.16-4
66	2385.4	6.29-4	5.71-4	4.61-4	3.35-4	2.33-4	1.84-4
67	2486.4	5.90-4	5.34-4	4.29-4	3.06-4	2.05-4	1.55-4
68	2589.4	5.55-4	5.01-4	3.99-4	2.80-4	1.81-4	1.31-4
69	2694.6	5.23-4	4.70-4	3.72-4	2.57-4	1.60-4	1.10-4
70	2802.0	4.93-4	4.43-4	3.47-4	2.36-4	1.42-4	9.21-5
71	2911.4	4.66-4	4.17-4	3.26-4	2.18-4	1.26-4	7.71-5
72	3023.0	4.41-4	3.94-4	3.06-4	2.02-4	1.15-4	6.47-5
73	3136.8	4.18-4	3.74-4	2.89-4	1.88-4	1.02-4	5.47-5
74	3252.7	3.98-4	3.55-4	2.73-4	1.76-4	9.25-5	4.69-5
75	3370.7	3.79-4	3.38-4	2.59-4	1.66-4	8.54-5	4.12-5
76	3491.0	3.62-4	3.22-4	2.47-4	1.57-4	7.99-5	3.72-5
77	3613.4	3.47-4	3.09-4	2.36-4	1.50-4	7.59-5	3.49-5
78	3738.0	3.33-4	2.96-4	2.27-4	1.45-4	7.33-5	3.41-5
79	3864.8	3.21-4	2.86-4	2.19-4	1.40-4	7.19-5	3.45-5
80	3993.8	3.09-4	2.76-4	2.12-4	1.37-4	7.16-5	3.61-5
81	4125.1	2.99-4	2.67-4	2.06-4	1.34-4	7.21-5	3.86-5
82	4258.5	2.90-4	2.59-4	2.01-4	1.32-4	7.34-5	4.19-5
83	4394.2	2.82-4	2.52-4	1.96-4	1.31-4	7.53-5	4.59-5
84	4532.2	2.74-4	2.46-4	1.93-4	1.31-4	7.78-5	5.04-5
85	4672.4	2.67-4	2.40-4	1.89-4	1.30-4	8.07-5	5.53-5
86	4814.8	2.61-4	2.35-4	1.87-4	1.31-4	8.39-5	6.06-5
87	4959.6	2.55-4	2.31-4	1.85-4	1.31-4	8.73-5	6.60-5
88	5106.6	2.50-4	2.27-4	1.83-4	1.32-4	9.09-5	7.16-5
89	5255.9	2.45-4	2.23-4	1.81-4	1.33-4	9.45-5	7.72-5
90	5407.5	2.41-4	2.19-4	1.80-4	1.34-4	9.82-5	8.27-5
91	5561.4	2.37-4	2.16-4	1.78-4	1.36-4	1.02-4	8.82-5
92	5717.7	2.33-4	2.13-4	1.77-4	1.37-4	1.05-4	9.35-5

A1 − F27

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1827.4	5.44-3	5.79-3	6.59-3	7.88-3	9.68-3	1.14-2
61	1916.0	5.23-3	5.57-3	6.34-3	7.56-3	9.27-3	1.09-2
62	2006.7	5.04-3	5.37-3	6.09-3	7.26-3	8.88-3	1.04-2
63	2099.4	4.86-3	5.17-3	5.87-3	6.99-3	8.53-3	9.97-3
64	2194.3	4.70-3	4.99-3	5.66-3	6.73-3	8.20-3	9.56-3
65	2291.2	4.54-3	4.82-3	5.46-3	6.48-3	7.89-3	9.19-3
66	2390.3	4.38-3	4.66-3	5.27-3	6.24-3	7.59-3	8.84-3
67	2491.4	4.24-3	4.50-3	5.09-3	6.02-3	7.32-3	8.51-3
68	2594.7	4.10-3	4.35-3	4.91-3	5.81-3	7.05-3	8.20-3
69	2700.1	3.96-3	4.20-3	4.74-3	5.60-3	6.80-3	7.90-3
70	2807.7	3.84-3	4.06-3	4.58-3	5.41-3	6.56-3	7.62-3
71	2917.3	3.71-3	3.93-3	4.43-3	5.22-3	6.33-3	7.36-3
72	3029.2	3.59-3	3.80-3	4.28-3	5.04-3	6.11-3	7.11-3
73	3143.2	3.48-3	3.68-3	4.14-3	4.87-3	5.90-3	6.87-3
74	3259.4	3.37-3	3.56-3	4.00-3	4.71-3	5.70-3	6.64-3
75	3377.7	3.26-3	3.45-3	3.87-3	4.55-3	5.51-3	6.42-3
76	3498.2	3.16-3	3.34-3	3.75-3	4.40-3	5.32-3	6.22-3
77	3621.0	3.06-3	3.23-3	3.63-3	4.26-3	5.15-3	6.02-3
78	3745.9	2.97-3	3.13-3	3.51-3	4.12-3	4.98-3	5.82-3
79	3873.1	2.88-3	3.04-3	3.40-3	3.98-3	4.82-3	5.64-3
80	4002.5	2.79-3	2.94-3	3.29-3	3.86-3	4.66-3	5.46-3
81	4134.1	2.70-3	2.85-3	3.19-3	3.73-3	4.51-3	5.29-3
82	4268.0	2.62-3	2.76-3	3.09-3	3.62-3	4.37-3	5.13-3
83	4404.1	2.54-3	2.68-3	2.99-3	3.50-3	4.23-3	4.97-3
84	4542.5	2.47-3	2.60-3	2.90-3	3.40-3	4.10-3	4.82-3
85	4683.1	2.39-3	2.52-3	2.81-3	3.29-3	3.98-3	4.68-3
86	4826.1	2.32-3	2.45-3	2.73-3	3.19-3	3.86-3	4.54-3
87	4971.3	2.26-3	2.38-3	2.65-3	3.10-3	3.74-3	4.41-3
88	5118.9	2.19-3	2.31-3	2.57-3	3.01-3	3.63-3	4.28-3
89	5268.8	2.13-3	2.24-3	2.50-3	2.92-3	3.52-3	4.15-3
90	5421.0	2.07-3	2.18-3	2.43-3	2.84-3	3.42-3	4.04-3
91	5575.5	2.01-3	2.12-3	2.36-3	2.76-3	3.32-3	3.92-3
92	5732.4	1.96-3	2.06-3	2.30-3	2.68-3	3.23-3	3.82-3

A1 − F28

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1833.6	2.88-4	2.75-4	2.55-4	2.41-4	2.41-4	2.59-4
61	1927.9	3.08-4	2.98-4	2.83-4	2.77-4	2.90-4	3.17-4
62	2024.9	3.14-4	3.06-4	2.95-4	2.93-4	3.12-4	3.42-4
63	2124.6	3.12-4	3.05-4	2.96-4	2.97-4	3.20-4	3.50-4
64	2227.1	3.06-4	3.00-4	2.92-4	2.95-4	3.19-4	3.49-4
65	2332.3	2.98-4	2.92-4	2.86-4	2.90-4	3.14-4	3.44-4
66	2440.3	2.89-4	2.84-4	2.78-4	2.82-4	3.07-4	3.36-4
67	2551.2	2.80-4	2.75-4	2.70-4	2.74-4	2.98-4	3.27-4
68	2665.0	2.70-4	2.65-4	2.61-4	2.66-4	2.89-4	3.17-4
69	2781.7	2.60-4	2.56-4	2.52-4	2.57-4	2.80-4	3.07-4
70	2901.4	2.51-4	2.47-4	2.43-4	2.48-4	2.70-4	2.97-4
71	3024.1	2.42-4	2.38-4	2.35-4	2.39-4	2.61-4	2.87-4
72	3150.0	2.33-4	2.30-4	2.26-4	2.30-4	2.51-4	2.78-4
73	3279.0	2.25-4	2.21-4	2.18-4	2.22-4	2.42-4	2.68-4
74	3411.1	2.17-4	2.13-4	2.10-4	2.14-4	2.33-4	2.59-4
75	3546.6	2.09-4	2.05-4	2.02-4	2.06-4	2.24-4	2.50-4
76	3685.3	2.01-4	1.98-4	1.94-4	1.98-4	2.16-4	2.41-4
77	3827.5	1.94-4	1.90-4	1.87-4	1.91-4	2.08-4	2.33-4
78	3973.0	1.87-4	1.83-4	1.80-4	1.84-4	2.00-4	2.25-4
79	4122.1	1.80-4	1.77-4	1.74-4	1.77-4	1.92-4	2.17-4
80	4274.8	1.73-4	1.70-4	1.67-4	1.70-4	1.85-4	2.09-4
81	4431.2	1.67-4	1.64-4	1.61-4	1.64-4	1.78-4	2.02-4
82	4591.2	1.61-4	1.58-4	1.55-4	1.57-4	1.71-4	1.94-4
83	4755.1	1.55-4	1.52-4	1.49-4	1.51-4	1.64-4	1.87-4
84	4922.9	1.50-4	1.47-4	1.44-4	1.46-4	1.58-4	1.80-4
85	5094.7	1.44-4	1.42-4	1.39-4	1.40-4	1.52-4	1.73-4
86	5270.6	1.39-4	1.37-4	1.33-4	1.35-4	1.46-4	1.67-4
87	5450.7	1.34-4	1.32-4	1.29-4	1.30-4	1.40-4	1.60-4
88	5635.1	1.30-4	1.27-4	1.24-4	1.25-4	1.35-4	1.54-4
89	5823.8	1.25-4	1.23-4	1.19-4	1.20-4	1.30-4	1.48-4
90	6017.1	1.21-4	1.18-4	1.15-4	1.16-4	1.25-4	1.42-4
91	6215.0	1.17-4	1.14-4	1.11-4	1.11-4	1.20-4	1.36-4
92	6417.6	1.13-4	1.10-4	1.07-4	1.07-4	1.15-4	1.30-4

A1 − F29

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1935.3	2.80-3	2.95-3	3.29-3	3.86-3	4.70-3	5.54-3
61	2033.1	2.68-3	2.82-3	3.15-3	3.69-3	4.48-3	5.27-3
62	2133.6	2.57-3	2.71-3	3.01-3	3.53-3	4.28-3	5.02-3
63	2236.8	2.47-3	2.60-3	2.89-3	3.38-3	4.09-3	4.79-3
64	2342.7	2.37-3	2.49-3	2.77-3	3.24-3	3.91-3	4.58-3
65	2451.5	2.28-3	2.39-3	2.66-3	3.10-3	3.75-3	4.38-3
66	2563.1	2.18-3	2.30-3	2.55-3	2.97-3	3.59-3	4.19-3
67	2677.6	2.10-3	2.20-3	2.45-3	2.85-3	3.44-3	4.01-3
68	2795.0	2.02-3	2.12-3	2.35-3	2.74-3	3.30-3	3.85-3
69	2915.4	1.94-3	2.04-3	2.26-3	2.63-3	3.17-3	3.69-3
70	3038.8	1.87-3	1.96-3	2.17-3	2.52-3	3.04-3	3.55-3
71	3165.3	1.80-3	1.88-3	2.09-3	2.42-3	2.92-3	3.41-3
72	3295.0	1.73-3	1.81-3	2.01-3	2.33-3	2.81-3	3.28-3
73	3427.8	1.67-3	1.75-3	1.93-3	2.24-3	2.70-3	3.16-3
74	3563.8	1.60-3	1.68-3	1.86-3	2.16-3	2.60-3	3.04-3
75	3703.2	1.55-3	1.62-3	1.79-3	2.08-3	2.50-3	2.93-3
76	3846.0	1.49-3	1.56-3	1.72-3	2.00-3	2.41-3	2.83-3
77	3992.1	1.44-3	1.50-3	1.66-3	1.93-3	2.32-3	2.73-3
78	4141.8	1.39-3	1.45-3	1.60-3	1.86-3	2.24-3	2.63-3
79	4295.0	1.34-3	1.40-3	1.54-3	1.79-3	2.16-3	2.54-3
80	4451.9	1.29-3	1.35-3	1.49-3	1.73-3	2.08-3	2.46-3
81	4612.5	1.25-3	1.30-3	1.44-3	1.67-3	2.01-3	2.37-3
82	4776.9	1.20-3	1.26-3	1.39-3	1.61-3	1.94-3	2.30-3
83	4945.2	1.16-3	1.22-3	1.34-3	1.55-3	1.87-3	2.22-3
84	5117.4	1.12-3	1.17-3	1.29-3	1.50-3	1.81-3	2.15-3
85	5293.7	1.09-3	1.13-3	1.25-3	1.45-3	1.75-3	2.08-3
86	5474.2	1.05-3	1.10-3	1.21-3	1.40-3	1.69-3	2.01-3
87	5658.9	1.01-3	1.06-3	1.17-3	1.35-3	1.64-3	1.95-3
88	5848.0	9.81-4	1.02-3	1.13-3	1.31-3	1.58-3	1.88-3
89	6041.5	9.49-4	9.92-4	1.09-3	1.27-3	1.53-3	1.82-3
90	6239.7	9.18-4	9.60-4	1.06-3	1.23-3	1.48-3	1.77-3
91	6442.5	8.88-4	9.28-4	1.02-3	1.19-3	1.43-3	1.71-3
92	6650.2	8.59-4	8.98-4	9.90-4	1.15-3	1.39-3	1.66-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – F30

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2052.5	4.95-4	5.02-4	5.27-4	5.88-4	6.97-4	8.25-4
61	2153.0	4.83-4	4.91-4	5.17-4	5.78-4	6.86-4	8.09-4
62	2256.3	4.72-4	4.80-4	5.07-4	5.67-4	6.73-4	7.92-4
63	2362.3	4.61-4	4.69-4	4.96-4	5.56-4	6.61-4	7.75-4
64	2471.1	4.49-4	4.58-4	4.86-4	5.45-4	6.48-4	7.58-4
65	2582.8	4.38-4	4.47-4	4.75-4	5.33-4	6.35-4	7.42-4
66	2697.3	4.27-4	4.36-4	4.64-4	5.22-4	6.21-4	7.25-4
67	2814.7	4.16-4	4.25-4	4.53-4	5.10-4	6.07-4	7.08-4
68	2935.0	4.05-4	4.14-4	4.42-4	4.98-4	5.93-4	6.92-4
69	3058.4	3.95-4	4.04-4	4.31-4	4.86-4	5.79-4	6.76-4
70	3184.9	3.84-4	3.93-4	4.20-4	4.74-4	5.65-4	6.60-4
71	3314.4	3.74-4	3.83-4	4.09-4	4.61-4	5.51-4	6.44-4
72	3447.1	3.63-4	3.72-4	3.98-4	4.49-4	5.37-4	6.28-4
73	3583.1	3.53-4	3.62-4	3.87-4	4.38-4	5.23-4	6.13-4
74	3722.3	3.44-4	3.52-4	3.76-4	4.26-4	5.09-4	5.98-4
75	3864.8	3.34-4	3.42-4	3.66-4	4.14-4	4.95-4	5.83-4
76	4010.8	3.24-4	3.32-4	3.56-4	4.02-4	4.82-4	5.68-4
77	4160.2	3.15-4	3.23-4	3.45-4	3.91-4	4.68-4	5.54-4
78	4313.2	3.05-4	3.13-4	3.35-4	3.80-4	4.55-4	5.39-4
79	4469.7	2.96-4	3.04-4	3.25-4	3.69-4	4.42-4	5.25-4
80	4630.0	2.88-4	2.95-4	3.16-4	3.58-4	4.29-4	5.10-4
81	4794.0	2.79-4	2.86-4	3.06-4	3.47-4	4.16-4	4.96-4
82	4961.8	2.71-4	2.77-4	2.97-4	3.36-4	4.04-4	4.82-4
83	5133.6	2.62-4	2.69-4	2.88-4	3.26-4	3.91-4	4.68-4
84	5309.4	2.54-4	2.61-4	2.79-4	3.16-4	3.80-4	4.55-4
85	5489.4	2.46-4	2.52-4	2.70-4	3.06-4	3.68-4	4.41-4
86	5673.5	2.38-4	2.44-4	2.61-4	2.96-4	3.56-4	4.27-4
87	5861.9	2.31-4	2.37-4	2.53-4	2.87-4	3.45-4	4.14-4
88	6054.8	2.23-4	2.29-4	2.45-4	2.78-4	3.34-4	4.01-4
89	6252.3	2.16-4	2.22-4	2.37-4	2.69-4	3.23-4	3.88-4
90	6454.4	2.09-4	2.14-4	2.29-4	2.60-4	3.12-4	3.75-4
91	6661.3	2.02-4	2.07-4	2.21-4	2.51-4	3.02-4	3.63-4
92	6873.1	1.95-4	2.00-4	2.14-4	2.42-4	2.91-4	3.51-4

A1 – F31

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2056.1	8.04-4	8.51-4	9.63-4	1.16-3	1.45-3	1.76-3
61	2156.9	7.79-4	8.24-4	9.32-4	1.12-3	1.40-3	1.69-3
62	2260.6	7.55-4	7.98-4	9.02-4	1.08-3	1.35-3	1.63-3
63	2367.0	7.31-4	7.73-4	8.73-4	1.04-3	1.30-3	1.56-3
64	2476.2	7.08-4	7.48-4	8.44-4	1.01-3	1.26-3	1.50-3
65	2588.3	6.85-4	7.23-4	8.16-4	9.75-4	1.21-3	1.45-3
66	2703.2	6.63-4	7.00-4	7.89-4	9.41-4	1.17-3	1.39-3
67	2821.2	6.41-4	6.76-4	7.62-4	9.08-4	1.13-3	1.34-3
68	2942.1	6.20-4	6.54-4	7.36-4	8.76-4	1.09-3	1.29-3
69	3066.0	5.99-4	6.32-4	7.11-4	8.45-4	1.05-3	1.25-3
70	3193.1	5.79-4	6.10-4	6.86-4	8.15-4	1.01-3	1.20-3
71	3323.3	5.59-4	5.90-4	6.62-4	7.86-4	9.75-4	1.16-3
72	3456.7	5.41-4	5.70-4	6.39-4	7.59-4	9.40-4	1.12-3
73	3593.3	5.22-4	5.50-4	6.17-4	7.31-4	9.06-4	1.08-3
74	3733.3	5.04-4	5.31-4	5.95-4	7.05-4	8.73-4	1.04-3
75	3876.7	4.87-4	5.12-4	5.73-4	6.80-4	8.42-4	1.01-3
76	4023.5	4.70-4	4.94-4	5.53-4	6.55-4	8.11-4	9.73-4
77	4173.8	4.53-4	4.77-4	5.33-4	6.31-4	7.82-4	9.40-4
78	4327.7	4.37-4	4.60-4	5.14-4	6.08-4	7.53-4	9.07-4
79	4485.2	4.22-4	4.43-4	4.95-4	5.86-4	7.26-4	8.76-4
80	4646.5	4.07-4	4.27-4	4.77-4	5.64-4	6.99-4	8.45-4
81	4811.6	3.92-4	4.12-4	4.59-4	5.43-4	6.73-4	8.15-4
82	4980.6	3.78-4	3.97-4	4.42-4	5.23-4	6.48-4	7.86-4
83	5153.6	3.64-4	3.82-4	4.25-4	5.03-4	6.23-4	7.58-4
84	5330.7	3.51-4	3.68-4	4.09-4	4.84-4	6.00-4	7.31-4
85	5511.9	3.38-4	3.54-4	3.94-4	4.66-4	5.77-4	7.04-4
86	5697.4	3.25-4	3.41-4	3.79-4	4.48-4	5.55-4	6.78-4
87	5887.3	3.13-4	3.28-4	3.64-4	4.31-4	5.34-4	6.52-4
88	6081.7	3.01-4	3.15-4	3.50-4	4.14-4	5.13-4	6.27-4
89	6280.8	2.89-4	3.03-4	3.37-4	3.98-4	4.93-4	6.03-4
90	6484.5	2.78-4	2.91-4	3.24-4	3.82-4	4.74-4	5.79-4
91	6693.1	2.67-4	2.80-4	3.11-4	3.67-4	4.55-4	5.56-4
92	6906.7	2.57-4	2.69-4	2.98-4	3.52-4	4.36-4	5.34-4

A1 – G1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	840.1	1.13-3	1.01-3	7.80-4	5.17-4	2.75-4	1.29-4
61	885.4	1.08-3	9.56-4	7.40-4	4.90-4	2.60-4	1.22-4
62	931.8	1.02-3	9.07-4	7.03-4	4.65-4	2.47-4	1.15-4
63	979.2	9.70-4	8.62-4	6.68-4	4.43-4	2.35-4	1.09-4
64	1027.5	9.23-4	8.21-4	6.37-4	4.21-4	2.23-4	1.04-4
65	1076.8	8.79-4	7.82-4	6.07-4	4.02-4	2.12-4	9.86-5
66	1127.0	8.39-4	7.47-4	5.79-4	3.83-4	2.02-4	9.39-5
67	1178.1	8.02-4	7.14-4	5.54-4	3.66-4	1.93-4	8.95-5
68	1230.1	7.67-4	6.83-4	5.30-4	3.50-4	1.84-4	8.55-5
69	1283.0	7.34-4	6.54-4	5.08-4	3.35-4	1.77-4	8.17-5
70	1336.8	7.04-4	6.27-4	4.87-4	3.22-4	1.69-4	7.82-5
71	1391.4	6.76-4	6.02-4	4.67-4	3.09-4	1.62-4	7.49-5
72	1446.8	6.50-4	5.79-4	4.49-4	2.96-4	1.55-4	7.18-5
73	1503.0	6.25-4	5.57-4	4.32-4	2.85-4	1.49-4	6.89-5
74	1560.0	6.02-4	5.36-4	4.16-4	2.74-4	1.44-4	6.63-5
75	1617.7	5.80-4	5.17-4	4.01-4	2.64-4	1.38-4	6.37-5
76	1676.1	5.60-4	4.98-4	3.87-4	2.55-4	1.33-4	6.14-5
77	1735.3	5.40-4	4.81-4	3.73-4	2.46-4	1.28-4	5.91-5
78	1795.1	5.22-4	4.65-4	3.61-4	2.37-4	1.24-4	5.70-5
79	1855.5	5.05-4	4.50-4	3.49-4	2.29-4	1.20-4	5.50-5
80	1916.6	4.89-4	4.36-4	3.37-4	2.22-4	1.15-4	5.32-5
81	1978.2	4.74-4	4.22-4	3.27-4	2.15-4	1.12-4	5.14-5
82	2040.3	4.60-4	4.09-4	3.17-4	2.08-4	1.08-4	4.98-5
83	2103.0	4.46-4	3.97-4	3.07-4	2.02-4	1.05-4	4.82-5
84	2166.2	4.33-4	3.85-4	2.98-4	1.96-4	1.02-4	4.67-5
85	2229.7	4.21-4	3.74-4	2.90-4	1.90-4	9.85-5	4.53-5
86	2293.7	4.09-4	3.64-4	2.81-4	1.84-4	9.56-5	4.39-5
87	2358.1	3.98-4	3.54-4	2.74-4	1.79-4	9.29-5	4.27-5
88	2422.7	3.88-4	3.45-4	2.66-4	1.74-4	9.03-5	4.14-5
89	2487.7	3.78-4	3.36-4	2.59-4	1.70-4	8.78-5	4.03-5
90	2552.8	3.68-4	3.27-4	2.53-4	1.65-4	8.54-5	3.92-5
91	2618.1	3.59-4	3.19-4	2.46-4	1.61-4	8.32-5	3.81-5
92	2683.6	3.51-4	3.12-4	2.40-4	1.57-4	8.10-5	3.71-5

A1 – G2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1046.0	1.80-3	1.57-3	1.16-3	6.85-4	3.09-4	1.26-4
61	1099.9	1.69-3	1.48-3	1.09-3	6.43-4	2.89-4	1.17-4
62	1155.0	1.60-3	1.40-3	1.02-3	6.05-4	2.72-4	1.10-4
63	1211.3	1.51-3	1.32-3	9.66-4	5.70-4	2.56-4	1.03-4
64	1268.9	1.43-3	1.25-3	9.13-4	5.38-4	2.41-4	9.72-5
65	1327.7	1.35-3	1.18-3	8.64-4	5.09-4	2.28-4	9.16-5
66	1387.8	1.29-3	1.12-3	8.20-4	4.82-4	2.15-4	8.66-5
67	1449.1	1.22-3	1.07-3	7.78-4	4.57-4	2.04-4	8.19-5
68	1511.6	1.16-3	1.01-3	7.40-4	4.34-4	1.94-4	7.76-5
69	1575.3	1.11-3	9.67-4	7.05-4	4.13-4	1.84-4	7.37-5
70	1640.3	1.06-3	9.22-4	6.72-4	3.94-4	1.75-4	7.00-5
71	1706.5	1.01-3	8.81-4	6.41-4	3.76-4	1.67-4	6.66-5
72	1774.0	9.67-4	8.42-4	6.13-4	3.59-4	1.59-4	6.35-5
73	1847.6	9.26-4	8.06-4	5.86-4	3.43-4	1.52-4	6.06-5
74	1912.5	8.88-4	7.73-4	5.62-4	3.28-4	1.45-4	5.79-5
75	1983.5	8.52-4	7.41-4	5.39-4	3.15-4	1.39-4	5.54-5
76	2055.8	8.18-4	7.11-4	5.17-4	3.02-4	1.33-4	5.30-5
77	2129.3	7.86-4	6.84-4	4.96-4	2.90-4	1.28-4	5.08-5
78	2203.9	7.56-4	6.57-4	4.77-4	2.78-4	1.23-4	4.88-5
79	2279.8	7.28-4	6.33-4	4.59-4	2.68-4	1.18-4	4.68-5
80	2356.9	7.01-4	6.10-4	4.42-4	2.58-4	1.14-4	4.50-5
81	2435.1	6.76-4	5.88-4	4.26-4	2.48-4	1.09-4	4.33-5
82	2514.5	6.52-4	5.67-4	4.11-4	2.39-4	1.05-4	4.17-5
83	2595.1	6.30-4	5.47-4	3.97-4	2.31-4	1.02-4	4.02-5
84	2676.9	6.08-4	5.28-4	3.83-4	2.23-4	9.82-5	3.87-5
85	2759.9	5.88-4	5.11-4	3.70-4	2.15-4	9.48-5	3.74-5
86	2844.0	5.69-4	4.94-4	3.58-4	2.08-4	9.16-5	3.61-5
87	2929.2	5.51-4	4.78-4	3.47-4	2.01-4	8.86-5	3.49-5
88	3015.7	5.33-4	4.63-4	3.36-4	1.95-4	8.57-5	3.38-5
89	3103.3	5.17-4	4.49-4	3.25-4	1.89-4	8.30-5	3.27-5
90	3192.0	5.01-4	4.35-4	3.15-4	1.83-4	8.04-5	3.16-5
91	3281.9	4.86-4	4.22-4	3.05-4	1.77-4	7.79-5	3.06-5
92	3372.9	4.71-4	4.09-4	2.96-4	1.72-4	7.55-5	2.97-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 − G3

Z	ΔE	E'=.002	E'=.01	E'=.03	E' 07	E'=.15	E'=.28
60	1052.2	2.23-3	1.96-3	1.45-3	8.75-4	4.07-4	1.72-4
61	1106.7	2.12-3	1.86-3	1.38-3	8.31-4	3.86-4	1.63-4
62	1162.5	2.02-3	1.77-3	1.31-3	7.90-4	3.67-4	1.55-4
63	1219.6	1.93-3	1.69-3	1.25-3	7.52-4	3.50-4	1.48-4
64	1276.0	1.84-3	1.61-3	1.19-3	7.17-4	3.33-4	1.41-4
65	1337.7	1.75-3	1.54-3	1.14-3	6.84-4	3.18-4	1.34-4
66	1398.7	1.68-3	1.47-3	1.09-3	6.53-4	3.04-4	1.28-4
67	1461.0	1.60-3	1.40-3	1.04-3	6.24-4	2.90-4	1.23-4
68	1524.5	1.54-3	1.35-3	9.93-4	5.97-4	2.77-4	1.17-4
69	1589.4	1.47-3	1.29-3	9.51-4	5.71-4	2.66-4	1.12-4
70	1655.6	1.41-3	1.23-3	9.11-4	5.47-4	2.54-4	1.08-4
71	1723.1	1.35-3	1.19-3	8.74-4	5.25-4	2.44-4	1.03-4
72	1791.8	1.30-3	1.14-3	8.39-4	5.04-4	2.34-4	9.91-5
73	1861.9	1.25-3	1.09-3	8.06-4	4.84-4	2.25-4	9.51-5
74	1933.3	1.20-3	1.05-3	7.75-4	4.65-4	2.16-4	9.14-5
75	2005.9	1.16-3	1.01-3	7.46-4	4.48-4	2.08-4	8.79-5
76	2079.9	[illegible]	9.76-4	7.19-4	4.31-4	2.00-4	8.47-5
77	2155.1	1.08-3	9.40-4	6.92-4	4.15-4	1.93-4	8.15-5
78	2231.6	1.04-3	9.07-4	6.68-4	4.00-4	1.86-4	7.86-5
79	2309.4	1.00-3	8.75-4	6.44-4	3.86-4	1.79-4	7.58-5
80	2388.6	9.67-4	8.45-4	6.22-4	3.73-4	1.73-4	7.31-5
81	2469.0	9.35-4	8.17-4	6.01-4	3.60-4	1.67-4	7.06-5
82	2550.7	9.04-4	7.90-4	5.81-4	3.48-4	1.62-4	6.83-5
83	2633.7	8.74-4	7.64-4	5.62-4	3.37-4	1.56-4	6.60-5
84	2717.9	8.46-4	7.39-4	5.44-4	3.26-4	1.51-4	6.39-5
85	2803.5	8.20-4	7.16-4	5.27-4	3.16-4	1.46-4	6.18-5
86	2890.4	7.94-4	6.94-4	5.11-4	3.06-4	1.42-4	5.99-5
87	2978.5	7.70-4	6.73-4	4.95-4	2.96-4	1.37-4	5.80-5
88	3068.0	7.47-4	6.53-4	4.80-4	2.87-4	1.33-4	5.62-5
89	3158.7	7.25-4	6.33-4	4.66-4	2.79-4	1.29-4	5.46-5
90	3250.7	7.04-4	6.15-4	4.52-4	2.71-4	1.26-4	5.29-5
91	3344.0	6.84-4	5.97-4	4.39-4	2.63-4	1.22-4	5.14-5
92	3438.6	6.64-4	5.80-4	4.27-4	2.55-4	1.18-4	5.00-5

A1 − G4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1066.5	1.97-3	1.73-3	1.28-3	7.78-4	3.66-4	1.56-4
61	1122.3	1.87-3	1.64-3	1.22-3	7.39-4	3.48-4	1.49-4
62	1179.4	1.78-3	1.56-3	1.16-3	7.02-4	3.31-4	1.41-4
63	1238.0	1.69-3	1.48-3	1.10-3	6.68-4	3.15-4	1.35-4
64	1297.9	1.61-3	1.42-3	1.05-3	6.37-4	3.00-4	1.28-4
65	1359.3	1.54-3	1.35-3	1.00-3	6.07-4	2.86-4	1.22-4
66	1422.0	1.47-3	1.29-3	9.56-4	5.80-4	2.73-4	1.17-4
67	1486.1	1.40-3	1.23-3	9.14-4	5.54-4	2.61-4	1.12-4
68	1551.7	1.34-3	1.18-3	8.74-4	5.30-4	2.49-4	1.07-4
69	1618.6	1.29-3	1.13-3	8.37-4	5.07-4	2.39-4	1.02-4
70	1687.0	1.23-3	1.08-3	8.02-4	4.86-4	2.29-4	9.79-5
71	1756.7	1.18-3	1.04-3	7.69-4	4.66-4	2.19-4	9.39-5
72	1827.9	1.14-3	9.96-4	7.38-4	4.47-4	2.11-4	9.01-5
73	1900.5	1.09-3	9.56-4	7.09-4	4.30-4	2.02-4	8.65-5
74	1974.5	1.05-3	9.19-4	6.82-4	4.13-4	1.94-4	8.32-5
75	2049.9	1.01-3	8.84-4	6.56-4	3.97-4	1.87-4	8.00-5
76	2126.8	9.71-4	8.51-4	6.31-4	3.82-4	1.80-4	7.70-5
77	2205.1	9.36-4	8.20-4	6.08-4	3.69-4	1.73-4	7.42-5
78	2284.9	9.02-4	7.91-4	5.86-4	3.55-4	1.67-4	7.15-5
79	2366.1	8.70-4	7.62-4	5.65-4	3.43-4	1.61-4	6.90-5
80	2448.7	8.39-4	7.36-4	5.45-4	3.31-4	1.56-4	6.66-5
81	2532.8	8.10-4	7.10-4	5.27-4	3.19-4	1.50-4	6.43-5
82	2618.4	7.83-4	6.86-4	5.09-4	3.09-4	1.45-4	6.22-5
83	2705.4	7.57-4	6.63-4	4.92-4	2.98-4	1.41-4	6.01-5
84	2793.9	7.32-4	6.42-4	4.76-4	2.89-4	1.36-4	5.82-5
85	2883.8	7.08-4	6.21-4	[illegible]	2.79-4	1.32-4	5.64-5
86	2975.3	6.86-4	6.01-4	4.46-4	2.70-4	1.28-4	5.46-5
87	3068.2	6.64-4	5.82-4	4.32-4	2.62-4	1.24-4	5.29-5
88	3162.6	6.43-4	5.64-4	4.18-4	2.54-4	[illegible]	5.13-5
89	3258.5	6.23-4	5.47-4	4.06-4	2.46-4	[illegible]	4.98-5
90	3355.9	6.05-4	5.30-4	3.93-4	2.39-4	1.13-4	4.84-5
91	3454.7	5.87-4	5.14-4	3.82-4	2.32-4	1.09-4	4.70-5
92	3555.1	5.69-4	4.99-4	3.70-4	2.25-4	1.06-4	4.57-5

A1 − G5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1076.6	1.55-3	1.36-3	9.90-4	5.77-4	2.52-4	9.81-5
61	1133.2	1.48-3	1.29-3	9.39-4	5.48-4	2.40-4	9.32-5
62	1191.2	1.40-3	1.23-3	8.93-4	5.20-4	2.28-4	8.86-5
63	1250.7	1.34-3	1.17-3	8.49-4	4.95-4	2.17-4	8.44-5
64	1311.6	1.27-3	1.11-3	8.09-4	4.71-4	2.06-4	8.04-5
65	1373.9	1.22-3	1.06-3	7.71-4	4.49-4	1.97-4	7.67-5
66	1437.7	1.16-3	1.01-3	7.37-4	4.29-4	1.88-4	7.33-5
67	1502.9	1.11-3	9.68-4	7.04-4	4.10-4	1.79-4	7.01-5
68	1569.6	1.06-3	9.26-4	6.73-4	3.92-4	1.72-4	6.71-5
69	1637.8	1.02-3	8.87-4	6.45-4	3.76-4	1.65-4	6.43-5
70	1707.5	9.78-4	8.51-4	6.18-4	3.60-4	1.58-4	6.17-5
71	1778.6	9.38-4	8.16-4	5.93-4	3.45-4	1.51-4	5.92-5
72	1851.3	9.01-4	7.84-4	5.70-4	3.31-4	1.45-4	5.68-5
73	1925.4	8.66-4	7.54-4	5.47-4	3.19-4	1.40-4	5.47-5
74	2001.1	8.34-4	7.25-4	5.27-4	3.06-4	1.34-4	5.26-5
75	2078.2	8.03-4	6.98-4	5.07-4	2.95-4	1.29-4	5.07-5
76	2156.9	7.73-4	6.72-4	4.88-4	2.84-4	1.25-4	4.88-5
77	2237.1	7.46-4	6.48-4	4.71-4	2.74-4	1.20-4	4.71-5
78	2318.9	7.19-4	6.26-4	4.54-4	2.64-4	1.16-4	4.55-5
79	2402.2	6.95-4	6.04-4	4.38-4	2.55-4	1.12-4	4.39-5
80	2487.0	6.71-4	5.83-4	4.24-4	2.47-4	1.08-4	4.24-5
81	2573.4	6.49-4	5.64-4	4.09-4	2.38-4	1.05-4	4.10-5
82	2661.3	6.28-4	5.46-4	3.96-4	2.31-4	1.01-4	3.97-5
83	2750.9	6.07-4	5.28-4	3.83-4	2.23-4	9.80-5	3.85-5
84	2842.0	5.88-4	5.11-4	3.71-4	2.16-4	9.50-5	3.73-5
85	2934.7	5.70-4	4.96-4	3.60-4	2.09-4	9.21-5	3.61-5
86	3029.0	5.52-4	4.80-4	3.49-4	2.03-4	8.93-5	3.51-5
87	3124.9	5.36-4	4.66-4	3.38-4	1.97-4	8.66-5	3.40-5
88	3222.5	5.20-4	4.52-4	3.28-4	1.91-4	8.41-5	3.30-5
89	3321.7	5.05-4	4.39-4	3.19-4	1.86-4	8.17-5	3.21-5
90	3422.5	4.90-4	4.26-4	3.10-4	1.80-4	7.94-5	3.12-5
91	3524.9	4.77-4	4.14-4	3.01-4	1.76-4	7.72-5	3.04-5
92	3629.0	4.63-4	4.03-4	2.93-4	1.71-4	7.51-5	2.95-5

A1 − G6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1249.1	1.19-3	1.06-3	8.18-4	5.41-4	2.89-4	1.39-4
61	1308.8	1.13-3	1.00-3	7.77-4	5.14-4	2.74-4	1.31-4
62	1369.9	1.07-3	9.54-4	7.39-4	4.89-4	2.61-4	1.25-4
63	1432.4	1.02-3	9.09-4	7.04-4	4.65-4	2.48-4	1.18-4
64	1496.2	9.73-4	8.66-4	6.72-4	4.44-4	2.36-4	1.13-4
65	1561.5	9.29-4	8.28-4	6.42-4	4.24-4	2.26-4	1.07-4
66	1628.2	8.88-4	7.91-4	6.14-4	4.05-4	2.16-4	1.02-4
67	1696.4	8.50-4	7.58-4	5.88-4	3.88-4	2.06-4	9.78-5
68	1765.9	8.14-4	7.26-4	5.64-4	3.72-4	1.97-4	9.35-5
69	1836.8	7.81-4	6.97-4	5.41-4	3.57-4	1.89-4	8.95-5
70	1909.2	7.50-4	6.69-4	5.20-4	3.43-4	1.81-4	8.58-5
71	1983.0	7.21-4	6.44-4	5.00-4	3.30-4	1.74-4	8.23-5
72	2058.2	6.94-4	6.19-4	4.81-4	3.18-4	1.67-4	7.91-5
73	2134.9	6.68-4	5.97-4	4.64-4	3.06-4	1.61-4	7.60-5
74	2213.0	6.44-4	5.75-4	4.47-4	2.95-4	1.55-4	7.32-5
75	2292.6	6.22-4	5.55-4	4.32-4	2.85-4	1.49-4	[illegible]
76	2373.6	6.01-4	5.36-4	4.17-4	2.75-4	1.44-4	6.79-5
77	2456.0	5.80-4	5.18-4	4.03-4	2.66-4	1.39-4	6.55-5
78	2539.9	5.61-4	5.01-4	3.90-4	2.57-4	1.34-4	6.33-5
79	2625.3	5.43-4	4.85-4	3.78-4	[illegible]	1.30-4	6.11-5
80	2712.2	5.26-4	4.70-4	3.66-4	[illegible]	1.26-4	5.91-5
81	2800.5	5.10-4	4.56-4	3.55-4	2.33-4	1.22-4	5.72-5
82	2890.3	4.95-4	4.42-4	3.44-4	2.26-4	1.18-4	5.54-5
83	2981.5	4.80-4	4.29-4	3.34-4	2.19-4	1.14-4	5.36-5
84	3074.3	4.67-4	4.17-4	3.24-4	2.13-4	1.11-4	5.20-5
85	3168.5	4.54-4	4.05-4	3.15-4	2.07-4	1.07-4	5.04-5
86	3264.3	4.41-4	3.94-4	3.07-4	2.01-4	1.04-4	4.89-5
87	3361.5	4.29-4	3.83-4	2.98-4	1.96-4	1.01-4	4.75-5
88	3460.3	4.18-4	3.73-4	2.90-4	1.90-4	9.86-5	4.61-5
89	3560.5	4.07-4	3.64-4	2.83-4	1.85-4	9.59-5	4.48-5
90	3662.3	3.96-4	3.54-4	2.76-4	1.80-4	9.33-5	4.36-5
91	3765.6	3.87-4	3.46-4	2.69-4	1.76-4	9.09-5	4.24-5
92	3870.4	3.77-4	3.37-4	2.62-4	1.71-4	8.85-5	4.12-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z^2_{\rm eff}$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – G7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1367.4	4.15-4	3.67-4	2.81-4	1.85-4	9.85-5	4.61-5
61	1440.9	3.96-4	3.50-4	2.69-4	1.77-4	9.41-5	4.40-5
62	1516.1	3.79-4	3.35-4	2.57-4	1.70-4	9.00-5	4.20-5
63	1593.1	3.62-4	3.21-4	2.46-4	1.62-4	8.60-5	4.01-5
64	1671.8	3.47-4	3.07-4	2.36-4	1.55-4	8.23-5	3.83-5
65	1752.3	3.33-4	2.95-4	2.27-4	1.49-4	7.89-5	3.67-5
66	1834.6	3.19-4	2.83-4	2.18-4	1.43-4	7.56-5	3.51-5
67	1918.6	3.06-4	2.71-4	2.09-4	1.37-4	7.25-5	3.36-5
68	2004.3	2.95-4	2.61-4	2.01-4	1.32-4	6.96-5	3.22-5
69	2091.7	2.84-4	2.51-4	1.94-4	1.27-4	6.69-5	3.09-5
70	2180.8	2.73-4	2.42-4	1.87-4	1.22-4	6.43-5	2.97-5
71	2271.6	2.64-4	2.34-4	1.80-4	1.18-4	6.19-5	2.86-5
72	2364.1	2.58-4	2.29-4	1.76-4	1.15-4	5.98-5	2.75-5
73	2457.1	7.51-4	6.55-4	4.82-4	2.89-4	1.35-4	5.79-5
74	2543.3	6.94-4	6.06-4	4.46-4	2.67-4	1.25-4	5.36-5
75	2631.1	6.48-4	5.66-4	4.16-4	2.49-4	1.16-4	4.98-5
76	2720.4	6.09-4	5.32-4	3.91-4	2.34-4	1.09-4	4.66-5
77	2811.2	5.75-4	5.02-4	3.68-4	2.20-4	1.02-4	4.37-5
78	2903.7	5.45-4	4.75-4	3.49-4	2.08-4	9.67-5	4.12-5
79	2997.6	5.18-4	4.52-4	3.31-4	1.97-4	9.16-5	3.90-5
80	3093.2	4.94-4	4.30-4	3.15-4	1.88-4	8.70-5	3.70-5
81	3190.4	4.72-4	4.11-4	3.01-4	1.79-4	8.30-5	3.52-5
82	3289.1	4.51-4	3.93-4	2.88-4	1.71-4	7.92-5	3.36-5
83	3389.5	4.33-4	3.77-4	2.76-4	1.64-4	7.59-5	3.22-5
84	3491.4	4.16-4	3.62-4	2.65-4	1.58-4	7.28-5	3.08-5
85	3595.0	4.00-4	3.49-4	2.55-4	1.51-4	6.99-5	2.96-5
86	3700.2	3.86-4	3.36-4	2.46-4	1.46-4	6.72-5	2.84-5
87	3807.1	3.72-4	3.24-4	2.37-4	1.41-4	6.48-5	2.74-5
88	3915.6	3.59-4	3.13-4	2.29-4	1.36-4	6.25-5	2.64-5
89	4025.8	3.47-4	3.02-4	2.21-4	1.31-4	6.03-5	2.55-5
90	4137.6	3.36-4	2.93-4	2.14-4	1.27-4	5.83-5	2.46-5
91	4251.1	3.25-4	2.83-4	2.07-4	1.23-4	5.64-5	2.38-5
92	4366.3	3.15-4	2.75-4	2.00-4	1.19-4	5.46-5	2.31-5

A1 – G8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1464.0	7.60-4	6.64-4	4.85-4	2.85-4	1.27-4	5.04-5
61	1538.5	1.95-3	1.71-3	1.26-3	7.60-4	3.58-4	1.55-4
62	1607.2	1.90-3	1.57-3	1.23-3	7.51-4	3.57-4	1.56-4
63	1677.1	1.77-3	1.55-3	1.15-3	6.99-4	3.33-4	1.46-4
64	1746.5	1.63-3	1.43-3	1.06-3	6.47-4	3.08-4	1.35-4
65	1821.3	1.50-3	1.32-3	9.78-4	5.95-4	2.84-4	1.24-4
66	1895.6	1.38-3	1.21-3	8.96-4	5.45-4	2.59-4	1.13-4
67	1971.4	1.26-3	1.10-3	8.17-4	4.96-4	2.36-4	1.03-4
68	2048.6	1.15-3	1.00-3	7.42-4	4.50-4	2.13-4	9.31-5
69	2127.3	1.04-3	9.12-4	6.74-4	4.08-4	1.93-4	8.41-5
70	2207.5	9.50-4	8.31-4	6.14-4	3.71-4	1.75-4	7.60-5
71	2289.2	8.69-4	7.60-4	5.61-4	3.38-4	1.59-4	6.90-5
72	2372.4	7.98-4	6.97-4	5.14-4	3.10-4	1.46-4	6.30-5
73	2458.2	2.58-4	2.28-4	1.75-4	1.13-4	5.85-5	2.67-5
74	2546.7	9.55-4	8.36-4	6.19-4	3.75-4	1.78-4	7.76-5
75	2634.8	[illegible].39-4	8.23-4	6.09-4	3.70-4	1.76-4	7.69-5
76	2724.6	[illegible].21-4	8.07-4	5.98-4	3.63-4	1.73-4	7.57-5
77	2815.9	9.01-4	7.89-4	5.85-4	3.56-4	1.70-4	7.42-5
78	2908.8	8.80-4	7.71-4	5.72-4	3.48-4	1.66-4	7.26-5
79	3003.3	8.59-4	7.52-4	5.58-4	3.39-4	1.62-4	7.10-5
80	3099.5	8.37-4	7.33-4	5.44-4	3.31-4	1.58-4	6.92-5
81	3197.3	8.15-4	7.14-4	5.30-4	3.22-4	1.54-4	6.75-5
82	3296.7	7.93-4	6.95-4	5.16-4	3.14-4	1.50-4	6.58-5
83	3397.7	7.72-4	6.77-4	5.02-4	3.05-4	1.46-4	6.40-5
84	3500.4	7.51-4	6.58-4	4.88-4	2.97-4	1.42-4	6.24-5
85	3604.8	7.30-4	6.40-4	4.75-4	2.89-4	1.38-4	6.07-5
86	3710.9	7.11-4	6.23-4	4.62-4	2.81-4	1.35-4	5.91-5
87	3818.6	6.91-4	6.06-4	4.49-4	2.74-4	1.31-4	5.75-5
88	3928.1	6.72-4	5.89-4	4.37-4	2.66-4	1.27-4	5.60-5
89	4039.2	6.54-4	5.73-4	4.25-4	2.59-4	1.24-4	5.45-5
90	4152.1	6.36-4	5.58-4	4.14-4	2.52-4	1.21-4	5.31-5
91	4266.7	6.19-4	5.43-4	4.03-4	2.46-4	1.18-4	5.17-5
92	4383.1	6.03-4	5.28-4	3.92-4	2.39-4	1.15-4	5.04-5

A1 – G9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1467.0	9.93-4	8.69-4	6.39-4	3.81-4	1.74-4	7.21-5
61	1540.0	9.84-4	8.55-4	6.20-4	3.63-4	1.64-4	6.83-5
62	1608.9	8.73-4	7.59-4	5.53-4	3.26-4	1.49-4	6.24-5
63	1678.8	8.61-4	7.50-4	5.48-4	3.25-4	1.49-4	6.28-5
64	1750.1	8.65-4	7.54-4	5.52-4	3.28-4	1.51-4	6.41-5
65	1823.0	8.78-4	7.66-4	5.62-4	3.35-4	1.55-4	6.62-5
66	1897.3	8.98-4	7.84-4	5.76-4	3.45-4	1.60-4	6.87-5
67	1973.1	9.20-4	8.04-4	5.91-4	3.55-4	1.66-4	7.15-5
68	2050.4	9.41-4	8.23-4	6.06-4	3.65-4	1.72-4	7.41-5
69	2129.3	9.59-4	8.39-4	6.19-4	3.74-4	1.76-4	7.63-5
70	2209.7	9.70-4	8.49-4	6.27-4	3.79-4	1.79-4	7.79-5
71	2291.6	9.75-4	8.53-4	6.31-4	3.82-4	1.81-4	7.89-5
72	2375.1	9.72-4	8.51-4	6.30-4	3.82-4	1.82-4	7.93-5
73	2460.1	9.43-4	8.27-4	6.14-4	3.74-4	1.79-4	7.87-5
74	2554.1	2.31-4	2.06-4	1.59-4	1.05-4	5.57-5	2.60-5
75	2651.6	2.25-4	2.00-4	1.54-4	1.02-4	5.34-5	2.48-5
76	2750.8	2.18-4	1.94-4	1.50-4	9.85-5	5.16-5	2.39-5
77	2851.5	2.12-4	1.88-4	1.45-4	9.53-5	4.98-5	2.30-5
78	2953.9	2.05-4	1.82-4	1.40-4	9.23-5	4.82-5	2.23-5
79	3057.9	1.99-4	1.77-4	1.36-4	8.95-5	4.66-5	2.15-5
80	3163.4	1.93-4	1.71-4	1.32-4	8.68-5	4.51-5	2.08-5
81	3270.5	1.88-4	1.66-4	1.28-4	8.42-5	4.38-5	2.02-5
82	3379.2	1.82-4	1.62-4	1.25-4	8.17-5	4.24-5	1.96-5
83	3489.5	1.77-4	1.57-4	1.21-4	7.93-5	4.12-5	1.90-5
84	3601.2	1.72-4	1.53-4	1.18-4	7.71-5	4.00-5	1.84-5
85	3714.5	1.68-4	1.49-4	1.15-4	7.49-5	3.88-5	1.79-5
86	3829.2	1.64-4	1.45-4	1.11-4	7.29-5	3.78-5	1.74-5
87	3945.4	1.60-4	1.41-4	1.09-4	7.09-5	3.67-5	1.69-5
88	4063.1	1.56-4	1.38-4	1.06-4	6.90-5	3.57-5	1.65-5
89	4182.2	1.52-4	1.34-4	1.03-4	6.72-5	3.48-5	1.60-5
90	4302.7	1.48-4	1.31-4	1.01-4	6.55-5	3.39-5	1.56-5
91	4424.6	1.45-4	1.28-4	9.82-5	6.38-5	3.31-5	1.52-5
92	4547.8	1.42-4	1.25-4	9.59-5	6.22-5	3.22-5	1.48-5

A1 – G10

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1472.1	2.00-3	1.76-3	1.31-3	8.05-4	3.88-4	1.71-4
61	1542.4	6.61-4	5.83-4	4.36-4	2.65-4	1.24-4	5.17-5
62	1621.4	6.18-4	5.41-4	3.99-4	2.37-4	1.07-4	4.32-5
63	1702.8	5.92-4	5.18-4	3.81-4	2.26-4	1.01-4	4.06-5
64	1786.1	5.65-4	4.95-4	3.63-4	2.14-4	9.58-5	3.84-5
65	1871.2	5.39-4	4.72-4	3.46-4	2.04-4	9.09-5	3.64-5
66	1958.3	5.15-4	4.50-4	3.30-4	1.94-4	8.64-5	3.46-5
67	2047.2	4.92-4	4.30-4	3.15-4	1.85-4	8.22-5	3.29-5
68	2138.1	4.70-4	4.11-4	3.00-4	1.76-4	7.83-5	3.13-5
69	2230.8	4.50-4	3.92-4	2.87-4	1.68-4	7.47-5	2.98-5
70	2325.4	4.31-4	3.76-4	2.75-4	1.61-4	7.13-5	2.84-5
71	2421.9	4.13-4	3.60-4	2.63-4	1.54-4	6.82-5	2.71-5
72	2520.3	3.96-4	3.45-4	2.52-4	1.48-4	6.53-5	2.59-5
73	2620.6	3.80-4	3.31-4	2.42-4	1.42-4	6.25-5	2.48-5
74	2722.7	3.65-4	3.18-4	2.32-4	1.36-4	6.00-5	2.38-5
75	2826.7	3.51-4	3.06-4	2.23-4	1.30-4	5.76-5	2.28-5
76	2932.6	3.38-4	2.94-4	2.14-4	1.25-4	5.53-5	2.19-5
77	3040.4	3.25-4	2.83-4	2.06-4	1.21-4	5.32-5	2.10-5
78	3150.0	3.13-4	2.73-4	1.99-4	1.16-4	5.12-5	2.02-5
79	3261.5	3.02-4	2.63-4	1.91-4	1.12-4	4.93-5	1.94-5
80	3374.8	2.91-4	2.54-4	1.85-4	1.08-4	4.75-5	1.87-5
81	3490.1	2.82-4	2.45-4	1.78-4	1.04-4	4.58-5	1.80-5
82	3607.2	2.72-4	2.37-4	1.72-4	1.00-4	4.42-5	1.74-5
83	3726.1	2.63-4	2.29-4	1.66-4	9.70-5	4.27-5	1.68-5
84	3846.9	2.54-4	2.21-4	1.61-4	9.38-5	4.13-5	1.62-5
85	3969.6	2.46-4	2.14-4	1.56-4	9.07-5	3.99-5	1.57-5
86	4094.1	2.38-4	2.07-4	1.51-4	8.78-5	3.86-5	1.52-5
87	4220.5	2.31-4	2.01-4	1.46-4	8.50-5	3.74-5	1.47-5
88	4348.8	2.24-4	1.95-4	1.41-4	8.24-5	3.62-5	1.42-5
89	4478.9	2.17-4	1.89-4	1.37-4	7.99-5	3.51-5	1.38-5
90	4610.8	2.11-4	1.83-4	1.33-4	7.75-5	3.41-5	1.34-5
91	4744.6	2.05-4	1.78-4	1.29-4	7.52-5	3.30-5	1.30-5
92	4880.2	1.99-4	1.73-4	1.26-4	7.30-5	3.21-5	1.26-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - G11

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1473.7	8.67-4	7.57-4	5.54-4	3.29-4	1.51-4	6.33-5
61	1545.4	7.83-4	6.91-4	5.18-4	3.17-4	1.50-4	6.43-5
62	1625.1	7.72-4	6.79-4	5.06-4	3.06-4	1.43-4	6.07-5
63	1706.8	7.45-4	6.55-4	4.87-4	2.94-4	1.37-4	5.80-5
64	1790.5	7.16-4	6.29-4	4.67-4	2.82-4	1.31-4	5.55-5
65	1876.1	6.87-4	6.04-4	4.48-4	2.70-4	1.25-4	5.31-5
66	1963.6	6.60-4	5.79-4	4.29-4	2.59-4	1.20-4	5.08-5
67	2053.1	6.33-4	5.56-4	4.12-4	2.48-4	1.15-4	4.87-5
68	2144.5	6.08-4	5.33-4	3.95-4	2.38-4	1.10-4	4.67-5
69	2237.7	5.84-4	5.12-4	3.79-4	2.28-4	1.06-4	4.48-5
70	2332.9	5.62-4	4.92-4	3.64-4	2.19-4	1.02-4	4.30-5
71	2430.1	5.40-4	4.74-4	3.50-4	2.11-4	9.77-5	4.13-5
72	2529.1	5.20-4	4.56-4	3.37-4	2.03-4	9.39-5	3.97-5
73	2630.1	5.01-4	4.39-4	3.24-4	1.95-4	9.04-5	3.82-5
74	2732.9	4.83-4	4.23-4	3.12-4	1.88-4	8.70-5	3.68-5
75	2837.7	4.65-4	4.08-4	3.01-4	1.81-4	8.39-5	3.54-5
76	2944.4	4.49-4	3.93-4	2.90-4	1.74-4	8.09-5	3.42-5
77	3053.1	4.33-4	3.80-4	2.80-4	1.68-4	7.81-5	3.29-5
78	3163.6	4.19-4	3.67-4	2.71-4	1.62-4	7.54-5	3.18-5
79	3276.1	4.05-4	3.54-4	2.61-4	1.57-4	7.28-5	3.07-5
80	3390.5	3.91-4	3.42-4	2.53-4	1.52-4	7.04-5	2.97-5
81	3506.8	3.79-4	3.31-4	2.44-4	1.47-4	6.81-5	2.87-5
82	3625.0	3.67-4	3.21-4	2.36-4	1.42-4	6.59-5	2.78-5
83	3745.1	3.55-4	3.11-4	2.29-4	1.37-4	6.38-5	2.69-5
84	3867.2	3.44-4	3.01-4	2.22-4	1.33-4	6.18-5	2.60-5
85	3991.2	3.33-4	2.92-4	2.15-4	1.29-4	5.99-5	2.52-5
86	4117.1	3.24-4	2.83-4	2.08-4	1.25-4	5.81-5	2.44-5
87	4244.9	3.14-4	2.75-4	2.02-4	1.21-4	5.63-5	2.37-5
88	4374.6	3.05-4	2.67-4	1.96-4	1.18-4	5.47-5	2.30-5
89	4506.3	2.96-4	2.59-4	1.91-4	1.14-4	5.31-5	2.24-5
90	4639.8	2.88-4	2.52-4	1.85-4	1.11-4	5.16-5	2.17-5
91	4775.3	2.80-4	2.45-4	1.80-4	1.08-4	5.01-5	2.11-5
92	4912.7	2.72-4	2.38-4	1.75-4	1.05-4	4.87-5	2.05-5

A1 - G12

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1486.3	8.23-4	7.24-4	5.40-4	3.29-4	1.55-4	6.62-5
61	1565.9	7.90-4	6.95-4	5.17-4	3.15-4	1.48-4	6.32-5
62	1647.5	7.55-4	6.64-4	4.94-4	3.00-4	1.41-4	6.02-5
63	1731.2	7.21-4	6.34-4	4.71-4	2.86-4	1.34-4	5.74-5
64	1816.9	6.89-4	6.06-4	4.50-4	2.73-4	1.28-4	5.47-5
65	1904.7	6.59-4	5.79-4	4.30-4	2.61-4	1.22-4	5.22-5
66	1994.5	6.31-4	5.54-4	4.12-4	2.49-4	1.17-4	4.99-5
67	2086.3	6.04-4	5.31-4	3.94-4	2.39-4	1.12-4	4.77-5
68	2180.2	5.79-4	5.09-4	3.78-4	2.29-4	1.07-4	4.57-5
69	2276.2	5.56-4	4.88-4	3.62-4	2.19-4	1.03-4	4.38-5
70	2374.2	5.34-4	4.69-4	3.48-4	2.10-4	9.86-5	4.20-5
71	2474.4	5.13-4	4.50-4	3.34-4	2.02-4	9.47-5	4.03-5
72	2576.5	4.93-4	4.33-4	3.21-4	1.94-4	9.10-5	3.88-5
73	2680.8	4.75-4	4.16-4	3.09-4	1.87-4	8.76-5	3.73-5
74	2787.2	4.57-4	4.01-4	2.97-4	1.80-4	8.43-5	3.59-5
75	2895.6	4.40-4	3.86-4	2.86-4	1.73-4	8.11-5	3.45-5
76	3006.2	4.24-4	3.72-4	2.76-4	1.67-4	7.82-5	3.33-5
77	3118.8	4.09-4	3.58-4	2.66-4	1.61-4	7.54-5	3.21-5
78	3233.6	3.94-4	3.46-4	2.56-4	1.55-4	7.27-5	3.09-5
79	3350.5	3.80-4	3.33-4	2.47-4	1.50-4	7.02-5	2.99-5
80	3469.5	3.67-4	3.22-4	2.39-4	1.44-4	6.78-5	2.88-5
81	3590.7	3.54-4	3.11-4	2.30-4	1.40-4	6.55-5	2.79-5
82	3714.0	3.42-4	3.00-4	2.23-4	1.35-4	6.34-5	2.70-5
83	3839.5	3.30-4	2.90-4	2.15-4	1.31-4	6.13-5	2.61-5
84	3967.1	3.19-4	2.80-4	2.08-4	1.26-4	5.93-5	2.53-5
85	4096.8	3.09-4	2.71-4	2.01-4	1.22-4	5.74-5	2.45-5
86	4228.8	2.99-4	2.62-4	1.95-4	1.18-4	5.57-5	2.37-5
87	4362.9	2.90-4	2.54-4	1.89-4	1.15-4	5.39-5	2.30-5
88	4499.2	2.81-4	2.46-4	1.83-4	1.11-4	5.23-5	2.23-5
89	4637.6	2.72-4	2.39-4	1.78-4	1.08-4	5.08-5	2.17-5
90	4778.3	2.64-4	2.32-4	1.72-4	1.05-4	4.93-5	2.11-5
91	4921.2	2.56-4	2.25-4	1.67-4	1.02-4	4.79-5	2.05-5
92	5066.3	2.49-4	2.19-4	1.63-4	9.88-5	4.66-5	2.00-5

A1 - G13

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1491.0	6.55-4	5.72-4	4.18-4	2.45-4	1.08-4	4.19-5
61	1571.0	6.22-4	5.43-4	3.97-4	2.33-4	1.02-4	3.98-5
62	1653.1	5.92-4	5.17-4	3.78-4	2.21-4	9.70-5	3.79-5
63	1737.2	5.65-4	4.93-4	3.60-4	2.11-4	9.23-5	3.61-5
64	1823.3	5.39-4	4.70-4	3.44-4	2.01-4	8.79-5	3.44-5
65	1911.6	5.15-4	4.50-4	3.28-4	1.92-4	8.39-5	3.28-5
66	2001.9	4.93-4	4.30-4	3.14-4	1.83-4	8.01-5	3.14-5
67	2094.3	4.72-4	4.12-4	3.00-4	1.75-4	7.66-5	3.00-5
68	2188.8	4.53-4	3.95-4	2.88-4	1.68-4	7.34-5	2.88-5
69	2285.4	4.34-4	3.79-4	2.76-4	1.61-4	7.03-5	2.76-5
70	2384.1	4.17-4	3.64-4	2.65-4	1.54-4	6.75-5	2.64-5
71	2484.9	4.01-4	3.49-4	2.54-4	1.48-4	6.48-5	2.54-5
72	2587.8	3.86-4	3.36-4	2.45-4	1.43-4	6.23-5	2.44-5
73	2692.8	3.71-4	3.23-4	2.35-4	1.37-4	6.00-5	2.35-5
74	2800.0	3.58-4	3.11-4	2.27-4	1.32-4	5.77-5	2.26-5
75	2909.3	3.45-4	3.00-4	2.18-4	1.27-4	5.56-5	2.18-5
76	3020.7	3.32-4	2.89-4	2.10-4	1.22-4	5.36-5	2.10-5
77	3134.3	3.21-4	2.79-4	2.03-4	1.18-4	5.18-5	2.02-5
78	3250.1	3.09-4	2.69-4	1.96-4	1.14-4	5.00-5	1.95-5
79	3368.0	2.99-4	2.60-4	1.89-4	1.10-4	4.83-5	1.89-5
80	3488.1	2.89-4	2.51-4	1.83-4	1.06-4	4.66-5	1.82-5
81	3610.4	2.79-4	2.43-4	1.77-4	1.03-4	4.51-5	1.76-5
82	3734.9	2.70-4	2.35-4	1.71-4	9.95-5	4.37-5	1.71-5
83	3861.6	2.61-4	2.27-4	1.65-4	9.63-5	4.23-5	1.65-5
84	3990.5	2.53-4	2.20-4	1.60-4	9.32-5	4.09-5	1.60-5
85	4121.6	2.45-4	2.13-4	1.55-4	9.04-5	3.97-5	1.55-5
86	4255.0	2.38-4	2.07-4	1.50-4	8.77-5	3.85-5	1.51-5
87	4390.5	2.32-4	2.02-4	1.47-4	8.55-5	3.76-5	1.47-5
88	4523.9	1.34-4	1.11-4	7.30-5	3.69-5	1.38-5	4.83-6
89	4658.6	1.29-4	1.07-4	7.07-5	3.57-5	1.33-5	4.65-6
90	4795.1	1.26-4	1.04-4	6.86-5	3.46-5	1.29-5	4.50-6
91	4933.7	1.22-4	1.01-4	6.66-5	3.36-5	1.25-5	4.36-6
92	5074.1	1.19-4	9.83-5	6.46-5	3.25-5	1.21-5	4.22-6

A1 - G14

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.2	3.10-4	2.58-4	1.69-4	8.41-5	3.03-5	1.01-5
61	1619.7	3.19-4	2.65-4	1.75-4	8.78-5	3.21-5	1.09-5
62	1702.2	3.23-4	2.69-4	1.78-4	8.99-5	3.34-5	1.15-5
63	1786.5	3.23-4	2.69-4	1.79-4	9.11-5	3.42-5	1.19-5
64	1872.9	3.22-4	2.69-4	1.79-4	9.17-5	3.47-5	1.22-5
65	1961.1	3.20-4	2.68-4	1.79-4	9.21-5	3.52-5	1.25-5
66	2051.3	3.18-4	2.66-4	1.78-4	9.25-5	3.57-5	1.29-5
67	2143.4	3.17-4	2.66-4	1.78-4	9.32-5	3.64-5	1.33-5
68	2237.4	3.17-4	2.66-4	1.79-4	9.44-5	3.73-5	1.38-5
69	2333.4	3.18-4	2.67-4	1.81-4	9.59-5	3.84-5	1.44-5
70	2431.2	3.17-4	2.67-4	1.82-4	9.72-5	3.94-5	1.49-5
71	2531.0	3.14-4	2.65-4	1.81-4	9.73-5	3.98-5	1.53-5
72	2632.8	3.01-4	2.57-4	1.76-4	9.49-5	3.91-5	1.51-5
73	2736.5	2.88-4	2.43-4	1.66-4	8.98-5	3.70-5	1.43-5
74	2842.1	2.68-4	2.26-4	1.54-4	8.27-5	3.38-5	1.30-5
75	2949.7	2.47-4	2.08-4	1.41-4	7.50-5	3.03-5	1.15-5
76	3059.2	2.28-4	1.91-4	1.29-4	6.80-5	2.71-5	1.02-5
77	3170.6	2.12-4	1.78-4	1.19-4	6.21-5	2.44-5	9.02-6
78	3284.0	1.99-4	1.66-4	1.11-4	5.74-5	2.22-5	8.14-6
79	3399.3	1.87-4	1.56-4	1.04-4	5.36-5	2.06-5	7.45-6
80	3516.5	1.78-4	1.48-4	9.84-5	5.04-5	1.92-5	6.90-6
81	3635.7	1.70-4	1.41-4	9.37-5	4.78-5	1.81-5	6.47-6
82	3756.8	1.63-4	1.36-4	8.96-5	4.56-5	1.72-5	6.11-6
83	3879.8	1.57-4	1.30-4	8.60-5	4.37-5	1.64-5	5.80-6
84	4004.7	1.51-4	1.26-4	8.28-5	4.19-5	1.57-5	5.54-6
85	4131.6	1.46-4	1.21-4	7.99-5	4.04-5	1.51-5	5.31-6
86	4260.5	1.41-4	1.17-4	7.71-5	3.90-5	1.45-5	5.09-6
87	4391.2	1.35-4	1.12-4	7.39-5	3.73-5	1.38-5	4.84-6
88	4527.1	1.78-4	1.49-4	1.00-4	5.20-5	2.00-5	7.20-6
89	4662.0	1.74-4	1.46-4	9.77-5	5.08-5	1.96-5	7.03-6
90	4798.8	1.70-4	1.42-4	9.55-5	4.96-5	1.91-5	6.87-6
91	4937.6	1.66-4	1.39-4	9.34-5	4.86-5	1.87-5	6.71-6
92	5078.3	1.62-4	1.36-4	9.13-5	4.75-5	1.83-5	6.57-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

	A1 - G15							A1 - G16						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.5	2.32-4	1.90-4	1.22-4	5.86-5	2.02-5	6.55-6	1560.0	1.16-3	9.96-4	7.04-4	3.98-4	1.72-4	6.87-5
61	1620.0	2.34-4	1.92-4	1.24-4	5.99-5	2.09-5	6.90-6	1641.7	1.36-3	1.17-3	8.35-4	4.78-4	2.11-4	8.59-5
62	1702.5	2.35-4	1.94-4	1.25-4	6.11-5	2.17-5	7.23-6	1724.8	1.63-3	1.41-3	1.02-3	5.95-4	2.68-4	1.12-4
63	1786.9	2.37-4	1.96-4	1.27-4	6.24-5	2.24-5	7.59-6	1808.9	1.89-3	1.64-3	1.20-3	7.12-4	3.28-4	1.39-4
64	1873.3	2.39-4	1.98-4	1.29-4	6.39-5	2.33-5	7.98-6	1893.7	1.95-3	1.70-3	1.25-3	7.54-4	3.54-4	1.53-4
65	1961.5	2.42-4	2.01-4	1.31-4	6.57-5	2.43-5	8.45-6	1979.7	1.66-3	1.45-3	1.08-3	6.60-4	3.15-4	1.38-4
66	2051.7	2.46-4	2.05-4	1.35-4	6.81-5	2.56-5	9.04-6	2067.1	1.16-3	1.02-3	7.71-4	4.80-4	2.35-4	1.05-4
67	2143.9	2.53-4	2.10-4	1.39-4	7.12-5	2.72-5	9.80-6	2156.4	9.67-4	8.56-4	6.50-4	4.09-4	2.03-4	9.18-5
68	2237.9	2.62-4	2.18-4	1.46-4	7.56-5	2.95-5	1.08-5	2247.9	8.75-4	7.76-4	5.90-4	3.73-4	1.86-4	8.47-5
69	2333.9	2.74-4	2.30-4	1.55-4	8.16-5	3.25-5	1.22-5	2341.7	8.09-4	7.18-4	5.48-4	3.47-4	1.74-4	7.93-5
70	2431.9	2.92-4	2.46-4	1.67-4	8.96-5	3.66-5	1.41-5	2437.8	7.52-4	6.68-4	5.10-4	3.24-4	1.62-4	7.42-5
71	2531.7	3.13-4	2.64-4	1.82-4	9.91-5	4.14-5	1.63-5	2536.5	6.99-4	6.21-4	4.75-4	3.02-4	1.52-4	6.94-5
72	2633.5	3.30-4	2.80-4	1.94-4	1.07-4	4.55-5	1.82-5	2637.6	6.52-4	5.80-4	4.44-4	2.82-4	1.42-4	6.49-5
73	2737.3	3.32-4	2.82-4	1.96-4	1.09-4	4.63-5	1.85-5	2741.2	6.19-4	5.51-4	4.21-4	2.69-4	1.35-4	6.19-5
74	2843.0	3.17-4	2.69-4	1.86-4	1.02-4	4.33-5	1.72-5	2847.4	6.01-4	5.35-4	4.10-4	2.61-4	1.32-4	6.04-5
75	2950.7	2.93-4	2.48-4	1.71-4	9.28-5	3.86-5	1.50-5	2956.3	5.90-4	5.25-4	4.03-4	2.57-4	1.30-4	5.96-5
76	3060.3	2.71-4	2.29-4	1.56-4	8.40-5	3.43-5	1.31-5	3067.9	5.78-4	5.15-4	3.96-4	2.53-4	1.28-4	5.88-5
77	3171.8	2.54-4	2.13-4	1.45-4	7.72-5	3.11-5	1.17-5	3182.3	5.64-4	5.03-4	3.86-4	2.47-4	1.25-4	5.76-5
78	3285.3	2.40-4	2.02-4	1.37-4	7.22-5	2.87-5	1.07-5	3299.6	5.49-4	4.89-4	3.76-4	2.41-4	1.22-4	5.62-5
79	3400.7	2.30-4	1.93-4	1.30-4	6.84-5	2.69-5	9.92-6	3419.8	5.32-4	4.74-4	3.65-4	2.34-4	1.19-4	5.47-5
80	3518.1	2.21-4	1.85-4	1.25-4	6.54-5	2.56-5	9.36-6	3543.0	5.16-4	4.60-4	3.54-4	2.27-4	1.15-4	5.31-5
81	3637.4	2.13-4	1.79-4	1.20-4	6.29-5	2.45-5	8.92-6	3669.3	5.00-4	4.46-4	3.43-4	2.20-4	1.12-4	5.16-5
82	3758.7	2.07-4	1.74-4	1.17-4	6.08-5	2.36-5	8.56-6	3798.7	4.85-4	4.32-4	3.33-4	2.13-4	1.09-4	5.01-5
83	3881.9	2.01-4	1.69-4	1.13-4	5.90-5	2.28-5	8.26-6	3931.4	4.70-4	4.20-4	3.23-4	2.07-4	1.05-4	4.86-5
84	4007.0	1.96-4	1.64-4	1.10-4	5.74-5	2.22-5	8.00-6	4067.4	4.57-4	4.08-4	3.14-4	2.01-4	1.03-4	4.73-5
85	4134.1	1.91-4	1.60-4	1.07-4	5.59-5	2.16-5	7.77-6	4206.8	4.45-4	3.97-4	3.06-4	1.96-4	9.97-5	4.60-5
86	4263.1	1.86-4	1 56-4	1.05-4	5.45-5	2.10-5	7.56-6	4349.6	4.36-4	3.88-4	2.98-4	1.91-4	9.72-5	4.48-5
87	4394.1	1.82-4	1.52-4	1.02-4	5.32-5	2.05-5	7.36-6	4495.9	4.28-4	3.82-4	2.93-4	1.87-4	9.50-5	4.38-5
88	4528.4	2.23-4	1.94-4	1.41-4	8.21-5	3.61-5	1.41-5	4645.8	4.25-4	3.78-4	2.89-4	1.84-4	9.31-5	4.28-5
89	4668.5	2.17-4	1.88-4	1.37-4	7.99-5	3.51-5	1.38-5	4798.9	4.26-4	3.78-4	2.87-4	1.81-4	9.05-5	4.13-5
90	4810.9	2.11-4	1.83-4	1.33-4	7.77-5	3.42-5	1.34-5	4953.9	4.16-4	3.66-4	2.73-4	1.68-4	8.17-5	3.65-5
91	4955.5	2.05-4	1.78-4	1.30-4	7.55-5	3.32-5	1.30-5	5107.7	3.54-4	3.07-4	2.22-4	1.31-4	6.02-5	2.57-5
92	5102.5	1.99-4	1.73-4	1.26-4	7.35-5	3.23-5	1.27-5	5260.1	2.72-4	2.34-4	1.66-4	9.47-5	4.18-5	1.72-5

	A1 - G17							A1 - G18						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1561.7	4.34-4	3.66-4	2.51-4	1.36-4	5.68-5	2.27-5	1581.2	8.69-4	7.79-4	6.04-4	3.90-4	2.00-4	9.21-5
61	1643.8	5.28-4	4.50-4	3.14-4	1.76-4	7.66-5	3.16-5	1657.9	7.19-4	6.46-4	5.03-4	3.28-4	1.69-4	7.85-5
62	1727.2	7.26-4	6.27-4	4.50-4	2.63-4	1.21-4	5.17-5	1737.3	4.68-4	4.23-4	3.33-4	2.20-4	1.15-4	5.39-5
63	1811.0	9.67-4	8.46-4	6.25-4	3.80-4	1.82-4	8.06-5	1820.4	1.83-4	1.65-4	1.29-4	8.53-5	4.47-5	2.11-5
64	1895.0	1.05-3	9.24-4	6.93-4	4.29-4	2.10-4	9.43-5	1907.6	9.03-5	7.66-5	5.34-5	3.01-5	1.35-5	5.75-6
65	1980.4	1.24-3	1.09-3	8.17-4	5.05-4	2.46-4	1.09-4	1997.9	8.98-5	7.33-5	4.63-5	2.19-5	7.53-6	2.47-6
66	2067.9	1.57-3	1.38-3	1.03-3	6.32-4	3.04-4	1.34-4	2090.5	1.01-4	8.18-5	5.07-5	2.30-5	7.22-6	2.05-6
67	2157.6	1.60-3	1.41-3	1.05-3	6.45-4	3.10-4	1.37-4	2185.4	1.11-4	8.98-5	5.59-5	2.54-5	7.97-6	2.24-6
68	2249.5	1.54-3	1.35-3	1.01-3	6.22-4	3.00-4	1.32-4	2282.4	1.19-4	9.65-5	6.05-5	2.79-5	8.91-6	2.57-6
69	2343.7	1.46-3	1.28-3	9.60-4	5.91-4	2.86-4	1.26-4	2381.6	1.25-4	1.02-4	6.45-5	3.01-5	9.87-6	2.94-6
70	2440.3	1.37-3	1.21-3	9.06-4	5.59-4	2.71-4	1.20-4	2482.9	1.31-4	1.07-4	6.79-5	3.21-5	1.07-5	3.28-6
71	2539.4	1.30-3	1.14-3	8.57-4	5.30-4	2.57-4	1.14-4	2586.4	1.34-4	1.10-4	7.04-5	3.37-5	1.15-5	3.57-6
72	2640.9	1.23-3	1.09-3	8.15-4	5.04-4	2.45-4	1.09-4	2692.0	1.36-4	1.12-4	7.19-5	3.46-5	1.19-5	3.77-6
73	2745.0	1.18-3	1.04-3	7.82-4	4.85-4	2.35-4	1.05-4	2799.7	1.36-4	1.12-4	7.23-5	3.51-5	1.22-5	3.89-6
74	2851.7	1.14-3	1.01-3	7.59-4	4.70-4	2.29-4	1.02-4	2909.6	1.35-4	1.11-4	7.18-5	3.49-5	1.22-5	3.93-6
75	2961.0	1.11-3	9.83-4	7.40-4	4.59-4	2.24-4	9.94-5	3021.6	1.32-4	1.09-4	7.04-5	3.43-5	1.20-5	3.90-6
76	3073.2	1.09-3	9.60-4	7.22-4	4.49-4	2.19-4	9.73-5	3135.9	1.28-4	1.06-4	6.85-5	3.34-5	1.17-5	3.80-6
77	3188.1	1.06-3	9.37-4	7.05-4	4.38-4	2.14-4	9.51-5	3252.3	1.24-4	1.02-4	6.60-5	3.22-5	1.13-5	3.67-6
78	3305.9	1.03-3	9.13-4	6.88-4	4.27-4	2.08-4	9.28-5	3370.8	1.19-4	9.80-5	6.33-5	3.08-5	1.08-5	3.50-6
79	3426.7	1.01-3	8.89-4	6.70-4	4.16-4	2.03-4	9.05-5	3491.6	1.14-4	9.36-5	6.04-5	2.94-5	1.02-5	3.31-6
80	3550.5	9.81-4	8.66-4	6.52-4	4.06-4	1.98-4	8.82-5	3614.6	1.08-4	8.91-5	5.74-5	2.78-5	9.65-6	3.11-6
81	3677.5	9.56-4	8.44-4	6.36-4	3.95-4	1.93-4	8.59-5	3739.7	1.03-4	8.44-5	5.43-5	2.62-5	9.04-6	2.89-6
82	3807.5	9.32-4	8.23-4	6.20-4	3.85-4	1.88-4	8.38-5	3867.1	9.70-5	7.97-5	5.12-5	2.46-5	8.41-6	2.67-6
83	3940.9	9.11-4	8.05-4	6.06-4	3.77-4	1.84-4	8.18-5	3996.8	9.11-5	7.48-5	4.79-5	2.29-5	7.76-6	2.44-6
84	4077.5	8.94-4	7.89-4	5.94-4	3.69-4	1.80-4	7.99-5	4128.7	8.50-5	6.97-5	4.44-5	2.11-5	7.07-6	2.19-6
85	4217.4	8.80-4	7.77-4	5.84-4	3.62-4	1.76-4	7.82-5	4262.9	7.83-5	6.40-5	4.07-5	1.92-5	6.32-6	1.92-6
86	4360.7	8.71-4	7.68-4	5.77-4	3.57-4	1.73-4	7.67-5	4399.4	7.07-5	5.78-5	3.65-5	1.70-5	5.51-6	1.63-6
87	4507.2	8.65-4	7.62-4	5.70-4	3.51-4	1.70-4	7.48-5	4538.2	6.21-5	5.06-5	3.18-5	1.47-5	4.66-6	1.35-6
88	4656.5	8.51-4	7.48-4	5.57-4	3.41-4	1.63-4	7.14-5	4679.6	5.19-5	4.23-5	2.66-5	1.23-5	3.97-6	1.18-6
89	4807.7	7.90-4	6.91-4	5.11-4	3.09-4	1.45-4	6.29-5	4823.8	4.23-5	3.50-5	2.31-5	1.18-5	4.61-6	1.76-6
90	4959.2	6.36-4	5.54-4	4.04-4	2.40-4	1.11-4	4.70-5	4972.2	5.74-5	5.12-5	3.97-5	2.59-5	1.36-5	6.45-6
91	5110.7	4.47-4	3.87-4	2.79-4	1.62-4	7.33-5	3.05-5	5128.1	1.50-4	1.37-4	1.09-4	7.41-5	3.98-5	1.91-5
92	5262.8	3.46-4	2.98-4	2.12-4	1.21-4	5.34-5	2.18-5	5292.0	2.22-4	2.01-4	1.59-4	1.06-4	5.62-5	2.68-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – G19

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1583.2	1.32-3	1.18-3	8.99-4	5.68-4	2.83-4	1.28-4
61	1660.3	1.03-3	9.22-4	7.08-4	4.51-4	2.27-4	1.03-4
62	1740.1	6.65-4	5.96-4	4.63-4	2.99-4	1.53-4	7.07-5
63	1823.2	3.11-4	2.81-4	2.21-4	1.45-4	7.58-5	3.58-5
64	1909.7	1.31-4	1.17-4	8.92-5	5.68-5	2.88-5	1.36-5
65	1999.3	1.02-4	8.63-5	5.94-5	3.23-5	1.36-5	5.52-6
66	2091.6	1.24-4	1.03-4	6.75-5	3.34-5	1.19-5	3.97-6
67	2186.2	1.52-4	1.26-4	8.23-5	4.03-5	1.40-5	4.40-6
68	2283.1	1.74-4	1.45-4	9.49-5	4.69-5	1.65-5	5.22-6
69	2382.3	1.89-4	1.58-4	1.04-4	5.17-5	1.85-5	5.95-6
70	2483.6	1.99-4	1.66-4	1.09-4	5.50-5	1.99-5	6.52-6
71	2587.0	2.04-4	1.70-4	1.13-4	5.71-5	2.09-5	6.93-6
72	2692.6	2.07-4	1.73-4	1.15-4	5.84-5	2.15-5	7.22-6
73	2800.4	2.08-4	1.74-4	1.16-4	5.92-5	2.20-5	7.44-6
74	2910.4	2.08-4	1.74-4	1.16-4	5.96-5	2.22-5	7.58-6
75	3022.5	2.07-4	1.73-4	1.16-4	5.96-5	2.24-5	7.66-6
76	3136.8	2.04-4	1.71-4	1.15-4	5.92-5	2.23-5	7.66-6
77	3253.3	2.01-4	1.68-4	1.13-4	5.84-5	2.20-5	7.59-6
78	3372.0	1.96-4	1.64-4	1.10-4	5.71-5	2.15-5	7.43-6
79	3493.0	1.90-4	1.59-4	1.07-4	5.52-5	2.08-5	7.18-6
80	3616.1	1.82-4	1.53-4	1.03-4	5.29-5	1.99-5	6.85-6
81	3741.5	1.73-4	1.45-4	9.72-5	5.01-5	1.88-5	6.43-6
82	3869.2	1.62-4	1.36-4	9.09-5	4.67-5	1.74-5	5.92-6
83	3999.1	1.49-4	1.25-4	8.34-5	4.26-5	1.57-5	5.31-6
84	4131.4	1.34-4	1.12-4	7.44-5	3.78-5	1.38-5	4.58-6
85	4266.1	1.15-4	9.60-5	6.36-5	3.20-5	1.15-5	3.74-6
86	4403.3	9.26-5	7.70-5	5.07-5	2.52-5	8.90-6	2.85-6
87	4543.2	6.69-5	5.57-5	3.67-5	1.84-5	6.64-6	2.23-6
88	4686.3	4.80-5	4.11-5	2.90-5	1.65-5	7.37-6	3.16-6
89	4833.8	7.37-5	6.67-5	5.28-5	3.53-5	1.89-5	9.11-6
90	4987.4	1.80-4	1.63-4	1.29-4	8.60-5	4.55-5	2.16-5
91	5147.5	2.96-4	2.67-4	2.09-4	1.37-4	7.08-5	3.31-5
92	5313.4	3.69-4	3.31-4	2.57-4	1.67-4	8.53-5	3.95-5

A1 – G20

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1641.7	6.57-4	5.85-4	4.55-4	3.04-4	1.64-4	7.88-5
61	1719.2	6.25-4	5.57-4	4.33-4	2.89-4	1.56-4	7.47-5
62	1798.7	5.95-4	5.31-4	4.12-4	2.75-4	1.49-4	7.09-5
63	1880.5	5.68-4	5.06-4	3.94-4	2.62-4	1.42-4	6.75-5
64	1964.4	5.42-4	4.83-4	3.76-4	2.51-4	1.35-4	6.43-5
65	2050.6	5.18-4	4.62-4	3.59-4	2.40-4	1.29-4	6.13-5
66	2139.0	4.95-4	4.42-4	3.44-4	2.29-4	1.24-4	5.85-5
67	2229.8	4.74-4	4.23-4	3.29-4	2.19-4	1.18-4	5.60-5
68	2322.9	4.54-4	4.05-4	3.16-4	2.10-4	1.13-4	5.36-5
69	2418.5	4.34-4	3.88-4	3.02-4	2.02-4	1.09-4	5.13-5
70	2516.5	4.16-4	3.72-4	2.90-4	1.94-4	1.04-4	4.92-5
71	2617.0	4.00-4	3.57-4	2.79-4	1.86-4	1.00-4	4.72-5
72	2720.2	3.84-4	3.43-4	2.68-4	1.79-4	9.61-5	4.54-5
73	2825.9	3.69-4	3.30-4	2.58-4	1.72-4	9.24-5	4.37-5
74	2934.4	3.55-4	3.17-4	2.48-4	1.66-4	8.89-5	4.21-5
75	3045.6	3.42-4	3.06-4	2.39-4	1.60-4	8.58-5	4.06-5
76	3159.6	3.30-4	2.95-4	2.31-4	1.55-4	8.28-5	3.92-5
77	3276.5	3.20-4	2.86-4	2.24-4	1.50-4	8.01-5	3.79-5
78	3396.3	3.10-4	2.78-4	2.17-4	1.45-4	7.77-5	3.68-5
79	3519.2	3.02-4	2.70-4	2.11-4	1.41-4	7.55-5	3.57-5
80	3645.2	2.94-4	2.63-4	2.06-4	1.38-4	7.34-5	3.47-5
81	3774.3	2.87-4	2.57-4	2.01-4	1.34-4	7.15-5	3.38-5
82	3906.8	2.80-4	2.51-4	1.96-4	1.31-4	6.97-5	3.30-5
83	4042.5	2.74-4	2.45-4	1.91-4	1.28-4	6.80-5	3.21-5
84	4181.8	2.68-4	2.40-4	1.87-4	1.25-4	6.64-5	3.14-5
85	4324.6	2.62-4	2.34-4	1.83-4	1.22-4	6.49-5	3.07-5
86	4470.9	2.56-4	2.30-4	1.79-4	1.20-4	6.35-5	3.00-5
87	4621.1	2.51-4	2.25-4	1.76-4	1.17-4	6.22-5	2.94-5
88	4775.1	2.47-4	2.21-4	1.73-4	1.15-4	6.11-5	2.88-5
89	4933.1	2.43-4	2.17-4	1.70-4	1.13-4	6.01-5	2.83-5
90	5095.2	2.40-4	2.15-4	1.68-4	1.12-4	5.94-5	2.80-5
91	5261.5	2.39-4	2.14-4	1.67-4	1.11-4	5.92-5	2.78-5
92	5432.0	2.41-4	2.16-4	1.69-4	1.13-4	5.99-5	2.81-5

A1 – G21

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1723.3	4.40-4	3.92-4	3.05-4	2.04-4	1.10-4	5.32-5
61	1808.3	4.21-4	3.76-4	2.93-4	1.95-4	1.05-4	5.09-5
62	1895.4	4.04-4	3.60-4	2.81-4	1.87-4	1.01-4	4.87-5
63	1984.5	3.87-4	3.46-4	2.69-4	1.79-4	9.67-5	4.66-5
64	2075.7	3.72-4	3.32-4	2.59-4	1.72-4	9.28-5	4.46-5
65	2168.9	3.57-4	3.19-4	2.49-4	1.66-4	8.90-5	4.27-5
66	2264.2	3.43-4	3.06-4	2.39-4	1.59-4	8.55-5	4.10-5
67	2361.6	3.30-4	2.95-4	2.30-4	1.53-4	8.21-5	3.93-5
68	2461.1	3.17-4	2.84-4	2.22-4	1.48-4	7.89-5	3.78-5
69	2562.6	3.06-4	2.73-4	2.13-4	1.42-4	7.59-5	3.63-5
70	2666.2	2.95-4	2.63-4	2.06-4	1.37-4	7.31-5	3.49-5
71	2771.9	2.84-4	2.54-4	1.99-4	1.32-4	7.04-5	3.36-5
72	2879.7	2.74-4	2.45-4	1.92-4	1.27-4	6.79-5	3.24-5
73	2989.6	2.65-4	2.37-4	1.85-4	1.23-4	6.54-5	3.12-5
74	3101.6	2.56-4	2.29-4	1.79-4	1.19-4	6.32-5	3.01-5
75	3215.8	2.47-4	2.21-4	1.73-4	1.15-4	6.10-5	2.90-5
76	3332.0	2.39-4	2.14-4	1.67-4	1.11-4	5.89-5	2.80-5
77	3450.4	2.31-4	2.07-4	1.62-4	1.08-4	5.69-5	2.70-5
78	3570.9	2.24-4	2.01-4	1.57-4	1.04-4	5.50-5	2.61-5
79	3693.6	2.17-4	1.95-4	1.52-4	1.01-4	5.32-5	2.53-5
80	3818.4	2.11-4	1.89-4	1.48-4	9.79-5	5.15-5	2.44-5
81	3945.4	2.04-4	1.83-4	1.43-4	9.49-5	4.99-5	2.36-5
82	4074.5	1.98-4	1.77-4	1.39-4	9.20-5	4.83-5	2.29-5
83	4205.9	1.92-4	1.72-4	1.34-4	8.91-5	4.68-5	2.21-5
84	4339.4	1.86-4	1.67-4	1.30-4	8.64-5	4.53-5	2.14-5
85	4475.1	1.80-4	1.62-4	1.26-4	8.37-5	4.39-5	2.07-5
86	4613.0	1.75-4	1.57-4	1.22-4	8.10-5	4.24-5	2.01-5
87	4753.1	1.69-4	1.52-4	1.19-4	7.84-5	4.10-5	1.94-5
88	4895.4	1.63-4	1.47-4	1.15-4	7.57-5	3.96-5	1.87-5
89	5039.9	1.57-4	1.41-4	1.10-4	7.28-5	3.81-5	1.80-5
90	5186.7	1.51-4	1.35-4	1.06-4	6.96-5	3.64-5	1.72-5
91	5335.8	1.43-4	1.28-4	9.98-5	6.57-5	3.44-5	1.63-5
92	5487.2	1.31-4	1.17-4	9.13-5	6.01-5	3.15-5	1.49-5

A1 – G22

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1825.0	6.11-4	5.43-4	4.12-4	2.58-4	1.27-4	5.67-5
61	1913.5	5.56-4	4.93-4	3.74-4	2.34-4	1.15-4	5.11-5
62	2004.1	5.05-4	4.47-4	3.39-4	2.12-4	1.03-4	4.60-5
63	2096.7	4.58-4	4.06-4	3.08-4	1.92-4	9.34-5	4.13-5
64	2191.4	4.18-4	3.70-4	2.80-4	1.74-4	8.46-5	3.73-5
65	2288.2	3.83-4	3.39-4	2.56-4	1.59-4	7.70-5	3.38-5
66	2387.1	3.53-4	3.12-4	2.36-4	1.46-4	7.05-5	3.09-5
67	2488.1	3.27-4	2.89-4	2.18-4	1.35-4	6.49-5	2.84-5
68	2591.2	3.05-4	2.70-4	2.03-4	1.25-4	6.02-5	2.62-5
69	2696.4	2.86-4	2.52-4	1.90-4	1.17-4	5.61-5	2.43-5
70	2803.7	2.69-4	2.37-4	1.78-4	1.10-4	5.25-5	2.27-5
71	2913.2	2.54-4	2.24-4	1.68-4	1.03-4	4.94-5	2.13-5
72	3024.8	2.40-4	2.12-4	1.59-4	9.77-5	4.66-5	2.01-5
73	3138.6	2.28-4	2.02-4	1.51-4	9.26-5	4.41-5	1.90-5
74	3254.5	2.18-4	1.92-4	1.44-4	8.81-5	4.19-5	1.80-5
75	3372.6	2.08-4	1.83-4	1.37-4	8.40-5	3.98-5	1.71-5
76	3492.8	1.99-4	1.75-4	1.31-4	8.02-5	3.80-5	1.63-5
77	3615.2	1.90-4	1.68-4	1.26-4	7.67-5	3.63-5	1.56-5
78	3739.9	1.83-4	1.61-4	1.20-4	7.35-5	3.48-5	1.49-5
79	3866.7	1.75-4	1.55-4	1.16-4	7.06-5	3.33-5	1.43-5
80	3995.7	1.69-4	1.49-4	1.11-4	6.78-5	3.20-5	1.37-5
81	4127.0	1.62-4	1.43-4	1.07-4	6.53-5	3.07-5	1.31-5
82	4260.4	1.57-4	1.38-4	1.03-4	6.29-5	2.96-5	1.26-5
83	4396.1	1.51-4	1.33-4	9.95-5	6.06-5	2.85-5	1.22-5
84	4534.1	1.46-4	1.29-4	9.60-5	5.85-5	2.75-5	1.17-5
85	4674.3	1.41-4	1.24-4	9.28-5	5.65-5	2.65-5	1.13-5
86	4816.7	1.37-4	1.20-4	8.97-5	5.46-5	2.56-5	1.09-5
87	4961.5	1.32-4	1.16-4	8.68-5	5.28-5	2.48-5	1.05-5
88	5108.5	1.28-4	1.13-4	8.41-5	5.11-5	2.40-5	1.02-5
89	5257.8	1.24-4	1.09-4	8.15-5	4.95-5	2.32-5	9.87-6
90	5409.4	1.20-4	1.06-4	7.90-5	4.80-5	2.25-5	9.56-6
91	5563.3	1.17-4	1.03-4	7.66-5	4.65-5	2.18-5	9.27-6
92	5719.6	1.13-4	9.97-5	7.43-5	4.51-5	2.11-5	8.98-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 − G23

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1825.5	4.29-4	3.80-4	2.86-4	1.77-4	8.50-5	3.71-5
61	1914.1	4.35-4	3.86-4	2.91-4	1.80-4	8.71-5	3.82-5
62	2004.6	4.41-4	3.91-4	2.95-4	1.83-4	8.89-5	3.91-5
63	2097.3	4.45-4	3.94-4	2.98-4	1.85-4	9.02-5	3.98-5
64	2192.1	4.45-4	3.94-4	2.98-4	1.86-4	9.08-5	4.02-5
65	2289.0	4.43-4	3.92-4	2.97-4	1.85-4	9.06-5	4.03-5
66	2388.0	4.38-4	3.88-4	2.94-4	1.83-4	8.99-5	4.00-5
67	2489.1	4.30-4	3.81-4	2.89-4	1.80-4	8.86-5	3.95-5
68	2592.3	4.21-4	3.74-4	2.83-4	1.77-4	8.69-5	3.88-5
69	2697.7	4.11-4	3.65-4	2.76-4	1.73-4	8.50-5	3.80-5
70	2805.2	4.01-4	3.55-4	2.69-4	1.68-4	8.28-5	3.70-5
71	2914.9	3.90-4	3.45-4	2.62-4	1.64-4	8.06-5	3.61-5
72	3026.7	3.78-4	3.35-4	2.54-4	1.59-4	7.83-5	3.51-5
73	3140.7	3.67-4	3.25-4	2.46-4	1.54-4	7.60-5	3.41-5
74	3256.8	3.56-4	3.15-4	2.39-4	1.50-4	7.37-5	3.30-5
75	3375.1	3.45-4	3.06-4	2.32-4	1.45-4	7.14-5	3.20-5
76	3495.7	3.34-4	2.96-4	2.24-4	1.40-4	6.92-5	3.10-5
77	3618.4	3.24-4	2.87-4	2.17-4	1.36-4	6.71-5	3.01-5
78	3743.3	3.14-4	2.78-4	2.11-4	1.32-4	6.50-5	2.92-5
79	3870.4	3.04-4	2.69-4	2.04-4	1.28-4	6.29-5	2.82-5
80	3999.8	2.94-4	2.61-4	1.98-4	1.24-4	6.10-5	2.74-5
81	4131.4	2.85-4	2.53-4	1.91-4	1.20-4	5.91-5	2.65-5
82	4265.3	2.77-4	2.45-4	1.86-4	1.16-4	5.73-5	2.57-5
83	4401.4	2.68-4	2.38-4	1.80-4	1.13-4	5.55-5	2.49-5
84	4539.7	2.60-4	2.30-4	1.74-4	1.09-4	5.39-5	2.42-5
85	4680.4	2.52-4	2.24-4	1.69-4	1.06-4	5.22-5	2.35-5
86	4823.3	2.45-4	2.17-4	1.64-4	1.03-4	5.07-5	2.28-5
87	4968.5	2.38-4	2.11-4	1.60-4	9.99-5	4.92-5	2.21-5
88	5116.1	2.31-4	2.04-4	1.55-4	9.69-5	4.78-5	2.15-5
89	5266.0	2.24-4	1.99-4	1.50-4	9.42-5	4.64-5	2.08-5
90	5418.1	2.18-4	1.93-4	1.46-4	9.15-5	4.51-5	2.02-5
91	5572.7	2.12-4	1.87-4	1.42-4	8.88-5	4.38-5	1.97-5
92	5729.6	2.06-4	1.82-4	1.38-4	8.63-5	4.25-5	1.91-5

A1 − G24

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1933.8	4.41-4	3.98-4	3.13-4	2.06-4	1.07-4	5.01-5
61	2031.5	4.20-4	3.79-4	2.98-4	1.97-4	1.02-4	4.79-5
62	2131.9	4.01-4	3.62-4	2.85-4	1.88-4	9.78-5	4.58-5
63	2235.0	3.83-4	3.46-4	2.72-4	1.79-4	9.36-5	4.38-5
64	2340.9	3.67-4	3.31-4	2.60-4	1.72-4	8.97-5	4.20-5
65	2449.6	3.51-4	3.16-4	2.49-4	1.64-4	8.59-5	4.02-5
66	2561.2	3.36-4	3.03-4	2.39-4	1.57-4	8.23-5	3.86-5
67	2675.6	3.22-4	2.90-4	2.29-4	1.51-4	7.90-5	3.70-5
68	2793.0	3.08-4	2.78-4	2.19-4	1.45-4	7.58-5	3.56-5
69	2913.3	2.96-4	2.67-4	2.10-4	1.39-4	7.28-5	3.42-5
70	3036.7	2.84-4	2.56-4	2.02-4	1.33-4	7.00-5	3.28-5
71	3163.2	2.72-4	2.46-4	1.94-4	1.28-4	6.73-5	3.16-5
72	3292.7	2.62-4	2.36-4	1.86-4	1.23-4	6.47-5	3.04-5
73	3425.5	2.51-4	2.27-4	1.79-4	1.19-4	6.23-5	2.93-5
74	3561.5	2.42-4	2.18-4	1.72-4	1.14-4	6.00-5	2.82-5
75	3700.9	2.32-4	2.10-4	1.66-4	1.10-4	5.78-5	2.72-5
76	3843.5	2.24-4	2.02-4	1.60-4	1.06-4	5.57-5	2.62-5
77	3989.7	2.15-4	1.94-4	1.54-4	1.02-4	5.37-5	2.53-5
78	4139.3	2.07-4	1.87-4	1.48-4	9.83-5	5.18-5	2.45-5
79	4292.5	2.00-4	1.80-4	1.43-4	9.48-5	5.00-5	2.36-5
80	4449.3	1.92-4	1.74-4	1.37-4	9.15-5	4.83-5	2.28-5
81	4609.8	1.85-4	1.67-4	1.32-4	8.83-5	4.66-5	2.21-5
82	4774.2	1.78-4	1.61-4	1.28-4	8.52-5	4.51-5	2.14-5
83	4942.4	1.72-4	1.56-4	1.23-4	8.23-5	4.36-5	2.07-5
84	5114.6	1.66-4	1.50-4	1.19-4	7.95-5	4.21-5	2.00-5
85	5290.9	1.60-4	1.45-4	1.15-4	7.69-5	4.08-5	1.94-5
86	5471.3	1.55-4	1.40-4	1.11-4	7.43-5	3.95-5	1.88-5
87	5655.9	1.49-4	1.35-4	1.07-4	7.18-5	3.82-5	1.82-5
88	5845.0	1.44-4	1.31-4	1.04-4	6.95-5	3.70-5	1.76-5
89	6038.5	1.39-4	1.26-4	1.00-4	6.72-5	3.58-5	1.71-5
90	6236.5	1.34-4	1.22-4	9.69-5	6.51-5	3.47-5	1.66-5
91	6439.3	1.30-4	1.18-4	9.37-5	6.30-5	3.37-5	1.61-5
92	6647.0	1.25-4	1.14-4	9.06-5	6.10-5	3.27-5	1.56-5

A1 − G25

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1934.6	7.54-4	6.75-4	5.21-4	3.35-4	1.70-4	7.78-5
61	2032.4	7.18-4	6.43-4	4.96-4	3.19-4	1.62-4	7.43-5
62	2132.9	6.85-4	6.13-4	4.73-4	3.04-4	1.55-4	7.10-5
63	2236.2	6.54-4	5.85-4	4.52-4	2.91-4	1.48-4	6.78-5
64	2342.2	6.24-4	5.58-4	4.32-4	2.78-4	1.41-4	6.49-5
65	2451.1	5.96-4	5.34-4	4.13-4	2.66-4	1.35-4	6.21-5
66	2562.8	5.70-4	5.10-4	3.95-4	2.54-4	1.29-4	5.96-5
67	2677.4	5.46-4	4.88-4	3.78-4	2.43-4	1.24-4	5.71-5
68	2794.9	5.22-4	4.68-4	3.62-4	2.33-4	1.19-4	5.48-5
69	2915.5	5.01-4	4.48-4	3.47-4	2.24-4	1.14-4	5.26-5
70	3039.1	4.80-4	4.30-4	3.33-4	2.15-4	1.10-4	5.06-5
71	3165.7	4.60-4	4.12-4	3.19-4	2.06-4	1.05-4	4.86-5
72	3295.6	4.42-4	3.96-4	3.07-4	1.98-4	1.01-4	4.68-5
73	3428.6	4.24-4	3.80-4	2.94-4	1.90-4	9.74-5	4.50-5
74	3564.9	4.07-4	3.65-4	2.83-4	1.83-4	9.38-5	4.34-5
75	3704.5	3.91-4	3.51-4	2.72-4	1.76-4	9.03-5	4.18-5
76	3847.5	3.76-4	3.38-4	2.62-4	1.70-4	8.70-5	4.03-5
77	3993.9	3.62-4	3.25-4	2.52-4	1.63-4	8.39-5	3.89-5
78	4143.8	3.49-4	3.13-4	2.43-4	1.58-4	8.09-5	3.75-5
79	4297.4	3.36-4	3.01-4	2.34-4	1.52-4	7.81-5	3.62-5
80	4454.6	3.23-4	2.90-4	2.25-4	1.47-4	7.54-5	3.50-5
81	4615.5	3.12-4	2.80-4	2.18-4	1.42-4	7.28-5	3.38-5
82	4780.3	3.00-4	2.70-4	2.10-4	1.37-4	7.03-5	3.27-5
83	4949.0	2.90-4	2.60-4	2.02-4	1.32-4	6.80-5	3.17-5
84	5121.6	2.79-4	2.51-4	1.95-4	1.27-4	6.58-5	3.07-5
85	5298.4	2.70-4	2.42-4	1.89-4	1.23-4	6.36-5	2.97-5
86	5479.3	2.60-4	2.34-4	1.83-4	1.19-4	6.16-5	2.88-5
87	5664.5	2.51-4	2.26-4	1.76-4	1.15-4	5.96-5	2.79-5
88	5854.1	2.43-4	2.18-4	1.71-4	1.12-4	5.78-5	2.70-5
89	6048.1	2.35-4	2.11-4	1.65-4	1.08-4	5.60-5	2.62-5
90	6246.8	2.27-4	2.04-4	1.60-4	1.05-4	5.43-5	2.54-5
91	6450.3	2.19-4	1.97-4	1.54-4	1.01-4	5.26-5	2.47-5
92	6658.6	2.12-4	1.91-4	1.49-4	9.82-5	5.11-5	2.40-5

A1 − G26

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	2055.6	3.16-4	2.79-4	2.12-4	1.37-4	7.24-5	3.43-5
61	2156.5	3.02-4	2.66-4	2.03-4	1.31-4	6.93-5	3.27-5
62	2260.1	2.88-4	2.55-4	1.94-4	1.26-4	6.63-5	3.12-5
63	2366.5	2.76-4	2.43-4	1.85-4	1.20-4	6.35-5	2.98-5
64	2475.7	2.64-4	2.33-4	1.78-4	1.15-4	6.08-5	2.85-5
65	2587.8	2.53-4	2.23-4	1.70-4	1.11-4	5.83-5	2.73-5
66	2702.7	2.42-4	2.14-4	1.64-4	1.06-4	5.60-5	2.62-5
67	2820.6	2.33-4	2.06-4	1.57-4	1.02-4	5.38-5	2.52-5
68	2941.5	2.23-4	1.98-4	1.51-4	9.82-5	5.17-5	2.42-5
69	3065.5	2.15-4	1.90-4	1.45-4	9.45-5	4.97-5	2.32-5
70	3192.5	2.07-4	1.83-4	1.40-4	9.10-5	4.78-5	2.23-5
71	3322.7	1.99-4	1.76-4	1.35-4	8.77-5	4.61-5	2.15-5
72	3456.1	1.91-4	1.70-4	1.30-4	8.46-5	4.44-5	2.07-5
73	3592.7	1.85-4	1.64-4	1.25-4	8.16-5	4.28-5	2.00-5
74	3732.7	1.78-4	1.58-4	1.21-4	7.88-5	4.13-5	1.93-5
75	3876.0	1.72-4	1.52-4	1.17-4	7.62-5	3.99-5	1.86-5
76	4022.8	1.66-4	1.47-4	1.13-4	7.36-5	3.86-5	1.80-5
77	4173.1	1.60-4	1.42-4	1.09-4	7.12-5	3.72-5	1.74-5
78	4327.0	1.55-4	1.38-4	1.06-4	6.90-5	3.61-5	1.69-5
79	4484.5	1.50-4	1.33-4	1.02-4	6.68-5	3.49-5	1.63-5
80	4645.8	1.45-4	1.29-4	9.91-5	6.47-5	3.39-5	1.58-5
81	4810.9	1.41-4	1.25-4	9.61-5	6.27-5	3.28-5	1.54-5
82	4979.9	1.36-4	1.21-4	9.32-5	6.08-5	3.18-5	1.49-5
83	5152.9	1.32-4	1.17-4	9.04-5	5.90-5	3.09-5	1.44-5
84	5329.9	1.28-4	1.14-4	8.77-5	5.73-5	3.00-5	1.40-5
85	5511.2	1.25-4	1.11-4	8.52-5	5.57-5	2.91-5	1.36-5
86	5696.7	1.21-4	1.07-4	8.27-5	5.41-5	2.83-5	1.33-5
87	5886.6	1.17-4	1.04-4	8.04-5	5.26-5	2.75-5	1.29-5
88	6080.9	1.14-4	1.01-4	7.82-5	5.11-5	2.68-5	1.25-5
89	6280.0	1.11-4	9.96-5	7.60-5	4.97-5	2.61-5	1.22-5
90	6483.7	1.08-4	9.59-5	7.40-5	4.84-5	2.54-5	1.19-5
91	6692.3	1.05-4	9.33-5	7.20-5	4.71-5	2.48-5	1.16-5
92	6905.9	1.02-4	9.08-5	7.01-5	4.59-5	2.42-5	1.13-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leq Z \leq 92$

See page 96 for Explanation of Tables

A1 - G27

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2127.0	1.40-4	1.21-4	8.64-5	4.93-5	2.15-5	8.73-6
61	2230.5	1.37-4	1.18-4	8.46-5	4.84-5	2.11-5	8.59-6
62	2336.7	[illegible]	1.15-4	8.27-5	4.74-5	2.07-5	8.44-6
63	2445.7	[illegible]	1.13-4	8.08-5	4.64-5	2.03-5	8.29-6
64	2557.6	1.27-4	1.10-4	7.90-5	4.54-5	1.99-5	8.13-6
65	2672.3	1.24-4	1.07-4	7.71-5	4.43-5	1.95-5	7.97-6
66	2789.9	1.21-4	1.05-4	7.52-5	4.33-5	1.91-5	7.81-6
67	2910.4	1.16-4	1.02-4	7.34-5	4.23-5	1.86-5	7.64-6
68	3034.0	1.15-4	9.93-5	7.15-5	4.13-5	1.82-5	7.48-6
69	3140.6	1.12-4	7.69-5	6.97-5	4.03-5	1.78-5	7.31-6
70	3290.4	1.09-4	9.43-5	6.79-5	3.93-5	1.74-5	7.15-6
71	3423.2	1.06-4	9.18-5	6.61-5	3.83-5	1.70-5	6.98-6
72	3559.3	1.03-4	8.93-5	6.44-5	3.73-5	1.65-5	6.82-6
73	3698.7	1.00-4	8.69-5	6.27-5	3.63-5	1.61-5	6.66-6
74	3841.4	9.74-5	8.45-5	6.10-5	3.54-5	1.57-5	6.50-6
75	3987.5	9.47-5	8.21-5	5.93-5	3.44-5	1.53-5	6.34-6
76	4137.1	9.20-5	7.98-5	5.77-5	3.35-5	1.49-5	6.19-6
77	4290.1	8.94-5	7.75-5	5.61-5	3.26-5	1.46-5	6.03-6
78	[illegible]	8.68-5	7.53-5	5.45-5	3.17-5	1.42-5	5.88-6
79	4607.2	8.42-5	7.31-5	5.30-5	3.09-5	1.38-5	5.73-6
80	4771.3	8.18-5	7.10-5	5.15-5	3.00-5	1.34-5	5.59-6
81	4939.2	7.93-5	6.89-5	5.00-5	2.92-5	1.31-5	5.45-6
82	5111.1	7.70-5	6.69-5	4.86-5	2.84-5	1.27-5	5.31-6
83	5286.9	7.47-5	6.49-5	4.72-5	2.76-5	1.24-5	5.17-6
84	5466.9	7.24-5	6.30-5	4.58-5	2.68-5	1.21-5	5.03-6
85	5651.1	7.02-5	6.11-5	4.45-5	2.61-5	1.17-5	4.90-6
86	5839.5	6.81-5	5.93-5	4.32-5	2.53-5	1.14-5	4.77-6
87	6032.3	6.60-5	5.75-5	4.19-5	2.46-5	1.11-5	4.64-6
88	6229.7	6.39-5	5.57-5	4.06-5	2.39-5	1.08-5	4.52-6
89	6431.7	6.20-5	5.40-5	3.94-5	2.32-5	1.05-5	4.40-6
90	6638.5	6.00-5	5.23-5	3.82-5	2.25-5	1.02-5	4.28-6
91	6850.2	5.81-5	5.07-5	3.71-5	2.19-5	9.93-6	4.16-6
92	7066.8	5.63-5	4.91-5	3.59-5	2.12-5	9.65-6	4.05-6

A1 - H1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1043.5	2.47-3	2.23-3	1.79-3	1.32-3	9.76-4	8.53-4
61	1097.2	2.35-3	2.12-3	1.70-3	1.25-3	9.33-4	8.18-4
62	1152.2	2.23-3	2.02-3	1.62-3	1.19-3	8.92-4	7.86-4
63	1208.5	2.13-3	1.92-3	1.54-3	1.14-3	8.54-4	7.54-4
64	1266.0	2.03-3	1.83-3	1.47-3	1.09-3	8.18-4	7.25-4
65	1324.7	1.94-3	1.75-3	1.41-3	1.04-3	7.85-4	6.97-4
66	1384.7	1.85-3	1.67-3	1.35-3	9.99-4	7.54-4	6.71-4
67	1445.9	1.77-3	1.60-3	1.29-3	9.57-4	7.24-4	6.47-4
68	1508.3	1.70-3	1.53-3	1.23-3	9.18-4	6.97-4	6.23-4
69	1572.0	1.63-3	1.47-3	1.18-3	8.82-4	6.70-4	6.01-4
70	1636.9	1.56-3	1.41-3	1.14-3	8.48-4	6.46-4	5.81-4
71	1703.0	1.50-3	1.35-3	1.09-3	8.15-4	6.23-4	5.61-4
72	1770.3	1.44-3	1.30-3	1.05-3	7.85-4	6.01-4	5.42-4
73	1838.9	1.38-3	1.25-3	1.01-3	7.56-4	5.80-4	5.25-4
74	1908.7	1.33-3	1.20-3	9.73-4	7.29-4	5.61-4	5.08-4
75	1979.6	1.28-3	1.16-3	9.38-4	7.03-4	5.42-4	4.92-4
76	2051.8	1.24-3	1.12-3	9.04-4	6.79-4	5.24-4	4.77-4
77	2125.2	1.19-3	1.08-3	8.73-4	6.56-4	5.08-4	4.63-4
78	2199.8	1.15-3	1.04-3	8.43-4	6.34-4	4.92-4	4.49-4
79	2275.5	1.11-3	1.00-3	8.14-4	6.13-4	4.77-4	4.36-4
80	2352.5	1.08-3	9.72-4	7.88-4	5.94-4	4.62-4	4.24-4
81	2430.7	1.04-3	9.40-4	7.62-4	5.75-4	4.49-4	[illegible]
82	2510.0	1.00-3	9.09-4	7.38-4	5.57-4	4.36-4	4.01-4
83	2590.5	9.73-4	8.80-4	7.15-4	5.41-4	4.23-4	3.90-4
84	2672.2	9.43-4	8.53-4	6.92-4	5.25-4	4.11-4	3.80-4
85	2755.0	9.13-4	8.26-4	6.72-4	5.09-4	4.00-4	3.71-4
86	2839.0	8.86-4	8.01-4	6.51-4	4.95-4	3.89-4	3.61-4
87	2924.2	8.59-4	7.77-4	6.32-4	4.81-4	3.79-4	3.53-4
88	3010.6	8.33-4	7.55-4	6.14-4	4.67-4	3.69-4	3.44-4
89	3098.0	8.09-4	7.33-4	5.97-4	4.55-4	3.60-4	3.36-4
90	3186.7	7.86-4	7.12-4	5.80-4	4.42-4	3.51-4	3.28-4
91	3276.4	7.64-4	6.92-4	5.64-4	4.31-4	3.42-4	3.21-4
92	3367.3	7.42-4	6.72-4	5.48-4	4.20-4	3.34-4	3.14-4

A1 - H2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1053.6	1.72-3	1.52-3	1.15-3	7.57-4	4.76-4	3.72-4
61	1108.1	1.63-3	1.44-3	1.09-3	7.19-4	4.54-4	3.57-4
62	1164.0	1.55-3	1.37-3	1.04-3	6.83-4	4.33-4	3.42-4
63	1221.1	1.47-3	1.30-3	9.85-4	6.50-4	4.13-4	3.28-4
64	1279.5	1.40-3	1.24-3	9.37-4	6.19-4	3.95-4	3.16-4
65	1339.3	1.33-3	1.18-3	8.93-4	5.91-4	3.79-4	3.04-4
66	[illegible]	1.27-3	1.12-3	8.52-4	5.64-4	3.63-4	2.92-4
67	1462.6	1.22-3	1.07-3	8.13-4	5.39-4	3.48-4	2.82-4
68	1526.3	1.16-3	1.02-3	7.78-4	5.16-4	3.35-4	2.72-4
69	1591.2	1.11-3	9.81-4	7.44-4	4.95-4	3.22-4	2.62-4
70	1657.4	1.07-3	9.40-4	7.13-4	4.75-4	3.10-4	2.53-4
71	1724.9	1.02-3	9.01-4	6.84-4	4.56-4	2.98-4	2.45-4
72	1793.7	9.81-4	8.65-4	6.56-4	4.38-4	2.87-4	2.37-4
73	1863.8	9.43-4	8.31-4	6.31-4	4.21-4	2.77-4	2.29-4
74	1935.2	9.06-4	7.99-4	6.06-4	4.05-4	2.68-4	2.22-4
75	2007.9	8.72-4	7.68-4	5.83-4	3.90-4	2.59-4	2.15-4
76	2081.9	8.40-4	7.40-4	5.62-4	3.76-4	2.50-4	2.09-4
77	2157.1	8.09-4	7.13-4	5.42-4	3.63-4	2.42-4	2.02-4
78	2233.7	7.80-4	6.87-4	5.22-4	3.51-4	2.34-4	1.76-4
79	2311.6	7.53-4	6.63-4	5.04-4	3.39-4	2.27-4	1.91-4
80	2390.7	7.27-4	6.41-4	4.87-4	3.27-4	2.20-4	1.85-4
81	2471.2	7.02-4	6.19-4	4.71-4	3.17-4	2.13-4	1.80-4
82	2552.9	6.79-4	5.98-4	4.55-4	3.07-4	2.07-4	1.76-4
83	2635.9	6.57-4	5.79-4	4.40-4	2.97-4	2.01-4	1.71-4
84	2720.2	6.36-4	5.60-4	4.26-4	2.88-4	1.95-4	1.66-4
85	2805.9	6.16-4	5.43-4	4.13-4	2.79-4	1.89-4	1.62-4
86	2892.7	5.97-4	5.26-4	4.00-4	2.71-4	1.84-4	1.58-4
87	2980.9	5.79-4	5.10-4	3.88-4	2.63-4	1.79-4	1.54-4
88	3070.4	5.61-4	4.94-4	3.77-4	2.55-4	1.74-4	1.50-4
89	3161.2	5.45-4	4.80-4	3.66-4	2.48-4	1.70-4	1.47-4
90	3253.2	5.29-4	4.66-4	3.55-4	2.41-4	1.65-4	1.43-4
91	3346.5	5.14-4	4.53-4	3.45-4	2.34-4	1.61-4	1.40-4
92	3441.2	4.99-4	4.40-4	3.35-4	2.28-4	1.57-4	1.37-4

A1 - H3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1074.0	2.33-3	2.10-3	1.67-3	1.21-3	8.77-4	7.58-4
61	1130.5	2.22-3	1.99-3	1.59-3	1.15-3	8.36-4	7.24-4
62	1188.4	2.11-3	1.90-3	1.51-3	1.09-3	7.98-4	6.93-4
63	1247.8	2.01-3	1.81-3	1.44-3	1.04-3	7.62-4	6.63-4
64	1308.6	1.92-3	1.72-3	1.37-3	9.97-4	7.29-4	6.35-4
65	1370.9	1.83-3	1.64-3	1.31-3	9.52-4	6.97-4	6.09-4
66	1434.6	1.75-3	1.57-3	1.25-3	9.11-4	6.68-4	5.84-4
67	1499.8	1.67-3	1.50-3	1.20-3	8.72-4	6.40-4	5.60-4
68	1566.4	1.60-3	1.44-3	1.15-3	8.35-4	6.14-4	5.38-4
69	1634.5	1.54-3	1.38-3	1.10-3	8.00-4	5.89-4	5.17-4
70	1704.1	1.47-3	1.32-3	1.06-3	7.68-4	5.66-4	4.98-4
71	1775.2	1.41-3	1.27-3	1.01-3	7.37-4	5.44-4	4.79-4
72	1847.7	1.36-3	1.22-3	9.72-4	7.08-4	5.23-4	4.61-4
73	1921.8	1.31-3	1.17-3	9.35-4	6.81-4	5.03-4	4.44-4
74	1997.4	1.26-3	1.13-3	8.99-4	6.56-4	4.85-4	4.28-4
75	2074.4	1.21-3	1.09-3	8.66-4	6.31-4	4.67-4	4.13-4
76	2153.0	1.17-3	1.05-3	8.34-4	6.08-4	4.51-4	3.99-4
77	2233.2	1.12-3	1.01-3	8.04-4	5.86-4	4.35-4	3.85-4
78	2314.8	1.08-3	9.73-4	7.75-4	5.66-4	4.20-4	3.72-4
79	2398.0	1.04-3	9.39-4	7.48-4	5.46-4	4.05-4	3.60-4
80	2482.8	1.01-3	9.07-4	7.22-4	5.27-4	3.92-4	3.48-4
81	2569.1	9.75-4	8.76-4	6.98-4	5.10-4	3.79-4	3.37-4
82	2657.0	9.43-4	8.47-4	6.75-4	4.93-4	3.67-4	3.26-4
83	2746.4	9.12-4	8.19-4	6.52-4	4.76-4	3.55-4	3.16-4
84	2837.4	8.82-4	7.93-4	6.31-4	4.61-4	3.44-4	3.07-4
85	2930.1	8.54-4	7.67-4	6.11-4	4.47-4	3.33-4	2.97-4
86	3024.3	8.28-4	7.43-4	5.92-4	4.32-4	3.22-4	2.88-4
87	3120.1	8.02-4	7.20-4	5.74-4	4.19-4	3.13-4	2.80-4
88	3217.6	7.77-4	[illegible]	[illegible]	4.07-4	3.03-4	2.72-4
89	3316.7	7.54-4	6.77-4	5.39-4	3.94-4	2.94-4	2.64-4
90	3417.4	7.32-4	6.57-4	5.23-4	3.83-4	2.86-4	2.57-4
91	3519.7	7.10-4	6.38-4	5.08-4	3.71-4	2.77-4	2.50-4
92	3623.8	6.90-4	6.19-4	4.93-4	3.61-4	2.69-4	2.43-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - H4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1462 4	1 24-3	1.13-3	9.47-4	7.64-4	6.62-4	6.59-4
61	1536.1	2.00-3	1.93-3	1.81-3	1.76-3	1.86-3	2.06-3
62	1605.2	1.90-3	1.84-3	1.75-3	1.72-3	1.83-3	2.04-3
63	1675.0	1.80-3	1 74-3	1.66-3	1.63-3	1.73-3	1.94-3
64	1746.2	1.72-3	1 67-3	1 59-3	1.56-3	1.67-3	1.87-3
65	1818.9	1.66-3	1.60-3	1.53-3	1.51-3	1.61-3	1.80-3
66	1893.0	1.60-3	1.55-3	1.48-3	1.46-3	1.56-3	1.75-3
67	1968.5	1.54-3	1.49-3	1.43-3	1.41-3	1 51-3	1.70-3
68	2045.6	1.49-3	1.44-3	1.38-3	1.37-3	1.46-3	1.65-3
69	2124.1	1.44-3	1.40-3	1.34-3	1.33-3	1.42-3	1.60-3
70	2204.2	1.39-3	1.35-3	1.30-3	1.29-3	1.38-3	1.56-3
71	2285.7	1 35-3	1 31-3	1.26-3	1.25-3	1.34-3	1.51-3
72	2368.8	1.31-3	1.27-3	1.22-3	1.21-3	1.31-3	1.47-3
73	2453.3	1.27-3	1.23-3	1.18-3	1.18-3	1.27-3	1.44-3
74	2539.4	1.23-3	1.19-3	1.15-3	1.15-3	1.24-3	1.40-3
75	2627.1	1.19-3	1 16-3	1.12-3	1.11-3	1.21-3	1.36-3
76	2716.3	1.16-3	1.13-3	1.09-3	1.08-3	1.17-3	1.33-3
77	2807.0	1.12-3	1.09-3	1.06-3	1.05-3	1.15-3	1.30-3
78	2899.3	1.09-3	1.06-3	1.03-3	1.03-3	1.12-3	1.26-3
79	2993.2	1.06-3	1.03-3	9.98-4	9.99-4	1.09-3	1.23-3
80	3088.6	1.03-3	1.00-3	9.71-4	9.73-4	1 06-3	1.20-3
81	3185.7	1.00-3	9.78-4	9.45-4	9.48-4	1.04-3	1.18-3
82	3284.3	9.76-4	9.51-4	9.20-4	9.24-4	1.01-3	1.15-3
83	3384.5	9.50-4	9.26-4	8.96-4	9.01-4	9.85-4	1.12-3
84	3486.4	9.25-4	9.02-4	8.73-4	8.79-4	9.62-4	1.10-3
85	3589.8	9.00-4	8.78-4	8.51-4	8.57-4	9.39-4	1.07-3
86	3694.9	8.77-4	8.56-4	8.29-4	8.37-4	9.17-4	1.05-3
87	3801.7	8.55-4	8 34-4	8.09-4	8.16-4	8.96-4	1.03-3
88	3910.1	8.33-4	8.13-4	7.89-4	7.97-4	8.75-4	1.00-3
89	4020.2	8.12-4	7.93-4	7.70-4	7.78-4	8.56-4	9.82-4
90	4131.9	7.92-4	7.73-4	7.51-4	7.60-4	8.36-4	9.62-4
91	4245.3	7.73-4	7.54-4	7.33-4	7.43-4	8.18-4	9.42-4
92	4360.4	7.54-4	7.36-4	7.16-4	7.26-4	8.00-4	9.23-4

A1 - H5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1467.5	7.69-4	6.86-4	5.38-4	3.85-4	2.88-4	2.64-4
61	1541.8	7.84-4	6.92-4	5.19-4	3.21-4	1.61-4	8.58-5
62	1611.0	1.02-3	9.89-4	9.56-4	9.78-4	1.10-3	1.28-3
63	1681.1	9.69-4	9.42-4	9.12-4	9.35-4	1.06-3	1.23-3
64	1752.6	9.29-4	9.03-4	8.76-4	8.99-4	1.02-3	1.19-3
65	1825.6	8.93-4	8.69-4	8.43-4	8.67-4	9.81-4	1.14-3
66	1900.1	8.61-4	8.37-4	8.13-4	8.37-4	9.48-4	1.11-3
67	1976.1	8.30-4	8.07-4	7.85-4	8.09-4	9.18-4	1.07-3
68	2053.6	8.01-4	7.80-4	7.59-4	7.82-4	8.89-4	1.04-3
69	2132.6	7.74-4	7.53-4	7.34-4	7.57-4	8.61-4	1.01-3
70	2213.1	7.48-4	7.28-4	7.10-4	7.34-4	8.35-4	9.75-4
71	2295.2	7.24-4	7 05-4	6.87-4	7.11-4	8.09-4	9.46-4
72	2378.8	7.00-4	6.82-4	6.66-4	6.89-4	7.^5-4	9.18-4
73	2463.9	6.78-4	6.61-4	6.45-4	6.68-4	7.62-4	8.91-4
74	2550.6	6.57-4	6.40-4	6.25-4	6.48-4	7.40-4	8.66-4
75	2638.9	6.36-4	6.21-4	6.06-4	6.29-4	7.19-4	8.41-4
76	2728.7	6.17-4	6.02-4	5.88-4	6.11-4	6.98-4	8.18-4
77	2820.2	5.98-4	5.84-4	5.71-4	5.93-4	6.79-4	7.95-4
78	2913.2	5.80-4	5.66-4	5.54-4	5.76-4	6.60-4	7.73-4
79	3007.8	5.63-4	5.50-4	5.38-4	5.60-4	6.41-4	7.52-4
80	3104.1	5.47-4	5.34-4	5.23-4	5.44-4	6.24-4	7.32-4
81	3201.9	5.31-4	5.19-4	5.08-4	5.29-4	6.07-4	7.13-4
82	3301.4	5.16-4	5.04-4	4.94-4	5.15-4	5.91-4	6.94-4
83	3402 6	5.01-4	4.90-4	4.80-4	5.01-4	5.75-4	6.77-4
84	3505.4	4.87-4	4.76-4	4.67-4	4.87-4	5.60-4	6.59-4
85	3609.8	4.74-4	4.63-4	4.54-4	4.74-4	5.46-4	6.43-4
86	3716.0	4.61-4	4.50-4	4.42-4	4.62-4	5.32-4	6.27-4
87	3823.8	4.48-4	4.38-4	4.31-4	4.50-4	5.18-4	6.12-4
88	3933.4	4.36-4	4.27-4	4.19-4	4.39-4	5.05-4	5.97-4
89	4044.6	4.25-4	4.15-4	4.08-4	4.28-4	4.93-4	5.83-4
90	41[illegible]7 6	4.14-4	4.05-4	3.98-4	4.17-4	4.81-4	5.70-4
91	4272.3	4.03-4	3.94-4	3.88-4	4.07-4	4.69-4	5.57-4
92	4388.7	3.92-4	3.84-4	3.78-4	3.97-4	4.58-4	5.44-4

A1 - H6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1471.1	1.62-3	1.55-3	1.43-3	1.33-3	1.36-3	1.49-3
61	1542.1	1.08-3	1.04-3	1.01-3	1.03-3	1.16-3	1.35-3
62	1620.5	7.54-4	6.61-4	4.91-4	3.01-4	1.53-4	8.72-5
63	1701.7	7.52-4	6.63-4	4.98-4	3.17-4	1.79-4	1.21-4
64	1784.9	7.34-4	6.48-4	4.90-4	3.18-4	1.88-4	1.35-4
65	1870.0	7.10-4	6.27-4	4.77-4	3.12-4	1.90-4	1.41-4
66	1957.0	6.84-4	6.05-4	4.61-4	3.04-4	1.88-4	1.42-4
67	2045.9	6.59-4	5.83-4	4.45-4	2.95-4	1.84-4	1.41-4
68	2136.7	6.34-4	5.61-4	4.29-4	2.85-4	1.80-4	1.39-4
69	2229.4	6.10-4	5.40-4	4.13-4	2.75-4	1.75-4	1.36-4
70	2324.0	5.86-4	5.19-4	3.97-4	2.66-4	1.70-4	1.33-4
71	2420.4	5.65-4	5.00-4	3.83-4	2.56-4	1.65-4	1.30-4
72	2518.7	5.43-4	4.81-4	3 69-4	2 47-4	1.60-4	1.27-4
73	2619.0	5.23-4	4.64-4	3.56-4	2.39-4	1.55-4	1.23-4
74	2721 0	5.05-4	4.47-4	3.43-4	2.31-4	1.50-4	1.20-4
75	2825.0	4.87-4	4.31-4	3.31-4	2.23-4	1.45-4	1.17-4
76	2930.8	4.69-4	4.16-4	3.19-4	2 16-4	1.41-4	1.14-4
77	3038.6	4.53-4	4.01-4	3.08-4	2.08-4	1.37-4	1.10-4
78	3148.1	4.38-4	3.88-4	2.98-4	2.02-4	1.33-4	1.08-4
79	3259.6	4.23-4	3.75-4	2.88-4	1.95-4	1.29-4	1.05-4
80	3372.9	4.09-4	3.62-4	2.78-4	1.89-4	1.25-4	1.02-4
81	3488.1	3.96-4	3.51-4	2.70-4	1.83-4	1.21-4	9.92-5
82	3605.2	3.83-4	3.39-4	2.61-4	1.77-4	1.18-4	9.66-5
83	3724.1	3.71-4	3.28-4	2.53-4	1.72-4	1.15-4	9.42-5
84	3844.8	3.59-4	3.18-4	2.45-4	1.67-4	1.11-4	9.18-5
85	3967.5	3.48-4	3.08-4	2.37-4	1.62-4	1.08-4	8.95-5
86	4091.9	3.37-4	2.99-4	2.30-4	1.57-4	1.05-4	8.73-5
87	4218.3	3.27-4	2.90-4	2.24-4	1.53-4	1.03-4	8.52-5
88	4346.5	3.17-4	2.82-4	2.17-4	1.48-4	1.00-4	8.33-5
89	4476.5	3.08-4	2.73-4	2.11-4	1.44-4	9.73-5	8.13-5
90	4608.4	2.99-4	2.65-4	2.05-4	1.40-4	9.48-5	7.95-5
91	4742.1	2.91-4	2.58-4	1.99-4	1.37-4	9.24-5	7.77-5
92	4877.7	2.82-4	2.51-4	1.94-4	1.33-4	9.01-5	7.60-5

A1 - H7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1475.6	1.04-3	1.01-3	9.70-4	9.87-4	1.11-3	1.29-3
61	1546 1	5.97-4	5.20-4	3.79-4	2.25-4	1.13-4	7.14-5
62	1625.7	5.99-4	5.19-4	3.75-4	2.16-4	9.83-5	4.94-5
63	1707.4	5.80-4	5.04-4	3.66-4	2.16-4	1.06-4	6.15-5
64	1791.1	5.57-4	4.84-4	3.53-4	2.11-4	1.07-4	6.57-5
65	1876.7	5.33-4	4.64-4	3.39-4	2.04-4	1.05-4	6.70-5
66	1964.3	5.10-4	4.44-4	3.25-4	1.96-4	1.03-4	6.68-5
67	2053.7	4.89-4	4.26-4	3.11-4	1.88-4	9.99-5	6.60-5
68	2145.1	4.68-4	4.08-4	2.98-4	1.81-4	9.68-5	6.48-5
69	2238.4	4.49-4	3.91-4	2.86-4	1.74-4	9.36-5	6.34-5
70	2333.6	4.31-4	3.75-4	2.75-4	1.67-4	9.06-5	6.19-5
71	2430.8	4.14-4	3.60-4	2.64-4	1.61-4	8.76-5	6.03-5
72	2529.8	3.97-4	3.46-4	2.53-4	1.55-4	8.47-5	5.88-5
73	2630.8	3.82-4	3.33-4	2.44-4	1.49-4	8.19-5	5.72-5
74	2733.7	3.68-4	3.20-4	2.34-4	1.43-4	7.92-5	5.57-5
75	2838.5	3.54-4	3.08-4	2.26-4	1.38-4	7.67-5	5.42-5
76	2945.2	3.41-4	2.97-4	2.17-4	1.33-4	7.42-5	5.27-5
77	3053.9	3.29-4	2.86-4	2.10-4	1.29-4	7.19-5	5.13-5
78	3164.4	3.18-4	2.76-4	2.02-4	1.24-4	6.97-5	4.99-5
79	3276.9	3.07-4	2.67-4	1.95-4	1.20-4	6.75-5	4.86-5
80	3391.3	2.96-4	2.58-4	1.89-4	1.16-4	6.55-5	4.73-5
81	3507.6	2.86-4	2.49-4	1.82-4	1.12-4	6.35-5	4.61-5
82	3625.9	2.77-4	2.41-4	1.76-4	1.09-4	6.17-5	4.49-5
83	3746.0	2.68-4	2.33-4	1.71-4	1.05-4	5.99-5	4.37-5
84	3868.1	2.60-4	2.26-4	1.65-4	1.02-4	5.82-5	4.26-5
85	3992.1	2.52-4	2.19-4	1.60-4	9.89-5	5.65-5	4.16-5
86	4118.0	2.44-4	2.12-4	1.55-4	9.60-5	5.49-5	4.06-5
87	4245.8	2.37-4	2.06-4	1.51-4	9.31-5	5.34-5	3.96-5
88	4375.6	2.30-4	2.00-4	1.46-4	9.04-5	5.20-5	3.87-5
89	4507.2	2.23-4	1.94-4	1.42-4	8.79-5	5.06-5	3.78-5
90	4640.8	2.17-4	1.88-4	1.38-4	8.54-5	4.92-5	3.69-5
91	4776.3	2.11-4	1.83-4	1.34-4	8.30-5	4.80-5	3.61-5
92	4913.8	2.05-4	1.78-4	1.30-4	8.08-5	4.67-5	3.53-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - H8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1489.9	9.18-4	8.14-4	6.25-4	4.18-4	2.66-4	2.06-4
61	1569.8	8.83-4	7.84-4	6.04-4	4.08-4	2.64-4	2.10-4
62	1651.8	8.46-4	7.51-4	5.79-4	3.92-4	2.57-4	2.06-4
63	1735.9	8.09-4	7.19-4	5.54-4	3.77-4	2.48-4	2.00-4
64	1822.0	7.75-4	6.88-4	5.31-4	3.61-4	2.39-4	1.94-4
65	1910.2	7.42-4	6.59-4	5.09-4	3.47-4	2.31-4	1.88-4
66	2000.5	7.12-4	6.32-4	4.88-4	3.34-4	2.23-4	1.83-4
67	2092.9	6.83-4	6.07-4	4.69-4	3.21-4	2.15-4	1.78-4
68	2187.3	6.56-4	5.83-4	4.51-4	3.09-4	2.08-4	1.72-4
69	2283.9	6.31-4	5.60-4	4.34-4	2.98-4	2.01-4	1.68-4
70	2382.5	6.07-4	5.39-4	4.17-4	2.87-4	1.95-4	1.63-4
71	2483.3	5.84-4	5.19-4	4.02-4	2.77-4	1.89-4	1.59-4
72	2586.1	5.62-4	5.00-4	3.87-4	2.67-4	1.83-4	1.54-4
73	2691.1	5.42-4	4.82-4	3.74-4	2.58-4	1.77-4	1.50-4
74	2798.2	5.22-4	4.64-4	3.60-4	2.49-4	1.72-4	1.45-4
75	2907.5	5.04-4	4.48-4	3.47-4	2.41-4	1.66-4	1.41-4
76	3018.9	4.86-4	4.32-4	3.35-4	2.32-4	1.60-4	1.36-4
77	3132.5	4.69-4	4.16-4	3.23-4	2.24-4	1.55-4	1.31-4
78	3248.2	4.52-4	4.02-4	3.11-4	2.16-4	1.49-4	1.26-4
79	3366.1	4.36-4	3.88-4	3.00-4	2.08-4	1.44-4	1.22-4
80	3486.1	4.21-4	3.74-4	2.90-4	2.00-4	1.38-4	1.17-4
81	3608.4	4.07-4	3.61-4	2.80-4	1.93-4	1.33-4	1.12-4
82	3732.8	3.93-4	3.49-4	2.70-4	1.86-4	1.27-4	1.08-4
83	3859.5	3.80-4	3.37-4	2.60-4	1.79-4	1.22-4	1.03-4
84	3988.3	3.67-4	3.26-4	2.51-4	1.73-4	1.17-4	9.87-5
85	4119.4	3.55-4	3.15-4	2.43-4	1.66-4	1.13-4	9.44-5
86	4252.7	3.44-4	3.05-4	2.35-4	1.60-4	1.08-4	9.01-5
87	4388.3	3.33-4	2.95-4	2.26-4	1.53-4	1.02-4	8.37-5
88	4524.6	1.41-4	1.22-4	9.02-5	6.21-5	4.71-5	4.47-5
89	4659.3	1.33-4	1.16-4	8.91-5	6.62-5	5.57-5	5.64-5
90	4795.9	1.30-4	1.14-4	8.79-5	6.63-5	5.67-5	5.79-5
91	4934.4	1.27-4	1.11-4	8.66-5	6.58-5	5.69-5	5.84-5
92	5074.9	1.25-4	1.09-4	8.52-5	6.52-5	5.68-5	5.86-5

A1 - H9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.6	2.44-4	2.02-4	1.34-4	7.38-5	3.93-5	2.87-5
61	1620.1	2.44-4	2.02-4	1.34-4	7.34-5	3.84-5	2.74-5
62	1702.6	2.41-4	2.00-4	1.34-4	7.34-5	3.86-5	2.75-5
63	1787.0	2.38-4	1.98-4	1.32-4	7.35-5	3.93-5	2.83-5
64	1873.3	2.34-4	1.95-4	1.31-4	7.36-5	4.01-5	2.93-5
65	1961.6	2.30-4	1.92-4	1.30-4	7.36-5	4.09-5	3.04-5
66	2051.8	2.26-4	1.89-4	1.28-4	7.35-5	4.16-5	3.13-5
67	2143.9	2.22-4	1.85-4	1.27-4	7.32-5	4.20-5	3.19-5
68	2237.9	2.17-4	1.82-4	1.25-4	7.28-5	4.21-5	3.21-5
69	2333.9	2.13-4	1.79-4	1.23-4	7.21-5	4.20-5	3.21-5
70	2431.8	2.09-4	1.76-4	1.21-4	7.15-5	4.18-5	3.19-5
71	2531.7	2.05-4	1.73-4	1.20-4	7.08-5	4.17-5	3.20-5
72	2633.5	2.01-4	1.69-4	1.17-4	7.03-5	4.21-5	3.27-5
73	2737.2	1.95-4	1.65-4	1.15-4	7.00-5	4.30-5	3.43-5
74	2842.8	1.90-4	1.61-4	1.13-4	7.01-5	4.47-5	3.68-5
75	2950.4	1.84-4	1.57-4	1.11-4	7.04-5	4.68-5	3.99-5
76	3059.9	1.79-4	1.53-4	1.10-4	7.09-5	4.91-5	4.33-5
77	3171.3	1.74-4	1.49-4	1.08-4	7.14-5	5.13-5	4.65-5
78	3284.7	1.70-4	1.45-4	1.06-4	7.18-5	5.33-5	4.95-5
79	3400.0	1.65-4	1.42-4	1.05-4	7.21-5	5.49-5	5.20-5
80	3517.2	1.61-4	1.39-4	1.03-4	7.23-5	5.63-5	5.41-5
81	3636.3	1.57-4	1.36-4	1.02-4	7.23-5	5.74-5	5.58-5
82	3757.4	1.54-4	1.33-4	1.01-4	7.21-5	5.83-5	5.72-5
83	3880.5	1.50-4	1.31-4	9.90-5	7.19-5	5.89-5	5.85-5
84	4005.4	1.47-4	1.28-4	9.76-5	7.16-5	5.95-5	5.95-5
85	4132.3	1.44-4	1.25-4	9.62-5	7.14-5	6.01-5	6.06-5
86	4261.2	1.41-4	1.23-4	9.50-5	7.14-5	6.10-5	6.20-5
87	4392.0	1.38-4	1.21-4	9.47-5	7.29-5	6.40-5	6.60-5
88	4526.1	3.19-4	2.85-4	2.24-4	1.61-4	1.19-4	1.06-4
89	4663.4	1.61-4	1.53-4	1.43-4	1.43-4	1.57-4	1.80-4
90	4800.2	1.56-4	1.48-4	1.38-4	1.37-4	1.51-4	1.73-4
91	4939.1	1.52-4	1.44-4	1.34-4	1.34-4	1.47-4	1.69-4
92	5079.9	1.49-4	1.41-4	1.31-4	1.31-4	1.44-4	1.65-4

A1 - H10

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.9	2.70-4	2.56-4	2.39-4	2.40-4	2.65-4	2.97-4
61	1620.4	2.71-4	2.57-4	2.42-4	2.45-4	2.72-4	3.05-4
62	1703.0	2.69-4	2.57-4	2.43-4	2.47-4	2.75-4	3.09-4
63	1787.4	2.67-4	2.55-4	2.42-4	2.46-4	2.75-4	3.10-4
64	1873.8	2.64-4	2.52-4	2.40-4	2.45-4	2.73-4	3.08-4
65	1962.1	2.61-4	2.49-4	2.37-4	2.42-4	2.70-4	3.05-4
66	2052.4	2.57-4	2.46-4	2.34-4	2.39-4	2.67-4	3.02-4
67	2144.6	2.53-4	2.42-4	2.31-4	2.36-4	2.63-4	2.98-4
68	2238.7	2.50-4	2.38-4	2.27-4	2.32-4	2.60-4	2.94-4
69	2334.7	2.46-4	2.35-4	2.24-4	2.29-4	2.56-4	2.90-4
70	2432.7	2.42-4	2.31-4	2.21-4	2.26-4	2.53-4	2.86-4
71	2532.7	2.38-4	2.28-4	2.17-4	2.23-4	2.49-4	2.82-4
72	2634.5	2.34-4	2.24-4	2.14-4	2.19-4	2.44-4	2.78-4
73	2738.3	2.29-4	2.19-4	2.09-4	2.14-4	2.39-4	2.71-4
74	2844.1	2.24-4	2.14-4	2.04-4	2.08-4	2.32-4	2.64-4
75	2951.8	2.19-4	2.09-4	1.99-4	2.02-4	2.25-4	2.55-4
76	3061.4	2.14-4	2.04-4	1.93-4	1.95-4	2.18-4	2.47-4
77	3173.0	2.08-4	1.98-4	1.87-4	1.89-4	2.10-4	2.39-4
78	3286.5	2.03-4	1.93-4	1.82-4	1.84-4	2.03-4	2.31-4
79	3401.9	1.98-4	1.88-4	1.77-4	1.78-4	1.97-4	2.24-4
80	3519.3	1.94-4	1.84-4	1.73-4	1.73-4	1.91-4	2.17-4
81	3638.6	1.89-4	1.79-4	1.68-4	1.68-4	1.86-4	2.11-4
82	3759.9	1.85-4	1.75-4	1.64-4	1.64-4	1.81-4	2.06-4
83	3883.1	1.80-4	1.71-4	1.60-4	1.60-4	1.76-4	2.00-4
84	4008.3	1.76-4	1.67-4	1.56-4	1.56-4	1.72-4	1.95-4
85	4135.4	1.72-4	1.63-4	1.52-4	1.52-4	1.67-4	1.90-4
86	4264.5	1.68-4	1.59-4	1.49-4	1.48-4	1.63-4	1.85-4
87	4395.5	1.64-4	1.55-4	1.45-4	1.44-4	1.58-4	1.80-4
88	4528.5	1.59-4	1.50-4	1.39-4	1.38-4	1.51-4	1.72-4
89	4666.2	3.09-4	2.73-4	2.10-4	1.43-4	9.60-5	7.99-5
90	4808.5	3.01-4	2.67-4	2.06-4	1.40-4	9.44-5	7.90-5
91	4953.1	2.93-4	2.60-4	2.00-4	1.36-4	9.15-5	7.65-5
92	5100.0	2.85-4	2.52-4	1.94-4	1.32-4	8.85-5	7.40-5

A1 - H11

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1562.2	5.29-4	4.85-4	4.16-4	3.68-4	3.67-4	3.99-4
61	1644.5	6.20-4	5.72-4	5.00-4	4.50-4	4.54-4	4.96-4
62	1728.4	8.15-4	7.62-4	6.81-4	6.28-4	6.43-4	7.08-4
63	1813.1	1.14-3	1.08-3	9.94-4	9.41-4	9.78-4	1.08-3
64	1898.0	1.31-3	1.25-3	1.17-3	1.12-3	1.18-3	1.31-3
65	1983.7	1.27-3	1.23-3	1.15-3	1.11-3	1.17-3	1.31-3
66	2071.2	1.21-3	1.16-3	1.10-3	1.07-3	1.13-3	1.26-3
67	2160.8	1.15-3	1.11-3	1.04-3	1.02-3	1.08-3	1.20-3
68	2252.6	1.09-3	1.05-3	9.96-4	9.71-4	1.03-3	1.15-3
69	2346.8	1.04-3	1.00-3	9.52-4	9.29-4	9.85-4	1.11-3
70	2443.4	9.92-4	9.59-4	9.11-4	8.90-4	9.45-4	1.06-3
71	2542.4	9.49-4	9.18-4	8.73-4	8.54-4	9.08-4	1.02-3
72	2643.9	9.10-4	8.81-4	8.38-4	8.21-4	8.74-4	9.82-4
73	2748.0	8.75-4	8.47-4	8.06-4	7.90-4	8.42-4	9.47-4
74	2854.7	8.43-4	8.16-4	7.77-4	7.62-4	8.12-4	9.14-4
75	2964.2	8.14-4	7.88-4	7.51-4	7.36-4	7.84-4	8.83-4
76	3076.4	7.86-4	7.62-4	7.26-4	7.12-4	7.59-4	8.54-4
77	3191.4	7.61-4	7.37-4	7.02-4	6.88-4	7.34-4	8.26-4
78	3309.3	7.36-4	7.13-4	6.80-4	6.66-4	7.11-4	8.01-4
79	3430.2	7.13-4	6.91-4	6.59-4	6.46-4	6.89-4	7.76-4
80	3554.1	6.92-4	6.70-4	6.39-4	6.26-4	6.68-4	7.53-4
81	3681.1	6.71-4	6.50-4	6.20-4	6.08-4	6.49-4	7.32-4
82	3811.4	6.52-4	6.32-4	6.02-4	5.91-4	6.31-4	7.12-4
83	3944.9	6.35-4	6.15-4	5.86-4	5.75-4	6.14-4	6.94-4
84	4081.7	6.19-4	6.00-4	5.72-4	5.61-4	5.99-4	6.77-4
85	4221.9	6.06-4	5.87-4	5.59-4	5.49-4	5.86-4	6.63-4
86	4365.6	5.96-4	5.77-4	5.49-4	5.39-4	5.75-4	6.51-4
87	4512.8	5.90-4	5.71-4	5.42-4	5.31-4	5.67-4	6.42-4
88	4663.1	5.83-4	5.63-4	5.33-4	5.21-4	5.55-4	6.28-4
89	4815.2	5.29-4	5.08-4	4.77-4	4.64-4	4.94-4	5.60-4
90	4965.8	3.13-4	3.03-4	2.92-4	2.96-4	3.27-4	3.77-4
91	5114.3	1.11-4	1.07-4	1.05-4	1.11-4	1.27-4	1.49-4
92	5264.4	8.95-5	8.54-5	8.11-5	8.29-5	9.36-5	1.09-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leq Z \leq 92$

See page 96 for Explanation of Tables

A1 – H12

Z	Δ E	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1563.1	1.61-4	1.40-4	1.08-4	8.29-5	7.54-5	7.92-5
61	1645.7	1.57-4	1.37-4	1.07-4	8.34-5	7.70-5	8.13-5
62	1730.4	1.54-4	1.35-4	1.06-4	8.41-5	7.87-5	8.36-5
63	1817.1	1.50-4	1.32-4	1.05-4	8.49-5	8.06-5	8.62-5
64	1906.0	1.47-4	1.30-4	1.04-4	8.58-5	8.27-5	8.89-5
65	1996.9	[illegible]	1.27-4	1.03-4	8.67-5	8.48-5	9.17-5
66	2089.9	1.40-4	1.25-4	1.03-4	8.75-5	8.67-5	9.42-5
67	2185.0	1.37-4	1.23-4	1.02-4	8.81-5	8.83-5	9.64-5
68	2282.1	1.34-4	1.21-4	1.01-4	8.84-5	8.94-5	9.80-5
69	2381.4	1.31-4	1.18-4	9.97-5	8.83-5	9.01-5	9.90-5
70	2482.8	1.28-4	1.16-4	9.84-5	8.80-5	9.03-5	9.96-5
71	2586.4	1.25-4	1.14-4	9.70-5	8.73-5	9.01-5	9.96-5
72	2692.0	1.22-4	1.11-4	9.54-5	8.65-5	8.96-5	9.92-5
73	2799.8	1.20-4	1.09-4	9.37-5	8.54-5	8.88-5	9.85-5
74	2909.7	1.17-4	1.06-4	9.19-5	8.41-5	8.77-5	9.75-5
75	3021.8	1.14-4	1.04-4	9.01-5	8.27-5	8.65-5	9.62-5
76	3136.0	1.11-4	1.02-4	8.82-5	8.12-5	8.51-5	9.48-5
77	3252.4	1.08-4	9.91-5	8.63-5	7.96-5	8.36-5	9.32-5
78	3371.0	1.06-4	9.67-5	8.43-5	7.79-5	8.19-5	9.14-5
79	3491.7	1.03-4	9.43-5	8.23-5	7.62-5	8.01-5	8.95-5
80	3614.7	1.00-4	9.20-5	8.03-5	7.43-5	7.83-5	8.75-5
81	3739.8	9.78-5	8.96-5	7.83-5	7.25-5	7.63-5	8.53-5
82	3867.2	9.52-5	8.72-5	7.62-5	7.05-5	7.42-5	8.30-5
83	3996.8	9.26-5	8.48-5	7.40-5	6.84-5	7.19-5	8.05-5
84	4128.6	9.00-5	8.24-5	7.18-5	6.61-5	6.94-5	7.77-5
85	4262.6	8.74-5	7.99-5	6.94-5	6.36-5	6.65-5	7.44-5
86	4399.0	8.46-5	7.72-5	6.66-5	6.06-5	6.29-5	7.02-5
87	4537.5	8.17-5	7.41-5	6.33-5	5.67-5	5.81-5	6.46-5
88	4678.4	7.84-5	7.05-5	5.88-5	5.08-5	5.06-5	5.55-5
89	4821.5	7.56-5	6.62-5	5.16-5	3.98-5	3.51-5	3.64-5
90	4967.2	1.24-4	1.05-4	7.32-5	4.20-5	2.13-5	1.33-5
91	5116.3	2.13-4	1.91-4	1.55-4	1.23-4	1.10-4	1.16-4
92	5267.4	1.82-4	1.63-4	1.32-4	1.06-4	9.60-5	1.02-4

A1 – H13

Z	Δ E	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1583.5	1.13-3	1.09-3	1.04-3	1.01-3	1.06-3	1.18-3
61	1660.1	9.80-4	9.49-4	9.01-4	8.76-4	9.22-4	1.03-3
62	1739.4	7.27-4	7.05-4	6.70-4	6.51-4	6.86-4	7.67-4
63	1821.9	3.43-4	3.29-4	3.07-4	2.92-4	3.04-4	3.40-4
64	1908.5	1.24-4	1.10-4	8.73-5	6.75-5	6.00-5	6.43-5
65	1998.6	1.04-4	8.56-5	5.67-5	3.16-5	1.85-5	1.57-5
66	2091.2	1.19-4	9.79-5	6.52-5	3.72-5	2.27-5	1.93-5
67	2186.2	1.32-4	1.10-4	7.53-5	4.58-5	3.10-5	2.80-5
68	2283.3	1.41-4	1.18-4	8.25-5	5.22-5	3.74-5	3.48-5
69	2382.5	1.46-4	1.23-4	8.70-5	5.64-5	4.16-5	3.94-5
70	2484.0	1.48-4	1.26-4	8.95-5	5.90-5	4.43-5	4.23-5
71	2587.5	1.49-4	1.26-4	9.05-5	6.03-5	4.58-5	4.41-5
72	2693.2	1.48-4	1.26-4	9.07-5	6.08-5	4.66-5	4.50-5
73	2801.1	1.46-4	1.25-4	9.00-5	6.07-5	4.68-5	4.53-5
74	2911.1	1.44-4	1.23-4	8.89-5	6.02-5	4.65-5	4.52-5
75	3023.3	1.41-4	1.20-4	8.73-5	5.93-5	4.59-5	4.47-5
76	3137.6	1.38-4	1.18-4	8.54-5	5.81-5	4.51-5	4.39-5
77	3254.2	1.34-4	1.15-4	8.32-5	5.66-5	4.39-5	4.28-5
78	3372.9	1.30-4	1.11-4	8.08-5	5.49-5	4.26-5	4.15-5
79	3493.8	1.26-4	1.07-4	7.80-5	5.30-5	4.10-5	3.99-5
80	3617.0	1.21-4	1.03-4	7.50-5	5.08-5	3.92-5	3.81-5
81	3742.3	1.16-4	9.90-5	7.17-5	4.83-5	3.70-5	3.59-5
82	3869.9	1.10-4	9.41-5	6.78-5	4.54-5	3.45-5	3.33-5
83	3999.8	1.04-4	8.85-5	6.35-5	4.20-5	3.15-5	3.02-5
84	4131.9	9.69-5	8.21-5	5.83-5	3.79-5	2.78-5	2.64-5
85	4266.4	8.81-5	7.42-5	5.20-5	3.29-5	2.32-5	2.16-5
86	4403.2	7.71-5	6.45-5	4.42-5	2.66-5	1.76-5	1.57-5
87	4542.5	6.32-5	5.22-5	3.47-5	1.94-5	1.13-5	9.34-6
88	4684.7	5.07-5	4.24-5	2.90-5	1.75-5	1.17-5	1.11-5
89	4831.2	8.62-5	8.12-5	7.32-5	6.76-5	6.97-5	7.91-5
90	4985.2	2.33-4	2.27-4	2.19-4	2.16-4	2.32-4	2.65-4
91	5146.7	3.26-4	3.18-4	3.06-4	3.04-4	3.26-4	3.72-4
92	5313.6	3.58-4	3.49-4	3.36-4	3.33-4	3.57-4	4.08-4

A1 – H14

Z	Δ E	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1824.1	5.55-4	5.23-4	4.70-4	4.26-4	4.30-4	4.81-4
61	1912.5	5.30-4	5.00-4	4.49-4	4.08-4	4.12-4	4.61-4
62	2003.0	5.08-4	4.79-4	4.30-4	3.91-4	3.95-4	4.43-4
63	2095.5	4.86-4	4.58-4	4.12-4	3.74-4	3.79-4	4.26-4
64	2190.2	4.66-4	4.39-4	3.94-4	3.59-4	3.63-4	4.10-4
65	2286.9	4.47-4	4.21-4	3.78-4	3.44-4	3.49-4	3.95-4
66	2385.8	4.29-4	4.04-4	3.63-4	3.31-4	3.36-4	3.80-4
67	2486.7	4.12-4	3.88-4	3.49-4	3.18-4	3.23-4	3.66-4
68	2589.7	3.96-4	3.73-4	3.35-4	3.05-4	3.11-4	3.53-4
69	2694.9	3.81-4	3.59-4	3.22-4	2.94-4	3.00-4	3.40-4
70	2802.2	3.67-4	3.45-4	3.10-4	2.83-4	2.89-4	3.28-4
71	2911.6	3.53-4	3.33-4	2.99-4	2.72-4	2.79-4	3.17-4
72	3023.2	3.40-4	3.21-4	2.88-4	2.62-4	2.69-4	3.06-4
73	3136.9	3.28-4	3.09-4	2.77-4	2.53-4	2.60-4	2.96-4
74	3252.8	3.17-4	2.98-4	2.67-4	2.44-4	2.51-4	2.86-4
75	3370.8	3.06-4	2.88-4	2.58-4	2.36-4	2.43-4	2.77-4
76	3491.0	2.95-4	2.78-4	2.49-4	2.28-4	2.35-4	2.68-4
77	3613.4	2.86-4	2.69-4	2.41-4	2.20-4	2.27-4	2.60-4
78	3738.0	2.76-4	2.60-4	2.33-4	2.13-4	2.20-4	2.51-4
79	3864.7	2.67-4	2.51-4	2.25-4	2.06-4	2.13-4	2.44-4
80	3993.7	2.59-4	2.43-4	2.18-4	2.00-4	2.07-4	2.36-4
81	4124.9	2.51-4	2.36-4	2.11-4	1.93-4	2.00-4	2.30-4
82	4258.3	2.43-4	2.28-4	2.05-4	1.87-4	1.94-4	2.23-4
83	4394.0	2.35-4	2.21-4	1.98-4	1.82-4	1.89-4	2.17-4
84	4531.9	2.28-4	2.15-4	1.92-4	1.76-4	1.83-4	2.10-4
85	4672.0	2.22-4	2.08-4	1.87-4	1.71-4	1.78-4	2.05-4
86	4814.4	2.15-4	2.02-4	1.81-4	1.66-4	1.73-4	1.99-4
87	4959.1	2.09-4	1.96-4	1.76-4	1.61-4	1.68-4	1.94-4
88	5106.1	2.03-4	1.91-4	1.71-4	1.57-4	1.63-4	1.89-4
89	5255.3	1.97-4	1.85-4	1.66-4	1.53-4	1.59-4	1.84-4
90	5406.9	1.92-4	1.80-4	1.62-4	1.48-4	1.55-4	1.79-4
91	5560.8	1.87-4	1.76-4	1.57-4	1.44-4	1.51-4	1.75-4
92	5717.0	1.82-4	1.71-4	1.53-4	1.40-4	1.47-4	1.71-4

A1 – H15

Z	Δ E	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1826.4	3.05-4	2.83-4	2.47-4	2.23-4	2.37-4	2.80-4
61	1915.0	2.91-4	2.70-4	2.36-4	2.13-4	2.26-4	2.68-4
62	2005.6	2.79-4	2.58-4	2.25-4	2.04-4	2.16-4	2.57-4
63	2098.4	2.66-4	2.47-4	2.15-4	1.95-4	2.07-4	2.46-4
64	2193.2	2.55-4	2.36-4	2.06-4	1.86-4	1.98-4	2.36-4
65	2290.2	2.44-4	2.26-4	1.97-4	1.78-4	1.90-4	2.27-4
66	2389.2	2.34-4	2.17-4	1.89-4	1.71-4	1.83-4	2.18-4
67	2490.4	2.25-4	2.08-4	1.81-4	1.64-4	1.75-4	2.09-4
68	2593.6	2.16-4	2.00-4	1.74-4	1.57-4	1.68-4	2.01-4
69	2699.0	2.07-4	1.92-4	1.67-4	1.51-4	1.62-4	1.94-4
70	2806.6	1.99-4	1.84-4	1.60-4	1.45-4	1.56-4	1.86-4
71	2916.3	1.92-4	1.77-4	1.54-4	1.40-4	1.50-4	1.80-4
72	3028.1	1.85-4	1.71-4	1.48-4	1.34-4	1.44-4	1.73-4
73	3142.2	1.78-4	1.64-4	1.43-4	1.30-4	1.39-4	1.67-4
74	3258.3	1.72-4	1.58-4	1.38-4	1.25-4	1.34-4	1.61-4
75	3376.7	1.66-4	1.53-4	1.33-4	1.20-4	1.30-4	1.56-4
76	3497.3	1.60-4	1.47-4	1.28-4	1.16-4	1.25-4	1.50-4
77	3620.0	1.54-4	1.42-4	1.24-4	1.12-4	1.21-4	1.45-4
78	3745.0	1.49-4	1.38-4	1.20-4	1.08-4	1.17-4	1.41-4
79	3872.1	1.44-4	1.33-4	1.15-4	1.05-4	1.13-4	1.36-4
80	4001.5	1.39-4	1.29-4	1.12-4	1.01-4	1.10-4	1.32-4
81	4133.2	1.35-4	1.25-4	1.08-4	9.82-5	1.06-4	1.28-4
82	4267.1	1.31-4	1.21-4	1.05-4	9.51-5	1.03-4	1.24-4
83	4403.2	1.27-4	1.17-4	1.01-4	9.21-5	1.00-4	1.21-4
84	4541.6	1.23-4	1.13-4	9.83-5	8.93-5	9.70-5	1.17-4
85	4682.3	1.19-4	1.10-4	9.53-5	8.66-5	9.41-5	1.14-4
86	4825.2	1.15-4	1.06-4	9.24-5	8.41-5	9.14-5	1.10-4
87	4970.5	1.12-4	1.03-4	8.97-5	8.16-5	8.88-5	1.08-4
88	5118.1	1.09-4	1.00-4	8.71-5	7.93-5	8.63-5	1.05-4
89	5268.0	1.06-4	9.74-5	8.46-5	7.70-5	8.39-5	1.02-4
90	5420.2	1.03-4	9.47-5	8.22-5	7.49-5	8.16-5	9.92-5
91	5574.8	9.99-5	9.20-5	7.99-5	7.28-5	7.94-5	9.66-5
92	5731.7	9.72-5	8.95-5	7.77-5	7.08-5	7.73-5	9.42-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - H16

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1935.1	4.41-4	4.15-4	3.69-4	3.29-4	3.23-4	3.56-4
61	2032.9	4.21-4	3.96-4	3.53-4	3.14-4	3.09-4	3.41-4
62	2133.5	4.02-4	3.78-4	3.37-4	3.00-4	2.95-4	3.27-4
63	2236.7	3.84-4	3.62-4	3.22-4	2.87-4	2.83-4	3.13-4
64	2342.8	3.67-4	3.46-4	3.08-4	2.75-4	2.71-4	3.01-4
65	2451.6	3.52-4	3.31-4	2.95-4	2.63-4	2.60-4	2.89-4
66	2563.4	3.37-4	3.17-4	2.83-4	2.52-4	2.49-4	2.77-4
67	2678.0	3.23-4	3.04-4	2.71-4	2.42-4	2.39-4	2.66-4
68	2795.5	3.10-4	2.91-4	2.60-4	2.32-4	2.30-4	2.56-4
69	2916.1	2.97-4	2.80-4	2.50-4	2.23-4	2.21-4	2.46-4
70	3039.7	2.85-4	2.69-4	2.40-4	2.14-4	2.12-4	2.37-4
71	3166.4	2.74-4	2.58-4	2.30-4	2.06-4	2.04-4	2.28-4
72	3296.2	2.64-4	2.48-4	2.22-4	1.98-4	1.97-4	2.20-4
73	3429.3	2.53-4	2.39-4	2.13-4	1.91-4	1.90-4	2.12-4
74	3565.6	2.44-4	2.30-4	2.05-4	1.84-4	1.83-4	2.04-4
75	3705.2	2.35-4	2.21-4	1.98-4	1.77-4	1.76-4	1.97-4
76	3848.2	2.26-4	2.13-4	1.90-4	1.71-4	1.70-4	1.90-4
77	3994.6	2.18-4	2.05-4	1.84-4	1.65-4	1.64-4	1.83-4
78	4144.6	2.10-4	1.98-4	1.77-4	1.59-4	1.58-4	1.77-4
79	4298.1	2.02-4	1.91-4	1.71-4	1.53-4	1.53-4	1.71-4
80	4455.3	1.95-4	1.84-4	1.65-4	1.48-4	1.48-4	1.66-4
81	4616.3	1.88-4	1.77-4	1.59-4	1.43-4	1.43-4	1.60-4
82	4781.1	1.82-4	1.71-4	1.54-4	1.38-4	1.38-4	1.55-4
83	4949.7	1.75-4	1.65-4	1.48-4	1.34-4	1.34-4	1.50-4
84	5122.4	1.69-4	1.60-4	1.43-4	1.29-4	1.29-4	1.45-4
85	5299.2	1.63-4	1.54-4	1.39-4	1.25-4	1.25-4	1.41-4
86	5480.1	1.58-4	1.49-4	1.34-4	1.21-4	1.21-4	1.36-4
87	5665.3	1.53-4	1.44-4	1.30-4	1.17-4	1.17-4	1.32-4
88	5854.9	1.48-4	1.40-4	1.26-4	1.14-4	1.14-4	1.28-4
89	6049.0	1.43-4	1.35-4	1.22-4	1.10-4	1.10-4	1.24-4
90	6247.7	1.38-4	1.31-4	1.18-4	1.07-4	1.07-4	1.21-4
91	6451.1	1.34-4	1.26-4	1.14-4	1.03-4	1.04-4	1.17-4
92	6659.4	1.29-4	1.22-4	1.10-4	1.00-4	1.01-4	1.14-4

A1 - H17

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2127.1	2.00-4	1.85-4	1.60-4	1.36-4	1.25-4	1.27-4
61	2230.6	1.97-4	1.83-4	1.59-4	1.38-4	1.28-4	1.31-4
62	2336.8	1.95-4	1.81-4	1.59-4	1.39-4	1.31-4	1.35-4
63	2445.8	1.92-4	1.79-4	1.58-4	1.40-4	1.33-4	1.38-4
64	2557.6	1.89-4	1.77-4	1.57-4	1.41-4	1.35-4	1.41-4
65	2672.3	1.86-4	1.75-4	1.57-4	1.41-4	1.37-4	1.43-4
66	2789.9	1.83-4	1.72-4	1.55-4	1.41-4	1.38-4	1.45-4
67	2910.5	1.80-4	1.70-4	1.54-4	1.41-4	1.39-4	1.47-4
68	3034.1	1.77-4	1.67-4	1.53-4	1.41-4	1.40-4	1.49-4
69	3160.7	1.73-4	1.65-4	1.51-4	1.41-4	1.41-4	1.49-4
70	3290.4	1.70-4	1.62-4	1.49-4	1.40-4	1.41-4	1.50-4
71	3423.3	1.67-4	1.59-4	1.48-4	1.39-4	1.41-4	1.51-4
72	3559.4	1.63-4	1.56-4	1.46-4	1.38-4	1.40-4	1.51-4
73	3698.8	1.60-4	1.54-4	1.44-4	1.37-4	1.40-4	1.50-4
74	3841.5	1.57-4	1.51-4	1.41-4	1.36-4	1.39-4	1.50-4
75	3987.6	1.53-4	1.48-4	1.39-4	1.34-4	1.38-4	1.49-4
76	4137.1	1.50-4	1.45-4	1.37-4	1.32-4	1.37-4	1.48-4
77	4290.2	1.47-4	1.42-4	1.34-4	1.31-4	1.36-4	1.47-4
78	4446.9	1.43-4	1.39-4	1.32-4	1.29-4	1.34-4	1.46-4
79	4607.3	1.40-4	1.36-4	1.29-4	1.27-4	1.33-4	1.44-4
80	4771.4	1.37-4	1.32-4	1.27-4	1.25-4	1.31-4	1.43-4
81	4939.3	1.33-4	1.29-4	1.24-4	1.23-4	1.29-4	1.41-4
82	5111.2	1.30-4	1.26-4	1.21-4	1.20-4	1.27-4	1.39-4
83	5287.0	1.27-4	1.23-4	1.19-4	1.18-4	1.25-4	1.37-4
84	5467.0	1.23-4	1.20-4	1.16-4	1.16-4	1.23-4	1.34-4
85	5651.1	1.20-4	1.17-4	1.13-4	1.13-4	1.20-4	1.32-4
86	5839.6	1.17-4	1.14-4	1.11-4	1.11-4	1.18-4	1.30-4
87	6032.4	1.14-4	1.11-4	1.08-4	1.08-4	1.15-4	1.27-4
88	6229.8	1.10-4	1.08-4	1.05-4	1.06-4	1.13-4	1.25-4
89	6431.8	1.07-4	1.05-4	1.03-4	1.03-4	1.10-4	1.22-4
90	6638.6	1.04-4	1.02-4	9.97-5	1.01-4	1.08-4	1.20-4
91	6850.2	1.01-4	9.92-5	9.70-5	9.82-5	1.05-4	1.17-4
92	7066.9	9.82-5	9.64-5	9.44-5	9.56-5	1.03-4	1.14-4

A1 - H18

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2127.5	2.53-4	2.66-4	2.96-4	3.42-4	4.02-4	4.54-4
61	2231.0	2.50-4	2.63-4	2.92-4	3.37-4	3.95-4	4.47-4
62	2337.3	2.47-4	2.59-4	2.87-4	3.31-4	3.87-4	4.39-4
63	2446.4	2.44-4	2.55-4	2.82-4	3.25-4	3.79-4	4.30-4
64	2558.3	2.40-4	2.51-4	2.77-4	3.18-4	3.71-4	4.21-4
65	2673.0	2.36-4	2.46-4	2.72-4	3.11-4	3.62-4	4.11-4
66	2790.7	2.32-4	2.42-4	2.66-4	3.04-4	3.53-4	4.01-4
67	2911.4	2.27-4	2.37-4	2.60-4	2.96-4	3.45-4	3.91-4
68	3035.0	2.23-4	2.32-4	2.54-4	2.89-4	3.36-4	3.81-4
69	3161.7	2.18-4	2.26-4	2.48-4	2.81-4	3.27-4	3.71-4
70	3291.6	2.13-4	2.21-4	2.41-4	2.74-4	3.18-4	3.60-4
71	3424.5	2.08-4	2.16-4	2.35-4	2.66-4	3.09-4	3.50-4
72	3560.7	2.03-4	2.11-4	2.29-4	2.59-4	3.00-4	3.40-4
73	3700.2	1.98-4	2.05-4	2.23-4	2.51-4	2.91-4	3.30-4
74	3843.1	1.93-4	2.00-4	2.17-4	2.44-4	2.82-4	3.20-4
75	3989.3	1.88-4	1.95-4	2.11-4	2.37-4	2.74-4	3.11-4
76	4139.0	1.83-4	1.89-4	2.05-4	2.30-4	2.66-4	3.01-4
77	4292.2	1.78-4	1.84-4	1.99-4	2.23-4	2.57-4	2.92-4
78	4449.0	1.73-4	1.79-4	1.93-4	2.16-4	2.49-4	2.83-4
79	4609.6	1.69-4	1.74-4	1.87-4	2.09-4	2.41-4	2.74-4
80	4773.8	1.64-4	1.69-4	1.81-4	2.03-4	2.34-4	2.65-4
81	4942.0	1.59-4	1.64-4	1.76-4	1.96-4	2.26-4	2.57-4
82	5114.0	1.55-4	1.59-4	1.70-4	1.90-4	2.19-4	2.49-4
83	5290.1	1.50-4	1.54-4	1.65-4	1.84-4	2.12-4	2.41-4
84	5470.3	1.45-4	1.50-4	1.60-4	1.78-4	2.05-4	2.33-4
85	5654.6	1.41-4	1.45-4	1.55-4	1.72-4	1.98-4	2.25-4
86	5843.3	1.37-4	1.40-4	1.50-4	1.67-4	1.91-4	2.18-4
87	6036.4	1.32-4	1.36-4	1.45-4	1.61-4	1.85-4	2.11-4
88	6234.1	1.28-4	1.32-4	1.40-4	1.56-4	1.79-4	2.04-4
89	6436.4	1.24-4	1.27-4	1.35-4	1.50-4	1.73-4	1.97-4
90	6643.4	1.20-4	1.23-4	1.31-4	1.45-4	1.67-4	1.90-4
91	6855.4	1.16-4	1.19-4	1.26-4	1.40-4	1.61-4	1.84-4
92	7072.4	1.12-4	1.15-4	1.22-4	1.35-4	1.55-4	1.78-4

A1 - I1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1049.4	3.43-3	3.01-3	2.23-3	1.35-3	6.36-4	2.73-4
61	1103.9	3.26-3	2.85-3	2.11-3	1.28-3	6.03-4	2.59-4
62	1159.6	3.10-3	2.71-3	2.01-3	1.21-3	5.72-4	2.46-4
63	1216.6	2.95-3	2.58-3	1.91-3	1.15-3	5.43-4	2.34-4
64	1274.9	2.81-3	2.46-3	1.82-3	1.10-3	5.17-4	2.22-4
65	1334.5	2.68-3	2.35-3	1.73-3	1.05-3	4.92-4	2.12-4
66	1395.4	2.56-3	2.24-3	1.65-3	9.99-4	4.69-4	2.02-4
67	1457.6	2.45-3	2.14-3	1.58-3	9.54-4	4.48-4	1.93-4
68	1521.1	2.34-3	2.05-3	1.51-3	9.12-4	4.28-4	1.84-4
69	1585.9	2.24-3	1.96-3	1.45-3	8.72-4	4.09-4	1.76-4
70	1652.0	2.15-3	1.88-3	1.39-3	8.35-4	3.92-4	1.68-4
71	1719.3	2.06-3	1.80-3	1.33-3	8.01-4	3.75-4	1.61-4
72	1788.0	1.98-3	1.73-3	1.28-3	7.68-4	3.60-4	1.54-4
73	1858.0	1.90-3	1.66-3	1.23-3	7.38-4	3.45-4	1.48-4
74	1929.3	1.83-3	1.60-3	1.18-3	7.09-4	3.32-4	1.42-4
75	2001.8	1.76-3	1.54-3	1.13-3	6.82-4	3.19-4	1.37-4
76	2075.7	1.70-3	1.48-3	1.09-3	6.56-4	3.07-4	1.31-4
77	2150.8	1.64-3	1.43-3	1.05-3	6.32-4	2.96-4	1.26-4
78	2227.2	1.58-3	1.38-3	1.01-3	6.09-4	2.85-4	1.22-4
79	2305.0	1.52-3	1.33-3	9.78-4	5.87-4	2.75-4	1.17-4
80	2384.0	1.47-3	1.28-3	9.44-4	5.67-4	2.65-4	1.13-4
81	2464.3	1.42-3	1.24-3	9.12-4	5.47-4	2.56-4	1.09-4
82	2545.9	1.37-3	1.20-3	8.81-4	5.29-4	2.47-4	1.05-4
83	2628.8	1.33-3	1.16-3	8.52-4	5.11-4	2.39-4	1.02-4
84	2713.0	1.29-3	1.12-3	8.24-4	4.94-4	2.31-4	9.84-5
85	2798.5	1.25-3	1.09-3	7.98-4	4.79-4	2.24-4	9.52-5
86	2885.2	1.21-3	1.05-3	7.73-4	4.63-4	2.16-4	9.21-5
87	2973.3	1.17-3	1.02-3	7.49-4	4.49-4	2.10-4	8.92-5
88	3062.6	1.13-3	9.89-4	7.26-4	4.35-4	2.03-4	8.65-5
89	3153.2	1.10-3	9.60-4	7.05-4	4.22-4	1.97-4	8.39-5
90	3245.1	1.07-3	9.31-4	6.84-4	4.10-4	1.91-4	8.14-5
91	3338.3	1.04-3	9.04-4	6.64-4	3.98-4	1.85-4	7.90-5
92	3432.8	1.01-3	8.79-4	6.45-4	3.86-4	1.80-4	7.67-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – I2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1464.8	1.87-3	1.63-3	1.19-3	7.06-4	3.24-4	1.37-4
61	1536.2	2.48-3	2.19-3	1.64-3	1.01-3	4.90-4	2.20-4
62	1605.1	2.36-3	2.08-3	1.57-3	9.82-4	4.85-4	2.20-4
63	1675.1	2.24-3	1.98-3	1.50-3	9.41-4	4.67-4	2.13-4
64	1746.5	2.14-3	1.90-3	1.44-3	9.02-4	4.48-4	2.05-4
65	1819.3	2.06-3	1.82-3	1.38-3	8.66-4	4.31-4	1.97-4
66	1893.6	1.97-3	1.75-3	1.32-3	8.33-4	4.15-4	1.89-4
67	1969.4	1.90-3	1.68-3	1.27-3	8.02-4	3.99-4	1.82-4
68	2046.7	1.83-3	1.62-3	1.23-3	7.72-4	3.84-4	1.76-4
69	2125.5	1.76-3	1.56-3	1.18-3	7.44-4	3.71-4	1.69-4
70	2205.9	1.70-3	1.50-3	1.14-3	7.17-4	3.57-4	1.63-4
71	2287.7	1.64-3	1.45-3	1.10-3	6.92-4	3.45-4	1.57-4
72	2371.1	1.58-3	1.40-3	1.06-3	6.68-4	3.33-4	1.52-4
73	2456.1	1.53-3	1.35-3	1.03-3	6.45-4	3.21-4	1.46-4
74	2542.6	1.48-3	1.31-3	9.92-4	6.24-4	3.10-4	1.41-4
75	2630.7	1.43-3	1.27-3	9.59-4	6.03-4	3.00-4	1.37-4
76	2720.3	1.38-3	1.23-3	9.28-4	5.83-4	2.90-4	1.32-4
77	2811.6	1.34-3	1.19-3	8.98-4	5.64-4	2.81-4	1.28-4
78	2904.4	1.30-3	1.15-3	8.70-4	5.46-4	2.72-4	1.24-4
79	2998.9	1.26-3	1.11-3	8.43-4	5.29-4	2.63-4	1.20-4
80	3094.9	1.22-3	1.08-3	8.17-4	5.13-4	2.55-4	1.16-4
81	3192.6	1.18-3	1.05-3	7.93-4	4.97-4	2.47-4	1.12-4
82	3291.9	1.15-3	1.02-3	7.69-4	4.82-4	2.40-4	1.09-4
83	3392.9	1.12-3	9.87-4	7.46-4	4.68-4	2.32-4	1.05-4
84	3495.5	1.08-3	9.58-4	7.25-4	4.54-4	2.25-4	1.02-4
85	3599.8	1.05-3	9.31-4	7.04-4	4.41-4	2.19-4	9.93-5
86	3705.7	1.02-3	9.05-4	6.84-4	4.29-4	2.12-4	9.64-5
87	3813.3	9.96-4	8.80-4	6.65-4	4.16-4	2.07-4	9.36-5
88	3922.7	9.69-4	8.56-4	6.47-4	4.05-4	2.01-4	9.10-5
89	4033.7	9.43-4	8.33-4	6.29-4	3.94-4	1.95-4	8.85-5
90	4146.5	9.18-4	8.11-4	6.12-4	3.83-4	1.90-4	8.61-5
91	4261.0	8.94-4	7.90-4	5.96-4	3.73-4	1.85-4	8.37-5
92	4377.3	8.71-4	7.70-4	5.81-4	3.63-4	1.80-4	8.15-5

A1 – I3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1471.3	2.04-3	1.82-3	1.41-3	9.10-4	4.68-4	2.17-4
61	1544.7	1.25-3	1.11-3	8.48-4	5.35-4	2.65-4	1.18-4
62	1624.1	1.22-3	1.08-3	8.05-4	4.95-4	2.38-4	1.03-4
63	1705.7	1.18-3	1.04-3	7.76-4	4.74-4	2.25-4	9.73-5
64	1789.3	1.14-3	1.00-3	7.45-4	4.53-4	2.14-4	9.25-5
65	1874.8	1.10-3	9.62-4	7.14-4	4.33-4	2.05-4	8.81-5
66	1962.3	1.05-3	9.24-4	6.85-4	4.15-4	1.95-4	8.40-5
67	2051.7	1.01-3	8.87-4	6.57-4	3.97-4	1.87-4	8.03-5
68	2143.0	9.71-4	8.51-4	6.30-4	3.80-4	1.79-4	7.68-5
69	2236.2	9.33-4	8.17-4	6.05-4	3.65-4	1.71-4	7.35-5
70	2331.4	8.97-4	7.85-4	5.81-4	3.50-4	1.64-4	7.04-5
71	2428.4	8.62-4	7.55-4	5.58-4	3.36-4	1.58-4	6.75-5
72	2527.4	8.30-4	7.27-4	5.37-4	3.23-4	1.51-4	6.48-5
73	2628.3	7.99-4	6.99-4	5.16-4	3.11-4	1.46-4	6.22-5
74	2731.2	7.70-4	6.74-4	4.97-4	2.99-4	1.40-4	5.98-5
75	2835.9	7.42-4	6.50-4	4.79-4	2.88-4	1.35-4	5.75-5
76	2942.6	7.16-4	6.26-4	4.62-4	2.78-4	1.30-4	5.54-5
77	3051.2	6.92-4	6.05-4	4.46-4	2.68-4	1.25-4	5.34-5
78	3161.7	6.68-4	5.84-4	4.30-4	2.58-4	1.21-4	5.14-5
79	3274.1	6.46-4	5.64-4	4.16-4	2.50-4	1.17-4	4.96-5
80	3388.4	6.24-4	5.45-4	4.02-4	2.41-4	1.13-4	4.79-5
81	3504.7	6.04-4	5.28-4	3.89-4	2.33-4	1.09-4	4.63-5
82	3622.9	5.85-4	5.11-4	3.76-4	2.26-4	1.05-4	4.47-5
83	3743.0	5.66-4	4.95-4	3.64-4	2.18-4	1.02-4	4.33-5
84	3865.0	5.49-4	4.79-4	3.53-4	2.12-4	9.86-5	4.19-5
85	3988.9	5.32-4	4.65-4	3.42-4	2.05-4	9.55-5	4.05-5
86	4114.7	5.16-4	4.50-4	3.31-4	1.99-4	9.25-5	3.93-5
87	4242.5	5.01-4	4.37-4	3.21-4	1.93-4	8.97-5	3.81-5
88	4372.2	4.86-4	4.24-4	3.12-4	1.87-4	8.70-5	3.69-5
89	4503.8	4.72-4	4.12-4	3.03-4	1.81-4	8.44-5	3.59-5
90	4637.3	4.59-4	4.00-4	2.94-4	1.76-4	8.19-5	3.48-5
91	4772.8	4.46-4	3.89-4	2.86-4	1.71-4	7.95-5	3.38-5
92	4910.1	4.34-4	3.78-4	2.78-4	1.66-4	7.73-5	3.29-5

A1 – I4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.4	1.68-4	1.35-4	8.29-5	3.74-5	1.21-5	3.83-6
61	1620.0	1.63-4	1.32-4	8.08-5	3.66-5	1.19-5	3.79-6
62	1702.5	1.59-4	1.28-4	7.87-5	3.58-5	1.17-5	3.74-6
63	1786.9	1.54-4	1.25-4	7.67-5	3.50-5	1.15-5	3.68-6
64	1873.2	1.50-4	1.21-4	7.47-5	3.42-5	1.13-5	3.63-6
65	1961.5	1.46-4	1.18-4	7.27-5	3.34-5	1.11-5	3.56-6
66	2051.7	1.42-4	1.15-4	7.08-5	3.25-5	1.09-5	3.50-6
67	2143.9	1.38-4	1.11-4	6.89-5	3.17-5	1.06-5	3.43-6
68	2237.9	1.34-4	1.08-4	6.71-5	3.10-5	1.04-5	3.37-6
69	2333.9	1.30-4	1.05-4	6.53-5	3.02-5	1.02-5	3.30-6
70	2431.8	1.27-4	1.03-4	6.36-5	2.94-5	9.93-6	3.23-6
71	2531.7	1.23-4	9.97-5	6.19-5	2.87-5	9.70-6	3.16-6
72	2633.5	1.20-4	9.69-5	6.03-5	2.80-5	9.47-6	3.10-6
73	2737.2	1.17-4	9.43-5	5.87-5	2.73-5	9.25-6	3.03-6
74	2842.8	1.13-4	9.18-5	5.72-5	2.66-5	9.03-6	2.97-6
75	2950.4	1.10-4	8.94-5	5.57-5	2.60-5	8.82-6	2.90-6
76	3059.9	1.08-4	8.70-5	5.43-5	2.53-5	8.61-6	2.84-6
77	3171.3	1.05-4	8.48-5	5.29-5	2.47-5	8.41-6	2.78-6
78	3284.6	1.02-4	8.26-5	5.16-5	2.41-5	8.22-6	2.72-6
79	3399.9	9.93-5	8.05-5	5.03-5	2.35-5	8.03-6	2.66-6
80	3517.2	9.67-5	7.84-5	4.90-5	2.29-5	7.84-6	2.60-6
81	3636.3	9.43-5	7.65-5	4.79-5	2.24-5	7.66-6	2.54-6
82	3757.4	9.19-5	7.46-5	4.67-5	2.19-5	7.49-6	2.49-6
83	3880.4	8.97-5	7.27-5	4.56-5	2.14-5	7.32-6	2.44-6
84	4005.4	8.75-5	7.10-5	4.45-5	2.09-5	7.16-6	2.39-6
85	4132.3	8.54-5	6.93-5	4.34-5	2.04-5	7.00-6	2.34-6
86	4261.1	8.33-5	6.76-5	4.24-5	1.99-5	6.85-6	2.29-6
87	4391.9	8.14-5	6.61-5	4.15-5	1.95-5	6.70-6	2.24-6
88	4524.6	7.95-5	6.45-5	4.05-5	1.91-5	6.56-6	2.19-6
89	4659.3	7.76-5	6.31-5	3.96-5	1.86-5	6.42-6	2.15-6
90	4795.8	7.59-5	6.16-5	3.87-5	1.82-5	6.29-6	2.10-6
91	4934.4	7.42-5	6.03-5	3.78-5	1.78-5	6.16-6	2.06-6
92	5074.8	7.25-5	5.89-5	3.70-5	1.75-5	6.04-6	2.02-6

A1 – I5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.9	2.69-4	2.20-4	1.40-4	6.72-5	2.37-5	8.17-6
61	1620.5	2.67-4	2.18-4	1.39-4	6.74-5	2.41-5	8.41-6
62	1703.0	2.63-4	2.15-4	1.38-4	6.71-5	2.43-5	8.52-6
63	1787.5	2.58-4	2.12-4	1.36-4	6.64-5	2.42-5	8.56-6
64	1873.9	2.53-4	2.07-4	1.33-4	6.54-5	2.40-5	8.54-6
65	1962.2	2.47-4	2.03-4	1.31-4	6.43-5	2.37-5	8.49-6
66	2052.4	2.41-4	1.98-4	1.28-4	6.31-5	2.34-5	8.41-6
67	2144.6	2.35-4	1.93-4	1.25-4	6.18-5	2.30-5	8.30-6
68	2238.8	2.29-4	1.89-4	1.22-4	6.06-5	2.26-5	8.19-6
69	2334.8	2.24-4	1.84-4	1.19-4	5.93-5	2.22-5	8.06-6
70	2432.8	2.18-4	1.79-4	1.16-4	5.80-5	2.18-5	7.93-6
71	2532.8	2.12-4	1.75-4	1.14-4	5.67-5	2.13-5	7.79-6
72	2634.7	2.07-4	1.71-4	1.11-4	5.54-5	2.09-5	7.65-6
73	2738.5	2.01-4	1.66-4	1.08-4	5.41-5	2.05-5	7.51-6
74	2844.2	1.96-4	1.62-4	1.05-4	5.29-5	2.00-5	7.37-6
75	2951.9	1.91-4	1.58-4	1.03-4	5.17-5	1.96-5	7.22-6
76	3061.5	1.86-4	1.54-4	1.00-4	5.05-5	1.92-5	7.08-6
77	3173.1	1.82-4	1.50-4	9.80-5	4.93-5	1.88-5	6.94-6
78	3286.6	1.77-4	1.46-4	9.56-5	4.82-5	1.84-5	6.80-6
79	3402.0	1.73-4	1.43-4	9.33-5	4.71-5	1.80-5	6.67-6
80	3519.4	1.69-4	1.39-4	9.11-5	4.60-5	1.76-5	6.53-6
81	3638.8	1.65-4	1.36-4	8.90-5	4.50-5	1.72-5	6.40-6
82	3760.0	1.61-4	1.33-4	8.69-5	4.39-5	1.68-5	6.27-6
83	3883.3	1.57-4	1.30-4	8.49-5	4.30-5	1.65-5	6.14-6
84	4008.4	1.53-4	1.26-4	8.29-5	4.20-5	1.61-5	6.02-6
85	4135.6	1.49-4	1.24-4	8.10-5	4.11-5	1.58-5	5.90-6
86	4264.6	1.46-4	1.21-4	7.91-5	4.01-5	1.54-5	5.78-6
87	4395.6	1.42-4	1.18-4	7.73-5	3.93-5	1.51-5	5.66-6
88	4528.6	1.39-4	1.15-4	7.56-5	3.84-5	1.48-5	5.55-6
89	4663.5	1.36-4	1.13-4	7.39-5	3.76-5	1.45-5	5.44-6
90	4800.4	1.33-4	1.10-4	7.23-5	3.67-5	1.42-5	5.33-6
91	4939.2	1.30-4	1.08-4	7.07-5	3.60-5	1.39-5	5.22-6
92	5080.0	1.27-4	1.05-4	6.91-5	3.52-5	1.36-5	5.12-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - I6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1561.9	2 42-4	1.99-4	1.29-4	6.53-5	2.58-5	1.03-5
61	1644.5	2.34-4	1 93-4	1.25-4	6.34-5	2.52-5	1.00-5
62	1729.1	2.26-4	1.86-4	1.21-4	6.17-5	2.46-5	9.81-6
63	1815.8	2.19-4	1.81-4	1.18-4	5.99-5	2.40-5	9.58-6
64	1904.6	2.12-4	1.75-4	1.14-4	5.82-5	2.34-5	9.36-6
65	1995.5	2.06-4	1.70-4	1.11-4	5.66-5	2.28-5	9.14-6
66	2088.4	1.99-4	1.64-4	1.07-4	5.51-5	2.22-5	8.92-6
67	2183.5	1.93-4	1.59-4	1.04-4	5 36-5	2.17-5	8.71-6
68	2280.6	1.87-4	1.55-4	1.01-4	5.21-5	2.11-5	8.50-6
69	2379.8	1.81-4	1.50-4	9.83-5	5.07-5	2.06-5	8.29-6
70	2481.2	1.76-4	1.45-4	9.56-5	4.93-5	2.00-5	8.10-6
71	2584.7	1.71-4	1.41-4	9.29-5	4.80-5	1.96-5	7.90-6
72	2690.3	1.66-4	1.37-4	9.03-5	4.67-5	1.90-5	7.71-6
73	2798.0	1.61-4	1.33-4	8.78-5	4.55-5	1.86-5	7.53-6
74	2907.9	1 56-4	1.30-4	8.54-5	4.43-5	1.81-5	7.35-6
75	3019.9	1 52-4	1.26-4	8.31-5	4.32-5	1.77-5	7.17-6
76	3134.1	1.48-4	1.22-4	8.09-5	4.20-5	1.72-5	7.00-6
77	3250.4	1.44-4	1.19-4	7.87-5	4.10-5	1.68-5	6.84-6
78	3368.9	1.40-4	1.16-4	7.67-5	3.99-5	1.64-5	6.68-6
79	3489.6	1 36-4	1.13-4	7.47-5	3.89-5	1.60-5	6.52-6
80	3612.5	1.32-4	1.10-4	7.28-5	3.80-5	1.56-5	6.37-6
81	3737.6	1.29-4	1.07-4	7.09-5	3.70-5	1.52-5	6.22-6
82	3864.9	1.26-4	1.04-4	6.92-5	3.61-5	1.49-5	6.08-6
83	3994.5	1.22-4	1.02-4	6.74-5	3.53-5	1.45-5	5.94-6
84	4126.2	1.19-4	9.90-5	6.58-5	3.44-5	1.42-5	5.80-6
85	4260.2	1.16-4	9.65-5	6.42-5	3.36-5	1.39-5	5.67-6
86	4396.5	1 13-4	9.42-5	6.26-5	3.28-5	1.36-5	5.54-6
87	4535.0	1.10-4	9.19-5	6.11-5	3.20-5	1.32-5	5.42-6
88	4675.7	1.08-4	8.97-5	5.97-5	3.13-5	1.29-5	5.30-6
89	4818.8	1.05-4	8.75-5	5.83-5	3.06-5	1.27-5	5.18-6
90	4964.1	1.03-4	8.55-5	5.69-5	2.99-5	1.24-5	5.07-6
91	5111.8	1.00-4	8.35-5	5.56-5	2.92-5	1.21-5	4.96-6
92	5261.7	9.80-5	8.16-5	5.43-5	2.86-5	1.19-5	4.85-6

A1 - I7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1563.3	1.89-4	1.53-4	9.54-5	4.41-5	1.46-5	4.66-6
61	1646.0	1.84-4	1.49-4	9.33-5	4.33-5	1.45-5	4.66-6
62	1730.7	1.79-4	1.45-4	9.11-5	4.25-5	1.43-5	4.63-6
63	1817.5	1.74-4	1.41-4	8.87-5	4.15-5	1.41-5	4.58-6
64	1906.4	1.69-4	1.38-4	8.64-5	4.06-5	1.38-5	4.52-6
65	1997.4	1.64-4	1.34-4	8.41-5	3.96-5	1.36-5	4.45-6
66	2090.4	1.60-4	1.30-4	8.18-5	3.86-5	1.33-5	4.38-6
67	2185.6	1.55-4	1.26-4	7.95-5	3.76-5	1.30-5	4.30-6
68	2282.9	1.50-4	1.22-4	7.73-5	3.67-5	1.27-5	4.22-6
69	2382.2	1.46-4	1.19-4	7.52-5	3.57-5	1.24-5	4.14-6
70	2483.7	1.42-4	1.15-4	7.31-5	3.48-5	1.21-5	4.05-6
71	2587.3	1.38-4	1.12-4	7.11-5	3.39-5	1.18-5	3.97-6
72	2693.1	1.33-4	1.09-4	6.91-5	3.30-5	1.16-5	3.88-6
73	2801.0	1.30-4	1.06-4	6.72-5	3.21-5	1.13-5	3.80-6
74	2911.0	1.26-4	1.03-4	6.54-5	3.13-5	1.10-5	3.71-6
75	3023.2	1.22-4	1.00-4	6.36-5	3.05-5	1.07-5	3.63-6
76	3137.5	1.19-4	9.72-5	6.19-5	2.97-5	1.05-5	3.55-6
77	3254.1	1.16-4	9.45-5	6.02-5	2.89-5	1.02-5	3.47-6
78	3372.8	1.12-4	9.19-5	5 86-5	2.82-5	9.96-6	3.39-6
79	3493.7	1.09-4	8.94-5	5.70-5	2.75-5	9.72-6	3.32-6
80	3616.8	1.06-4	8.70-5	5.55-5	2.68-5	9.48-6	3.24-6
81	3742.1	1.03-4	8.46-5	5.41-5	2.61-5	9.25-6	3.17-6
82	3869.7	1.01-4	8.23-5	5.26-5	2.54-5	9.03-6	3.10-6
83	3999.4	9.78-5	8.02-5	5.13-5	2.48-5	8.81-6	3.03-6
84	4131.5	9.52-5	7.80-5	5.00-5	2.42-5	8.60-6	2.96-6
85	4265.7	9.27-5	7.60-5	4.87-5	2.36-5	8.40-6	2.89-6
86	4402.2	9.03-5	7.40-5	4.74-5	2.30-5	8.20-6	2.83-6
87	4541.0	8.79-5	7.21-5	4.62-5	2.24-5	8.01-6	2.76-6
88	4682.1	8.57-5	7.03-5	4.51-5	2.19-5	7.82-6	2.70-6
89	4825.5	8.35-5	6.85-5	4.40-5	2.14-5	7.64-6	2.64-6
90	4971.2	8.14-5	6.68-5	4.29-5	2.08-5	7.47-6	2.58-6
91	5119.1	7.93-5	6.51-5	4.18-5	2.03-5	7.30-6	2.52-6
92	5269.5	7.73-5	6.35-5	4.08-5	1.99-5	7.13-6	2.47-6

A1 - I8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1824.3	9.24-4	8.33-4	6.52-4	4.28-4	2.22-4	1.04-4
61	1912.8	8.85-4	7.97-4	6.24-4	4.09-4	2.12-4	9.92-5
62	2003.3	8.48-4	7.63-4	5.98-4	3.92-4	2.03-4	9.49-5
63	2096.0	8.13-4	7.32-4	5.73-4	3.75-4	1.94-4	9.08-5
64	2190.8	7.80-4	7.02-4	5.50-4	3.60-4	1.86-4	8.70-5
65	2287.6	7.49-4	6.74-4	5.27-4	3.45-4	1.79-4	8.34-5
66	2386.6	7.20-4	6.48-4	5.07-4	3.31-4	1.72-4	8.00-5
67	2487.7	6.93-4	6.23-4	4.87-4	3.18-4	1.65-4	7.68-5
68	2590.9	6.67-4	5.99-4	4.69-4	3.06-4	1.58-4	7.38-5
69	2696.2	6.42-4	5.77-4	4.51-4	2.95-4	1.52-4	7.09-5
70	2803.7	6.19-4	5.56-4	4.34-4	2.84-4	1.47-4	6.82-5
71	2913.3	5.97-4	5.36-4	4.19-4	2.73-4	1.41-4	6.56-5
72	3025.1	5.76-4	5.17-4	4.04-4	2.63-4	1.36-4	6.32-5
73	3139.0	5.56-4	4.99-4	3.90-4	2.54-4	1.31-4	6.09-5
74	3255.1	5.37-4	4.82-4	3.76-4	2.45-4	1.26-4	5.87-5
75	3373.4	5.19-4	4.66-4	3.63-4	2.37-4	1.22-4	5.66-5
76	3493.9	5.02-4	4.51-4	3.51-4	2.29-4	1.18-4	5.46-5
77	3616.6	4.86-4	4.36-4	3.40-4	2.21-4	1.14-4	5.28-5
78	3741.4	4.70-4	4.22-4	3.29-4	2.14-4	1.10-4	5.10-5
79	3868.5	4.55-4	4.09-4	3.18-4	2.07-4	1.07-4	4.93-5
80	3997.9	4.41-4	3.96-4	3.08-4	2.01-4	1.03-4	4.77-5
81	4129.4	4.28-4	3.84-4	2.99-4	1.94-4	9.98-5	4.61-5
82	4263.2	4.15-4	3.73-4	2.90-4	1.88-4	9.66-5	4.47-5
83	4399.3	4.03-4	3.62-4	2.81-4	1.83-4	9.36-5	4.33-5
84	4537.6	3.91-4	3.51-4	2.73-4	1.77-4	9.08-5	4.19-5
85	4678.2	3.80-4	3.41-4	2.65-4	1.72-4	8.81-5	4.06-5
86	4821.1	3.69-4	3.31-4	2.58-4	1.67-4	8.55-5	3.94-5
87	4966.3	3.59-4	3.22-4	2.50-4	1.62-4	8.30-5	3.83-5
88	5113.8	3.49-4	3.13-4	2.43-4	1.58-4	8.06-5	3.72-5
89	5263.6	3.40-4	3.05-4	2.37-4	1.53-4	7.83-5	3.61-5
90	5415.8	3.31-4	2.97-4	2.30-4	1.49-4	7.62-5	3.51-5
91	5570.3	3.22-4	2.89-4	2.24-4	1.45-4	7.41-5	3.41-5
92	5727.1	3.14-4	2.82-4	2.18-4	1.41-4	7.20-5	3.32-5

A1 - I9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2127.3	2.21-4	1.91-4	1.36-4	7.72-5	3.34-5	1.35-5
61	2230.8	2.16-4	1.86-4	1.33-4	7.57-5	3.28-5	1.33-5
62	2337.1	2.11-4	1.82-4	1.30-4	7.41-5	3.22-5	1.31-5
63	2446.2	2.06-4	1.78-4	1.27-4	7.25-5	3.16-5	1.28-5
64	2558.1	2.01-4	1.74-4	1.24-4	7.09-5	3.09-5	1.26-5
65	2672.8	1.96-4	1.69-4	1.21-4	6.93-5	3.02-5	1.23-5
66	2790.5	1.91-4	1.65-4	1.18-4	6.76-5	2.95-5	1.20-5
67	2911.1	1.86-4	1.61-4	1.15-4	6.60-5	2.89-5	1.18-5
68	3034.8	1.82-4	1.57-4	1.12-4	6.44-5	2.82-5	1.15-5
69	3161.5	1.77-4	1.53-4	1.09-4	6.27-5	2.75-5	1.12-5
70	3291.3	1.72-4	1.49-4	1.07-4	6.12-5	2.68-5	1.10-5
71	3424.2	1.67-4	1.45-4	1.04-4	5.96-5	2.62-5	1.07-5
72	3560.4	1.63-4	1.41-4	1.01-4	5.80-5	2.55-5	1.04-5
73	3699.9	1.58-4	1.37-4	9.82-5	5.65-5	2.49-5	1.02-5
74	3842.7	1.54-4	1.33-4	9.55-5	5.50-5	2.42-5	9.93-6
75	3988.9	1.49-4	1.29-4	9.29-5	5.35-5	2.36-5	9.68-6
76	4138.6	1.45-4	1.26-4	9.03-5	5.20-5	2.29-5	9.43-6
77	4291.8	1.41-4	1.22-4	8.77-5	5.06-5	2.23-5	9.18-6
78	4448.7	1.37-4	1.19-4	8.53-5	4.92-5	2.17-5	8.94-6
79	4609.2	1.33-4	1.15-4	8.29-5	4.78-5	2.11-5	8.71-6
80	4773.4	1.29-4	1.12-4	8.05-5	4.65-5	2.06-5	8.47-6
81	4941.5	1.25-4	1.08-4	7.82-5	4.52-5	2.00-5	8.25-6
82	5113.6	1.21-4	1.05-4	7.59-5	4.39-5	1.94-5	8.03-6
83	5289.6	1.18-4	1.02-4	7.37-5	4.26-5	1.89-5	7.81-6
84	5469.8	1.14-4	9.90-5	7.15-5	4.14-5	1.84-5	7.59-6
85	5654.2	1.11-4	9.60-5	6.94-5	4.02-5	1.79-5	7.38-6
86	5842.8	1.07-4	9.31-5	6.73-5	3.91-5	1.74-5	7.18-6
87	6035.9	1.04-4	9.02-5	6.53-5	3.79-5	1.68-5	6.98-6
88	6233.6	1.01-4	8.75-5	6.33-5	3.68-5	1.64-5	6.78-6
89	6435.8	9.76-5	8.48-5	6.14-5	3.57-5	1.59-5	6.59-6
90	6642.9	9.45-5	8.21-5	5.96-5	3.46-5	1.54-5	6.40-6
91	6854.8	9.15-5	7.96-5	5.77-5	3.36-5	1.50-5	6.22-6
92	7071.8	8.86-5	7.70-5	5.59-5	3.26-5	1.46-5	6.04-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leq Z \leq 92$

See page 96 for Explanation of Tables

A1 – J1

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1538.3	2.51-4	2.12-4	1.53-4	1.06-4	8.84-5	9.35-5
61	1618.8	2.43-4	2.06-4	1.49-4	1.03-4	8.66-5	9.17-5
62	1701.3	2.35-4	2.00-4	1.44-4	1.01-4	8.47-5	8.98-5
63	1785.6	2.28-4	1.94-4	1.40-4	9.83-5	8.29-5	8.79-5
64	1871.9	2.21-4	1.88-4	1.37-4	9.59-5	8.10-5	8.61-5
65	1960.2	2.15-4	1.82-4	1.33-4	9.35-5	7.92-5	8.42-5
66	2050.3	2.08-4	1.77-4	1.29-4	9.12-5	7.74-5	8.24-5
67	2142.4	2.02-4	1.72-4	1.26-4	8.90-5	7.57-5	8.06-5
68	2236.4	1.96-4	1.67-4	1.22-4	8.68-5	7.40-5	7.88-5
69	2332.3	1.91-4	1.63-4	1.19-4	8.47-5	7.23-5	7.71-5
70	2430.2	1.86-4	1.58-4	1.16-4	8.26-5	7.06-5	7.54-5
71	2530.0	1.80-4	1.54-4	1.13-4	8.06-5	6.90-5	7.37-5
72	2631.7	1.76-4	1.50-4	1.10-4	7.87-5	6.74-5	7.21-5
73	2735.4	1.71-4	1.46-4	1.08-4	7.68-5	6.59-5	7.05-5
74	2841.0	1.66-4	1.42-4	1.05-4	7.50-5	6.44-5	6.90-5
75	2948.5	1.62-4	1.39-4	1.02-4	7.32-5	6.30-5	6.75-5
76	3057.9	1.58-4	1.35-4	9.97-5	7.15-5	6.16-5	6.60-5
77	3169.3	1.54-4	1.32-4	9.73-5	6.99-5	6.02-5	6.46-5
78	3282.6	1.50-4	1.28-4	9.50-5	6.83-5	5.89-5	6.33-5
79	3397.8	1.46-4	1.25-4	9.27-5	6.67-5	5.76-5	6.19-5
80	3515.0	1.43-4	1.22-4	9.05-5	6.52-5	5.63-5	6.07-5
81	3634.1	1.39-4	1.19-4	8.84-5	6.37-5	5.51-5	5.94-5
82	3755.1	1.36-4	1.16-4	8.64-5	6.23-5	5.39-5	5.82-5
83	3878.1	1.33-4	1.14-4	8.44-5	6.09-5	5.28-5	5.70-5
84	4003.0	1.30-4	1.11-4	8.25-5	5.96-5	5.17-5	5.59-5
85	4129.9	1.26-4	1.09-4	8.07-5	5.83-5	5.06-5	5.48-5
86	4258.6	1.24-4	1.06-4	7.89-5	5.71-5	4.96-5	5.37-5
87	4389.3	1.21-4	1.04-4	7.72-5	5.59-5	4.85-5	5.27-5
88	4522.0	1.18-4	1.01-4	7.55-5	5.47-5	4.76-5	5.17-5
89	4656.6	1.15-4	9.92-5	7.39-5	5.36-5	4.66-5	5.07-5
90	4793.1	1.13-4	9.71-5	7.23-5	5.25-5	4.57-5	4.98-5
91	4931.6	1.10-4	9.50-5	7.08-5	5.14-5	4.48-5	4.89-5
92	5072.0	1.08-4	9.29-5	6.93-5	5.04-5	4.39-5	4.80-5

A1 – J2

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1539.7	1.78-4	1.44-4	9.04-5	4.56-5	2.35-5	1.91-5
61	1620.3	1.72-4	1.39-4	8.74-5	4.43-5	2.31-5	1.89-5
62	1702.9	1.66-4	1.34-4	8.46-5	4.31-5	2.27-5	1.87-5
63	1787.4	1.60-4	1.30-4	8.19-5	4.19-5	2.22-5	1.85-5
64	1873.8	1.55-4	1.26-4	7.92-5	4.07-5	2.18-5	1.82-5
65	1962.1	1.50-4	1.21-4	7.68-5	3.96-5	2.14-5	1.80-5
66	2052.4	1.45-4	1.17-4	7.44-5	3.85-5	2.10-5	1.78-5
67	2144.6	1.40-4	1.14-4	7.21-5	3.75-5	2.06-5	1.76-5
68	2238.7	1.36-4	1.10-4	6.99-5	3.65-5	2.02-5	1.74-5
69	2334.8	1.32-4	1.07-4	6.79-5	3.55-5	1.99-5	1.72-5
70	2432.8	1.27-4	1.03-4	6.59-5	3.46-5	1.95-5	1.70-5
71	2532.7	1.24-4	1.00-4	6.40-5	3.37-5	1.91-5	1.68-5
72	2634.6	1.20-4	9.73-5	6.21-5	3.29-5	1.88-5	1.65-5
73	2738.4	1.16-4	9.44-5	6.04-5	3.20-5	1.84-5	1.63-5
74	2844.2	1.13-4	9.17-5	5.87-5	3.12-5	1.81-5	1.61-5
75	2951.8	1.09-4	8.90-5	5.71-5	3.05-5	1.78-5	1.60-5
76	3061.5	1.06-4	8.65-5	5.55-5	2.97-5	1.75-5	1.58-5
77	3173.0	1.03-4	8.40-5	5.40-5	2.90-5	1.72-5	1.56-5
78	3286.6	1.00-4	8.17-5	5.26-5	2.83-5	1.69-5	1.54-5
79	3402.0	9.75-5	7.95-5	5.12-5	2.77-5	1.66-5	1.52-5
80	3519.4	9.48-5	7.73-5	4.98-5	2.70-5	1.63-5	1.50-5
81	3638.7	9.23-5	7.52-5	4.86-5	2.64-5	1.60-5	1.48-5
82	3760.0	8.98-5	7.32-5	4.73-5	2.58-5	1.57-5	1.47-5
83	3883.2	8.74-5	7.13-5	4.61-5	2.52-5	1.55-5	1.45-5
84	4008.4	8.51-5	6.95-5	4.50-5	2.47-5	1.52-5	1.43-5
85	4135.5	8.29-5	6.77-5	4.39-5	2.41-5	1.50-5	1.42-5
86	4264.6	8.08-5	6.60-5	4.28-5	2.36-5	1.47-5	1.40-5
87	4395.6	7.87-5	6.43-5	4.18-5	2.31-5	1.45-5	1.38-5
88	4528.6	7.68-5	6.27-5	4.08-5	2.26-5	1.42-5	1.37-5
89	4663.5	7.49-5	6.12-5	3.98-5	2.21-5	1.40-5	1.35-5
90	4800.4	7.31-5	5.97-5	3.89-5	2.17-5	1.38-5	1.33-5
91	4939.2	7.13-5	5.83-5	3.80-5	2.12-5	1.36-5	1.32-5
92	5080.0	6.96-5	5.69-5	3.71-5	2.08-5	1.34-5	1.30-5

A1 – J3

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1562.3	2.30-4	1.93-4	1.36-4	8.83-5	6.80-5	6.90-5
61	1644.9	2.22-4	1.87-4	1.32-4	8.60-5	6.66-5	6.77-5
62	1729.6	2.15-4	1.81-4	1.27-4	8.37-5	6.51-5	6.63-5
63	1816.4	2.07-4	1.75-4	1.24-4	8.15-5	6.36-5	6.49-5
64	1905.2	2.01-4	1.69-4	1.20-4	7.93-5	6.21-5	6.35-5
65	1996.1	1.94-4	1.64-4	1.16-4	7.72-5	6.07-5	6.21-5
66	2089.1	1.88-4	1.58-4	1.13-4	7.51-5	5.93-5	6.08-5
67	2184.3	1.82-4	1.54-4	1.09-4	7.31-5	5.79-5	5.94-5
68	2281.5	1.76-4	1.49-4	1.06-4	7.12-5	5.65-5	5.81-5
69	2380.8	1.70-4	1.44-4	1.03-4	6.93-5	5.51-5	5.68-5
70	2482.2	1.65-4	1.40-4	1.00-4	6.74-5	5.38-5	5.55-5
71	2585.8	1.60-4	1.36-4	9.71-5	6.57-5	5.25-5	5.43-5
72	2691.5	1.55-4	1.32-4	9.44-5	6.39-5	5.13-5	5.31-5
73	2799.4	1.51-4	1.28-4	9.17-5	6.22-5	5.01-5	5.19-5
74	2909.4	1.46-4	1.24-4	8.92-5	6.06-5	4.89-5	5.07-5
75	3021.5	1.42-4	1.20-4	8.67-5	5.91-5	4.77-5	4.96-5
76	3135.8	1.38-4	1.17-4	8.43-5	5.75-5	4.66-5	4.85-5
77	3252.3	1.34-4	1.14-4	8.20-5	5.61-5	4.55-5	4.74-5
78	3371.0	1.30-4	1.10-4	7.98-5	5.46-5	4.44-5	4.64-5
79	3491.9	1.26-4	1.07-4	7.77-5	5.33-5	4.33-5	4.53-5
80	3614.9	1.23-4	1.04-4	7.56-5	5.19-5	4.23-5	4.44-5
81	3740.2	1.19-4	1.02-4	7.36-5	5.06-5	4.13-5	4.34-5
82	3867.7	1.16-4	9.88-5	7.17-5	4.94-5	4.04-5	4.24-5
83	3997.4	1.13-4	9.62-5	6.99-5	4.82-5	3.94-5	4.15-5
84	4129.4	1.10-4	9.37-5	6.81-5	4.70-5	3.85-5	4.06-5
85	4263.6	1.07-4	9.12-5	6.64-5	4.59-5	3.77-5	3.98-5
86	4400.1	1.04-4	8.89-5	6.47-5	4.48-5	3.68-5	3.89-5
87	4538.8	1.02-4	8.66-5	6.31-5	4.37-5	3.60-5	3.81-5
88	4679.9	9.89-5	8.44-5	6.15-5	4.27-5	3.52-5	3.73-5
89	4823.2	9.64-5	8.23-5	6.00-5	4.17-5	3.44-5	3.66-5
90	4968.8	9.40-5	8.02-5	5.85-5	4.07-5	3.36-5	3.58-5
91	5116.8	9.17-5	7.83-5	5.71-5	3.98-5	3.29-5	3.51-5
92	5267.0	8.94-5	7.63-5	5.58-5	3.88-5	3.22-5	3.44-5

A1 – K1

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1538.6	3.63-4	2.99-4	1.95-4	9.97-5	4.03-5	1.64-5
61	1619.1	3.51-4	2.90-4	1.89-4	9.69-5	3.94-5	1.61-5
62	1701.6	3.40-4	2.80-4	1.83-4	9.42-5	3.84-5	1.57-5
63	1786.0	3.29-4	2.72-4	1.78-4	9.15-5	3.75-5	1.53-5
64	1872.4	3.19-4	2.63-4	1.72-4	8.90-5	3.65-5	1.50-5
65	1960.6	3.09-4	2.55-4	1.67-4	8.65-5	3.56-5	1.46-5
66	2050.8	2.99-4	2.47-4	1.62-4	8.42-5	3.47-5	1.43-5
67	2143.0	2.90-4	2.40-4	1.58-4	8.19-5	3.38-5	1.39-5
68	2237.1	2.81-4	2.33-4	1.53-4	7.96-5	3.30-5	1.36-5
69	2333.1	2.73-4	2.26-4	1.49-4	7.75-5	3.22-5	1.33-5
70	2431.0	2.65-4	2.19-4	1.44-4	7.54-5	3.14-5	1.30-5
71	2530.9	2.57-4	2.13-4	1.40-4	7.34-5	3.06-5	1.27-5
72	2632.7	2.50-4	2.07-4	1.37-4	7.15-5	2.98-5	1.24-5
73	2736.5	2.43-4	2.01-4	1.33-4	6.96-5	2.91-5	1.21-5
74	2842.2	2.36-4	1.95-4	1.29-4	6.78-5	2.84-5	1.18-5
75	2949.8	2.29-4	1.90-4	1.26-4	6.61-5	2.77-5	1.15-5
76	3059.4	2.23-4	1.85-4	1.22-4	6.44-5	2.70-5	1.13-5
77	3170.9	2.17-4	1.80-4	1.19-4	6.28-5	2.64-5	1.10-5
78	3284.3	2.11-4	1.75-4	1.16-4	6.12-5	2.57-5	1.07-5
79	3399.7	2.05-4	1.70-4	1.13-4	5.97-5	2.51-5	1.05-5
80	3517.1	2.00-4	1.66-4	1.10-4	5.82-5	2.45-5	1.03-5
81	3636.3	1.95-4	1.62-4	1.08-4	5.68-5	2.39-5	1.00-5
82	3757.6	1.90-4	1.57-4	1.05-4	5.54-5	2.34-5	9.81-6
83	3880.7	1.85-4	1.54-4	1.02-4	5.41-5	2.28-5	9.59-6
84	4005.8	1.80-4	1.50-4	9.97-5	5.28-5	2.23-5	9.38-6
85	4132.9	1.76-4	1.46-4	9.73-5	5.15-5	2.18-5	9.17-6
86	4261.9	1.71-4	1.42-4	9.49-5	5.03-5	2.13-5	8.98-6
87	4392.9	1.67-4	1.39-4	9.27-5	4.92-5	2.09-5	8.78-6
88	4525.8	1.63-4	1.36-4	9.05-5	4.80-5	2.04-5	8.59-6
89	4660.6	1.59-4	1.32-4	8.84-5	4.69-5	2.00-5	8.41-6
90	4797.4	1.55-4	1.29-4	8.63-5	4.59-5	1.95-5	8.23-6
91	4936.2	1.52-4	1.26-4	8.43-5	4.49-5	1.91-5	8.06-6
92	5076.9	1.48-4	1.23-4	8.24-5	4.39-5	1.87-5	7.90-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - L1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	959.6	3.11-4	2.89-4	2.40-4	1.66-4	8.73-5	4.06-5
61	1012.3	2.96-4	2.76-4	2.28-4	1.57-4	8.26-5	3.84-5
62	1066.3	2 83-4	2.63-4	2.17-4	1.49-4	7.83-5	3.63-5
63	1121.7	2.71-4	2.51-4	2 07-4	1.41-4	7.42-5	3.44-5
64	1178.5	2.59-4	2.40-4	1.97-4	1.34-4	7.05-5	3.27-5
65	1236.7	2.48-4	2.29-4	1.88-4	1.28-4	6.71-5	3.10-5
66	1296.2	2.37-4	2.19-4	1.79-4	1.22-4	6.38-5	2.95-5
67	1357.2	2.28-4	2.10-4	1.72-4	1.16-4	6.08-5	2.81-5
68	1419.6	2.18-4	2.01-4	1.64-4	1.11-4	5.80-5	2.68-5
69	1483.3	2.10-4	1.93-4	1.57-4	1.06-4	5.54-5	2.56-5
70	1548.4	2.01-4	1.85-4	1.51-4	1.02-4	5.30-5	2.45-5
71	1615.0	1.94-4	1.78-4	1.45-4	9.73-5	5.07-5	2.35-5
72	1683.0	1.86-4	1.71-4	1.39-4	9.33-5	4.86-5	2 25-5
73	1752.3	1 79-4	1.65-4	1.33-4	8.96-5	4.65-5	2 15-5
74	1823.1	1.73-4	1.59-4	1.28-4	8.60-5	4.47-5	2.07-5
75	1895.3	1.66-4	1.53-4	1.23-4	8.27-5	4.29-5	1.99-5
76	1968.9	1.60-4	1.47-4	1.19-4	7.96-5	4.12-5	1.91-5
77	2044.0	1.55-4	1.42-4	1.15-4	7.66-5	3.97-5	1.84-5
78	2120.5	1.49-4	1.37-4	1.10-4	7.38-5	3.82-5	1.77-5
79	2198.4	1.44-4	1.32-4	1.07-4	7 12-5	3.68-5	1.71-5
80	2277.7	1.39-4	1.28-4	1.03-4	6.87-5	3.55-5	1.65-5
81	2358.5	1.35-4	1.24-4	9.93-5	6.63-5	3.43-5	1.59-5
82	2440.7	1.31-4	1.20-4	9.60-5	6.41-5	3.31-5	1 54-5
83	2524.4	1.26-4	1.16-4	9.29-5	6.20-5	3.20-5	1.49-5
84	2609.6	1.22-4	1.12-4	8.99-5	5.99-5	3.10-5	1.44-5
85	2696.2	1.19-4	1.09-4	8.70-5	5.80-5	3.00-5	1.39-5
86	2784.2	1.15-4	1.05-4	8.43-5	5.62-5	2.90-5	1.35-5
87	2873.8	1.11-4	1.02-4	8.18-5	5.44-5	2.81-5	1.31-5
88	2964.8	1.08-4	9.89-5	7.93-5	5.28-5	2.73-5	1.27-5
89	3057.2	1.05-4	9.60-5	7.69-5	5.12-5	2.65-5	1.23-5
90	3151.2	1.02-4	9.33-5	7.47-5	4.97-5	2.57-5	1.20-5
91	3246.6	9.92-5	9.06-5	7.25-5	4.82-5	2.50-5	1.16-5
92	3343.6	9.65-5	8.81-5	7.05-5	4.68-5	2.43-5	1.13-5

A1 - L2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1155.4	1.44-3	1.26-3	9.34-4	5.71-4	2.73-4	1.19-4
61	1212.9	1.37-3	1.20-3	8.94-4	5.46-4	2.62-4	1.14-4
62	1271.8	1.31-3	1.15-3	8.56-4	5.24-4	2.51-4	1.09-4
63	1331.9	1.26-3	1.10-3	8.20-4	5.02-4	2.41-4	1.05-4
64	1393.3	1.21-3	1.06-3	7.87-4	4.82-4	2.31-4	1.01-4
65	1456.1	1.16-3	1.02-3	7.56-4	4.63-4	2.22-4	9.70-5
66	1520.1	1.11-3	9.76-4	7.26-4	4.45-4	2.14-4	9.34-5
67	1585.4	1.07-3	9.38-4	6.98-4	4.28-4	2.06-4	8.99-5
68	1652.0	1.03-3	9.02-4	6.72-4	4.12-4	1.98-4	8.66-5
69	1719.9	9.90-4	8.69-4	6.47-4	3.97-4	1.91-4	8.35-5
70	1789.1	9.54-4	8.37-4	6.23-4	3.83-4	1.84-4	8.05-5
71	1859.6	9.19-4	8.07-4	6.01-4	3.69-4	1.78-4	7.77-5
72	1931.4	8.87-4	7.78-4	5.80-4	3.56-4	1.71-4	7.51-5
73	2004.5	8.56-4	7.51-4	5.60-4	3.44-4	1.66-4	7.25-5
74	2078.8	8.27-4	7.26-4	5.41-4	3.32-4	1.60-4	7.01-5
75	2154.5	7.99-4	7.01-4	5.23-4	3.21-4	1.55-4	6.79-5
76	2231.4	7.73-4	6.78-4	5.06-4	3.11-4	1.50-4	6.57-5
77	2309.7	7.47-4	6.56-4	4.89-4	3.01-4	1.45-4	6.36-5
78	2389.2	7.24-4	6.35-4	4.74-4	2.91-4	1.40-4	6.16-5
79	2470.0	7.01-4	6.15-4	4.59-4	2.82-4	1.36-4	5.98-5
80	2552.2	6.79-4	5.96-4	4.45-4	2.74-4	1.32-4	5.80-5
81	2635.6	6.58-4	5.78-4	4.32-4	2.66-4	1.28-4	5.63-5
82	2720.3	6.39-4	5.61-4	4.19-4	2.58-4	1.24-4	5.46-5
83	2806.3	6.20-4	5.45-4	4.06-4	2.50-4	1.21-4	5.31-5
84	2893.5	6.02-4	5.29-4	3.95-4	2.43-4	1.17-4	5.16-5
85	2982.1	5.85-4	5.14-4	3.83-4	2.36-4	1.14-4	5.02-5
86	3071.9	5.68-4	4.99-4	3.73-4	2.30-4	1.11-4	4.88-5
87	3163.1	5.52-4	4.85-4	3.62-4	2.23-4	1.08-4	4.75-5
88	3255.5	5.37-4	4.72-4	3.53-4	2.17-4	1.05-4	4.63-5
89	3349.2	5.23-4	4.60-4	3.43-4	2.12-4	1.02-4	4.51-5
90	3444.2	5.09-4	4.47-4	3.34-4	2.06-4	9.97-5	4.39-5
91	3540.5	4.96-4	4.36-4	3.25-4	2.01-4	9.72-5	4.28-5
92	3638.1	4.83-4	4.24-4	3.17-4	1.96-4	9.47-5	4.18-5

A1 - L3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1259.1	1.47-4	1.36-4	1.11-4	7.45-5	3.77-5	1.74-5
61	1322.8	1.41-4	1.30-4	1.06-4	7.08-5	3.58-5	1.66-5
62	1388.2	1.35-4	1.25-4	1.01-4	6.73-5	3.41-5	1.58-5
63	1455.4	1.29-4	1.19-4	9.68-5	6.42-5	3.25-5	1.50-5
64	1524.5	1.24-4	1.15-4	9.27-5	6.14-5	3.11-5	1.44-5
65	1595.3	1.20-4	1.10-4	8 90-5	5.88-5	2.98-5	1.38-5
66	1668.0	1.15-4	1.06-4	8.55-5	5.64-5	2.86-5	1.32-5
67	1742.6	1.11-4	1.02-4	8.24-5	5.43-5	2.75-5	1.27-5
68	1819.1	1.08-4	9.91-5	7.97-5	5.24-5	2.65-5	1.23-5
69	1897.5	1.05-4	9.61-5	7.72-5	5.08-5	2.57-5	1.19-5
70	1977.9	1.02-4	9.35-5	7.51-5	4.94-5	2.50-5	1.16-5
71	2060.3	9.97-5	9.15-5	7.34-5	4.83-5	2.44-5	1.13-5
72	2144.6	9.81-5	8.99-5	7.21-5	4.75-5	2.40-5	1.12-5
73	2231.0	9.73-5	8.92-5	7.16-5	4.71-5	2.39-5	1.11-5
74	2319.4	9.78-5	8.97-5	7.20-5	4.74-5	2.40-5	1.11-5
75	2409.8	1.01-4	9.22-5	7.40-5	4.88-5	2.48-5	1.15-5
76	2502.1	1.08-4	9.86-5	7.92-5	5.24-5	2.66-5	1.23-5
77	2595.7	1.24-4	1.14-4	9.16-5	6.07-5	3.09-5	1.42-5
78	2689.4	1.56-4	1.43-4	1.15-4	7.64-5	3.89-5	1.78-5
79	2781.7	1.71-4	1.56-4	1.25-4	8.31-5	4.23-5	1.92-5
80	2873.2	1.64-4	1.50-4	1.20-4	7.91-5	4.02-5	1.82-5
81	2965.4	1.55-4	1.41-4	1.13-4	7.44-5	3.78-5	1.71-5
82	3058.8	1.48-4	1.34-4	1.07-4	7.06-5	3.58-5	1.62-5
83	3153.6	1.42-4	1.29-4	1.02-4	6.74-5	3.42-5	1.55-5
84	3249.8	1.36-4	1.24-4	9.84-5	6.47-5	3.28-5	1.48-5
85	3347.4	1.32-4	1.20-4	9.48-5	6.24-5	3.16-5	1.43-5
86	3446.6	1.27-4	1.16-4	9.17-5	6.02-5	3.05-5	1.38-5
87	3547.2	1.24-4	1.12-4	8.88-5	5.83-5	2.95-5	1.33-5
88	3649.4	1.20-4	1.09-4	8.61-5	5.65-5	2.86-5	1.29-5
89	3753.0	1.17-4	1.06-4	8.36-5	5.48-5	2.78-5	1.25-5
90	3858.2	1.13-4	1.03-4	8.13-5	5.33-5	2.70-5	1.22-5
91	3965.0	1.10-4	1.00-4	7.91-5	5.18-5	2.63-5	1.18-5
92	4073.2	1.08-4	9.75-5	7.70-5	5.04-5	2.56-5	1.15-5

A1 - ' 1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1350.2	2.71-4	2.49-4	2.04-4	1.39-4	7.29-5	3.36-5
61	1412.9	2.60-4	2.39-4	1.95-4	1.32-4	6.93-5	3.18-5
62	1477.1	2.49-4	2.29-4	1.86-4	1.26-4	6.59-5	3.02-5
63	1542.6	2.40-4	2.20-4	1.78-4	1.21-4	6.28-5	2.87-5
64	1609.6	2.30-4	2.11-4	1.71-4	1.15-4	5.99-5	2.73-5
65	1678.0	2.21-4	2.02-4	1.63-4	1.10-4	5.72-5	2.60-5
66	1747.8	2.13-4	1.95-4	1.57-4	1.05-4	5.46-5	2.48-5
67	1819.0	2.04-4	1.87-4	1.50-4	1.01-4	5.21-5	2.37-5
68	1891.6	1.96-4	1.79-4	1.44-4	9.64-5	4.98-5	2.26-5
69	1965.7	1.89-4	1.72-4	1.38-4	9.22-5	4.75-5	2.15-5
70	2041.3	1.81-4	1.65-4	1.32-4	8.81-5	4.54-5	2.06-5
71	2118.3	1.74-4	1.58-4	1.26-4	8.41-5	4.32-5	1.96-5
72	2196.8	1.66-4	1.51-4	1.21-4	8.01-5	4.11-5	1.86-5
73	2276.7	1.58-4	1.44-4	1.15-4	7.59-5	3.89-5	1.76-5
74	2358.2	1.49-4	1.36-4	1.08-4	7.13-5	3.65-5	1.65-5
75	2441.3	1.38-4	1.26-4	9.98-5	6.59-5	3.36-5	1.52-5
76	2526.1	1.24-4	1.12-4	8.89-5	5.85-5	2.98-5	1.35-5
77	2613.2	9.99-5	9.03-5	7.11-5	4.65-5	2.37-5	1.07-5
78	2704.0	6.08-5	5.46-5	4.24-5	2.74-5	1.39-5	6.35-6
79	2800.1	3.94-5	3.53-5	2.74-5	1.75-5	8.82-6	4.16-6
80	2900.6	4.03-5	3.65-5	2.86-5	1.85-5	9.33-6	4.44-6
81	3004.3	4.33-5	3.93-5	3.11-5	2.02-5	1.02-5	4.87-6
82	3110.7	4.50-5	4.10-5	3.25-5	2.13-5	1.08-5	5.13-6
83	3219.7	4.58-5	4.17-5	3.32-5	2.18-5	1.11-5	5.26-6
84	3331.4	4.59-5	4.19-5	3.34-5	2.20-5	1.12-5	5.31-6
85	3445.6	4.56-5	4.17-5	3.33-5	2.19-5	1.12-5	5.31-6
86	3562.5	4.51-5	4.12-5	3.30-5	2.18-5	1.12-5	5.29-6
87	3682.1	4.44-5	4.06-5	3.26-5	2.15-5	1.11-5	5.24-6
88	3804.5	4.37-5	4.00-5	3.21-5	2.13-5	1.07-5	5.19-6
89	3929.8	4.29-5	3.93-5	3.15-5	2.09-5	1.08-5	5.12-6
90	4057.9	4.20-5	3.85-5	3.10-5	2.06-5	1.07-5	5.06-6
91	4188.9	4.12-5	3.77-5	3.04-5	2.02-5	1.05-5	4.98-6
92	4323.1	4.03-5	3.70-5	2.98-5	1.99-5	1.03-5	4.91-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – L5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1436.6	1.10-4	1.03-4	8.54-5	5.93-5	3.15-5	1.47-5
61	1514.6	1.06-4	9.92-5	8.24-5	5.71-5	3.03-5	1.41-5
62	1594.7	1.03-4	9.60-5	7.97-5	5.50-5	2.91-5	1.36-5
63	1676.8	1.00-4	9.32-5	7.72-5	5.32-5	2.81-5	1.31-5
64	1760.9	9.78-5	9.09-5	7.51-5	5.16-5	2.72-5	1.27-5
65	1847.0	9.62-5	8.94-5	7.37-5	5.06-5	2.66-5	1.24-5
66	1935.1	9.66-5	8.97-5	7.39-5	5.06-5	2.66-5	1.24-5
67	2024.8	1.03-4	9.59-5	7.90-5	5.40-5	2.83-5	1.32-5
68	2112.6	1.07-4	9.85-5	8.03-5	5.39-5	2.78-5	1.29-5
69	2199.0	8.30-5	7.62-5	6.13-5	4.05-5	2.06-5	9.54-6
70	2287.0	7.49-5	6.86-5	5.50-5	3.62-5	1.83-5	8.47-6
71	2377.1	7.03-5	6.43-5	5.15-5	3.38-5	1.71-5	7.90-6
72	2469.3	6.70-5	6.13-5	4.89-5	3.21-5	1.62-5	7.49-6
73	2563.6	6.43-5	5.87-5	4.69-5	3.07-5	1.55-5	7.17-6
74	2660.2	6.19-5	5.66-5	4.51-5	2.95-5	1.49-5	6.90-6
75	2758.9	5.98-5	5.46-5	4.36-5	2.85-5	1.44-5	6.67-6
76	2860.0	5.79-5	5.28-5	4.21-5	2.76-5	1.39-5	6.45-6
77	2963.3	5.60-5	5.12-5	4.08-5	2.67-5	1.35-5	6.26-6
78	3069.0	5.44-5	4.96-5	3.96-5	2.60-5	1.31-5	6.08-6
79	3177.2	5.28-5	4.82-5	3.84-5	2.52-5	1.27-5	5.92-6
80	3287.7	5.13-5	4.68-5	3.74-5	2.45-5	1.24-5	5.76-6
81	3400.8	4.99-5	4.55-5	3.64-5	2.39-5	1.21-5	5.62-6
82	3516.5	4.85-5	4.43-5	3.54-5	2.33-5	1.18-5	5.49-6
83	3634.8	4.72-5	4.31-5	3.45-5	2.27-5	1.15-5	5.36-6
84	3755.8	4.60-5	4.20-5	3.36-5	2.22-5	1.13-5	5.25-6
85	3879.5	4.49-5	4.10-5	3.28-5	2.17-5	1.10-5	5.14-6
86	4005.9	4.38-5	4.00-5	3.20-5	2.12-5	1.08-5	5.03-6
87	4135.3	4.27-5	3.91-5	3.13-5	2.07-5	1.06-5	4.94-6
88	4267.6	4.17-5	3.81-5	3.06-5	2.03-5	1.04-5	4.85-6
89	4403.0	4.07-5	3.73-5	2.99-5	1.99-5	1.02-5	4.76-6
90	4541.4	3.98-5	3.64-5	2.93-5	1.95-5	1.00-5	4.68-6
91	4683.0	3.89-5	3.56-5	2.87-5	1.91-5	9.86-6	4.60-6
92	4827.9	3.81-5	3.49-5	2.81-5	1.87-5	9.70-6	4.53-6

A1 – L6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1496.8	9.19-5	8.45-5	6.82-5	4.51-5	2.26-5	1.04-5
61	1567.3	8.80-5	8.08-5	6.51-5	4.29-5	2.15-5	9.92-6
62	1639.6	8.42-5	7.72-5	6.20-5	4.07-5	2.04-5	9.42-6
63	1713.8	8.04-5	7.36-5	5.89-5	3.86-5	1.94-5	8.93-6
64	1789.9	7.63-5	6.98-5	5.58-5	3.64-5	1.82-5	8.41-6
65	1868.0	7.17-5	6.55-5	5.22-5	3.40-5	1.70-5	7.83-6
66	1948.0	6.55-5	5.96-5	4.73-5	3.07-5	1.53-5	7.04-6
67	2030.4	5.31-5	4.81-5	3.77-5	2.42-5	1.19-5	5.48-6
68	2118.8	4.45-5	4.05-5	3.23-5	2.13-5	1.09-5	5.03-6
69	2212.7	6.31-5	5.81-5	4.72-5	3.20-5	1.66-5	7.73-6
70	2309.1	6.63-5	6.11-5	4.98-5	3.37-5	1.76-5	8.17-6
71	2407.5	6.62-5	6.10-5	4.97-5	3.36-5	1.75-5	8.15-6
72	2508.1	6.52-5	6.00-5	4.88-5	3.30-5	1.72-5	7.99-6
73	2610.7	6.37-5	5.86-5	4.77-5	3.22-5	1.68-5	7.78-6
74	2715.5	6.20-5	5.71-5	4.64-5	3.13-5	1.63-5	7.56-6
75	2822.3	6.03-5	5.55-5	4.50-5	3.03-5	1.58-5	7.33-6
76	2931.2	5.86-5	5.39-5	4.37-5	2.94-5	1.53-5	7.10-6
77	3042.3	5.69-5	5.23-5	4.24-5	2.85-5	1.48-5	6.88-6
78	3155.4	5.53-5	5.08-5	4.11-5	2.76-5	1.44-5	6.66-6
79	3270.7	5.37-5	4.93-5	3.99-5	2.68-5	1.39-5	6.45-6
80	3388.1	5.21-5	4.79-5	3.87-5	2.60-5	1.35-5	6.25-6
81	3507.6	5.06-5	4.65-5	3.75-5	2.52-5	1.31-5	6.06-6
82	3629.2	4.92-5	4.51-5	3.64-5	2.44-5	1.27-5	5.87-6
83	3753.0	4.78-5	4.38-5	3.53-5	2.37-5	1.23-5	5.70-6
84	3878.9	4.64-5	4.26-5	3.43-5	2.30-5	1.19-5	5.53-6
85	4007.0	4.51-5	4.14-5	3.33-5	2.23-5	1.16-5	5.37-6
86	4137.2	4.39-5	4.02-5	3.24-5	2.16-5	1.12-5	5.21-6
87	4269.7	4.27-5	3.91-5	3.14-5	2.10-5	1.09-5	5.06-6
88	4404.3	4.15-5	3.80-5	3.06-5	2.04-5	1.06-5	4.92-6
89	4541.0	4.04-5	3.70-5	2.97-5	1.98-5	1.03-5	4.78-6
90	4680.0	3.93-5	3.60-5	2.89-5	1.93-5	1.00-5	4.65-6
91	4821.2	3.83-5	3.50-5	2.81-5	1.88-5	9.75-6	4.53-6
92	4964.6	3.73-5	3.41-5	2.73-5	1.82-5	9.49-6	4.41-6

A1 – L7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1512.8	5.80-4	5.10-4	3.82-4	2.36-4	1.15-4	5.11-5
61	1592.1	5.54-4	4.87-4	3.65-4	2.26-4	1.10-4	4.89-5
62	1673.4	5.29-4	4.65-4	3.48-4	2.16-4	1.05-4	4.68-5
63	1756.5	5.06-4	4.45-4	3.33-4	2.06-4	1.01-4	4.48-5
64	1841.6	4.84-4	4.26-4	3.19-4	1.98-4	9.66-5	4.30-5
65	1928.6	4.63-4	4.08-4	3.06-4	1.89-4	9.26-5	4.13-5
66	2017.6	4.44-4	3.91-4	2.93-4	1.82-4	8.89-5	3.96-5
67	2108.4	4.26-4	3.75-4	2.81-4	1.74-4	8.54-5	3.81-5
68	2201.2	4.09-4	3.60-4	2.70-4	1.68-4	8.21-5	3.66-5
69	2295.9	3.93-4	3.46-4	2.60-4	1.61-4	7.90-5	3.53-5
70	2392.5	3.78-4	3.33-4	2.50-4	1.55-4	7.60-5	3.40-5
71	2491.0	3.64-4	3.21-4	2.41-4	1.49-4	7.32-5	3.27-5
72	2591.4	3.51-4	3.09-4	2.32-4	1.44-4	7.06-5	3.16-5
73	2693.8	3.38-4	2.98-4	2.23-4	1.39-4	6.81-5	3.05-5
74	2798.1	3.26-4	2.87-4	2.16-4	1.34-4	6.58-5	2.94-5
75	2904.3	3.15-4	2.77-4	2.08-4	1.29-4	6.35-5	2.84-5
76	3012.4	3.04-4	2.68-4	2.01-4	1.25-4	6.14-5	2.75-5
77	3122.4	2.94-4	2.59-4	[illegible]	1.21-4	5.94-5	2.66-5
78	3234.3	2.84-4	2.50-4	1.88-4	1.17-4	5.75-5	2.57-5
79	3348.2	2.75-4	2.42-4	1.82-4	1.13-4	5.57-5	2.49-5
80	3464.0	2.66-4	2.34-4	1.76-4	1.10-4	5.40-5	2.42-5
81	3581.7	2.58-4	2.27-4	1.71-4	1.06-4	5.23-5	2.34-5
82	3701.3	2.50-4	2.20-4	1.65-4	1.03-4	5.07-5	2.28-5
83	3822.8	2.42-4	2.13-4	1.61-4	1.00-4	4.92-5	2.21-5
84	3946.3	2.35-4	2.07-4	1.56-4	9.71-5	4.78-5	2.14-5
85	4071.6	2.28-4	2.01-4	1.51-4	9.43-5	4.65-5	2.08-5
86	4198.9	2.22-4	1.95-4	1.47-4	9.16-5	4.51-5	2.03-5
87	4328.1	2.15-4	1.90-4	1.43-4	8.91-5	4.39-5	1.97-5
88	4459.3	2.09-4	1.84-4	1.39-4	8.66-5	4.27-5	1.92-5
89	4592.3	2.04-4	1.79-4	1.35-4	8.43-5	4.16-5	1.87-5
90	4727.3	1.98-4	1.75-4	1.31-4	8.20-5	4.05-5	1.82-5
91	4864.1	1.93-4	1.70-4	1.28-4	7.99-5	3.94-5	1.77-5
92	5002.9	1.88-4	1.66-4	1.25-4	7.78-5	3.84-5	1.73-5

A1 – L8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1770.7	1.30-4	1.19-4	9.65-5	6.56-5	3.44-5	1.57-5
61	1857.3	1.24-4	1.13-4	9.16-5	6.21-5	3.24-5	1.48-5
62	1945.9	1.18-4	1.08-4	8.75-5	5.91-5	3.08-5	1.41-5
63	2036.6	1.14-4	1.04-4	8.38-5	5.64-5	2.93-5	1.34-5
64	2129.3	1.09-4	1.00-4	8.04-5	5.41-5	2.80-5	1.28-5
65	2224.0	1.06-4	9.63-5	7.73-5	5.19-5	2.68-5	1.23-5
66	2320.9	1.02-4	9.29-5	7.45-5	4.99-5	2.58-5	1.18-5
67	2419.8	9.84-5	8.97-5	7.18-5	4.80-5	2.47-5	1.13-5
68	2520.8	9.52-5	8.67-5	6.93-5	4.62-5	2.38-5	1.09-5
69	2623.9	9.21-5	8.38-5	6.70-5	4.46-5	2.29-5	1.04-5
70	2729.0	8.92-5	8.11-5	6.47-5	4.30-5	2.21-5	1.00-5
71	2836.3	8.64-5	7.85-5	6.26-5	4.16-5	2.13-5	9.69-6
72	2945.6	8.38-5	7.61-5	6.06-5	4.02-5	2.06-5	9.35-6
73	3057.1	8.12-5	7.38-5	5.87-5	3.89-5	1.99-5	9.03-6
74	3170.7	7.88-5	7.16-5	5.69-5	3.76-5	1.93-5	8.73-6
75	3286.4	7.66-5	6.95-5	5.52-5	3.65-5	1.86-5	8.44-6
76	3404.2	7.44-5	6.75-5	5.36-5	3.53-5	1.81-5	8.17-6
77	3524.2	7.23-5	6.56-5	5.20-5	3.43-5	1.75-5	7.92-6
78	3646.3	7.03-5	6.37-5	5.05-5	3.33-5	1.70-5	7.67-6
79	3770.6	6.84-5	6.20-5	4.91-5	3.23-5	1.65-5	7.44-6
80	3897.0	6.65-5	6.03-5	4.77-5	3.14-5	1.60-5	7.23-6
81	4025.6	6.48-5	5.87-5	4.64-5	3.05-5	1.55-5	7.02-6
82	4156.4	6.31-5	5.71-5	4.52-5	2.97-5	1.51-5	6.82-6
83	4289.3	6.15-5	5.57-5	4.40-5	2.89-5	1.47-5	6.63-6
84	4424.4	5.99-5	5.42-5	4.28-5	2.81-5	1.43-5	6.46-6
85	4561.8	5.84-5	5.29-5	4.17-5	2.74-5	1.39-5	6.29-6
86	4701.3	5.70-5	5.16-5	4.07-5	2.67-5	1.36-5	6.13-6
87	4843.0	5.56-5	5.03-5	3.97-5	2.60-5	1.32-5	5.97-6
88	4987.0	5.43-5	4.91-5	3.87-5	2.54-5	1.29-5	5.82-6
89	5133.1	5.30-5	4.79-5	3.77-5	2.47-5	1.26-5	5.68-6
90	5281.6	5.18-5	4.68-5	3.69-5	2.41-5	1.23-5	5.55-6
91	5432.2	5.06-5	4.57-5	3.60-5	2.36-5	1.20-5	5.42-6
92	5585.1	4.94-5	4.47-5	3.52-5	2.30-5	1.17-5	5.30-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

	A1 - L9							A1 - L10						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1786.3	4.24-5	3.90-5	3.15-5	2.06-5	1.02-5	4.71-6	1987.7	4.47-5	4.12-5	3.34-5	2.22-5	1.12-5	5.10-6
61	1878.0	4.23-5	3.89-5	3.14-5	2.06-5	1.02-5	4.72-6	2085.2	4.31-5	3.96-5	3.21-5	2.13-5	1.07-5	4.88-6
62	1972.3	4.17-5	3.84-5	3.09-5	2.02-5	1.01-5	4.65-6	2185.3	4.15-5	3.82-5	3.08-5	2.04-5	1.02-5	4.68-6
63	2069.2	4.08-5	3.75-5	3.01-5	1.97-5	9.85-6	4.55-6	2288.1	4.01-5	3.68-5	2.96-5	1.96-5	9.83-6	4.49-6
64	2168.6	3.98-5	3.65-5	2.93-5	1.92-5	9.57-6	4.42-6	2393.5	3.87-5	3.55-5	2.85-5	1.88-5	9.43-6	4.32-6
65	2270.7	3.87-5	3.55-5	2.84-5	1.86-5	9.28-6	4.29-6	2501.5	3.73-5	3.42-5	2.75-5	1.81-5	9.07-6	4.15-6
66	2375.5	3.75-5	3.44-5	2.75-5	1.80-5	8.98-6	4.16-6	2612.4	3.61-5	3.30-5	2.65-5	1.74-5	8.72-6	4.00-6
67	2483.0	3.63-5	3.33-5	2.66-5	1.74-5	8.69-6	4.02-6	2726.0	3.49-5	3.19-5	2.55-5	1.68-5	8.40-6	3.85-6
68	2593.2	3.52-5	3.22-5	2.57-5	1.68-5	8.40-6	3.89-6	2842.4	3.37-5	3.08-5	2.46-5	1.62-5	8.10-6	3.71-6
69	2706.2	3.41-5	3 12-5	2.49-5	1.62-5	8.12-6	3.76-6	2961.6	3.26-5	2.98-5	2.38-5	1.56-5	7.82-6	3.58-6
70	2822.0	3.30-5	3.02-5	2.41-5	1.57-5	7.85-6	3.64-6	3083.8	3.16-5	2.89-5	2.30-5	1.51-5	7.56-6	3.46-6
71	2940.6	3.19-5	2.92-5	2.33-5	1.52-5	7.59-6	3.53-6	3208.9	3.06-5	2.79-5	2.23-5	1.46-5	7.31-6	3.35-6
72	3062.2	3.09-5	2.83-5	2.25-5	1.47-5	7.35-6	3.41-6	3336.9	2.96-5	2.71-5	2.16-5	1.41-5	7.08-6	3.24-6
73	3186.7	2.99-5	2.74-5	2.18-5	1.42-5	7.12-6	3.31-6	3468.0	2.87-5	2.62-5	2.09-5	1.37-5	6.86-6	3.14-6
74	3314.2	2.90-5	2.65-5	2.11-5	1.37-5	6.90-6	3.21-6	3602.2	2.79-5	2.54-5	2.03-5	1.32-5	6.65-6	3.05-6
75	3444.8	2.81-5	2.56-5	2.04-5	1.33-5	6.69-6	3.11-6	3739.5	2.70-5	2.47-5	1.97-5	1.29-5	6.46-6	2.96-6
76	3578.4	2.72-5	2.48-5	1.98-5	1.29-5	6.49-6	3.02-6	3880.0	2.63-5	2.39-5	1.91-5	1.25-5	6.27-6	2.88-6
77	3715.2	2.64-5	2.41-5	1.92-5	1.25-5	6.30-6	2.94-6	4023.7	2.55-5	2.33-5	1.85-5	1.21-5	6.10-6	2.80-6
78	3855.1	2.55-5	2.33-5	1.86-5	1.21-5	6.12-6	2.85-6	4170.7	2.48-5	2.26-5	1.80-5	1.18-5	5.94-6	2.73-6
79	3998.3	2.48-5	2.26-5	1.80-5	1.18-5	5.95-6	2.78-6	4321.1	2.41-5	2.20-5	1.75-5	1.15-5	5.78-6	2.66-6
80	4144.9	2.40-5	2.20-5	1.75-5	1.15-5	5.79-6	2.70-6	4474.9	2.34-5	2.14-5	1.70-5	1.12-5	5.64-6	2.59-6
81	4294.8	2.33-5	2.13-5	1.70-5	1.11-5	5.64-6	2.63-6	4632.2	2.28-5	2.08-5	1.66-5	1.09-5	5.50-6	2.53-6
82	4448.1	2.26-5	2.07-5	1.65-5	1.08-5	5.49-6	2.57-6	4793.0	2.22-5	2.02-5	1.61-5	1.06-5	5.37-6	2.47-6
83	4605.0	2.20-5	2.01-5	1.61-5	1.05-5	5.35-6	2.51-6	4957.5	2.16-5	1.97-5	1.57-5	1.03-5	5.24-6	2.41-6
84	4765.4	2.14-5	1.95-5	1.56-5	1.03-5	5.22-6	2.45-6	5125.6	2.10-5	1.92-5	1.53-5	1.01-5	5.12-6	2.36-6
85	4929.4	2.08-5	1.90-5	1.52-5	1.00-5	5.10-6	2.39-6	5297.6	2.05-5	1.87-5	1.49-5	9.85-6	5.01-6	2.31-6
86	5097.2	2.02-5	1.85-5	1.48-5	9.76-6	4.98-6	2.34-6	5473.4	1.99-5	1.82-5	1.46-5	9.63-6	4.91-6	2.26-6
87	5268.8	1.96-5	1.80-5	1.44-5	9.52-6	4.87-6	2.29-6	5653.2	1.94-5	1.78-5	1.42-5	9.41-6	4.80-6	2.22-6
88	5444.3	1.91-5	1.75-5	1.40-5	9.29-6	4.76-6	2.24-6	5837.0	1.90-5	1.73-5	1.39-5	9.20-6	4.71-6	2.18-6
89	5623.8	1.86-5	1.70-5	1.37-5	9.07-6	4.66-6	2.20-6	6025.0	1.85-5	1.69-5	1.36-5	9.00-6	4.62-6	2.14-6
90	5807.3	1.81-5	1.66-5	1.33-5	8.87-6	4.57-6	2.15-6	6217.3	1.81-5	1.65-5	1.32-5	8.82-6	4.53-6	2.10-6
91	5995.1	1.76-5	1.62-5	1.30-5	8.67-6	4.47-6	2.11-6	6413.9	1.76-5	1.61-5	1.29-5	8.63-6	4.45-6	2.06-6
92	6187.1	1.72-5	1.58-5	1.27-5	8.48-6	4.39-6	2.07-6	6614.9	1.72-5	1.57-5	1.27-5	8.46-6	4.37-6	2.03-6

	A1 - M1							A1 - M2						
Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	931.1	2.20-3	2.41-3	2.94-3	3.99-3	5.75-3	7.81-3	941.4	5.17-3	5.85-3	7.56-3	1.09-2	1.65-2	2.34-2
61	980.8	2.17-3	2.38-3	2.92-3	3.97-3	5.74-3	7.84-3	992.1	4.83-3	5.46-3	7.04-3	1.02-2	1.54-2	2.18-2
62	1031.6	2.13-3	2.34-3	2.88-3	3.93-3	5.70-3	7.82-3	1044.0	4.53-3	5.12-3	6.58-3	9.46-3	1.43-2	2.04-2
63	1083.5	2.09-3	2.30-3	2.84-3	3.88-3	5.66-3	7.90-3	1097.2	4.26-3	4.81-3	6.16-3	8.84-3	1.34-2	1.94-2
64	1136.6	2.04-3	2.26-3	2.79-3	3.83-3	5.58-3	7.82-3	1151.6	4.02-3	4.53-3	5.79-3	8.27-3	1.26-2	1.82-2
65	1190.8	2.00-3	2.21-3	2.74-3	3.76-3	5.50-3	7.72-3	1207.3	3.79-3	4.27-3	5.45-3	7.76-3	1.18-2	1.71-2
66	1246.1	1.95-3	2.16-3	2.69-3	3.69-3	5.39-3	7.48-3	1264.2	3.59-3	4.03-3	5.14-3	7.32-3	1.10-2	1.59-2
67	1302.5	1.91-3	2.12-3	2.63-3	3.63-3	5.30-3	7.35-3	1322.3	3.40-3	3.82-3	4.86-3	6.91-3	1.04-2	1.50-2
68	1360.0	1.87-3	2.07-3	2.58-3	3.56-3	5.21-3	7.22-3	1381.6	3.23-3	3.62-3	4.60-3	6.54-3	9.86-3	1.42-2
69	1418.6	1.83-3	2.03-3	2.53-3	3.49-3	5.11-3	7.08-3	1442.2	3.07-3	3.44-3	4.37-3	6.20-3	9.35-3	1.35-2
70	1478.2	1.78-3	1.98-3	2.48-3	3.42-3	5.02-3	6.95-3	1504.0	2.92-3	3.28-3	4.15-3	5.89-3	8.88-3	1.28-2
71	1538.9	1.75-3	1.94-3	2.43-3	3.36-3	4.93-3	6.81-3	1567.0	2.79-3	3.13-3	3.96-3	5.61-3	8.45-3	1.22-2
72	1600.6	1.71-3	1.90-3	2.38-3	3.30-3	4.85-3	6.68-3	1631.2	2.67-3	2.99-3	3.78-3	5.35-3	8.06-3	1.16-2
73	1663.4	1.68-3	1.87-3	2.34-3	3.24-3	4.76-3	6.55-3	1696.6	2.55-3	2.86-3	3.61-3	5.11-3	7.69-3	1.10-2
74	1727.1	1.64-3	1.83-3	2.29-3	3.19-3	4.68-3	6.43-3	1763.2	2.45-3	2.74-3	3.46-3	4.89-3	7.36-3	1.06-2
75	1791.9	1.61-3	1.80-3	2.26-3	3.14-3	4.60-3	6.31-3	1831.0	2.35-3	2.63-3	3.32-3	4.69-3	7.06-3	1.01-2
76	1857.6	1.59-3	1.77-3	2.22-3	3.09-3	4.53-3	6.20-3	1900.0	2.26-3	2.53-3	3.18-3	4.50-3	6.77-3	9.73-3
77	1924.3	1.56-3	1.74-3	2.19-3	3.05-3	4.47-3	6.09-3	1970.2	2.17-3	2.43-3	3.06-3	4.33-3	6.51-3	9.37-3
78	1992.0	1.54-3	1.72-3	2.16-3	3.00-3	4.40-3	5.99-3	2041.6	2.10-3	2.34-3	2.95-3	4.17-3	6.27-3	9.03-3
79	2060.5	1.52-3	1.69-3	2.13-3	2.97-3	4.34-3	5.90-3	2114.1	2.02-3	2.26-3	2.84-3	4.02-3	6.04-3	8.74-3
80	2130.0	1.50-3	1.67-3	2.10-3	2.93-3	4.29-3	5.81-3	2187.9	1.95-3	2.18-3	2.74-3	3.88-3	5.83-3	8.50-3
81	2200.4	1.48-3	1.66-3	2.08-3	2.90-3	4.24-3	5.74-3	2262.8	1.89-3	2.11-3	2.65-3	3.74-3	5.63-3	8.13-3
82	2271.6	1.47-3	1.64-3	2.06-3	2.87-3	4.19-3	5.66-3	2338.9	1.83-3	2.04-3	2.57-3	3.62-3	5.45-3	8.26-3
83	2343.6	1.46-3	1.63-3	2.04-3	2.84-3	4.15-3	5.60-3	2416.1	1.77-3	1.98-3	2.49-3	3.51-3	5.28-3	7.40-3
84	2416.5	1.44-3	1.61-3	2.03-3	2.82-3	4.11-3	5.54-3	2494.5	1.72-3	1.92-3	2.41-3	3.40-3	5.12-3	7.17-3
85	2490.1	1.44-3	1.60-3	2.02-3	2.80-3	4.07-3	5.48-3	2574.1	1.67-3	1.86-3	2.34-3	3.30-3	4.97-3	6.96-3
86	2564.5	1.43-3	1.60-3	2.01-3	2.78-3	4.04-3	5.43-3	2654.8	1.62-3	1.81-3	2.28-3	3.21-3	4.83-3	6.76-3
87	2639.7	1.42-3	1.59-3	2.00-3	2.76-3	4.01-3	5.39-3	2736.6	1.58-3	1.76-3	2.24-3	3.12-3	4.70-3	6.58-3
88	2715.5	1.42-3	1.58-3	1.99-3	2.75-3	3.98-3	5.35-3	2819.6	1.54-3	1.71-3	2.17-3	3.04-3	4.58-3	6.41-3
89	2792.0	1.42-3	1.58-3	1.99-3	2.74-3	3.95-3	5.31-3	2903.8	1.50-3	1.67-3	2.11-3	2.96-3	4.47-3	6.26-3
90	2869.2	1.42-3	1.58-3	1.98-3	2.72-3	3.93-3	5.28-3	2989.0	1.46-3	1.63-3	2.06-3	2.89-3	4.36-3	6.11-3
91	2946.9	1.42-3	1.58-3	1.98-3	2.77-3	3.91-3	5.26-3	3075.4	1.43-3	1.59-3	2.02-3	2.83-3	4.26-3	5.98-3
92	3025.2	1.42-3	1.58-3	1.98-3	2.74-3	3.89-3	5.24-3	3162.9	1.40-3	1.56-3	1.97-3	2.76-3	4.17-3	5.87-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - M3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	963.4	1.09-3	1.13-3	1.26-3	1.53-3	2.08-3	2.85-3
61	1016.1	1.03-3	1.06-3	1.17-3	1.41-3	1.91-3	2.62-3
62	1070.2	9 70-4	1.00-3	1 09-3	1.31-3	1 75-3	2.42-3
63	1125.7	9.17-4	9 45-4	1 02-3	1.21-3	1.62-3	2 27-3
64	1182 5	8 69-4	8.93-4	9 62-4	1.13-3	1.50-3	2 10-3
65	1240.8	8.24-4	8 45-4	9 05-4	1.06-3	1.39-3	1.95-3
66	1300.4	7.83-4	8.00-4	8.53-4	9.96-4	1 29-3	1.79-3
67	1361.4	7 45-4	7.59-4	8 05-4	9.24-4	1.21-3	1.66-3
68	1423.8	7 10-4	7.22-4	7.60-4	8.67-4	1.13-3	1.56-3
69	1487.6	6.77-4	6 87-4	7 20-4	8.16-4	1 06-3	1.46-3
70	1552.8	6.46-4	6.54-4	6.83-4	7.69-4	9.92-4	1.37-3
71	1619.4	6.18-4	6.24-4	6.48-4	7.25-4	9.29-4	1.30-3
72	1687.5	5.91-4	5.96-4	6.17-4	6.86-4	8.75-4	1.25-3
73	1756.9	5.66-4	5.69-4	5.87-4	6.49-4	8 26-4	1.11-3
74	1827.7	5.43-4	5.45-4	5.59-4	6 15-4	7.76-4	1 04-3
75	1900.0	5.21-4	5.22-4	5.33-4	5.84-4	7.32-4	9.77-4
76	1973.7	5.00-4	5 00-4	5.09-4	5.55-4	6.90-4	9.21-4
77	2048.8	4.81-4	4.79-4	4.87-4	5.27-4	6.55-4	8.68-4
78	2125.3	4.63-4	4.60-4	4.65-4	5.02-4	6.20-4	8.19-4
79	2203.3	4.45-4	4.42-4	4.45-4	4.78-4	5.87-4	7.73-4
80	2282.7	4.29-4	4.25-4	4.26-4	4.55-4	5.56-4	7.31-4
81	2363.5	4.14-4	4.09-4	4.08-4	4.33-4	5.27-4	6.89-4
82	2445.8	4.00-4	3.94-4	3.91-4	4.12-4	4.99-4	6.61-4
83	2529.5	3.86-4	3.80-4	3.74-4	3.92-4	4.72-4	6.04-4
84	2614.7	3.75-4	3.66-4	3.59-4	3.73-4	4.47-4	5.68-4
85	2701.4	3.43-4	3.53-4	3 44-4	3.53-4	4.23-4	5.31-4
86	2789.5	3.30-4	3.40-4	3.29-4	3.35-4	3.89-4	4.95-4
87	2879.0	3.17-4	3.28-4	3.05-4	3.16-4	3.63-4	4.58-4
88	2970.0	3.04-4	3.18-4	2.96-4	2.97-4	3.35-4	4.20-4
89	3062.5	2.90-4	3.07-4	2.83-4	2.76-4	3.05-4	3.78-4
90	3156.5	2.76-4	2.99-4	2.68-4	2.54-4	2.72-4	3.31-4
91	3251.9	2.61-4	2.49-4	2.53-4	2.29-4	2.33-4	2.75-4
92	3348.8	2.45-4	2.31-4	2.[illegible]9-4	2.02-4	1.87-4	2.07-4

A1 - M4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1152.4	4.19-3	4.81-3	6.34-3	9.73-3	1.42-2	2.05-2
61	1206.9	4.01-3	4.59-3	6.07-3	9.36-3	1.37-2	1.98-2
62	1262.6	3.80-3	4.36-3	5.77-3	8.88-3	1.30-2	1.89-2
63	1319 4	3 60-3	4.13-3	5.48-3	8 45-3	1.24-2	1.81-2
64	1377.3	3.42-3	3.93-3	5.22-3	8.01-3	1.18-2	1.73-2
65	1435.3	3.26-3	3.75-3	4.98-3	7.63-3	1.12-2	1.65-2
66	1496.5	3.11-3	3.58-3	4.76-3	7.29-3	1.07-2	1.56-2
67	1557.7	2.98-3	3.43-3	4.56-3	6.98-3	1.03-2	1.50-2
68	1620.0	2.86-3	3.29-3	4.39-3	6.74-3	9.90-3	1.44-2
69	1683.5	2.76-3	3.17-3	4.22-3	6.47-3	9.54-3	1.38-2
70	1747.9	2.66-3	3.06-3	4.08-3	6.22-3	9.21-3	1.33-2
71	1813.5	2 57-3	2.96-3	3.94-3	6.02-3	8.91-3	1.29-2
72	1880.1	2.49-3	2.87-3	3.83-3	5.82-3	8.64-3	1.24-2
73	1947.7	2.42-3	2 79-3	3.72-3	5.64-3	8.39-3	1.20-2
74	2016.3	2.36-3	2.72-3	3.63-3	5.47-3	8.17-3	1.17-2
75	2085.9	2.30-3	2.66-3	3.54-3	5.33-3	7.97-3	1.14-2
76	2156.4	2.26-3	2.61-3	3.47-3	5.19-3	7.78-3	1.11-2
77	2228.0	2.21-3	2.56-3	3.40-3	5.08-3	7.62-3	1.08-2
78	2300.5	2.18-3	2.51-3	3.34-3	4.97-3	7.47-3	1.05-2
79	2373.8	2.14-3	2.48-3	3.29-3	4.88-3	7.33-3	1.03-2
80	2448.1	2 12-3	2.45-3	3.25-3	4.80-3	7.20-3	1.01-2
81	2523.3	2.10-3	2.42-3	3.21-3	4.73-3	7.09-3	9.93-3
82	2599.3	2.08-3	2.40-3	3.18-3	4.67-3	7.00-3	9.75-3
83	2676.2	2.07-3	2.39-3	3.16-3	4.61-3	6.91-3	9.63-3
84	2753.9	2.06-3	2.38-3	3.14-3	4.57-3	6.83-3	9.50-3
85	2832.3	2.08-3	2.37-3	3.13-3	4.53-3	6.76-3	9.38-3
86	2911.5	2.08-3	2.37-3	3.12-3	4.50-3	6.70-3	9.28-3
87	2991.4	2.08-3	2.37-3	3.37-3	4.47-3	6.64-3	9.20-3
88	3072.0	2.09-3	2.37-3	3.18-3	4.45-3	6.60-3	9.13-3
89	3153.3	2.11-3	2.38-3	3.16-3	4.44-3	6.56-3	9.07-3
90	3235.2	2.12-3	2.39-3	3.16-3	4.43-3	6.54-3	9.03-3
91	3317.7	2.14-3	2.44-3	3.16-3	4.43-3	6.52-3	9.00-3
92	3400.8	2.17-3	2.47-3	3.17-3	4.44-3	6.51-3	9.00-3

A1 - M5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1157.1	4.39-3	3.99-3	3.30-3	2.64-3	2.31-3	2.46-3
61	1214.7	4.07-3	3.67-3	2.97-3	2.25-3	1.81-3	1.80-3
62	1273.6	3.83-3	3.44-3	2.75-3	2.03-3	1.55-3	1 49-3
63	1333.8	3.62-3	3.25-3	2 57-3	1.87-3	1 39-3	1 29-3
64	1395.4	3.43-3	3.07-3	2.42-3	1.73-3	1.25-3	1.14-3
65	1458.2	3.26-3	2.91-3	2.28-3	1.61-3	1.14-3	1.01-3
66	1522.3	3.10-3	2.76-3	2 16-3	1.51-3	1.05-3	9.04-4
67	1587.7	2.95-3	2.62-3	2.04-3	1.42-3	9.63-4	8.12-4
68	1654.4	2.81-3	2.49-3	1.93-3	1.33-3	8.87-4	7.30-4
69	1722.4	2.67-3	2.37-3	1.83-3	1.25-3	8.17-4	6.56-4
70	1791.7	2.55-3	2.26-3	1.74-3	1.17-3	7.53-4	5.88-4
71	1862.3	2.43-3	2.16-3	1.66-3	1.11-3	6.94-4	5.27-4
72	1934.2	2.33-3	2.06-3	1.57-3	1.04-3	6.41-4	4.71-4
73	2007.3	2.22-3	1.97-3	1.50-3	9.82-4	5.92-4	4.21-4
74	2081.8	2.13-3	1.88-3	1.43-3	9.27-4	5.36-4	3.74-4
75	2157.6	2.04-3	1.80-3	1.36-3	8.76-4	5.01-4	3.33-4
76	2234.6	1.95-3	1.71-3	1.30-3	8.29-4	4.63-4	2.95-4
77	2313.0	1.87-3	1.64-3	1.24-3	7.85-4	4.28-4	2.61-4
78	2392.6	1.80-3	1.59-3	1.19-3	7.45-4	3.97-4	2.31-4
79	2473.6	1.73-3	1.52-3	1.13-3	7.08-4	3.69-4	2.05-4
80	2555.8	1.66-3	1.46-3	1.09-3	6.74-4	3.43-4	1.81-4
81	2639.3	1.60-3	1.40-3	1.04-3	6.43-4	3.21-4	1.61-4
82	2724.1	1.54-3	1.35-3	1.00-3	6.15-4	3.02-4	1.58-4
83	2810.2	1.49-3	1.31-3	9.67-4	5.89-4	2.85-4	1.32-4
84	2897.6	1.44-3	1.26-3	9.33-4	5.66-4	2.71-4	1.21-4
85	2986.3	1.39-3	1.22-3	9.01-4	5.46-4	2.59-4	1.13-4
86	3076.2	1.35-3	1.18-3	8.72-4	5.28-4	2.49-4	1.07-4
87	3167.5	1.31-3	1.14-3	8.13-4	5.12-4	2.41-4	1.04-4
88	3260.0	1.27-3	1.11-3	8.19-4	4.98-4	2.35-4	1.03-4
89	3353.9	1.23-3	1.08-3	7.97-4	4.86-4	2.32-4	1.05-4
90	3449.0	1.20-3	1.05-3	7.78-4	4.82-4	2.30-4	1.08-4
91	3545.4	1.17-3	1.02-3	7.60-4	4.67-4	2.31-4	1.14-4
92	3643.1	1.14-3	9.98-4	7.44-4	4.61-4	2.33-4	1.22-4

A1 - M6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1171.1	2.45-2	2.59-2	2.95-2	3.58-2	4.65-2	5.91-2
61	1229 6	2.55-2	2.70-2	3.07-2	3.73-2	4.84-2	6.17-2
62	1289.4	2.64-2	2.80-2	3.19-2	3.88-2	5.03-2	6.42-2
63	1350.6	2.73-2	2.90-2	3.31-2	4.02-2	5.22-2	6.69-2
64	1413.1	2.83-2	3.00-2	3.42-2	4.16-2	5.40-2	6.93-2
65	1477.0	2.92-2	3.10-2	3.53-2	4.30-2	5.58-2	7.16-2
66	1542.1	3.01-2	3.19-2	3.64-2	4.43-2	5.74-2	7.34-2
67	1608.6	3.09-2	3.28-2	3.75-2	4.56-2	5.91-2	7.55-2
68	1676.5	3.17-2	3.37-2	3.85-2	4.69-2	6.07-2	7.75-2
69	1745.6	3.25-2	3.46-2	3.94-2	4.80-2	6.22-2	7.93-2
70	1816.1	3.33-2	3.54-2	4.04-2	4.92-2	6.36-2	8.10-2
71	1887.9	3.40-2	3.61-2	4.12-2	5.02-2	6.49-2	8.27-2
72	1961.0	3.47-2	3.69-2	4.20-2	5.12-2	6.62-2	8.41-2
73	2035.5	3.53-2	3.75-2	4.28-2	5.21-2	6.73-2	8.55-2
74	2111.2	3.59-2	3.81-2	4.35-2	5.29-2	6.83-2	8.68-2
75	2188.4	3.64-2	3.87-2	4.41-2	5.37-2	6.93-2	8.79-2
76	2266.8	3.69-2	3.92-2	4.47-2	5.44-2	7.01-2	8.89-2
77	2346.6	3.73-2	3.97-2	4.52-2	5.50-2	7.09-2	8.98-2
78	2427.6	3.77-2	4.01-2	4.57-2	5.56-2	7.16-2	9.06-2
79	2510.1	3.80-2	4.05-2	4.61-2	5.60-2	7.21-2	9.12-2
80	2593.8	3.83-2	4.08-2	4.64-2	5.65-2	7.26-2	9.18-2
81	2678.9	3.86-2	4.10-2	4.67-2	5.68-2	7.30-2	9.22-2
82	2765.3	3.87-2	4.12-2	4.69-2	5.70-2	7.32-2	9.22-2
83	2853.0	3.89-2	4.14-2	4.71-2	5.72-2	7.35-2	9.30-2
84	2942.1	3.90-2	4.15-2	4.72-2	5.74-2	7.37-2	9.32-2
85	3032.5	3.90-2	4.15-2	4.73-2	5.74-2	7.38-2	9.33-2
86	3124.2	3.91-2	4.16-2	4.73-2	5.75-2	7.38-2	9.33-2
87	3217.2	3.91-2	4.15-2	4.72-2	5.74-2	7.37-2	9.33-2
88	3311.6	3.90-2	4.15-2	4.72-2	5.73-2	7.36-2	9.32-2
89	3407.3	3.89-2	4.14-2	4.71-2	5.72-2	7.35-2	9.31-2
90	3504.4	3.88-2	4.13-2	4.70-2	5.71-2	7.33-2	9.29-2
91	3602.8	3.87-2	4.11-2	4.68-2	5.68-2	7.30-2	9.27-2
92	3702.5	3.85-2	4.09-2	4.66-2	5.66-2	7.27-2	9.24-2

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 − M7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1204.8	1.74-1	1.86-1	2.16-1	2.67-1	3.49-1	4.47-1
61	1265.2	1.68-1	1.80-1	2.08-1	2.57-1	3.36-1	4.31-1
62	1326.9	1.62-1	1.73-1	2.00-1	2.47-1	3.23-1	4.15-1
63	1390.1	1.56-1	1.67-1	1.93-1	2.38-1	3.11-1	4.01-1
64	1454.7	1.50-1	1.61-1	1.86-1	2.29-1	2.99-1	3.85-1
65	1520.8	1.45-1	1.55-1	1.79-1	2.20-1	2.87-1	3.70-1
66	1588.2	1.39-1	1.49-1	1.72-1	2.11-1	2.75-1	3.54-1
67	1657.1	1.34-1	1.43-1	1.65-1	2.03-1	2.64-1	3.39-1
68	1727.5	1.29-1	1.38-1	1.59-1	1.95-1	2.54-1	3.25-1
69	1799.3	1.24-1	1.33-1	1.53-1	1.87-1	2.44-1	3.12-1
70	1872.5	1.20-1	1.28-1	1.47-1	1.80-1	2.34-1	2.99-1
71	1947.2	1.15-1	1.23-1	1.41-1	1.73-1	2.24-1	2.87-1
72	2023.4	1.11-1	1.18-1	1.35-1	1.66-1	2.15-1	2.75-1
73	2101.1	1.06-1	1.14-1	1.30-1	1.59-1	2.07-1	2.63-1
74	2180.3	1.02-1	1.09-1	1.25-1	1.53-1	1.98-1	2.53-1
75	2261.0	9.84-2	1.05-1	1.20-1	1.47-1	1.90-1	2.42-1
76	2343.2	9.46-2	1.01-1	1.16-1	1.41-1	1.82-1	2.32-1
77	2426.9	9.10-2	9.71-2	1.11-1	1.35-1	1.75-1	2.23-1
78	2512.1	8.75-2	9.33-2	1.07-1	1.30-1	1.68-1	2.13-1
79	2598.8	8.42-2	8.98-2	1.02-1	1.25-1	1.62-1	2.05-1
80	2687.1	8.10-2	8.64-2	9.86-2	1.20-1	1.55-1	1.97-1
81	2777.0	7.80-2	8.31-2	9.48-2	1.16-1	1.49-1	1.89-1
82	2868.4	7.51-2	8.00-2	9.12-2	1.11-1	1.43-1	1.81-1
83	2961.4	7.23-2	7.70-2	8.78-2	1.07-1	1.38-1	1.75-1
84	3055.9	6.96-2	7.41-2	8.45-2	1.03-1	1.33-1	1.68-1
85	3152.1	6.71-2	7.14-2	8.14-2	9.91-2	1.28-1	1.62-1
86	3249.8	6.47-2	6.88-2	7.84-2	9.54-2	1.23-1	1.56-1
87	3349.2	6.23-2	6.63-2	7.54-2	9.20-2	1.18-1	1.50-1
88	3450.1	6.01-2	6.40-2	7.28-2	8.86-2	1.14-1	1.45-1
89	3552.7	5.80-2	6.17-2	7.02-2	8.55-2	1.10-1	1.40-1
90	3656.9	5.60-2	5.95-2	6.78-2	8.24-2	1.06-1	1.35-1
91	3762.8	5.41-2	5.75-2	6.54-2	7.95-2	1.02-1	1.30-1
92	3870.3	5.22-2	5.55-2	6.32-2	7.68-2	9.88-2	1.26-1

A1 − M8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1260.6	8.56-4	8.51-4	8.85-4	1.04-3	1.41-3	2.16-3
61	1324.3	8.24-4	8.33-4	8.50-4	9.98-4	1.35-3	2.07-3
62	1389.8	7.93-4	7.94-4	8.19-4	9.56-4	1.30-3	1.99-3
63	1457.0	7.63-4	7.65-4	7.90-4	9.20-4	1.26-3	1.93-3
64	1526.1	7.34-4	7.37-4	7.65-4	8.85-4	1.17-3	1.87-3
65	1597.0	7.06-4	7.09-4	7.44-4	8.58-4	1.13-3	1.81-3
66	1669.8	6.79-4	6.83-4	7.38-4	8.22-4	1.09-3	1.75-3
67	1744.4	6.54-4	6.59-4	6.85-4	7.95-4	1.05-3	1.71-3
68	1821.0	6.31-4	6.36-4	6.62-4	7.69-4	1.02-3	1.67-3
69	1899.5	6.09-4	6.15-4	6.40-4	7.38-4	9.84-4	1.63-3
70	1979.9	5.89-4	5.95-4	6.26-4	7.46-4	9.45-4	1.60-3
71	2062.3	5.70-4	5.77-4	6.10-4	7.30-4	9.04-4	1.57-3
72	2146.8	5.53-4	5.61-4	5.95-4	7.15-4	8.48-4	1.54-3
73	2233.3	5.38-4	5.47-4	5.77-4	7.01-4	7.02-4	1.51-3
74	2321.9	5.25-4	5.34-4	5.67-4	6.87-4	9.97-4	1.48-3
75	2412.5	5.15-4	5.23-4	5.57-4	6.73-4	9.77-4	1.44-3
76	2505.2	5.07-4	5.17-4	5.44-4	6.49-4	9.38-4	1.38-3
77	2599.7	4.99-4	5.04-4	5.17-4	5.93-4	8.31-4	1.21-3
78	2695.0	4.92-4	4.73-4	4.35-4	4.03-4	4.64-4	6.05-4
79	2787.9	5.50-4	5.24-4	4.74-4	4.10-4	3.89-4	4.12-4
80	2879.1	5.97-4	5.91-4	5.88-4	6.12-4	7.16-4	8.96-4
81	2971.1	6.15-4	6.19-4	6.42-4	7.10-4	8.83-4	1.15-3
82	3064.4	6.24-4	6.34-4	6.71-4	7.67-4	9.77-4	1.29-3
83	3159.2	6.29-4	6.43-4	6.90-4	8.02-4	1.04-3	1.39-3
84	3255.3	6.32-4	6.49-4	7.03-4	8.28-4	1.09-3	1.45-3
85	3353.0	6.35-4	6.54-4	7.13-4	8.47-4	1.12-3	1.50-3
86	3452.2	6.34-4	6.55-4	7.21-4	8.62-4	1.15-3	1.54-3
87	3552.9	6.34-4	6.57-4	7.26-4	8.74-4	1.17-3	1.58-3
88	3655.1	6.33-4	6.58-4	7.28-4	8.82-4	1.18-3	1.60-3
89	3758.8	6.31-4	6.58-4	7.31-4	8.89-4	1.19-3	1.62-3
90	3864.1	6.29-4	6.57-4	7.32-4	8.93-4	1.20-3	1.64-3
91	3970.9	6.24-4	6.55-4	7.36-4	8.97-4	1.21-3	1.65-3
92	4079.2	6.23-4	6.53-4	7.34-4	8.98-4	1.22-3	1.66-3

A1 − M9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1352.7	6.73-4	6.28-4	5.37-4	4.16-4	3.05-4	2.74-4
61	1415.5	6.55-4	6.12-4	5.34-4	4.32-4	3.49-4	3.49-4
62	1479.8	6.44-4	6.07-4	5.36-4	4.53-4	3.98-4	4.32-4
63	1545.4	6.36-4	6.03-4	5.42-4	4.80-4	4.53-4	5.22-4
64	1612.5	6.30-4	6.05-4	5.50-4	5.09-4	5.11-4	6.17-4
65	1681.0	6.26-4	6.03-4	5.60-4	5.41-4	5.71-4	7.13-4
66	1750.8	6.24-4	6.06-4	5.71-4	5.75-4	6.33-4	8.08-4
67	1822.2	6.25-4	6.11-4	5.92-4	6.12-4	6.96-4	9.06-4
68	1894.9	6.26-4	6.17-4	6.09-4	6.51-4	7.59-4	1.00-3
69	1969.1	6.29-4	6.24-4	6.28-4	6.95-4	8.23-4	1.10-3
70	2044.7	6.32-4	6.31-4	6.43-4	7.08-4	8.86-4	1.19-3
71	2121.7	6.36-4	6.41-4	6.61-4	7.44-4	9.49-4	1.29-3
72	2200.2	6.41-4	6.50-4	6.81-4	7.81-4	1.01-3	1.39-3
73	2280.2	6.46-4	6.61-4	7.03-4	8.20-4	1.08-3	1.49-3
74	2361.6	6.53-4	6.71-4	7.26-4	8.62-4	1.16-3	1.60-3
75	2444.6	6.61-4	6.85-4	7.53-4	9.21-4	1.25-3	1.74-3
76	2529.1	6.72-4	7.06-4	7.91-4	9.94-4	1.38-3	1.94-3
77	2615.4	6.91-4	7.35-4	8.57-4	1.12-3	1.61-3	2.29-3
78	2704.7	7.28-4	8.04-4	1.01-3	1.42-3	2.16-3	3.17-3
79	2799.9	7.38-4	8.37-4	1.09-3	1.62-3	2.57-3	3.86-3
80	2900.5	8.77-4	9.95-4	1.30-3	1.91-3	3.03-3	4.55-3
81	3002.9	1.74-3	2.00-3	2.64-3	3.90-3	6.12-3	9.07-3
82	3103.0	4.77-3	5.45-3	7.11-3	1.03-2	1.58-2	2.28-2
83	3201.1	5.24-3	5.96-3	7.71-3	1.10-2	1.68-2	2.41-2
84	3300.1	5.19-3	5.89-3	7.59-3	1.08-2	1.64-2	2.35-2
85	3400.5	5.10-3	5.78-3	7.43-3	1.06-2	1.60-2	2.28-2
86	3502.5	5.00-3	5.66-3	7.27-3	1.03-2	1.56-2	2.22-2
87	3606.1	4.90-3	5.54-3	7.11-3	1.01-2	1.52-2	2.17-2
88	3711.3	4.80-3	5.43-3	6.96-3	9.85-3	1.48-2	2.12-2
89	3818.2	4.71-3	5.32-3	6.81-3	9.63-3	1.45-2	2.07-2
90	3926.8	4.62-3	5.21-3	6.67-3	9.42-3	1.42-2	2.02-2
91	4037.1	4.52-3	5.10-3	6.53-3	9.21-3	1.38-2	1.98-2
92	4149.0	4.43-3	5.00-3	6.39-3	9.00-3	1.35-2	1.94-2

A1 − M10

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1362.2	6.66-3	7.72-3	1.04-2	1.56-2	2.49-2	3.76-2
61	1425.7	6.68-3	7.73-3	1.04-2	1.55-2	2.47-2	3.71-2
62	1490.7	6.69-3	7.72-3	1.03-2	1.54-2	2.43-2	3.66-2
63	1557.1	6.68-3	7.69-3	1.02-2	1.52-2	2.40-2	3.61-2
64	1625.0	6.66-3	7.68-3	1.02-2	1.50-2	2.36-2	3.55-2
65	1694.3	6.62-3	7.61-3	1.00-2	1.48-2	2.32-2	3.48-2
66	1765.1	6.58-3	7.55-3	9.94-3	1.46-2	2.28-2	3.40-2
67	1837.5	6.52-3	7.48-3	9.83-3	1.44-2	2.24-2	3.33-2
68	1911.3	6.46-3	7.40-3	9.71-3	1.42-2	2.20-2	3.26-2
69	1986.6	6.39-3	7.31-3	9.60-3	1.39-2	2.15-2	3.18-2
70	2063.4	6.32-3	7.22-3	9.43-3	1.37-2	2.11-2	3.11-2
71	2141.7	6.24-3	7.12-3	9.28-3	1.34-2	2.07-2	3.03-2
72	2221.5	6.16-3	7.02-3	9.13-3	1.32-2	2.02-2	2.96-2
73	2302.9	6.07-3	6.91-3	8.97-3	1.29-2	1.98-2	2.88-2
74	2385.8	5.97-3	6.80-3	8.81-3	1.27-2	1.93-2	2.81-2
75	2470.3	5.88-3	6.68-3	8.64-3	1.24-2	1.89-2	2.74-2
76	2556.3	5.77-3	6.55-3	8.46-3	1.21-2	1.84-2	2.66-2
77	2643.9	5.65-3	6.41-3	8.26-3	1.18-2	1.79-2	2.58-2
78	2733.0	5.52-3	6.26-3	8.04-3	1.15-2	1.74-2	2.49-2
79	2823.9	5.35-3	6.05-3	7.76-3	1.10-2	1.66-2	2.38-2
80	2916.5	5.06-3	5.71-3	7.28-3	1.03-2	1.55-2	2.21-2
81	3012.0	4.07-3	4.55-3	5.73-3	7.99-3	1.19-2	1.67-2
82	3113.9	9.26-4	9.72-4	1.08-3	1.32-3	1.77-3	2.28-3
83	3222.1	3.44-4	3.33-4	3.11-4	3.03-4	3.39-4	3.71-4
84	3333.6	2.84-4	2.74-4	2.58-4	2.59-4	3.14-4	3.88-4
85	3447.8	2.74-4	2.67-4	2.60-4	2.78-4	3.62-4	4.81-4
86	3564.7	2.70-4	2.67-4	2.66-4	2.96-4	3.99-4	5.48-4
87	3684.3	2.66-4	2.65-4	2.69-4	3.07-4	4.24-4	5.92-4
88	3806.8	2.62-4	2.62-4	2.70-4	3.14-4	4.39-4	6.19-4
89	3932.0	2.58-4	2.59-4	2.70-4	3.18-4	4.48-4	6.37-4
90	4060.2	2.53-4	2.55-4	2.68-4	3.18-4	4.52-4	6.46-4
91	4191.3	2.49-4	2.51-4	2.65-4	3.18-4	4.52-4	6.50-4
92	4325.4	2.43-4	2.46-4	2.62-4	3.15-4	4.51-4	6.50-4

TABLE IV. Collision Strengths Ω Given as a Function of Z a… …ttered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leq Z \leq 92$

See page 96 for Explanation of Tables

A1 - M11

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1414.8	5.55-4	6.02-4	7.24-4	9.65-4	1.39-3	1.95-3
61	1490.9	5.26-4	5.70-4	6.81-4	9.02-4	1.29-3	1.81-3
62	1568.8	5.01-4	5.42-4	6.43-4	8.49-4	1.21-3	1.70-3
63	1648.6	4.79-4	5.16-4	6.10-4	8.02-4	1.15-3	1.60-3
64	1730.4	4.58-4	4.93-4	5.81-4	7.61-4	1.08-3	1.51-3
65	1814.0	4.39-4	4.72-4	5.54-4	7.23-4	1.03-3	1.43-3
66	1899.5	4.22-4	4.52-4	5.29-4	6.89-4	9.78-4	1.36-3
67	1986.8	4.05-4	4.34-4	5.07-4	6.58-4	9.33-4	1.29-3
68	2076.1	3.91-4	4.18-4	4.87-4	6.31-4	8.93-4	1.23-3
69	2167.2	3.78-4	4.03-4	4.69-4	6.07-4	8.60-4	1.19-3
70	2260.3	3.66-4	3.91-4	4.55-4	5.88-4	8.34-4	1.15-3
71	2355.1	3.58-4	3.82-4	4.46-4	5.76-4	8.19-4	1.13-3
72	2451.9	3.52-4	3.77-4	4.40-4	5.73-4	8.18-4	1.13-3
73	2550.5	3.52-4	3.78-4	4.45-4	5.83-4	8.41-4	1.16-3
74	2651.0	3.63-4	3.92-4	4.67-4	6.22-4	9.08-4	1.27-3
75	2753.4	4.10-4	4.49-4	5.49-4	7.55-4	1.12-3	1.61-3
76	2857.0	1.15-3	1.33-3	1.77-3	2.68-3	4.39-3	6.75-3
77	2961.8	8.60-4	9.71-4	1.29-3	1.93-3	3.16-3	4.87-3
78	3068.0	9.74-4	1.11-3	1.49-3	2.25-3	3.64-3	5.52-3
79	3175.8	9.37-4	1.07-3	1.43-3	2.16-3	3.51-3	5.34-3
80	3286.5	8.74-4	9.98-4	1.33-3	2.01-3	3.26-3	4.96-3
81	3399.8	8.23-4	9.44-4	1.25-3	1.89-3	3.05-3	4.63-3
82	3516.0	7.79-4	8.93-4	1.18-3	1.78-3	2.87-3	4.34-3
83	3635.7	6.92-4	7.92-4	1.04-3	1.55-3	2.48-3	3.72-3
84	3756.3	4.55-4	5.07-4	6.50-4	9.50-4	1.53-3	2.34-3
85	3879.2	6.69-4	7.65-4	1.01-3	1.51-3	2.43-3	3.68-3
86	4002.4	2.87-4	3.13-4	3.78-4	5.13-4	7.53-4	1.07-3
87	4127.2	2.57-4	2.78-4	3.31-4	4.41-4	6.37-4	8.97-4
88	4253.8	2.40-4	2.58-4	3.05-4	4.02-4	5.76-4	8.07-4
89	4382.2	2.29-4	2.44-4	2.88-4	3.76-4	5.36-4	7.50-4
90	4512.5	2.19-4	2.34-4	2.75-4	3.58-4	5.07-4	7.09-4
91	4644.5	2.12-4	2.26-4	2.64-4	3.43-4	4.85-4	6.77-4
92	4778.4	2.05-4	2.19-4	2.55-4	3.30-4	4.67-4	6.51-4

A1 - M12

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1423.1	4.82-4	5.30-4	6.52-4	8.86-4	1.27-3	1.79-3
61	1499.7	4.50-4	4.94-4	6.04-4	8.15-4	1.17-3	1.63-3
62	1578.2	4.22-4	4.62-4	5.61-4	7.52-4	1.07-3	1.50-3
63	1658.6	3.95-4	4.31-4	5.21-4	6.94-4	9.87-4	1.37-3
64	1741.0	3.70-4	4.02-4	4.82-4	6.38-4	9.02-4	1.25-3
65	1825.3	3.44-4	3.73-4	4.43-4	5.81-4	8.15-4	1.12-3
66	1911.5	3.16-4	3.41-4	4.01-4	5.18-4	7.19-4	9.79-4
67	1999.5	2.85-4	3.04-4	3.51-4	4.43-4	6.03-4	8.08-4
68	2089.5	2.44-4	2.55-4	2.83-4	3.40-4	4.40-4	5.71-4
69	2181.3	1.85-4	1.83-4	1.79-4	1.79-4	1.86-4	2.08-4
70	2274.6	4.40-4	4.68-4	5.46-4	7.42-4	1.17-3	1.84-3
71	2367.9	1.33-3	1.51-3	1.98-3	2.98-3	4.88-3	7.61-3
72	2461.6	1.54-3	1.76-3	2.34-3	3.55-3	5.82-3	9.03-3
73	2557.5	1.48-3	1.70-3	2.26-3	3.42-3	5.61-3	8.69-3
74	2655.3	1.32-3	1.51-3	2.01-3	3.05-3	5.00-3	7.73-3
75	2755.1	1.12-3	1.28-3	1.69-3	2.56-3	4.19-3	6.47-3
76	2857.5	2.36-4	2.42-4	2.60-4	3.04-4	3.85-4	4.96-4
77	2962.8	4.14-4	4.54-4	5.63-4	7.81-4	1.17-3	1.68-3
78	3070.7	2.04-4	2.05-4	2.10-4	2.39-4	3.19-4	4.55-4
79	3181.3	1.60-4	1.55-4	1.45-4	1.36-4	1.37-4	1.55-4
80	3293.2	1.56-4	1.52-4	1.43-4	1.36-4	1.34-4	1.46-4
81	3406.7	1.51-4	1.45-4	1.38-4	1.30-4	1.28-4	1.40-4
82	3521.8	1.45-4	1.40-4	1.32-4	1.25-4	1.30-4	1.53-4
83	3637.9	1.89-4	1.90-4	2.07-4	2.50-4	3.54-4	5.18-4
84	3757.5	3.88-4	4.31-4	5.40-4	7.62-4	1.16-3	1.68-3
85	3879.4	1.38-4	1.32-4	1.27-4	1.22-4	1.21-4	1.35-4
86	4005.6	4.82-4	5.45-4	7.04-4	1.04-3	1.67-3	2.55-3
87	4135.0	4.77-4	5.38-4	6.95-4	1.02-3	1.65-3	2.51-3
88	4267.4	4.48-4	5.02-4	6.45-4	9.46-4	1.52-3	2.33-3
89	4402.9	3.38-4	3.72-4	4.66-4	6.69-4	1.08-3	1.66-3
90	4542.5	4.72-4	5.39-4	7.07-4	1.03-3	1.59-3	2.31-3
91	4676.8	1.59-4	1.70-4	1.95-4	2.43-4	3.24-4	4.24-4
92	4811.3	1.71-4	1.84-4	2.15-4	2.73-4	3.72-4	4.94-4

A1 - M13

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1437.8	2.41-4	2.26-4	1.93-4	1.46-4	1.01-4	7.88-5
61	1515.9	2.36-4	2.20-4	1.86-4	1.37-4	8.83-5	6.18-5
62	1595.9	2.38-4	2.22-4	1.86-4	1.37-4	8.99-5	6.67-5
63	1677.9	2.76-4	2.64-4	2.38-4	2.10-4	2.05-4	2.49-4
64	1761.3	7.34-4	7.90-4	9.43-4	1.28-3	1.96-3	3.00-3
65	1843.5	2.01-3	2.30-3	3.06-3	4.61-3	7.53-3	1.17-2
66	1926.0	2.20-3	2.54-3	3.40-3	5.18-3	8.48-3	1.32-2
67	2010.4	2.22-3	2.57-3	3.46-3	5.28-3	8.64-3	1.34-2
68	2096.7	2.23-3	2.59-3	3.49-3	5.32-3	8.71-3	1.35-2
69	2185.2	2.24-3	2.61-3	3.52-3	5.37-3	8.79-3	1.36-2
70	2276.0	1.92-3	2.24-3	3.05-3	4.66-3	7.57-3	1.16-2
71	2370.7	9.35-4	1.09-3	1.46-3	2.19-3	3.48-3	5.19-3
72	2468.7	5.78-4	6.63-4	8.72-4	1.28-3	1.98-3	2.89-3
73	2568.2	4.48-4	5.09-4	6.57-4	9.43-4	1.43-3	2.07-3
74	2669.5	3.85-4	4.34-4	5.54-4	7.85-4	1.18-3	1.68-3
75	2772.8	3.43-4	3.85-4	4.86-4	6.80-4	1.01-3	1.43-3
76	2877.9	3.13-4	3.48-4	4.35-4	6.05-4	8.91-4	1.25-3
77	2984.9	2.91-4	3.23-4	4.00-4	5.53-4	8.08-4	1.13-3
78	3093.8	2.75-4	3.05-4	3.76-4	5.16-4	7.51-4	1.05-3
79	3204.6	2.64-4	2.92-4	3.60-4	4.91-4	7.12-4	9.89-4
80	3317.2	2.56-4	2.83-4	3.50-4	4.74-4	6.84-4	9.48-4
81	3431.7	2.50-4	2.76-4	3.41-4	4.61-4	6.64-4	9.19-4
82	3548.0	2.45-4	2.71-4	3.34-4	4.51-4	6.50-4	8.98-4
83	3666.2	2.42-4	2.67-4	3.29-4	4.45-4	6.41-4	8.85-4
84	3786.2	2.40-4	2.65-4	3.27-4	4.42-4	6.37-4	8.78-4
85	3908.1	2.40-4	2.65-4	3.27-4	4.43-4	6.38-4	8.81-4
86	4031.8	2.41-4	2.67-4	3.31-4	4.49-4	6.49-4	8.98-4
87	4157.3	2.49-4	2.76-4	3.43-4	4.69-4	6.81-4	9.44-4
88	4284.6	2.70-4	3.00-4	3.79-4	5.23-4	7.68-4	1.08-3
89	4413.5	3.67-4	4.18-4	5.39-4	7.70-4	1.17-3	1.67-3
90	4543.3	2.21-4	2.36-4	2.78-4	3.80-4	6.02-4	9.39-4
91	4683.3	5.20-4	5.89-4	7.69-4	1.13-3	1.81-3	2.75-3
92	4828.1	4.96-4	5.61-4	7.29-4	1.07-3	1.71-3	2.60-3

A1 - M14

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1464.1	2.45-3	2.85-3	3.89-3	6.01-3	9.94-3	1.55-2
61	1536.2	2.42-3	2.81-3	3.83-3	5.91-3	9.77-3	1.52-2
62	1610.2	2.38-3	2.77-3	3.77-3	5.81-3	9.59-3	1.50-2
63	1686.4	2.30-3	2.68-3	3.66-3	5.64-3	9.32-3	1.46-2
64	1765.2	1.81-3	2.12-3	2.90-3	4.48-3	7.41-3	1.16-2
65	1849.3	5.05-4	5.68-4	7.32-4	1.07-3	1.71-3	2.63-3
66	1937.2	2.85-4	3.01-4	3.43-4	4.44-4	6.51-4	9.57-4
67	2027.4	2.34-4	2.38-4	2.51-4	2.92-4	3.93-4	5.54-4
68	2118.5	1.81-4	1.70-4	1.48-4	1.18-4	9.75-5	9.79-5
69	2205.1	1.14-4	1.05-4	8.76-5	6.98-5	6.37-5	7.62-5
70	2294.4	1.07-4	9.77-5	8.09-5	6.05-5	4.50-5	3.85-5
71	2386.3	1.27-4	1.23-4	1.18-4	1.17-4	1.32-4	1.64-4
72	2480.9	1.94-4	2.02-4	2.27-4	2.84-4	4.01-4	5.70-4
73	2578.3	3.02-4	3.30-4	4.02-4	5.53-4	8.39-4	1.24-3
74	2678.5	4.28-4	4.78-4	6.05-4	8.66-4	1.35-3	2.02-3
75	2781.7	5.44-4	6.14-4	7.93-4	1.16-3	1.83-3	2.75-3
76	2887.7	6.35-4	7.21-4	9.41-4	1.39-3	2.21-3	3.32-3
77	2996.6	6.95-4	7.96-4	1.04-3	1.54-3	2.47-3	3.72-3
78	3108.4	7.33-4	8.40-4	1.10-3	1.64-3	2.63-3	3.98-3
79	3223.1	7.54-4	8.64-4	1.14-3	1.70-3	2.73-3	4.12-3
80	3340.9	7.59-4	8.71-4	1.15-3	1.72-3	2.77-3	4.18-3
81	3461.6	7.54-4	8.66-4	1.15-3	1.72-3	2.76-3	4.18-3
82	3585.5	7.42-4	8.52-4	1.13-3	1.69-3	2.73-3	4.13-3
83	3712.5	7.26-4	8.33-4	1.11-3	1.66-3	2.68-3	4.05-3
84	3842.7	7.06-4	8.10-4	1.08-3	1.62-3	2.61-3	3.93-3
85	3976.3	6.83-4	7.83-4	1.04-3	1.56-3	2.53-3	3.84-3
86	4113.3	6.57-4	7.53-4	1.00-3	1.50-3	2.43-3	3.70-3
87	4253.7	6.26-4	7.17-4	9.50-4	1.43-3	2.31-3	3.51-3
88	4397.8	5.67-4	6.45-4	8.48-4	1.26-3	2.04-3	3.10-3
89	4542.0	1.76-4	1.78-4	1.88-4	2.22-4	3.07-4	4.44-4
90	4681.9	9.34-5	8.58-5	7.01-5	4.96-5	3.07-5	2.09-5
91	4823.2	9.00-5	8.35-5	7.03-5	5.41-5	4.16-5	3.85-5
92	4966.7	8.87-5	8.29-5	7.16-5	5.86-5	5.11-5	5.38-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - M15

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1498.6	4.46-4	4.86-4	5.93-4	8.60-4	1.39-3	2.20-3
61	1569.2	3.93-4	4.25-4	5.12-4	7.32-4	1.18-3	1.87-3
62	1641.7	3.52-4	3.77-4	4.49-4	6.33-4	1.02-3	1.62-3
63	1716.2	3.15-4	3.35-4	3.93-4	5.46-4	8.75-4	1.39-3
64	1792.5	2.79-4	2.94-4	3.40-4	4.64-4	7.39-4	1.17-3
65	1870.8	2.43-4	2.54-4	2.87-4	3.84-4	6.04-4	9.54-4
66	1951.2	2.09-4	2.14-4	2.35-4	3.05-4	4.72-4	7.39-4
67	2033.7	1.74-4	1.76-4	1.87-4	2.34-4	3.52-4	5.46-4
68	2119.5	1.72-4	1.79-4	2.02-4	2.69-4	4.15-4	6.34-4
69	2214.2	2.01-4	2.01-4	2.06-4	2.32-4	3.03-4	4.22-4
70	2310.7	1.90-4	1.89-4	1.89-4	2.04-4	2.56-4	3.49-4
71	2409.2	1.82-4	1.79-4	1.76-4	1.86-4	2.28-4	3.07-4
72	2509.0	1.74-4	1.71-4	1.67-4	1.73-4	2.09-4	2.78-4
73	2612.[illegible]	1.68-4	1.64-4	1.59-4	1.63-4	1.94-4	2.56-4
74	2717.3	1.62-4	1.58-4	1.52-4	1.55-4	1.82-4	2.39-4
75	2824.1	1.57-4	1.53-4	1.46-4	1.48-4	1.73-4	2.26-4
76	2933.1	1.51-4	1.47-4	1.41-4	1.42-4	1.65-4	2.14-4
77	3044.2	1.47-4	1.43-4	1.36-4	1.36-4	1.58-4	2.05-4
78	3157.3	1.42-4	1.[illegible]3-4	1.32-4	1.31-4	1.52-4	1.97-4
79	3272.6	1.38-4	1.34-4	1.27-4	1.27-4	1.47-4	1.91-4
80	3390.0	1.34-4	1.30-4	1.24-4	1.24-4	1.43-4	1.85-4
81	3509.6	1.30-4	1.26-4	1.21-4	1.21-4	1.40-4	1.82-4
82	3631.3	1.27-4	1.23-4	1.18-4	1.19-4	1.38-4	1.80-4
83	3755.1	1.24-4	1.20-4	1.16-4	1.17-4	1.39-4	1.82-4
84	3881.1	1.21-4	1.18-4	1.15-4	1.18-4	1.41-4	1.86-4
85	4009.2	1.20-4	1.17-4	1.15-4	1.21-4	1.48-4	1.98-4
86	4139.5	1.20-4	1.19-4	1.19-4	1.29-4	1.64-4	2.24-4
87	4272.0	1.25-4	1.26-4	1.33-4	1.54-4	2.09-4	2.94-4
88	4406.7	1.61-4	1.71-4	2.01-4	2.69-4	4.04-4	5.95-4
89	4547.2	5.32-4	6.15-4	8.31-4	1.27-3	2.07-3	3.16-3
90	4697.9	6.01-4	6.93-4	9.30-4	1.41-3	2.30-3	3.51-3
91	[illegible]	6.12-4	7.03-4	9.39-4	1.41-3	2.30-3	3.52-3
92	[illegible]	4.43-4	3.92-4	2.98-4	1.95-4	1.13-4	7.49-5

A1 - M16

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1513.5	1.52-3	1.34-3	1.03-3	6.83-4	4.11-4	2.87-4
61	1592.9	1.44-3	1.27-3	9.71-4	6.40-4	3.79-4	2.57-4
62	1674.2	1.36-3	1.20-3	9.15-4	5.96-4	3.42-4	2.18-4
63	1757.4	1.27-3	1.12-3	8.46-4	5.37-4	2.85-4	1.54-4
64	1839.7	8.40-4	9.69-4	1.31-3	2.09-3	3.61-3	5.90-3
65	1921.8	7.05-4	8.27-4	1.15-3	1.88-3	3.31-3	5.47-3
66	2006.2	6.35-4	7.37-4	1.01-3	1.65-3	2.90-3	4.80-3
67	2092.9	5.93-4	6.82-4	9.24-4	1.49-3	2.62-3	4.34-3
68	2181.8	5.63-4	6.42-4	8.60-4	1.37-3	2.41-3	4.00-3
69	2273.1	5.38-4	6.11-4	8.11-4	1.28-3	2.22-3	3.71-3
70	2366.8	5.17-4	5.84-4	7.67-4	1.21-3	2.13-3	3.48-3
71	2462.9	4.99-4	5.60-4	7.30-4	1.15-3	2.01-3	3.28-3
72	2561.5	4.81-4	5.38-4	6.98-4	1.09-3	1.90-3	3.10-3
73	2662.7	4.65-4	5.18-4	6.70-4	1.04-3	1.81-3	2.95-3
74	2766.4	4.49-4	5.00-4	6.43-4	9.96-4	1.73-3	2.81-3
75	2872.8	4.34-4	4.82-4	6.20-4	9.56-4	1.66-3	2.69-3
76	2981.9	4.20-4	4.66-4	5.98-4	9.21-4	1.59-3	2.58-3
77	3093.8	4.05-4	4.50-4	5.79-4	8.91-4	1.54-3	2.49-3
78	3208.6	3.91-4	4.35-4	5.62-4	8.66-4	1.50-3	2.42-3
79	3326.3	3.78-4	4.21-4	5.48-4	8.49-4	1.47-3	2.37-3
80	3446.9	3.66-4	4.11-4	5.41-4	8.45-4	1.46-3	2.36-3
81	3570.7	3.61-4	4.09-4	5.46-4	8.62-4	1.50-3	2.41-3
82	3699.5	3.71-4	4.31-4	5.98-4	9.67-4	1.69-3	2.70-3
83	3824.4	5.61-4	4.96-4	3.78-4	2.50-4	1.55-4	1.22-4
84	3947.9	5.47-4	4.80-4	3.60-4	2.25-4	1.17-4	6.47-5
85	4073.4	5.30-4	4.66-4	3.49-4	2.18-4	1.11-4	5.79-5
86	4200.7	5.15-4	4.53-4	3.39-4	2.12-4	1.09-4	5.69-5
87	4330.0	5.01-4	4.40-4	3.30-4	2.07-4	1.07-4	5.74-5
88	4461.2	4.87-4	4.29-4	3.22-4	2.03-4	1.07-4	5.87-5
89	4594.3	4.75-4	4.18-4	3.15-4	2.00-4	1.07-4	6.06-5
90	4729.3	4.63-4	4.08-4	3.08-4	1.96-4	1.07-4	6.28-5
91	4866.2	4.51-4	3.98-4	3.01-4	1.93-4	1.06-4	6.42-5
92	5012.9	7.17-4	8.20-4	1.08-3	1.60-3	2.57-3	3.89-3

A1 - M17

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1521.8	1.96-2	2.08-2	2.36-2	2.86-2	3.66-2	4.63-2
61	1601.4	1.92-2	2.04-2	2.34-2	2.86-2	3.69-2	4.73-2
62	1681.5	1.06-2	1.16-2	1.40-2	1.84-2	2.57-2	3.54-2
63	1759.6	1.61-3	1.88-3	2.59-3	4.02-3	6.64-3	1.05-2
64	1842.4	1.29-3	1.18-3	1.00-3	8.73-4	9.02-4	1.16-3
65	1929.6	1.19-3	1.06-3	8.16-4	5.56-4	3.64-4	3.01-4
66	2018.6	1.13-3	9.98-4	7.65-4	5.09-4	3.12-4	2.34-4
67	2109.5	1.07-3	9.48-4	7.23-4	4.75-4	2.82-4	2.00-4
68	2202.3	1.02-3	9.03-4	6.86-4	4.47-4	2.38-4	1.76-4
69	2297.0	9.75-4	8.61-4	6.52-4	4.21-4	2.37-4	1.56-4
70	2393.6	9.32-4	8.21-4	6.21-4	3.98-4	2.22-4	1.40-4
71	2492.2	8.91-4	7.85-4	5.92-4	3.77-4	2.06-4	1.25-4
72	2592.7	8.53-4	7.51-4	5.65-4	3.58-4	1.93-4	1.13-4
73	2695.1	8.17-4	7.19-4	5.40-4	3.40-4	1.80-4	1.02-4
74	2799.4	7.84-4	6.89-4	5.17-4	3.24-4	1.69-4	9.25-5
75	2905.6	7.52-4	6.61-4	4.95-4	3.09-4	1.59-4	8.43-5
76	3013.8	7.23-4	6.35-4	4.75-4	2.95-4	1.50-4	7.74-5
77	3123.9	6.95-4	6.10-4	4.56-4	2.83-4	1.42-4	7.18-5
78	3235.8	6.69-4	5.88-4	4.38-4	2.71-4	1.36-4	6.75-5
79	3349.8	6.45-4	5.66-4	4.22-4	2.61-4	1.31-4	6.51-5
80	3465.6	6.22-4	5.46-4	4.07-4	2.53-4	1.28-4	6.66-5
81	3583.3	5.98-4	5.26-4	3.95-4	2.51-4	1.38-4	9.02-5
82	3700.9	5.83-4	5.12-4	3.81-4	2.35-4	1.15-4	5.40-5
83	3827.8	5.43-4	6.35-4	8.77-4	1.38-3	2.34-3	3.62-3
84	3961.7	3.15-3	3.48-3	4.28-3	5.76-3	8.30-3	1.16-2
85	4095.0	1.15-2	1.22-2	1.39-2	1.70-2	2.19-2	2.78-2
86	4223.9	1.29-2	1.36-2	1.53-2	1.84-2	2.32-2	2.90-2
87	4354.1	1.29-2	1.36-2	1.53-2	1.82-2	2.28-2	2.84-2
88	4486.2	1.27-2	1.34-2	1.50-2	1.79-2	2.24-2	2.78-2
89	4620.2	1.25-2	1.32-2	1.47-2	1.75-2	2.18-2	2.72-2
90	4756.1	1.22-2	1.29-2	1.44-2	1.71-2	2.13-2	2.65-2
91	4894.0	1.19-2	1.26-2	1.41-2	1.67-2	2.08-2	2.58-2
92	5033.8	1.16-2	1.22-2	1.36-2	1.61-2	1.99-2	2.48-2

A1 - M18

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1532.3	8.32-4	9.80-4	1.39-3	2.28-3	3.98-3	6.62-3
61	1606.3	9.41-4	9.64-4	1.05-3	1.32-3	1.97-3	3.05-3
62	1683.8	9.45-3	9.70-3	1.03-2	1.12-2	1.26-2	1.39-2
63	1767.3	1.83-2	1.93-2	2.15-2	2.52-2	3.10-2	3.81-2
64	1852.8	1.89-2	1.99-2	2.24-2	2.65-2	3.29-2	4.09-2
65	1940.3	1.89-2	2.00-2	2.25-2	2.66-2	3.32-2	4.15-2
66	2029.8	1.88-2	1.99-2	2.24-2	2.65-2	3.32-2	4.14-2
67	2121.2	1.87-2	1.97-2	2.22-2	2.63-2	3.29-2	4.11-2
68	2214.5	1.85-2	1.95-2	2.20-2	2.61-2	3.26-2	4.07-2
69	2309.7	1.82-2	1.93-2	2.17-2	2.57-2	3.22-2	4.02-2
70	2406.9	1.80-2	1.90-2	2.14-2	2.54-2	3.17-2	3.96-2
71	2506.0	1.78-2	1.88-2	2.11-2	2.50-2	3.12-2	3.90-2
72	2607.0	1.75-2	1.85-2	2.08-2	2.46-2	3.07-2	3.83-2
73	2710.0	1.72-2	1.82-2	2.04-2	2.42-2	3.02-2	3.76-2
74	2814.9	1.69-2	1.79-2	2.01-2	2.38-2	2.96-2	3.68-2
75	2921.7	1.66-2	1.76-2	1.97-2	2.33-2	2.91-2	3.61-2
76	3030.5	1.64-2	1.73-2	1.94-2	2.29-2	2.85-2	3.54-2
77	3141.2	1.61-2	1.70-2	1.90-2	2.25-2	2.80-2	3.46-2
78	3253.8	1.58-2	1.66-2	1.86-2	2.20-2	2.74-2	3.38-2
79	3368.4	1.55-2	1.63-2	1.83-2	2.16-2	2.68-2	3.31-2
80	3484.9	1.52-2	1.60-2	1.79-2	2.11-2	2.62-2	3.23-2
81	3603.3	1.49-2	1.57-2	1.75-2	2.06-2	2.55-2	3.14-2
82	3723.8	1.46-2	1.53-2	1.71-2	2.01-2	2.48-2	3.04-2
83	3846.1	1.41-2	1.48-2	1.64-2	1.92-2	2.35-2	2.87-2
84	3969.8	1.12-2	1.17-2	1.27-2	1.44-2	1.70-2	2.01-2
85	4099.5	2.59-3	2.62-3	2.67-3	2.76-3	2.90-3	3.09-3
86	4239.1	9.11-4	9.07-4	9.09-4	9.38-4	1.04-3	1.24-3
87	4382.9	6.25-4	6.24-4	6.36-4	6.91-4	8.46-4	1.11-3
88	4530.5	5.11-4	5.13-4	5.32-4	6.02-4	7.86-4	1.09-3
89	4682.0	4.43-4	4.47-4	4.71-4	5.50-4	7.52-4	1.08-3
90	4837.4	3.89-4	3.95-4	4.23-4	5.11-4	7.28-4	1.07-3
91	4996.9	3.34-4	3.42-4	3.77-4	4.77-4	7.15-4	1.09-3
92	5160.5	2.70-4	2.84-4	3.31-4	4.56-4	7.41-4	1.17-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – M19

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1546.3	4.39-2	4.65-2	5.26-2	6.28-2	7.90-2	9.78-2
61	1627.8	4.16-2	4.41-2	4.99-2	5.99-2	7.54-2	9.41-2
62	1711.4	3.92-2	4.16-2	4.72-2	5.65-2	7.13-2	8.92-2
63	1797.1	3.70-2	3.92-2	4.45-2	5.33-2	6.72-2	8.44-2
64	1884.8	3.49-2	3.70-2	4.20-2	5.02-2	6.33-2	7.96-2
65	1974.6	3.30-2	3.50-2	3.96-2	4.74-2	5.97-2	7.51-2
66	2066.5	3.12-2	3.31-2	3.74-2	4.47-2	5.63-2	7.08-2
67	2160.5	2.95-2	3.13-2	3.54-2	4.23-2	5.32-2	6.69-2
68	2256.6	2.80-2	2.96-2	3.35-2	4.00-2	5.03-2	6.32-2
69	2354.8	2.66-2	2.81-2	3.18-2	3.79-2	4.76-2	5.98-2
70	2455.0	2.52-2	2.67-2	3.01-2	3.59-2	4.51-2	5.66-2
71	2557.4	2.40-2	2.54-2	2.86-2	3.41-2	4.27-2	5.36-2
72	2661.9	2.28-2	2.41-2	2.72-2	3.24-2	4.06-2	5.08-2
73	2768.5	2.17-2	2.30-2	2.59-2	3.08-2	3.86-2	4.83-2
74	2877.2	2.07-2	2.19-2	2.47-2	2.93-2	3.67-2	4.59-2
75	2988.1	1.98-2	2.09-2	2.35-2	2.79-2	3.50-2	4.36-2
76	3101.1	1.89-2	2.00-2	2.25-2	2.67-2	3.34-2	4.15-2
77	3216.3	1.81-2	1.91-2	2.15-2	2.55-2	3.18-2	3.96-2
78	3333.7	1.73-2	1.83-2	2.05-2	2.43-2	3.04-2	3.78-2
79	3453.2	1.66-2	1.75-2	1.96-2	2.33-2	2.91-2	3.61-2
80	3574.8	1.59-2	1.68-2	1.88-2	2.23-2	2.78-2	3.45-2
81	3698.7	1.53-2	1.61-2	1.81-2	2.14-2	2.67-2	3.31-2
82	3824.8	1.47-2	1.55-2	1.73-2	2.05-2	2.56-2	3.17-2
83	3953.0	1.41-2	1.49-2	1.66-2	1.97-2	2.46-2	3.04-2
84	4083.5	1.36-2	1.43-2	1.60-2	1.89-2	2.36-2	2.92-2
85	4216.2	1.31-2	1.38-2	1.54-2	1.82-2	2.27-2	2.81-2
86	4351.1	1.26-2	1.33-2	1.48-2	1.75-2	2.18-2	2.70-2
87	4488.3	1.22-2	1.28-2	1.43-2	1.69-2	2.10-2	2.61-2
88	4627.8	1.18-2	1.24-2	1.38-2	1.63-2	2.03-2	2.51-2
89	4769.5	1.14-2	1.20-2	1.33-2	1.58-2	1.96-2	2.42-2
90	4913.4	1.10-2	1.16-2	1.29-2	1.52-2	1.89-2	2.34-2
91	5059.7	1.07-2	1.12-2	1.25-2	1.47-2	1.82-2	2.26-2
92	5208.3	1.04-2	1.09-2	1.21-2	1.43-2	1.76-2	2.18-2

A1 – M20

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1677.3	3.50-4	3.90-4	4.87-4	6.93-4	1.08-3	1.62-3
61	1759.8	3.40-4	3.79-4	4.72-4	6.73-4	1.05-3	1.57-3
62	1844.2	3.31-4	3.68-4	4.58-4	6.54-4	1.02-3	1.52-3
63	1930.5	3.21-4	3.58-4	4.45-4	6.35-4	9.93-4	1.48-3
64	2018.8	3.12-4	3.48-4	4.32-4	6.18-4	9.66-4	1.43-3
65	2108.9	3.03-4	3.39-4	4.21-4	6.01-4	9.39-4	1.39-3
66	2201.0	2.95-4	3.30-4	4.10-4	5.86-4	9.14-4	1.35-3
67	2295.0	2.96-4	3.21-4	4.00-4	5.71-4	8.91-4	1.31-3
68	2391.0	2.90-4	3.13-4	3.90-4	5.58-4	8.68-4	1.27-3
69	2488.8	2.80-4	3.05-4	3.82-4	5.45-4	8.47-4	1.24-3
70	2588.6	2.73-4	2.99-4	3.74-4	5.34-4	8.28-4	1.21-3
71	2690.3	2.66-4	2.92-4	3.66-4	5.23-4	8.09-4	1.18-3
72	2793.8	2.60-4	2.86-4	3.59-4	5.13-4	7.92-4	1.16-3
73	2899.3	2.54-4	2.81-4	3.53-4	5.04-4	7.77-4	1.13-3
74	3006.7	2.49-4	2.76-4	3.48-4	4.96-4	7.62-4	1.11-3
75	3116.0	2.45-4	2.72-4	3.43-4	4.88-4	7.49-4	1.09-3
76	3227.2	2.41-4	2.68-4	3.38-4	4.81-4	7.37-4	1.07-3
77	3340.2	2.38-4	2.65-4	3.34-4	4.75-4	7.26-4	1.05-3
78	3455.2	2.35-4	2.62-4	3.31-4	4.70-4	7.15-4	1.03-3
79	3572.0	2.33-4	2.60-4	3.28-4	4.65-4	7.06-4	1.02-3
80	3690.7	2.31-4	2.58-4	3.25-4	4.60-4	6.97-4	1.00-3
81	3811.3	2.29-4	2.56-4	3.23-4	4.56-4	6.90-4	9.89-4
82	3933.8	2.28-4	2.54-4	3.21-4	4.53-4	6.82-4	9.77-4
83	4058.1	2.27-4	2.53-4	3.20-4	4.49-4	6.76-4	9.66-4
84	4184.2	2.26-4	2.52-4	3.18-4	4.47-4	6.70-4	9.55-4
85	4312.2	2.25-4	2.51-4	3.17-4	4.44-4	6.64-4	9.45-4
86	4442.1	2.24-4	2.50-4	3.15-4	4.41-4	6.58-4	9.35-4
87	4573.7	2.24-4	2.49-4	3.14-4	4.38-4	6.52-4	9.26-4
88	4707.2	2.23-4	2.48-4	3.13-4	4.35-4	6.46-4	9.16-4
89	4842.5	2.22-4	2.47-4	3.11-4	4.32-4	6.40-4	9.06-4
90	4979.5	2.21-4	2.46-4	3.08-4	4.27-4	6.32-4	8.94-4
91	5118.4	2.18-4	2.43-4	3.05-4	4.22-4	6.23-4	8.80-4
92	5259.0	2.15-4	2.39-4	2.99-4	4.14-4	6.11-4	8.62-4

A1 – M21

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1771.9	3.06-4	2.84-4	2.33-4	1.63-4	9.47-5	5.60-5
61	1858.5	2.96-4	2.75-4	2.28-4	1.65-4	1.06-4	7.67-5
62	1947.2	2.88-4	2.68-4	2.26-4	1.69-4	1.20-4	1.01-4
63	2037.9	2.82-4	2.64-4	2.26-4	1.75-4	1.35-4	1.26-4
64	2130.6	2.78-4	2.61-4	2.26-4	1.83-4	1.51-4	1.52-4
65	2225.4	2.74-4	2.58-4	2.27-4	1.90-4	1.67-4	1.77-4
66	2322.3	2.71-4	2.57-4	2.29-4	1.97-4	1.82-4	2.02-4
67	2421.3	2.69-4	2.56-4	2.31-4	2.05-4	1.97-4	2.25-4
68	2522.3	2.67-4	2.55-4	2.33-4	2.12-4	2.12-4	2.47-4
69	2625.4	2.65-4	2.54-4	2.35-4	2.19-4	2.25-4	2.68-4
70	2730.6	2.63-4	2.53-4	2.37-4	2.25-4	2.38-4	2.88-4
71	2837.9	2.61-4	2.53-4	2.39-4	2.31-4	2.50-4	3.05-4
72	2947.3	2.59-4	2.52-4	2.41-4	2.36-4	2.61-4	3.22-4
73	3058.8	2.58-4	2.52-4	2.43-4	2.41-4	2.70-4	3.36-4
74	3172.5	2.56-4	2.51-4	2.44-4	2.46-4	2.79-4	3.50-4
75	3288.2	2.55-4	2.50-4	2.45-4	2.50-4	2.87-4	3.62-4
76	3406.1	2.53-4	2.49-4	2.46-4	2.54-4	2.95-4	3.72-4
77	3526.1	2.51-4	2.49-4	2.46-4	2.57-4	3.01-4	3.81-4
78	3648.3	2.49-4	2.47-4	2.47-4	2.59-4	3.07-4	3.90-4
79	3772.6	2.48-4	2.46-4	2.47-4	2.62-4	3.11-4	3.97-4
80	3899.1	2.46-4	2.45-4	2.47-4	2.63-4	3.15-4	4.03-4
81	4027.7	2.44-4	2.43-4	2.47-4	2.65-4	3.18-4	4.08-4
82	4158.5	2.42-4	2.42-4	2.46-4	2.66-4	3.21-4	4.12-4
83	4291.5	2.40-4	2.40-4	2.45-4	2.66-4	3.23-4	4.15-4
84	4426.6	2.37-4	2.38-4	2.44-4	2.66-4	3.25-4	4.18-4
85	4564.0	2.35-4	2.36-4	2.43-4	2.66-4	3.26-4	4.20-4
86	4703.6	2.33-4	2.34-4	2.41-4	2.66-4	3.27-4	4.22-4
87	4845.3	2.30-4	2.32-4	2.40-4	2.65-4	3.27-4	4.23-4
88	4989.3	2.28-4	2.30-4	2.38-4	2.64-4	3.27-4	4.23-4
89	5135.6	2.26-4	2.28-4	2.36-4	2.63-4	3.27-4	4.23-4
90	5284.0	2.23-4	2.25-4	2.35-4	2.62-4	3.26-4	4.23-4
91	5434.7	2.21-4	2.23-4	2.33-4	2.61-4	3.24-4	4.23-4
92	5587.7	2.18-4	2.21-4	2.31-4	2.59-4	3.23-4	4.22-4

A1 – M22

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1776.1	2.59-3	2.93-3	3.78-3	5.39-3	8.21-3	1.20-2
61	1863.1	2.57-3	2.90-3	3.73-3	5.29-3	8.01-3	1.17-2
62	1952.1	2.54-3	2.86-3	3.67-3	5.18-3	7.82-3	1.14-2
63	2043.2	2.50-3	2.82-3	3.60-3	5.07-3	7.63-3	1.11-2
64	2136.3	2.47-3	2.78-3	3.54-3	4.96-3	7.44-3	1.08-2
65	2231.6	2.43-3	2.73-3	3.47-3	4.85-3	7.26-3	1.05-2
66	2328.9	2.39-3	2.68-3	3.40-3	4.74-3	7.07-3	1.02-2
67	2428.4	2.35-3	2.64-3	3.34-3	4.63-3	6.89-3	9.90-3
68	2530.0	2.31-3	2.59-3	3.27-3	4.53-3	6.71-3	9.62-3
69	2633.6	2.27-3	2.54-3	3.20-3	4.42-3	6.54-3	9.35-3
70	2739.4	2.23-3	2.49-3	3.13-3	4.31-3	6.37-3	9.08-3
71	2847.4	2.19-3	2.44-3	3.06-3	4.21-3	6.20-3	8.82-3
72	2957.5	2.14-3	2.39-3	2.99-3	4.11-3	6.04-3	8.56-3
73	3069.7	2.10-3	2.34-3	2.93-3	4.01-3	5.88-3	8.32-3
74	3184.1	2.06-3	2.29-3	2.86-3	3.91-3	5.72-3	8.08-3
75	3300.6	2.02-3	2.24-3	2.80-3	3.82-3	5.58-3	7.85-3
76	3419.4	1.97-3	2.20-3	2.73-3	3.73-3	5.43-3	7.63-3
77	3540.3	1.93-3	2.15-3	2.67-3	3.63-3	5.29-3	7.42-3
78	3663.4	1.89-3	2.10-3	2.61-3	3.55-3	5.15-3	7.21-3
79	3788.7	1.85-3	2.06-3	2.55-3	3.46-3	5.02-3	7.02-3
80	3916.2	1.81-3	2.01-3	2.49-3	3.38-3	4.89-3	6.83-3
81	4045.9	1.77-3	1.97-3	2.43-3	3.30-3	4.77-3	6.64-3
82	4177.8	1.74-3	1.92-3	2.38-3	3.22-3	4.64-3	6.47-3
83	4312.0	1.70-3	1.88-3	2.32-3	3.14-3	4.53-3	6.30-3
84	4448.4	1.66-3	1.84-3	2.27-3	3.06-3	4.42-3	6.14-3
85	4587.1	1.63-3	1.80-3	2.22-3	2.99-3	4.31-3	5.99-3
86	4728.0	1.59-3	1.76-3	2.16-3	2.92-3	4.20-3	5.84-3
87	4871.3	1.56-3	1.72-3	2.12-3	2.85-3	4.10-3	5.70-3
88	5016.7	1.52-3	1.68-3	2.07-3	2.78-3	4.00-3	5.56-3
89	5164.5	1.49-3	1.65-3	2.02-3	2.72-3	3.90-3	5.43-3
90	5314.6	1.46-3	1.61-3	1.97-3	2.66-3	3.81-3	5.30-3
91	5467.1	1.43-3	1.57-3	1.93-3	2.59-3	3.72-3	5.19-3
92	5621.8	1.40-3	1.54-3	1.89-3	2.54-3	3.63-3	5.07-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - M23

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1786.7	2.01-4	1.95-4	1.87-4	1.89-4	2.12-4	2.72-4
61	1878.5	1.95-4	1.90-4	1.86-4	1.96-4	2.35-4	3.13-4
62	1972.7	1.89-4	1.86-4	1.84-4	1.98-4	2.45-4	3.32-4
63	2069.6	1.84-4	1.81-4	1.80-4	1.97-4	2.49-4	3.40-4
64	2169.1	1.79-4	1.76-4	1.76-4	1.94-4	2.49-4	3.40-4
65	2271.2	1.74-4	1.71-4	1.71-4	1.91-4	2.46-4	3.37-4
66	2376.0	1.65-4	1.65-4	1.66-4	1.86-4	2.41-4	3.31-4
67	2483.5	1.59-4	1.60-4	1.61-4	1.81-4	2.35-4	3.23-4
68	2593.7	1.54-4	1.55-4	1.56-4	1.76-4	2.29-4	3.15-4
69	2706.7	1.49-4	1.50-4	1.51-4	1.71-4	2.23-4	3.06-4
70	2822.5	1.44-4	1.45-4	1.47-4	1.66-4	2.16-4	2.97-4
71	2941.2	1.39-4	1.41-4	1.42-4	1.61-4	2.09-4	2.88-4
72	3062.8	1.35-4	1.36-4	1.38-4	1.56-4	2.03-4	2.79-4
73	3187.3	1.30-4	1.32-4	1.33-4	1.52-4	1.96-4	2.70-4
74	3314.8	1.26-4	1.26-4	1.29-4	1.47-4	1.90-4	2.62-4
75	3445.4	1.22-4	1.22-4	1.25-4	1.43-4	1.84-4	2.53-4
76	3579.0	1.18-4	1.18-4	1.21-4	1.38-4	1.78-4	2.45-4
77	3715.8	1.14-4	1.15-4	1.17-4	1.32-4	1.72-4	2.37-4
78	3855.8	1.11-4	1.11-4	1.14-4	1.28-4	1.66-4	2.30-4
79	3999.0	1.07-4	1.08-4	1.10-4	1.24-4	1.61-4	2.23-4
80	4145.5	1.04-4	1.04-4	1.07-4	1.20-4	1.56-4	2.16-4
81	4295.5	1.01-4	1.01-4	1.04-4	1.17-4	1.51-4	2.09-4
82	4448.8	9.79-5	9.82-5	1.01-4	1.13-4	1.46-4	2.02-4
83	4605.7	9.50-5	9.53-5	9.80-5	1.10-4	1.42-4	1.96-4
84	4766.1	9.22-5	9.25-5	9.51-5	1.06-4	1.37-4	1.90-4
85	4930.2	8.95-5	8.98-5	9.24-5	1.03-4	1.33-4	1.85-4
86	5098.0	8.70-5	8.73-5	8.97-5	1.00-4	1.29-4	1.79-4
87	5269.6	8.45-5	8.48-5	8.72-5	9.73-5	1.25-4	1.74-4
88	5445.1	8.22-5	8.24-5	8.48-5	9.45-5	1.22-4	1.69-4
89	5624.6	7.99-5	8.02-5	8.24-5	9.18-5	1.18-4	1.64-4
90	5808.1	7.77-5	7.80-5	8.01-5	8.92-5	1.15-4	1.59-4
91	5995.9	7.56-5	7.59-5	7.78-5	8.67-5	1.12-4	1.55-4
92	6187.9	7.36-5	7.42-5	7.57-5	8.48-5	1.09-4	1.51-4

A1 - M24

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1882.7	8.60-4	9.69-4	1.25-3	1.80-3	2.80-3	4.21-3
61	1978.6	8.42-4	9.47-4	1.22-3	1.75-3	2.73-3	4.09-3
62	2077.2	8.22-4	9.24-4	1.19-3	1.70-3	2.65-3	3.96-3
63	2178.5	8.01-4	9.01-4	1.15-3	1.65-3	2.57-3	3.84-3
64	2282.5	7.80-4	8.77-4	1.12-3	1.60-3	2.49-3	3.71-3
65	2389.3	7.59-4	8.52-4	1.09-3	1.55-3	2.41-3	3.59-3
66	2498.9	7.37-4	8.27-4	1.06-3	1.50-3	2.33-3	3.46-3
67	2611.3	7.14-4	8.02-4	1.02-3	1.46-3	2.25-3	3.34-3
68	2726.7	6.92-4	7.76-4	9.89-4	1.41-3	2.18-3	3.22-3
69	2845.0	6.70-4	7.51-4	9.56-4	1.36-3	2.10-3	3.10-3
70	2966.3	6.48-4	7.26-4	9.23-4	1.31-3	2.02-3	2.98-3
71	3090.6	6.25-4	7.01-4	8.91-4	1.26-3	1.95-3	2.87-3
72	3218.0	6.03-4	6.76-4	8.59-4	1.22-3	1.87-3	2.76-3
73	3348.6	5.82-4	6.52-4	8.27-4	1.17-3	1.80-3	2.65-3
74	3482.4	5.60-4	6.28-4	7.97-4	1.13-3	1.73-3	2.55-3
75	3619.4	5.39-4	6.04-4	7.66-4	1.09-3	1.66-3	2.45-3
76	3759.8	5.19-4	5.81-4	7.36-4	1.04-3	1.60-3	2.35-3
77	3903.6	4.98-4	5.58-4	7.07-4	1.00-3	1.54-3	2.25-3
78	4050.8	4.78-4	5.35-4	6.79-4	9.61-4	1.47-3	2.16-3
79	4201.5	4.59-4	5.13-4	6.51-4	9.22-4	1.41-3	2.07-3
80	4355.8	4.40-4	4.92-4	6.24-4	8.83-4	1.35-3	1.99-3
81	4513.8	4.21-4	4.71-4	5.98-4	8.46-4	1.30-3	1.91-3
82	4675.5	4.03-4	4.51-4	5.72-4	8.10-4	1.24-3	1.83-3
83	4841.0	3.85-4	4.31-4	5.47-4	7.75-4	1.19-3	1.75-3
84	5010.5	3.68-4	4.12-4	5.23-4	7.42-4	1.14-3	1.68-3
85	5183.9	3.51-4	3.93-4	4.99-4	7.09-4	1.09-3	1.60-3
86	5361.5	3.35-4	3.75-4	4.76-4	6.77-4	1.04-3	1.54-3
87	5543.2	3.19-4	3.57-4	4.54-4	6.46-4	9.94-4	1.47-3
88	5729.3	3.04-4	3.40-4	4.33-4	6.16-4	9.50-4	1.41-3
89	5919.7	2.89-4	3.24-4	4.12-4	5.87-4	9.08-4	1.35-3
90	6114.6	2.75-4	3.08-4	3.92-4	5.59-4	8.67-4	1.29-3
91	6314.2	2.61-4	2.93-4	3.73-4	5.33-4	8.28-4	1.24-3
92	6518.5	2.48-4	2.78-4	3.54-4	5.07-4	7.90-4	1.19-3

A1 - M25

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1988.1	1.92-4	2.04-4	2.39-4	3.24-4	5.10-4	8.05-4
61	2085.6	1.88-4	1.99-4	2.34-4	3.18-4	5.04-4	7.90-4
62	2185.7	1.84-4	1.95-4	2.29-4	3.12-4	4.97-4	7.74-4
63	2288.4	1.79-4	1.90-4	2.24-4	3.06-4	4.89-4	7.58-4
64	2393.8	1.75-4	1.86-4	2.19-4	3.00-4	4.80-4	7.41-4
65	2501.9	1.71-4	1.82-4	2.15-4	2.94-4	4.70-4	7.24-4
66	2612.8	1.67-4	1.78-4	2.10-4	2.88-4	4.61-4	7.07-4
67	2726.4	1.64-4	1.74-4	2.06-4	2.83-4	4.51-4	6.90-4
68	2842.8	1.60-4	1.71-4	2.01-4	2.77-4	4.41-4	6.73-4
69	2962.1	1.56-4	1.67-4	1.97-4	2.71-4	4.31-4	6.57-4
70	3084.2	1.53-4	1.63-4	1.93-4	2.65-4	4.20-4	6.40-4
71	3209.3	1.49-4	1.60-4	1.89-4	2.6[illegible]-4	4.10-4	6.24-4
72	3337.4	1.46-4	1.56-4	1.85-4	2.54-4	4.00-4	6.08-4
73	3468.5	1.43-4	1.53-4	1.81-4	2.49-4	3.91-4	5.92-4
74	3602.7	1.40-4	1.49-4	1.77-4	2.43-4	3.81-4	5.77-4
75	3740.0	1.37-4	1.46-4	1.74-4	2.38-4	3.72-4	5.62-4
76	3880.5	1.34-4	1.43-4	1.70-4	2.32-4	3.62-4	5.48-4
77	4024.3	1.31-4	1.40-4	1.66-4	2.27-4	3.53-4	5.34-4
78	4171.3	1.28-4	1.37-4	1.63-4	2.22-4	3.44-4	5.20-4
79	4321.7	1.25-4	1.34-4	1.59-4	2.17-4	3.36-4	5.06-4
80	4475.5	1.22-4	1.31-4	1.56-4	2.12-4	3.27-4	4.93-4
81	4632.8	1.20-4	1.28-4	1.53-4	2.07-4	3.19-4	4.80-4
82	4793.6	1.17-4	1.26-4	1.49-4	2.03-4	3.11-4	4.68-4
83	4958.1	1.15-4	1.23-4	1.46-4	1.98-4	3.03-4	4.56-4
84	5126.3	1.12-4	1.20-4	1.43-4	1.93-4	2.95-4	4.44-4
85	5298.3	1.10-4	1.17-4	1.40-4	1.89-4	2.88-4	4.32-4
86	5474.2	1.07-4	1.15-4	1.37-4	1.84-4	2.80-4	4.21-4
87	5654.0	1.05-4	1.12-4	1.33-4	1.80-4	2.73-4	4.10-4
88	5837.8	1.03-4	1.10-4	1.30-4	1.75-4	2.66-4	3.99-4
89	6025.9	1.00-4	1.07-4	1.27-4	1.71-4	2.59-4	3.88-4
90	6218.1	9.79-5	1.05-4	1.24-4	1.67-4	2.52-4	3.77-4
91	6414.8	9.56-5	1.02-4	1.21-4	1.62-4	2.46-4	3.67-4
92	6615.8	9.33-5	9.98-5	1.18-4	1.58-4	2.39-4	3.57-4

A1 - M26

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2004.1	2.16-4	2.32-4	2.81-4	4.05-4	6.90-4	1.15-3
61	2103.2	2.10-4	2.25-4	2.71-4	3.92-4	6.72-4	1.10-3
62	2204.9	2.03-4	2.18-4	2.61-4	3.78-4	6.51-4	1.06-3
63	2309.4	1.97-4	2.10-4	2.52-4	3.65-4	6.30-4	1.01-3
64	2416.6	1.91-4	2.03-4	2.43-4	3.52-4	6.08-4	9.72-4
65	2526.7	1.85-4	1.97-4	2.34-4	3.39-4	5.85-4	9.30-4
66	2639.7	1.79-4	1.90-4	2.26-4	3.26-4	5.62-4	8.90-4
67	2755.5	1.73-4	1.84-4	2.18-4	3.14-4	5.39-4	8.52-4
68	2874.3	1.68-4	1.78-4	2.11-4	3.02-4	5.16-4	8.14-4
69	2996.2	1.63-4	1.72-4	2.03-4	2.90-4	4.94-4	7.78-4
70	3121.0	1.58-4	1.67-4	1.97-4	2.79-4	4.72-4	7.44-4
71	3249.0	1.53-4	1.61-4	1.90-4	2.68-4	4.51-4	7.10-4
72	3380.2	1.48-4	1.56-4	1.85-4	2.58-4	4.31-4	6.78-4
73	3514.5	1.44-4	1.52-4	1.77-4	2.48-4	4.11-4	6.47-4
74	3652.2	1.40-4	1.47-4	1.72-4	2.38-4	3.93-4	6.18-4
75	3793.1	1.36-4	1.43-4	1.66-4	2.29-4	3.75-4	5.90-4
76	3937.5	1.33-4	1.39-4	1.61-4	2.20-4	3.57-4	5.63-4
77	4085.3	1.29-4	1.35-4	1.56-4	2.12-4	3.41-4	5.37-4
78	4236.6	1.26-4	1.32-4	1.51-4	2.04-4	3.25-4	5.12-4
79	4391.6	1.23-4	1.29-4	1.47-4	1.97-4	3.10-4	4.89-4
80	4550.2	1.21-4	1.26-4	1.43-4	1.90-4	2.96-4	4.66-4
81	4712.6	1.18-4	1.23-4	1.39-4	1.83-4	2.83-4	4.45-4
82	4878.9	1.15-4	1.20-4	1.35-4	1.77-4	2.70-4	4.24-4
83	5049.0	1.13-4	1.18-4	1.32-4	1.71-4	2.58-4	4.05-4
84	5223.2	1.11-4	1.15-4	1.28-4	1.65-4	2.47-4	3.86-4
85	5401.5	1.09-4	1.13-4	1.26-4	1.60-4	2.37-4	3.69-4
86	5584.0	1.08-4	1.11-4	1.23-4	1.54-4	2.27-4	3.52-4
87	5770.8	1.06-4	1.09-4	1.20-4	1.49-4	2.18-4	3.36-4
88	5962.0	1.05-4	1.07-4	1.17-4	1.45-4	2.10-4	3.21-4
89	6157.8	1.03-4	1.06-4	1.15-4	1.40-4	2.02-4	3.07-4
90	6358.2	1.02-4	1.05-4	1.13-4	1.36-4	1.95-4	2.93-4
91	6563.4	1.02-4	1.03-4	1.11-4	1.32-4	1.88-4	2.80-4
92	6773.6	1.01-4	1.02-4	1.09-4	1.29-4	1.82-4	2.68-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – N1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	905.4	1.13-3	1.04-3	8.51-4	5.78-4	2.99-4	1.36-4
61	952.9	1.07-3	9.85-4	8.04-4	5.45-4	2.81-4	1.28-4
62	1001.4	1.02-3	9.35-4	7.62-4	5.14-4	2.65-4	1.20-4
63	1050.9	9.66-4	8.89-4	7.22-4	4.86-4	2.50-4	1.13-4
64	1101.5	9.21-4	8.46-4	6.86-4	4.61-4	2.37-4	1.07-4
65	1153.0	8.78-4	8.06-4	6.52-4	4.37-4	2.24-4	1.01-4
66	1205.4	8.39-4	7.70-4	6.21-4	4.15-4	2.13-4	9.58-5
67	1258.8	8.02-4	7.35-4	5.92-4	3.95-4	2.02-4	9.10-5
68	1313.1	7.68-4	7.03-4	5.66-4	3.77-4	1.92-4	8.65-5
69	1368.3	7.35-4	6.73-4	5.41-4	3.60-4	1.83-4	8.24-5
70	1424.4	7.05-4	6.45-4	5.18-4	3.44-4	1.75-4	7.85-5
71	1481.4	6.77-4	6.19-4	4.96-4	3.29-4	1.67-4	7.50-5
72	1539.2	6.51-4	5.94-4	4.76-4	3.15-4	1.60-4	7.17-5
73	1597.8	6.26-4	5.71-4	4.57-4	3.02-4	1.53-4	6.87-5
74	1657.2	6.03-4	5.50-4	4.39-4	2.90-4	1.47-4	6.58-5
75	1717.4	5.81-4	5.29-4	4.22-4	2.79-4	1.41-4	6.32-5
76	1778.4	5.60-4	5.10-4	4.07-4	2.68-4	1.35-4	6.07-5
77	1840.0	5.41-4	4.92-4	3.92-4	2.58-4	1.30-4	5.84-5
78	1902.4	5.22-4	4.76-4	3.78-4	2.49-4	1.25-4	5.62-5
79	1965.5	5.05-4	4.60-4	3.65-4	2.40-4	1.21-4	5.42-5
80	2029.1	4.89-4	4.45-4	3.53-4	2.32-4	1.17-4	5.23-5
81	2093.5	4.73-4	4.30-4	3.42-4	2.24-4	1.13-4	5.05-5
82	2158.4	4.59-4	4.17-4	3.31-4	2.17-4	1.09-4	4.88-5
83	2223.8	4.45-4	4.04-4	3.20-4	2.10-4	1.05-4	4.72-5
84	2289.8	4.32-4	3.92-4	3.11-4	2.03-4	1.02-4	4.57-5
85	2356.2	4.20-4	3.81-4	3.01-4	1.97-4	9.89-5	4.43-5
86	2423.1	4.08-4	3.70-4	2.93-4	1.91-4	9.59-5	4.29-5
87	2490.4	3.97-4	3.60-4	2.84-4	1.86-4	9.31-5	4.16-5
88	2558.1	3.86-4	3.50-4	2.76-4	1.80-4	9.05-5	4.04-5
89	2626.1	3.76-4	3.41-4	2.69-4	1.75-4	8.80-5	3.93-5
90	2694.4	3.67-4	3.32-4	2.62-4	1.71-4	8.56-5	3.82-5
91	2762.9	3.58-4	3.24-4	2.55-4	1.66-4	8.33-5	3.71-5
92	2831.7	3.49-4	3.16-4	2.49-4	1.62-4	8.12-5	3.62-5

A1 – N2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	928.9	8.91-4	7.96-4	6.14-4	3.95-4	1.99-4	8.98-5
61	978.5	8.45-4	7.54-4	5.82-4	3.74-4	1.88-4	8.48-5
62	1029.2	8.03-4	7.16-4	5.52-4	3.54-4	1.78-4	8.01-5
63	1081.0	7.63-4	6.81-4	5.24-4	3.36-4	1.68-4	7.59-5
64	1134.0	7.27-4	6.48-4	4.99-4	3.19-4	1.60-4	7.19-5
65	1188.1	6.93-4	6.18-4	4.75-4	3.04-4	1.52-4	6.83-5
66	1243.3	6.62-4	5.90-4	4.53-4	2.89-4	1.44-4	6.49-5
67	1299.6	6.32-4	5.63-4	4.33-4	2.76-4	1.38-4	6.18-5
68	1357.0	6.05-4	5.39-4	4.14-4	2.64-4	1.31-4	5.90-5
69	1415.5	5.80-4	5.16-4	3.96-4	2.52-4	1.25-4	5.63-5
70	1475.1	5.56-4	4.95-4	3.80-4	2.41-4	1.20-4	5.38-5
71	1535.7	5.34-4	4.75-4	3.64-4	2.31-4	1.15-4	5.15-5
72	1597.3	5.13-4	4.57-4	3.50-4	2.22-4	1.10-4	4.93-5
73	1660.0	4.94-4	4.39-4	3.36-4	2.13-4	1.06-4	4.73-5
74	1723.7	4.76-4	4.23-4	3.24-4	2.05-4	1.02-4	4.55-5
75	1788.3	4.58-4	4.08-4	3.12-4	1.97-4	9.78-5	4.37-5
76	1854.0	4.43-4	3.93-4	3.01-4	1.90-4	9.42-5	4.21-5
77	1920.6	4.27-4	3.80-4	2.90-4	1.84-4	9.08-5	4.05-5
78	1988.2	4.13-4	3.67-4	2.80-4	1.77-4	8.76-5	3.91-5
79	2056.6	4.00-4	3.55-4	2.71-4	1.71-4	8.46-5	3.77-5
80	2126.0	3.87-4	3.44-4	2.62-4	1.66-4	8.17-5	3.64-5
81	2196.3	3.75-4	3.33-4	2.54-4	1.60-4	7.91-5	3.52-5
82	2267.4	3.64-4	3.23-4	2.46-4	1.55-4	7.66-5	3.41-5
83	2339.3	3.53-4	3.13-4	2.39-4	1.51-4	7.42-5	3.30-5
84	2412.1	3.43-4	3.04-4	2.32-4	1.46-4	7.19-5	3.20-5
85	2485.7	3.33-4	2.96-4	2.25-4	1.42-4	6.98-5	3.10-5
86	2560.0	3.24-4	2.88-4	2.19-4	1.38-4	6.78-5	3.01-5
87	2635.0	3.16-4	2.80-4	2.13-4	1.34-4	6.59-5	2.93-5
88	2710.8	3.07-4	2.73-4	2.07-4	1.30-4	6.41-5	2.85-5
89	2787.2	3.00-4	2.66-4	2.02-4	1.27-4	6.24-5	2.77-5
90	2864.2	2.92-4	2.59-4	1.97-4	1.24-4	6.08-5	2.70-5
91	2941.8	2.85-4	2.53-4	1.92-4	1.21-4	5.92-5	2.63-5
92	3020.0	2.79-4	2.47-4	1.88-4	1.18-4	5.77-5	2.56-5

A1 – N3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	940.6	8.08-4	7.39-4	5.94-4	3.91-4	1.95-4	8.53-5
61	991.3	7.78-4	7.12-4	5.70-4	3.75-4	1.86-4	8.16-5
62	1043.2	7.50-4	6.86-4	5.48-4	3.60-4	1.79-4	7.82-5
63	1096.3	7.24-4	6.61-4	5.27-4	3.45-4	1.71-4	7.49-5
64	1150.7	6.98-4	6.37-4	5.07-4	3.31-4	1.64-4	7.19-5
65	1206.4	6.74-4	6.14-4	4.88-4	3.18-4	1.58-4	6.90-5
66	1263.2	6.50-4	5.92-4	4.70-4	3.06-4	1.51-4	6.62-5
67	1321.3	6.28-4	5.72-4	4.53-4	2.94-4	1.45-4	6.36-5
68	1380.6	6.06-4	5.52-4	4.36-4	2.83-4	1.40-4	6.12-5
69	1441.2	5.86-4	5.33-4	4.21-4	2.72-4	1.34-4	5.89-5
70	1502.9	5.67-4	5.14-4	4.06-4	2.62-4	1.30-4	5.67-5
71	1565.9	5.48-4	4.97-4	3.92-4	2.53-4	1.25-4	5.46-5
72	1630.1	5.30-4	4.81-4	3.78-4	2.44-4	1.20-4	5.26-5
73	1695.4	5.13-4	4.65-4	3.66-4	2.35-4	1.16-4	5.07-5
74	1762.0	4.97-4	4.50-4	3.53-4	2.27-4	1.12-4	4.90-5
75	1829.8	4.81-4	4.36-4	3.42-4	2.20-4	1.08-4	4.73-5
76	1898.8	4.66-4	4.22-4	3.31-4	2.12-4	1.04-4	4.57-5
77	1968.9	4.52-4	4.09-4	3.20-4	2.06-4	1.01-4	4.42-5
78	2040.3	4.39-4	3.97-4	3.11-4	1.99-4	9.75-5	4.28-5
79	2112.8	4.26-4	3.85-4	3.01-4	1.93-4	9.43-5	4.14-5
80	2186.5	4.13-4	3.73-4	2.92-4	1.87-4	9.14-5	4.01-5
81	2261.4	4.01-4	3.62-4	2.83-4	1.81-4	8.85-5	3.89-5
82	2337.5	3.90-4	3.52-4	2.75-4	1.76-4	8.59-5	3.77-5
83	2414.7	3.79-4	3.42-4	2.67-4	1.71-4	8.33-5	3.66-5
84	2493.1	3.69-4	3.33-4	2.60-4	1.66-4	8.09-5	3.55-5
85	2572.6	3.59-4	3.24-4	2.52-4	1.61-4	7.86-5	3.45-5
86	2653.3	3.49-4	3.15-4	2.45-4	1.56-4	7.64-5	3.35-5
87	2735.1	3.40-4	3.07-4	2.39-4	1.52-4	7.43-5	3.26-5
88	2818.1	3.32-4	2.99-4	2.33-4	1.48-4	7.23-5	3.17-5
89	2902.2	3.24-4	2.91-4	2.27-4	1.44-4	7.04-5	3.09-5
90	2987.4	3.16-4	2.84-4	2.21-4	1.40-4	6.86-5	3.01-5
91	3073.8	3.08-4	2.78-4	2.16-4	1.37-4	6.69-5	2.93-5
92	3161.2	3.01-4	2.71-4	2.10-4	1.34-4	6.53-5	2.86-5

A1 – N4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	965.4	5.41-4	4.86-4	3.78-4	2.40-4	1.15-4	4.79-5
61	1018.2	5.17-4	4.64-4	3.60-4	2.29-4	1.09-4	4.56-5
62	1072.4	4.94-4	4.44-4	3.44-4	2.18-4	1.04-4	4.34-5
63	1127.9	4.73-4	4.24-4	3.29-4	2.08-4	9.90-5	4.13-5
64	1184.8	4.53-4	4.06-4	3.14-4	1.98-4	9.45-5	3.95-5
65	1243.1	4.34-4	3.89-4	3.01-4	1.90-4	9.03-5	3.77-5
66	1302.8	4.16-4	3.73-4	2.88-4	1.81-4	8.63-5	3.60-5
67	1363.9	4.00-4	3.58-4	2.76-4	1.74-4	8.26-5	3.45-5
68	1426.4	3.84-4	3.44-4	2.65-4	1.67-4	7.91-5	3.30-5
69	1490.3	3.69-4	3.31-4	2.55-4	1.60-4	7.59-5	3.17-5
70	1555.5	3.55-4	3.18-4	2.45-4	1.53-4	7.28-5	3.04-5
71	1622.2	3.42-4	3.06-4	2.35-4	1.47-4	6.99-5	2.92-5
72	1690.3	3.30-4	2.95-4	2.27-4	1.42-4	6.73-5	2.81-5
73	1759.8	3.18-4	2.84-4	2.18-4	1.37-4	6.47-5	2.71-5
74	1830.7	3.07-4	2.74-4	2.10-4	1.32-4	6.23-5	2.61-5
75	1903.0	2.96-4	2.65-4	2.03-4	1.27-4	6.01-5	2.51-5
76	1976.8	2.86-4	2.56-4	1.96-4	1.22-4	5.79-5	2.42-5
77	2051.9	2.77-4	2.47-4	1.89-4	1.18-4	5.60-5	2.34-5
78	2128.5	2.68-4	2.39-4	1.83-4	1.14-4	5.41-5	2.26-5
79	2206.5	2.59-4	2.31-4	1.77-4	1.11-4	5.23-5	2.19-5
80	2286.0	2.51-4	2.24-4	1.72-4	1.07-4	5.06-5	2.12-5
81	2366.9	2.43-4	2.17-4	[illegible].66-4	1.04-4	4.90-5	2.06-5
82	2449.3	2.36-4	2.11-4	[illegible].61-4	1.01-4	4.75-5	1.99-5
83	2533.1	2.29-4	2.05-[illegible]	[illegible].56-4	9.75-5	4.61-5	1.93-5
84	2618.3	2.23-4	1.99-[illegible]	[illegible].52-4	9.47-5	4.48-5	1.88-5
85	2705.0	2.17-4	1.93-4	1.48-4	9.21-5	4.36-5	1.83-5
86	2793.2	2.11-4	1.88-4	1.44-4	8.97-5	4.24-5	1.78-5
87	2882.8	2.05-4	1.83-4	1.40-4	8.74-5	4.14-5	1.74-5
88	2973.9	2.01-4	1.79-4	1.37-4	8.53-5	4.04-5	1.70-5
89	3066.4	1.96-4	1.75-4	1.34-4	8.35-5	3.96-5	1.66-5
90	3160.4	1.93-4	1.72-4	1.32-4	8.20-5	3.89-5	1.64-5
91	3255.8	1.90-4	1.70-4	1.30-4	8.11-5	3.85-5	1.62-5
92	3352.7	1.90-4	1.70-4	1.30-4	8.12-5	3.87-5	1.63-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – N5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1150.1	8.45-4	7.69-4	6.07-4	3.87-4	1.86-4	8.23-5
61	1204.5	7.79-4	7.09-4	5.60-4	3.57-4	1.72-4	7.66-5
62	1260.1	7.29-4	6.63-4	5.23-4	3.33-4	1.61-4	7.20-5
63	1316.8	6.88-4	6.26-4	4.92-4	3.13-4	1.51-4	6.80-5
64	1374.6	6.52-4	5.93-4	4.66-4	2.95-4	1.43-4	6.44-5
65	1433.6	6.21-4	5.64-4	4.42-4	2 80-4	1.36-4	6.12-5
66	1493.7	5.92-4	5.37-4	4.20-4	2.66-4	1.29-4	5.82-5
67	1554.9	5.66-4	5.13-4	4.01-4	2.53-4	1.23-4	5.55-5
68	1617.1	5.42-4	4.91-4	3.82-4	2.41-4	1.17-4	5.30-5
69	1680.5	5.20-4	4.70-4	3.66-4	2.30-4	1.12-4	5.07-5
70	1744.9	4.99-4	4.51-4	3.50-4	2.20-4	1.07-4	4.86-5
71	1810.4	4.80-4	4.33-4	3.36-4	2.11-4	1.02-4	4.66-5
72	1876.9	4.61-4	4.16-4	3.23-4	2.02-4	9.82-5	4.47-5
73	1944.4	4.44-4	4.01-4	3.10-4	1.94-4	9.44-5	4.30-5
74	2012.9	4.28-4	3.86-4	2.99-4	1.87-4	9.08-5	4.13-5
75	2082.5	4.13-4	3.72-4	2.88-4	1.80-4	8.74-5	3.98-5
76	2153.0	3.99-4	3.59-4	2.77-4	1.73-4	8.42-5	3.84-5
77	2224.4	3.85-4	3.47-4	2.68-4	1.67-4	8.13-5	3.71-5
78	2296.8	3.73-4	3.35-4	2.59-4	1.62-4	7.85-5	3.58-5
79	2370.2	3.61-4	3.24-4	2.50-4	1.56-4	7.59-5	3.46-5
80	2444.4	3.49-4	3.14-4	2.42-4	1.51-4	7.34-5	3.35-5
81	2519.5	3.38-4	3.04-4	2.34-4	1.46-4	7.11-5	3.25-5
82	2595.4	3.28-4	2.95-4	2.27-4	1.42-4	6.89-5	3.15-5
83	2672.2	3.18-4	2.86-4	2.20-4	1.38-4	6.68-5	3.05-5
84	2749.8	3.09-4	2.78-4	2.14-4	1.33-4	6.49-5	2.96-5
85	2828.1	3.00-4	2.69-4	2.07-4	1.30-4	6.29-5	2.88-5
86	2907.3	2.91-4	2.62-4	2.01-4	1.26-4	6.11-5	2.79-5
87	2987.1	2.83-4	2.54-4	1.95-4	1.22-4	5.93-5	2.71-5
88	3067.6	2.75-4	2.46-4	1.89-4	1.18-4	5.76-5	2.63-5
89	3148.8	2.66-4	2.39-4	1.84-4	1.15-4	5.59-5	2.55-5
90	3230.6	2.58-4	2.31-4	1.78-4	1.11-4	5.41-5	2.47-5
91	3313.1	2.49-4	2.23-4	1.72-4	1.07-4	5.21-5	2.38-5
92	3396.2	2.38-4	2.13-4	1.64-4	1.02-4	4.98-5	2.27-5

A1 – N6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1159.8	4.48-3	3.90-3	2.84-3	1.69-3	7.77-4	3.27-4
61	1217.6	4.25-3	3.69-3	2.69-3	1.60-3	7.35-4	3.09-4
62	1276.7	4.02-3	3.50-3	2.55-3	1.51-3	6.94-4	2.91-4
63	1337.1	3.80-3	3.30-3	2.41-3	1.42-3	6.54-4	2.74-4
64	1398.7	3 59-3	3.12-3	2.27-3	1.34-3	6.16-4	2.58-4
65	1461.7	3.39-3	2.94-3	2.14-3	1.27-3	5.79-4	2.42-4
66	1526.0	3.20-3	2.78-3	2.02-3	1.19-3	5.45-4	2.27-4
67	1591.6	3.02-3	2 62-3	1.90-3	1.12-3	5.11-4	2.13-4
68	1658.5	2.84-3	2.47-3	1.79-3	1 06-3	4.80-4	1.99-4
69	1726.6	2.68-3	2.32-3	1.68-3	9.92-4	4.50-4	1.87-4
70	1796.1	2.53-3	2.19-3	1.59-3	9.33-4	4.23-4	1.75-4
71	1866.8	2.38-3	2.06-3	1.50-3	8.77-4	3.97-4	1.64-4
72	1938.9	2 25-3	1.95-3	1.41-3	8.25-4	3.73-4	1.53-4
73	2012.2	2.13-3	1.84-3	1.33-3	7.77-4	3.50-4	1.44-4
74	2086.8	2.01-3	1.74-3	1.26-3	7.33-4	3.29-4	1.35-4
75	2162.7	1.90-3	1.65-3	1.19-3	6.92-4	3.10-4	1.27-4
76	2239.9	1.81-3	1.56-3	1.13-3	6.55-4	2.93-4	1.19-4
77	2318.4	1.71-3	1.48-3	1.07-3	6 20-4	2.77-4	1.13-4
78	2398.2	1.63-3	1.41-3	1.01-3	5.88-4	2.62-4	1.06-4
79	2479.2	1.55-3	1.34-3	9.64-4	5.59-4	2.48-4	1.01-4
80	2561.6	1.48-3	1.28-3	9.19-4	5.32-4	2.36-4	9.53-5
81	2645.2	1.42-3	1.22-3	8.77-4	5.07-4	2.24-4	9.05-5
82	2730.1	1.36-3	1.17-3	8.38-4	4.84-4	2.14-4	8.61-5
83	2816.3	1.30-3	1.12-3	8.03-4	4.63-4	2.04-4	8.21-5
84	2903.8	1.25-3	1.08-3	7.69-4	4.43-4	1.95-4	7.84-5
85	2992.6	1.20-3	1.03-3	7.39-4	4.25-4	1.87-4	7.49-5
86	3082.7	1.15-3	9.93-4	7.10-4	4.08-4	1.79-4	7.18-5
87	3174.0	1.11-3	9.56-4	6.83-4	3.92-4	1.72-4	6.88-5
88	3266.7	1.07-3	9.21-4	6.58-4	3.78-4	1.66-4	6.61-5
89	3360.6	1.03-3	8.88-4	6.35-4	3.64-4	1.59-4	6.36-5
90	3455.8	9.96-4	8.58-4	6.13-4	3.51-4	1.54-4	6.12-5
91	3552.3	9.63-4	8.29-4	5.92-4	3.39-4	1.48-4	5.90-5
92	3650.1	9.32-4	8.02-4	5.72-4	3.28-4	1.43-4	5.70-5

A1 – N7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1162.5	2 23-3	1.90-3	1.32-3	7.21-4	2.94-4	1.09-4
61	1220.4	2.15-3	1.83-3	1.27-3	6.99-4	2.87-4	1.06-4
62	1279.5	2.08-3	1.77-3	1.24-3	6.80-4	2.80-4	1.04-4
63	1340.0	2.02-3	1.72-3	1.20-3	6 64-4	2.75-4	1.03-4
64	1401.8	1.97-3	1.68-3	1.17-3	6.50-4	2.70-4	1.02-4
65	1464.9	1.92-3	1.64-3	1.15-3	6.38-4	2.67-4	1.01-4
66	1529.2	1.87-3	1.60-3	1.13-3	6.28-4	2.64-4	1.01-4
67	1595.0	1.84-3	1.57-3	1.11-3	6 20-4	2.62-4	1.01-4
68	1662.0	1.80-3	1.54-3	1.09-3	6 13-4	2.60-4	1.01-4
69	1730.3	1.77-3	1.52-3	1.08-3	6.06-4	2.59-4	1.01-4
70	1800.0	1.75-3	1.50-3	1.06-3	6.00-4	2.58-4	1.01-4
71	1870.9	1.72-3	1.48-3	1.05-3	5.94-4	2.56-4	1.01-4
72	1943.2	1.69-3	1.45-3	1.03-3	5.88-4	2.55-4	1.01-4
73	2016.9	1.6[illegible]	1.43-3	1.02-3	5.81-4	2.53-4	1.00-4
74	2091.8	1.64-[illegible]	1.41-3	1.00-3	5.74-4	2.50-4	9.96-5
75	2168.1	1.61-3	1.38-3	9.87-4	5.66-4	2.48-4	9.89-5
76	2245.7	1.58-3	1.36-3	9.71-4	5.58-4	2.45-4	9.80-5
77	2324.6	1.55-3	1.33-3	9.54-4	5.49-4	2.42-4	9.69-5
78	2404.8	1 52-3	1.31-3	9.36-4	5.40-4	2.38-4	9.57-5
79	2486.4	1.48-3	1.28-3	9.18-4	5.30-4	2.34-4	9.44-5
80	2569.3	1.45-3	1.25-3	9.00-4	5.20-4	2.30-4	9.29-5
81	2653.5	1.42-3	1.23-3	8.81-4	5.10-4	2.26-4	9.14-5
82	2739.1	1.39-3	1.20-3	8.62-4	4.99-4	2.22-4	8.97-5
83	2826.0	1.36-3	1.17-3	8.43-4	4.89-4	2.17-4	8.80-5
84	2914.2	1.33-3	1.15-3	8.24-4	4.78-4	2.13-4	8.63-5
85	3003.7	1.29-3	1.12-3	8 05-4	4.67-4	2.08-4	8.46-5
86	3094.6	1.26-3	1.09-3	7.86-4	4.57-4	2.04-4	8.28-5
87	3186.8	1.23-3	1.07-3	7.68-4	4.46-4	1.99-4	8.11-5
88	3280.4	1.21-3	1.04-3	7.50-4	4.36-4	1.95-4	7.93-5
89	3375.3	1.18-3	1 02-3	7.32-4	4.26-4	1.90-4	7.76-5
90	3471.5	1.15-3	9.92-4	7.15-4	4.16-4	1.86-4	7.59-5
91	3569.1	1.12-3	9.68-4	6.98-4	4.07-4	1.82-4	7.42-5
92	3668.0	1.09-3	9.45-4	6.81-4	3.97-4	1.78-4	7.26-5

A1 – N8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1183.1	4.10-3	3.56-3	2.59-3	1.54-3	7.04-4	2.93-4
61	1242.9	3.93-3	3.42-3	2.49-3	1.48-3	6.77-4	2.83-4
62	1304.2	3.76-3	3.27-3	2.39-3	1.42-3	6.50-4	2.72-4
63	1366.9	3.60-3	3.13-3	2.29-3	1.36-3	6.24-4	2.61-4
64	1431.1	3.45-3	3.00-3	2.19-3	1.30-3	5.98-4	2.51-4
65	1496.7	3.29-3	2.86-3	2.09-3	1.24-3	5.73-4	2.40-4
66	1563.8	3.14-3	2.73-3	2.00-3	1.19-3	5.47-4	2.29-4
67	1632.4	2.99-3	2.60-3	1.90-3	1.13-3	5.21-4	2.19-4
68	1702.4	2.84-3	2.47-3	1.81-3	1.07-3	4.95-4	2.07-4
69	1773.9	2.69-3	2.34-3	1.71-3	1.02-3	4.68-4	1.96-4
70	1846.9	2.54-3	2.21-3	1.61-3	9.59-4	4.41-4	1.85-4
71	1921.3	2.39-3	2.08-3	1.52-3	9.02-4	4.15-4	1.73-4
72	1997.3	2.25-3	1.95-3	1.42-3	8.46-4	3.88-4	1.62-4
73	2074.7	2.11-3	1.83-3	1.33-3	7.91-4	3.62-4	1.51-4
74	2153.6	1.97-3	1.71-3	1.25-3	7.38-4	3.37-4	1.40-4
75	2234.1	1.85-3	1.60-3	1.17-3	6.88-4	3.14-4	1.30-4
76	2316.0	1.73-3	1.50-3	1.09-3	6.42-4	2.92-4	1.21-4
77	2399.5	1.62-3	1.40-3	1.02-3	6 00-4	2.72-4	1.13-4
78	2484.5	1.52-3	1.32-3	9.56-4	5.61-4	2.54-4	1.05-4
79	2571.0	1.43-3	1.24-3	8.99-4	5.27-4	2.38-4	9.78-5
80	2659.1	1.35-3	1.17-3	8.47-4	4.96-4	2.23-4	9.15-5
81	2748.7	1.28-3	1.11-3	8.00-4	4.67-4	2.10-4	8.59-5
82	2839.9	1.21-3	1.05-3	7.58-4	4.42-4	1.98-4	8.09-5
83	2932.6	1.15-3	9.97-4	7.20-4	4.19-4	1.88-4	7.65-5
84	3026.9	1.10-3	9.50-4	6.85-4	3.99-4	1.78-4	7.25-5
85	3122.9	1.05-3	9.07-4	6.54-4	3.80-4	1.69-4	6.88-5
86	3220.4	1 00-3	8.67-4	6.25-4	3.63-4	1.62-4	6.56-5
87	3319.5	9.61-4	8.31-4	5.98-4	3.47-4	1.54-4	6.26-5
88	3420.2	9.23-4	7.97-4	5.74-4	3.33-4	1.48-4	5.99-5
89	3522.6	8.87-4	7.66-4	5.52-4	3.20-4	1.42-4	5.74-5
90	3626.5	8.54-4	7.38-4	5.31-4	3.07-4	1.36-4	5.51-5
91	3732.2	8.23-4	7.11-4	5.11-4	2.96-4	1.31-4	5.30-5
92	3839.5	7.94-4	6.86-4	4.93-4	2.85-4	1.26-4	5.10-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – N9

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1185.7	2.12-3	1.81-3	1.27-3	7.10-4	2.99-4	1.14-4
61	1245.6	2.04-3	1.74-3	1.22-3	6.84-4	2.88-4	1.11-4
62	1306.9	1.96-3	1.68-3	1.18-3	6.60-4	2.78-4	1.07-4
63	1369.6	1.89-3	1.62-3	1.14-3	6.39-4	2.70-4	1.04-4
64	1433.8	1.83-3	1.56-3	1.11-3	6.21-4	2.64-4	1.02-4
65	1499.5	1.77-3	1.52-3	1.08-3	6.06-4	2.58-4	1.01-4
66	1566.6	1.73-3	1.48-3	1.05-3	5.94-4	2.54-4	9.95-5
67	1635.1	1.70-3	1.46-3	1.03-3	5.86-4	2.52-4	9.91-5
68	1705.2	1.67-3	1.44-3	1.02-3	5.81-4	2.51-4	9.93-5
69	1776.7	1.65-3	1.42-3	1.01-3	5.79-4	2.52-4	1.00-4
70	1849.7	1.64-3	1.42-3	1.01-3	5.81-4	2.54-4	1.02-4
71	1924.3	1.64-3	1.42-3	1.01-3	5.85-4	2.58-4	1.03-4
72	2000.3	1.64-3	1.42-3	1.02-3	5.90-4	2.62-4	1.06-4
73	2077.9	1.65-3	1.42-3	1.03-3	5.96-4	2.66-4	1.08-4
74	2157.0	1.65-3	1.43-3	1.03-3	6.03-4	2.70-4	1.10-4
75	2237.7	1.66-3	1.43-3	1.04-3	6.08-4	2.74-4	1.13-4
76	2319.9	1.66-3	1.44-3	1.04-3	6.12-4	2.77-4	1.14-4
77	2403.7	1.65-3	1.43-3	1.04-3	6.14-4	2.79-4	1.15-4
78	2489.1	1.64-3	1.43-3	1.04-3	6.13-4	2.80-4	1.16-4
79	2576.0	1.63-3	1.42-3	1.03-3	6.11-4	2.80-4	1.16-4
80	2664.5	1.61-3	1.40-3	1.02-3	6.07-4	2.78-4	1.16-4
81	2754.7	1.59-3	1.38-3	1.01-3	6.01-4	2.76-4	1.16-4
82	2846.4	1.57-3	1.36-3	9.98-4	5.94-4	2.74-4	1.15-4
83	2939.8	1.54-3	1.34-3	9.82-4	5.86-4	2.70-4	1.14-4
84	3034.8	1.51-3	1.32-3	9.66-4	5.77-4	2.67-4	1.12-4
85	3131.4	1.48-3	1.29-3	9.49-4	5.67-4	2.62-4	1.10-4
86	3229.7	1.46-3	1.27-3	9.30-4	5.56-4	2.58-4	1.09-4
87	3329.6	1.42-3	1.24-3	9.12-4	5.46-4	2.53-4	1.07-4
88	3431.2	1.39-3	1.22-3	8.93-4	5.35-4	2.48-4	1.05-4
89	3534.5	1.36-3	1.19-3	8.74-4	5.24-4	2.44-4	1.03-4
90	3639.4	1.33-3	1.16-3	8.55-4	5.13-4	2.39-4	1.01-4
91	3746.1	1.30-3	1.14-3	8.36-4	5.02-4	2.34-4	9.90-5
92	3854.4	1.27-3	1.11-3	8.17-4	4.91-4	2.29-4	9.70-5

A1 – N10

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1356.1	5.63-4	5.10-4	4.03-4	2.64-4	1.32-4	5.76-5
61	1419.0	5.31-4	4.80-4	3.78-4	2.46-4	1.23-4	5.34-5
62	1483.3	5.02-4	4.53-4	3.56-4	2.31-4	1.15-4	4.98-5
63	1549.0	4.77-4	4.30-4	3.37-4	2.18-4	1.08-4	4.66-5
64	1616.1	4.54-4	4.08-4	3.19-4	2.06-4	1.02-4	4.38-5
65	1684.6	4.32-4	3.89-4	3.03-4	1.95-4	9.60-5	4.13-5
66	1754.5	4.13-4	3.71-4	2.89-4	1.85-4	9.09-5	3.90-5
67	1825.9	3.95-4	3.55-4	2.76-4	1.77-4	8.63-5	3.69-5
68	1898.7	3.79-4	3.40-4	2.64-4	1.68-4	8.21-5	3.50-5
69	1972.9	3.63-4	3.26-4	2.52-4	1.61-4	7.82-5	3.33-5
70	2048.5	3.49-4	3.13-4	2.42-4	1.54-4	7.47-5	3.17-5
71	2125.6	3.36-4	3.00-4	2.32-4	1.48-4	7.14-5	3.03-5
72	2204.1	3.23-4	2.89-4	2.23-4	1.42-4	6.84-5	2.90-5
73	2284.1	3.11-4	2.78-4	2.15-4	1.36-4	6.55-5	2.77-5
74	2365.5	3.00-4	2.69-4	2.07-4	1.31-4	6.29-5	2.66-5
75	2448.3	2.90-4	2.59-4	1.99-4	1.26-4	6.05-5	2.55-5
76	2532.7	2.80-4	2.50-4	1.92-4	1.21-4	5.82-5	2.45-5
77	2618.5	2.71-4	2.42-4	1.86-4	1.17-4	5.60-5	2.36-5
78	2705.7	2.62-4	2.34-4	1.80-4	1.13-4	5.40-5	2.27-5
79	2794.5	2.54-4	2.27-4	1.74-4	1.09-4	5.21-5	2.19-5
80	2884.7	2.46-4	2.19-4	1.68-4	1.05-4	5.04-5	2.11-5
81	2976.4	2.39-4	2.13-4	1.63-4	1.02-4	4.87-5	2.04-5
82	3069.6	2.32-4	2.06-4	1.58-4	9.89-5	4.71-5	1.97-5
83	3164.3	2.25-4	2.00-4	1.53-4	9.58-5	4.56-5	1.91-5
84	3260.5	2.18-4	1.95-4	1.49-4	9.30-5	4.42-5	1.85-5
85	3358.1	2.12-4	1.89-4	1.44-4	9.02-5	4.29-5	1.79-5
86	3457.4	2.07-4	1.84-4	1.40-4	8.76-5	4.16-5	1.74-5
87	3558.1	2.01-4	1.79-4	1.37-4	8.51-5	4.04-5	1.69-5
88	3660.3	1.96-4	1.74-4	1.33-4	8.27-5	3.92-5	1.64-5
89	3764.1	1.91-4	1.70-4	1.29-4	8.05-5	3.82-5	1.59-5
90	3869.4	1.86-4	1.65-4	1.26-4	7.83-5	3.71-5	1.55-5
91	3976.2	1.81-4	1.61-4	1.23-4	7.63-5	3.61-5	1.51-5
92	4084.6	1.77-4	1.57-4	1.20-4	7.43-5	3.52-5	1.47-5

A1 – N11

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1361.6	7.06-4	6.45-4	5.18-4	3.46-4	1.77-4	7.90-5
61	1425.1	6.80-4	6.21-4	4.98-4	3.31-4	1.69-4	7.53-5
62	1490.0	6.56-4	5.98-4	4.79-4	3.18-4	1.62-4	7.19-5
63	1556.5	6.33-4	5.77-4	4.61-4	3.05-4	1.55-4	6.87-5
64	1624.4	6.11-4	5.56-4	4.43-4	2.93-4	1.48-4	6.57-5
65	1693.7	5.90-4	5.36-4	4.27-4	2.82-4	1.42-4	6.29-5
66	1764.6	5.69-4	5.17-4	4.11-4	2.71-4	1.37-4	6.03-5
67	1836.9	5.50-4	4.99-4	3.96-4	2.60-4	1.31-4	5.78-5
68	1910.7	5.31-4	4.82-4	3.82-4	2.51-4	1.26-4	5.54-5
69	1986.0	5.13-4	4.66-4	3.69-4	2.41-4	1.21-4	5.32-5
70	2062.8	4.96-4	4.50-4	3.56-4	2.32-4	1.16-4	5.11-5
71	2141.1	4.80-4	4.35-4	3.43-4	2.24-4	1.12-4	4.91-5
72	2221.0	4.64-4	4.20-4	3.32-4	2.16-4	1.08-4	4.73-5
73	2302.3	4.49-4	4.07-4	3.20-4	2.08-4	1.04-4	4.55-5
74	2385.2	4.35-4	3.94-4	3.10-4	2.01-4	1.00-4	4.38-5
75	2469.7	4.21-4	3.81-4	3.00-4	1.94-4	9.65-5	4.23-5
76	2555.6	4.08-4	3.69-4	2.90-4	1.88-4	9.31-5	4.08-5
77	2643.2	3.96-4	3.58-4	2.81-4	1.82-4	8.99-5	3.94-5
78	2732.3	3.84-4	3.47-4	2.72-4	1.76-4	8.69-5	3.80-5
79	2823.0	3.72-4	3.36-4	2.64-4	1.70-4	8.40-5	3.67-5
80	2915.2	3.61-4	3.26-4	2.55-4	1.65-4	8.13-5	3.55-5
81	3009.1	3.51-4	3.16-4	2.48-4	1.60-4	7.87-5	3.44-5
82	3104.5	3.41-4	3.07-4	2.40-4	1.55-4	7.62-5	3.33-5
83	3201.6	3.31-4	2.98-4	2.33-4	1.50-4	7.38-5	3.22-5
84	3300.2	3.22-4	2.90-4	2.26-4	1.46-4	7.16-5	3.12-5
85	3400.5	3.13-4	2.82-4	2.20-4	1.41-4	6.94-5	3.03-5
86	3502.5	3.04-4	2.74-4	2.14-4	1.37-4	6.74-5	2.94-5
87	3606.0	2.96-4	2.67-4	2.08-4	1.33-4	6.54-5	2.85-5
88	3711.3	2.88-4	2.60-4	2.02-4	1.30-4	6.36-5	2.77-5
89	3818.2	2.81-4	2.53-4	1.97-4	1.26-4	6.18-5	2.69-5
90	3926.7	2.73-4	2.46-4	1.91-4	1.22-4	6.01-5	2.61-5
91	4037.0	2.66-4	2.40-4	1.86-4	1.19-4	5.85-5	2.54-5
92	4148.9	2.60-4	2.33-4	1.82-4	1.16-4	5.69-5	2.47-5

A1 – N12

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1398.7	3.95-4	3.65-4	2.98-4	2.04-4	1.06-4	4.81-5
61	1473.2	3.81-4	3.51-4	2.87-4	1.95-4	1.02-4	4.61-5
62	1549.5	3.67-4	3.38-4	2.75-4	1.87-4	9.69-5	4.40-5
63	1627.6	3.53-4	3.24-4	2.64-4	1.79-4	9.25-5	4.20-5
64	1707.5	3.39-4	3.12-4	2.53-4	1.71-4	8.83-5	4.01-5
65	1789.1	3.26-4	2.99-4	2.43-4	1.64-4	8.44-5	3.83-5
66	1872.5	3.13-4	2.88-4	2.33-4	1.57-4	8.06-5	3.65-5
67	1957.6	3.01-4	2.76-4	2.24-4	1.50-4	7.71-5	3.49-5
68	2044.5	2.90-4	2.66-4	2.15-4	1.44-4	7.38-5	3.34-5
69	2133.1	2.79-4	2.56-4	2.06-4	1.38-4	7.07-5	3.20-5
70	2223.4	2.69-4	2.46-4	1.98-4	1.32-4	6.77-5	3.06-5
71	2315.4	2.59-4	2.37-4	1.91-4	1.27-4	6.49-5	2.93-5
72	2409.1	2.50-4	2.28-4	1.84-4	1.22-4	6.23-5	2.81-5
73	2504.5	2.41-4	2.20-4	1.77-4	1.17-4	5.98-5	2.70-5
74	2601.6	2.32-4	2.12-4	1.70-4	1.13-4	5.75-5	2.59-5
75	2700.3	2.24-4	2.05-4	1.64-4	1.09-4	5.53-5	2.49-5
76	2800.7	2.17-4	1.98-4	1.58-4	1.05-4	5.32-5	2.39-5
77	2902.8	2.09-4	1.91-4	1.53-4	1.01-4	5.13-5	2.30-5
78	3006.4	2.03-4	1.85-4	1.47-4	9.75-5	4.94-5	2.22-5
79	3111.7	1.96-4	1.79-4	1.43-4	9.42-5	4.77-5	2.14-5
80	3218.6	1.90-4	1.73-4	1.38-4	9.10-5	4.61-5	2.06-5
81	3327.1	1.84-4	1.67-4	1.33-4	8.80-5	4.45-5	1.99-5
82	3437.2	1.79-4	1.62-4	1.29-4	8.51-5	4.30-5	1.93-5
83	3548.8	1.73-4	1.58-4	1.25-4	8.25-5	4.17-5	1.86-5
84	3661.9	1.68-4	1.53-4	1.21-4	7.99-5	4.04-5	1.81-5
85	3776.6	1.64-4	1.49-4	1.18-4	7.75-5	3.91-5	1.75-5
86	3892.8	1.59-4	1.44-4	1.15-4	7.52-5	3.80-5	1.70-5
87	4010.5	1.55-4	1.41-4	1.11-4	7.31-5	3.69-5	1.65-5
88	4129.7	1.51-4	1.37-4	1.08-4	7.10-5	3.58-5	1.60-5
89	4250.3	1.47-4	1.33-4	1.05-4	6.90-5	3.48-5	1.55-5
90	4372.4	1.44-4	1.30-4	1.03-4	6.72-5	3.39-5	1.51-5
91	4495.8	1.40-4	1.27-4	1.00-4	6.54-5	3.30-5	1.47-5
92	4620.7	1.37-4	1.24-4	9.75-5	6.37-5	3.21-5	1.43-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - N13

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1414.7	3.33-4	3.05-4	2.45-4	1.63-4	8.22-5	3.63-5
61	1490.8	3.23-4	2.95-4	2.37-4	1.57-4	7.91-5	3.50-5
62	1568.7	3.12-4	2.86-4	2.29-4	1.52-4	7.62-5	3.38-5
63	1648.5	3.02-4	2.76-4	2.22-4	1.46-4	7.34-5	3.25-5
64	1730.2	2.93-4	2.67-4	2.14-4	1.41-4	7.07-5	3.13-5
65	1813.8	2.84-4	2.59-4	2.07-4	1.36-4	6.81-5	3.02-5
66	1899.3	2.75-4	2.51-4	2.00-4	1.31-4	6.57-5	2.92-5
67	1986.7	2.66-4	2.43-4	1.94-4	1.27-4	6.34-5	2.81-5
68	2075.9	2.58-4	2.35-4	1.87-4	1.23-4	6.12-5	2.72-5
69	2167.1	2.50-4	2.28-4	1.81-4	1.19-4	5.91-5	2.62-5
70	2260.1	2.43-4	2.21-4	1.75-4	1.15-4	5.70-5	2.53-5
71	2355.0	2.35-4	2 14-4	1.70-4	1.11-4	5.51-5	2.45-5
72	2451.7	2.28-4	2.07-4	1.64-4	1.07-4	5.31-5	2.36-5
73	2550.4	2.20-4	2.00-4	1.58-4	1.03-4	5.12-5	2.27-5
74	2650.9	2.13-4	1.93-4	1.53-4	9.93-5	4.93-5	2.18-5
75	2753.3	2.06-4	1.87-4	1.47-4	9.56-5	4.74-5	2.10-5
76	2857.5	1.99-4	1.80-4	1.42-4	9.21-5	4.56-5	2.02-5
77	2963.6	1.92-4	1.74-4	1.37-4	8.87-5	4.39-5	1.94-5
78	3071.6	1.85-4	1.68-4	1.32-4	8.55-5	4.22-5	1.86-5
79	3181.5	1.79-4	1.62-4	1.28-4	8.24-5	4.07-5	1.79-5
80	3293.2	1.73-4	1.57-4	1.23-4	7.95-5	3.92-5	1.73-5
81	3406.8	1.68-4	1.52-4	1.19-4	7.68-5	3.79-5	1.67-5
82	3522.2	1.63-4	1.47-4	1.15-4	7.43-5	3.66-5	1.61-5
83	3639.5	1.58-4	1.43-4	1.12-4	7.19-5	3.54-5	1.55-5
84	3758.6	1.53-4	1.38-4	1.08-4	6.96-5	3.42-5	1.50-5
85	3879.6	1.49-4	1.34-4	1.05-4	6.74-5	3.31-5	1.46-5
86	4002.4	1.44-4	1.31-4	1.02-4	6.54-5	3.21-5	1.41-5
87	4127.1	1.40-4	1.27-4	9.90-5	6.34-5	3.12-5	1.37-5
88	4253.7	1.37-4	1.23-4	9.62-5	6.16-5	3.03-5	1.33-5
89	4382.0	1.33-4	1.20-4	9.36-5	5.99-5	2.94-5	1.29-5
90	4512.2	1.30-4	1.17-4	9.10-5	5.82-5	2.85-5	1.25-5
91	4644.3	1.26-4	1.14-4	8.86-5	5.66-5	2.78-5	1.22-5
92	4778.2	1.23-4	1.11-4	8.63-5	5.51-5	2.70-5	1.18-5

A1 - N14

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1422.0	3.69-4	3 29-4	2.53-4	1.61-4	8.05-5	3.60-5
61	1498.5	3.58-4	3.19-4	2.45-4	1.56-4	7.79-5	3.49-5
62	1577.0	3.49-4	3.11-4	2.38-4	1.52-4	7.58-5	3.39-5
63	1657.4	3.41-4	3.04-4	2.33-4	1.49-4	7.41-5	3.32-5
64	1739.6	3.36-4	2.99-4	2.30-4	1.47-4	7.31-5	3.28-5
65	1823.8	3.34-4	2.97-4	2.28-4	1.46-4	7.27-5	3.27-5
66	1909.8	3.35-4	2.99-4	2.30-4	1.46-4	7.31-5	3.29-5
67	1997.7	3.41-4	3.04-4	2.34-4	1.49-4	7.47-5	3.37-5
68	2087.4	3.51-4	3.13-4	2.41-4	1.54-4	7.74-5	3.49-5
69	2179.0	3.66-4	3.27-4	2.52-4	1.62-4	8.13-5	3.68-5
70	2272.4	3.83-4	3.42-4	2.64-4	1.70-4	8.55-5	3.88-5
71	2367.6	3.95-4	3.53-4	2.73-4	1.76-4	8 89-5	4.03-5
72	2464.7	3.99-4	3.57-4	2.76-4	1.78-4	9.01-5	4.09-5
73	2563.9	3.93-4	3.52-4	2.73-4	1.76-4	8.89-5	4.04-5
74	2665.2	3.79-4	3.39-4	2.63-4	1.69-4	8.56-5	3.89-5
75	2768.7	3.57-4	3.19-4	2.47-4	1.59-4	8.03-5	3.65-5
76	2874.2	3.27-4	2.93-4	2.26-4	1.45-4	7.32-5	3.32-5
77	2981.6	2.94-4	2.62-4	2.02-4	1.30-4	6.50-5	2.94-5
78	3090 9	2.61-4	2.33-4	1.79-4	1.14-4	5.71-5	2.57-5
79	3201.9	2.33-4	2.07-4	1.59-4	1.01-4	5.04-5	2.27-5
80	3314.8	2.11-4	1.88-4	1.44-4	9.12-5	4.52-5	2.03-5
81	3429.4	1.94-4	1.73-4	1.32-4	8.35-5	4.13-5	1.84-5
82	3545.9	1.81-4	1.61-4	1.23-4	7.75-5	3.82-5	1.70-5
83	3664.1	1.71-4	1.51-4	1.15-4	7.28-5	3.58-5	1.59-5
84	3784.2	1.62-4	1.44-4	1.09-4	6.89-5	3.39-5	1.50-5
85	3906.0	1.55-4	1.37-4	1.04-4	6.57-5	3.22-5	1.43-5
86	4029.7	1.48-4	1.32-4	1.00-4	6.29-5	3.08-5	1.36-5
87	4155.2	1.43-4	1.27-4	9.63-5	6.04-5	2.96-5	1.31-5
88	4282.5	1.38-4	1.22-4	9.29-5	5.83-5	2.85-5	1.26-5
89	4411.6	1.34-4	1.18-4	8.99-5	5.63-5	2.75-5	1.22-5
90	4542.4	1.30-4	1.15-4	8.71-5	5.45-5	2.66-5	1.18-5
91	4675.0	1.26-4	1.12-4	8.45-5	5.29-5	2.58-5	1.14-5
92	4809.4	1.23-4	1.09-4	8.22-5	5.14-5	2.51-5	1.11-5

A1 - N15

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1438.7	2.45-4	2.21-4	1.72-4	1.10-4	5.35-5	2.26-5
61	1516.8	2.40-4	2.16-4	1.68-4	1.08-4	5.23-5	2.22-5
62	1596.9	2.38-4	2.14-4	1.67-4	1.07-4	5.21-5	2.22-5
63	1678.9	2.47-4	2.22-4	1.73-4	1.11-4	5.43-5	2.34-5
64	1762.5	3.25-4	2.92-4	2.28-4	1.47-4	7.34-5	3.26-5
65	1844.7	4.27-4	3.83-4	2.98-4	1.94-4	9.90-5	4.49-5
66	1927.5	3.93-4	3.52-4	2.74-4	1.78-4	9.11-5	4.12-5
67	2012.4	3.56-4	3.19-4	2.49-4	1.62-4	8.23-5	3.72-5
68	2099.7	3.17-4	2.84-4	2.21-4	1.43-4	7.29-5	3.28-5
69	2189.3	2.75-4	2.46-4	1.91-4	1.24-4	6.28-5	2.82-5
70	2281.3	2.34-4	2.09-4	1.62-4	1.05-4	5.28-5	2.35-5
71	2375.7	1.98-4	1.77-4	1.36-4	8.77-5	4.40-5	1.95-5
72	2472.6	1.72-4	1.53-4	1.18-4	7.56-5	3.77-5	1.66-5
73	2571.8	1.57-4	1.40-4	1.07-4	6.86-5	3.42-5	1.50-5
74	2673.2	1.52-4	1.35-4	1 04-4	6.64-5	3.30-5	1.45-5
75	2777.1	1.55-4	1.39-4	1.07-4	6.84-5	3.42-5	1.50-5
76	2883.4	1.67-4	1.49-4	1.15-4	7.43-5	3.74-5	1.66-5
77	2992.3	1.85-4	1.65-4	1.28-4	8.28-5	4.19-5	1.87-5
78	3104.1	2.02-4	1.81-4	1.40-4	9.11-5	4.63-5	2.08-5
79	3218.8	2.15-4	1.93-4	1.50-4	9.74-5	4.96-5	2.24-5
80	3336.5	2.22-4	1.99-4	1.55-4	1.01-4	5.16-5	2.33-5
81	3457.2	2.25-4	2.02-4	1.58-4	1.03-4	5.25-5	2.38-5
82	3581.0	2.25-4	2.02-4	1.58-4	1.03-4	5.27-5	2.39-5
83	3708.0	2.23-4	2.01-4	1.57-4	1.02-4	5.23-5	2.38-5
84	3838.3	2.20-4	1.98-4	1.54-4	1.01-4	5.17-5	2.35-5
85	3971.9	2.16-4	1.94-4	1.52-4	9.91-5	5.08-5	2.32-5
86	4108.8	2.11-4	1.90-4	1.49-4	9.72-5	4.99-5	2.28-5
87	4249.3	2.07-4	1.86-4	1.45-4	9.52-5	4.90-5	2.24-5
88	4393.4	2.03-4	1.82-4	1.43-4	9.33-5	4.80-5	2.20-5
89	4540.6	1.90-4	1.71-4	1.33-4	8.72-5	4.48-5	2.05-5
90	4683.4	9.75-5	8.72-5	6.70-5	4.23-5	2.05-5	8.87-6
91	4824.9	8.5[illegible]-5	7.68-5	5.89-5	3.69-5	1.77-5	7.54-6
92	4968.4	8.13-5	7.26-5	5.56-5	3.49-5	1.67-5	7.06-6

A1 - N16

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1463.7	5.61-4	5.04-4	3.94-4	2.58-4	1.33-4	6.06-5
61	1535.9	5.29-4	4.75-4	3.72-4	2.43-4	1.25-4	5.69-5
62	1610.1	4.97-4	4.46-4	3.49-4	2.28-4	1.17-4	5.32-5
63	1686.3	4.58-4	4.12-4	3.22-4	2.10-4	1.08-4	4.89-5
64	1765.1	3.59-4	3.23-4	2.53-4	1.66-4	8.43-5	3.78-5
65	1849.5	2.69-4	2.45-4	1.95-4	1.28-4	6.40-5	2.82-5
66	1936.4	4.63-4	4.25-4	3.44-4	2.32-4	1.21-4	5.49-5
67	2023.2	5.53-4	5.08-4	4.14-4	2.81-4	1.48-4	6.76-5
68	2111.5	5.33-4	4.90-4	3.99-4	2.71-4	1.42-4	6.51-5
69	2202.0	5.10-4	4.69-4	3.81-4	2.59-4	1.36-4	6.21-5
70	2294.8	4.89-4	4.49-4	3.65-4	2.47-4	1.30-4	5.94-5
71	2390.1	4.69-4	4.31-4	3.50-4	2.37-4	1.24-4	5.69-5
72	2487.9	4.51-4	4.14-4	3.36-4	2.28-4	1.19-4	5.47-5
73	2588.2	4.35-4	3.99-4	3.24-4	2.19-4	1.15-4	5.26-5
74	2691.2	4.19-4	3.85-4	3.12-4	2.11-4	1.10-4	5.07-5
75	2796.8	4.04-4	3.71-4	3.01-4	2.04-4	1.07-4	4.90-5
76	2905.1	3.91-4	3.58-4	2.91-4	1.97-4	1.03-4	4.74-5
77	3016.3	3.77-4	3.46-4	2.81-4	1.90-4	9.96-5	4.59-5
78	3130.3	3.65-4	3.35-4	2.72-4	1.84-4	9.64-5	4.45-5
79	3247.3	3.53-4	3.24-4	2.63-4	1.78-4	9.35-5	4.32-5
80	3367.2	3.43-4	3.15-4	2.55-4	1.73-4	9.08-5	4.20-5
81	3490.3	3.33-4	3.05-4	2.48-4	1.68-4	8.93-5	4.09-5
82	3616.4	3.24-4	2.97-4	2.41-4	1.64-4	8.60-5	3.99-5
83	3745.8	3.16-4	2.90-4	2.35-4	1.60-4	8.39-5	3.90-5
84	3878.0	2.93-4	2.69-4	2.18-4	1.47-4	7.72-5	3.59-5
85	4009.7	1.57-4	1.42-4	1.13-4	7.36-5	3.71-5	1.66-5
86	4140.6	1.10-4	9.86-5	7.66-5	4.88-5	2.38-5	1.03-5
87	4273.3	9.61-5	8.62-5	6.65-5	4.20-5	2.02-5	8.59-6
88	4408.1	8.85-5	7.92-5	6.09-5	3.83-5	1.83-5	7.71-6
89	4545.6	9.10-5	8.16-5	6.30-5	4.00-5	1.94-5	8.25-6
90	4693.5	1.75-4	1.57-4	1.23-4	8.09-5	4.16-5	1.90-5
91	4848.8	1.78-4	1.60-4	1.26-4	8.26-5	4.27-5	1.96-5
92	5007.8	3.79-4	3.27-4	2.35-4	1.36-4	6.01-5	2.41-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – N17

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1469.9	6.92-4	6.38-4	5.24-4	3.61-4	1.91-4	8.79-5
61	1542.6	6.61-4	6.09-4	4.99-4	3.43-4	1.81-4	8.33-5
62	1617.5	6.29-4	5.80-4	4.74-4	3.25-4	1.71-4	7.87-5
63	1694.5	5.96-4	5.49-4	4.48-4	3.06-4	1.61-4	7.39-5
64	1773.6	5.55-4	5.10-4	4.16-4	2.84-4	1.49-4	6.82-5
65	1855.1	4.81-4	4.42-4	3.59-4	2.44-4	1.28-4	5.81-5
66	1939.8	2.60-4	2.36-4	1.88-4	1.24-4	6.30-5	2.77-5
67	2029.0	1.44-4	1.28-4	9.84-5	6.14-5	2.87-5	1.17-5
68	2121.1	1.38-4	1.23-4	9.39-5	5.82-5	2.70-5	1.10-5
69	2215.5	1.36-4	1.22-4	9.31-5	5.78-5	2.68-5	1.10-5
70	2311.9	1.34-4	1.20-4	9.16-5	5.70-5	2.65-5	1.09-5
71	2410.5	1.31-4	1.17-4	8.96-5	5.57-5	2.60-5	1.07-5
72	2511.1	1.28-4	1.14-4	8.72-5	5.43-5	2.53-5	1.04-5
73	2613.8	1.24-4	1.11-4	8.47-5	5.27-5	2.46-5	1.01-5
74	2718.6	1.20-4	1.07-4	8.21-5	5.10-5	2.38-5	9.82-6
75	2825.5	1.16-4	1.04-4	7.94-5	4.94-5	2.31-5	9.49-6
76	2934.5	1.13-4	1.01-4	7.67-5	4.77-5	2.23-5	9.16-6
77	3045.6	1.09-4	9.70-5	7.41-5	4.60-5	2.15-5	8.83-6
78	3158.9	1.05-4	9.36-5	7.14-5	4.43-5	2.07-5	8.48-6
79	3274.2	1.01-4	9.00-5	6.86-5	4.25-5	1.98-5	8.12-6
80	3391.7	9.69-5	8.63-5	6.57-5	4.07-5	1.89-5	7.74-6
81	3511.3	9.26-5	8.24-5	6.26-5	3.87-5	1.80-5	7.32-6
82	3633.1	8.77-5	7.80-5	5.92-5	3.65-5	1.69-5	6.84-6
83	3757.0	8.26-5	7.34-5	5.57-5	3.43-5	1.59-5	6.39-6
84	3883.7	9.22-5	8.26-5	6.38-5	4.05-5	1.95-5	8.18-6
85	4016.4	2.16-4	1.98-4	1.60-4	1.08-4	5.68-5	2.62-5
86	4155.6	2.51-4	2.30-4	1.87-4	1.27-4	6.73-5	3.13-5
87	4298.8	2.53-4	2.32-4	1.89-4	1.29-4	6.82-5	3.18-5
88	4445.9	2.48-4	2.28-4	1.86-4	1.27-4	6.75-5	3.16-5
89	4596.6	3.23-4	2.87-4	2.20-4	1.40-4	7.02-5	3.19-5
90	4731.9	4.04-4	3.49-4	2.51-4	1.45-4	6.43-5	2.58-5
91	4868.9	3.91-4	3.38-4	2.43-4	1.41-4	6.22-5	2.49-5
92	5008.4	1.76-4	1.58-4	1.24-4	8.14-5	4.21-5	1.94-5

A1 – N18

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1514.7	1.70-3	1.48-3	1.08-3	6.40-4	2.94-4	1.23-4
61	1594.2	1.60-3	1.39-3	1.01-3	6.01-4	2.76-4	1.15-4
62	1675.5	1.50-3	1.31-3	9.53-4	5.66-4	2.60-4	1.09-4
63	1758.6	1.26-3	1.10-3	8.11-4	4.90-4	2.32-4	1.01-4
64	1838.3	3.97-4	3.60-4	2.82-4	1.82-4	9.21-5	4.44-5
65	1920.5	3.62-4	3.28-4	2.57-4	1.64-4	8.27-5	3.97-5
66	2004.8	3.43-4	3.11-4	2.43-4	1.55-4	7.79-5	3.73-5
67	2091.5	3.28-4	2.97-4	2.31-4	1.47-4	7.41-5	3.55-5
68	2180.4	3.15-4	2.84-4	2.21-4	1.41-4	7.07-5	3.39-5
69	2271.6	3.02-4	2.73-4	2.12-4	1.35-4	6.78-5	3.25-5
70	2365.3	2.91-4	2.62-4	2.03-4	1.29-4	6.50-5	3.13-5
71	2461.3	2.80-4	2.52-4	1.95-4	1.24-4	6.25-5	3.01-5
72	2559.9	2.70-4	2.43-4	1.88-4	1.19-4	6.02-5	2.90-5
73	2661.0	2.60-4	2.34-4	1.81-4	1.15-4	5.81-5	2.80-5
74	2764.8	2.51-4	2.26-4	1.75-4	1.11-4	5.61-5	2.71-5
75	2871.1	2.43-4	2.18-4	1.69-4	1.07-4	5.43-5	2.63-5
76	2980.2	2.35-4	2.11-4	1.63-4	1.04-4	5.26-5	2.55-5
77	3092.1	2.28-4	2.05-4	1.58-4	1.01-4	5.11-5	2.48-5
78	3206.9	2.21-4	1.99-4	1.54-4	9.79-5	4.98-5	2.42-5
79	3324.5	2.15-4	1.94-4	1.50-4	9.55-5	4.86-5	2.37-5
80	3445.1	2.11-4	1.89-4	1.47-4	9.37-5	4.79-5	2.34-5
81	3568.9	2.09-4	1.88-4	1.46-4	9.34-5	4.79-5	2.35-5
82	3695.9	2.32-4	2.08-4	1.61-4	1.03-4	5.33-5	2.61-5
83	3826.7	5.31-4	4.61-4	3.36-4	1.99-4	9.09-5	3.81-5
84	3950.4	4.99-4	4.32-4	3.11-4	1.81-4	8.07-5	3.27-5
85	4075.9	4.80-4	4.15-4	2.99-4	1.73-4	7.69-5	3.10-5
86	4203.3	4.62-4	4.00-4	2.88-4	1.67-4	7.39-5	2.97-5
87	4332.6	4.46-4	3.86-4	2.78-4	1.61-4	7.11-5	2.85-5
88	4463.8	4.31-4	3.73-4	2.68-4	1.55-4	6.85-5	2.75-5
89	4597.2	3.37-4	2.96-4	2.21-4	1.34-4	6.25-5	2.58-5
90	4741.0	4.82-4	4.19-4	3.05-4	1.80-4	8.20-5	3.41-5
91	4878.6	4.70-4	4.09-4	2.97-4	1.75-4	7.98-5	3.31-5
92	5018.1	4.59-4	3.98-4	2.90-4	1.71-4	7.78-5	3.22-5

A1 – N19

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1515.8	1.07-3	9.22-4	6.54-4	3.69-4	1.57-4	6.01-5
61	1595.3	1.04-3	8.94-4	6.35-4	3.60-4	1.54-4	5.93-5
62	1676.7	1.01-3	8.67-4	6.17-4	3.50-4	1.50-4	5.86-5
63	1758.9	6.18-4	5.43-4	4.03-4	2.39-4	1.07-4	4.41-5
64	1844.0	1.28-3	1.11-3	8.06-4	4.74-4	2.14-4	8.79-5
65	1931.1	1.22-3	1.06-3	7.71-4	4.54-4	2.06-4	8.48-5
66	2020.2	1.15-3	1.00-3	7.28-4	4.28-4	1.94-4	7.99-5
67	2111.1	1.09-3	9.45-4	6.86-4	4.03-4	1.82-4	7.50-5
68	2204.0	1.03-3	8.92-4	6.47-4	3.79-4	1.71-4	7.04-5
69	2298.7	9.71-4	8.42-4	6.10-4	3.57-4	1.61-4	6.61-5
70	2395.4	9.19-4	7.97-4	5.77-4	3.37-4	1.52-4	6.21-5
71	2494.1	8.71-4	7.54-4	5.46-4	3.19-4	1.43-4	5.85-5
72	2594.6	8.26-4	7.16-4	5.17-4	3.02-4	1.35-4	5.52-5
73	2697.0	7.85-4	6.80-4	4.91-4	2.87-4	1.28-4	5.22-5
74	2801.4	7.47-4	6.47-4	4.67-4	2.72-4	1.22-4	4.94-5
75	2907.7	7.12-4	6.16-4	4.45-4	2.59-4	1.15-4	4.68-5
76	3015.9	6.79-4	5.88-4	4.24-4	2.47-4	1.10-4	4.45-5
77	3126.0	6.49-4	5.62-4	4.05-4	2.35-4	1.05-4	4.23-5
78	3238.0	6.21-4	5.37-4	3.87-4	2.25-4	9.99-5	4.02-5
79	3352.0	5.95-4	5.14-4	3.70-4	2.15-4	9.53-5	3.83-5
80	3467.9	5.69-4	4.92-4	3.54-4	2.05-4	9.08-5	3.65-5
81	3585.7	5.43-4	4.69-4	3.38-4	1.95-4	8.62-5	3.44-5
82	3705.2	4.99-4	4.31-4	3.09-4	1.78-4	7.74-5	3.05-5
83	3828.1	2.80-4	2.47-4	1.85-4	1.14-4	5.56-5	2.56-5
84	3956.3	5.65-4	4.91-4	3.58-4	2.12-4	9.71-5	4.06-5
85	4082.4	5.53-4	4.80-4	3.49-4	2.06-4	9.37-5	3.88-5
86	4210.2	5.38-4	4.67-4	3.40-4	2.00-4	9.09-5	3.76-5
87	4340.0	5.24-4	4.54-4	3.30-4	1.95-4	8.84-5	3.65-5
88	4471.7	5.10-4	4.42-4	3.22-4	1.89-4	8.60-5	3.55-5
89	4605.4	4.96-4	4.31-4	3.13-4	1.84-4	8.36-5	3.45-5
90	4751.8	2.37-4	2.18-4	1.77-4	1.21-4	6.42-5	2.99-5
91	4910.8	2.30-4	2.12-4	1.72-4	1.18-4	6.30-5	2.95-5
92	5073.9	2.24-4	2.06-4	1.68-4	1.15-4	6.16-5	2.90-5

A1 – N20

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1531.1	4.43-4	4.04-4	3.20-4	2.06-4	1.03-4	4.87-5
61	1604.8	4.16-4	3.79-4	2.98-4	1.91-4	9.48-5	4.46-5
62	1680.6	3.97-4	3.60-4	2.82-4	1.79-4	8.81-5	4.11-5
63	1759.7	8.97-4	7.73-4	5.51-4	3.14-4	1.36-4	5.35-5
64	1845.3	9.68-4	8.34-4	5.95-4	3.40-4	1.47-4	5.77-5
65	1932.5	9.42-4	8.13-4	5.81-4	3.33-4	1.45-4	5.71-5
66	2021.6	9.19-4	7.93-4	5.68-4	3.26-4	1.43-4	5.66-5
67	2112.7	8.97-4	7.74-4	5.55-4	3.20-4	1.40-4	5.59-5
68	2205.7	8.75-4	7.56-4	5.43-4	3.13-4	1.38-4	5.52-5
69	2300.6	8.53-4	7.37-4	5.30-4	3.07-4	1.36-4	5.44-5
70	2397.5	8.32-4	7.19-4	5.18-4	3.00-4	1.33-4	5.36-5
71	2496.2	8.11-4	7.01-4	5.05-4	2.93-4	1.30-4	5.27-5
72	2597.0	7.89-4	6.83-4	4.93-4	2.87-4	1.28-4	5.17-5
73	2699.6	7.69-4	6.65-4	4.80-4	2.80-4	1.25-4	5.07-5
74	2804.2	7.48-4	6.48-4	4.68-4	2.73-4	1.22-4	4.96-5
75	2910.7	7.28-4	6.30-4	4.56-4	2.66-4	1.19-4	4.85-5
76	3019.2	7.08-4	6.13-4	4.43-4	2.59-4	1.16-4	4.74-5
77	3129.6	6.88-4	5.96-4	4.32-4	2.52-4	1.13-4	4.63-5
78	3241.9	6.69-4	5.80-4	4.20-4	2.46-4	1.10-4	4.51-5
79	3356.2	6.50-4	5.63-4	4.08-4	2.39-4	1.08-4	4.40-5
80	3472.4	6.31-4	5.47-4	3.96-4	2.32-4	1.05-4	4.27-5
81	3590.5	6.13-4	5.31-4	3.85-4	2.25-4	1.01-4	4.14-5
82	3710.6	5.91-4	5.12-4	3.71-4	2.17-4	9.74-5	3.97-5
83	3830.6	4.69-4	4.06-4	2.93-4	1.70-4	7.46-5	2.96-5
84	3959.6	1.76-4	1.57-4	1.20-4	7.47-5	3.67-5	1.73-5
85	4096.3	1.70-4	1.53-4	1.18-4	7.45-5	3.76-5	1.82-5
86	4236.5	1.67-4	1.50-4	1.16-4	7.36-5	3.74-5	1.82-5
87	4380.5	1.63-4	1.47-4	1.13-4	7.23-5	3.69-5	1.80-5
88	4528.1	1.60-4	1.43-4	1.11-4	7.10-5	3.64-5	1.78-5
89	4679.6	1.56-4	1.40-4	1.09-4	6.98-5	3.59-5	1.76-5
90	4835.1	1.53-4	1.38-4	1.07-4	6.86-5	3.54-5	1.74-5
91	4994.6	1.51-4	1.36-4	1.05-4	6.78-5	3.51-5	1.73-5
92	5158.2	1.50-4	1.35-4	1.05-4	6.75-5	3.51-5	1.73-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – N21

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1538.0	1.85-3	1.62-3	1.19-3	7.16-4	3.35-4	1.42-4
61	1619.5	1.76-3	1.54-3	1.13-3	6.81-4	3.19-4	1.36-4
62	1703.1	1.66-3	1.45-3	1.07-3	6.43-4	3.02-4	1.28-4
63	1788.7	1.57-3	1.37-3	1.01-3	6.06-4	2.84-4	1.21-4
64	1876.4	1.47-3	1.29-3	9.46-4	5.69-4	2.67-4	1.14-4
65	1966.2	1.38-3	1.20-3	8.87-4	5.33-4	2.49-4	1.06-4
66	2058.0	1.29-3	1.13-3	8.28-4	4.97-4	2.32-4	9.88-5
67	2151.9	1.20-3	1.05-3	7.71-4	4.62-4	2.16-4	9.15-5
68	2247.9	1.12-3	9.75-4	7.16-4	4.29-4	2.00-4	8.45-5
69	2346.0	1.04-3	9.06-4	6.64-4	3.97-4	1.84-4	7.79-5
70	2446.2	9.65-4	8.41-4	6.17-4	3.68-4	1.70-4	7.18-5
71	2548.5	8.98-4	7.83-4	5.73-4	3.41-4	1.57-4	6.62-5
72	2652.9	8.38-4	7.30-4	5.33-4	3.17-4	1.46-4	6.12-5
73	2759.5	7.84-4	6.82-4	4.98-4	2.96-4	1.36-4	5.67-5
74	2868.1	7.35-4	6.39-4	4.66-4	2.76-4	1.26-4	5.27-5
75	2978.9	6.91-4	6.01-4	4.38-4	2.59-4	1.18-4	4.91-5
76	3091.8	6.52-4	5.67-4	4.13-4	2.44-4	1.11-4	4.60-5
77	3206.9	6.17-4	5.36-4	3.90-4	2.30-4	1.05-4	4.33-5
78	3324.2	5.85-4	5.09-4	3.70-4	2.18-4	9.88-5	4.08-5
79	3443.6	5.57-4	4.84-4	3.51-4	2.07-4	9.37-5	3.86-5
80	3565.1	5.31-4	4.61-4	3.35-4	1.97-4	8.90-5	3.66-5
81	3688.9	5.07-4	4.40-4	3.20-4	1.88-4	8.48-5	3.48-5
82	3814.9	4.85-4	4.21-4	3.06-4	1.79-4	8.09-5	3.32-5
83	3943.0	4.65-4	4.03-4	2.93-4	1.72-4	7.74-5	3.17-5
84	4073.4	4.46-4	3.87-4	2.81-4	1.65-4	7.41-5	3.03-5
85	4206.0	4.29-4	3.72-4	2.70-4	1.58-4	7.11-5	2.91-5
86	4340.8	4.13-4	3.58-4	2.60-4	1.52-4	6.83-5	2.79-5
87	4477.9	3.98-4	3.45-4	2.50-4	1.46-4	6.57-5	2.68-5
88	4617.2	3.83-4	3.33-4	2.41-4	1.41-4	6.33-5	2.58-5
89	4758.7	3.70-4	3.21-4	2.33-4	1.36-4	6.10-5	2.49-5
90	4902.6	3.58-4	3.10-4	2.25-4	1.31-4	5.89-5	2.40-5
91	5048.7	3.45-4	3.00-4	2.17-4	1.27-4	5.69-5	2.32-5
92	5197.1	3.34-4	2.90-4	2.10-4	1.23-4	5.49-5	2.23-5

A1 – N22

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.0	1.01-3	8.67-4	6.19-4	3.53-4	1.53-4	6.00-5
61	1620.5	9.74-4	8.40-4	6.01-4	3.44-4	1.49-4	5.90-5
62	1704.1	9.48-4	8.18-4	5.86-4	3.37-4	1.47-4	5.84-5
63	1789.7	9.28-4	8.02-4	5.76-4	3.32-4	1.46-4	5.82-5
64	1877.4	9.14-4	7.90-4	5.68-4	3.29-4	1.45-4	5.85-5
65	1967.2	9.04-4	7.83-4	5.65-4	3.28-4	1.46-4	5.91-5
66	2059.1	8.98-4	7.79-4	5.63-4	3.28-4	1.47-4	6.00-5
67	2153.1	8.96-4	7.77-4	5.63-4	3.30-4	1.49-4	6.11-5
68	2249.1	8.94-4	7.77-4	5.65-4	3.32-4	1.51-4	6.23-5
69	2347.3	8.93-4	7.76-4	5.66-4	3.34-4	1.52-4	6.34-5
70	2447.6	8.91-4	7.75-4	5.66-4	3.35-4	1.54-4	6.43-5
71	2550.0	8.86-4	7.71-4	5.64-4	3.36-4	1.55-4	6.49-5
72	2654.6	8.79-4	7.66-4	5.61-4	3.35-4	1.55-4	6.52-5
73	2761.3	8.69-4	7.58-4	5.56-4	3.33-4	1.54-4	6.52-5
74	2870.1	8.57-4	7.48-4	5.50-4	3.29-4	1.53-4	6.50-5
75	2981.1	8.43-4	7.36-4	5.42-4	3.25-4	1.52-4	6.44-5
76	3094.2	8.28-4	7.23-4	5.32-4	3.20-4	1.50-4	6.37-5
77	3209.6	8.11-4	7.09-4	5.22-4	3.15-4	1.47-4	6.28-5
78	3327.1	7.94-4	6.94-4	5.12-4	3.09-4	1.45-4	6.18-5
79	3446.8	7.76-4	6.78-4	5.00-4	3.02-4	1.42-4	6.07-5
80	3568.6	7.57-4	6.62-4	4.89-4	2.96-4	1.39-4	5.95-5
81	3692.7	7.39-4	6.46-4	4.77-4	2.89-4	1.36-4	5.82-5
82	3819.1	7.20-4	6.30-4	4.66-4	2.82-4	1.33-4	5.70-5
83	3947.6	7.02-4	6.14-4	4.54-4	2.75-4	1.30-4	5.57-5
84	4078.4	6.84-4	5.99-4	4.43-4	2.69-4	1.27-4	5.44-5
85	4211.4	6.66-4	5.83-4	4.32-4	2.62-4	1.24-4	5.31-5
86	4346.6	6.49-4	5.68-4	4.21-4	2.55-4	1.21-4	5.19-5
87	4484.2	6.32-4	5.53-4	4.10-4	2.49-4	1.18-4	5.06-5
88	4624.0	6.16-4	5.39-4	3.99-4	2.43-4	1.15-4	4.94-5
89	4766.1	5.99-4	5.25-4	3.89-4	2.36-4	1.12-4	4.82-5
90	4910.5	5.84-4	5.11-4	3.79-4	2.30-4	1.09-4	4.69-5
91	5057.2	5.68-4	4.98-4	3.69-4	2.24-4	1.06-4	4.57-5
92	5206.2	5.53-4	4.85-4	3.59-4	2.18-4	1.03-4	4.44-5

A1 – N23

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1676.5	2.76-4	2.53-4	2.03-4	1.31-4	6.40-5	2.90-5
61	1758.9	2.66-4	2.43-4	1.94-4	1.25-4	6.10-5	2.77-5
62	1843.3	2.55-4	2.34-4	1.85-4	1.19-4	5.81-5	2.64-5
63	1929.6	2.46-4	2.24-4	1.78-4	1.14-4	5.54-5	2.52-5
64	2017.8	2.37-4	2.16-4	1.70-4	1.09-4	5.30-5	2.41-5
65	2108.0	2.28-4	2.07-4	1.63-4	1.04-4	5.07-5	2.31-5
66	2200.1	2.20-4	2.00-4	1.57-4	9.96-5	4.85-5	2.21-5
67	2294.0	2.12-4	1.92-4	1.51-4	9.55-5	4.65-5	2.12-5
68	2389.9	2.04-4	1.85-4	1.45-4	9.17-5	4.46-5	2.03-5
69	2487.8	1.97-4	1.79-4	1.40-4	8.81-5	4.29-5	1.96-5
70	2587.5	1.90-4	1.72-4	1.34-4	8.48-5	4.12-5	1.88-5
71	2689.1	1.84-4	1.67-4	1.30-4	8.16-5	3.97-5	1.81-5
72	2792.7	1.78-4	1.61-4	1.25-4	7.87-5	3.83-5	1.75-5
73	2898.2	1.72-4	1.56-4	1.21-4	7.59-5	3.69-5	1.69-5
74	3005.5	1.67-4	1.51-4	1.17-4	7.33-5	3.56-5	1.63-5
75	3114.8	1.62-4	1.46-4	1.13-4	7.09-5	3.44-5	1.57-5
76	3225.9	1.57-4	1.41-4	1.09-4	6.85-5	3.33-5	1.52-5
77	3339.0	1.52-4	1.37-4	1.06-4	6.64-5	3.22-5	1.47-5
78	3453.9	1.47-4	1.33-4	1.03-4	6.43-5	3.12-5	1.43-5
79	3570.7	1.43-4	1.29-4	9.96-5	6.23-5	3.03-5	1.38-5
80	3689.4	1.39-4	1.25-4	9.66-5	6.04-5	2.94-5	1.34-5
81	3810.0	1.35-4	1.21-4	9.38-5	5.87-5	2.85-5	1.30-5
82	3932.4	1.31-4	1.18-4	9.11-5	5.70-5	2.77-5	1.27-5
83	4056.7	1.27-4	1.15-4	8.85-5	5.54-5	2.69-5	1.23-5
84	4182.8	1.24-4	1.11-4	8.60-5	5.38-5	2.62-5	1.20-5
85	4310.8	1.21-4	1.08-4	8.36-5	5.23-5	2.54-5	1.16-5
86	4440.6	1.17-4	1.05-4	8.13-5	5.09-5	2.47-5	1.13-5
87	4572.2	1.14-4	1.03-4	7.91-5	4.94-5	2.41-5	1.10-5
88	4705.7	1.11-4	9.97-5	7.68-5	4.81-5	2.34-5	1.07-5
89	4841.0	1.08-4	9.68-5	7.46-5	4.67-5	2.27-5	1.04-5
90	4978.0	1.04-4	9.39-5	7.23-5	4.52-5	2.20-5	1.01-5
91	5116.9	1.01-4	9.08-5	6.99-5	4.37-5	2.13-5	9.73-6
92	5257.5	9.71-5	8.72-5	6.71-5	4.19-5	2.04-5	9.33-6

A1 – N24

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1749.8	1.01-3	9.07-4	7.05-4	4.55-4	2.29-4	1.03-4
61	1830.5	9.66-4	8.66-4	6.73-4	4.34-4	2.19-4	9.86-5
62	1913.4	9.24-4	8.29-4	6.44-4	4.16-4	2.09-4	9.44-5
63	1998.4	8.85-4	7.94-4	6.17-4	3.98-4	2.01-4	9.05-5
64	2085.6	8.48-4	7.61-4	5.91-4	3.82-4	1.92-4	8.68-5
65	2175.0	8.14-4	7.30-4	5.67-4	3.66-4	1.84-4	8.33-5
66	2266.7	7.81-4	7.01-4	5.44-4	3.51-4	1.77-4	8.00-5
67	2360.7	7.51-4	6.73-4	5.23-4	3.38-4	1.70-4	7.69-5
68	2457.0	7.22-4	6.47-4	5.03-4	3.25-4	1.64-4	7.39-5
69	2555.8	6.94-4	6.23-4	4.84-4	3.12-4	1.57-4	7.11-5
70	2657.1	6.68-4	5.99-4	4.66-4	3.01-4	1.52-4	6.85-5
71	2760.8	6.44-4	5.77-4	4.49-4	2.90-4	1.46-4	6.60-5
72	2867.2	6.20-4	5.56-4	4.32-4	2.79-4	1.41-4	6.36-5
73	2976.1	5.98-4	5.36-4	4.17-4	2.69-4	1.36-4	6.14-5
74	3087.8	5.77-4	5.18-4	4.02-4	2.60-4	1.31-4	5.93-5
75	3202.2	5.57-4	5.00-4	3.88-4	2.51-4	1.27-4	5.73-5
76	3319.4	5.38-4	4.83-4	3.75-4	2.42-4	1.22-4	5.54-5
77	3439.5	5.20-4	4.66-4	3.62-4	2.34-4	1.18-4	5.36-5
78	3562.5	5.02-4	4.51-4	3.51-4	2.27-4	1.15-4	5.18-5
79	3688.6	4.86-4	4.36-4	3.39-4	2.19-4	1.11-4	5.02-5
80	3817.8	4.70-4	4.22-4	3.28-4	2.12-4	1.08-4	4.87-5
81	3950.2	4.56-4	4.09-4	3.18-4	2.06-4	1.04-4	4.72-5
82	4085.8	4.41-4	3.96-4	3.09-4	2.00-4	1.01-4	4.58-5
83	4224.8	4.28-4	3.85-4	2.99-4	1.94-4	9.83-5	4.45-5
84	4367.2	4.16-4	3.74-4	2.91-4	1.88-4	9.55-5	4.33-5
85	4513.2	4.05-4	3.63-4	2.83-4	1.83-4	9.30-5	4.21-5
86	4662.7	3.94-4	3.54-4	2.76-4	1.79-4	9.06-5	4.11-5
87	4816.1	3.85-4	3.46-4	2.69-4	1.75-4	8.86-5	4.02-5
88	4973.2	3.79-4	3.40-4	2.65-4	1.71-4	8.68-5	3.93-5
89	5135.6	3.44-4	3.08-4	2.39-4	1.54-4	7.72-5	3.46-5
90	5286.0	1.02-4	9.05-5	6.89-5	4.30-5	2.04-5	8.55-6
91	5436.8	9.24-5	8.21-5	6.25-5	3.90-5	1.85-5	7.72-6
92	5589.8	8.80-5	7.83-5	5.95-5	3.71-5	1.76-5	7.35-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - N25

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1773.4	2.30-4	2.07-4	1.63-4	1.06-4	5.27-5	2.28-5
61	1860.0	2.21-4	1 99-4	1.56-4	1.01-4	5.00-5	2.16-5
62	1948.7	2.12-4	1.91-4	1.49-4	9.62-5	4.75-5	2.05-5
63	2039.4	2.04-4	1.83-4	1.43-4	9.18-5	4.52-5	1.94-5
64	2132 1	1.96-4	1.76-4	1.37-4	8.78-5	4.30-5	1.85-5
65	2227 0	1.89-4	1.69-4	1.31-4	8.40-5	4.11-5	1.76-5
66	2323 9	1.81-4	1.63-4	1.26-4	8.05-5	3.92-5	1.68-5
67	2422.9	1.75-4	1.56-4	1.21-4	7.72-5	3.75-5	1.60-5
68	2523.9	1.68-4	1.51-4	1.16-4	7.41-5	3.60-5	1.53-5
69	2627.1	1.62-4	1.45-4	1.12-4	7.12-5	3.45-5	1.47-5
70	2732.3	1.56-4	1.40-4	1.08-4	6.85-5	3.31-5	1.41-5
71	2839.6	1.51-4	1.35-4	1.04-4	6.60-5	3.18-5	1.35-5
72	2949.1	1.46-4	1.31-4	1.01-4	6.35-5	3.06-5	1.30-5
73	3060.6	1 41-4	1.26-4	9.70-5	6.13-5	2.95-5	1.25-5
74	3174.3	1.37-4	1.22-4	9.37-5	5.91-5	2.84-5	1.20-5
75	3290.0	1.32-4	1.18-4	9.06-5	5.71-5	2.74-5	1.15-5
76	3407.9	1 28-4	1.14-4	8.76-5	5.52-5	2.64-5	1.11-5
77	3528.0	1.24-4	1 11-4	8.48-5	5.33-5	2.55-5	1.07-5
78	3650.2	1.20-4	1.07-4	8.21-5	5.16-5	2.47-5	1.04-5
79	3774.5	1.16-4	1.04-4	7.95-5	4.99-5	2.39-5	1.00-5
80	3901.0	1.13-4	1 01-4	7.70-5	4.83-5	2.31-5	9.67-6
81	4029.7	1.09-4	9.76-5	7.46-5	4.68-5	2.24-5	9.35-6
82	4160.5	1.06-4	9.46-5	7.23-5	4.53-5	2.16-5	9.04-6
83	4293.5	1.03-4	9.17-5	7.00-5	4.39-5	2.09-5	8.74-6
84	4428.7	9.97-5	8.88-5	6.78-5	4.24-5	2.02-5	8.45-6
85	4566.1	9.64-5	8.58-5	6.55-5	4.10-5	1.96-5	8.16-6
86	4705.7	9.29-5	8.26-5	6.31-5	3.95-5	1.88-5	7.86-6
87	4847.6	8.86-5	7.88-5	6.02-5	3.77-5	1.80-5	7.52-6
88	4991.6	8.28-5	7 38-5	5.65-5	3.55-5	1 71-5	7.22-6
89	5136 6	1.07-4	9.57-5	7.44-5	4.82-5	2.42-5	1.08-5
90	5300.0	3.40-4	3.05-4	2.38-4	1.55-4	7.88-5	3.59-5
91	5466.9	1.36-4	1.22-4	9.47-5	6.04-5	2.96-5	1.28-5
92	5621 8	1.24-4	1.11-4	8.65-5	5.52-5	2.70-5	1.17-5

A1 - N26

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1776.1	3.04-4	2.76-4	2.20-4	1.46-4	7.41-5	3.28-5
61	1863.0	2.95-4	2.68-4	2.13-4	1.41-4	7.15-5	3.16-5
62	1952.0	2.87-4	2.60-4	2.07-4	1.36-4	6.89-5	3.05-5
63	2043.1	2.78-4	2.52-4	2.00-4	1.32-4	6.64-5	2.94-5
64	2136.2	2.70-4	2.45-4	1.94-4	1.27-4	6.40-5	2.83-5
65	2231.5	2.62-4	2.37-4	1.87-4	1.23-4	6.17-5	2.72-5
66	2328.8	2.54-4	2.30-4	1.81-4	1.19-4	5.95-5	2.62-5
67	2428.3	2.46-4	2.23-4	1.76-4	1.15-4	5.74-5	2.53-5
68	2529.9	2.39-4	2.16-4	1.70-4	1.11-4	5.53-5	2.44-5
69	2633.5	2.31-4	2.09-4	1.65-4	1.07-4	5.34-5	2.35-5
70	2739.4	2 24-4	2.03-4	1.59-4	1.04-4	5.16-5	2.27-5
71	2847.3	2.18-4	1.96-4	1.54-4	1.00-4	4.98-5	2.19-5
72	2957.4	2.11-4	1.90-4	1.50-4	9.70-5	4.81-5	2.11-5
73	3069.6	2.05-4	1.85-4	1.45-4	9.39-5	4.65-5	2.04-5
74	3184.0	1.99-4	1.79-4	1.40-4	9.09-5	4.50-5	1.97-5
75	3300.6	1.93-4	1.74-4	1.36-4	8.81-5	4.36-5	1.90-5
76	3419.3	1.87-4	1.69-4	1.32-4	8.54-5	4.22-5	1.84-5
77	3540.2	1.82-4	1.64-4	1.28-4	8.27-5	4.09-5	1.78-5
78	3663.3	1.77-4	1.59-4	1.25-4	8.02-5	3.96-5	1.72-5
79	3788.6	1.72-4	1.55-4	1.21-4	7.78-5	3.84-5	1.67-5
80	3916.1	1.67-4	1.50-4	1.17-4	7.55-5	3.72-5	1.62-5
81	4045.8	1.62-4	1.46-4	1.14-4	7.33-5	3.61-5	1.57-5
82	4177.8	1.58-4	1.42-4	1.11-4	7.12-5	3.51-5	1.52-5
83	4311.9	1.54-4	1.38-4	1.08-4	6.92-5	3.40-5	1.48-5
84	4448.4	1.50-4	1.35-4	1.05-4	6.72-5	3.31-5	1.43-5
85	4587.1	1.46-4	1.31-4	1.02-4	6.53-5	3.21-5	1.39-5
86	4728.0	1.42-4	1.27-4	9.91-5	6.35-5	3.12-5	1.35-5
87	4871.2	1.38-4	1.24-4	9.64-5	6.17-5	3.03-5	1.31-5
88	5016.7	1.34-4	1.21-4	9.37-5	6.00-5	2.94-5	1.27-5
89	5164.6	1.30-4	1.17-4	9.09-5	5.82-5	2.85-5	1.24-5
90	5314.6	1.26-4	1.13-4	8.78-5	5.63-5	2.77-5	1.20-5
91	5469.5	3.26-4	2.93-4	2.29-4	1.49-4	7.60-5	3.47-5
92	5643.0	3.31-4	2.98-4	2.32-4	1.51-4	7.70-5	3.51-5

A1 - N27

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1847.0	2.40-4	2.04-4	1.42-4	7.84-5	3.27-5	1.27-5
61	1936.4	2.38-4	2.03-4	1.42-4	7.83-5	3.28-5	1.27-5
62	2028.0	2.36-4	2.01-4	1.40-4	7.79-5	3.28-5	1.27-5
63	2121.6	2.33-4	1.99-4	1.39-4	7.73-5	3.26-5	1.27-5
64	2217.4	2.30-4	1.96-4	1.38-4	7.66-5	3.24-5	1.26-5
65	2315.2	2.27-4	1 94-4	1.36-4	7.56-5	3.21-5	1.25-5
66	2415.1	2.23-4	1 90-4	1.34-4	7.46-5	3.17-5	1.24-5
67	2517.2	2.19-4	1.87-4	1.32-4	7.35-5	3.13-5	1.22-5
68	2621.4	2.15-4	1.84-4	1.29-4	7.24-5	3.09-5	1.21-5
69	2727.7	2.11-4	1.81-4	1.27-4	7.12-5	3.04-5	1.19-5
70	2836.1	2.07-4	1.77-4	1.25-4	6.99-5	2.99-5	1.17-5
71	2946.7	2.03-4	1.74-4	1.22-4	6.86-5	2.94-5	1.15-5
72	3059.5	1.99-4	1 70-4	1.20-4	6.73-5	2.88-5	1.13-5
73	3174.4	1.95-4	1.67-4	1.17-4	6.59-5	2.83-5	1.11-5
74	3291.5	1.90-4	1.63-4	1.15-4	6.46-5	2.77-5	1.09-5
75	3410.7	1.86-4	1.60-4	1.12-4	6.32-5	2.72-5	1.07-5
76	3532.2	1.82-4	1.56-4	1.10-4	6.19-5	2.66-5	1.05-5
77	3655.8	1.78-4	1.52-4	1.08-4	6.05-5	2.60-5	1.03-5
78	3781.7	1.74-4	1.49-4	1.05-4	5.92-5	2.54-5	1.01-5
79	3909.7	1.70-4	1.45-4	1.03-4	5.78-5	2.49-5	9.86-6
80	4040.0	1.66-4	1.42-4	1.00-4	5.64-5	2.43-5	9.63-6
81	4172.6	1.61-4	1.38-4	9.76-5	5.50-5	2.37-5	9.40-6
82	4307.3	1.57-4	1.35-4	9.52-5	5.36-5	2.31-5	9.17-6
83	4444.4	1.53-4	1.31-4	9.27-5	5.22-5	2.25-5	8.94-6
84	4583.7	1.49-4	1.28-4	9.02-5	5.08-5	2.19-5	8.69-6
85	4725.2	1.45-4	1.24-4	8.76-5	4.94-5	2.13-5	8.44-6
86	4869.1	1.41-4	1.20-4	8.50-5	4.79-5	2.06-5	8.18-6
87	5015.3	1.36-4	1.17-4	8.23-5	4.63-5	1.99-5	7.91-6
88	5163.8	1.32-4	1.13-4	7.94-5	4.47-5	1.92-5	7.61-6
89	5314.6	1.27-4	1.08-4	7.63-5	4.29-5	1.84-5	7.30-6
90	5467.8	1.21-4	1.04-4	7.30-5	4.10-5	1.75-5	6.94-6
91	5623.3	1.15-4	9.86-5	6.93-5	3.88-5	1 66-5	6.53-6
92	5781.3	1.08-4	9.26-5	6.49-5	3.62-5	1.54-5	6.05-6

A1 - N28

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1882.1	2.62-4	2.36-4	1.85-4	1.22-4	6.27-5	2.86-5
61	1978.0	2.51-4	2.26-4	1.77-4	1.16-4	6.00-5	2.73-5
62	2076.6	2.41-4	2.17-4	1.70-4	1.12-4	5.74-5	2.61-5
63	2177.8	2.32-4	2.08-4	1.63-4	1.07-4	5.49-5	2.50-5
64	2281.8	2.23-4	2.00-4	1.57-4	1.03-4	5.26-5	2.39-5
65	2388.6	2.14-4	1.92-4	1.50-4	9.85-5	5.05-5	2.29-5
66	2498.2	2.06-4	1.85-4	1.45-4	9.46-5	4.84-5	2.20-5
67	2610.6	1.98-4	1.78-4	1.39-4	9.09-5	4.65-5	2.11-5
68	2725.9	1.90-4	1.71-4	1.34-4	8.74-5	4.47-5	2.03-5
69	2844.2	1.83-4	1.65-4	1.29-4	8.41-5	4.30-5	1.95-5
70	2965.5	1.76-4	1.59-4	1.24-4	8.10-5	4.14-5	1.87-5
71	3089.8	1.70-4	1.53-4	1.19-4	7.80-5	3.98-5	1.81-5
72	3217.2	1.64-4	1.47-4	1.15-4	7.51-5	3.84-5	1.74-5
73	3347.8	1.58-4	1.42-4	1.11-4	7.24-5	3.70-5	1.68-5
74	3481.6	1.52-4	1.37-4	1.07-4	6.99-5	3.57-5	1.61-5
75	3618.6	1.47-4	1.32-4	1.03-4	6.74-5	3.44-5	1.56-5
76	3759.0	1.42-4	1.27-4	9.97-5	6.51-5	3.32-5	1.50-5
77	3902.7	1.37-4	1.23-4	9.63-5	6.28-5	3.21-5	1.45-5
78	4049.9	1.32-4	1.19-4	9.30-5	6.07-5	3.10-5	1.40-5
79	4200.6	1.28-4	1.15-4	8.98-5	5.87-5	3.00-5	1.36-5
80	4354.9	1.23-4	1.11-4	8.69-5	5.68-5	2.90-5	1.32-5
81	4512.9	1.19-4	1.07-4	8.40-5	5.49-5	2.81-5	1.27-5
82	4674.6	1.15-4	1.04-4	8.12-5	5.31-5	2.72-5	1.23-5
83	4840.1	1.11-4	1.00-4	7.86-5	5.14-5	2.64-5	1.20-5
84	5009.6	1.08-4	9.71-5	7.61-5	4.98-5	2.55-5	1.16-5
85	5183.0	1.04-4	9.40-5	7.36-5	4.82-5	2.47-5	1.13-5
86	5360.6	1.01-4	9.09-5	7.13-5	4.67-5	2.40-5	1.09-5
87	5542.3	9.78-5	8.80-5	6.91-5	4.53-5	2.33-5	1.06-5
88	5728.3	9.47-5	8.53-5	6.69-5	4.39-5	2.26-5	1.03-5
89	5918.8	9.17-5	8.26-5	6.48-5	4.26-5	2.19-5	1.00-5
90	6113.7	8.88-5	8.00-5	6.28-5	4.13-5	2.13-5	9.73-6
91	6313.3	8.61-5	7.76-5	6.09-5	4.01-5	2.07-5	9.47-6
92	6517.7	8.34-5	7.52-5	5.91-5	3.89-5	2.01-5	9.22-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - N29

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1885.4	2.98-4	2.73-4	2.23-4	1.53-4	8.09-5	3.71-5
61	1981.7	2.86-4	2.62-4	2.13-4	1.46-4	7.73-5	3.54-5
62	2080.6	2.75-4	2 52-4	2.05-4	1 40-4	7.38-5	3.38-5
63	2182.2	2.64-4	2.42-4	1 97-4	1 34-4	7.06-5	3.24-5
64	2286.6	2.54-4	2.33-4	1.89-4	1.28-4	6.76-5	3.10-5
65	2393.8	2.44-4	2.24-4	1.81-4	1.23-4	6.47-5	2.97-5
66	2503.9	2.35-4	2.15-4	1.74-4	1.18-4	6.20-5	2.84-5
67	2616.8	2.26-4	2.07-4	1.67-4	1.14-4	5.95-5	2.73-5
68	2732.7	2.18-4	1.99-4	1.61-4	1.09-4	5.71-5	2.61-5
69	2851.5	2.09-4	1.91-4	1.55-4	1.05-4	5.48-5	2.51-5
70	2973.4	2.01-4	1.84-4	1.49-4	1.01-4	5.27-5	2.41-5
71	3098.4	1.94-4	1.77-4	1.43-4	9.68-5	5.06-5	2.32-5
72	3226.5	1.87-4	1 71-4	1.38-4	9.32-5	4.87-5	2.23-5
73	3357.8	1.80-4	1.64-4	1 33-4	8.97-5	4.69-5	2.14-5
74	3492.3	1.73-4	1.58-4	1.28-4	8.63-5	4.51-5	2.06-5
75	3630.1	1.67-4	1.53-4	1.23-4	8.31-5	4.34-5	1.99-5
76	3771.3	1.61-4	1.47-4	1.19-4	8.01-5	4.19-5	1.92-5
77	3916.0	1.55-4	1.42-4	1.14-4	7.72-5	4.04-5	1.85-5
78	4064.1	1.49-4	1.36-4	1.10-4	7.44-5	3.90-5	1.78-5
79	4215.8	1.44-4	1.32-4	1.06-4	7.17-5	3.76-5	1.72-5
80	4371.1	1.39-4	1.27-4	1.02-4	6.92-5	3.63-5	1.66-5
81	4530.2	1.34-4	1.22-4	9.87-5	6.68-5	3.50-5	1.61-5
82	4693.0	1.29-4	1.18-4	9.52-5	6.45-5	3.38-5	1.55-5
83	4859.8	1.24-4	1.14-4	9.18-5	6.22-5	3.27-5	1.50-5
84	5030.5	1.20-4	1.10-4	8.86-5	6.01-5	3.16-5	1.45-5
85	5205.3	1.16-4	1.06-4	8.55-5	5.80-5	3.06-5	1.41-5
86	5384.2	1.11-4	1.02-4	8.25-5	5.61-5	2.96-5	1.36-5
87	5567.4	1.08-4	9.85-5	7.97-5	5.42-5	2.86-5	1.32-5
88	5754.9	1.04-4	9.50-5	7.69-5	5.24-5	2.77-5	1.28-5
89	5947.0	1.00-4	9.17-5	7.43-5	5.06-5	2.68-5	1.24-5
90	6143.6	9.66-5	8.85-5	7.17-5	4.89-5	2.60-5	1.21-5
91	6344.9	9.32-5	8.54-5	6.93-5	4.73-5	2.52-5	1.17-5
92	6551.0	9.00-5	8.25-5	6.69-5	4.58-5	2.44-5	1.14-5

A1 - N30

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2003.4	2.17-4	1.99-4	1.59-4	1.03-4	5.13-5	2.37-5
61	2102.4	2.09-4	1.91-4	1.52-4	9.83-5	4.89-5	2.26-5
62	2204.1	2.01-4	1.83-4	1.45-4	9.38-5	4.66-5	2.16-5
63	2308.6	1.93-4	1.76-4	1.39-4	8.97-5	4.45-5	2.07-5
64	2415.8	1.86-4	1.69-4	1.33-4	8.58-5	4.26-5	1.98-5
65	2525.9	1.79-4	1.62-4	1.28-4	8.21-5	4.08-5	1.90-5
66	2638.8	1.72-4	1.56-4	1.23-4	7.87-5	3.91-5	1.82-5
67	2754.7	1.66-4	1.50-4	1.18-4	7.55-5	3.75-5	1.75-5
68	2873.5	1.60-4	1.45-4	1.13-4	7.25-5	3.60-5	1.68-5
69	2995.3	1.54-4	1.39-4	1.09-4	6.97-5	3.46-5	1.62-5
70	3120.1	1.49-4	1.34-4	1.05-4	6.70-5	3.33-5	1.56-5
71	3248.1	1.44-4	1.30-4	1.01-4	6.45-5	3.21-5	1.50-5
72	3379.2	1.39-4	1.25-4	9.76-5	6.22-5	3.09-5	1.45-5
73	3513.5	1.34-4	1.21-4	9.42-5	6.00-5	2.98-5	1.40-5
74	3651.1	1.29-4	1.17-4	9.10-5	5.79-5	2.88-5	1.36-5
75	3792.1	1.25-4	1.13-4	8.79-5	5.59-5	2.79-5	1.31-5
76	3936.4	1.21-4	1.09-4	8.49-5	5.40-5	2.70-5	1.27-5
77	4084.2	1.17-4	1.06-4	8.21-5	5.23-5	2.61-5	1.23-5
78	4235.5	1.13-4	1.02-4	7.95-5	5.06-5	2.53-5	1.19-5
79	4390.5	1.10-4	9.90-5	7.70-5	4.90-5	2.45-5	1.16-5
80	4549.1	1.06-4	9.59-5	7.46-5	4.75-5	2.38-5	1.13-5
81	4711.4	1.03-4	9.29-5	7.23-5	4.61-5	2.31-5	1.09-5
82	4877.6	1.00-4	9.01-5	7.01-5	4.47-5	2.25-5	1.07-5
83	5047.8	9.70-5	8.74-5	6.80-5	4.34-5	2.18-5	1.04-5
84	5221.9	9.41-5	8.48-5	6.60-5	4.22-5	2.13-5	1.01-5
85	5400.2	9.14-5	8.24-5	6.41-5	4.10-5	2.07-5	9.85-6
86	5582.6	8.88-5	8.00-5	6 23-5	3.99-5	2.02-5	9.61-6
87	5769.4	8.62-5	7.77-5	6.05-5	3.88-5	1.97-5	9.38-6
88	5960.6	8.38-5	7.56-5	5.89-5	3.78-5	1.92-5	9.17-6
89	6156.3	8.15-5	7.35-5	5.73-5	3.68-5	1.87-5	8.96-6
90	6356.7	7.93-5	7.15-5	5.57-5	3.59-5	1.83-5	8.76-6
91	6561.9	7.71-5	6.96-5	5.43-5	3.50-5	1.79-5	8.58-6
92	6772.0	7.51-5	6.77-5	5.29-5	3.41-5	1.75-5	8.40-6

A1 - N31

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2103.7	3.64-4	3.31-4	2.64-4	1.77-4	9.26-5	4.30-5
61	2206.1	3.48-4	3.16-4	2.52-4	1.69-4	8.83-5	4.10-5
62	2311.2	3.33-4	3.02-4	2.41-4	1.61-4	8.43-5	3.92-5
63	2419.1	3.18-4	2.89-4	2.30-4	1.54-4	8.05-5	3.74-5
64	2529.8	3.05-4	2.77-4	2.21-4	1.47-4	7.70-5	3.58-5
65	2643.3	2.92-4	2.65-4	2.11-4	1.41-4	7.37-5	3.43-5
66	2759.8	2.80-4	2.54-4	2.02-4	1.35-4	7.06-5	3.28-5
67	2879.2	2.69-4	2.44-4	1.94-4	1.30-4	6.77-5	3.15-5
68	3001.6	2.58-4	2.34-4	1.86-4	1.24-4	6.49-5	3.02-5
69	3127.0	2.48-4	2.25-4	1.79-4	1.19-4	6.24-5	2.90-5
70	3255.5	2.38-4	2.16-4	1.72-4	1.15-4	5.99-5	2.7[illegible]-5
71	3387.2	2.29-4	2.08-4	1.65-4	1.10-4	5.76-5	2.68-5
72	3522.1	2.20-4	2.00-4	1.59-4	1.06-4	5.54-5	2.58-5
73	3660.2	2.12-4	1.92-4	1.53-4	1.02-4	5.34-5	2.48-5
74	3801.7	2.04-4	1.85-4	1.47-4	9.83-5	5.14-5	2.39-5
75	3946.5	1.97-4	1.78-4	1.42-4	9.47-5	4.96-5	2.31-5
76	4094.8	1.90-4	1.72-4	1.37-4	9.13-5	4.78-5	2.22-5
77	4246.5	1.83-4	1.66-4	1.32-4	8.81-5	4.61-5	2.15-5
78	4401.9	1.77-4	1.60-4	1.27-4	8.50-5	4.46-5	2.07-5
79	4560.9	1.70-4	1.55-4	1.23-4	8.21-5	4.31-5	2.00-5
80	4723.7	1.65-4	1.49-4	1.19-4	7.94-5	4.16-5	1.94-5
81	4890.3	1.59-4	1.44-4	1.15-4	7.67-5	4.03-5	1.88-5
82	5060.8	1.54-4	1.39-4	1.11-4	7.42-5	3.90-5	1.82-5
83	5235.2	1.49-4	1.35-4	1.07-4	7.18-5	3.77-5	1.76-5
84	5413.8	1.44-4	1.31-4	1.04-4	6.95-5	3.66-5	1.71-5
85	5596.5	1.39-4	1.26-4	1.01-4	6.74-5	3.55-5	1.65-5
86	5783.5	1.35-4	1.22-4	9.75-5	6.53-5	3.44-5	1.61-5
87	5974.9	1.30-4	1.19-4	9.44-5	6.33-5	3.34-5	1.56-5
88	6170.7	1.26-4	1.15-4	9.15-5	6.14-5	3.24-5	1.52-5
89	6371.2	1.22-4	1.11-4	8.88-5	5.96-5	3.14-5	1.47-5
90	6576.4	1.19-4	1.08-4	8.61-5	5.78-5	3.06-5	1.43-5
91	6786.6	1.15-4	1.05-4	8.36-5	5.62-5	2.97-5	1.39-5
92	7001.6	1.12-4	1.02-4	8.11-5	5.46-5	2.89-5	1.36-5

A1 - O1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	906.5	1.70-3	1.63-3	1.52-3	1.39-3	1.32-3	1.31-3
61	954.0	1.62-3	1.56-3	1.45-3	1.33-3	1.26-3	1.25-3
62	1002.5	1.55-3	1.49-3	1.38-3	1.27-3	1.20-3	1.20-3
63	1052.1	1.48-3	1.42-3	1.32-3	1.22-3	1.15-3	1.15-3
64	1102.6	1.42-3	1.36-3	1.26-3	1.17-3	1.11-3	1.11-3
65	1154.1	1.36-3	1.30-3	1.21-3	1.12-3	1.06-3	1.07-3
66	1206.5	1.30-3	1.25-3	1.16-3	1.07-3	1.02-3	1.03-3
67	1259.9	1.25-3	1.20-3	1.12-3	1.03-3	9.84-4	9.89-4
68	1314.2	1.20-3	1.16-3	1.08-3	9.94-4	9.48-4	9.55-4
69	1369.5	1.16-3	1.11-3	1.04-3	9.59-4	9.15-4	9.22-4
70	1425.6	1.12-3	1.07-3	1.00-3	9.25-4	8.84-4	8.91-4
71	1482.5	1.08-3	1.04-3	9.65-4	8.94-4	8.55-4	8.63-4
72	1540.3	1.04-3	1.00-3	9.33-4	8.65-4	8.28-4	8.36-4
73	1599.0	1.01-3	9.70-4	9.03-4	8.37-4	8.03-4	8.11-4
74	1658.4	9.76-4	9.39-4	8.75-4	8.12-4	7.79-4	7.87-4
75	1718.6	9.46-4	9.11-4	8.49-4	7.88-4	7.57-4	7.65-4
76	1779.6	9.18-4	8.84-4	8.24-4	7.65-4	7.36-4	7.44-4
77	1841.2	8.92-4	8.58-4	8.01-4	7.44-4	7.16-4	7.25-4
78	1903.6	8.67-4	8.35-4	7.79-4	7.24-4	6.98-4	7.06-4
79	1966.7	8.43-4	8.12-4	7.58-4	7.05-4	6.81-4	6.89-4
80	2030.4	8.21-4	7.91-4	7.39-4	6.88-4	6.64-4	6.73-4
81	2094.7	8.00-4	7.71-4	7.20-4	6.71-4	6.49-4	6.58-4
82	2159.6	7.81-4	7.52-4	7.03-4	6.56-4	6.34-4	6.44-4
83	2225.1	7.62-4	7.35-4	6.87-4	6.41-4	6.21-4	6.31-4
84	2291.0	7.45-4	7.18-4	6.71-4	6.27-4	6.08-4	6.18-4
85	2357.5	7.28-4	7.02-4	6.57-4	6.14-4	5.96-4	6.07-4
86	2424.4	7.12-4	6.87-4	6.43-4	6.02-4	5.84-4	5.96-4
87	2491.7	6.98-4	6.73-4	6.30-4	5.90-4	5.73-4	5.85-4
88	2559.4	6.84-4	6.59-4	6.18-4	5.79-4	5.63-4	5.76-4
89	2627.4	6.70-4	6.46-4	6.06-4	5.68-4	5.53-4	5.67-4
90	2695.7	6.57-4	6.34-4	5.95-4	5.59-4	5.44-4	5.58-4
91	2764.2	6.46-4	6.23-4	5.84-4	5.49-4	5.35-4	5.50-4
92	2833.0	6.34-4	6.12-4	5.74-4	5.40-4	5.27-4	5.43-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 − 02

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	942.7	1.02-3	9.88-4	9.23-4	8.54-4	8.18-4	8.26-4
61	993.5	9.74-4	9.40-4	8.77-4	8.12-4	7.78-4	7.88-4
62	1045.5	9.27-4	8.95-4	8.35-4	7.73-4	7.41-4	7.52-4
63	1098.7	8.84-4	8.53-4	7.96-4	7.36-4	7.06-4	7.19-4
64	1153.2	8.44-4	8.14-4	7.59-4	7.02-4	6.75-4	6.88-4
65	1208.9	8.07-4	7.78-4	7.25-4	6.71-4	6.45-4	6.58-4
66	1265.8	7.72-4	7.44-4	6.93-4	6.42-4	6.17-4	6.31-4
67	1324.0	7.39-4	7.12-4	6.64-4	6.14-4	5.91-4	6.05-4
68	1383.4	7.09-4	6.83-4	6.36-4	5.89-4	5.67-4	5.81-4
69	1444.0	6.80-4	6.55-4	6.10-4	5.65-4	5.44-4	5.58-4
70	1505.8	6.53-4	6.29-4	5.85-4	5.42-4	5.23-4	5.37-4
71	1568.9	6.28-4	6.05-4	5.63-4	5.21-4	5.03-4	5.16-4
72	1633.1	6.04-4	5.81-4	5.41-4	5.01-4	4.84-4	4.98-4
73	1698.6	5.82-4	5.60-4	5.21-4	4.83-4	4.67-4	4.80-4
74	1765.3	5.61-4	5.39-4	5.02-4	4.65-4	4.50-4	4.63-4
75	1833.1	5.41-4	5.20-4	4.84-4	4.48-4	4.34-4	4.47-4
76	1902.2	5.22-4	5.02-4	4.67-4	4.33-4	4.20-4	4.32-4
77	1972.4	5.04-4	4.85-4	4.51-4	4.18-4	4.05-4	4.17-4
78	2043.8	4.87-4	4.69-4	4.36-4	4.04-4	3.92-4	4.04-4
79	2116.5	4.71-4	4.53-4	4.21-4	3.91-4	3.80-4	3.91-4
80	2190.3	4.56-4	4.39-4	4.08-4	3.78-4	3.68-4	3.79-4
81	2265.2	4.42-4	4.25-4	3.95-4	3.66-4	3.56-4	3.68-4
82	2341.4	4.28-4	4.11-4	3.82-4	3.55-4	3.46-4	3.57-4
83	2418.7	4.15-4	3.99-4	3.71-4	3.44-4	3.36-4	3.47-4
84	2497.1	4.02-4	3.87-4	3.60-4	3.34-4	3.26-4	3.37-4
85	2576.7	3.91-4	3.76-4	3.49-4	3.24-4	3.16-4	3.27-4
86	2657.5	3.79-4	3.65-4	3.39-4	3.15-4	3.08-4	3.19-4
87	2739.4	3.68-4	3.54-4	3.29-4	3.06-4	2.99-4	3.10-4
88	2822.5	3.58-4	3.44-4	3.20-4	2.98-4	2.91-4	3.02-4
89	2906.7	3.48-4	3.35-4	3.11-4	2.90-4	2.84-4	2.95-4
90	2992.0	3.39-4	3.26-4	3.03-4	2.82-4	2.76-4	2.88-4
91	3078.5	3.30-4	3.17-4	2.95-4	2.75-4	2.69-4	2.81-4
92	3166.0	3.21-4	3.09-4	2.87-4	2.68-4	2.62-4	2.74-4

A1 − 03

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	963.4	1.54-3	1.48-3	1.39-3	1.29-3	1.23-3	1.24-3
61	1016.1	1.46-3	1.40-3	1.31-3	1.22-3	1.17-3	1.17-3
62	1070.2	1.38-3	1.33-3	1.25-3	1.16-3	1.11-3	1.11-3
63	1125.7	1.31-3	1.27-3	1.18-3	1.10-3	1.05-3	1.06-3
64	1182.6	1.25-3	1.20-3	1.12-3	1.04-3	9.98-4	1.01-3
65	1240.9	1.19-3	1.14-3	1.07-3	9.92-4	9.49-4	9.60-4
66	1300.5	1.13-3	1.09-3	1.02-3	9.45-4	9.04-4	9.15-4
67	1361.5	1.08-3	1.04-3	9.71-4	9.00-4	8.62-4	8.73-4
68	1424.0	1.03-3	9.92-4	9.26-4	8.59-4	8.23-4	8.34-4
69	1487.8	9.85-4	9.48-4	8.85-4	8.21-4	7.87-4	7.98-4
70	1553.0	9.42-4	9.07-4	8.46-4	7.85-4	7.52-4	7.63-4
71	1619.6	9.02-4	8.68-4	8.10-4	7.51-4	7.20-4	7.31-4
72	1687.7	8.64-4	8.32-4	7.76-4	7.19-4	6.90-4	7.01-4
73	1757.1	8.29-4	7.98-4	7.44-4	6.90-4	6.62-4	6.72-4
74	1828.0	7.96-4	7.66-4	7.14-4	6.62-4	6.36-4	6.46-4
75	1900.3	7.64-4	7.36-4	6.86-4	6.35-4	6.11-4	6.21-4
76	1973.9	7.35-4	7.07-4	6.59-4	6.11-4	5.87-4	5.97-4
77	2049.1	7.07-4	6.80-4	6.34-4	5.87-4	5.65-4	5.74-4
78	2125.6	6.81-4	6.55-4	6.10-4	5.65-4	5.44-4	5.53-4
79	2203.6	6.56-4	6.31-4	5.88-4	5.44-4	5.24-4	5.33-4
80	2283.0	6.32-4	6.08-4	5.66-4	5.25-4	5.06-4	5.15-4
81	2363.9	6.10-4	5.87-4	5.46-4	5.06-4	4.88-4	4.97-4
82	2446.2	5.88-4	5.66-4	5.27-4	4.88-4	4.71-4	4.80-4
83	2529.9	5.68-4	5.47-4	5.09-4	4.72-4	4.55-4	4.64-4
84	2615.1	5.49-4	5.28-4	4.92-4	4.56-4	4.40-4	4.49-4
85	2701.8	5.31-4	5.11-4	4.75-4	4.41-4	4.26-4	4.34-4
86	2789.9	5.13-4	4.94-4	4.60-4	4.26-4	4.12-4	4.21-4
87	2879.5	4.97-4	4.78-4	4.45-4	4.13-4	3.99-4	4.08-4
88	2970.5	4.81-4	4.63-4	4.31-4	4.00-4	3.86-4	3.96-4
89	3063.1	4.66-4	4.48-4	4.17-4	3.87-4	3.74-4	3.84-4
90	3157.1	4.51-4	4.34-4	4.04-4	3.76-4	3.63-4	3.73-4
91	3252.6	4.38-4	4.21-4	3.92-4	3.64-4	3.52-4	3.62-4
92	3349.6	4.25-4	4.08-4	3.80-4	3.53-4	3.42-4	3.52-4

A1 − 04

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1162.7	2.87-3	2.45-3	1.71-3	9.50-4	4.08-4	1.72-4
61	1220.5	2.74-3	2.33-3	1.64-3	9.17-4	4.03-4	1.79-4
62	1279.6	2.61-3	2.23-3	1.57-3	8.88-4	4.00-4	1.89-4
63	1340.1	2.50-3	2.14-3	1.51-3	8.62-4	4.00-4	2.00-4
64	1401.8	2.39-3	2.05-3	1.45-3	8.40-4	4.02-4	2.13-4
65	1464.8	2.29-3	1.97-3	1.40-3	8.20-4	4.05-4	2.27-4
66	1529.1	2.20-3	1.89-3	1.35-3	8.03-4	4.10-4	2.42-4
67	1594.7	2.12-3	1.82-3	1.31-3	7.88-4	4.16-4	2.58-4
68	1661.6	2.04-3	1.76-3	1.27-3	7.75-4	4.23-4	2.75-4
69	1729.8	1.96-3	1.70-3	1.23-3	7.63-4	4.30-4	2.91-4
70	1799.3	1.89-3	1.64-3	1.20-3	7.53-4	4.38-4	3.08-4
71	1870.0	1.83-3	1.58-3	1.17-3	7.44-4	4.46-4	3.24-4
72	1942.1	1.76-3	1.54-3	1.14-3	7.35-4	4.54-4	3.40-4
73	2015.4	1.71-3	1.49-3	1.11-3	7.28-4	4.62-4	3.55-4
74	2090.1	1.65-3	1.44-3	1.09-3	7.20-4	4.69-4	3.70-4
75	2166.0	1.60-3	1.40-3	1.06-3	7.14-4	4.76-4	3.83-4
76	2243.2	1.55-3	1.36-3	1.04-3	7.07-4	4.83-4	3.96-4
77	2321.8	1.51-3	1.33-3	1.01-3	7.01-4	4.88-4	4.08-4
78	2401.6	1.46-3	1.29-3	9.93-4	6.94-4	4.94-4	4.20-4
79	2482.7	1.42-3	1.26-3	9.73-4	6.88-4	4.98-4	4.30-4
80	2565.1	1.38-3	1.22-3	9.53-4	6.82-4	5.02-4	4.39-4
81	2648.7	1.35-3	1.19-3	9.34-4	6.75-4	5.06-4	4.47-4
82	2733.7	1.31-3	1.16-3	9.16-4	6.69-4	5.08-4	4.55-4
83	2820.0	1.27-3	1.14-3	8.98-4	6.63-4	5.10-4	4.61-4
84	2907.5	1.24-3	1.11-3	8.81-4	6.56-4	5.12-4	4.67-4
85	2996.3	1.21-3	1.08-3	8.64-4	6.49-4	5.12-4	4.72-4
86	3086.5	1.18-3	1.06-3	8.48-4	6.43-4	5.13-4	4.76-4
87	3177.9	1.15-3	1.03-3	8.32-4	6.36-4	5.13-4	4.79-4
88	3270.5	1.12-3	1.01-3	8.17-4	6.29-4	5.12-4	4.82-4
89	3364.5	1.10-3	9.88-4	8.02-4	6.22-4	5.11-4	4.84-4
90	3459.8	1.07-3	9.66-4	7.87-4	6.14-4	5.09-4	4.86-4
91	3556.3	1.05-3	9.45-4	7.73-4	6.07-4	5.07-4	4.87-4
92	3654.2	1.02-3	9.25-4	7.59-4	6.00-4	5.05-4	4.87-4

A1 − 05

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1166.1	4.18-3	4.22-3	4.37-3	4.73-3	5.29-3	5.76-3
61	1224.2	4.04-3	4.08-3	4.23-3	4.59-3	5.13-3	5.59-3
62	1283.5	3.91-3	3.95-3	4.10-3	4.44-3	4.97-3	5.42-3
63	1344.2	3.78-3	3.82-3	3.97-3	4.30-3	4.81-3	5.26-3
64	1406.2	3.66-3	3.70-3	3.84-3	4.17-3	4.66-3	5.09-3
65	1469.5	3.54-3	3.58-3	3.72-3	4.04-3	4.51-3	4.93-3
66	1534.1	3.43-3	3.46-3	3.60-3	3.91-3	4.37-3	4.77-3
67	1600.0	3.32-3	3.35-3	3.48-3	3.78-3	4.23-3	4.62-3
68	1667.2	3.21-3	3.25-3	3.37-3	3.66-3	4.09-3	4.47-3
69	1735.7	3.11-3	3.14-3	3.27-3	3.54-3	3.96-3	4.33-3
70	1805.6	3.02-3	3.05-3	3.16-3	3.43-3	3.83-3	4.19-3
71	1876.7	2.92-3	2.95-3	3.06-3	3.32-3	3.70-3	4.05-3
72	1949.2	2.83-3	2.86-3	2.97-3	3.21-3	3.58-3	3.92-3
73	2023.0	2.74-3	2.77-3	2.87-3	3.11-3	3.47-3	3.79-3
74	2098.2	2.66-3	2.68-3	2.78-3	3.01-3	3.35-3	3.67-3
75	2174.6	2.58-3	2.60-3	2.70-3	2.91-3	3.25-3	3.56-3
76	2252.4	2.50-3	2.52-3	2.61-3	2.82-3	3.14-3	3.44-3
77	2331.5	2.43-3	2.45-3	2.53-3	2.73-3	3.04-3	3.34-3
78	2411.9	2.36-3	2.37-3	2.46-3	2.65-3	2.95-3	3.23-3
79	2493.6	2.29-3	2.30-3	2.38-3	2.57-3	2.86-3	3.13-3
80	2576.7	2.22-3	2.24-3	2.31-3	2.49-3	2.77-3	3.04-3
81	2661.1	2.16-3	2.17-3	2.24-3	2.41-3	2.69-3	2.95-3
82	2746.8	2.10-3	2.11-3	2.18-3	2.34-3	2.61-3	2.86-3
83	2833.9	2.04-3	2.05-3	2.12-3	2.27-3	2.53-3	2.78-3
84	2922.3	1.98-3	1.99-3	2.05-3	2.21-3	2.45-3	2.70-3
85	3012.0	1.93-3	1.94-3	2.00-3	2.14-3	2.38-3	2.63-3
86	3103.0	1.87-3	1.89-3	1.94-3	2.08-3	2.32-3	2.55-3
87	3195.4	1.82-3	1.83-3	1.89-3	2.02-3	2.25-3	2.48-3
88	3289.1	1.78-3	1.79-3	1.84-3	1.97-3	2.19-3	2.42-3
89	3384.1	1.73-3	1.74-3	1.79-3	1.92-3	2.13-3	2.35-3
90	3480.5	1.68-3	1.69-3	1.74-3	1.87-3	2.07-3	2.29-3
91	3578.2	1.64-3	1.65-3	1.69-3	1.82-3	2.02-3	2.24-3
92	3677.3	1.60-3	1.61-3	1.65-3	1.77-3	1.97-3	2.18-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – 06

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1187.7	2.36-3	2.05-3	1.52-3	9.78-4	6.13-4	4.69-4
61	1247.7	2.15-3	1.85-3	1.34-3	8.24-4	4.65-4	3.18-4
62	1309.1	1.94-3	1.66-3	1.17-3	6.81-4	3.33-4	1.87-4
63	1372.0	1.73-3	1.48-3	1.02-3	5.65-4	2.38-4	9.79-5
64	1436.4	1.55-3	1.32-3	9.14-4	5.00-4	2.08-4	8.35-5
65	1502.1	1.42-3	1.21-3	8.63-4	5.10-4	2.67-4	1.69-4
66	1569.3	1.33-3	1.16-3	8.73-4	5.90-4	4.07-4	3.44-4
67	1637.9	1.30-3	1.16-3	9.27-4	7.10-4	5.88-4	5.62-4
68	1708.0	1.29-3	1.18-3	9.93-4	8.35-4	7.66-4	7.73-4
69	1779.6	1.29-3	1.20-3	1.05-3	9.42-4	9.15-4	9.48-4
70	1852.6	1.29-3	1.21-3	1.10-3	1.02-3	1.03-3	1.08-3
71	1927.1	1.29-3	1.22-3	1.13-3	1.08-3	1.11-3	1.18-3
72	2003.0	1.28-3	1.22-3	1.15-3	1.12-3	1.17-3	1.25-3
73	2080.5	1.26-3	1.22-3	1.15-3	1.14-3	1.20-3	1.29-3
74	2159.5	1.25-3	1.20-3	1.15-3	1.15-3	1.22-3	1.31-3
75	2239.9	1.23-3	1.19-3	1.15-3	1.15-3	1.23-3	1.33-3
76	2321.9	1.20-3	1.17-3	1.13-3	1.15-3	1.23-3	1.33-3
77	2405.4	1.18-3	1.15-3	1.12-3	1.14-3	1.22-3	1.33-3
78	2490.5	1.15-3	1.13-3	1.10-3	1.12-3	1.21-3	1.31-3
79	2577.1	1.13-3	1.10-3	1.08-3	1.11-3	1.20-3	1.30-3
80	2665.2	1.10-3	1.08-3	1.06-3	1.09-3	1.18-3	1.29-3
81	2754.9	1.08-3	1.06-3	1.04-3	1.07-3	1.16-3	1.27-3
82	2846.1	1.05-3	1.03-3	1.02-3	1.05-3	1.14-3	1.25-3
83	2938.9	1.02-3	1.01-3	9.96-4	1.03-3	1.12-3	1.23-3
84	3033.3	1.00-3	9.83-4	9.74-4	1.01-3	1.10-3	1.20-3
85	3129.3	9.75-4	9.60-4	9.52-4	9.87-4	1.08-3	1.18-3
86	3226.9	9.51-4	9.37-4	9.31-4	9.66-4	1.06-3	1.16-3
87	3326.1	9.28-4	9.15-4	9.09-4	9.45-4	1.03-3	1.14-3
88	3426.9	9.05-4	8.93-4	8.89-4	9.25-4	1.01-3	1.11-3
89	3529.4	8.83-4	8.71-4	8.68-4	9.05-4	9.91-4	1.09-3
90	3632.5	8.61-4	8.50-4	8.48-4	8.85-4	9.70-4	1.07-3
91	3739.2	8.40-4	8.30-4	8.28-4	8.66-4	9.50-4	1.05-3
92	3846.6	8.20-4	8.10-4	8.09-4	8.46-4	9.30-4	1.03-3

A1 – 07

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1188.6	3.34-3	3.36-3	3.48-3	3.77-3	4.23-3	4.62-3
61	1248.6	3.30-3	3.33-3	3.44-3	3.73-3	4.17-3	4.56-3
62	1310.0	3.29-3	3.30-3	3.41-3	3.68-3	4.11-3	4.49-3
63	1372.8	3.28-3	3.28-3	3.37-3	3.62-3	4.02-3	4.39-3
64	1437.1	3.25-3	3.25-[illegible]	3.31-3	3.52-3	3.88-3	4.22-3
65	1502.9	3.20-3	3.17-[illegible]	3.19-3	3.35-3	3.66-3	3.96-3
66	1570.2	3.10-3	3.05-3	3.02-3	3.12-3	3.36-3	3.63-3
67	1638.9	2.96-3	2.89-3	2.82-3	2.85-3	3.04-3	3.26-3
68	1709.2	2.80-3	2.72-3	2.61-3	2.59-3	2.72-3	2.90-3
69	1780.9	2.65-3	2.55-3	2.41-3	2.36-3	2.44-3	2.59-3
70	1854.2	2.50-3	2.40-3	2.24-3	2.16-3	2.21-3	2.33-3
71	1929.0	2.37-3	2.26-3	2.09-3	1.99-3	2.01-3	2.11-3
72	2005.2	2.25-3	2.13-3	1.96-3	1.84-3	1.84-3	1.93-3
73	2083.1	2.14-3	2.02-3	1.84-3	1.71-3	1.70-3	1.77-3
74	2162.4	2.04-3	1.92-3	1.74-3	1.60-3	1.58-3	1.64-3
75	2243.3	1.95-3	1.83-3	1.65-3	1.51-3	1.48-3	1.53-3
76	2325.7	1.86-3	1.75-3	1.57-3	1.42-3	1.39-3	1.43-3
77	2409.7	1.78-3	1.67-3	1.49-3	1.35-3	1.31-3	1.35-3
78	2495.3	1.71-3	1.60-3	1.42-3	1.28-3	1.24-3	1.27-3
79	2582.4	1.64-3	1.54-3	1.36-3	1.22-3	1.17-3	1.21-3
80	2671.2	1.58-3	1.48-3	1.31-3	1.16-3	1.12-3	1.15-3
81	2761.5	1.52-3	1.42-3	1.25-3	1.11-3	1.06-3	1.09-3
82	2853.4	1.47-3	1.37-3	1.20-3	1.07-3	1.02-3	1.04-3
83	2946.9	1.41-3	1.32-3	1.16-3	1.02-3	9.72-4	9.97-4
84	3042.1	1.36-3	1.27-3	1.11-3	9.82-4	9.32-4	9.55-4
85	3138.9	1.32-3	1.23-3	1.08-3	9.45-4	8.95-4	9.16-4
86	3237.3	1.27-3	1.18-3	1.04-3	9.10-4	8.60-4	8.81-4
87	3337.4	1.23-3	1.14-3	1.00-3	8.77-4	8.27-4	8.48-4
88	3439.2	1.19-3	1.11-3	9.67-4	8.46-4	7.97-4	8.17-4
89	3542.6	1.15-3	1.07-3	9.35-4	8.17-4	7.68-4	7.88-4
90	3647.7	1.12-3	1.04-3	9.05-4	7.90-4	7.42-4	7.61-4
91	3754.5	1.08-3	1.00-3	8.76-4	7.64-4	7.17-4	7.36-4
92	3863.0	1.05-3	9.74-4	8.49-4	7.39-4	6.93-4	7.12-4

A1 – 08

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1354.0	2.07-3	2.08-3	2.11-3	2.18-3	2.30-3	2.41-3
61	1416.8	2.00-3	2.00-3	2.03-3	2.10-3	2.21-3	2.32-3
62	1481.0	1.93-3	1.93-3	1.96-3	2.03-3	2.14-3	2.24-3
63	1546.7	1.86-3	1.87-3	1.89-3	1.96-3	2.06-3	2.17-3
64	1613.7	1.80-3	1.81-3	1.83-3	1.90-3	2.00-3	2.10-3
65	1682.1	1.74-3	1.75-3	1.77-3	1.84-3	1.93-3	2.04-3
66	1752.0	1.69-3	1.69-3	1.72-3	1.78-3	1.88-3	1.97-3
67	1823.3	1.63-3	1.64-3	1.67-3	1.73-3	1.82-3	1.92-3
68	1896.0	1.58-3	1.59-3	1.62-3	1.67-3	1.77-3	1.86-3
69	1970.1	1.54-3	1.54-3	1.57-3	1.62-3	1.71-3	1.81-3
70	2045.7	1.49-3	1.50-3	1.52-3	1.58-3	1.66-3	1.75-3
71	2122.7	1.45-3	1.46-3	1.48-3	1.53-3	1.62-3	1.71-3
72	2201.1	1.41-3	1.41-3	1.44-3	1.49-3	1.57-3	1.66-3
73	2281.0	1.37-3	1.37-3	1.40-3	1.45-3	1.53-3	1.61-3
74	2362.3	1.33-3	1.34-3	1.36-3	1.41-3	1.49-3	1.57-3
75	2445.1	1.29-3	1.30-3	1.32-3	1.37-3	1.45-3	1.53-3
76	2529.4	1.26-3	1.27-3	1.29-3	1.33-3	1.41-3	1.49-3
77	2615.1	1.23-3	1.23-3	1.25-3	1.30-3	1.37-3	1.45-3
78	2702.3	1.19-3	1.20-3	1.22-3	1.26-3	1.34-3	1.41-3
79	2790.9	1.16-3	1.17-3	1.19-3	1.23-3	1.30-3	1.38-3
80	2881.1	1.13-3	1.14-3	1.16-3	1.20-3	1.27-3	1.34-3
81	2972.7	1.10-3	1.11-3	1.13-3	1.17-3	1.24-3	1.31-3
82	3065.8	1.08-3	1.08-3	1.10-3	1.14-3	1.21-3	1.28-3
83	3160.4	1.05-3	1.05-3	1.07-3	1.11-3	1.18-3	1.25-3
84	3256.5	1.02-3	1.03-3	1.04-3	1.09-3	1.15-3	1.22-3
85	3354.1	9.99-4	1.00-3	1.02-3	1.06-3	1.12-3	1.19-3
86	3453.3	9.75-4	9.79-4	9.96-4	1.03-3	1.10-3	1.16-3
87	3553.9	9.52-4	9.56-4	9.72-4	1.01-3	1.07-3	1.14-3
88	3656.1	9.29-4	9.34-4	9.49-4	9.87-4	1.05-3	1.11-3
89	3759.7	9.08-4	9.12-4	9.27-4	9.64-4	1.02-3	1.09-3
90	3865.0	8.87-4	8.91-4	9.06-4	9.42-4	1.00-3	1.07-3
91	3971.7	8.67-4	8.71-4	8.86-4	9.22-4	9.79-4	1.04-3
92	4080.0	8.47-4	8.51-4	8.66-4	9.01-4	9.58-4	1.02-3

A1 – 09

Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.[illegible]
60	1363.9	1.12-3	1.13-3	1.14-3	1.18-3	1.24-3	1.31-3
61	1427.5	1.09-3	1.09-3	1.11-3	1.14-3	1.21-3	1.27-3
62	1492.6	1.05-3	1.06-3	1.07-3	1.11-3	1.17-3	1.24-3
63	1559.0	1.02-3	1.03-3	1.04-3	1.08-3	1.14-3	1.20-3
64	1627.0	9.91-4	9.96-4	1.01-3	1.05-3	1.11-3	1.17-3
65	1696.4	9.63-4	9.67-4	9.85-4	1.02-3	1.08-3	1.14-3
66	1767.3	9.35-4	9.40-4	9.57-4	9.92-4	1.05-3	1.11-3
67	1839.7	9.09-4	9.14-4	9.30-4	9.65-4	1.02-3	1.08-3
68	1913.6	8.84-4	8.88-4	9.05-4	9.39-4	9.94-4	1.05-3
69	1988.9	8.59-4	8.64-4	8.80-4	9.14-4	9.68-4	1.03-3
70	2065.8	8.36-4	8.40-4	8.56-4	8.89-4	9.43-4	1.00-3
71	2144.2	8.13-4	8.18-4	8.33-4	8.66-4	9.19-4	9.74-4
72	2224.1	7.91-4	7.96-4	8.11-4	8.43-4	8.95-4	9.50-4
73	2305.5	7.70-4	7.75-4	7.90-4	8.21-4	8.73-4	9.26-4
74	2388.5	7.50-4	7.54-4	7.69-4	8.00-4	8.51-4	9.03-4
75	2473.0	7.30-4	7.34-4	7.49-4	7.79-4	8.30-4	8.81-4
76	2559.0	7.11-4	7.15-4	7.29-4	7.59-4	8.09-4	8.59-4
77	2646.6	6.93-4	6.97-4	7.11-4	7.40-4	7.89-4	8.38-4
78	2735.8	6.75-4	6.79-4	6.92-4	7.21-4	7.70-4	8.18-4
79	2826.5	6.58-4	6.62-4	6.75-4	7.03-4	7.51-4	7.99-4
80	2918.8	6.41-4	6.45-4	6.58-4	6.86-4	7.33-4	7.80-4
81	3012.7	6.25-4	6.29-4	6.41-4	6.69-4	7.15-4	7.61-4
82	3108.2	6.09-4	6.13-4	6.26-4	6.53-4	6.98-4	7.44-4
83	3205.3	5.94-4	5.98-4	6.10-4	6.37-4	6.81-4	7.27-4
84	3304.1	5.79-4	5.83-4	5.95-4	6.22-4	6.65-4	7.10-4
85	3404.4	5.65-4	5.69-4	5.81-4	6.07-4	6.50-4	6.94-4
86	3506.4	5.52-4	5.55-4	5.67-4	5.92-4	6.35-4	6.79-4
87	3610.0	5.38-4	5.42-4	5.53-4	5.78-4	6.20-4	6.64-4
88	3715.3	5.25-4	5.29-4	5.40-4	5.65-4	6.06-4	6.49-4
89	3822.3	5.13-4	5.16-4	5.27-4	5.52-4	5.92-4	6.35-4
90	3930.9	5.01-4	5.04-4	5.15-4	5.39-4	5.79-4	6.22-4
91	4041.2	4.89-4	4.92-4	5.03-4	5.27-4	5.65-4	6.09-4
92	4153.2	4.78-4	4.81-4	4.92-4	5.15-4	5.53-4	5.96-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leq Z \leq 92$

See page 96 for Explanation of Tables

A1 - 010

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1399.1	4.45-4	4.07-4	3.37-4	2.61-4	2.05-4	1.85-4
61	1473.6	4.35-4	3.98-4	3.31-4	2.59-4	2.06-4	1.87-4
62	1550.0	4.23-4	3.87-4	3.23-4	2.53-4	2.03-4	1.86-4
63	1628.0	4.09-4	3.75-4	3.13-4	2.47-4	1.99-4	1.83-4
64	1707.9	3.96-4	3.62-4	3.03-4	2.40-4	1.94-4	1.79-4
65	1789.5	3.82-4	3.50-4	2.93-4	2.32-4	1.88-4	1.75-4
66	1872.9	3.69-4	3.38-4	2.83-4	2.25-4	1.83-4	1.70-4
67	1958.0	3.56-4	3.26-4	2.74-4	2.17-4	1.78-4	1.66-4
68	2044.9	3.44-4	3.15-4	2.65-4	2.10-4	1.72-4	1.61-4
69	2133.5	3.32-4	3.04-4	2.56-4	2.04-4	1.67-4	1.57-4
70	2223.8	3.21-4	2.94-4	2.47-4	1.97-4	1.62-4	1.52-4
71	2315.8	3.10-4	2.85-4	2.39-4	1.91-4	1.57-4	1.48-4
72	2409.5	3.00-4	2.75-4	2.32-4	1.85-4	1.53-4	1.44-4
73	2504.9	2.90-4	2.67-4	2.24-4	1.79-4	1.49-4	1.40-4
74	2602.0	2.81-4	2.58-4	2.18-4	1.74-4	1.45-4	1.37-4
75	2700.7	2.73-4	2.51-4	2.11-4	1.69-4	1.41-4	1.33-4
76	2801.1	2.65-4	2.43-4	2.05-4	1.64-4	1.37-4	1.30-4
77	2903.2	2.57-4	2.36-4	1.99-4	1.60-4	1.34-4	1.27-4
78	3006.9	2.49-4	2.29-4	1.93-4	1.55-4	1.30-4	1.24-4
79	3112.1	2.42-4	2.23-4	1.88-4	1.51-4	1.27-4	1.21-4
80	3219.0	2.36-4	2.17-4	1.83-4	1.47-4	1.24-4	1.18-4
81	3327.5	2.29-4	2.11-4	1.78-4	1.44-4	1.21-4	1.16-4
82	3437.6	2.23-4	2.05-4	1.73-4	1.40-4	1.18-4	1.13-4
83	3549.2	2.18-4	2.00-4	1.69-4	1.36-4	1.15-4	1.11-4
84	3662.4	2.12-4	1.95-4	1.65-4	1.33-4	1.13-4	1.08-4
85	3777.0	2.07-4	1.90-4	1.61-4	1.30-4	1.10-4	1.06-4
86	3893.3	2.02-4	1.85-4	1.57-4	1.27-4	1.08-4	1.04-4
87	4010.9	1.97-4	1.81-4	1.53-4	1.24-4	1.05-4	1.02-4
88	4130.1	1.93-4	1.77-4	1.49-4	1.21-4	1.03-4	9.99-5
89	4250.7	1.88-4	1.73-4	1.46-4	1.19-4	1.01-4	9.80-5
90	4372.8	1.84-4	1.69-4	1.43-4	1.16-4	9.90-5	9.61-5
91	4496.2	1.80-4	1.65-4	1.40-4	1.14-4	9.70-5	9.44-5
92	4621.1	1.76-4	1.62-4	1.37-4	1.11-4	9.50-5	9.27-5

A1 - 011

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1415.7	2.96-4	2.72-4	2.27-4	1.78-4	1.42-4	1.31-4
61	1491.7	2.85-4	2.62-4	2.20-4	1.73-4	1.39-4	1.31-4
62	1569.7	2.75-4	2.53-4	2.13-4	1.68-4	1.36-4	1.28-4
63	1649.5	2.64-4	2.43-4	2.05-4	1.62-4	1.32-4	1.25-4
64	1731.3	2.54-4	2.34-4	1.98-4	1.57-4	1.28-4	1.22-4
65	1814.9	2.44-4	2.25-4	1.90-4	1.51-4	1.24-4	1.19-4
66	1900.4	2.35-4	2.17-4	1.83-4	1.46-4	1.20-4	1.15-4
67	1987.8	2.26-4	2.09-4	1.76-4	1.41-4	1.16-4	1.12-4
68	2077.1	2.18-4	2.01-4	1.70-4	1.36-4	1.12-4	1.08-4
69	2168.3	2.10-4	1.93-4	1.63-4	1.31-4	1.09-4	1.05-4
70	2261.3	2.02-4	1.86-4	1.58-4	1.26-4	1.05-4	1.02-4
71	2356.3	1.95-4	1.80-4	1.52-4	1.22-4	1.02-4	9.83-5
72	2453.1	1.88-4	1.73-4	1.47-4	1.18-4	9.84-5	9.54-5
73	2551.7	1.82-4	1.67-4	1.42-4	1.14-4	9.53-5	9.26-5
74	2652.3	1.76-4	1.62-4	1.37-4	1.10-4	9.24-5	8.99-5
75	2754.7	1.70-4	1.56-4	1.32-4	1.06-4	8.97-5	8.73-5
76	2859.0	1.64-4	1.51-4	1.28-4	1.03-4	8.71-5	8.49-5
77	2965.1	1.59-4	1.47-4	1.24-4	9.98-5	8.46-5	8.26-5
78	3073.1	1.54-4	1.42-4	1.20-4	9.68-5	8.22-5	8.04-5
79	3183.0	1.49-4	1.38-4	1.16-4	9.39-5	7.99-5	7.82-5
80	3294.7	1.45-4	1.33-4	1.13-4	9.11-5	7.77-5	7.62-5
81	3408.3	1.40-4	1.29-4	1.09-4	8.85-5	7.56-5	7.42-5
82	3523.8	1.36-4	1.26-4	1.06-4	8.59-5	7.36-5	7.23-5
83	3641.1	1.32-4	1.22-4	1.03-4	8.35-5	7.16-5	7.05-5
84	3760.3	1.28-4	1.18-4	1.00-4	8.12-5	6.97-5	6.87-5
85	3881.3	1.25-4	1.15-4	9.74-5	7.90-5	6.79-5	6.71-5
86	4004.2	1.21-4	1.12-4	9.47-5	7.69-5	6.62-5	6.54-5
87	4128.9	1.18-4	1.09-4	9.21-5	7.48-5	6.45-5	6.39-5
88	4255.4	1.15-4	1.06-4	8.97-5	7.29-5	6.29-5	6.24-5
89	4383.8	1.12-4	1.03-4	8.73-5	7.10-5	6.13-5	6.09-5
90	4514.1	1.09-4	1.00-4	8.50-5	6.92-5	5.98-5	5.95-5
91	4646.2	1.06-4	9.77-5	8.29-5	6.75-5	5.83-5	5.82-5
92	4780.1	1.03-4	9.52-5	8.08-5	6.59-5	5.69-5	5.69-5

A1 - 012

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1437.7	5.60-4	5.27-4	4.68-4	4.06-4	3.65-4	3.57-4
61	1515.7	5.52-4	5.21-4	4.65-4	4.07-4	3.68-4	3.63-4
62	1595.8	5.53-4	5.23-4	4.70-4	4.15-4	3.80-4	3.78-4
63	1677.8	5.67-4	5.39-4	4.89-4	4.38-4	4.08-4	4.09-4
64	1761.8	6.07-4	5.81-4	5.35-4	4.89-4	4.64-4	4.71-4
65	1847.6	7.03-4	6.79-4	6.39-4	6.00-4	5.86-4	6.03-4
66	1934.9	9.04-4	8.84-4	8.54-4	8.31-4	3.37-4	8.73-4
67	2023.0	1.10-3	1.09-3	1.07-3	1.07-3	1.10-3	1.15-3
68	2112.1	1.11-3	1.10-3	1.09-3	1.09-3	1.13-3	1.19-3
69	2202.9	1.05-3	1.04-3	1.04-3	1.05-3	1.09-3	1.14-3
70	2296.0	9.96-4	9.89-4	9.84-4	9.93-4	1.03-3	1.09-3
71	2391.4	9.47-4	9.40-4	9.35-4	9.45-4	9.82-4	1.03-3
72	2489.3	9.03-4	8.96-4	8.91-4	9.01-4	9.36-4	9.87-4
73	2589.7	8.63-4	8.57-4	8.52-4	8.61-4	8.96-4	9.44-4
74	2692.7	8.27-4	8.21-4	8.16-4	8.25-4	8.58-4	9.04-4
75	2798.4	7.94-4	7.88-4	7.83-4	7.91-4	8.24-4	8.68-4
76	2906.8	7.63-4	7.57-4	7.52-4	7.60-4	7.92-4	8.35-4
77	3018.0	7.35-4	7.29-4	7.24-4	7.32-4	7.62-4	8.04-4
78	3132.0	7.09-4	7.04-4	6.98-4	7.06-4	7.35-4	7.76-4
79	3249.0	6.86-4	6.80-4	6.75-4	6.82-4	7.11-4	7.50-4
80	3368.9	6.66-4	6.60-4	6.55-4	6.61-4	6.89-4	7.28-4
81	3491.9	6.49-4	6.43-4	6.37-4	6.43-4	6.71-4	7.09-4
82	3617.8	6.35-4	6.29-4	6.22-4	6.27-4	6.54-4	6.92-4
83	3746.5	6.11-4	6.05-4	5.96-4	5.99-4	6.23-4	6.60-4
84	3876.7	5.12-4	5.03-4	4.89-4	4.83-4	4.97-4	5.25-4
85	4007.1	3.52-4	3.41-4	3.22-4	3.06-4	3.05-4	3.19-4
86	4138.2	2.67-4	2.55-4	2.35-4	2.16-4	2.08-4	2.15-4
87	4271.0	2.26-4	2.15-4	1.95-4	1.75-4	1.65-4	1.68-4
88	4405.8	2.03-4	1.92-4	1.72-4	1.52-4	1.41-4	1.42-4
89	4542.8	1.87-4	1.77-4	1.57-4	1.37-4	1.26-4	1.26-4
90	4681.8	1.76-4	1.65-4	1.47-4	1.27-4	1.15-4	1.16-4
91	4823.1	1.67-4	1.57-4	1.38-4	1.19-4	1.08-4	1.08-4
92	4966.5	1.59-4	1.49-4	1.32-4	1.13-4	1.02-4	1.01-4

A1 - 013

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1471.3	1.23-3	1.22-3	1.21-3	1.22-3	1.26-3	1.31-3
61	1544.2	1.16-3	1.15-3	1.15-3	1.15-3	1.19-3	1.24-3
62	1619.1	1.09-3	1.09-3	1.08-3	1.08-3	1.12-3	1.17-3
63	1696.2	1.01-3	1.00-3	9.96-4	1.00-3	1.03-3	1.08-3
64	1775.5	9.10-4	9.01-4	8.92-4	8.94-4	9.20-4	9.58-4
65	1857.3	7.53-4	7.44-4	7.32-4	7.28-4	7.44-4	7.72-4
66	1941.7	4.95-4	4.82-4	4.62-4	4.45-4	4.42-4	4.50-4
67	2029.7	2.46-4	2.28-4	1.96-4	1.61-4	1.33-4	1.21-4
68	2121.1	1.85-4	1.65-4	1.27-4	8.46-5	4.94-5	3.24-5
69	2215.1	1.89-4	1.69-4	1.30-4	8.66-5	5.13-5	3.52-5
70	2311.4	1.97-4	1.77-4	1.39-4	9.61-5	6.23-5	4.78-5
71	2409.8	2.00-4	1.80-4	1.44-4	1.03-4	7.05-5	5.74-5
72	2510.4	2.00-4	1.81-4	1.46-4	1.06-4	7.53-5	6.33-5
73	2613.0	1.97-4	1.79-4	1.45-4	1.07-4	7.74-5	6.63-5
74	2717.8	1.93-4	1.75-4	1.42-4	1.06-4	7.76-5	6.72-5
75	2824.7	1.87-4	1.70-4	1.39-4	1.03-4	7.63-5	6.64-5
76	2933.6	1.81-4	1.64-4	1.34-4	9.96-5	7.38-5	6.42-5
77	3044.7	1.73-4	1.57-4	1.28-4	9.50-5	7.01-5	6.07-5
78	3153.0	1.65-4	1.49-4	1.21-4	8.93-5	6.52-5	5.60-5
79	3273.3	1.55-4	1.40-4	1.12-4	8.24-5	5.89-5	4.97-5
80	3390.9	1.44-4	1.30-4	1.03-4	7.38-5	5.09-5	4.16-5
81	3510.6	1.30-4	1.17-4	9.18-5	6.34-5	4.09-5	3.13-5
82	3632.6	1.15-4	1.03-4	7.92-5	5.22-5	3.03-5	2.02-5
83	3757.3	1.10-4	9.93-5	7.85-5	5.47-5	3.51-5	2.57-5
84	3885.9	1.83-4	1.74-4	1.60-4	[illegible]	1.36-4	1.34-4
85	4020.0	3.17-4	3.11-4	3.02-4	2.98-4	3.03-4	3.16-4
86	4159.0	3.78-4	3.72-4	3.66-4	3.65-4	3.76-4	3.96-4
87	4302.1	3.95-4	3.90-4	3.84-4	3.84-4	3.98-4	4.20-4
88	4449.1	3.96-4	3.91-4	3.86-4	3.87-4	4.02-4	4.25-4
89	4598.5	4.16-4	3.71-4	2.93-4	2.14-4	1.64-4	1.49-4
90	4733.6	3.91-4	3.45-4	2.65-4	1.85-4	1.32-4	1.15-4
91	4870.6	3.80-4	3.35-4	2.58-4	1.80-4	1.28-4	1.13-4
92	5009.5	3.69-4	3.25-4	2.51-4	1.76-4	1.26-4	1.11-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - 014

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1515.8	1.27-3	1.09-3	7.76-4	4.44-4	2.01-4	9.22-5
61	1595.2	1.21-3	1.04-3	7.39-4	4.25-4	1.96-4	9.39-5
62	1676.6	1.15-3	9.86-4	7.05-4	4.08-4	1.91-4	9.58-5
63	1759.9	1.09-3	9.39-4	6.73-4	3.92-4	1.88-4	9.79-5
64	1845.1	1.04-3	8.95-4	6.43-4	3.78-4	1.85-4	1.00-4
65	1932.2	9.90-4	8.55-4	6.15-4	3.64-4	1.82-4	1.03-4
66	2021.3	9.45-4	8.16-4	5.90-4	3.52-4	1.79-4	1.05-4
67	2112.2	9.02-4	7.80-4	5.65-4	3.40-4	1.77-4	1.07-4
68	2205.1	8.63-4	7.47-4	5.43-4	3.29-4	1.75-4	1.09-4
69	2299.9	8.26-4	7.16-4	5.21-4	3.18-4	1.73-4	1.11-4
70	2396.6	7.91-4	6.86-4	5.01-4	3.09-4	1.71-4	1.13-4
71	2495.3	7.50-4	6.58-4	4.83-4	3.00-4	1.69-4	1.15-4
72	2595.8	7.28-4	6.32-4	4.65-4	2.91-4	1.67-4	1.16-4
73	2698.3	6.99-4	6.08-4	4.48-4	2.82-4	1.65-4	1.17-4
74	2802.7	6.71-4	5.85-4	4.32-4	2.75-4	1.63-4	1.18-4
75	[illegible]	6.46-4	5.63-4	4.18-4	2.67-4	1.61-4	1.19-4
76	3017.2	6.21-4	5.42-4	4.03-4	2.60-4	1.59-4	1.19-4
77	3127.3	5.99-4	5.23-4	3.90-4	2.53-4	1.57-4	1.20-4
78	3239.4	5.77-4	5.04-4	3.77-4	2.46-4	1.55-4	1.20-4
79	3353.4	5.57-4	4.87-4	3.65-4	2.40-4	1.53-4	1.20-4
80	3469.2	5.37-4	4.70-4	3.53-4	2.34-4	1.51-4	1.20-4
81	3587.1	5.19-4	4.55-4	3.42-4	2.28-4	1.49-4	1.19-4
82	3706.8	5.01-4	4.40-4	3.32-4	2.22-4	1.47-4	1.19-4
83	3828.4	4.85-4	4.26-4	3.22-4	2.16-4	1.44-4	1.18-4
84	3952.0	4.69-4	4.12-4	3.13-4	2.11-4	1.42-4	1.17-4
85	4077.5	4.54-4	3.99-4	3.03-4	2.06-4	1.40-4	1.17-4
86	4204.9	4.40-4	3.87-4	2.95-4	2.01-4	1.37-4	1.16-4
87	4334.2	4.26-4	3.75-4	2.86-4	1.95-4	1.35-4	1.14-4
88	4465.4	4.13-4	3.63-4	2.77-4	1.90-4	1.31-4	1.12-4
89	4600.1	3.76-4	3.69-4	3.58-4	3.54-4	3.63-4	3.84-4
90	4744.8	3.94-4	3.77-4	3.54-4	3.51-4	3.82-4	4.32-4
91	4882.4	3.82-4	3.64-4	3.42-4	3.38-4	3.68-4	4.18-4
92	5022.0	3.71-4	3.54-4	3.32-4	3.28-4	3.57-4	4.06-4

A1 - 015

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1517.4	1.11-3	1.07-3	1.04-3	1.08-3	1.21-3	1.36-3
61	1597.0	1.06-3	1.02-3	9.96-4	1.03-3	1.15-3	1.30-3
62	1678.5	1.01-3	9.80-4	9.52-4	9.84-4	1.10-3	1.24-3
63	1761.9	9.69-4	9.39-4	9.11-4	9.40-4	1.05-3	1.18-3
64	1847.3	9.29-4	9.00-4	8.72-4	8.99-4	1.00-3	1.13-3
65	1934.5	8.92-4	8.63-4	8.36-4	8.59-4	9.56-4	[illegible]
66	2023.7	8.57-4	8.29-4	8.01-4	8.22-4	9.14-4	1.03-3
67	2114.9	8.24-4	7.96-4	7.68-4	7.87-4	8.74-4	9.87-4
68	2207.9	7.93-4	7.65-4	7.37-4	7.54-4	8.37-4	9.44-4
69	2302.9	7.63-4	7.36-4	7.08-4	7.23-4	8.01-4	9.04-4
70	2399.9	7.35-4	7.09-4	6.81-4	6.93-4	7.68-4	8.66-4
71	2498.7	7.09-4	6.83-4	6.55-4	6.66-4	7.36-4	8.30-4
72	2599.5	6.84-4	6.58-4	6.30-4	6.39-4	7.06-4	7.96-4
73	2702.2	6.60-4	6.35-4	6.07-4	6.14-4	6.78-4	7.64-4
74	2806.9	6.37-4	6.13-4	5.85-4	5.91-4	6.52-4	7.34-4
75	2913.5	6.16-4	5.92-4	5.64-4	5.69-4	6.27-4	7.06-4
76	3022.0	5.96-4	5.72-4	5.44-4	5.48-4	6.03-4	6.79-4
77	3132.4	5.76-4	5.53-4	5.25-4	5.28-4	5.81-4	6.54-4
78	3244.8	5.58-4	5.33-4	5.08-4	5.09-4	5.59-4	6.30-4
79	3359.2	5.40-4	5.18-4	4.91-4	4.91-4	5.39-4	6.07-4
80	3475.4	5.23-4	5.01-4	4.74-4	4.74-4	5.21-4	5.86-4
81	3593.6	5.07-4	4.86-4	4.59-4	4.58-4	5.03-4	5.66-4
82	3713.8	4.92-4	4.71-4	4.45-4	4.43-4	4.86-4	5.47-4
83	3835.8	4.77-4	4.57-4	4.31-4	4.29-4	4.69-4	5.29-4
84	3959.9	4.63-4	4.43-4	4.17-4	4.15-4	4.54-4	5.12-4
85	4085.8	4.50-4	4.30-4	4.05-4	4.02-4	4.40-4	4.96-4
86	4213.7	4.37-4	4.17-4	3.93-4	3.90-4	4.26-4	4.80-4
87	4343.6	4.25-4	4.05-4	3.81-4	3.78-4	4.12-4	4.66-4
88	4475.4	4.12-4	3.93-4	3.69-4	3.66-4	3.99-4	4.51-4
89	4609.1	3.99-4	3.80-4	3.57-4	3.53-4	3.85-4	4.35-4
90	4755.0	3.72-4	3.67-4	3.61-4	3.61-4	3.74-4	3.97-4
91	4914.0	3.63-4	3.59-4	3.53-4	3.53-4	3.66-4	3.89-4
92	5077.2	3.51-4	3.47-4	3.41-4	3.41-4	3.54-4	3.77-4

A1 - 016

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1540.0	8.50-4	7.27-4	5.11-4	2.85-4	1.23-4	5.31-5
61	1621.5	7.51-4	6.45-4	4.60-4	2.71-4	1.39-4	8.57-5
62	1705.1	6.72-4	5.83-4	4.23-4	2.74-4	1.73-4	1.38-4
63	1790.8	6.15-4	5.39-4	4.10-4	2.86-4	[illegible]	1.94-4
64	1878.5	5.73-4	5.08-4	3.99-4	2.98-4	[illegible]	2.41-4
65	1968.3	5.42-4	4.85-4	3.91-4	3.07-4	2.70-4	2.75-4
66	2060.1	5.16-4	4.65-4	3.82-4	3.12-4	2.86-4	2.98-4
67	2154.	4.94-4	4.48-4	3.74-4	3.13-4	2.95-4	3.12-4
68	2250.	4.74-4	4.31-4	3.64-4	3.11-4	2.99-4	3.19-4
69	2348.2	4.56-4	4.16-4	3.54-4	3.07-4	3.00-4	3.23-4
70	2448.4	4.38-4	4.02-4	3.45-4	3.02-4	2.98-4	3.22-4
71	2550.7	4.22-4	3.88-4	3.35-4	2.96-4	2.95-4	3.20-4
72	2655.2	4.07-4	3.74-4	3.25-4	2.90-4	2.91-4	3.16-4
73	2761.7	[illegible]	3.62-4	3.15-4	2.83-4	2.85-4	3.11-4
74	[illegible]	[illegible]	3.49-4	3.05-4	2.75-4	2.79-4	3.05-4
75	[illegible]	[illegible]	[illegible]	2.96-4	2.68-4	2.73-4	2.99-4
76	3094.2	[illegible]	[illegible]	2.87-4	2.61-4	2.67-4	2.93-4
77	3209.3	3.41-4	[illegible]	2.78-4	2.54-4	2.60-4	2.86-4
78	3326.6	3.29-4	3.05-4	2.69-4	2.47-4	2.54-4	2.79-4
79	3446.0	[illegible]	[illegible]	2.61-4	2.40-4	2.47-4	2.73-4
80	3567.6	3.08-4	2.86-4	2.53-4	2.33-4	2.41-4	2.66-4
81	3691.4	[illegible]	2.77-4	2.46-4	2.27-4	2.35-4	2.60-4
82	3817.4	[illegible]	2.69-4	2.39-4	2.20-4	2.29-4	2.53-4
83	3945.6	2.60-4	2.61-4	2.32-4	2.14-4	2.23-4	2.47-4
84	4076.0	2.72-4	2.53-4	2.25-4	2.08-4	2.17-4	2.41-4
85	4208.7	2.64-4	2.45-4	2.19-4	2.03-4	2.12-4	2.35-4
86	4343.5	2.56-4	2.38-4	2.12-4	1.97-4	2.06-4	2.30-4
87	4480.6	2.48-4	2.31-4	2.07-4	1.92-4	2.01-4	2.24-4
88	4620.0	2.41-4	2.25-4	2.01-4	1.87-4	1.96-4	2.19-4
89	4761.6	2.34-4	2.18-4	1.95-4	1.82-4	1.91-4	2.14-4
90	4905.4	2.28-4	2.12-4	1.90-4	1.78-4	1.86-4	2.09-4
91	5051.6	2.22-4	2.07-4	1.85-4	1.73-4	1.82-4	2.04-4
92	5200.0	2.16-4	2.01-4	1.80-4	1.69-4	1.78-4	2.00-4

A1 - 017

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1540.3	1.09-3	1.02-3	9.38-4	8.96-4	9.41-4	1.03-3
61	1621.8	1.09-3	1.02-3	9.19-4	8.54-4	8.73-4	9.45-4
62	1705.5	1.09-3	1.01-3	8.86-4	7.97-4	7.91-4	8.44-4
63	1791.2	1.06-3	9.77-4	8.44-4	7.35-4	7.06-4	7.43-4
64	1879.0	1.03-3	9.39-4	7.98-4	6.77-4	6.31-4	6.55-4
65	1968.9	9.87-4	8.99-4	7.53-4	6.24-4	5.68-4	5.81-4
66	2060.8	9.46-4	8.58-4	7.12-4	5.79-4	5.15-4	5.21-4
67	2154.9	9.06-4	8.19-4	6.74-4	5.40-4	4.72-4	4.72-4
68	2251.0	8.67-4	7.82-4	6.40-4	5.06-4	4.35-4	4.32-4
69	2349.3	8.30-4	7.48-4	6.08-4	4.76-4	4.04-4	3.98-4
70	2449.7	7.96-4	7.15-4	5.79-4	4.50-4	3.78-4	3.69-4
71	2552.2	7.63-4	6.85-4	5.53-4	4.26-4	3.54-4	3.45-4
72	2656.8	7.32-4	6.57-4	5.28-4	4.05-4	3.34-4	3.23-4
73	2763.6	7.03-4	6.30-4	5.06-4	3.85-4	3.16-4	3.04-4
74	2872.5	6.76-4	6.05-4	4.85-4	3.68-4	3.00-4	2.87-4
75	2983.6	6.50-4	5.82-4	4.65-4	3.52-4	2.85-4	2.72-4
76	3096.8	6.26-4	5.60-4	4.47-4	3.37-4	2.72-4	2.59-4
77	3212.2	6.03-4	5.39-4	4.29-4	3.23-4	2.59-4	2.46-4
78	3329.8	5.81-4	5.19-4	4.13-4	3.10-4	2.48-4	2.35-4
79	3449.5	5.60-4	5.01-4	3.98-4	2.98-4	2.38-4	2.25-4
80	3571.5	5.41-4	4.83-4	3.84-4	2.87-4	2.28-4	2.16-4
81	3695.7	5.22-4	4.66-4	3.70-4	2.76-4	2.19-4	2.07-4
82	3822.0	5.05-4	4.50-4	3.57-4	2.66-4	2.11-4	1.99-4
83	3950.6	4.88-4	4.35-4	3.45-4	2.57-4	2.03-4	1.91-4
84	4081.5	4.72-4	4.21-4	3.34-4	2.48-4	1.96-4	1.85-4
85	4214.5	4.57-4	4.07-4	3.23-4	2.40-4	1.89-4	1.78-4
86	4349.9	4.42-4	3.95-4	3.13-4	2.32-4	1.83-4	1.72-4
87	4487.5	4.29-4	3.82-4	3.03-4	2.25-4	1.77-4	1.67-4
88	4627.3	4.16-4	3.71-4	2.94-4	2.18-4	1.71-4	1.61-4
89	4769.5	4.03-4	3.60-4	2.85-4	2.11-4	1.66-4	1.56-4
90	4914.0	3.91-4	3.49-4	2.76-4	2.05-4	1.61-4	1.52-4
91	5060.7	3.80-4	3.39-4	2.69-4	1.99-4	1.56-4	1.48-4
92	5209.8	3.69-4	3.29-4	2.61-4	1.94-4	1.52-4	1.44-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

	A1 − 018							A1 − 019						
Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1750.2	1.57-3	1.43-3	1.18-3	8.69-4	5.98-4	4.55-4	1754.7	5.92-3	6.32-3	7.18-3	8.42-3	9.83-3	1.09-2
61	1831.0	1.50-3	1.38-3	1.14-3	8.51-4	5.99-4	4.67-4	1835.7	5.72-3	6.11-3	6.93-3	8.10-3	9.44-3	1.04-2
62	1913.9	1.46-3	1.34-3	1.11-3	8.44-4	6.08-4	4.87-4	1918.9	5.53-3	5.90-3	6.68-3	7.81-3	9.08-3	1.00-2
63	1999.0	1.41-3	1.30-3	1.09-3	8.41-4	6.24-4	5.13-4	2004.2	5.35-3	5.70-3	6.45-3	7.32-3	8.74-3	9.66-3
64	2086.2	1.38-3	1.27-3	1.08-3	8.43-4	6.43-4	5.43-4	2091.7	5.18-3	5.51-3	6.23-3	7.25-3	8.41-3	9.30-3
65	2175.7	1.34-3	1.25-3	1.07-3	8.49-4	6.64-4	5.74-4	2181.5	5.01-3	5.33-3	6.02-3	6.99-3	8.10-3	8.96-3
66	2267.4	1.31-3	1.23-3	1.06-3	8.56-4	6.88-4	6.08-4	2273.5	4.84-3	5.15-3	5.80-3	6.74-3	7.80-3	8.62-3
67	2361.5	1.29-3	1.21-3	1.05-3	8.66-4	7.13-4	6.43-4	2367.9	4.68-3	4.97-3	5.60-3	6.49-3	7.50-3	8.29-3
68	2457.9	1.27-3	1.19-3	1.05-3	8.77-4	7.39-4	6.78-4	2464.6	4.52-3	4.80-3	5.40-3	6.25-3	7.22-3	7.98-3
69	2556.8	1.25-3	1.18-3	1.04-3	8.89-4	7.65-4	7.14-4	2560.8	4.37-3	4.63-3	5.20-3	6.02-3	6.95-3	7.67-3
70	2658.1	1.23-3	1.17-3	1.04-3	9.02-4	7.92-4	7.49-4	2665.5	4.21-3	4.47-3	5.01-3	5.79-3	6.68-3	7.38-3
71	2761.9	1.21-3	1.15-3	1.04-3	9.15-4	8.18-4	7.8[illegible]-4	2769.7	4.07-3	4.31-3	4.83-3	5.57-3	6.42-3	7.09-3
72	2868.3	1.20-3	1.14-3	1.04-3	9.28-4	8.44-4	8.17-4	2876.6	3.92-3	4.15-3	4.65-3	5.36-3	6.18-3	6.82-3
73	2977.4	1.19-3	1.13-3	1.04-3	9.41-4	8.69-4	8.50-4	2986.0	3.78-3	4.00-3	4.48-3	5.15-3	5.94-3	6.55-3
74	3089.1	1.17-3	1.13-3	1.04-3	9.53-4	8.92-4	8.81-4	3098.2	3.65-3	3.86-3	4.31-3	4.96-3	5.71-3	6.30-3
75	3203.6	1.16-3	1.12-3	1.04-3	9.64-4	9.15-4	9.11-4	3213.2	3.52-3	3.72-3	4.15-3	4.77-3	5.49-3	6.05-3
76	3320.9	1.15-3	1.11-3	1.04-3	9.75-4	9.36-4	9.38-4	3331.0	3.39-3	3.58-3	3.99-3	4.58-3	5.27-3	5.82-3
77	3441.1	1.13-3	1.10-3	1.04-3	9.84-4	9.55-4	9.64-4	3451.7	3.27-3	3.45-3	3.84-3	4.41-3	5.07-3	5.59-3
78	3564.2	1.12-3	1.09-3	1.04-3	9.93-4	9.73-4	9.88-4	3575.5	3.15-3	3.32-3	3.70-3	4.24-3	4.87-3	5.38-3
79	3690.3	1.11-3	1.09-3	1.04-3	1.00-3	9.89-4	1.01-3	3702.2	3.03-3	3.20-3	3.56-3	4.07-3	4.68-3	5.17-3
80	3819.6	1.10-3	1.08-3	1.04-3	1.01-3	1.00-3	1.03-3	3832.1	2.93-3	3.09-3	3.42-3	3.92-3	4.51-3	4.97-3
81	3952.0	1.09-3	1.07-3	1.04-3	1.01-3	1.02-3	1.05-3	3965.3	2.82-3	2.97-3	3.30-3	3.77-3	4.34-3	4.79-3
82	4087.7	1.08-3	1.06-3	1.04-3	1.02-3	1.03-3	1.06-3	4101.7	2.72-3	2.87-3	3.18-3	3.63-3	4.17-3	4.61-3
83	4226.8	1.07-3	1.06-3	1.03-3	1.02-3	1.04-3	1.08-3	4241.5	2.63-3	2.76-3	3.06-3	3.50-3	4.02-3	4.44-3
84	4369.3	1.06-3	1.05-3	1.03-3	1.03-3	1.05-3	1.10-3	4384.9	2.53-3	2.67-3	2.95-3	3.37-3	3.87-3	4.28-3
85	4515.3	1.06-3	1.05-3	1.03-3	1.03-3	1.06-3	1.11-3	4531.8	2.45-3	2.58-3	2.85-3	3.25-3	3.74-3	4.13-3
86	4664.9	1.06-3	1.05-3	1.04-3	1.05-3	1.08-3	1.14-3	4682.3	2.37-3	2.49-3	2.75-3	3.14-3	3.61-3	4.00-3
87	4818.2	1.08-3	1.07-3	1.06-3	1.08-3	1.12-3	1.18-3	4836.7	2.25-3	2.37-3	2.61-3	2.98-3	3.42-3	3.79-3
88	4975.5	1.12-3	1.11-3	1.11-3	1.14-3	1.19-3	1.27-3	4990.0	1.06-4	9.56-5	7.67-5	5.43-5	3.54-5	2.66-5
89	5133.5	6.68-4	6.65-4	6.63-4	6.75-4	7.10-4	7.57-4	5139.5	5.38-4	5.30-4	5.17-4	5.09-4	5.16-4	5.38-4
90	5283.5	3.91-4	3.86-4	3.78-4	3.78-4	3.92-4	4.16-4	5303.3	7.95-4	7.91-4	7.87-4	7.96-4	8.27-4	8.75-4
91	5434.5	3.27-4	3.22-4	3.13-4	3.11-4	3.19-4	3.38-4	5468.8	1.99-4	1.99-4	2.00-4	2.06-4	2.20-4	2.38-4
92	5587.5	2.98-4	2.92-4	2.84-4	2.80-4	2.87-4	3.03-4	5623.6	1.74-4	1.72-4	1.70-4	1.72-4	1.81-4	1.95-4

	A1 − 020							A1 − 021						
Z	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28	ΔE	E′=.002	E′=.01	E′=.03	E′=.07	E′=.15	E′=.28
60	1772.6	4.83-4	4.65-4	4.32-4	4.00-4	3.82-4	3.84-4	1777.0	3.08-4	2.94-4	2.69-4	2.44-4	2.29-4	2.29-4
61	1859.2	4.99-4	4.82-4	4.53-4	4.26-4	4.14-4	4.20-4	1864.0	3.09-4	2.96-4	2.74-4	2.52-4	2.41-4	2.43-4
62	1947.8	5.02-4	4.86-4	4.59-4	4.35-4	4.26-4	4.35-4	1953.0	3.06-4	2.94-4	2.74-4	2.55-4	2.45-4	2.50-4
63	2038.4	4.98-4	4.83-4	4.58-4	4.36-4	4.29-4	4.40-4	2044.1	3.01-4	2.90-4	2.72-4	2.54-4	2.46-4	2.52-4
64	2131.2	4.90-4	4.76-4	4.53-4	4.33-4	4.27-4	4.39-4	2137.3	2.95-4	2.85-4	2.67-4	2.51-4	2.45-4	2.51-4
65	2226.0	4.81-4	4.67-4	4.45-4	4.26-4	4.22-4	4.34-4	2232.6	2.88-4	2.78-4	2.62-4	2.47-4	2.42-4	2.49-4
66	2322.8	4.70-4	4.57-4	4.36-4	4.18-4	4.14-4	4.27-4	2330.0	2.81-4	2.72-4	2.57-4	2.42-4	2.38-4	2.46-4
67	2421.8	4.58-4	4.46-4	4.26-4	4.08-4	4.06-4	4.19-4	2429.4	2.74-4	2.65-4	2.51-4	2.37-4	2.34-4	2.42-4
68	2522.8	4.46-4	4.34-4	4.15-4	3.98-4	3.96-4	4.09-4	2531.0	2.66-4	2.58-4	2.44-4	2.32-4	2.29-4	2.37-4
69	2625.9	4.34-4	4.23-4	4.04-4	3.88-4	3.86-4	3.99-4	2634.8	2.59-4	2.51-4	2.38-4	2.26-4	2.24-4	2.32-4
70	2731.1	4.22-4	4.11-4	3.93-4	3.78-4	3.76-4	3.89-4	2740.6	2.52-4	2.44-4	2.32-4	2.21-4	2.19-4	2.27-4
71	2838.4	4.10-4	3.99-4	3.82-4	3.67-4	3.66-4	3.78-4	2848.6	2.45-4	2.38-4	2.25-4	2.15-4	2.13-4	2.22-4
72	2947.8	3.98-4	3.88-4	3.71-4	3.56-4	3.56-4	3.68-4	2958.7	2.38-4	2.31-4	2.19-4	2.09-4	2.08-4	2.16-4
73	3059.3	3.87-4	3.76-4	3.60-4	3.46-4	3.45-4	3.58-4	3070.9	2.31-4	2.24-4	2.13-4	2.04-4	2.03-4	2.11-4
74	3172.9	3.75-4	3.65-4	3.49-4	3.36-4	3.35-4	3.47-4	3185.4	2.25-4	2.18-4	2.07-4	1.98-4	1.97-4	2.05-4
75	3288.7	3.64-4	3.54-4	3.38-4	3.26-4	3.25-4	3.37-4	3301.9	2.18-4	2.12-4	2.01-4	1.92-4	1.92-4	2.00-4
76	3406.5	3.53-4	3.43-4	3.28-4	3.16-4	3.16-4	3.27-4	3420.7	2.12-4	2.06-4	1.95-4	1.87-4	1.87-4	1.94-4
77	3526.6	3.42-4	3.33-4	3.18-4	3.06-4	3.06-4	3.16-4	3541.6	2.06-4	2.00-4	1.90-4	1.82-4	1.81-4	1.89-4
78	3648.7	3.31-4	3.22-4	3.07-4	2.96-4	2.96-4	3.06-4	3664.8	2.00-4	1.94-4	1.84-4	1.76-4	1.76-4	1.83-4
79	3773.0	3.20-4	3.11-4	2.97-4	2.86-4	2.86-4	2.96-4	3790.1	1.94-4	1.88-4	1.78-4	1.71-4	1.71-4	1.78-4
80	3899.5	3.09-4	3.01-4	2.87-4	2.76-4	2.76-4	2.85-4	3917.6	1.88-4	1.82-4	1.73-4	1.65-4	1.65-4	1.72-4
81	4028.1	2.98-4	2.90-4	2.76-4	2.65-4	2.65-4	2.75-4	4047.4	1.82-4	1.76-4	1.67-4	1.60-4	1.60-4	1.66-4
82	4158.9	2.87-4	2.79-4	2.65-4	2.55-4	2.54-4	2.63-4	4179.4	1.76-4	1.70-4	1.61-4	1.54-4	1.54-4	1.60-4
83	4291.9	2.75-4	2.67-4	2.53-4	2.43-4	2.42-4	2.51-4	4313.6	1.70-4	1.64-4	1.55-4	1.47-4	1.47-4	1.53-4
84	4427.1	2.61-4	2.53-4	2.40-4	2.29-4	2.28-4	2.36-4	4450.0	1.63-4	1.57-4	1.48-4	1.41-4	1.40-4	1.46-4
85	4564.5	2.45-4	2.37-4	2.24-4	2.13-4	2.11-4	2.18-4	4588.7	1.55-4	1.50-4	1.40-4	1.32-4	1.31-4	1.36-4
86	4704.1	2.24-4	2.16-4	2.03-4	1.92-4	1.89-4	1.95-4	4729.7	1.46-4	1.41-4	1.31-4	1.22-4	1.20-4	1.24-4
87	4846.0	2.30-4	2.26-4	2.20-4	2.18-4	2.23-4	2.35-4	4873.0	1.33-4	1.27-4	1.17-4	1.06-4	1.02-4	1.05-4
88	4994.9	2.26-3	2.37-3	2.62-3	2.99-3	3.44-3	3.82-3	5018.5	1.09-4	1.02-4	8.89-5	7.50-5	6.62-5	6.52-5
89	5158.9	2.02-3	2.12-3	2.35-3	2.68-3	3.08-3	3.42-3	5164.7	2.67-4	2.68-4	2.72-4	2.84-4	3.08-4	3.35-4
90	5316.2	2.67-4	2.70-4	2.78-4	2.96-4	3.23-4	3.52-4	5323.9	1.95-3	2.05-3	2.26-3	2.58-3	2.96-3	3.29-3
91	5472.5	8.26-4	8.22-4	8.19-4	8.30-4	8.64-4	9.17-4	5494.4	1.98-3	2.08-3	2.29-3	2.61-3	3.00-3	3.34-3
92	5646.3	8.36-4	8.33-4	8.33-4	8.48-4	8.87-4	9.45-4	5669.3	1.95-3	2.05-3	2.26-3	2.58-3	2.97-3	3.31-3

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - 022

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1847.4	5.00-4	4.93-4	4.94-4	5.25-4	5.91-4	6.53-4
61	1936.9	4.93-4	4.85-4	4.84-4	5.10-4	5.71-4	6.30-4
62	2028.5	4.83-4	4.74-4	4.70-4	4.92-4	5.47-4	6.01-4
63	2122.2	4.70-4	4.60-4	4.53-4	4.70-4	5.19-4	5.69-4
64	2218.0	4.56-4	4.44-4	4.34-4	4.46-4	4.89-4	5.34-4
65	2315.9	4.39-4	4.26-4	4.13-4	4.20-4	4.56-4	4.96-4
66	2415.9	4.21-4	4.07-4	3.90-4	3.92-4	4.21-4	4.56-4
67	2518.0	4.02-4	3.86-4	3.66-4	3.62-4	3.85-4	4.15-4
68	2622.3	3.82-4	3.65-4	3.41-4	3.32-4	3.48-4	3.73-4
69	2728.6	3.61-4	3.43-4	3.16-4	3.02-4	3.11-4	3.31-4
70	2837.1	3.40-4	3.20-4	2.91-4	2.72-4	2.75-4	2.90-4
71	2947.8	3.19-4	2.98-4	2.66-4	2.42-4	2.39-4	2.49-4
72	3060.6	2.98-4	2.76-4	2.41-4	2.13-4	2.05-4	2.11-4
73	3175.6	2.78-4	2.55-4	2.18-4	1.86-4	1.73-4	1.75-4
74	3292.8	2.59-4	2.35-4	1.96-4	1.61-4	1.44-4	1.42-4
75	3412.1	2.40-4	2.16-4	1.76-4	1.38-4	1.17-4	1.12-4
76	3533.6	2.23-4	1.99-4	1.57-4	1.18-4	9.34-5	8.62-5
77	3657.3	2.07-4	1.83-4	1.41-4	9.99-5	7.33-5	6.40-5
78	3783.2	1.93-4	1.68-4	1.27-4	8.49-5	5.67-5	4.57-5
79	3911.4	1.80-4	1.56-4	1.15-4	7.26-5	4.34-5	3.14-5
80	4041.7	1.69-4	1.45-4	1.05-4	6.30-5	3.34-5	2.07-5
81	4174.3	1.59-4	1.36-4	9.67-5	5.58-5	2.64-5	1.35-5
82	4309.2	1.51-4	1.29-4	9.04-5	5.08-5	2.21-5	9.32-6
83	4446.3	1.43-4	1.22-4	8.58-5	4.78-5	2.02-5	7.93-6
84	4585.6	1.37-4	1.17-4	8.26-5	4.65-5	2.05-5	8.92-6
85	4727.3	1.32-4	1.13-4	8.05-5	4.67-5	2.25-5	1.19-5
86	4871.2	1.28-4	1.10-4	7.95-5	4.81-5	2.60-5	1.67-5
87	5017.4	1.24-4	1.08-4	7.94-5	5.06-5	3.08-5	2.29-5
88	5165.9	1.21-4	1.06-4	8.00-5	5.40-5	3.67-5	3.05-5
89	5316.8	1.19-4	1.05-4	8.12-5	5.82-5	4.38-5	3.92-5
90	5469.9	1.17-4	1.04-4	8.30-5	6.33-5	5.19-5	4.94-5
91	5625.5	1.15-4	1.04-4	8.55-5	6.93-5	6.14-5	6.12-5
92	5783.4	1.13-4	1.04-4	8.88-5	7.68-5	7.27-5	7.52-5

A1 - 023

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1848.2	5.56-4	6.09-4	7.28-4	9.11-4	1.13-3	1.29-3
61	1937.7	5.76-4	6.31-4	7.56-4	9.45-4	1.17-3	1.34-3
62	2029.3	5.95-4	6.52-4	7.81-4	9.76-4	1.21-3	1.38-3
63	2123.1	6.12-4	6.72-4	8.05-4	1.01-3	1.24-3	1.42-3
64	2218.9	6.29-4	6.91-4	8.28-4	1.03-3	1.28-3	1.46-3
65	2316.8	6.45-4	7.08-4	8.49-4	1.06-3	1.31-3	1.49-3
66	2416.9	6.61-4	7.25-4	8.69-4	1.08-3	1.34-3	1.52-3
67	2519.0	6.75-4	7.41-4	8.89-4	1.11-3	1.36-3	1.56-3
68	2623.3	6.89-4	7.57-4	9.06-4	1.13-3	1.39-3	1.58-3
69	2729.7	7.02-4	7.71-4	9.23-4	1.15-3	1.41-3	1.61-3
70	2838.3	7.14-4	7.84-4	9.38-4	1.17-3	1.43-3	1.63-3
71	2949.0	7.25-4	7.96-4	9.51-4	1.18-3	1.45-3	1.65-3
72	3061.9	7.35-4	8.06-4	9.63-4	1.19-3	1.46-3	1.67-3
73	3176.9	7.44-4	8.15-4	9.73-4	1.21-3	1.48-3	1.68-3
74	3294.1	7.50-4	8.22-4	9.80-4	1.21-3	1.48-3	1.69-3
75	3413.5	7.55-4	8.27-4	9.84-4	1.22-3	1.49-3	1.69-3
76	3535.1	7.59-4	8.30-4	9.86-4	1.22-3	1.49-3	1.69-3
77	3658.9	7.60-4	8.31-4	9.86-4	1.22-3	1.49-3	1.69-3
78	3784.9	7.59-4	8.29-4	9.82-4	1.21-3	1.48-3	1.68-3
79	3913.1	7.56-4	8.25-4	9.76-4	1.20-3	1.47-3	1.67-3
80	4043.6	7.51-4	8.19-4	9.67-4	1.19-3	1.45-3	1.65-3
81	4176.3	7.44-4	8.10-4	9.56-4	1.17-3	1.43-3	1.62-3
82	4311.3	7.35-4	8.00-4	9.42-4	1.15-3	1.41-3	1.60-3
83	4448.5	7.24-4	7.87-4	9.26-4	1.13-3	1.38-3	1.57-3
84	4588.0	7.11-4	7.73-4	9.07-4	1.11-3	1.35-3	1.54-3
85	4729.8	6.97-4	7.56-4	8.87-4	1.08-3	1.32-3	1.50-3
86	4873.9	6.81-4	7.38-4	8.64-4	1.06-3	1.28-3	1.46-3
87	5020.3	6.62-4	7.17-4	8.39-4	1.02-3	1.24-3	1.42-3
88	5169.1	6.42-4	6.95-4	8.11-4	9.89-4	1.20-3	1.37-3
89	5320.2	6.18-4	6.68-4	7.80-4	9.50-4	1.15-3	1.32-3
90	5473.6	5.91-4	6.39-4	7.44-4	9.06-4	1.10-3	1.26-3
91	5629.5	5.58-4	6.03-4	7.02-4	8.54-4	1.04-3	1.19-3
92	5787.7	5.17-4	5.58-4	6.49-4	7.90-4	9.61-4	1.10-3

A1 - 024

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1885.7	4.59-4	4.45-4	4.19-4	3.95-4	3.84-4	3.90-4
61	1982.0	4.42-4	4.28-4	4.03-4	3.80-4	3.70-4	3.77-4
62	2080.9	4.25-4	4.12-4	3.88-4	3.66-4	3.56-4	3.63-4
63	2182.5	4.09-4	3.96-4	3.74-4	3.52-4	3.43-4	3.50-4
64	2286.9	3.94-4	3.81-4	3.60-4	3.39-4	3.31-4	3.38-4
65	2394.1	3.79-4	3.67-4	3.46-4	3.26-4	3.18-4	3.26-4
66	2504.2	3.65-4	3.53-4	3.33-4	3.14-4	3.07-4	3.14-4
67	2617.1	3.51-4	3.40-4	3.21-4	3.03-4	2.96-4	3.03-4
68	2733.0	3.38-4	3.27-4	3.09-4	2.91-4	2.85-4	2.92-4
69	2851.9	3.26-4	3.15-4	2.98-4	2.81-4	2.74-4	2.81-4
70	2973.8	3.13-4	3.04-4	2.87-4	2.70-4	2.64-4	2.71-4
71	3098.7	3.02-4	2.92-4	2.76-4	2.60-4	2.55-4	2.61-4
72	3226.8	2.91-4	2.82-4	2.66-4	2.51-4	2.45-4	2.52-4
73	3358.1	2.80-4	2.71-4	2.56-4	2.41-4	2.36-4	2.43-4
74	3492.7	2.70-4	2.62-4	2.47-4	2.33-4	2.28-4	2.34-4
75	3630.5	2.60-4	2.52-4	2.38-4	2.24-4	2.20-4	2.26-4
76	3771.7	2.51-4	2.43-4	2.29-4	2.16-4	2.12-4	2.18-4
77	3916.3	2.42-4	2.34-4	2.21-4	2.08-4	2.04-4	2.10-4
78	4064.5	2.33-4	2.26-4	2.13-4	2.01-4	1.97-4	2.02-4
79	4216.2	2.25-4	2.17-4	2.05-4	1.93-4	1.90-4	1.95-4
80	4371.5	2.17-4	2.10-4	1.97-4	1.86-4	1.83-4	1.88-4
81	4530.6	2.09-4	2.02-4	1.90-4	1.79-4	1.76-4	1.81-4
82	4693.5	2.01-4	1.95-4	1.83-4	1.73-4	1.70-4	1.75-4
83	4860.2	1.94-4	1.88-4	1.77-4	1.67-4	1.64-4	1.69-4
84	5030.9	1.87-4	1.81-4	1.70-4	1.61-4	1.58-4	1.63-4
85	5205.7	1.80-4	1.75-4	1.64-4	1.55-4	1.52-4	1.57-4
86	5384.6	1.74-4	1.68-4	1.58-4	1.49-4	1.47-4	1.51-4
87	5567.8	1.68-4	1.62-4	1.53-4	1.44-4	1.41-4	1.46-4
88	5755.4	1.62-4	1.56-4	1.47-4	1.38-4	1.36-4	1.41-4
89	5947.4	1.56-4	1.51-4	1.42-4	1.33-4	1.31-4	1.36-4
90	6144.0	1.50-4	1.45-4	1.37-4	1.28-4	1.26-4	1.31-4
91	6345.3	1.45-4	1.40-4	1.32-4	1.24-4	1.21-4	1.26-4
92	6551.5	1.40-4	1.35-4	1.27-4	.19-4	1.17-4	1.21-4

A1 - 025

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1957.5	4.18-4	4.40-4	4.95-4	5.90-4	7.17-4	8.19-4
61	2056.4	4.16-4	4.39-4	4.94-4	5.88-4	7.13-4	8.15-4
62	2157.9	4.14-4	4.36-4	4.91-4	5.84-4	7.08-4	8.09-4
63	2262.2	4.10-4	4.32-4	4.87-4	5.79-4	7.01-4	8.01-4
64	2369.2	4.06-4	4.28-4	4.82-4	5.73-4	6.93-4	7.92-4
65	2479.1	4.01-4	4.23-4	4.76-4	5.66-4	6.84-4	7.81-4
66	2591.8	3.96-4	4.17-4	4.70-4	5.58-4	6.74-4	7.69-4
67	2707.5	3.90-4	4.11-4	4.63-4	5.49-4	6.63-4	7.57-4
68	2826.0	3.83-4	4.04-4	4.55-4	5.40-4	6.51-4	7.43-4
69	2947.6	3.77-4	3.97-4	4.47-4	5.30-4	6.39-4	7.29-4
70	3072.2	3.70-4	3.90-4	4.39-4	5.20-4	6.27-4	7.15-4
71	3199.9	3.62-4	3.82-4	4.30-4	5.10-4	6.14-4	7.00-4
72	3330.7	3.55-4	3.74-4	4.21-4	4.99-4	6.01-4	6.85-4
73	3464.7	3.48-4	3.66-4	4.12-4	4.88-4	5.88-4	6.70-4
74	3602.0	3.40-4	3.58-4	4.03-4	4.77-4	5.74-4	6.55-4
75	3742.6	3.32-4	3.50-4	3.93-4	4.65-4	5.61-4	6.39-4
76	3886.6	3.24-4	3.42-4	3.84-4	4.54-4	5.47-4	6.24-4
77	4034.0	3.16-4	3.33-4	3.74-4	4.43-4	5.33-4	6.08-4
78	4185.0	3.08-4	3.25-4	3.65-4	4.31-4	5.19-4	5.93-4
79	4339.5	3.00-4	3.17-4	3.55-4	4.20-4	5.06-4	5.77-4
80	4497.7	2.93-4	3.08-4	3.46-4	4.09-4	4.92-4	5.62-4
81	4659.6	2.85-4	3.00-4	3.36-4	3.98-4	4.79-4	5.47-4
82	4825.4	2.77-4	2.91-4	3.27-4	3.86-4	4.65-4	5.32-4
83	4995.0	2.69-4	2.83-4	3.18-4	3.75-4	4.52-4	5.17-4
84	5168.7	2.61-4	2.75-4	3.08-4	3.64-4	4.39-4	5.03-4
85	5346.4	2.54-4	2.67-4	2.99-4	3.54-4	4.26-4	4.89-4
86	5528.3	2.46-4	2.59-4	2.90-4	3.43-4	4.14-4	4.74-4
87	5714.4	2.39-4	2.51-4	2.81-4	3.32-4	4.01-4	4.61-4
88	5905.0	2.31-4	2.43-4	2.72-4	3.22-4	3.89-4	4.47-4
89	6100.0	2.24-4	2.35-4	2.64-4	3.12-4	3.76-4	4.33-4
90	6299.6	2.17-4	2.28-4	2.55-4	3.02-4	3.64-4	4.20-4
91	6504.0	2.09-4	2.20-4	2.47-4	2.92-4	3.52-4	4.07-4
92	6713.3	2.02-4	2.13-4	2.38-4	2.82-4	3.41-4	3.94-4

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - 026

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2103.9	5.61-4	5.21-4	4.42-4	3.42-4	2.49-4	1.99-4
61	2206.3	5.43-4	5.06-4	4.32-4	3.39-4	2.53-4	2.08-4
62	2311.5	5.26-4	4.92-4	4.23-4	3.36-4	2.58-4	2.17-4
63	2419.4	5.10-4	4.78-4	4.15-4	3.34-4	2.62-4	2.26-4
64	2530.1	4.96-4	4.66-4	4.07-4	3.33-4	2.67-4	2.35-4
65	2643.7	4.83-4	4.55-4	4.00-4	3.31-4	2.72-4	2.44-4
66	2760.2	4.70-4	4.44-4	3.93-4	3.30-4	2.76-4	2.52-4
67	2879.6	4.58-4	4.34-4	3.87-4	3.29-4	2.80-4	2.60-4
68	3002.0	4.47-4	4.24-4	3.81-4	3.28-4	2.84-4	2.67-4
69	3127.5	4.36-4	4.15-4	3.75-4	3.27-4	2.88-4	2.73-4
70	3256.0	4.25-4	4.06-4	3.70-4	3.26-4	2.91-4	2.79-4
71	3387.7	4.15-4	3.98-4	3.64-4	3.24-4	2.93-4	2.84-4
72	3522.6	4.06-4	3.89-4	3.59-4	3.22-4	2.95-4	2.89-4
73	3660.8	3.96-4	3.81-4	3.53-4	3.20-4	2.97-4	2.93-4
74	3802.2	3.87-4	3.74-4	3.47-4	3.18-4	2.98-4	2.96-4
75	3947.1	3.78-4	3.66-4	3.42-4	3.15-4	2.98-4	2.98-4
76	4095.4	3.69-4	3.58-4	3.36-4	3.13-4	2.98-4	3.00-4
77	4247.2	3.61-4	3.51-4	3.31-4	3.09-4	2.98-4	3.01-4
78	4402.6	3.53-4	3.43-4	3.25-4	3.06-4	2.97-4	3.02-4
79	4561.7	3.45-4	3.36-4	3.19-4	3.02-4	2.95-4	3.01-4
80	4724.4	3.36-4	3.29-4	3.14-4	2.99-4	2.94-4	3.01-4
81	4891.0	3.29-4	3.21-4	3.08-4	2.95-4	2.91-4	3.00-4
82	5061.5	3.21-4	3.14-4	3.02-4	2.91-4	2.89-4	2.98-4
83	5236.0	3.13-4	3.07-4	2.96-4	2.87-4	2.86-4	2.97-4
84	5414.6	3.06-4	3.00-4	2.91-4	2.82-4	2.83-4	2.95-4
85	5597.4	2.99-4	2.94-4	2.85-4	2.78-4	2.80-4	2.92-4
86	5784.3	2.92-4	2.87-4	2.79-4	2.73-4	2.77-4	2.90-4
87	5975.8	2.85-4	2.80-4	2.74-4	2.69-4	2.73-4	2.87-4
88	6171.6	2.78-4	2.74-4	2.68-4	2.64-4	2.70-4	2.84-4
89	6372.2	2.71-4	2.68-4	2.62-4	2.60-4	2.66-4	2.81-4
90	6577.4	2.65-4	2.62-4	2.57-4	2.55-4	2.62-4	2.78-4
91	6787.5	2.58-4	2.56-4	2.51-4	2.50-4	2.58-4	2.74-4
92	7002.6	2.52-4	2.50-4	2.46-4	2.46-4	2.54-4	2.71-4

A1 - 027

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2105.9	1.37-3	1.46-3	1.64-3	1.91-3	2.24-3	2.51-3
61	2208.4	1.32-3	1.39-3	1.56-3	1.82-3	2.13-3	2.38-3
62	2313.7	1.26-3	1.33-3	1.49-3	1.73-3	2.02-3	2.26-3
63	2421.7	1.21-3	1.27-3	1.42-3	1.65-3	1.92-3	2.15-3
64	2532.5	1.15-3	1.22-3	1.36-3	1.57-3	1.83-3	2.05-3
65	2646.3	1.10-3	1.16-3	1.29-3	1.49-3	1.74-3	1.95-3
66	2762.9	1.06-3	1.11-3	1.24-3	1.42-3	1.65-3	1.85-3
67	2882.5	1.01-3	1.06-3	1.18-3	1.35-3	1.57-3	1.76-3
68	3005.1	9.67-4	1.02-3	1.13-3	1.29-3	1.49-3	1.67-3
69	3130.7	9.26-4	9.72-4	1.08-3	1.23-3	1.42-3	1.59-3
70	3259.5	8.86-4	9.30-4	1.03-3	1.17-3	1.35-3	1.51-3
71	3391.4	8.49-4	8.90-4	9.80-4	1.12-3	1.29-3	1.44-3
72	3526.5	8.13-4	8.52-4	9.37-4	1.07-3	1.23-3	1.37-3
73	3664.9	7.79-4	8.16-4	8.96-4	1.02-3	1.17-3	1.31-3
74	3806.7	7.47-4	7.81-4	8.57-4	9.72-4	1.12-3	1.25-3
75	3951.8	7.16-4	7.48-4	8.20-4	9.28-4	1.07-3	1.19-3
76	4100.4	6.87-4	7.18-4	7.84-4	8.87-4	1.02-3	1.14-3
77	4252.5	6.60-4	6.88-4	7.51-4	8.49-4	9.75-4	1.09-3
78	4408.2	6.33-4	6.60-4	7.20-4	8.13-4	9.33-4	1.04-3
79	4567.6	6.08-4	6.34-4	6.90-4	7.78-4	8.93-4	9.95-4
80	4730.8	5.85-4	6.09-4	6.62-4	7.46-4	8.55-4	9.53-4
81	4897.8	5.62-4	5.85-4	6.36-4	7.15-4	8.20-4	9.14-4
82	5068.7	5.41-4	5.63-4	6.11-4	6.86-4	7.86-4	8.76-4
83	5243.6	5.21-4	5.41-4	5.87-4	6.59-4	7.54-4	8.41-4
84	5422.6	5.01-4	5.21-4	5.64-4	6.33-4	7.24-4	8.08-4
85	5605.9	4.83-4	5.02-4	5.43-4	6.09-4	6.96-4	7.77-4
86	5793.4	4.66-4	4.83-4	5.23-4	5.85-4	6.70-4	7.48-4
87	5985.3	4.49-4	4.66-4	5.03-4	5.64-4	6.44-4	7.20-4
88	6181.7	4.33-4	4.49-4	4.85-4	5.43-4	6.21-4	6.94-4
89	6382.8	4.18-4	4.33-4	4.68-4	5.23-4	5.98-4	6.70-4
90	6588.7	4.04-4	4.18-4	4.51-4	5.05-4	5.77-4	6.46-4
91	6799.4	3.90-4	4.04-4	4.36-4	4.87-4	5.56-4	6.25-4
92	7015.2	3.77-4	3.90-4	4.21-4	4.70-4	5.37-4	6.04-4

A1 - P1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	938.9	1.56-3	1.40-3	1.08-3	7.02-4	3.58-4	1.64-4
61	989.6	1.48-3	1.33-3	1.03-3	6.65-4	3.39-4	1.55-4
62	1041.5	1.41-3	1.26-3	9.76-4	6.31-4	3.21-4	1.47-4
63	1094.6	1.34-3	1.20-3	9.27-4	5.99-4	3.05-4	1.40-4
64	1149.0	1.28-3	1.14-3	8.82-4	5.69-4	2.90-4	1.33-4
65	1204.6	1.22-3	1.09-3	8.40-4	5.42-4	2.76-4	1.26-4
66	1261.4	1.16-3	1.04-3	8.01-4	5.16-4	2.62-4	1.20-4
67	1319.5	1.11-3	9.89-4	7.64-4	4.92-4	2.50-4	1.15-4
68	1378.8	1.06-3	9.45-4	7.30-4	4.70-4	2.39-4	1.09-4
69	1439.3	1.01-3	9.04-4	6.98-4	4.49-4	2.28-4	1.05-4
70	1501.0	9.69-4	8.66-4	6.68-4	4.30-4	2.18-4	1.00-4
71	1564.0	9.29-4	8.30-4	6.40-4	4.12-4	2.09-4	9.58-5
72	1628.1	8.91-4	7.96-4	6.14-4	3.95-4	2.01-4	9.18-5
73	1693.5	8.55-4	7.64-4	5.89-4	3.79-4	1.92-4	8.80-5
74	1760.0	8.21-4	7.33-4	5.66-4	3.64-4	1.85-4	8.45-5
75	1827.8	7.90-4	7.05-4	5.44-4	3.50-4	1.77-4	8.12-5
76	1896.7	7.59-4	6.78-4	5.23-4	3.36-4	1.71-4	7.81-5
77	1966.9	7.31-4	6.53-4	5.03-4	3.24-4	1.64-4	7.51-5
78	2038.2	7.04-4	6.29-4	4.85-4	3.12-4	1.58-4	7.24-5
79	2110.7	6.79-4	6.06-4	4.67-4	3.00-4	1.53-4	6.98-5
80	2184.4	6.55-4	5.85-4	4.51-4	2.90-4	1.47-4	6.73-5
81	2259.3	6.32-4	5.64-4	4.35-4	2.80-4	1.42-4	6.49-5
82	2335.3	6.10-4	5.45-4	4.20-4	2.70-4	1.37-4	6.27-5
83	2412.5	5.90-4	5.26-4	4.06-4	2.61-4	1.33-4	6.06-5
84	2490.8	5.70-4	5.09-4	3.92-4	2.53-4	1.28-4	5.86-5
85	2570.3	5.51-4	4.92-4	3.80-4	2.44-4	1.24-4	5.67-5
86	2651.0	5.34-4	4.76-4	3.67-4	2.36-4	1.20-4	5.49-5
87	2732.8	5.17-4	4.61-4	3.56-4	2.29-4	1.16-4	5.32-5
88	2815.8	5.01-4	4.47-4	3.45-4	2.22-4	1.13-4	5.16-5
89	2899.8	4.85-4	4.33-4	3.34-4	2.15-4	1.09-4	5.01-5
90	2985.1	4.70-4	4.20-4	3.24-4	2.09-4	1.06-4	4.86-5
91	3071.4	4.56-4	4.08-4	3.15-4	2.03-4	1.03-4	4.72-5
92	3158.9	4.43-4	3.96-4	3.05-4	1.97-4	1.00-4	4.58-5

A1 - P2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1163.7	2.51-3	2.13-3	1.48-3	8.11-4	3.36-4	1.28-4
61	1221.5	2.31-3	1.97-3	1.36-3	7.45-4	3.07-4	1.17-4
62	1280.7	2.14-3	1.82-3	1.26-3	6.87-4	2.82-4	1.07-4
63	1341.1	2.00-3	1.70-3	1.17-3	6.37-4	2.61-4	9.85-5
64	1402.9	1.87-3	1.58-3	1.09-3	5.93-4	2.42-4	9.10-5
65	1465.9	1.75-3	1.48-3	1.02-3	5.54-4	2.25-4	8.44-5
66	1530.2	1.65-3	1.40-3	9.61-4	5.19-4	2.10-4	7.87-5
67	1595.8	1.56-3	1.32-3	9.05-4	4.89-4	1.97-4	7.36-5
68	1662.7	1.47-3	1.25-3	8.56-4	4.61-4	1.86-4	6.91-5
69	1730.9	1.40-3	1.18-3	8.11-4	4.36-4	1.75-4	6.50-5
70	1800.4	1.33-3	1.12-3	7.70-4	4.14-4	1.66-4	6.14-5
71	1871.2	1.26-3	1.07-3	7.32-4	3.93-4	1.57-4	5.81-5
72	1943.2	1.21-3	1.02-3	6.98-4	3.74-4	1.50-4	5.51-5
73	2016.6	1.15-3	9.73-4	6.66-4	3.57-4	1.43-4	5.24-5
74	2091.2	1.10-3	9.31-4	6.37-4	3.41-4	1.36-4	4.99-5
75	2167.2	1.06-3	8.92-4	6.10-4	3.26-4	1.30-4	4.76-5
76	2244.4	1.01-3	8.56-4	5.85-4	3.13-4	1.24-4	4.55-5
77	2322.9	9.73-4	8.22-4	5.62-4	3.00-4	1.19-4	4.36-5
78	2402.7	9.35-4	7.90-4	5.40-4	2.88-4	1.14-4	4.18-5
79	2483.8	9.00-4	7.60-4	5.19-4	2.77-4	1.10-4	4.01-5
80	2566.2	8.67-4	7.33-4	5.00-4	2.67-4	1.06-4	3.85-5
81	2649.9	8.37-4	7.06-4	4.82-4	2.57-4	1.02-4	3.71-5
82	2734.8	8.07-4	6.82-4	4.65-4	2.48-4	9.81-5	3.57-5
83	2821.1	7.80-4	6.58-4	4.49-4	2.39-4	9.46-5	3.44-5
84	2908.6	7.54-4	6.36-4	4.34-4	2.31-4	9.14-5	3.32-5
85	2997.5	7.29-4	6.15-4	4.20-4	2.24-4	8.83-5	3.21-5
86	3087.6	7.06-4	5.96-4	4.06-4	2.16-4	8.54-5	3.10-5
87	3179.0	6.84-4	5.77-4	3.94-4	2.09-4	8.26-5	3.00-5
88	3271.7	6.63-4	5.59-4	3.81-4	2.03-4	8.01-5	2.90-5
89	3365.7	6.43-4	5.42-4	3.70-4	1.97-4	7.76-5	2.81-5
90	3460.9	6.24-4	5.26-4	3.59-4	1.91-4	7.52-5	2.73-5
91	3557.5	6.06-4	5.11-4	3.48-4	1.85-4	7.30-5	2.65-5
92	3655.3	5.88-4	4.96-4	3.38-4	1.80-4	7.09-5	2.57-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 − P3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1164.6	2 55-3	2.17-3	1.51-3	8 27-4	3 44-4	1.32-4
61	1222.6	2.50-3	2.12-3	1.48-3	8.16-4	3.41-4	1.32-4
62	1281.9	2.44-3	2.08-3	1.45-3	8.01-4	3.36-4	1.30-4
63	1342.5	2 37-3	2.02-3	1.41-3	7.84-4	3.30-4	1.28-4
64	1404.4	2 31-3	1 97-3	1.38-3	7.65-4	3.23-4	1.26-4
65	1467.6	2.24-3	1.91-3	1.34-3	7.45-4	3.15-4	1.23-4
66	1532 2	2.17-3	1.85-3	1 30-3	7.24-4	3.07-4	1.20-4
67	1598.0	2 10-3	1 79-3	1.26-3	7.02-4	2.98-4	1.17-4
68	1665.2	2 03-3	1.74-3	1 22-3	6.81-4	2.90-4	1.14-4
69	1733.7	1.97-3	1.68-3	1.18-3	6.60-4	2.81-4	1.11-4
70	1803.5	1.90-3	1.62-3	1.14-3	6.39-4	2.73-4	1.08-4
71	1874.6	1.84-3	1 57-3	1.10-3	6.19-4	2.64-4	1.04-4
72	1947.1	1.78-3	1.52-3	1.07-3	5.99-4	2.56-4	1.01-4
73	2020.9	1.72-3	1.47-3	1.03-3	5.80-4	2.48-4	9.81-5
74	2095.9	1.66-3	1.42-3	9.99-4	5.61-4	2.40-4	9.51-5
75	2172.3	1.61-3	1.37-3	9.67-4	5.43-4	2.33-4	9.22-5
76	2250.1	1 55-3	1.33-3	9.36-4	5.26-4	2.25-4	8.94-5
77	2329.1	1.50-3	1.29-3	9.06-4	5.09-4	2.18-4	8.67-5
78	2409.5	1 46-3	1.25-3	8.77-4	4.93-4	2 12-4	8.40-5
79	2491.2	1.41-3	1.21-3	8.50-4	4.78-4	2.05-4	8.15-5
80	2574.2	1.37-3	1.17-3	8 23-4	4.63-4	1.99-4	7.90-5
81	2658.6	1.32-3	1.13-3	7.98-4	4.49-4	1 93-4	7.67-5
82	2744.2	1.28-3	1.10-3	7 74-4	4.35-4	1.87-4	7.44-5
83	2831.3	1.24-3	1.06-3	7.50-4	4.22-4	1.82-4	7 23-5
84	2919.6	1.21-3	1.03-3	7.28-4	4.10-4	1.76-4	7.02-5
85	3009.3	1.17-3	1.00-3	7 06-4	3.98-4	1.71-4	6.82-5
86	3100.3	1.14-3	9.73-4	6.86-4	3.86-4	1.66-4	6.63-5
87	3192.6	1.10-3	9.45-4	6.66-4	3.75-4	1.62-4	6.44-5
88	3286.3	1.07-3	9.18-4	6.47-4	3.65-4	1.57-4	6.26-5
89	3381 3	1.04-3	8.92-4	6.29-4	3.55-4	1.53-4	6.09-5
90	3477.6	1.01-3	8.67-4	6.12-4	3.45-4	1.49-4	5.93-5
91	3575.3	9.85-4	8.43-4	5.95-4	3.36-4	1.45-4	5.77-5
92	3674.3	9.58-4	8.20-4	5.79-4	3.27-4	1.41-4	5.62-5

A1 − P4

ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
1183.6	2.46-3	2 11-3	1.49-3	8.40-4	3.60-4	1.43-4
1243.3	2.35-3	2 02-3	1.43-3	8.04-4	3.46-4	1.38-4
1304.5	2 25-3	1.93-3	1.37-3	7.71-4	3.32-4	1.32-4
1367.1	2.16-3	1.85-3	1.31-3	7.39-4	3.18-4	1.27-4
1431.2	2.06-3	1.77-3	1.25-3	7.09-4	3.06-4	1.22-4
1496 7	1 98-3	1.70-3	1.20-3	6.81-4	2.94-4	1.18-4
1563.6	1.90-3	1.63-3	1.15-3	6.54-4	2.83-4	1.13-4
1632.0	1.82-3	1 56-3	1.11-3	6.29-4	2.72-4	1.09-4
1701.9	1 75-3	1.50-3	1.07-3	6.05-4	2.62-4	1.05-4
1773.2	1.68-3	1.44-3	1.02-3	5.82-4	2.52-4	1.01-4
1846.0	1.62-3	1.39-3	9.87-4	5.60-4	2.43-4	9.79-5
1920.3	1.56-3	1 34-3	9.50-4	5.40-4	2.35-4	9.44-5
1996.1	1.50-3	1.29-3	9.15-4	5.20-4	2.26-4	9.12-5
2073.4	1 44-3	1 24-3	8.82-4	5.02-4	2.18-4	8.81-5
2152.1	1.39-3	1.20-3	8.51-4	4.85-4	2.11-4	8.51-5
2232.4	1.34-3	1.15-3	8.22-4	4.68-4	2.04-4	8.23-5
2314.2	1.30-3	1 11-3	7.93-4	4.52-4	1.97-4	7.96-5
2397.5	1.25-3	1.08-3	7.67-4	4.37-4	1.91-4	7.71-5
2482.4	1.21-3	1.04-3	7.41-4	4.23-4	1.84-4	7.46-5
2568.8	1.17-3	1.01-3	7.17-4	4.09-4	1.79-4	7.23-5
2656.7	1.13-3	9.74-4	6.94-4	3.96-4	1.73-4	7.01-5
2746.3	1 10-3	9.43-4	6.72-4	3.83-4	1.68-4	6.79-5
2837.3	1.06-3	9.13-4	6.51-4	3.71-4	1.63-4	6.59-5
2930.0	1.03-3	8.85-4	6.30-4	3.60-4	1.58-4	6.40-5
3024.2	9.96-4	8.58-4	6.11-4	3.49-4	1.53-4	6.21-5
3120.0	9.66-4	8.32-4	5.93-4	3.39-4	1.49-4	6.03-5
3217.4	9.37-4	8.07-4	5.76-4	3.29-4	1.44-4	5.86-5
3316.4	9.10-4	7.83-4	5.59-4	3.20-4	1.40-4	5.70-5
3417.0	8.84-4	7 61-4	5.43-4	3.11-4	1.36-4	5.55-5
3519.3	8.58-4	7.39-4	5.27-4	3.02-4	1.33-4	5.40-5
3623.2	8.34-4	7.18-4	5.13-4	2.94-4	1.29-4	5.26-5
3728.7	8.11-4	6.98-4	4.99-4	2 86-4	1.26-4	5.12-5
3835.9	7.89-4	6.79-4	4.85-4	2.78-4	1.22-4	4.99-5

A1 − P5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1188.8	1.87-3	1.57-3	1.07-3	5.67-4	2.22-4	7.94-5
61	1248.9	1.78-3	1.50-3	1.02-3	5.42-4	2.12-4	7.62-5
62	1310.5	1.70-3	1.43-3	9.77-4	5.19-4	2.03-4	7.31-5
63	1373.4	1.62-3	1.37-3	9.35-4	4.96-4	1.95-4	7.02-5
64	1437.9	1.55-3	1.31-3	8.95-4	4.76-4	1.87-4	6.75-5
65	1503.7	1.49-3	1.25-3	8.57-4	4.56-4	1.80-4	6.49-5
66	1571.1	1.42-3	1.20-3	8.22-4	4.38-4	1.73-4	6.25-5
67	1639.9	1.37-3	1.15-3	7.88-4	4.20-4	1.66-4	6.01-5
68	1710.2	1.31-3	1.11-3	7.57-4	4.04-4	1.60-4	5.79-5
69	1782.1	1.26-3	1.06-3	7.27-4	3.88-4	1.54-4	5.58-5
70	1855.4	1.21-3	1.02-3	6 99-4	3.74-4	1.48-4	5.38-5
71	1930.2	1.16-3	9.82-4	6.72-4	3.60-4	1.43-4	5.19-5
72	2006.5	1.12-3	9.45-4	6.47-4	3 46-4	1.37-4	5.01-5
73	2084.4	1.08-3	9.10-4	6.23-4	3.34-4	1.33-4	4.83-5
74	2163.7	1.04-3	8.76-4	6.01-4	3.22-4	1.28-4	4.67-5
75	2244.7	9.98-4	8.45-4	5.79-4	3.10-4	1.24-4	4.51-5
76	2327.1	9.63-4	8.15-4	5.59-4	3.00-4	1.19-4	4.36-5
77	2411.2	9.29-4	7.86-4	5.39-4	2.89-4	1.15-4	4.22-5
78	2496.8	8.97-4	7.59-4	5.21-4	2.80-4	1.11-4	4.08-5
79	2583.9	8.66-4	7.33-4	5.03-4	2.70-4	1.08-4	3.95-5
80	2672.7	8.37-4	7.09-4	4.87-4	2.61-4	1.04-4	3.82-5
81	2763.0	8.09-4	6.85-4	4.71-4	2.53-4	1.01-4	3.70-5
82	2855.0	7.83-4	6.63-4	4.55-4	2.45-4	9.79-5	3.59-5
83	2948.5	7.58-4	6.42-4	4.41-4	2.37-4	9.49-5	3.48-5
84	3043.7	7.33-4	6.21-4	4.27-4	2.30-4	9.20-5	3.38-5
85	3140.5	7.10-4	6.02-4	4.14-4	2.23-4	8.92-5	3.28-5
86	3239.0	6.88-4	5.83-4	4.01-4	2.16-4	8.66-5	3.18-5
87	3339.1	6.67-4	5.65-4	3.89-4	2.09-4	8.40-5	3.09-5
88	3440.9	6.47-4	5.48-4	3.77-4	2.03-4	8.16-5	3.00-5
89	3544.3	6.28-4	5.32-4	3.66-4	1.97-4	7.92-5	2.92-5
90	3649.5	6.09-4	5.16-4	3.56-4	1.92-4	7.70-5	2.84-5
91	3756.3	5.92-4	5.01-4	3.45-4	1.86-4	7.48-5	2.76-5
92	3864.8	5.75-4	4.87-4	3.36-4	1.81-4	7.28-5	2.69-5

A1 − P6

ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
1360 1	1.41-3	1.25-3	9.68-4	6.24-4	3.16-4	1.44-4
1423.6	1.34-3	1.19-3	9.19-4	5 91-4	3.00-4	1.36-4
1488.5	1.28-3	1.14-3	8.75-4	5.62-4	2.84-4	1.28-4
1554.9	1.22-3	1.09-3	8.35-4	5.36-4	2.71-4	1.22-4
1622.8	1.17-3	1.04-3	7.98-4	5.12-4	2.58-4	1.16-4
1692.1	1.12-3	9.95-4	7.64-4	4.89-4	2.46-4	1.11-4
1762.9	1.07-3	9.54-4	7.32-4	4.68-4	2.35-4	1.06-4
1835.2	1.03-3	9.16-4	7.03-4	4.49-4	2.25-4	1.01-4
1908.9	9.89-4	8.80-4	6.75-4	4.31-4	2.16-4	9.67-5
1984.2	9.52-4	8.47-4	6.49-4	4.14-4	2.07-4	9.26-5
2060.9	9.16-4	8.15-4	6.24-4	3.98-4	1.99-4	8.88-5
2139.2	8.83-4	7.85-4	6.01-4	3.82-4	1.91-4	8.53-5
2219.0	8.51-4	7.57-4	5.79-4	3.68-4	1.84-4	8.19-5
2300.3	8.21-4	7 30-4	5.58-4	3.55-4	1.77-4	7.88-5
2383.2	7.92-4	7.04-4	5.38-4	3.42-4	1.70-4	7.58-5
2467.5	7.65-4	6.80-4	5.20-4	3.30-4	1.64-4	7.30-5
2553.5	7.40-4	6.57-4	5.02-4	3.18-4	1.58-4	7.03-5
2641.0	7.15-4	6.35-4	4.85-4	3.08-4	1.53-4	6.78-5
2730.0	6.92-4	6.15-4	4.69-4	2.97-4	1.48-4	6.55-5
2820.6	6.70-4	5.95-4	4.54-4	2.88-4	1.43-4	6.32-5
2912.8	6.49-4	5.76-4	4.39-4	2.78-4	1.38-4	6.11-5
3006.6	6.28-4	5.58-4	4 26-4	2.69-4	1.33-4	5.91-5
3102.0	6.09-4	5.41-4	4.12-4	2.61-4	1.29-4	5.72-5
3199.0	5.91-4	5.24-4	4.00-4	2.53-4	1.25-4	5.54-5
3297.6	5.73-4	5.09-4	3.88-4	2.45-4	1.21-4	5.36-5
3397.9	5.56-4	4.94-4	3.76-4	2.38-4	1.18-4	5.20-5
3499.8	5.40-4	4.80-4	3.65-4	2.31-4	1.14-4	5.04-5
3603.3	5.25-4	4.66-4	3.55-4	2.24-4	1.11-4	4.89-5
3708.5	5.10-4	4.53-4	3.45-4	2.18-4	1.08-4	4.75-5
3815.3	4.96-4	4.40-4	3.35-4	2.12-4	1.05-4	4.61-5
3923.8	4.82-4	4.28-4	3.26-4	2.06-4	1.02-4	4.48-5
4034.0	4.69-4	4.16-4	3.17-4	2.00-4	9.89-5	4.36-5
4145.9	4.57-4	4.05-4	3.08-4	1.95-4	9.62-5	4.24-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leq Z \leq 92$

See page 96 for Explanation of Tables

A1 - P7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1414.2	5.83-4	5.20-4	4.02-4	2.59-4	1.32-4	5.99-5
61	1490.2	5.64-4	5.03-4	3.89-4	2.50-4	1.27-4	5.79-5
62	1568.2	5.44-4	4.85-4	3.74-4	2.41-4	1.22-4	5.58-5
63	1647.9	5.23-4	4.67-4	3.60-4	2.32-4	1.17-4	5.36-5
64	1729.6	5.03-4	4.49-4	3.46-4	2.22-4	1.13-4	5.15-5
65	1813.2	4.83-4	4.31-4	3.32-4	2.13-4	1.08-4	4.94-5
66	1898.7	4.64-4	4.14-4	3.19-4	2.05-4	1.04-4	4.74-5
67	1986.0	4.45-4	3.97-4	3.06-4	1.96-4	9.95-5	4.54-5
68	2075.3	4.28-4	3.82-4	2.94-4	1.89-4	9.55-5	4.36-5
69	2166.4	4.11-4	3.67-4	2.83-4	1.81-4	9.17-5	4.19-5
70	2259.4	3.96-4	3.53-4	2.72-4	1.74-4	8.81-5	4.02-5
71	2354.2	3.80-4	3.39-4	2.61-4	1.68-4	8.47-5	3.87-5
72	2451.0	3.66-4	3.27-4	2.51-4	1.61-4	8.15-5	3.72-5
73	2549.6	3.53-4	3.15-4	2.42-4	1.55-4	7.85-5	3.58-5
74	2650.1	3.40-4	3.03-4	2.33-4	1.50-4	7.56-5	3.45-5
75	2752.5	3.27-4	2.92-4	2.25-4	1.44-4	7.29-5	3.32-5
76	2856.7	3.16-4	2.82-4	2.17-4	1.39-4	7.03-5	3.21-5
77	2962.8	3.05-4	2.72-4	2.09-4	1.34-4	6.78-5	3.09-5
78	3070.8	2.94-4	2.62-4	2.02-4	1.30-4	6.55-5	2.99-5
79	3180.6	2.84-4	2.53-4	1.95-4	1.25-4	6.33-5	2.89-5
80	3292.3	2.75-4	2.45-4	1.89-4	1.21-4	6.12-5	2.79-5
81	3405.8	2.65-4	2.37-4	1.82-4	1.17-4	5.92-5	2.70-5
82	3521.2	2.57-4	2.29-4	1.76-4	1.13-4	5.73-5	2.61-5
83	3638.5	2.48-4	2.22-4	1.71-4	1.10-4	5.55-5	2.53-5
84	3757.6	2.41-4	2.14-4	1.65-4	1.06-4	5.38-5	2.45-5
85	3878.6	2.33-4	2.08-4	1.60-4	1.03-4	5.21-5	2.38-5
86	4001.4	2.26-4	2.01-4	1.55-4	9.98-5	5.06-5	2.31-5
87	4126.0	2.19-4	1.95-4	1.50-4	9.68-5	4.91-5	2.24-5
88	4252.5	2.12-4	1.89-4	1.46-4	9.39-5	4.76-5	2.17-5
89	4380.9	2.06-4	1.84-4	1.42-4	9.12-5	4.63-5	2.11-5
90	4511.1	2.00-4	1.78-4	1.38-4	8.86-5	4.50-5	2.05-5
91	4643.1	1.94-4	1.73-4	1.34-4	8.60-5	4.37-5	2.00-5
92	4777.0	1.89-4	1.68-4	1.30-4	8.36-5	4.25-5	1.94-5

A1 - P8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1516.2	9.97-4	8.50-4	5.92-4	3.24-4	1.33-4	4.99-5
61	1595.6	9.32-4	7.94-4	5.52-4	3.02-4	1.23-4	4.62-5
62	1677.0	8.74-4	7.45-4	5.17-4	2.82-4	1.15-4	4.29-5
63	1760.3	8.23-4	7.01-4	4.86-4	2.65-4	1.08-4	4.01-5
64	1845.5	7.77-4	6.61-4	4.58-4	2.49-4	1.01-4	3.76-5
65	1932.6	7.35-4	6.25-4	4.33-4	2.35-4	9.53-5	3.53-5
66	2021.7	6.97-4	5.92-4	4.10-4	2.23-4	9.01-5	3.33-5
67	2112.6	6.61-4	5.62-4	3.89-4	2.11-4	8.53-5	3.14-5
68	2205.5	6.30-4	5.35-4	3.70-4	2.00-4	8.09-5	2.98-5
69	2300.3	6.00-4	5.10-4	3.53-4	1.91-4	7.69-5	2.83-5
70	2397.0	5.73-4	4.87-4	3.36-4	1.82-4	7.32-5	2.69-5
71	2495.7	5.47-4	4.65-4	3.21-4	1.74-4	6.99-5	2.56-5
72	2596.2	5.24-4	4.45-4	3.07-4	1.66-4	6.67-5	2.45-5
73	2698.7	5.02-4	4.26-4	2.94-4	1.59-4	6.39-5	2.34-5
74	2803.1	4.81-4	4.09-4	2.82-4	1.52-4	6.12-5	2.24-5
75	2909.4	4.62-4	3.92-4	2.71-4	1.46-4	5.86-5	2.14-5
76	3017.6	4.44-4	3.77-4	2.60-4	1.40-4	5.63-5	2.06-5
77	3127.7	4.27-4	3.63-4	2.50-4	1.35-4	5.41-5	1.98-5
78	3239.8	4.12-4	3.49-4	2.41-4	1.30-4	5.21-5	1.90-5
79	3353.8	3.97-4	3.37-4	2.32-4	1.25-4	5.01-5	1.83-5
80	3469.7	3.83-4	3.25-4	2.24-4	1.21-4	4.83-5	1.76-5
81	3587.5	3.69-4	3.13-4	2.16-4	1.17-4	4.66-5	1.70-5
82	3707.2	3.57-4	3.03-4	2.09-4	1.13-4	4.50-5	1.64-5
83	3828.8	3.45-4	2.93-4	2.02-4	1.09-4	4.35-5	1.58-5
84	3952.4	3.34-4	2.83-4	1.95-4	1.05-4	4.20-5	1.53-5
85	4077.9	3.23-4	2.74-4	1.89-4	1.02-4	4.07-5	1.48-5
86	4205.3	3.13-4	2.66-4	1.83-4	9.87-5	3.94-5	1.44-5
87	4334.6	3.03-4	2.57-4	1.77-4	9.56-5	3.82-5	1.39-5
88	4465.8	2.94-4	2.49-4	1.72-4	9.27-5	3.70-5	1.35-5
89	4599.0	2.85-4	2.42-4	1.67-4	9.00-5	3.59-5	1.31-5
90	4734.0	2.77-4	2.35-4	1.62-4	8.73-5	3.49-5	1.27-5
91	4871.0	2.69-4	2.28-4	1.57-4	8.48-5	3.39-5	1.23-5
92	5009.9	2.62-4	2.22-4	1.53-4	8.24-5	3.29-5	1.20-5

A1 - P9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1516.8	1.24-3	1.07-3	7.53-4	4.24-4	1.81-4	7.13-5
61	1596.3	1.20-3	1.03-3	7.27-4	4.10-4	1.76-4	6.94-5
62	1677.8	1.15-3	9.90-4	7.01-4	3.96-4	1.70-4	6.74-5
63	1761.2	1.11-3	9.54-4	6.76-4	3.82-4	1.65-4	6.53-5
64	1846.5	1.07-3	9.18-4	6.51-4	3.68-4	1.59-4	6.33-5
65	1933.8	1.03-3	8.83-4	6.26-4	3.55-4	1.53-4	6.12-5
66	2023.0	9.89-4	8.49-4	6.03-4	3.42-4	1.48-4	5.91-5
67	2114.1	9.51-4	8.17-4	5.80-4	3.29-4	1.43-4	5.71-5
68	2207.1	9.15-4	7.87-4	5.59-4	3.17-4	1.38-4	5.51-5
69	2302.1	8.81-4	7.57-4	5.38-4	3.05-4	1.33-4	5.33-5
70	2399.0	8.48-4	7.29-4	5.18-4	2.94-4	1.28-4	5.14-5
71	2497.9	8.17-4	7.02-4	4.99-4	2.84-4	1.24-4	4.97-5
72	2598.6	7.87-4	6.77-4	4.81-4	2.74-4	1.19-4	4.80-5
73	2701.4	7.59-4	6.52-4	4.64-4	2.64-4	1.15-4	4.63-5
74	2806.0	7.32-4	6.29-4	4.48-4	2.55-4	1.11-4	4.48-5
75	2912.6	7.06-4	6.07-4	4.32-4	2.46-4	1.08-4	4.33-5
76	3021.1	6.81-4	5.86-4	4.17-4	2.38-4	1.04-4	4.18-5
77	3131.5	6.58-4	5.66-4	4.03-4	2.30-4	1.00-4	4.05-5
78	3243.9	6.36-4	5.47-4	3.89-4	2.22-4	9.71-5	3.91-5
79	3358.2	6.15-4	5.29-4	3.76-4	2.15-4	9.40-5	3.79-5
80	3474.4	5.94-4	5.11-4	3.64-4	2.08-4	9.09-5	3.67-5
81	3592.6	5.75-4	4.95-4	3.52-4	2.01-4	8.80-5	3.55-5
82	3712.8	5.57-4	4.79-4	3.41-4	1.95-4	8.53-5	3.44-5
83	3834.8	5.39-4	4.64-4	3.30-4	1.89-4	8.27-5	3.34-5
84	3958.8	5.22-4	4.49-4	3.20-4	1.83-4	8.01-5	3.24-5
85	4084.8	5.06-4	4.36-4	3.10-4	1.77-4	7.77-5	3.14-5
86	4212.6	4.91-4	4.23-4	3.01-4	1.72-4	7.54-5	3.05-5
87	4342.5	4.76-4	4.10-4	2.92-4	1.67-4	7.32-5	2.96-5
88	4474.2	4.63-4	3.98-4	2.84-4	1.62-4	7.11-5	2.88-5
89	4608.0	4.49-4	3.86-4	2.75-4	1.57-4	6.90-5	2.79-5
90	4743.6	4.36-4	3.75-4	2.67-4	1.53-4	6.71-5	2.72-5
91	4881.2	4.24-4	3.65-4	2.60-4	1.49-4	6.52-5	2.64-5
92	5020.8	4.12-4	3.55-4	2.53-4	1.44-4	6.34-5	2.57-5

A1 - P10

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1538.0	1.11-3	9.62-4	6.89-4	3.96-4	1.73-4	7.02-5
61	1619.5	1.06-3	9.16-4	6.57-4	3.77-4	1.66-4	6.71-5
62	1703.0	1.01-3	8.73-4	6.26-4	3.60-4	1.58-4	6.42-5
63	1788.5	9.65-4	8.34-4	5.98-4	3.44-4	1.51-4	6.14-5
64	1876.2	9.22-4	7.97-4	5.71-4	3.29-4	1.45-4	5.89-5
65	1965.9	8.82-4	7.62-4	5.46-4	3.14-4	1.39-4	5.65-5
66	2057.6	8.44-4	7.29-4	5.23-4	3.01-4	1.33-4	5.42-5
67	2151.5	8.08-4	6.98-4	5.01-4	2.89-4	1.28-4	5.20-5
68	2247.4	7.75-4	6.69-4	4.80-4	2.77-4	1.23-4	5.00-5
69	2345.5	7.43-4	6.42-4	4.61-4	2.66-4	1.18-4	4.81-5
70	2445.6	7.14-4	6.17-4	4.43-4	2.55-4	1.13-4	4.63-5
71	2547.8	6.86-4	5.93-4	4.26-4	2.46-4	1.09-4	4.46-5
72	2652.2	6.59-4	5.70-4	4.09-4	2.36-4	1.05-4	4.30-5
73	2758.7	6.35-4	5.48-4	3.94-4	2.28-4	1.01-4	4.14-5
74	2867.3	6.11-4	5.28-4	3.80-4	2.19-4	9.76-5	4.00-5
75	2978.0	5.89-4	5.09-4	3.66-4	2.12-4	9.41-5	3.86-5
76	3090.9	5.68-4	4.91-4	3.53-4	2.04-4	9.09-5	3.73-5
77	3206.0	5.48-4	4.74-4	3.41-4	1.97-4	8.78-5	3.60-5
78	3323.1	5.29-4	4.57-4	3.29-4	1.90-4	8.48-5	3.49-5
79	3442.5	5.11-4	4.42-4	3.18-4	1.84-4	8.21-5	3.38-5
80	3564.1	4.94-4	4.27-4	3.07-4	1.78-4	7.94-5	3.27-5
81	3687.8	4.78-4	4.13-4	2.97-4	1.72-4	7.69-5	3.17-5
82	3813.7	4.62-4	4.00-4	2.88-4	1.67-4	7.45-5	3.07-5
83	3941.8	4.47-4	3.87-4	2.79-4	1.62-4	7.22-5	2.98-5
84	4072.1	4.33-4	3.75-4	2.70-4	1.57-4	7.00-5	2.89-5
85	4204.7	4.20-4	3.63-4	2.62-4	1.52-4	6.80-5	2.81-5
86	4339.5	4.07-4	3.52-4	2.54-4	1.48-4	6.60-5	2.73-5
87	4476.5	3.95-4	3.42-4	2.46-4	1.43-4	6.41-5	2.65-5
88	4615.8	3.83-4	3.32-4	2.39-4	1.39-4	6.23-5	2.58-5
89	4757.3	3.72-4	3.22-4	2.32-4	1.35-4	6.06-5	2.51-5
90	4901.1	3.62-4	3.13-4	2.26-4	1.31-4	5.89-5	2.44-5
91	5047.2	3.52-4	3.04-4	2.20-4	1.28-4	5.73-5	2.38-5
92	5195.5	3.42-4	2.96-4	2.14-4	1.24-4	5.58-5	2.32-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - P11

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1540.5	8.93-4	7.60-4	5.26-4	2.85-4	1.14-4	4.17-5
61	1622.2	8.50-4	7.23-4	5.01-4	2.71-4	1.09-4	3.99-5
62	1705.8	8.10-4	6.89-4	4.77-4	2.59-4	1.04-4	3.81-5
63	1791.6	7.72-4	6.57-4	4.55-4	2.47-4	9.95-5	3.65-5
64	1879.4	7.37-4	6.27-4	4.35-4	2.36-4	9.51-5	3.50-5
65	1969.3	7.04-4	5.99-4	4.15-4	2.25-4	9.11-5	3.35-5
66	2061.3	6.73-4	5.73-4	3.97-4	2.16-4	8.72-5	3.21-5
67	2155.4	6.44-4	5.48-4	3.80-4	2.07-4	8.37-5	3.09-5
68	2251.5	6.17-4	5.25-4	3.64-4	1.98-4	8.03-5	2.96-5
69	2349.8	5.91-4	5.03-4	3.49-4	1.90-4	7.71-5	2.85-5
70	2450.2	5.67-4	4.83-4	3.35-4	1.82-4	7.41-5	2.74-5
71	2552.7	5.44-4	4.63-4	3.22-4	1.75-4	7.12-5	2.64-5
72	2657.4	5.23-4	4.45-4	3.09-4	1.69-4	6.85-5	2.54-5
73	2764.2	5.02-4	4.28-4	2.97-4	1.62-4	6.60-5	2.45-5
74	2873.1	4.83-4	4.12-4	2.86-4	1.56-4	6.35-5	2.36-5
75	2984.2	4.65-4	3.96-4	2.76-4	1.50-4	6.13-5	2.28-5
76	3097.4	4.48-4	3.82-4	2.66-4	1.45-4	5.91-5	2.20-5
77	3212.8	4.32-4	3.68-4	2.56-4	1.40-4	5.70-5	2.12-5
78	3330.4	4.16-4	3.55-4	2.47-4	1.35-4	5.51-5	2.05-5
79	3450.2	4.02-4	3.42-4	2.38-4	1.30-4	5.32-5	1.98-5
80	3572.2	3.88-4	3.31-4	2.30-4	1.26-4	5.14-5	1.92-5
81	3696.3	3.75-4	3.19-4	2.22-4	1.22-4	4.97-5	1.85-5
82	3822.7	3.62-4	3.09-4	2.15-4	1.18-4	4.81-5	1.79-5
83	3951.3	3.50-4	2.98-4	2.08-4	1.14-4	4.66-5	1.74-5
84	4082.2	3.39-4	2.89-4	2.01-4	1.10-4	4.51-5	1.68-5
85	4215.3	3.28-4	2.80-4	1.95-4	1.07-4	4.37-5	1.63-5
86	4350.6	3.17-4	2.71-4	1.89-4	1.03-4	4.23-5	1.58-5
87	4488.2	3.07-4	2.62-4	1.83-4	1.00-4	4.11-5	1.54-5
88	4628.1	2.98-4	2.54-4	1.77-4	9.73-5	3.98-5	1.49-5
89	4770.3	2.89-4	2.47-4	1.72-4	9.44-5	3.87-5	1.45-5
90	4914.7	2.80-4	2.39-4	1.67-4	9.16-5	3.75-5	1.41-5
91	5061.5	2.72-4	2.32-4	1.62-4	8.89-5	3.65-5	1.37-5
92	5210.6	2.64-4	2.25-4	1.57-4	8.64-5	3.54-5	1.33-5

A1 - P12

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1751.1	1.86-3	1.66-3	1.29-3	8.27-4	4.13-4	1.85-4
61	1832.0	1.76-3	1.58-3	1.22-3	7.86-4	3.93-4	1.76-4
62	1915.1	1.68-3	1.51-3	1.17-3	7.50-4	3.75-4	1.68-4
63	2000.3	1.60-3	1.44-3	1.11-3	7.16-4	3.58-4	1.61-4
64	2087.7	1.54-3	1.38-3	1.07-3	6.85-4	3.43-4	1.54-4
65	2177.4	1.47-3	1.32-3	1.02-3	6.56-4	3.28-4	1.47-4
66	2269.3	1.41-3	1.26-3	9.79-4	6.29-4	3.15-4	1.41-4
67	2363.6	1.35-3	1.21-3	9.40-4	6.04-4	3.02-4	1.36-4
68	2460.3	1.30-3	1.17-3	9.03-4	5.80-4	2.90-4	1.30-4
69	2559.4	1.25-3	1.12-3	8.68-4	5.58-4	2.79-4	1.25-4
70	2661.0	1.20-3	1.08-3	8.35-4	5.36-4	2.68-4	1.20-4
71	2765.2	1.16-3	1.04-3	8.04-4	5.16-4	2.58-4	1.16-4
72	2871.9	1.11-3	9.99-4	7.74-4	4.97-4	2.49-4	1.12-4
73	2981.3	1.08-3	9.63-4	7.46-4	4.79-4	2.40-4	1.08-4
74	3093.4	1.04-3	9.28-4	7.19-4	4.62-4	2.31-4	1.04-4
75	3208.3	1.00-3	8.96-4	6.94-4	4.46-4	2.23-4	1.00-4
76	3326.1	9.65-4	8.65-4	6.70-4	4.31-4	2.16-4	9.66-5
77	3446.8	9.32-4	8.35-4	6.47-4	4.16-4	2.08-4	9.33-5
78	3570.4	9.01-4	8.07-4	6.26-4	4.02-4	2.01-4	9.03-5
79	3697.1	8.71-4	7.81-4	6.05-4	3.89-4	1.95-4	8.73-5
80	3827.0	8.43-4	7.55-4	5.86-4	3.76-4	1.89-4	8.45-5
81	3960.0	8.16-4	7.32-4	5.67-4	3.65-4	1.83-4	8.19-5
82	4096.4	7.91-4	7.09-4	5.50-4	3.54-4	1.77-4	7.94-5
83	4236.2	7.68-4	6.88-4	5.34-4	3.43-4	1.72-4	7.71-5
84	4379.4	7.47-4	6.69-4	5.19-4	3.34-4	1.67-4	7.49-5
85	4526.2	7.28-4	6.52-4	5.06-4	[illegible]	1.63-4	7.30-5
86	4676.7	7.12-4	6.38-4	4.95-4	[illegible]	1.59-4	7.13-5
87	4830.9	7.02-4	6.29-4	4.87-4	[illegible]	1.56-4	6.99-5
88	4988.9	7.03-4	6.30-4	4.87-4	3.12-4	1.55-4	6.90-5
89	5151.4	6.95-4	6.20-4	4.75-4	3.01-4	1.47-4	6.45-5
90	5311.1	4.02-4	3.57-4	2.71-4	1.69-4	8.12-5	3.49-5
91	5464.8	2.86-4	2.54-4	1.93-4	1.20-4	5.84-5	2.53-5
92	5619.9	2.52-4	2.23-4	1.70-4	1.06-4	5.18-5	2.25-5

A1 - P13

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1775.6	5.04-4	4.52-4	3.52-4	2.30-4	1.19-4	5.47-5
61	1862.5	5.00-4	4.48-4	3.48-4	2.26-4	1.16-4	5.32-5
62	1951.5	4.91-4	4.39-4	3.40-4	2.21-4	1.13-4	5.14-5
63	2042.5	4.79-4	4.28-4	3.32-4	2.14-4	1.09-4	4.96-5
64	2135.6	4.66-4	4.16-4	3.22-4	2.08-4	1.06-4	4.78-5
65	2230.9	4.52-4	4.04-4	3.12-4	2.01-4	1.02-4	4.60-5
66	2328.2	4.38-4	3.91-4	3.02-4	1.94-4	9.82-5	4.43-5
67	2427.6	4.25-4	3.79-4	2.92-4	1.88-4	9.47-5	4.26-5
68	2529.2	4.11-4	3.67-4	2.83-4	1.81-4	9.13-5	4.10-5
69	2632.8	3.98-4	3.55-4	2.73-4	1.75-4	8.80-5	3.95-5
70	2738.6	3.85-4	3.43-4	2.64-4	1.69-4	8.48-5	3.80-5
71	2846.5	3.72-4	3.32-4	2.55-4	1.63-4	8.18-5	3.66-5
72	2956.6	3.60-4	3.21-4	2.47-4	1.58-4	7.90-5	3.53-5
73	3068.8	3.49-4	3.11-4	2.39-4	1.52-4	7.62-5	3.40-5
74	3183.2	3.37-4	3.00-4	2.31-4	1.47-4	7.35-5	3.28-5
75	3299.7	3.26-4	2.91-4	2.23-4	1.42-4	7.10-5	3.16-5
76	3418.4	3.16-4	2.81-4	2.16-4	1.37-4	6.86-5	3.05-5
77	3539.3	3.05-4	2.72-4	2.08-4	1.33-4	6.62-5	2.95-5
78	3662.4	2.95-4	2.63-4	2.02-4	1.28-4	6.40-5	2.84-5
79	3787.7	2.86-4	2.54-4	1.95-4	1.24-4	6.18-5	2.75-5
80	3915.1	2.76-4	2.46-4	1.88-4	1.20-4	5.96-5	2.65-5
81	4044.9	2.66-4	2.37-4	1.82-4	1.16-4	5.76-5	2.56-5
82	4176.8	2.57-4	2.29-4	1.75-4	1.11-4	5.55-5	2.47-5
83	4311.0	2.47-4	2.20-4	1.68-4	1.07-4	5.34-5	2.38-5
84	4447.4	2.37-4	2.11-4	1.61-4	1.03-4	5.13-5	2.28-5
85	4586.1	2.25-4	2.01-4	1.54-4	9.82-5	4.91-5	2.19-5
86	4727.1	2.12-4	1.89-4	1.45-4	9.28-5	4.65-5	2.08-5
87	4870.4	1.95-4	1.74-4	1.34-4	8.59-5	4.34-5	1.95-5
88	5016.0	1.67-4	1.50-4	1.16-4	7.57-5	3.90-5	1.79-5
89	5163.6	1.51-4	1.37-4	1.10-4	7.58-5	4.15-5	2.00-5
90	5320.3	4.20-4	3.79-4	2.99-4	1.98-4	1.03-4	4.74-5
91	5489.7	5.14-4	4.63-4	3.62-4	2.36-4	1.21-4	5.49-5
92	5664.3	5.28-4	4.75-4	3.71-4	2.42-4	1.23-4	5.57-5

A1 - P14

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1848.2	1.49-4	1.26-4	8.60-5	4.60-5	1.85-5	6.91-6
61	1937.7	1.44-4	1.22-4	8.35-5	4.48-5	1.80-5	6.75-6
62	2029.4	1.39-4	1.18-4	8.07-5	4.33-5	1.75-5	6.55-6
63	2123.1	1.34-4	1.13-4	7.78-5	4.18-5	1.69-5	6.34-6
64	2218.9	1.29-4	1.09-4	7.49-5	4.03-5	1.64-5	6.13-6
65	2316.8	1.24-4	1.05-4	7.21-5	3.88-5	1.58-5	5.91-6
66	2416.8	1.20-4	1.01-4	6.94-5	3.75-5	1.52-5	5.71-6
67	2519.0	1.15-4	9.76-5	6.70-5	3.61-5	1.47-5	5.52-6
68	2623.2	1.11-4	9.42-5	6.46-5	3.49-5	1.42-5	5.34-6
69	2729.6	1.08-4	9.10-5	6.25-5	3.38-5	1.38-5	5.17-6
70	2838.1	1.04-4	8.80-5	6.05-5	3.27-5	1.33-5	5.01-6
71	2948.8	1.01-4	8.53-5	5.86-5	3.17-5	1.29-5	4.86-6
72	3061.6	9.76-5	8.27-5	5.68-5	3.07-5	1.25-5	4.72-6
73	3176.6	9.47-5	8.02-5	5.51-5	2.98-5	1.22-5	4.58-6
74	3293.8	9.20-5	7.79-5	5.36-5	2.90-5	1.18-5	4.46-6
75	3413.1	8.94-5	7.57-5	5.21-5	2.81-5	1.15-5	4.34-6
76	3534.6	8.69-5	7.36-5	5.06-5	2.74-5	1.12-5	4.22-6
77	3658.3	8.45-5	7.16-5	4.93-5	2.67-5	1.09-5	4.11-6
78	3784.2	8.23-5	6.97-5	4.80-5	2.60-5	1.06-5	4.01-6
79	3912.3	8.01-5	6.79-5	4.67-5	2.53-5	1.03-5	3.91-6
80	4042.7	7.80-5	6.61-5	4.55-5	2.46-5	1.00-5	3.81-6
81	4175.3	7.60-5	6.44-5	4.44-5	2.40-5	9.80-6	3.72-6
82	4310.1	7.41-5	6.28-5	4.33-5	2.34-5	9.55-6	3.63-6
83	4447.2	7.23-5	6.12-5	4.22-5	2.28-5	9.32-6	3.54-6
84	4586.5	7.05-5	5.97-5	4.11-5	2.23-5	9.09-6	3.45-6
85	4728.1	6.87-5	5.82-5	4.01-5	2.17-5	8.87-6	3.37-6
86	4872.0	6.70-5	5.68-5	3.91-5	2.12-5	8.65-6	3.29-6
87	5018.2	6.54-5	5.54-5	3.82-5	2.07-5	8.44-6	3.21-6
88	5166.7	6.38-5	5.41-5	3.72-5	2.02-5	8.23-6	3.13-6
89	5317.5	6.22-5	5.27-5	3.63-5	1.97-5	8.03-6	3.05-6
90	5470.6	6.06-5	5.14-5	3.54-5	1.92-5	7.83-6	2.97-6
91	5626.1	5.91-5	5.01-5	3.45-5	1.87-5	7.62-6	2.89-6
92	5783.9	5.75-5	4.87-5	3.35-5	1.82-5	7.41-6	2.81-6

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - P15

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1848.3	1.83-4	1.54-4	1.06-4	5.68-5	2.28-5	8.53-6
61	1937.9	1.82-4	1.54-4	1.06-4	5.69-5	2.30-5	8.60-6
62	2029.5	1.82-4	1.54-4	1.06-4	5.71-5	2.31-5	8.67-6
63	2123.3	1.81-4	1.54-4	1.06-4	5.72-5	2.32-5	8.73-6
64	2219.1	1.81-4	1.53-4	1.05-4	5.71-5	2.33-5	8.76-6
65	2317.1	1.80-4	1.52-4	1.05-4	5.69-5	2.33-5	8.77-6
66	2417.2	1.78-4	1.51-4	1.04-4	5.66-5	2.32-5	8.75-6
67	2519.4	1.76-4	1.50-4	1.03-4	5.62-5	2.31-5	8.72-6
68	2623.7	1.74-4	1.48-4	1.02-4	5.56-5	2.29-5	8.66-6
69	2730.1	1.72-4	1.46-4	1.01-4	5.50-5	2.26-5	8.58-6
70	2838.7	1.69-4	1.44-4	9.93-5	5.42-5	2.24-5	8.49-6
71	2949.5	1.66-4	1.41-4	9.77-5	5.34-5	2.21-5	8.38-6
72	3062.4	1.63-4	1.39-4	9.61-5	5.25-5	2.17-5	8.26-6
73	3177.4	1.60-4	1.36-4	9.43-5	5.16-5	2.14-5	8.14-6
74	3294.7	1.57-4	1.34-4	9.25-5	5.07-5	2.10-5	8.00-6
75	3414.1	1.54-4	1.31-4	9.07-5	4.97-5	2.06-5	7.86-6
76	3535.8	1.51-4	1.28-4	8.88-5	4.87-5	2.02-5	7.71-6
77	3659.6	1.48-4	1.25-4	8.69-5	4.76-5	1.98-5	7.56-6
78	3785.6	1.44-4	1.23-4	8.50-5	4.66-5	1.93-5	7.41-6
79	3913.9	1.41-4	1.20-4	8.31-5	4.56-5	1.89-5	7.25-6
80	4044.4	1.38-4	1.17-4	8.12-5	4.45-5	1.85-5	7.08-6
81	4177.2	1.34-4	1.14-4	7.92-5	4.34-5	1.80-5	6.92-6
82	4312.2	1.31-4	1.11-4	7.72-5	4.23-5	1.76-5	6.75-6
83	4449.4	1.27-4	1.08-4	7.52-5	4.12-5	1.71-5	6.57-6
84	4589.0	1.24-4	1.05-4	7.32-5	4.01-5	1.66-5	6.39-6
85	4730.8	1.21-4	1.03-4	7.12-5	3.90-5	1.62-5	6.20-6
86	4874.9	1.17-4	9.96-5	6.91-5	3.78-5	1.57-5	6.01-6
87	5021.4	1.14-4	9.65-5	6.69-5	3.66-5	1.51-5	5.80-6
88	5170.1	1.10-4	9.33-5	6.46-5	3.53-5	1.46-5	5.58-6
89	5321.3	1.06-4	8.98-5	6.21-5	3.39-5	1.40-5	5.34-6
90	5474.7	1.02-4	8.61-5	5.95-5	3.24-5	1.33-5	5.07-6
91	5630.5	9.66-5	8.19-5	5.64-5	3.06-5	1.25-5	4.75-6
92	5788.7	9.08-5	7.69-5	5.28-5	2.85-5	1.16-5	4.37-6

A1 - P16

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1957.2	1.52-4	1.31-4	9.40-5	5.40-5	2.38-5	9.75-6
61	2056.1	1.48-4	1.28-4	9.18-5	5.28-5	2.34-5	9.55-6
62	2157.6	1.45-4	1.25-4	8.95-5	5.16-5	2.29-5	9.36-6
63	2261.9	1.41-4	1.21-4	8.72-5	5.04-5	2.24-5	9.16-6
64	2368.9	1.37-4	1.18-4	8.50-5	4.92-5	2.19-5	8.96-6
65	2478.8	1.33-4	1.15-4	8.28-5	4.80-5	2.14-5	8.76-6
66	2591.5	1.29-4	1.12-4	8.06-5	4.68-5	2.09-5	8.56-6
67	2707.1	1.26-4	1.09-4	7.84-5	4.57-5	2.04-5	8.36-6
68	2825.7	1.22-4	1.06-4	7.63-5	4.45-5	1.99-5	8.16-6
69	2947.2	1.19-4	1.03-4	7.42-5	4.33-5	1.94-5	7.96-6
70	3071.8	1.15-4	9.98-5	7.21-5	4.22-5	1.89-5	7.76-6
71	3199.5	1.12-4	9.69-5	7.01-5	4.10-5	1.84-5	7.57-6
72	3330.3	1.08-4	9.40-5	6.81-5	3.99-5	1.80-5	7.38-6
73	3464.3	1.05-4	9.13-5	6.62-5	3.88-5	1.75-5	7.19-6
74	3601.6	1.02-4	8.85-5	6.42-5	3.77-5	1.70-5	7.01-6
75	3742.2	9.88-5	8.59-5	6.24-5	3.66-5	1.65-5	6.82-6
76	3886.2	9.58-5	8.33-5	6.05-5	3.56-5	1.61-5	6.64-6
77	4033.6	9.28-5	8.07-5	5.88-5	3.46-5	1.57-5	6.47-6
78	4184.5	8.99-5	7.82-5	5.70-5	3.36-5	1.52-5	6.30-6
79	4339.1	8.71-5	7.58-5	5.53-5	3.26-5	1.48-5	6.13-6
80	4497.2	8.43-5	7.34-5	5.36-5	3.17-5	1.44-5	5.96-6
81	4659.1	8.16-5	7.11-5	5.20-5	3.07-5	1.40-5	5.80-6
82	4824.9	7.90-5	6.89-5	5.04-5	2.98-5	1.36-5	5.64-6
83	4994.5	7.65-5	6.67-5	4.88-5	2.89-5	1.32-5	5.48-6
84	5168.1	7.40-5	6.45-5	4.73-5	2.81-5	1.28-5	5.33-6
85	5345.8	7.16-5	6.25-5	4.58-5	2.72-5	1.24-5	5.18-6
86	5527.7	6.92-5	6.04-5	4.44-5	2.64-5	1.21-5	5.03-6
87	5713.9	6.69-5	5.85-5	4.30-5	2.56-5	1.17-5	4.89-6
88	5904.4	6.47-5	5.65-5	4.16-5	2.48-5	1.14-5	4.75-6
89	6099.4	6.25-5	5.47-5	4.02-5	2.40-5	1.10-5	4.62-6
90	6299.1	6.04-5	5.28-5	3.89-5	2.33-5	1.07-5	4.48-6
91	6503.4	5.83-5	5.11-5	3.77-5	2.25-5	1.04-5	4.35-6
92	6712.7	5.63-5	4.93-5	3.64-5	2.18-5	1.01-5	4.22-6

A1 - P17

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1957.7	2.48-4	2.12-4	1.49-4	8.33-5	3.51-5	1.36-5
61	2056.6	2.42-4	2.08-4	1.46-4	8.18-5	3.46-5	1.34-5
62	2158.2	2.37-4	2.03-4	1.43-4	8.03-5	3.40-5	1.32-5
63	2262.5	2.31-4	1.98-4	1.40-4	7.86-5	3.34-5	1.30-5
64	2369.6	2.25-4	1.94-4	1.37-4	7.70-5	3.28-5	1.28-5
65	2479.5	2.20-4	1.89-4	1.33-4	7.52-5	3.21-5	1.25-5
66	2592.3	2.14-4	1.84-4	1.30-4	7.35-5	3.14-5	1.23-5
67	2707.9	2.08-4	1.79-4	1.27-4	7.17-5	3.07-5	1.20-5
68	2826.6	2.03-4	1.74-4	1.24-4	7.00-5	3.00-5	1.17-5
69	2948.2	1.97-4	1.70-4	1.20-4	6.82-5	2.93-5	1.15-5
70	3072.9	1.92-4	1.65-4	1.17-4	6.65-5	2.86-5	1.12-5
71	3200.6	1.86-4	1.60-4	1.14-4	6.47-5	2.79-5	1.10-5
72	3331.6	1.81-4	1.56-4	1.11-4	6.30-5	2.72-5	1.07-5
73	3465.7	1.76-4	1.51-4	1.08-4	6.13-5	2.65-5	1.04-5
74	3603.1	1.70-4	1.47-4	1.05-4	5.97-5	2.58-5	1.02-5
75	3743.8	1.65-4	1.42-4	1.02-4	5.80-5	2.51-5	9.93-6
76	3887.9	1.60-4	1.38-4	9.87-5	5.64-5	2.45-5	9.68-6
77	4035.5	1.55-4	1.34-4	9.58-5	5.48-5	2.38-5	9.43-6
78	4186.6	1.51-4	1.30-4	9.30-5	5.33-5	2.32-5	9.18-6
79	4341.3	1.46-4	1.26-4	9.03-5	5.17-5	2.25-5	8.94-6
80	4499.6	1.42-4	1.22-4	8.76-5	5.02-5	2.19-5	8.71-6
81	4661.7	1.37-4	1.18-4	8.50-5	4.88-5	2.13-5	8.47-6
82	4827.6	1.33-4	1.15-4	8.24-5	4.73-5	2.07-5	8.24-6
83	4997.5	1.28-4	1.11-4	7.99-5	4.59-5	2.01-5	8.02-6
84	5171.3	1.24-4	1.08-4	7.74-5	4.46-5	1.95-5	7.80-6
85	5349.2	1.20-4	1.04-4	7.50-5	4.32-5	1.89-5	7.58-6
86	5531.3	1.16-4	1.01-4	7.27-5	4.19-5	1.84-5	7.37-6
87	5717.7	1.13-4	9.76-5	7.04-5	4.07-5	1.79-5	7.16-6
88	5908.5	1.09-4	9.45-5	6.82-5	3.94-5	1.74-5	6.96-6
89	6103.8	1.05-4	9.14-5	6.60-5	3.82-5	1.68-5	6.76-6
90	6303.8	1.02-4	8.84-5	6.39-5	3.70-5	1.63-5	6.56-6
91	6508.4	9.85-5	8.55-5	6.18-5	3.59-5	1.59-5	6.37-6
92	6718.0	9.52-5	8.26-5	5.98-5	3.48-5	1.54-5	6.19-6

A1 - P18

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	2104.5	6.60-4	5.99-4	4.77-4	3.18-4	1.66-4	7.65-5
61	2207.0	6.31-4	5.73-4	4.56-4	3.04-4	1.58-4	7.30-5
62	2312.2	6.03-4	5.48-4	4.36-4	2.90-4	1.51-4	6.97-5
63	2420.2	5.77-4	5.24-4	4.17-4	2.77-4	1.44-4	6.66-5
64	2531.0	5.53-4	5.02-4	3.99-4	2.65-4	1.38-4	6.36-5
65	2644.7	5.30-4	4.81-4	3.82-4	2.54-4	1.32-4	6.09-5
66	2761.4	5.08-4	4.61-4	3.66-4	2.43-4	1.26-4	5.83-5
67	2880.9	4.88-4	4.43-4	3.51-4	2.33-4	1.21-4	5.59-5
68	3003.5	4.68-4	4.25-4	3.37-4	2.24-4	1.16-4	5.36-5
69	3129.1	4.50-4	4.08-4	3.24-4	2.15-4	1.11-4	5.15-5
70	3257.8	4.32-4	3.92-4	3.11-4	2.06-4	1.07-4	4.94-5
71	3389.7	4.16-4	3.77-4	2.99-4	1.98-4	1.03-4	4.75-5
72	3524.8	4.00-4	3.63-4	2.88-4	1.91-4	9.90-5	4.57-5
73	3663.2	3.85-4	3.49-4	2.77-4	1.84-4	9.53-5	4.40-5
74	3804.9	3.71-4	3.36-4	2.67-4	1.77-4	9.17-5	4.23-5
75	3950.0	3.58-4	3.24-4	2.57-4	1.70-4	8.84-5	4.08-5
76	4098.6	3.45-4	3.12-4	2.48-4	1.64-4	8.53-5	3.93-5
77	4250.7	3.32-4	3.01-4	2.39-4	1.59-4	8.23-5	3.79-5
78	4406.4	3.21-4	2.91-4	2.31-4	1.53-4	7.94-5	3.66-5
79	4565.8	3.10-4	2.81-4	2.23-4	1.48-4	7.67-5	3.54-5
80	4728.9	2.99-4	2.71-4	2.15-4	1.43-4	7.41-5	3.42-5
81	4895.8	2.89-4	2.62-4	2.08-4	1.38-4	7.17-5	3.31-5
82	5066.7	2.79-4	2.53-4	2.01-4	1.33-4	6.94-5	3.20-5
83	5241.6	2.70-4	2.45-4	1.94-4	1.29-4	6.71-5	3.10-5
84	5420.6	2.61-4	2.37-4	1.88-4	1.25-4	6.50-5	3.00-5
85	5603.8	2.52-4	2.29-4	1.82-4	1.21-4	6.30-5	2.91-5
86	5791.3	2.44-4	2.22-4	1.76-4	1.17-4	6.10-5	2.82-5
87	5983.2	2.36-4	2.14-4	1.71-4	1.14-4	5.92-5	2.74-5
88	6179.6	2.29-4	2.08-4	1.65-4	1.10-4	5.74-5	2.66-5
89	6380.7	2.22-4	2.01-4	1.60-4	1.07-4	5.57-5	2.58-5
90	6586.5	2.15-4	1.95-4	1.55-4	1.04-4	5.41-5	2.51-5
91	6797.2	2.08-4	1.89-4	1.51-4	1.01-4	5.26-5	2.44-5
92	7013.0	2.02-4	1.83-4	1.46-4	9.77-5	5.11-5	2.37-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 - Q1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1160.4	2.37-3	2.06-3	1.55-3	1.07-3	8.14-4	7.87-4
61	1218.1	2.26-3	1.97-3	1.48-3	1.02-3	7.84-4	7.61-4
62	1277.1	2.16-3	1.88-3	1.42-3	9.83-4	7.56-4	7.35-4
63	1337.4	2.07-3	1.80-3	1.35-3	9.44-4	7.29-4	7.11-4
64	1399.0	1.98-3	1.73-3	1.30-3	9.07-4	7.03-4	6.88-4
65	1461.9	1.90-3	1.65-3	1.25-3	8.73-4	6.79-4	6.65-4
66	1526.1	1.82-3	1.59-3	1.20-3	8.40-4	6.55-4	6.44-4
67	1591.5	1.75-3	1.52-3	1.15-3	8.09-4	6.33-4	6.23-4
68	1658.3	1.68-3	1.46-3	1.11-3	7.80-4	6.12-4	6.04-4
69	1726.4	1.61-3	1.41-3	1.07-3	7.53-4	5.92-4	5.85-4
70	1793.7	1.55-3	1.35-3	1.03-3	7.26-4	5.73-4	5.67-4
71	1866.3	1.49-3	1.31-3	9.90-4	7.01-4	5.54-4	5.50-4
72	1938.3	1.44-3	1.26-3	9.55-4	6.77-4	5.37-4	5.33-4
73	2011.5	1.39-3	1.21-3	9.22-4	6.55-4	5.20-4	5.18-4
74	2086.0	1.34-3	1.17-3	8.90-4	6.34-4	5.04-4	5.02-4
75	2161.8	1.29-3	1.13-3	8.60-4	6.13-4	4.[illegible]9-4	4.88-4
76	2238.9	1.25-3	1.09-3	8.32-4	5.94-4	4.75-4	4.74-4
77	2317.3	1.21-3	1.06-3	8.05-4	5.75-4	4.61-4	4.61-4
78	2397.0	1.17-3	1.02-3	7.80-4	5.58-4	4.48-4	4.48-4
79	2477.9	1.13-3	9.91-4	7.55-4	5.41-4	4.35-4	4.36-4
80	2560.2	1.10-3	9.60-4	7.32-4	5.25-4	4.23-4	4.25-4
81	2643.7	1.06-3	9.31-4	7.10-4	5.10-4	4.11-4	4.14-4
82	2728.5	1.03-3	9.03-4	6.89-4	4.95-4	4.00-4	4.03-4
83	2814.6	1.00-3	8.76-4	6.69-4	4.81-4	3.89-4	3.93-4
84	2902.0	9.71-4	8.50-4	6.50-4	4.68-4	3.79-4	3.83-4
85	2990.7	9.43-4	8.26-4	6.32-4	4.55-4	3.69-4	3.74-4
86	3080.7	9.16-4	8.03-4	6.14-4	4.43-4	3.60-4	3.65-4
87	3172.0	8.91-4	7.80-4	5.97-4	4.31-4	3.51-4	3.56-4
88	3264.5	8.66-4	7.59-4	5.81-4	4.20-4	3.42-4	3.48-4
89	3358.3	8.43-4	7.39-4	5.66-4	4.09-4	3.33-4	3.40-4
90	3453.4	8.20-4	7.19-4	5.51-4	3.99-4	3.25-4	3.32-4
91	3549.8	7.99-4	7.00-4	5.37-4	3.89-4	3.18-4	3.25-4
92	3647.5	7.78-4	6.82-4	5.23-4	3.79-4	3.10-4	3.18-4

A1 - Q2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1165.5	1.63-3	1.37-3	9.34-4	5.35-4	3.16-4	2.68-4
61	1223.5	1.55-3	1.30-3	8.89-4	5.10-4	3.02-4	2.57-4
62	1282.9	1.48-3	1.24-3	8.46-4	4.87-4	2.90-4	2.48-4
63	1343.6	1.41-3	1.18-3	8.07-4	4.65-4	2.78-4	2.39-4
64	1405.5	1.34-3	1.13-3	7.70-4	4.45-4	2.67-4	2.30-4
65	1468.8	1.28-3	1.08-3	7.36-4	4.26-4	2.57-4	2.23-4
66	1533.4	1.23-3	1.03-3	7.04-4	4.08-4	2.47-4	2.15-4
67	1599.3	1.17-3	9.83-4	6.73-4	3.91-4	2.38-4	2.08-4
68	1666.5	1.12-3	9.41-4	6.45-4	3.76-4	2.30-4	2.02-4
69	1735.0	1.07-3	9.02-4	6.18-4	3.61-4	2.22-4	1.96-4
70	1804.9	1.03-3	8.65-4	5.93-4	3.47-4	2.14-4	1.90-4
71	1876.1	9.88-4	8.30-4	5.70-4	3.34-4	2.07-4	1.84-4
72	1948.5	9.49-4	7.97-4	5.47-4	3.21-4	2.01-4	1.79-4
73	2022.3	9.12-4	7.66-4	5.27-4	3.10-4	1.94-4	1.74-4
74	2097.5	[illegible].77-4	7.37-4	5.07-4	2.99-4	1.88-4	1.70-4
75	2173.9	8.44-4	7.09-4	4.88-4	2.88-4	1.82-4	1.65-4
76	2251.7	8.13-4	6.83-4	4.70-4	2.78-4	1.77-4	1.61-4
77	2330.8	7.83-4	6.58-4	4.54-4	2.69-4	1.72-4	1.57-4
78	2411.2	7.55-4	6.35-4	4.38-4	2.60-4	1.67-4	1.53-4
79	2492.9	7.29-4	6.13-4	4.23-4	2.51-4	1.62-4	1.49-4
80	2576.0	7.04-4	5.92-4	4.08-4	2.43-4	1.58-4	1.46-4
81	2660.4	6.80-4	5.72-4	3.95-4	2.36-4	1.53-4	1.42-4
82	2746.1	6.57-4	5.53-4	3.82-4	2.28-4	1.49-4	1.39-4
83	2833.1	6.35-4	5.34-4	3.69-4	2.21-4	1.45-4	1.36-4
84	2921.5	6.15-4	5.17-4	3.58-4	2.15-4	1.42-4	1.33-4
85	3011.2	5.95-4	5.01-4	3.47-4	2.08-4	1.38-4	1.30-4
86	3102.2	5.77-4	4.85-4	3.36-4	2.02-4	1.34-4	1.27-4
87	3194.6	5.59-4	4.70-4	3.26-4	1.97-4	1.31-4	1.25-4
88	3288.3	5.42-4	4.56-4	3.16-4	1.91-4	1.28-4	1.22-4
89	3383.3	5.25-4	4.42-4	3.07-4	1.86-4	1.25-4	1.20-4
90	3479.7	5.10-4	4.29-4	2.98-4	1.81-4	1.22-4	1.17-4
91	3577.4	4.95-4	4.17-4	2.89-4	1.76-4	1.19-4	1.15-4
92	3676.4	4.81-4	4.05-4	2.81-4	1.71-4	1.16-4	1.13-4

A1 - Q3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1185.7	2.04-3	1.77-3	1.31-3	9.04-4	6.98-4	6.89-4
61	1245.7	1.95-3	1.69-3	1.26-3	8.68-4	6.72-4	6.64-4
62	1307.1	1.86-3	1.61-3	1.20-3	8.33-4	6.48-4	6.41-4
63	1370.0	1.78-3	1.54-3	1.15-3	8.01-4	6.24-4	6.18-4
64	1434.3	1.70-3	1.48-3	1.11-3	7.70-4	6.01-4	5.97-4
65	1500.1	1.63-3	1.42-3	1.06-3	7.40-4	5.80-4	5.77-4
66	1567.3	1.56-3	1.36-3	1.02-3	7.13-4	5.59-4	5.57-4
67	1636.1	1.50-3	1.31-3	9.80-4	6.86-4	5.40-4	5.38-4
68	1706.3	1.44-3	1.25-3	9.42-4	6.61-4	5.21-4	5.20-4
69	1778.0	1.38-3	1.20-3	9.07-4	6.37-4	5.04-4	5.03-4
70	1851.2	1.33-3	1.16-3	8.73-4	6.14-4	4.87-4	4.87-4
71	1925.9	1.28-3	1.11-3	8.40-4	5.92-4	4.70-4	4.71-4
72	2002.1	1.23-3	1.07-3	8.10-4	5.72-4	4.55-4	4.56-4
73	2079.9	1.19-3	1.03-3	7.81-4	5.52-4	4.40-4	4.42-4
74	2159.1	1.14-3	9.96-4	7.53-4	5.33-4	4.26-4	4.29-4
75	2240.0	1.10-3	9.61-4	7.27-4	5.16-4	4.13-4	4.16-4
76	2322.3	1.06-3	9.27-4	7.02-4	4.98-4	4.00-4	4.03-4
77	2406.3	1.03-3	8.95-4	6.78-4	4.82-4	3.88-4	3.91-4
78	2491.7	9.90-4	8.64-4	6.55-4	4.67-4	3.76-4	3.80-4
79	2578.8	9.57-4	8.35-4	6.34-4	4.52-4	3.64-4	3.69-4
80	2667.4	9.25-4	8.07-4	6.13-4	4.38-4	3.54-4	3.58-4
81	2757.7	8.94-4	7.81-4	5.93-4	4.24-4	3.43-4	3.48-4
82	2849.5	8.65-4	7.56-4	5.74-4	4.11-4	3.33-4	3.39-4
83	2943.0	8.37-4	7.31-4	5.56-4	3.98-4	3.24-4	3.29-4
84	3038.1	8.11-4	7.08-4	5.39-4	3.87-4	3.15-4	3.21-4
85	3134.8	7.85-4	6.86-4	5.23-4	3.75-4	3.06-4	3.12-4
86	3233.1	7.61-4	6.65-4	5.07-4	3.64-4	2.97-4	3.04-4
87	3333.2	7.37-4	6.45-4	4.92-4	3.54-4	2.89-4	2.96-4
88	3434.8	7.15-4	6.26-4	4.77-4	3.44-4	2.81-4	2.89-4
89	3538.2	6.94-4	6.07-4	4.63-4	3.34-4	2.74-4	2.82-4
90	3643.2	6.73-4	5.89-4	4.50-4	3.24-4	2.67-4	2.75-4
91	3749.9	6.54-4	5.72-4	4.37-4	3.16-4	2.60-4	2.68-4
92	3858.4	6.35-4	5.56-4	4.24-4	3.07-4	2.53-4	2.62-4

A1 - Q4

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1514.7	9.83-4	8.42-4	6.00-4	3.65-4	2.25-4	1.94-4
61	1594.1	9.36-4	8.02-4	5.72-4	3.48-4	2.14-4	1.86-4
62	1675.5	8.93-4	7.65-4	5.45-4	3.32-4	2.05-4	1.78-4
63	1758.7	8.53-4	7.30-4	5.21-4	3.17-4	1.96-4	1.70-4
64	1843.9	8.15-4	6.98-4	4.98-4	3.03-4	1.88-4	1.63-4
65	1930.9	7.80-4	6.68-4	4.76-4	2.90-4	1.80-4	1.57-4
66	2019.9	7.47-4	6.40-4	4.56-4	2.78-4	1.72-4	1.51-4
67	2110.8	7.16-4	6.13-4	4.38-4	2.67-4	1.66-4	1.45-4
68	2203.7	6.87-4	5.86-4	4.20-4	2.56-4	1.59-4	1.39-4
69	2298.4	6.60-4	5.65-4	4.03-4	2.46-4	1.53-4	1.34-4
70	2395.1	6.34-4	5.43-4	3.87-4	2.37-4	1.47-4	1.29-4
71	2493.7	6.10-4	5.22-4	3.73-4	2.28-4	1.42-4	1.24-4
72	2594.2	5.87-4	5.03-4	3.59-4	2.19-4	1.37-4	1.20-4
73	2696.6	5.66-4	4.85-4	3.46-4	2.11-4	1.32-4	1.16-4
74	2800.9	5.45-4	4.67-4	3.33-4	2.04-4	1.27-4	1.12-4
75	2907.1	5.26-4	4.51-4	3.22-4	1.97-4	1.23-4	1.08-4
76	3015.3	5.08-4	4.35-4	3.11-4	1.90-4	1.19-4	1.05-4
77	3125.4	4.91-4	4.20-4	3.00-4	1.84-4	1.15-4	1.01-4
78	3237.4	4.74-4	4.06-4	2.90-4	1.78-4	1.11-4	9.80-5
79	3351.3	4.59-4	3.93-4	2.81-4	1.72-4	1.08-4	9.50-5
80	3467.1	4.44-4	3.80-4	2.72-4	1.67-4	1.04-4	9.21-5
81	3584.9	4.30-4	3.69-4	2.64-4	1.61-4	1.01-4	8.93-5
82	3704.5	4.17-4	3.57-4	2.55-4	1.56-4	9.81-5	8.67-5
83	3826.1	4.04-4	3.46-4	2.48-4	1.52-4	9.53-5	8.42-5
84	3949.6	3.92-4	3.36-4	2.40-4	1.47-4	9.25-5	8.19-5
85	4075.0	3.80-4	3.26-4	2.33-4	1.43-4	8.99-5	7.96-5
86	4202.4	3.69-4	3.17-4	2.27-4	1.39-4	8.73-5	7.75-5
87	4331.6	3.59-4	3.08-4	2.20-4	1.35-4	8.50-5	7.54-5
88	4462.8	3.49-4	2.99-4	2.14-4	1.32-4	8.26-5	7.35-5
89	4595.9	3.39-4	2.91-4	2.08-4	1.28-4	8.05-5	7.16-5
90	4730.9	3.30-4	2.83-4	2.03-4	1.25-4	7.83-5	6.98-5
91	4867.8	3.22-4	2.76-4	1.97-4	1.21-4	7.63-5	6.81-5
92	5006.6	3.13-4	2.68-4	1.92-4	1.18-4	7.44-5	6.65-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of Z_{eff}^2 Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 – G5

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1517.2	7.68-4	6.43-4	4.30-4	2.26-4	1.01-4	6.46-5
61	1596.7	7.28-4	6.10-4	4.08-4	2.14-4	9.64-5	6.20-5
62	1678.2	6.92-4	5.79-4	3.88-4	2.04-4	9.19-5	5.95-5
63	1761.6	6.58-4	5.51-4	3.69-4	1.94-4	8.77-5	5.72-5
64	1847.0	6.27-4	5.25-4	3.51-4	1.84-4	8.37-5	5.50-5
65	1934.3	5.97-4	5.00-4	3.34-4	1.76-4	8.01-5	5.29-5
66	2023.5	5.70-4	4.77-4	3.19-4	1.68-4	7.66-5	5.10-5
67	2114.6	5.44-4	4.55-4	3.05-4	1.60-4	7.34-5	4.92-5
68	2207.7	5.20-4	4.35-4	2.91-4	1.53-4	7.04-5	4.75-5
69	2302.7	4.98-4	4.16-4	2.78-4	1.47-4	6.76-5	4.59-5
70	2399.6	4.76-4	3.98-4	2.67-4	1.40-4	6.49-5	4.43-5
71	2498.4	4.56-4	3.82-4	2.55-4	1.34-4	6.25-5	4.29-5
72	2599.2	4.38-4	3.66-4	2.45-4	1.29-4	6.01-5	4.15-5
73	2702.0	4.20-4	3.51-4	2.35-4	1.24-4	5.79-5	4.02-5
74	2806.6	4.04-4	3.38-4	2.26-4	1.19-4	5.58-5	3.90-5
75	2913.2	3.88-4	3.24-4	2.17-4	1.15-4	5.38-5	3.78-5
76	3021.7	3.73-4	3.12-4	2.09-4	1.10-4	5.19-5	3.66-5
77	3132.2	3.59-4	3.00-4	2.01-4	1.06-4	5.02-5	3.56-5
78	3244.6	3.46-4	2.89-4	1.94-4	1.02-4	4.85-5	3.46-5
79	3358.9	3.34-4	2.79-4	1.87-4	9.87-5	4.69-5	3.36-5
80	3475.1	3.22-4	2.69-4	1.80-4	9.53-5	4.54-5	3.27-5
81	3593.3	3.11-4	2.60-4	1.74-4	9.20-5	4.40-5	3.18-5
82	3713.5	3.00-4	2.51-4	1.68-4	8.89-5	4.26-5	3.10-5
83	3835.6	2.90-4	2.42-4	1.62-4	8.59-5	4.13-5	3.02-5
84	3959.6	2.81-4	2.34-4	1.57-4	8.31-5	4.00-5	2.94-5
85	4085.5	2.71-4	2.27-4	1.52-4	8.05-5	3.88-5	2.87-5
86	4213.4	2.63-4	2.20-4	1.47-4	7.79-5	3.77-5	2.80-5
87	4343.3	2.55-4	2.13-4	1.42-4	7.55-5	3.66-5	2.73-5
88	4475.0	2.47-4	2.06-4	1.38-4	7.32-5	3.56-5	2.67-5
89	4608.8	2.39-4	2.00-4	1.34-4	7.10-5	3.46-5	2.61-5
90	4744.4	2.32-4	1.94-4	1.30-4	6.89-5	3.37-5	2.55-5
91	4882.1	2.25-4	1.88-4	1.26-4	6.68-5	3.27-5	2.49-5
92	5021.6	2.19-4	1.83-4	1.22-4	6.49-5	3.19-5	2.44-5

A1 – G6

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1539.2	9.06-4	7.75-4	5.50-4	3.31-4	1.99-4	1.69-4
61	1620.8	8.63-4	7.38-4	5.23-4	3.15-4	1.90-4	1.62-4
62	1704.4	8.22-4	7.03-4	4.99-4	3.00-4	1.82-4	1.55-4
63	1790.1	7.84-4	6.70-4	4.76-4	2.87-4	1.74-4	1.49-4
64	1877.9	7.48-4	6.40-4	4.54-4	2.74-4	1.66-4	1.43-4
65	1967.8	7.15-4	6.11-4	4.34-4	2.62-4	1.59-4	1.37-4
66	2059.7	6.83-4	5.85-4	4.15-4	2.51-4	1.53-4	1.32-4
67	2153.7	6.54-4	5.59-4	3.98-4	2.40-4	1.47-4	1.27-4
68	2249.9	6.26-4	5.36-4	3.81-4	2.30-4	1.41-4	1.22-4
69	2348.1	6.00-4	5.14-4	3.65-4	2.21-4	1.35-4	1.17-4
70	2448.5	5.76-4	4.93-4	3.50-4	2.12-4	1.30-4	1.13-4
71	2550.9	5.53-4	4.73-4	3.36-4	2.04-4	1.25-4	1.09-4
72	2655.5	5.31-4	4.54-4	3.23-4	1.96-4	1.21-4	1.05-4
73	2762.3	5.10-4	4.37-4	3.11-4	1.89-4	1.16-4	1.01-4
74	2871.2	4.91-4	4.20-4	2.99-4	1.82-4	1.12-4	9.80-5
75	2982.2	4.72-4	[illegible]	2.88-4	1.75-4	1.08-4	9.47-5
76	3095.4	4.55-4	[illegible]	2.78-4	1.69-4	1.05-4	9.16-5
77	3210.8	4.39-4	[illegible]	2.68-4	1.63-4	1.01-4	8.86-5
78	3328.3	4.23-4	[illegible]	2.58-4	1.57-4	9.78-5	8.58-5
79	3448.0	4.08-4	[illegible]	2.49-4	1.52-4	9.46-5	8.32-5
80	3569.9	3.94-4	3.38-4	2.41-4	1.47-4	9.16-5	8.06-5
81	3694.1	3.81-4	3.26-4	2.33-4	1.42-4	8.87-5	7.82-5
82	3820.4	3.68-4	3.15-4	2.25-4	1.37-4	8.59-5	7.59-5
83	3949.0	3.56-4	3.05-4	2.18-4	1.33-4	8.33-5	7.37-5
84	4079.8	3.44-4	2.95-4	2.11-4	1.29-4	8.08-5	7.16-5
85	4212.8	3.33-4	2.85-4	2.04-4	1.25-4	7.84-5	6.96-5
86	4348.1	3.23-4	2.76-4	1.97-4	1.21-4	7.61-5	6.77-5
87	4485.7	3.13-4	2.68-4	1.91-4	1.17-4	7.39-5	6.59-5
88	4625.5	3.03-4	2.60-4	1.86-4	1.14-4	7.17-5	6.41-5
89	4767.6	2.94-4	2.52-4	1.80-4	1.10-4	6.97-5	6.25-5
90	4912.0	2.85-4	2.44-4	1.75-4	1.07-4	6.78-5	6.09-5
91	5058.8	2.77-4	2.37-4	1.70-4	1.04-4	6.59-5	5.93-5
92	5207.8	2.69-4	2.30-4	1.65-4	1.01-4	6.42-5	5.79-5

A1 – G7

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1847.0	2.54-4	2.39-4	2.18-4	2.05-4	2.13-4	2.31-4
61	1936.5	2.50-4	2.36-4	2.15-4	2.03-4	2.11-4	2.29-4
62	2028.1	2.47-4	2.33-4	2.12-4	2.01-4	2.09-4	2.27-4
63	2121.8	2.43-4	2.29-4	2.09-4	1.99-4	2.07-4	2.25-4
64	2217.5	2.39-4	2.26-4	2.07-4	1.96-4	2.04-4	2.22-4
65	2315.4	2.35-4	2.22-4	2.03-4	1.94-4	2.02-4	2.19-4
66	2415.4	2.31-4	2.18-4	2.00-4	1.91-4	1.99-4	2.16-4
67	2517.4	2.27-4	2.15-4	1.97-4	1.88-4	1.96-4	2.13-4
68	2621.6	2.23-4	2.11-4	1.94-4	1.85-4	1.93-4	2.10-4
69	2728.0	2.19-4	2.07-4	1.91-4	1.82-4	1.90-4	2.07-4
70	2836.4	2.15-4	2.04-4	1.87-4	1.79-4	1.87-4	2.04-4
71	2947.0	2.11-4	2.00-4	1.84-4	1.76-4	1.84-4	2.01-4
72	3059.8	2.07-4	1.96-4	1.81-4	1.73-4	1.81-4	1.97-4
73	3174.7	2.03-4	1.93-4	1.78-4	1.70-4	1.78-4	1.94-4
74	3291.8	2.00-4	1.89-4	1.74-4	1.67-4	1.75-4	1.91-4
75	3411.1	1.96-4	1.86-4	1.71-4	1.64-4	1.72-4	1.88-4
76	3532.6	1.92-4	1.82-4	1.68-4	1.61-4	1.69-4	1.84-4
77	3656.2	1.89-4	1.79-4	1.65-4	1.58-4	1.66-4	1.81-4
78	3782.1	1.85-4	1.76-4	1.62-4	1.55-4	1.63-4	1.78-4
79	3910.1	1.82-4	1.72-4	1.59-4	1.53-4	1.60-4	1.75-4
80	4040.4	1.78-4	1.69-4	1.56-4	1.50-4	1.57-4	1.72-4
81	4172.9	1.75-4	1.66-4	1.53-4	1.47-4	1.54-4	1.69-4
82	4307.7	1.71-4	1.63-4	1.50-4	1.44-4	1.52-4	1.66-4
83	4444.7	1.68-4	1.60-4	1.47-4	1.42-4	1.49-4	1.63-4
84	4584.0	1.65-4	1.56-4	1.44-4	1.39-4	1.46-4	1.60-4
85	4725.5	1.62-4	1.54-4	1.42-4	1.36-4	1.43-4	1.57-4
86	4869.4	1.59-4	1.51-4	1.39-4	1.34-4	1.41-4	1.55-4
87	5015.5	1.56-4	1.48-4	1.37-4	1.31-4	1.38-4	1.52-4
88	5163.9	1.53-4	1.45-4	1.34-4	1.29-4	1.36-4	1.49-4
89	5314.7	1.50-4	1.42-4	1.31-4	1.26-4	1.33-4	1.47-4
90	5467.7	1.47-4	1.40-4	1.29-4	1.24-4	1.31-4	1.44-4
91	5623.1	1.44-4	1.37-4	1.26-4	1.22-4	1.28-4	1.42-4
92	5780.9	1.42-4	1.34-4	1.24-4	1.20-4	1.26-4	1.39-4

A1 – G8

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1848.6	1.25-4	1.12-4	9.20-5	7.60-5	7.21-5	7.63-5
61	1938.1	1.22-4	1.10-4	9.06-5	7.55-5	7.21-5	7.65-5
62	2029.8	1.20-4	1.08-4	8.93-5	7.49-5	7.19-5	7.66-5
63	2123.6	1.17-4	1.06-4	8.79-5	7.42-5	7.17-5	7.65-5
64	2219.5	1.15-4	1.04-4	8.65-5	7.35-5	7.14-5	7.64-5
65	2317.5	1.13-4	1.02-4	8.51-5	7.28-5	7.11-5	7.62-5
66	2417.5	1.10-4	9.97-5	8.37-5	7.20-5	7.06-5	7.59-5
67	2519.8	1.08-4	9.77-5	8.23-5	7.12-5	7.02-5	7.55-5
68	2624.1	1.05-4	9.57-5	8.09-5	7.03-5	6.96-5	7.51-5
69	2730.6	1.03-4	9.38-5	7.95-5	6.95-5	6.91-5	7.46-5
70	2839.2	1.01-4	9.18-5	7.81-5	6.86-5	6.85-5	7.41-5
71	2949.9	9.87-5	9.00-5	7.67-5	6.77-5	6.79-5	7.35-5
72	3062.9	9.65-5	8.81-5	7.54-5	6.67-5	6.72-5	7.30-5
73	3178.0	9.44-5	8.63-5	7.40-5	6.58-5	6.65-5	7.23-5
74	3295.2	9.23-5	8.45-5	7.27-5	6.49-5	6.58-5	7.17-5
75	3414.7	9.03-5	8.27-5	7.14-5	6.40-5	6.51-5	7.10-5
76	3536.3	8.83-5	8.10-5	7.00-5	6.30-5	6.44-5	7.03-5
77	3660.2	8.64-5	7.93-5	6.88-5	6.21-5	6.36-5	6.96-5
78	3786.2	8.45-5	7.77-5	6.75-5	6.12-5	6.29-5	6.89-5
79	3914.5	8.27-5	7.60-5	6.62-5	6.02-5	6.21-5	6.82-5
80	4045.0	8.09-5	7.45-5	6.50-5	5.93-5	6.14-5	6.75-5
81	4177.8	7.91-5	7.29-5	6.38-5	5.84-5	6.06-5	6.67-5
82	4312.8	7.74-5	7.14-5	6.26-5	5.75-5	5.98-5	6.60-5
83	4450.1	7.57-5	6.99-5	6.14-5	5.66-5	5.90-5	6.52-5
84	4589.6	7.41-5	6.85-5	6.03-5	5.57-5	5.82-5	6.45-5
85	4731.5	7.25-5	6.71-5	5.92-5	5.48-5	5.75-5	6.38-5
86	4875.6	7.09-5	6.57-5	5.81-5	5.40-5	5.67-5	6.30-5
87	5022.0	6.94-5	6.43-5	5.70-5	5.31-5	5.59-5	6.23-5
88	5170.8	6.79-5	6.30-5	5.59-5	5.22-5	5.51-5	6.15-5
89	5321.8	6.65-5	6.17-5	5.48-5	5.14-5	5.44-5	6.08-5
90	5475.2	6.51-5	6.04-5	5.38-5	5.06-5	5.36-5	6.01-5
91	5631.0	6.37-5	5.92-5	5.28-5	4.98-5	5.29-5	5.93-5
92	5789.1	6.24-5	5.80-5	5.18-5	4.90-5	5.21-5	5.86-5

TABLE IV. Collision Strengths Ω Given as a Function of Z and Scattered Electron Energy E' in Units of $Z_{\rm eff}^2$ Rydbergs, $60 \leqslant Z \leqslant 92$

See page 96 for Explanation of Tables

A1 − Q9

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1957.6	1.63-4	1.50-4	1.31-4	1.15-4	1.12-4	1.19-4
61	2056.5	1.59-4	1.47-4	1.28-4	1.13-4	1.10-4	1.17-4
62	2158.1	1.55-4	1.44-4	1.25-4	1.11-4	1.09-4	1.15-4
63	2262.4	1.51-4	1.40-4	1.23-4	1.09-4	1.07-4	1.14-4
64	2369.5	1.47-4	1.37-4	1.20-4	1.07-4	1.05-4	1.12-4
65	2479.5	1.44-4	1.33-4	1.17-4	1.05-4	1.03-4	1.10-4
66	2592.2	1.40-4	1.30-4	1.14-4	1.02-4	1.01-4	1.08-4
67	2707.9	1.36-4	1.26-4	1.12-4	1.00-4	9.90-5	1.06-4
68	2826.6	1.32-4	1.23-4	1.09-4	9.77-5	9.68-5	1.03-4
69	2948.2	1.29-4	1.20-4	1.06-4	9.54-5	9.46-5	1.01-4
70	3072.9	1.25-4	1.16-4	1.03-4	9.30-5	9.25-5	9.88-5
71	3200.6	1.21-4	1.13-4	1.00-4	9.07-5	9.02-5	9.65-5
72	3331.6	1.18-4	1.10-4	9.77-5	8.84-5	8.80-5	9.43-5
73	3465.7	1.14-4	1.07-4	9.50-5	8.60-5	8.58-5	9.19-5
74	3603.1	1.11-4	1.04-4	9.23-5	8.37-5	8.36-5	8.97-5
75	3743.8	1.08-4	1.01-4	8.97-5	8.15-5	8.14-5	8.74-5
76	3887.9	1.04-4	9.77-5	8.71-5	7.92-5	7.93-5	8.51-5
77	4035.5	1.01-4	9.47-5	8.46-5	7.70-5	7.71-5	8.29-5
78	4186.6	9.80-5	9.18-5	8.21-5	7.48-5	7.50-5	8.06-5
79	4341.3	9.49-5	8.90-5	7.96-5	7.26-5	7.29-5	7.84-5
80	4499.6	9.19-5	8.62-5	7.72-5	7.05-5	7.08-5	7.63-5
81	4661.7	8.90-5	8.35-5	7.48-5	6.84-5	6.88-5	7.41-5
82	4827.7	8.61-5	8.09-5	7.25-5	6.63-5	6.67-5	7.20-5
83	4997.5	8.33-5	7.83-5	7.02-5	6.43-5	6.47-5	7.00-5
84	5171.3	8.06-5	7.58-5	6.80-5	6.23-5	6.28-5	6.79-5
85	5349.3	7.79-5	7.33-5	6.58-5	6.03-5	6.09-5	6.59-5
86	5531.4	7.53-5	7.09-5	6.37-5	5.85-5	5.90-5	6.40-5
87	5717.8	7.28-5	6.85-5	6.16-5	5.66-5	5.72-5	6.21-5
88	5908.6	7.03-5	6.62-5	5.96-5	5.47-5	5.53-5	6.02-5
89	6103.9	6.79-5	6.39-5	5.76-5	5.30-5	5.36-5	5.83-5
90	6303.8	6.55-5	6.17-5	5.56-5	5.12-5	5.18-5	5.65-5
91	6508.5	6.32-5	5.96-5	5.37-5	4.95-5	5.01-5	5.47-5
92	6718.0	6.10-5	5.75-5	5.19-5	4.78-5	4.84-5	5.30-5

A1 − R1

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1160.7	4.02-3	3.45-3	2.45-3	1.39-3	6.02-4	2.42-4
61	1218.5	3.84-3	3.29-3	2.34-3	1.33-3	5.76-4	2.32-4
62	1277.7	3.66-3	3.15-3	2.23-3	1.27-3	5.51-4	2.22-4
63	1338.2	3.50-3	3.01-3	2.14-3	1.21-3	5.28-4	2.13-4
64	1400.0	3.35-3	2.88-3	2.05-3	1.16-3	5.06-4	2.04-4
65	1463.1	3.21-3	2.76-3	1.96-3	1.11-3	4.85-4	1.96-4
66	1527.5	3.08-3	2.64-3	1.88-3	1.07-3	4.66-4	1.88-4
67	1593.2	2.95-3	2.54-3	1.80-3	1.03-3	4.47-4	1.81-4
68	1660.3	2.84-3	2.44-3	1.73-3	9.86-4	4.30-4	1.74-4
69	1728.6	2.72-3	2.34-3	1.66-3	9.48-4	4.14-4	1.68-4
70	1798.3	2.62-3	2.25-3	1.60-3	9.12-4	3.98-4	1.61-4
71	1869.3	2.52-3	2.17-3	1.54-3	8.78-4	3.83-4	1.55-4
72	1941.6	2.43-3	2.09-3	1.48-3	8.46-4	3.70-4	1.50-4
73	2015.2	2.34-3	2.01-3	1.43-3	8.16-4	3.56-4	1.45-4
74	2090.1	2.26-3	1.94-3	1.38-3	7.87-4	3.44-4	1.39-4
75	2166.4	2.18-3	1.87-3	1.33-3	7.59-4	3.32-4	1.35-4
76	2244.0	2.10-3	1.81-3	1.29-3	7.33-4	3.21-4	1.30-4
77	2322.9	2.03-3	1.75-3	1.24-3	7.08-4	3.10-4	1.26-4
78	2403.1	1.96-3	1.69-3	1.20-3	6.85-4	3.00-4	1.22-4
79	2484.7	1.90-3	1.63-3	1.16-3	6.62-4	2.90-4	1.18-4
80	2567.5	1.83-3	1.58-3	1.12-3	6.41-4	2.80-4	1.14-4
81	2651.7	1.78-3	1.53-3	1.09-3	6.20-4	2.72-4	1.10-4
82	2737.3	1.72-3	1.48-3	1.05-3	6.01-4	2.63-4	1.07-4
83	2824.1	1.67-3	1.43-3	1.02-3	5.82-4	2.55-4	1.04-4
84	2912.3	1.62-3	1.39-3	9.90-4	5.65-4	2.47-4	1.01-4
85	3001.8	1.57-3	1.35-3	9.60-4	5.48-4	2.40-4	9.77-5
86	3092.7	1.52-3	1.31-3	9.31-4	5.32-4	2.33-4	9.48-5
87	3184.9	1.48-3	1.27-3	9.04-4	5.16-4	2.26-4	9.21-5
88	3278.4	1.44-3	1.23-3	8.78-4	5.01-4	2.20-4	8.95-5
89	3373.2	1.39-3	1.20-3	8.53-4	4.87-4	2.14-4	8.70-5
90	3469.4	1.35-3	1.17-3	8.29-4	4.74-4	2.08-4	8.47-5
91	3566.9	1.32-3	1.13-3	8.07-4	4.61-4	2.02-4	8.24-5
92	3665.8	1.28-3	1.10-3	7.85-4	4.48-4	1.96-4	8.02-5

A1 − R2

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1515.1	1.75-3	1.51-3	1.09-3	6.27-4	2.77-4	1.13-4
61	1594.6	1.67-3	1.44-3	1.04-3	5.97-4	2.64-4	1.08-4
62	1676.1	1.59-3	1.37-3	9.87-4	5.69-4	2.52-4	1.03-4
63	1759.4	1.52-3	1.31-3	9.42-4	5.44-4	2.41-4	9.84-5
64	1844.7	1.45-3	1.25-3	9.00-4	5.19-4	2.30-4	9.42-5
65	1931.9	1.39-3	1.20-3	8.61-4	4.97-4	2.21-4	9.03-5
66	2021.0	1.33-3	1.15-3	8.24-4	4.76-4	2.11-4	8.65-5
67	2112.1	1.27-3	1.10-3	7.90-4	4.56-4	2.03-4	8.30-5
68	2205.1	1.22-3	1.06-3	7.58-4	4.38-4	1.95-4	7.97-5
69	2300.0	1.17-3	1.01-3	7.27-4	4.20-4	1.87-4	7.66-5
70	2396.8	1.13-3	9.73-4	6.99-4	4.03-4	1.80-4	7.37-5
71	2495.6	1.08-3	9.35-4	6.72-4	3.88-4	1.73-4	7.09-5
72	2596.3	1.04-3	8.99-4	6.46-4	3.73-4	1.66-4	6.83-5
73	2699.0	1.00-3	8.66-4	6.22-4	3.60-4	1.60-4	6.58-5
74	2803.5	9.65-4	8.34-4	5.99-4	3.46-4	1.54-4	6.34-5
75	2910.1	9.31-4	8.04-4	5.78-4	3.34-4	1.49-4	6.12-5
76	3018.5	8.98-4	7.76-4	5.57-4	3.22-4	1.44-4	5.91-5
77	3128.9	8.66-4	7.49-4	5.38-4	3.11-4	1.39-4	5.71-5
78	3241.2	8.37-4	7.23-4	5.20-4	3.01-4	1.34-4	5.51-5
79	3355.4	8.09-4	6.99-4	5.02-4	2.91-4	1.29-4	5.33-5
80	3471.6	7.82-4	6.76-4	4.86-4	2.81-4	1.25-4	5.16-5
81	3589.7	7.57-4	6.54-4	4.70-4	2.72-4	1.21-4	5.00-5
82	3709.8	7.33-4	6.33-4	4.55-4	2.63-4	1.17-4	4.84-5
83	3831.8	7.10-4	6.13-4	4.41-4	2.55-4	1.14-4	4.69-5
84	3955.7	6.88-4	5.94-4	4.27-4	2.47-4	1.10-4	4.55-5
85	4081.6	6.67-4	5.76-4	4.14-4	2.40-4	1.07-4	4.41-5
86	4209.4	6.47-4	5.59-4	4.02-4	2.33-4	1.04-4	4.28-5
87	4339.2	6.28-4	5.42-4	3.90-4	2.26-4	1.01-4	4.16-5
88	4470.9	6.10-4	5.27-4	3.79-4	2.19-4	9.78-5	4.04-5
89	4604.6	5.92-4	5.12-4	3.68-4	2.13-4	9.50-5	3.93-5
90	4740.1	5.75-4	4.97-4	3.58-4	2.07-4	9.23-5	3.82-5
91	4877.7	5.59-4	4.83-4	3.48-4	2.01-4	8.98-5	3.72-5
92	5017.2	5.44-4	4.70-4	3.38-4	1.96-4	8.74-5	3.62-5

A1 − R3

Z	ΔE	E'=.002	E'=.01	E'=.03	E'=.07	E'=.15	E'=.28
60	1847.2	3.38-4	2.91-4	2.07-4	1.18-4	5.23-5	2.15-5
61	1936.8	3.32-4	2.85-4	2.03-4	1.16-4	5.15-5	2.12-5
62	2028.4	3.25-4	2.80-4	1.99-4	1.14-4	5.07-5	2.08-5
63	2122.1	3.19-4	2.74-4	1.95-4	1.12-4	4.99-5	2.04-5
64	2217.9	3.12-4	2.69-4	1.91-4	1.10-4	4.90-5	2.01-5
65	2315.8	3.06-4	2.63-4	1.88-4	1.08-4	4.81-5	1.97-5
66	2415.8	3.00-4	2.58-4	1.84-4	1.06-4	4.72-5	1.93-5
67	2518.0	2.93-4	2.52-4	1.80-4	1.04-4	4.63-5	1.89-5
68	2622.2	2.87-4	2.47-4	1.76-4	1.02-4	4.54-5	1.86-5
69	2728.6	2.81-4	2.42-4	1.73-4	9.96-5	4.44-5	1.82-5
70	2837.2	2.75-4	2.37-4	1.69-4	9.75-5	4.35-5	1.78-5
71	2947.9	2.69-4	2.32-4	1.66-4	9.55-5	4.26-5	1.75-5
72	3060.7	2.63-4	2.27-4	1.62-4	9.35-5	4.17-5	1.71-5
73	3175.8	2.58-4	2.22-4	1.59-4	9.15-5	4.09-5	1.68-5
74	3293.0	2.52-4	2.17-4	1.55-4	8.96-5	4.00-5	1.64-5
75	3412.4	2.47-4	2.12-4	1.52-4	8.76-5	3.91-5	1.61-5
76	3533.9	2.41-4	2.08-4	1.49-4	8.58-5	3.83-5	1.57-5
77	3657.7	2.36-4	2.03-4	1.45-4	8.40-5	3.75-5	1.54-5
78	3783.7	2.31-4	1.99-4	1.42-4	8.22-5	3.67-5	1.51-5
79	3911.9	2.26-4	1.95-4	1.39-4	8.04-5	3.59-5	1.48-5
80	4042.4	2.21-4	1.90-4	1.36-4	7.87-5	3.51-5	1.45-5
81	4175.1	2.16-4	1.86-4	1.33-4	7.70-5	3.43-5	1.42-5
82	4310.0	2.12-4	1.82-4	1.31-4	7.54-5	3.36-5	1.39-5
83	4447.2	2.07-4	1.78-4	1.28-4	7.38-5	3.29-5	1.36-5
84	4586.7	2.03-4	1.75-4	1.25-4	7.22-5	3.22-5	1.33-5
85	4728.5	1.99-4	1.71-4	1.22-4	7.06-5	3.15-5	1.30-5
86	4872.5	1.94-4	1.67-4	1.20-4	6.92-5	3.09-5	1.27-5
87	5018.9	1.90-4	1.64-4	1.17-4	6.77-5	3.02-5	1.25-5
88	5167.5	1.86-4	1.61-4	1.15-4	6.63-5	2.96-5	1.22-5
89	5318.6	1.82-4	1.57-4	1.12-4	6.49-5	2.90-5	1.19-5
90	5471.9	1.78-4	1.54-4	1.10-4	6.35-5	2.84-5	1.17-5
91	5627.6	1.75-4	1.51-4	1.08-4	6.22-5	2.78-5	1.15-5
92	5785.7	1.71-4	1.48-4	1.05-4	6.09-5	2.72-5	1.12-5

On Use of the Van Regemorter Formula

for Collision Strengths or Cross Sections

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Abstract

The accuracy of the widely used Van Regemorter formula [Astrophys. J. 136, 906 (1962)] for calculating the collision strengths needed in applications to high temperature plasmas is tested by comparison with numerous more accurate calculations. It is found to be frequently a very poor approximation, especially for $\Delta n \geq 1$ excitation transitions from levels with $l < n - 1$, and the recommendation is made that with the recent advances in calculational procedures and available accurate atomic data use of the Van Regemorter formula should be discontinued.

I. INTRODUCTION

In general it is much more lengthy and consuming of computer time to calculate electron impact excitation cross sections or collision strengths than it is to calculate radiative oscillator strengths or decay rates. Hence, about 30 years ago when Van Regemorter[1,2], Burgess[3] and Seaton[4] obtained an approximate, simple formula, commonly called the Van Regemorter formula, in which the electron impact excitation cross section was expressed in terms of the electric dipole radiative oscillator strength f and an effective Gaunt factor $\overline{g}$, the formula became very widely used almost immed'.tely in the modeling of high temperature plasmas and its use has continued to the present time. Howevei, recently the picture has drastically changed from that existing a few years ago due to advances in computers and the development of very rapid procedures for calculating collision strengths, such as done in the work of Ref. 5 - 7 and applied to large scale calculations of atomic data in Ref. 8 - 13. Hence, it is no longer a prohibitive task to make accurate, direct calculations of the collision strengths needed in non-LTE plasma applications. Moreover, it is now clear that the Van Regemorter formula is often a much worse approximation than was earlier expected. Our principal purpose here is to illustrate this and to determine more precisely than previously the conditions for which use of the Van Regemorter formula is an especially poor approximation. We concentrate on highly charged ions satisfying Eq. (8) below, but expect that the conclusions apply approximately to much less highly ionized atoms, as well.

First we briefly review the Van Regemorter method. Then we discuss its accuracy based on many comparisons with more accurate calculations and we give some illustrative examples of these comparisons.

II. SUMMARY OF THE VAN REGEMORTER PROCEDURE

The Van Regemorter formula[2] expresses the cross section Q_{if} for a transition $i \rightarrow f$ in terms of the electric dipole oscillator strength f_{if} for the transition and an effective Gaunt factor $\overline{g}$. Specifically,

$$Q_{if} = \frac{8\pi}{\sqrt{3}} \frac{1}{k_i^2} \frac{f_{if}}{\Delta E(Ry)} \overline{g} \pi a_o^2, \tag{1}$$

where $\Delta E(Ry)$ is the transition energy in Rydbergs, a_o is the Bohr radius and k_i is the wave number of the impact electron. In the non-relativistic limit

$$k_i^2 = E_i(Ry), \tag{2}$$

where $E_i(Ry)$ is the impact electron energy in Rydbergs. The relativistic expression for k_i^2 contains an extra factor, see Eq. (2) of Ref. 7, but that factor is negligible for most conditions of interest. The well-known relationship between the cross section Q and collision strength Ω is

$$Q_{if} = \frac{\pi a_o^2}{k_i^2 g_i} \Omega_{if}, \tag{3}$$

where g_i is the statistical weight of the initial level. Hence, one sees that Eq. (1) corresponds to using

$$\Omega_{if} = \frac{8\pi}{\sqrt{3}} \frac{g_i f_{if}}{\Delta E(Ry)} \overline{g} \tag{4}$$

as the Van Regemorter formula for the collision strength.

Van Regemorter[2] assumed the $\overline{g}$ for every optically allowed transition in any positive ion could be represented by one universal function of x, where x^2 is the scattered electron energy in threshold units

$$x^2 = E_f/\Delta E. \tag{5}$$

Of course, if $\overline{g}$ could be represented as a function of x, it could also be given as a function of ϵ, where ϵ is the impact electron energy in threshold units

$$\epsilon = E_i/\Delta E \tag{6}$$

because obviously ϵ must equal x^2+1. For very high energies for which $\epsilon \simeq x^2 \gg 1$, $\overline{g}$ is given accurately by

$$\overline{g} = \frac{\sqrt{3}}{2\pi} ln(x^2) = \frac{\sqrt{3}}{2\pi} ln\epsilon. \tag{7}$$

For lower energies, where $\overline{g}$ is apriori unknown, Van Regemorter chose $\overline{g}$ such that Eq. (1) gave approximate agreement with the best theoretical and experimental results available at that time. His choice for $\overline{g}(x)$ is given in Table 1 of Ref. 2. For the region $\epsilon \leq 3$, or $x^2 \leq 2$, which is usually the most important energy region for $\Delta n \geq 1$ transitions, he simply used $\overline{g} = 0.2$ for positive ions.

III. ACCURACY OF THE VAN REGEMORTER FORMULA

Now we consider the accuracy of the Van Regemorter formula. The error due to use of this formula can obviously be considered to be a consequence of one or the other of the following two causes:

1) the optically forbidden transitions are omitted
2) the optically allowed transitions are not treated with sufficient accuracy by the Van Regemorter formula

In testing the importance of (1) and (2) we have used the very rapid relativistic distorted wave approach and associated computer programs that have been developed recently in Ref. 6 and 7 and applied to large scale production of atomic data in Ref. 8 – 13. As discussed in these references, the approach appears to be accurate for

$$Z \geq 2N, \tag{8}$$

where Z is the nuclear charge number and N is the number of bound electrons per ion. The results in Ref. 9, 10 and 11 for Li-like, Na-like and Cu-like ions, which are not complicated by configuration and intermediate coupling mixing effects, are particularly helpful for these purposes, but we expect the conclusions reached to apply for transitions involving principally the same orbital transitions $nlj - n'l'j'$ in more complex ions, as well. Also they probably apply approximately for ions much more nearly neutral than those satisfying Eq. (8).

It should be noted that the programs of Ref. 6 and 7 have recently been expanded to include the effect of resonances treated as a two step process of electron capture followed by autoionization with the possibility of radiative decay of the doubly excited intermediate levels included. However, the results in Ref. 8 – 13 do not include resonance effects. Nevertheless, the resonance contributions are expected to be small except for the weak transitions, and we expect the inclusion of resonance effects would not greatly affect the conclusions reached here.

On the basis of comparison of results using the Van Regemorter formula with those of Ref. 9-11 plus additional test calculations, we have reached the following conclusions, essentially independent of Z and N:

i) For the $\Delta n \equiv n' - n = 0$ transitions we find, as has been found by others, that the allowed transitions greatly dominate. Hence, the error due to cause (1) above is not very significant for these transitions. However, the error due to cause (2) is rather large for the energies of principal interest, if one uses the original $\overline{g}$ values of Van Regemorter given in Table 1 of Ref. 2. On the other hand, since this error is generally in the same direction and quite similar for all of these transitions, it appears that for them moderately accurate results, to within about 30% or 40%, could be obtained by choosing a larger $\overline{g} \simeq 0.8$ at and near threshold that increases with energy and goes into the form given by Eq. (7) only for very high energies.

ii) In contrast to this, for the $\Delta n \geq 1$ transitions the error due to both causes (1) and (2) above is frequently very large. Moreover, that due to cause (2) is not in a single direction. In fact, we find that for $\Delta n \geq 1$ transitions use of the Van Regemorter formula leads to near theshold results too small by as much as an order of magnitude in some cases and too large by nearly as big as a factor in others. Thus, although Van Regemorter's choice for $\overline{g}$ is probably about as good as can be made for the $\Delta n \geq 1$ transitions assuming a single $\overline{g}(x)$ applies for all of them, it appears there is no way one can in general choose a single, convenient $\overline{g}(x)$ that will lead to generally accurate results for all $\Delta n \geq 1$ transitions in complex ions. However, in the very special case of $n - n'$ transitions in hydrogenic ions, where all transitions are optically allowed, we have been successful in choosing a moderately simple form for $\overline{g}$ that leads to accurate results, see Eqs. (17) and (18) of Ref. 14.

iii) Finally we have found the interesting result that in all of the very numerous cases we considered the sum of the collision strengths for the optically forbidden transitions from a given sublevel nlj to upper sublevels with a given $n' \geq n+1$ exceeds (generally by a wide margin) the sum of the collision strengths for all the allowed transitions from nlj to the sublevels with the same n' value, with the exception of the transitions from the sublevels nlj with $l = n - 1$. Hence, for this reason use of the Van Regemorter formula tends to be a very poor approximation for all sublevels with a given n value that satisfy $l < n - 1$. Thus, for $n = 1$, where there is only the single sublevel $1s_{1/2}$, the allowed transitions do dominate. However, for $n = 2$, the forbidden transitions dominate the transitions from $2s_{1/2}$ to the $n' \geq 3$ sublevels, while the allowed transitions dominate the transitions from $2p_{1/2}$ and $2p_{3/2}$ to the $n' \geq 3$ sublevels. For $n = 3$, the forbidden transitions dominate the transitions from $3s_{1/2}, 3p_{1/2}$ and $3p_{3/2}$ to the $n' \geq 4$ sublevels, while the allowed transitions dominate the transitions from $3d_{3/2}$ and $3d_{5/2}$ to these same sublevels, etc. Thus, the error from use of the Van Regemorter formula due to cause (1) above becomes greater the higher the n values of the sublevels one is considering.

The points we have been making are illustrated by the comparisons made in Table I and II of collision strengths for the transitions among the $n = 3$ sublevels and from the $n = 3$ sublevels to those with $n' = 4$ and 5 in the Na-like iron (Z=26) and for the transitions from the $n = 4$ sublevels to the $n' = 5$ sublevels in Cu-like gadolinium ($Z = 64$). Here $nl*$ designates nlj with $j = l - 1/2$, while nl designates nlj with $j = l + 1/2$. For example

$$3s = 3s_{1/2},\ 3d* = 3d_{3/2},\ 4f = 4f_{7/2},\ etc. \tag{9}$$

Results are given as a function of scattered electron energy E' in units of Z_{eff}^2 Rydbergs[15], where $Z_{eff} = Z - 8.34$ for Na-like ions and $Z_{eff} = Z - 23.3$ for Cu-like ions. The range of energies covered includes those needed to obtain collision rates for the temperatures ordinarily of interest for plasma applications, with the two lower energy points ordinarily being of more importance. Of course, for determining accurate rates more energy points, as given in Ref. 10 and 11, are needed, but this is not necessary for our present purposes.

For each of the allowed transitions in the tables the first entries are the relativistic distorted wave values given in Ref. 10 or 11. The second entries are those obtained with the Van Regemorter formula [Eq. (4)] using the values for the transition energies ΔE and oscillator strengths f also given in Ref. 10 or 11. The values of $\overline{g}$ used are those given in Table 1 of Ref. 2 supplemented by Eq. (7) for very large ϵ or x. The third entries are the ratios of the second entries to the first, or upper, entries and hence give an indication of the error in use of the Van Regemorter formula for allowed transitions, that is, the error due to cause (2) above. Inspection of the results in Table I for transitions among the $n = 3$ sublevels in

Na-like iron indicates, as noted in point (i) above, that this error, although quite substantial, could be largely eliminated by using a larger value for $\overline{g}$ starting with about 0.8 at threshold. In contrast to this, as noted in point (ii) above, for the $\Delta n \geq 1$ transitions one sees from the tables that this type error is in various directions for different transitions. Hence, it can not be removed by using a single, different choice for $\overline{g}(x)$. Extreme examples of this type of error for the $\Delta n \geq 1$ transitions are given by the near threshold results for the $3s_{1/2} - 4p_{1/2}, 3s_{1/2} - 4p_{3/2}$ and $3d_{3/2} - 5p_{3/2}$ transitions in Na-like iron and the $4s_{1/2} - 5p_{1/2}$, $4p_{1/2} - 5d_{3/2}$ and $4f_{5/2} - 5d_{5/2}$ transitions in Cu-like gadolinium, where one sees from Tables I and II that the ratios of the near threshold results of the Van Regemorter formula to the relativistic distorted wave collision strengths are 4.313, 4.222, 0.097, 4.473, 3.997 and 0.160, respectively.

The single entries for the forbidden transitions in Tables I and II are the relativistic distorted wave collision strengths of Ref. 10 or 11. The entries labeled A and T that follow the results for all the transitions from a sublevel nlj to the sublevels with a given n' value are the sum of the relativistic distorted wave collision strengths for the allowed transitions and for all of these transitions, respectively. These entries are followed by the ratio A/T, which indicates directly the error due to cause (1) above, that is the neglect of the forbidden transitions by the Van Regemorter formula. The results for the transitions among the $n = 3$ sublevels in Table I illustrate the point made in (i) above that this type error is small for $\Delta n = 0$ transitions. However, the results for the $\Delta n \geq 1$ transitions in Table I and II illustrate the points made in (ii) and (iii) above that this type error is generally large for these transitions with the exception of those from the sublevels nlj with $l = n-1$. In fact, even for the latter the error is seen not to be negligible in most cases. Some extreme examples of this type error are given by the near threshold results for transitions from the $3s_{1/2}$ sublevel in Na-like iron to the sublevels with $n' = 4$ and 5 and from the $4s_{1/2}$ and $4p_{1/2}$ sublevels in Cu-like gadolinium to the sublevels with $n' = 5$, where one sees from Tables I and II that the "allowed" contributions to the total collision strengths are only 7.3%, 7.9%, 8.3% and 7.3%, respectively.

In summary we find that the Van Regemorter formula is frequently a very poor approximation for the $\Delta n \geq 1$ transitions because the forbidden transitions omitted by it are dominant and/or because it gives a poor approximation for results for the allowed transitions. It is a considerably better approximation for the $\Delta n = 0$ transitions if a larger $\overline{g}$ than originally recommended in Ref. 2 is used. However, with the very rapid procedures now available for more accurate calculations, such as those of Ref. 5 – 7, and the large amount of accurate atomic data now available, for example at the Belfast Atomic Data Bank[16], which is being continuously updated and expanded, there appears to be little reason to continue use of the Van Regemorter formula for either kind of transitions.

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TABLE I. (Continued)

Transition	E′ 0.0025	E′ 0.04	E′ 0.40
3d* 4s	1.46e-2	1.48e-2	1.83e-2
3d* 4p*	2.02e-2	2.87e-2	8.04e-2
	3.31e-2	3.31e-2	1.02e-1
	1.639	1.155	1.269
3d* 4p	2.06e-2	1.80e-2	2.36e-2
	6.21e-3	6.21e-3	1.90e-2
	0.301	0.345	0.808
3d* 4d*	2.95e-1	2.95e-1	2.99e-1
3d* 4d	4.46e-2	2.84e-2	1.65e-2
3d* 4f*	9.03e-1	1.15e+0	2.34e+0
	7.55e-1	7.55e-1	2.13e+0
	0.836	0.659	0.909
3d* 4f	7.25e-2	4.17e-2	1.98e-2
3d* A	9.44e-1	1.19e+0	2.45e+0
3d* T	1.37e+0	1.57e+0	2.80e+0
	0.689	0.758	0.874
3d 4s	2.20e-2	2.23e-2	2.77e-2
3d 4p*	1.43e-2	1.08e-2	7.49e-3
3d 4p	4.59e-2	5.73e-2	1.43e-1
	5.68e-2	5.68e-2	1.75e-1
	1.239	0.991	1.220
3d 4d*	4.47e-2	2.86e-2	1.68e-2
3d 4d	4.65e-1	4.58e-1	4.57e-1
3d 4f*	1.43e-1	1.27e-1	1.89e-1
	5.41e-2	5.41e-2	1.53e-1
	0.379	0.426	0.808
3d 4f	1.33e+0	1.66e+0	3.37e+0
	1.08e+0	1.08e+0	3.06e+0
	0.816	0.652	0.907
3d A	1.52e+0	1.85e+0	3.70e+0
3d T	2.06e+0	2.37e+0	4.21e+0
	0.735	0.780	0.879
3s 5s	1.88e-2	1.98e-2	2.19e-2
3s 5p*	1.78e-3	2.36e-3	8.66e-3
	5.66e-3	5.66e-3	1.09e-2
	3.181	2.402	1.254
3s 5p	3.41e-3	4.42e-3	1.62e-2
	1.08e-2	1.08e-2	2.06e-2
	3.149	2.434	1.269
3s 5d*	5.66e-3	6.16e-3	9.42e-3
3s 5d	8.46e-3	9.19e-3	1.41e-2
3s 5f*	7.76e-3	7.08e-3	6.95e-3
3s 5f	1.04e-2	9.45e-3	9.28e-3
3s 5g*	4.29e-3	3.64e-3	3.85e-3
3s 5g	5.36e-3	4.55e-3	4.81e-3
3s A	5.20e-3	6.78e-3	2.49e-2
3s T	6.59e-2	6.67e-2	9.52e-2
	0.079	0.102	0.261
3p* 5s	1.96e-3	2.31e-3	6.51e-3
	3.23e-3	3.23e-3	6.75e-3
	1.649	1.401	1.037
3p* 5p*	2.20e-2	2.28e-2	2.42e-2
3p* 5p	4.71e-3	4.18e-3	4.77e-3
3p* 5d*	1.16e-2	1.65e-2	4.81e-2
	2.45e-2	2.45e-2	4.95e-2
	2.101	1.479	1.029
3p* 5d	5.64e-3	4.43e-3	3.30e-3
3p* 5f*	2.11e-2	2.35e-2	3.35e-2
3p* 5f	7.08e-3	4.64e-3	2.79e-3
3p* 5g*	9.71e-3	1.08e-2	1.45e-2
3p* 5g	5.03e-3	3.13e-3	1.93e-3
3p* A	1.36e-2	1.88e-2	5.46e-2
3p* T	8.89e-2	9.23e-2	1.40e-1
	0.153	0.204	0.391
3p 5s	4.08e-3	4.91e-3	1.40e-2
	6.86e-3	6.86e-3	1.44e-2
	1.679	1.397	1.034
3p 5p*	4.90e-3	4.39e-3	5.09e-3
3p 5p	4.92e-2	5.04e-2	5.39e-2
3p 5d*	9.47e-3	9.01e-3	1.42e-2
	5.09e-3	5.09e-3	1.03e-2
	0.537	0.565	0.726
3p 5d	2.69e-2	3.51e-2	9.34e-2
	4.56e-2	4.56e-2	9.26e-2
	1.697	1.298	0.991
3p 5f*	1.53e-2	1.28e-2	1.32e-2
3p 5f	4.16e-2	4.38e-2	5.97e-2
3p 5g*	1.03e-2	8.05e-3	7.65e-3
3p 5g	2.02e-2	2.09e-2	2.63e-2
3p A	4.04e-2	4.90e-2	1.22e-1
3p T	1.82e-1	1.89e-1	2.87e-1
	0.222	0.259	0.423
3d* 5s	3.50e-3	2.83e-3	2.65e-3
3d* 5p*	4.41e-3	4.53e-3	9.45e-3
	3.44e-3	3.44e-3	8.04e-3
	0.780	0.758	0.851
3d* 5p	6.75e-3	4.73e-3	3.67e-3
	6.56e-4	6.56e-4	1.53e-3
	0.097	0.139	0.418
3d* 5d*	5.87e-2	5.61e-2	5.47e-2
3d* 5d	1.72e-2	9.96e-3	3.84e-3
3d* 5f*	1.73e-1	2.04e-1	3.69e-1
	1.02e-1	1.02e-1	2.32e-1
	0.591	0.500	0.628
3d* 5f	2.75e-2	1.43e-2	4.01e-3
3d* 5g*	3.36e-2	4.10e-2	7.44e-2
3d* 5g	1.24e-2	6.08e-3	2.54e-3
3d* A	1.84e-1	2.14e-1	3.82e-1
3d* T	3.37e-1	3.44e-1	5.24e-1
	0.546	0.621	0.729
3d 5s	5.26e-3	4.26e-3	3.99e-3
3d 5p*	4.95e-3	3.25e-3	1.58e-3
3d 5p	1.17e-2	1.05e-2	1.77e-2
	5.98e-3	5.98e-3	1.40e-2
	0.509	0.568	0.790
3d 5d*	1.72e-2	9.97e-3	3.87e-3
3d 5d	9.68e-2	8.93e-2	8.42e-2
3d 5f*	4.20e-2	3.01e-2	3.07e-2
	7.29e-3	7.29e-3	1.66e-2
	0.173	0.243	0.540
3d 5f	2.60e-1	2.99e-1	5.31e-1
	1.46e-1	1.46e-1	3.32e-1
	0.563	0.489	0.626
3d 5g*	1.76e-2	1.14e-2	1.12e-2
3d 5g	5.19e-2	5.97e-2	1.05e-1
3d A	3.14e-1	3.40e-1	5.79e-1
3d T	5.07e-1	5.18e-1	7.89e-1
	0.618	0.656	0.734

TABLE II. Comparison of Collision strengths for Cu-like gadolinium (Z=64). Notation as in Table I except that Z_{eff} = Z - 23.3 and Ref. 11 replaces Ref. 10.

Transition	E′ 0.001	0.15	0.18
4s 5s	4.87e-2	5.06e-2	5.58e-2
4s 5p*	2.40e-3	3.22e-3	1.34e-2
	1.07e-2	1.07e-2	2.35e-2
	4.473	3.332	1.761
4s 5p	5.11e-3	5.49e-3	1.51e-2
	1.19e-2	1.19e-2	2.55e-2
	2.325	2.163	1.686
4s 5d*	3.86e-3	4.28e-3	7.06e-3
4s 5d	5.44e-3	5.98e-3	9.74e-3
4s 5f*	4.09e-3	4.32e-3	5.44e-3
4s 5f	5.39e-3	5.67e-3	7.11e-3
4s 5g*	6.82e-3	6.65e-3	7.70e-3
4s 5g	8.53e-3	8.31e-3	9.62e-3
4s A	7.51e-3	8.71e-3	2.85e-2
4s T	9.03e-2	9.45e-2	1.31e-1
	0.083	0.092	0.217
4p* 5s	3.80e-3	5.28e-3	1.88e-2
	1.17e-2	1.17e-2	2.90e-2
	3.070	2.210	1.542
4p* 5p*	5.36e-2	5.54e-2	5.97e-2
4p* 5p	5.05e-3	5.36e-3	7.75e-3
4p* 5d*	4.39e-3	5.44e-3	2.11e-2
	1.76e-2	1.76e-2	3.83e-2
	3.997	3.231	1.820
4p* 5d	3.46e-3	3.33e-3	3.62e-3
4p* 5f*	1.00e-2	1.17e-2	2.09e-2
4p* 5f	3.46e-3	2.98e-3	2.39e-3
4p* 5g*	2.20e-2	2.35e-2	2.83e-2
4p* 5g	6.04e-3	5.03e-3	3.79e-3
4p* A	8.19e-3	1.07e-2	3.99e-2
4p* T	1.12e-1	1.18e-1	1.66e-1
	0.073	0.091	0.240
4p 5s	1.52e-2	2.13e-2	6.92e-2
	3.82e-2	3.82e-2	1.00e-1
	2.518	1.793	1.451
4p 5p*	8.94e-3	9.87e-3	1.50e-2
4p 5p	1.21e-1	1.25e-1	1.38e-1
4p 5d*	7.01e-3	7.55e-3	1.43e-2
	6.18e-3	6.18e-3	1.43e-2
	0.882	0.819	1.001
4p 5d	1.37e-2	1.81e-2	6.71e-2
	4.93e-2	4.93e-2	1.13e-1
	3.594	2.729	1.692
4p 5f*	9.37e-3	9.43e-3	1.26e-2
4p 5f	2.70e-2	3.07e-2	5.24e-2
4p 5g*	1.73e-2	1.63e-2	1.62e-2
4p 5g	4.63e-2	4.82e-2	5.58e-2
4p A	3.59e-2	4.69e-2	1.51e-1
4p T	2.66e-1	2.87e-1	4.41e-1
	0.135	0.163	0.342
4d* 5s	1.07e-2	1.17e-2	1.60e-2
4d* 5p*	2.01e-2	2.72e-2	7.74e-2
	3.54e-2	3.54e-2	1.04e-1
	1.759	1.301	1.340
4d* 5p	8.86e-3	9.30e-3	1.55e-2
	4.78e-3	4.78e-3	1.36e-2
	0.540	0.514	0.877
4d* 5d*	1.43e-1	1.46e-1	1.54e-1
4d* 5d	9.66e-3	8.55e-3	8.02e-3
4d* 5f*	5.40e-2	7.12e-2	2.10e-1
	1.16e-1	1.16e-1	2.87e-1
	2.158	1.637	1.364

Transition	E′ 0.001	0.15	0.18
4d* 5f	9.69e-3	7.88e-3	5.38e-3
4d* 5g*	1.19e-1	1.35e-1	2.08e-1
4d* 5g	1.44e-2	1.07e-2	7.04e-3
4d* A	8.30e-2	1.08e-1	3.03e-1
4d* T	3.90e-1	4.28e-1	7.02e-1
	0.213	0.252	0.432
4d 5s	1.75e-2	1.90e-2	2.60e-2
4d 5p*	7.04e-3	6.70e-3	6.47e-3
4d 5p	2.82e-2	3.69e-2	1.04e-1
	4.89e-2	4.89e-2	1.41e-1
	1.735	1.324	1.352
4d 5d*	1.04e-2	9.33e-3	9.24e-3
4d 5d	2.22e-1	2.27e-1	2.40e-1
4d 5f*	1.55e-2	1.49e-2	2.31e-2
	9.10e-3	9.10e-3	2.27e-2
	0.586	0.612	0.984
4d 5f	9.00e-2	1.16e-1	3.30e-1
	1.78e-1	1.78e-1	4.43e-1
	1.979	1.535	1.342
4d 5g*	3.02e-2	2.78e-2	3.19e-2
4d 5g	1.77e-1	1.98e-1	3.01e-1
4d A	1.34e-1	1.68e-1	4.58e-1
4d T	5.98e-1	6.56e-1	1.07e+0
	0.224	0.256	0.427
4f* 5s	5.51e-3	4.97e-3	4.38e-3
4f* 5p*	1.25e-2	1.33e-2	1.67e-2
4f* 5p	7.62e-3	6.79e-3	6.13e-3
4f* 5d*	2.49e-2	3.05e-2	7.34e-2
	2.86e-2	2.86e-2	9.16e-2
	1.147	0.937	1.247
4f* 5d	1.15e-2	9.05e-3	7.95e-3
	1.84e-3	1.84e-3	5.84e-3
	0.160	0.203	0.735
4f* 5f*	2.43e-1	2.42e-1	2.41e-1
4f* 5f	2.21e-2	1.49e-2	6.51e-3
4f* 5g*	8.36e-1	9.76e-1	1.91e+0
	6.29e-1	6.29e-1	1.77e+0
	0.753	0.645	0.931
4f* 5g	3.45e-2	2.26e-2	9.19e-3
4f* A	8.72e-1	1.02e+0	1.99e+0
4f* T	1.20e+0	1.32e+0	2.27e+0
	0.728	0.769	0.875
4f 5s	7.36e-3	6.68e-3	5.95e-3
4f 5p*	4.13e-3	3.30e-3	2.17e-3
4f 5p	2.00e-2	2.05e-2	2.44e-2
4f 5d*	9.27e-3	6.74e-3	3.25e-3
4f 5d	3.74e-2	4.34e-2	9.86e-2
	3.82e-2	3.82e-2	1.22e-1
	1.023	0.882	1.236
4f 5f*	2.22e-2	1.51e-2	6.72e-3
4f 5f	3.32e-1	3.28e-1	3.25e-1
4f 5g*	6.76e-2	6.03e-2	8.09e-2
	2.35e-2	2.35e-2	6.64e-2
	0.347	0.390	0.821
4f 5g	1.11e+0	1.29e+0	2.50e+0
	8.24e-1	8.24e-1	2.33e+0
	0.746	0.641	0.931
4f A	1.21e+0	1.39e+0	2.68e+0
4f T	1.61e+0	1.77e+0	3.05e+0
	0.754	0.785	0.879