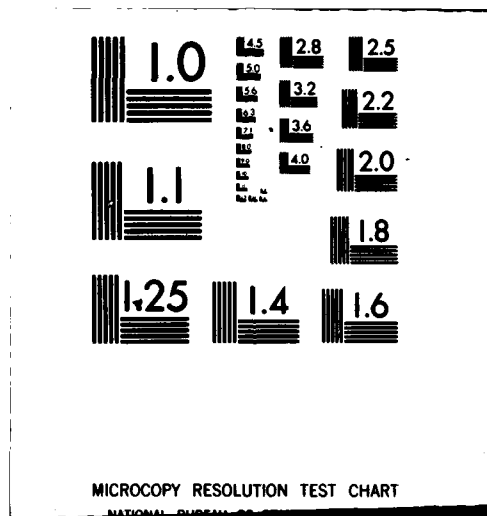




AD A 082665

LEVEL III

21

TECHNICAL REPORT H-78-1

CUMULATIVE REACTANT SPECIES INDEX FOR VOLUMES I-V
OF THE COMPILATION OF DATA RELEVANT TO GAS LASERS
VOLUME VI

E. W. McDaniel et al.
School of Physics, Georgia Institute of Technology
Atlanta, Georgia 30332

S. T. Manson
Physics Department, Georgia State University
Atlanta, Georgia 30303

J. W. Gallagher, J. R. Rumble, and E. C. Beaty
Joint Institute for Laboratory Astrophysics
University of Colorado
Boulder, Colorado 80302

T. G. Roberts
High Energy Laser Laboratory

DTIC
ELECTE
S APR 4 1980 D
C

September 1979



U.S. ARMY MISSILE COMMAND

Redstone Arsenal, Alabama 35809

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

DDC FILE COPY,

SMI FORM 1021, 1 JUL 79 PREVIOUS EDITION IS OBSOLETE

80 4 4 047

DISPOSITION INSTRUCTIONS

**DESTROY THIS REPORT WHEN IT IS NO LONGER NEEDED. DO NOT
RETURN IT TO THE ORIGINATOR.**

DISCLAIMER

**THE FINDINGS IN THIS REPORT ARE NOT TO BE CONSTRUED AS AN
OFFICIAL DEPARTMENT OF THE ARMY POSITION UNLESS SO DESIGNATED
BY OTHER AUTHORIZED DOCUMENTS.**

TRADE NAMES

**USE OF TRADE NAMES OR MANUFACTURERS IN THIS REPORT DOES
NOT CONSTITUTE AN OFFICIAL INDORSEMENT OR APPROVAL OF
THE USE OF SUCH COMMERCIAL HARDWARE OR SOFTWARE.**

70 E W. ...
↓
INCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Technical Report H-78-1, Vol VI ✓	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) CUMULATIVE REACTANT SPECIES INDEX FOR VOLUMES I-V OF THE COMPILATION OF DATA RELEVANT TO GAS LASERS. Volume VI. AD5595	5. TYPE OF REPORT & PERIOD COVERED	
6. AUTHOR(s) See Reverse	7. CONTRACT OR GRANT NUMBER(s)	
8. PERFORMING ORGANIZATION NAME AND ADDRESS Commander, US Army Missile Command ✓ Attn: DRSMI-RH Redstone Arsenal, Alabama 35809	9. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS (13) 1431	
10. CONTROLLING OFFICE NAME AND ADDRESS Commander, US Army Missile Command Attn: DRSMI-RPT Redstone Arsenal, Alabama 35809	11. REPORT DATE September 1979	
12. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	13. NUMBER OF PAGES 142	
	14. SECURITY CLASS. (of this report) UNCLASSIFIED	
	15. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES *Volume I contains pages 1-427 Volume IV contains pages 1349-1916 Volume II contains pages 429-892 Volume V contains pages 1917-2401 Volume III contains pages 893-1348		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) See Reverse		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This volume contains a cumulative reactant species index for MIRADCOM Technical Report H-78-1. Volumes I and II covered data relevant to rare gas - rare gas and rare gas - monohalide excimer lasers. Volumes III-V covered data relevant to nuclear pumped lasers. ↙		

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

4150201

70

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

7. AUTHORS

School of Physics, Georgia Institute of Technology:

E. W. McDaniel, M. R. Flannery, E. W. Thomas, H. W. Ellis,*
K. J. McCann, F. L. Eisele, and W. Pope

Physics Department, Georgia State University:

S. T. Manson

Joint Institute for Laboratory Astrophysics, University of Colorado:

J. W. Gallagher, J. R. Rumble, and E. C. Beaty

High Energy Laser Laboratory, US Army Missile Command:

T. G. Roberts

*Present address: Eckerd College, St. Petersburg, Florida 33733

19. KEYWORDS

Lasers
Rare gas - rare gas excimers
Rare gas - monohalide excimers
Cross sections
Lifetimes
Reaction rates
Transport properties
Particle collisions
Potential energy curves
Excitation
Ionization
Laser pumping mechanisms
Heavy nuclides
Light nuclides
High energy electron beams
High energy ion beams

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

Notes Concerning Use of Index

1. For references to electron - heavy particle collisions, look under "Electrons".
2. For references to photon - heavy particle collisions, look under the heading for the heavy particle involved.
3. For references to heavy particle - heavy particle collisions, it may be necessary to look under the headings for each of the species involved. In general, each combination of reactants is listed only once.

Accession For:	
NTIS	Q-11
DDC TAB	
Unpublished	
Justification	
By:	
Date:	
Initials:	
Special:	
A	

Ac

Polarizability 1157

Ag

Electron affinity 1160

Polarizability 1157

Self-sputtering coefficients 838-39

Ag⁺

On Ar, high energy electron capture 1628

high energy electron loss 1628

On N₂, high energy electron capture 1628

high energy electron loss 1628

On O₂, high energy electron capture 1628

high energy electron loss 1628

Air

Ionizations per volt per mm Hg at 0° C 732

Al

Electron affinity 1160

Energy level and Grotrian diagrams 1009-11

Photoelectric yields 889

Polarizability 1156

Self-sputtering coefficients 838-39

Al⁺

Energy level and Grotrian diagrams 1012-18

Al⁻

Beam attenuation in an electric field 767

Am

Polarizability 1157

Ar

Absorption coefficient showing structure due to
autoionization 646

Average energy expended by a charged particle to
create an ion pair 814

Continuous free - free absorption coefficients 692

Electron affinity 214, 1160

Energy level and Grotrian diagrams 1081-1103

Energy parameters 152

Free - free absorption cross section 2078

General wavelength ranges for observed emission continua 711

Interaction parameters 1187

Ionizations per volt per mm Hg at 0° C 732

Lifetimes 202-3, 208

Low-energy collisions 235-38, 247-51, 274-75, 300-1, 316, 318, 1510,
1513-16

Mobilities of ions in Ar 740

Multiphoton ionization 700

Photoionization cross sections 642-4, 647, 658, 662, 1926

Polarizabilities $\alpha_{zz}(m_j=1)$ and $\alpha_{zz}(m_j=2)$ of the 3P_2
 Noble Gas Atoms 216
 Polarizability 216-17, 1156
 Refractive indices 696
 Secondary electron spectrum from electron impact
 ionization 2255-59, 61
 Secondary electron spectrum from proton impact
 ionization 2313-18
 Secondary electron spectrum from Ar^+ impact
 ionization 2367-69
 Secondary electron spectrum from He^+ impact
 ionization 2356-58
 Secondary electron spectrum from He^{++} impact
 ionization 2359-61
 Stopping power for heavy ions 2175-76
 V_0 in the equation $i = i_0 e^{n(V-V_0)}$ 732

Ar^*

Autoionization structure in the photoionization
 cross section 663
 Low-energy collisions 236-38, 245-46, 254-55, 306-7, 1513-16
 Photoionization cross section 658, 662-3, 1928, 1931-34

$Ar(^3P_0)$

Diffusion data in argon 752, 2119
 Loss rates in Ar 752
 Low-energy reactions 1509, 1510, 2119

$Ar(^3P_2)$

Diffusion data in argon 752, 2119
 Loss rates in argon 752
 Low-energy reactions 1509, 1510, 2119

Ar(4p)

Photoionization cross section 667-68

Low-energy reactions 1509

Ar(4s)

Photoionization cross section 667-68

Ar⁺

Drift velocity in argon 742

Energy level and Grotrian diagrams 1104-29

Energy parameters 152

Interaction parameters 1187

Ion-molecule reactions 1392 1510. 1513 1522-24

Low-energy collisions 237, 245-46, 292-93, 319-20, 1510, 1523-24,

Mobility in argon 740-41

Mobility in helium 737

On Ar, ionization, secondary electron spectra 2367-69

On Br⁻, three-body recombination 1360, 1380-81

On Cl⁻, three-body recombination 1360, 1380-81

On F⁻, three-body recombination 1360, 1375-76, 1380-81, 1518

On I⁻, three-body recombination 1360. 1380-81

On Mo, electron yields 864, 866

On Pt, electron yields 868

On Ta, electron yields 868

On W, electron yields 864-66

scattering 886

On 28 elements, sputtering yields 844

Polarizability 220

Spin-orbit parameters 73

Ar²⁺

Ion-molecule reactions 1508-10
Low-energy collisions 321-22
Mobility in argon 740-41
On Mo, electron yields 864
On W, electron yields 865
Polarizability 220

Ar³⁺

Ion-molecule reactions 1509, 1524

Ar₂

Interaction energies 179
Interatomic potential energy 188-89, 1180
Low-energy collisions 1512
Photoionization cross section (relative) 2041

Ar₂^{*}

Extrema of the $^3\Sigma_g^+$ and $^3\Sigma_u^+$ potential curves 185
Lifetimes 212
Low-energy collisions 242-43, 255, 1512, 1518
Photoabsorption cross sections 713
Potential curves 184
Potential curves for the $^3\Sigma_g^+$ and $^3\Sigma_u^+$ states 183
Spectroscopic constants 185

$\text{Ar}_2 ({}^1\Sigma^+)$

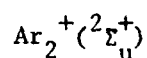
Interaction energies 180

Ar_2^+

Absorption data 133, 1206-7, 1263
Absorption spectra for the $\text{I}(1/2)_u \rightarrow \text{II}(1/2)_g$
transition 150, 1207
Dipole-allowed absorptions 134
Energies of states 1258
Energy level difference parameters 154
Energy parameters 152
Equilibrium separation 135
Ground state potential curve characteristics 121
Low-energy collisions 242, 246, 1518
Mobility in argon 740-41
On F^- , three-body recombination 321-22, 1360, 1377-78
two-body recombination 1358
Photoabsorption cross sections 712
Photodissociation cross sections 686-87
Photoionization efficiency curve 672
Potential curves 130-31, 136-37, 1188, 1190, 1195, 1196
Potential curves for the ground state 121
Spectroscopic constants 1202, 1205
Spectroscopic data 133, 1259
Total energies 132, 134

$\text{Ar}_2^+ \text{I}(1/2)_u$

Dissociation energy 149



Dissociation energy 135



Absorption data 1262, 1264
 Covalent states 32
 Diatomics-in-molecules potential surfaces 35
 Diatomics-in-molecules potential surfaces
 for the ionic states 34-36
 Electronic energies 1268
 Emission data 1256, 1260, 1262
 Ionic states 33
 Orbital representation 1251, 1256
 Potential energy curves 1252-55
 Radiative lifetimes 1268
 Spectroscopic constants 1259
 Transition moments 1261
 Vertical transition energies 1257



Low-energy collisions 256, 1520



Laser and fluorescent wavelengths 12

ArCl

Einstein coefficients 1223-25
Emission data 1226
Laser and fluorescent wavelengths 12
Potential energy curves 1222
Transition probabilities 1223
Vibrational levels 1222

ArF

Crossing points and energies of the
 III 1/2 - II 3/2 curve crossings 53
Dipole moments of the covalent states 78-79
Dipole moments of the ionic states 80-81
Einstein coefficients 107, 110, 1219-21
Emission energies and wavelengths 107, 110, 1226
Laser and fluorescent wavelengths 12
Lifetimes 107, 110
Potential energy curves for the covalent states 39, 52
Potential energy curves for the covalent and
 ionic states 20-21, 1218
Separated atom limits for the ionic states 54
Spectroscopic constants 1259
Spectroscopic constants for the ionic states 67, 69
Total energies of the covalent and ionic states 46-47
Transition moments and probabilities 107, 110, 1219
Transition moments for the ionic-covalent
 transitions 82-83, 85-86, 107, 110
Vibrational levels 1218

ArF^{*}

Dominant formation kinetics 1484
Dominant quenching kinetics 1484
Low-energy collisions 256-57, 1519, 1520

ArH⁺

Mobility in argon 740

ArI

Laser and fluorescent wavelengths 12

ArKr

Interaction energy 1182
Interatomic potential 188
Potential energy curves 1182

ArKr^{*}

Low-energy collisions 244

ArKr⁺

Absorption data 1210
Low-energy collisions 244
Potential energy curves 1208-9

Ar-Kr Ion Chemistry

Reaction rates 1495

Ar-N₂-NO e-beam Pumped System

Flow chart, with reaction rates indicated 1486

Rate coefficients 1487-88

ArO

Crossing points 1296

Dipole moments 1299

Energies of states 1286

Orbital representation 1295

Potential energy curves 1288

Radiative lifetimes 1297

Transition moments 1296, 1298

ArXe

Interatomic potential 188

As

Polarizability 1156

At

Polarizability 1157

Au

Energy distributions of photoelectrons 888

Excitation energies 1322, 1323, 1325, 1327

Orbital energies 1321, 1323

Photoelectric yield 890

Polarizability 1157

Radial expectation values 1321

Self-sputtering coefficients 838-39

AuCl

Potential energy curves 1330

Spectroscopic constants 1328

AuH

Potential energy curves 1329

Spectroscopic constants 1328

B

Electron affinity 1160

Energy level and Grotrian diagrams 911, 912

Polarizability 1156

B^+

Energy level and Grotrian diagrams 913-16

Ba

Polarizability 1157

Ba^+

On Ar, high energy electron capture 1633

high energy electron loss 1633

On N_2 , high energy electron capture 1633

high energy excitation 1650-51

high energy electron loss 1633

On O_2 , high energy electron capture 1633

high energy electron loss 1633

Ba^{2+}

On N_2 , high energy excitation 1650-51

On O_2 , high energy electron capture 1634

Be

Polarizability 217, 1156

Be^{2+}

Polarizability 220

B1

Polarizability 1157

Bk

Polarizability 1157

Br

Electron affinity 214, 1160

Low-energy collisions 251, 253, 1520-21

Photoionization cross section 652-53, 1940, 1944

Polarizability 216, 1156

Spin-orbit parameter 73

Stopping power for heavy ions 2185-86

Br^+

Equilibrium fractions in H_2 , He, N_2 , and O_2 2230

Equilibrium fractions in Ar, Kr, Ne, and Xe 2231

Br^{n+}

On Ar, high energy electron capture 1638-39

high energy electron loss 1638-39

On He, high energy electron capture 1638-39, 1644

high energy electron loss 1638-39, 1644

On H_2 , high energy electron capture 1638-39

high energy electron loss 1638-39

Br^-

Electron photodetachment cross section 682-83, 2044
Low-energy collisions 253, 1519, 1525
Mobility in argon 744
Mobility in helium 743
Polarizability 220

Br_2

Electron affinity 214, 1161
Extinction coefficient for continuous absorption 702, 704, 2032
Low-energy collisions 252, 317
Photoabsorption cross section 1968
Photoionization cross sections 652-54
Polarizability 221
Refractive indices 697

Br_2^-

Photodissociation cross section 688-89, 2066

BrCN

Photoionization cross section (relative) 2013

BrCl

Extinction coefficient for continuous absorption 702, 2032



Average energy expended by a charged particle to
create an ion pair 814



Electron affinity 1162



Electron affinity 1160
Energy level and Grotrian diagrams 917-27
Photoionization cross section 1949-50
Polarizability 1156
Stopping power for heavy ions 2189, 2190



Energy level and Grotrian diagrams 928-32
Ion-molecule reactions 1392



Beam attenuation in an electric field 767
Ion-molecule reactions 1401
Photodetachment cross section 2046, 2048, 2061



Electron affinity 1162



Ion-molecule reactions 1393



Ion-molecule reactions 1401-2

Photodetachment cross section (relative) 2062



Electron affinity 1162



Ion-molecule reactions 1402

Photodetachment cross section (relative) 2062



Secondary electron spectra from electron impact
ionization 2275-79



Secondary electron spectra from electron impact
ionization 2277-79



Secondary electron spectra from electron impact
ionization 2277-79, 2283-85



Photoionization cross section (relative) 2017



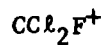
On Cl^- , two-body recombination 1359



On Cl^- , two-body recombination 1359



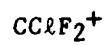
Polarizability 221



On Cl^- , two-body recombination 1359



Average energy expended by a charged particle to
create an ion pair 814



On Cl^- , two-body recombination 1359



Electron affinity 1161



Electron affinity 1161



Electron affinity 1161



Polarizability 221



Electron affinity 1161



Ion-molecule reactions 1392



Photodetachment cross section 2061

2422

CH₂

Electron affinity 1162

CH₂⁻

Photodetachment cross section 2063

CH₃

Electron affinity 1162

CH₃⁻

Photodetachment cross section 2064

CH₃Br

Photoionization cross section (relative) 2014

CH₃Cl

Photoionization cross section (relative) 2015

CH₃F

Photoionization cross section (relative) 2016

2423

CH₃O

Electron affinity 1161

CH₃S

Electron affinity 1161

CH₄

Photoabsorption cross section 1988

Polarization 221

Secondary electron spectra from electron impact
ionization 2280-85, 2288

Secondary electron spectra from proton impact
ionization 2350-51

CN

Electron affinity 1162

CN⁻

Ion-molecule reactions 1401

CO

Average energy expended by a charged particle to
create an ion pair 814
Dipole and quadrupole moments 221
Photoabsorption cross section 1989
Polarizability 221
Secondary electron spectra from electron impact
ionization 2286-87

CO*

On He, Ar, H₂, D₂, CO, and O: V → T energy transfer
rates at 300° K 1448
On CO, O₂, N₂: V + V energy transfer rates at
300° K: 1449
On CS₂, SO₂, OCS, N₂O, CO₂: V + V energy transfer
rates at 300° K 1450
On CO, He, Ar, H₂, N₂: cross sections for broadening
V - R optical transitions 1451
Rates for deactivation 1465-66

CO⁺

Ion-molecule reactions 1392-93

CO₂

- Average energy expended by a charged particle to create an ion pair 814
- Dipole and quadruple moments 221
- Electron affinity 1162
- Energy levels for three vibrational modes, compared with those of N₂ and CO 1460
- On HCl, DCl, HBr, DBr, HI, HF, DF
 - deactivation rates for HX and DX at 300° K 1454, 1456-58
 - deactivation rates for CO₂ at 300° K 1455, 1459
- Photoabsorption cross section 1990
- Polarizability 221
- Rates for deactivation 1460-68
- Secondary electron spectra from electron impact ionization 2286, 2288, 2373

CO₂^{*}

- Diffusion in CO₂ 2120

CO₂ Electric Discharge Laser

- Rate coefficients for electron impact ionization 1472
- Rate coefficients for electron attachment 1472-73
- Rate coefficients for electron detachment 1473
- Rate coefficients for charge transfer, interchange, clustering 1473-75
- Rate coefficients for electron-ion and ion-ion recombination 1476-77
- Rate coefficients for vibrational pumping reactions 1478
- Rate coefficients for electronic pumping and de-excitation reactions 1478

Rate coefficients for vibrational relaxation reactions 1479-80

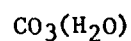
Rate coefficients for free radical reactions 1481-83



Ion-molecule reactions 1393



Electron affinity 1162



Electron affinity 1162

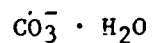


Ion-molecule reactions 1401

Photodestruction cross section 2072-73

Photodetachment cross section 2055-56

Photodissociation cross section 2069



Ion-molecule reactions 1401



Electron affinity 1162

2427

CO_4^-

Ion-molecule reactions 1401
Photodissociation cross section 2070

CS

Electron affinity 1162

Ca

Polarizability 1156

Ca^{2+}

Polarizability 220

Cd

Electron affinity 1160
Photoelectric yields 889
Photoionization cross section 1959-61
Polarizability 1157
Stopping power for heavy ions 2197-98

Ce

Polarizability 1157

Cf

Polarizability 1157

Cl

Continuous free - free absorption coefficients 693
Electron affinity 214, 1160
Energy level and Grotrian diagrams 1032-55
Energy parameters 152
Free - free absorption cross sections 2078
Low-energy collisions 251, 253, 316, 1520
Photoionization cross section 652-53, 1939, 1943
Polarizability of ground state 216, 1156
Spin-orbit parameter 73
Stopping power for heavy ions 2183-84

Cl⁺

Energy level and Grotrian diagrams 1056-80
Ion-molecule reactions 1393

Cl⁻

Electron photodetachment cross section 682-83, 2044
Energy parameters 152
Ion-molecule reactions 1402
Low-energy collisions 1519, 1521, 1524-25
Mobility in argon 744
Mobility in helium 743
Polarizability 220

C₂CN

Photoionization cross section (relative) 2018

Cl₂

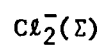
Dipole and quadrupole moments 221
Electron affinity 214, 1161
Extinction coefficient for continuous absorption 702, 704, 2032
Ground state potential curve characteristics 121
Low-energy collisions 252
Polarizability 221
Potential curves 151-52
Potential curves for the ground state 121
Refractive indices 697

Cl₂⁻

Energy level difference parameters 154
Ground state potential curve characteristics 121
Ion-molecule reactions 1402
Low-energy collisions 252
Photodissociation cross section 688-89, 2066
Potential curves 151
Potential curves for the ground state 121

Cl₂⁻(π)

Energy parameters 152



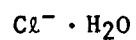
Energy parameters 152



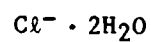
Photoabsorption cross section (relative) 2019-20



Ion-molecule reactions 1393



Ion-molecule reactions 1402



Ion-molecule reactions 1402



Photoabsorption cross section 1991-93



Ion-molecule reactions 1402

$C_2F_x/CS_2/D_2$ Reaction Model

23 low energy reactions involving various combinations
of C,F,C,S, and D atoms 1443

$C_2F_x/CS_2/H_2$ Reaction Model

19 low energy reactions involving various combinations
of C,F,C,S, and H atoms 1428-19

Cm

Polarizability 1157

Co

Polarizability 1156

Cr

Polarizability 1156

Self-sputtering coefficients 840-41

Cs

Electron affinity 1160

Polarizability 217, 1157

Stopping power for heavy ions 2199-2200

Cs (np)

Minimum electric field strength for field ionization 769

Cs (42p)

Electric field strength for ionization 770

Cs⁺

Longitudinal diffusion 746

Mobility in argon 740

Mobility in krypton 739

Mobility in neon 739

Mobility in xenon 739

On Ar, high energy electron capture 1632

high energy electron loss 1632

On H₂, high energy excitation 1648-49

On N₂, high energy electron capture 1632

high energy electron loss 1632

On O₂, high energy electron capture 1632

high energy electron loss 1632

Polarizability 220

Cu

Electron affinity 1160

Photoelectric yield 891

Polarizability 1156

Self-sputtering coefficient 838-39

D

Electron affinity 1160

D⁺

On Ag, sputtering yields 844

D₂

Photoabsorption cross section 1970, 1973-74

D₂(C³π_u)

Quenching rate in external electric field 773

D₂O

Photoabsorption cross section 1999-2000, 2002

DF/CO₂ Transfer Reaction Model

38 low-energy reactions involving DF and CO₂ molecules 1441-42

DF/HF, D/H V-V and Isotopic Exchange Reaction Model

47 low energy reactions involving various combinations
of D, H, and F atoms 1444-45

Dy

Polarizability 1157

Electrons

Backscattering coefficients 870-78
Energy to create ion-pair in pure gas 814-2207
On air, constants A and B in the equation
 $\alpha/p = Ae^{-B/(E/p)}$ 731
On Al, backscattering 878
bremsstrahlung yield 782
On Ar, constants A and B in the equation
 $\alpha/p = Ae^{-B(E/p)}$ 731
On Ar, cross sections for simultaneous ionization
and excitation 492
On Ar, energy loss 782
On Ar, excitation cross sections 489-91
On Ar, excitation of the 1048 Å line 490
On Ar, excitation of the 1067 Å line 489
On Ar, first Townsend ionization coefficient α
divided by gas pressure (p) 731
On Ar, fractional energy loss (K) per collision
for electrons of mean energy ($\bar{E}$) 729
On Ar, ionization 540-41
On Ar, ionization and excitation efficiencies 507
On Ar, ionization, secondary electron spectra 2255-59, 2261
On Ar, momentum transfer cross section 442, 446-47, 1663
On Ar, range 782
On Ar, rate coefficient for ionization 577
On Ar, ratios of cross sections σ^{n+}/σ_T in ionization 546-47
On Ar, total collision cross section 440-41
On Ar, total elastic scattering cross section 442
On Ar, transport coefficients 726-29

On Ar, total cross section for scattering from mixture
 of $3p_0$ and $3p_2$ states 443
 On Ar, [combined $4s$ ($4s'$) states], excitation 491
 On Ar*, ionization 586
 On Ar⁺, excitation cross sections 470-71
 recombination (radiative) 1859
 On Ar²⁺, recombination (radiative) 1859
 On Ar³⁺, recombination (radiative) 1859
 On Ar⁴⁺, recombination (radiative) 1859
 On Ar₂*, ionization 1829-30
 On Ar₂⁺, dissociative recombination 622-23
 On Ba⁺, single ionization 564-65
 On Br, bremsstrahlung yield 787
 On Br, energy loss 787
 elastic scattering 1661
 On Br₂, drift velocity 730
 ratio of electron to gas temperature 730
 On C, attachment (radiative) 1866
 elastic scattering 1664
 excitation 496-97
 ionization 1823
 On C⁺, recombination coefficient 592
 recombination (dielectronic) 1861
 recombination (radiative) 622, 1859, 1860
 On C³⁺, excitation (electronic) 1734
 ionization 1824
 recombination (dielectronic) 1861
 recombination (radiative) 1860
 On C⁴⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On C⁵⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On C₂⁺, recombination (dielectronic) 1861
 recombination (dissociative) 1847, 1851
 recombination (radiative) 1860

On C_2F_6 ,	attachment coefficient	2106
	ionization coefficient	2106
	transport properties	2104-5
On C_2H_2 ,	dissociation	1814-17
	energy and angular distributions of secondary electrons	2373
	ionization, secondary electron spectra	2277-79
	total scattering	1718
On $C_2H_2^+$,	recombination (dissociative)	1847, 1857
On $C_2H_3^+$,	recombination (dissociative)	1847, 1858
On C_2H_4 ,	ionization, secondary electron spectra	2277-79
On C_2H_6 ,	ionization, secondary electron spectra	2277-79, 2283-85
On C_3F_8 ,	transport properties	2104-5
On C_4F_{10} ,	transport properties	2104-5
On CCl_2F_2 ,	transport properties	2103
On CF_4 ,	attachment (dissociative)	1915-16
	attachment coefficient	2106
	ionization coefficient	2106
	transport properties	2104-5
On CH^+ ,	recombination (dissociative)	1847, 1852
On CH_2^+ ,	recombination (dissociative)	1847, 1853
On CH_3^+ ,	recombination (dissociative)	1847, 1854
On CH_4 ,	dissociation	1807-13
	ionization, secondary electron spectra	2280-85, 2288
	momentum transfer	1716
	total scattering	1714-15
On CH_4^+ ,	recombination (dissociative)	1847, 1855
On CH_5^+ ,	recombination (dissociative)	1847, 1856
On CO,	attachment (dissociative)	1866-87
	dissociation	1782-84
	excitation (electronic)	1749
	excitation (vibrational)	504
	first ionization coefficient	2101
	ionization	542-43
	ionization, secondary electron spectra	2286-87
	momentum transfer	1694

total scattering 1691-93
 transport coefficients 2091-92
 On CO₂, attachment (dissociative) 1889-94
 constants A and B in the equation $\alpha/p = A e^{-B/(E/p)}$ 731
 dissociation 1789-94
 effective ionization coefficient 2101
 energy and angular distributions of secondary
 electrons 2373
 first ionization coefficient 2102
 ionization 548-49, 1831
 ionization, secondary electron spectra 2286, 2288
 momentum transfer 1702-3
 total scattering 1699-1701
 transport coefficients 2093-94
 On CO₂⁺, recombination (dissociative) 623
 In CO₂:N₂: He Mixtures, transport properties 2097-2100
 On CS₂, attachment (dissociative) 1910-14
 On Ca⁺, ionization 562-63
 On Cl attachment (radiative) 1869
 bremsstrahlung yield 786
 elastic scattering 1660
 energy loss 786
 range 786
 On Cl₂, attachment 632-35, 1878
 drift velocity 730
 ionization 582-84
 ion-pair formation 634-35
 ratio of electron to gas temperature 730
 total and partial dissociative attachment 632-33
 total scattering crosssection 450, 1719
 On Cs⁺, ionization 568-69
 On Cu, backscattering 878
 On D₂, attachment (dissociative) 1874

dissociation 520-21, 1757-59
 ionization 532-33
 On D_2^+ , cross section for production of D^+ ions 550-51
 dissociative recombination 616-17
 On DCl , attachment (dissociative) 1883
 On different metals, values of the peak secondary electron levels 853
 On F , attachment (radiative) 1868
 bremsstrahlung yield 785
 elastic scattering 1659
 energy loss 785
 momentum transfer cross section 442
 range 785
 total elastic scattering cross section 442
 On F_2 , dissociative attachment 630-31
 ionization 584
 momentum transfer cross section 449
 total elastic cross section 449
 On Fe , backscattering 872-73
 On H , attachment (dissociative) 1871-72
 attachment (radiative) 628-29, 1865
 bremsstrahlung yield 789
 collisional excitation 456-57
 energy loss 789
 range 789
 single ionization 528-29
 total scattering 434-35
 On H^* (2s), ionization 530-31
 On H^+ , cross sections for radiative capture of electrons 596-97
 recombination coefficients 591-95, 598-601
 recombination cross sections 593, 622
 On HBr , attachment (dissociative) 1884
 On HCl , attachment (dissociative) 1880-82
 constants A and B in the equation $\alpha/p = Ae^{-B/(E/p)}$ 731
 elastic scattering 1721
 excitation (rotational) 1722-24
 momentum transfer 1725

total scattering 1720
 On HCO^+ , recombination (dissociative) 623
 On HD, attachment (dissociative) 1873
 On HF, elastic scattering 1726
 excitation (rotational) 1727-29
 On H_2 , angular distribution of protons produced in
 dissociative ionization 516-17
 attachment (dissociative) 1871-72
 constants A and B in the equation $\alpha/p = Ae^{-B/(E/p)}$ 731
 differential cross sections for ejection of electrons 572-73
 dissociation 518-19, 1754-56
 dissociative ionization 534-35
 energy spectra of protons obtained in dissociative
 ionization 514-15
 excitation (electronic) 1742
 first ionization coefficient 2101
 fractional energy loss (K) per collision for electrons
 of mean energy ($\bar{E}$) 729
 ionization 532-33
 ionization, secondary electron spectra 2272-74, 2283-85
 momentum transfer 1676-77
 total scattering 434-35, 1675
 transport coefficients 2086-87
 On H_2^+ , attachment (radiative) 1875
 cross section for dissociative ionization 552-53
 cross section for the production of protons 550-53
 dissociation 512-13
 dissociative recombination 616-17, 623, 1841
 recombination coefficients 602-3
 On H_2O , attachment (dissociative) 1897-99
 constants A and B in the equation $\alpha/p = Ae^{-B/(E/p)}$ 731
 dissociation 1795-1802
 energy and angular distributions of secondary electrons 2373
 ionization, secondary electron spectra 2289-92
 momentum transfer 1709-10

	total scattering	1708
	transport coefficients	2095-96
On H_2O^+ ,	recombination (dissociative)	1847, 1849
On H_3^+ ,	dissociation	1760
	recombination (dissociative)	618-19, 623, 1842
On $H_3^+ \cdot H_2$	recombination (dissociative)	623
On H_3O^+ ,	recombination (dissociative)	623, 1837-38,
		1847, 1850
On $H_3O^+ \cdot H_2O$,	electron temperature dependence for	
	recombination	625
On $H_3O^+ \cdot (H_2O)_2$,	electron temperature dependence for	
	recombination	625
On $H_3O^+ \cdot (H_2O)_3$,	electron temperature dependence for	
	recombination	625
On hydrogenic ions,	collisional excitation	458-59
On HI,	attachment (dissociative)	1885
	bremsstrahlung yield	780
On He,	constants A and B in the equation	
	$\alpha/p = Ae^{-B/(E/p)}$	731
	cross sections for emission of the He II	
	spectral lines	462-63
	differential cross sections for ejection	
	of electrons	570-71
	differential cross sections for inelastic	
	and elastic scattering	438-39
	elastic differential scattering	436-37
	electron energy distribution function	
	at 77° K	724-25
	energy loss	780
	excitation cross sections	460-61, 472-77
	first ionization coefficient	2102
	first Townsend coefficient (α) divided	
	by the gas pressure (p)	731
	ionization	540-41, 1820

	ionization, secondary electron	
	spectra	2248-52
	momentum transfer cross section	442, 444, 724-25
	range	780
	rate coefficients for ionization	575
	ratios for cross sections σ^{2+}/σ_T in	
	ionization	536-37
	single ionization	538-39
	total collision cross section	440
	total elastic scattering cross section	442
	total scattering	434-35
	transport coefficients	721-23
On He (2^1S_0),	total scattering cross section	450
On He (2^3S_1),	total scattering cross section	450
On He ($2^1,^3S$),	ionization	585
On He ⁺ ,	collisional excitation	464-65
	cross section for production of He ²⁺	554-55
	recombination coefficients	592, 604-7, 610-15, 622
	recombination (dielectronic)	1861
On He ₂ ⁺ ,	recombination (dissociative)	623
On He/N ₂ /CO ₂ ,	recombination rate as function of E/N	1470
On He/N ₂ /CO ₂ /H ₂ O,	attachment rate as function of E/N	1471
On Hg,	constants A and B in the equation	
	$\alpha/p = Ae^{-B/(E/p)}$	731
	excitation (electronic)	1735-36
	fractional energy loss (K) for electrons	
	of mean energy ($\bar{\epsilon}$)	729
	momentum transfer	1674
	total scattering	1673
On Hg ⁺ ,	excitation (electronic)	1737-39
	ionization	1832
On Hg ²⁺ ,	excitation (electronic)	1740
On I,	attachment (radiative)	1870
	bremsstrahlung yield	788

elastic scattering 1662
 energy loss 788
 range 788
 On I₂, attachment (dissociative) 636, 1879
 drift velocity 730
 electron attachment coefficient K 637
 ratio of electron to gas temperature 730
 On K⁺, single ionization 556-57
 recombination 622
 On Kr, bremsstrahlung yield 783
 constants A and B in the equation $\alpha/p = Ae^{-B/(E/p)}$ 731
 drift velocities 728
 energy loss 783
 first Townsend coefficient (α) divided by the
 gas pressure (p) 731
 ionization 580-81
 ionization, secondary electron spectra 2260-61
 momentum transfer cross section 442, 448
 range 783
 rate coefficient for ionization 578
 total collision cross section 440-41
 total elastic scattering cross section 442
 On Kr*, ionization 586
 On Kr₂⁺, rate coefficient for dissociative recombination 623-24
 On Li, ionization 554-55
 On Li⁺, excitation 500-1
 recombination coefficient 622
 single and double ionization 556-57
 On Mg⁺, single ionization 566-67
 On Mg²⁺, single ionization 566-67
 On Mo, backscattering 876-77
 emission of secondary electrons 850-51
 On N, bremsstrahlung yield 790
 elastic scattering 1667
 energy loss 791

ionization 542-43, 1822
 range 790
 total scattering 1665-66
 On N^+ , recombination coefficient 592, 622
 recombination (dielectronic) 1861
 recombination (radiative) 1859, 1860
 single ionization 558-59
 On N^{2+} , recombination (dielectronic) 1861
 recombination (radiative) 1860
 single ionization 558-59
 On N^{3+} , recombination (dielectronic) 1861
 recombination (radiative) 1860
 On N^{4+} , ionization 1825
 recombination (dielectronic) 1861
 recombination (radiative) 1860
 On N^{5+} , recombination (dielectronic) 1861
 recombination (radiative) 1860
 On N^{6+} , recombination (dielectronic) 1861
 recombination (radiative) 1860
 On NF_3 , attachment (dissociative) 1901-3
 On NH_3 , attachment (dissociative) 1900
 dissociation 1803-6
 drift velocity 2108
 energy and angular distributions of secondary
 electrons 2373
 ionization, secondary electron spectra 2286
 momentum transfer 1713
 total scattering 1712
 On NH_4^+ , recombination (dissociative) 1839-40
 On N_2 , constants A and B in the equation $\alpha/p = Ae^{-B/(E/p)}$ 731
 differential cross sections for ejection of electrons 572-73
 dissociation 1761-71
 dissociative ionization 534-35
 elastic scattering 1682-83

excitation (electronic) 1743-44
 excitation (vibrational) 502-3
 first ionization coefficient 2102
 fractional energy loss (K) per collision for
 electrons of mean energy ($\bar{E}$) 729
 global view of vibrational excitation 502
 ionization 538-39, 544-45
 ionization, secondary electron spectra 2268-71
 momentum transfer 1684-85
 recombination rate as function of E/N 1469
 total scattering 1678-81
 transport coefficients 2088-89
 On N_2^+ , recombination coefficient 608-9
 On N_2^+ , dissociation 512-13
 excitation (electronic) 1745
 recombination (collisional-radiative) 608-9
 recombination (dissociative) 622-23, 1845
 On N_2H^+ , recombination (dissociative) 1846
 On $N_2^+ \cdot N_2$, recombination (dissociative) 623
 On N_2O , attachment (dissociative) 1895-96
 drift velocity 2108
 momentum transfer 1706-7
 total scattering 1704-5
 On NO, attachment (dissociative) 1888
 dissociation 1785-88
 elastic scattering 1697
 excitation (electronic) 1750-51
 excitation (vibrational) 506
 ionization, secondary electron spectra 2286
 momentum transfer 1698
 total scattering 1695-96
 On NO^+ , recombination (dissociative) 620-23, 1843
 On $NO^+ \cdot NO$, recombination (dissociative) 623
 On Na^+ , single ionization 556-57
 recombination 622

On Ne, bremsstrahlung yield 781
 constants A and B in the equation $\alpha/p = Ae^{-B/(E/p)}$ 731
 emission cross sections 466-67
 energy loss 781
 excitation cross sections 466-67, 478-88
 first Townsend coefficient (α) divided by the
 gas pressure (p) 731
 ionization 540-41
 ionization, secondary electron spectra 2253-54
 momentum transfer cross section 442, 445
 range 781
 rate coefficient for ionization 576
 ratios of cross sections σ^{n+}/σ_T in ionization 536-37
 total collision cross section 440
 total elastic scattering cross section 442
 total scattering cross section 441
 transport coefficients 726-27
 On Ne*, ionization 586
 On Ne⁺, ionization 548-49
 recombination (dielectronic) 1861
 recombination (radiative) 622, 1859, 1860
 On Ne²⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On Ne³⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On Ne⁴⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On Ne⁵⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On Ne⁶⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On Ne₂*, ionization 1827-28
 On Ne₂⁺, dissociative recombination 622-23
 On Ni, backscattering 874-75
 emission of secondary electrons 848-49

On O, attachment (radiative) 1867
 bremsstrahlung yield 791
 elastic scattering 1668
 energy loss 792
 excitation 498-99
 ionization 1821
 momentum transfer 1671-72
 range 791
 single ionization 528-29
 total scattering 1669-70
 On O⁺, recombination (dielectronic) 1861
 recombination (radiative) 592, 622, 1859, 1860
 single ionization 560-61
 On O²⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 single ionization 560-61
 On O³⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On O⁴⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On O⁵⁺, ionization 1826
 recombination (dielectronic) 1861
 recombination (radiative) 1860
 On O⁶⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On O⁷⁺, recombination (dielectronic) 1861
 recombination (radiative) 1860
 On OCS, attachment (dissociative) 1904-9
 total scattering 1717
 On OH, momentum transfer 1711
 On OH⁺, recombination (dissociative) 1847-48
 On O₂, attachment (dissociative) 1876-77
 constants A and B in the equation $\alpha/p = Ae^{-B/(E/p)}$ 731
 differential cross sections for ejection of electrons 572-3
 dissociation 522-23, 1772-81

effective ionization coefficient 2101
 elastic scattering 1689
 excitation (electronic) 1746-48
 excitation (vibrational) 505
 ionization 544-45
 ionization coefficient 2103
 ionization, secondary electron spectra 2265-67
 momentum transfer 1690
 total scattering 1686-88
 transport coefficients 2090, 2092
 On O_2^+ , dissociation 510-11
 recombination (dissociative) 620-23, 1844
 On $O_2^+ \cdot O_2$, recombination (dissociative) 623
 On Pb, backscattering 878
 On Rb^+ , ionization 568-69
 On SF_6 , momentum transfer 1730
 transport properties 2107
 On semiconductors and insulators,
 maximum secondary electron yields 854
 On steel, backscattering 870-71
 On steel, emission of secondary electrons 846-47
 On Sr^+ , ionization 562-63
 On T^+ , single ionization 564-65
 On U, excitation 1741
 ionization 1833
 On UF_6 , elastic scattering 1731
 momentum transfer 1732
 On Xe, bremsstrahlung yield 784
 constants A and B in the equation

$$\alpha/p = Ae^{-B/(E/p)} \quad 731$$

 cross sections for the production of
 fluorescence 493-95
 drift velocities 728
 energy losses 784
 first Townsend coefficient (α) divided by the
 gas pressure (p) 731

ionization 580-81
 ionization, secondary electron spectra 2260-61
 momentum transfer cross section 442, 448
 range 784
 rate coefficient for ionization 579
 total collision cross section 440-41
 total elastic scattering cross section 442
 On Xe*, ionization 586
 On Xe₂⁺, recombination (dissociative) 623-25
 On XeF₂, thermal rate coefficient for dissociative
 electron attachment 638

Er

Polarizability 1157

Es

Polarizability 1157

Eu

Polarizability 1157

F

Electron affinity 214, 1160
 Energy level and Grotrian diagrams 970-75
 Energy parameters 152
 Low-energy collisions 251

On He, high-energy F^- production 419
Photoionization cross section 652-53, 1938, 1942
Polarizability 216, 1156
Spin-orbit parameter 73
Stopping power for heavy ions 2181-82

F^+

Energy level and Grotrian diagrams 976-90

F^-

Electron photodetachment cross section 682-83, 2044
Energy parameters 152
Ion-molecule reactions 1403
Mobility in argon 744
Mobility in helium 743
Polarizability 220

FCN

Photoionization cross section (relative) 2022

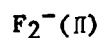
F_2

Attachment 630-31
Dipole and quadrupole moments 221
Electron affinity 214, 1161
Extinction coefficient for continuous absorption 702, 704
Low-energy collisions 252-53
Photoabsorption cross section (relative) 2021

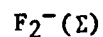
Refractive index 697



Energy level difference parameters 154
Ground state potential curve characteristics 121
Photodissociation cross section 688-89, 2066
Potential curves for the ground state 121



Energy parameters 152



Energy parameters 152

F_2/D_2 Chain Reaction Model

261 low-energy reactions involving various combinations
of F and D atoms 1430-36

F_2/D_2 Cold Reaction Model

127 low-energy reactions involving various combinations
of F and D atoms 1437-40

F_2/H_2 Chain Reaction Model

148 low-energy reactions involving various combinations
of F and H atoms 1413-17

F_2/H_2 Cold Reaction Model

64 low-energy reactions involving various combinations
of F and H atoms 1418-20

$F_2/NO/HI/H_2$ Reaction Model

71 low-energy reactions involving various combinations
of F, N, O, H, and I atoms 1423-25

F_2O

Photoionization cross section (relative) 2023-24

F_2/O_2H_2 Reaction Model

35 low-energy reactions involving various combinations
of F, O, and H atoms 1426-27

Fe

Electron affinity 1160

Polarizability 1156

Self-sputtering coefficients 843

Fe⁺

Ion-molecule reactions 1393

FeO

Electron affinity 1161

Fission Fragments

Excited state formation in N₂ 2215

Fm

Polarizability 1157

Fr

Polarizability 1157

Ga

Excitation energies 1304

Ionization potential 1304

Polarizability 1156

GaKr

Absorption data 1314

2453

Electronic energies 1303
Emission data 1314
Orbital representation 1316
Potential energy curves 1305-6
Spectroscopic constants 1304
Transition moments 1309-11

GaKr⁺

Electronic energies 1303
Orbital representation 1316
Potential energy curves 1305-6
Spectroscopic constants 1304

Gd

Polarizability 1157

Ge

Polarizability 1156
Spectral distribution curve 892

h ν

See target species.

H

Critical electric field strength, F_c 760

Electric field ionization probability	763
Electron affinity	1160
Energy level and Grotrian diagrams	902-4
Field ionization spectra	761-62, 764
Ionization energy as function of external magnetic flux density	772
On Ar,	high-energy electron capture 396-97
	high-energy ionization 1534-35
	high-energy production of slow positive ions 1538
	high-energy stripping 1548-49
On C,	high-energy stripping 1552-53
On CCl ₂ F ₂ ,	high-energy stripping 419
On CO,	high-energy stripping 1552-53
On CO ₂ ,	high-energy production of slow negative ions 1537
	high-energy production of slow positive ions 1537
	high-energy stripping 1552-53
On Cu,	scattering from surface 880-81
On He,	high-energy electron capture 350-51
	high-energy excitation 336-37, 340-41, 1560-61
	high-energy ionization 1534-35
	high-energy production of free electrons 358-59
	high-energy production of slow positive ions 356-57, 1538
	high-energy stripping 362-63, 1548-49
On H ₂ ,	high-energy ionization 1534-35
	high-energy production of free electrons 358-59
	high-energy production of slow positive ions 356-57, 1541-42
	high-energy stripping 1548-49
On H ₂ O,	high-energy stripping 1552-53
On Kr,	high-energy H ⁺ production 401
	high-energy H ⁻ production 403
	high-energy Kr ion production 401
	high-energy ionization 1534-35

	high-energy production of slow positive ions	1538
	high-energy stripping	404-5, 1548-49
On N,	high-energy stripping	1552
On N ₂ ,	high-energy excitation	1577-78
	high-energy ionization	1534-35
	high-energy stripping	1548-49
On Ne,	high-energy electron capture	394-95
	high-energy ionization	1534-35
	high-energy production of slow positive ions	1538
	high-energy stripping	362-63, 1548-49
On O,	high-energy stripping	1552
On O ₂ ,	high-energy ionization	1534-35
On Xe,	high-energy H ⁻ production	403, 406-9
	high-energy ionization	406-9, 1534-35
	high-energy production of slow positive ions	1540
	high-energy stripping	406-9, 1548-49
Photoionization cross section		1922-23
Polarizability		217, 1156
Stopping power for heavy ions		2169-70

H (2s)

On H ₂ ,	high-energy electron loss or stripping	360-61
On He,	high-energy electron loss or stripping	360-61

H (n = 8)

Electric field spectrum line	765
------------------------------	-----

H*

Electric field ionization spectrum	761-62
------------------------------------	--------

Photoionization cross section 1922-23

H^+

Emission spectrum induced by 4 MeV H^+ on dense Ar target	2220
Emission spectrum induced by 4 MeV H^+ on dense He target	2219
Energy degradation of 4 MeV H^+ in He	2218
Energy deposition for 1 keV H^+ in N_2	2213
Energy loss pathways for high-energy H^+ in high-density N_2	2211
Energy loss pathways for high-energy H^+ in high-density O_2	2212
Energy to create ion-pair in binary gas mixtures	2208
Energy to create ion-pair in pure gas	2207
Equilibrium fractions in H and H_2	2225-26
in He and Ar	816-17
in CO , CO_2 , H_2O , Kr, and Ne	2227
in N_2 and O_2	818-19
Ion-molecule reactions	1393
On Ag, sputtering yields	844
On Ar, high-energy electron capture	392-93, 396-97, 1550-51
equilibrium fractions	816-17
high-energy excitation	392-93, 1562-64
high-energy ionization	1532-33
high-energy production of slow positive ions	1538-39
ionization, secondary electron spectra	2313-18
path length	2137
projected range	2141, 2146
range	804-5
rate coefficient for ionization	577
rate coefficient for charge transfer	577
stopping cross section	794-95
stopping power	2128, 2133
On Br, path length	2138
projected range	2142, 2147

stopping power 2129, 2134
 On C, high-energy electron capture 1554
 path length 2139
 projected range 2143, 2148
 stopping power 2130, 2135
 On C₂H₂, ionization, secondary electron spectra 2350
 On C₂H₄, ionization, secondary electron spectra 2350
 On C₂H₆, ionization, secondary electron spectra 2350
 On CH₄, high-energy electron capture 1556-57
 high-energy production of slow positive ions 1547
 ionization, secondary electron spectra 2350-51
 On CO, high-energy electron capture 1554-55
 high-energy excitation 1580
 high-energy ionization 1536
 high-energy production of slow negative ions 1536
 high-energy production of slow positive ions 1536, 1547
 ON CO₂, high-energy electron capture 1554-55
 high-energy production of slow negative ions 1537
 high-energy production of slow positive ions 1537
 On Cd, path length 2140
 projected range 2144, 2149
 stopping power 2131, 2136
 On Cl, path length 2138
 projected range 2142, 2147
 stopping power 2129, 2134
 On Cs, path length 2140
 projected range 2144, 2149
 stopping power 2131, 2136
 On Cu, scattering from surface 880-81
 On F, path length 2138
 projected range 2142, 2147
 stopping power 2129, 2134
 On H, high-energy electron capture 1556
 path length 2137

stopping power 2129, 2134
 On Kr, high-energy electron capture 402, 1550-51
 high-energy excitation 1563
 high-energy ionization 402, 1532-33
 high-energy production of slow positive ions 402, 1538-39
 path length 2137
 projected range 2141, 2146
 range 804-5
 rate coefficient for charge transfer 578
 rate coefficient for ionization 578
 stopping cross section 794-95
 stopping power 2128, 2133
 On Mo, electron yields 867
 On N, high-energy electron capture 1556
 path length 2139
 projected range 2143, 2148
 stopping power 2130, 2135
 On NH₃, ionization, secondary electron spectra 2349
 On N₂, equilibrium fractions 818-19
 high-energy electron capture 348-49, 1550-51
 high-energy excitation 348-49, 352-53, 1574-76, 1620
 high-energy ionization 1532-33
 high-energy production of slow positive ions 1543-44
 ionization, secondary electron spectra 2335-2345
 range 806-7
 stopping cross section 796-97
 On NO, high-energy excitation 1579
 On Ne, high-energy electron capture 394-95, 1550-51
 high-energy excitation 1562-63, 1565
 high-energy ionization 1532-33
 high-energy production of slow positive ions 1538-39
 ionization, secondary electron spectra 2310-12, 2348

path length 2137
 projected range 2141, 2145
 range 804-5
 rate coefficient for charge transfer 576
 rate coefficient for ionization 576
 stopping cross-section 794-95
 stopping power 2128, 2132
 On Ni, secondary electron emission 856-57
 On O, high-energy electron capture 1556
 path length 2139
 projected range 2143, 2148
 stopping power 2130, 2135
 On O₂, equilibrium fractions 818-19
 high-energy electron capture 348-49, 1550-51
 high-energy excitation 348-49, 1570-73
 high-energy ionization 1532-33
 high-energy production of slow positive ions 1545-46
 ionization, secondary electron spectra 2346
 On S, path length 2139
 projected range 2143, 2148
 stopping power 2130, 2135
 On U, path length 2140
 projected range 2144, 2149
 stopping power 2131, 2136
 On Xe, energy and angular distributions of secondary electrons 2374
 high-energy electron capture 406-9, 1550-51
 high-energy ionization 406-9
 high-energy production of slow positive ions 406-9, 1540
 ionization, secondary electron spectra 2319-22
 path length 2137
 projected range 2141, 2146
 range 804-5

rate coefficient for charge transfer 579
 rate coefficient for ionization 579
 stopping cross-section 794-95
 stopping power 2128, 2133

H⁻

Beam attenuation in an electric field 767
 Electron detachment by applied electric field 771
 Ion-molecule reactions 1403
 On Ar, high-energy single electron loss or stripping 398-99
 On CCl₂F₂, high-energy stripping 419
 high-energy ion production 420
 On CCl₄, high-energy ion production 420
 On H₂, high-energy loss of two electrons 366-67
 high-energy one electron loss or stripping 364-65
 On He, high-energy excitation 338-39
 high-energy loss of two electrons 366-67
 high-energy one electron loss or stripping 338-39, 364-65
 On Kr, high-energy electron capture 404
 high-energy excitation 404
 high-energy stripping 405
 On Ne, high-energy single electron loss or stripping 398-99
 On Xe, high-energy electron capture 404
 high-energy excitation 404
 high-energy ionization 406-9
 high-energy production of slow positive ions 1540
 high-energy stripping 405-9
 Photodetachment cross section 2046-47
 Polarizability 220

HBr

Dipole and quadrupole moments 221
Extinction coefficient for continuous absorption 2033
Polarizability 221

HCl

Dipole and quadrupole moments 221
Photoabsorption cross section 1994
Polarizability 221
Photoionization cross section (relative) 2025
Rates for deactivation 1465-66

HF

Dipole and quadrupole moments 221
Photoionization cross section (relative) 2026
Polarizability 221
Rates for deactivation 1465-66

HF/CO₂ Transfer Reaction Model

35 low-energy reactions involving HF and CO₂ 1421-2

HI

Extinction coefficients 2033

H₂

Average energy expended by a charged particle to create an ion pair	814
Dipole and quadrupole moments	221
Electron affinity	1162
General wavelength ranges for observed emission continua	711
Multiphoton ionization	700
Photoabsorption cross section	1970-72
Polarizability	221
Rates for deactivation	1465-66
Secondary electron spectra from electron impact ionization	2272-74, 2283-85
Secondary electron spectra from proton impact ionization	2325-35

H₂(C³π_u)

Quenching rate in external electric field	773
---	-----

H₂⁺

Dissociation in electric field	775-76
On Cu, scattering	880-81
On D ⁻ , two-body recombination	1357, 1367-68
On Mo, electron yields	867
On Ni, secondary electron emission	856-57

H_2O

Dipole and quadrupole moments 221
Photoabsorption cross section 1995-2001
Polarizability 221
Secondary electron spectra from electron
 impact ionization 2289-92, 2373
Secondary electron spectra from proton
 impact ionization 2347-48

H_2O^+

Ion-molecule reactions 1394

H_2O_2^+

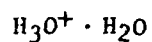
Ion-molecule reactions 1394

H_3^+

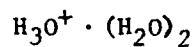
Ion-molecule reactions 1394-95
Mobility in argon 740
On Cu, scattering from surface 880-81
On Ni, secondary electron emission 856-57

H_3O^+

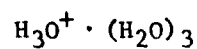
Ion-molecule reactions 1395



Mobility in argon 740



Mobility in argon 740



On NO_2^- , NO_3^- , $\text{NO}_2^- \cdot \text{H}_2\text{O}$, $\text{NO}_3^- \cdot \text{H}_2\text{O}$,

$\text{NO}_3^- \cdot \text{HNO}_3$, $\text{NO}_3^- \cdot (\text{HNO}_3)_2$:

two-body recombination 1359

Mobility in argon 740



Ion-molecule reactions 1394



Ion-molecule reactions 1394



Ion-molecule reactions 1394

H_2S

Dipole and quadrupole moments 221
Polarizability 221

HHe^+

Ion-molecule reactions 1393

HHe_2^+

Ion-molecule reactions 1393

HI

Dipole and quadrupole moments 221
Extinction coefficient for continuous absorption 2033
Polarizability 221

HN^+

Ion-molecule reactions 1393

HNO_3

Electron affinity 1162



Ion-molecule reactions 1393



Ion-molecule reactions 1393



Ion-molecule reactions 1394



Ion-molecule reactions 1403



Ion-molecule reactions 1394



Average energy expended by a charged particle to
create an ion pair 814

Continuous free - free absorption coefficients 692

Critical electric field strength, F_c 760

Dynamic polarizability 217

Electric field ionization spectrum 766

Electron affinity 214, 1160

Energy level and Grotrian diagrams 905-8

Energy parameters	152
Free - free absorption cross section	2078
General wavelength ranges for observed emission continua	711
Ionizations per volt per mm Hg at 0° C	732
Lifetimes	194-97
Low-energy collisions	227-28, 230-33, 245, 247, 250, 262-73, 276-91, 1507-8, 1522-23
Multiphoton ionization	700
On Ar, high-energy production of free electrons	1592
high-energy production of slow positive ions	1593
high-energy stripping	1599
On CH ₄ , high-energy production of slow positive ions	1597
On CO, high-energy production of slow positive ions	1596
On CO ₂ , high-energy production of slow positive ions	1597
On H ₂ , high-energy excitation	1620
high-energy ionization	390-91
high-energy one and two electron loss	388-89
high-energy production of free electrons	1592
high-energy production of slow positive ions	1593-95
On He, high-energy ionization	390-91
high-energy one and two electron loss	388-89
high-energy production of free electrons	1592
high-energy production of slow positive ions	1593-94
On Kr, high-energy He ⁺ production	413-14
high-energy He ⁻ production	415
high-energy stripping	413-14, 1600
On N ₂ , high-energy production of free electrons	1592
high-energy production of slow positive ions	1593-95
high-energy stripping	1603
On Ne, high-energy production of slow positive ions	1594
high-energy stripping	1598
On O ₂ , high-energy production of slow positive ions	1596
high-energy stripping	1602

On Xe, high-energy He^+ production 414
 high energy He^- production 415
 high-energy stripping 414, 1601
 On W, secondary electron emission 860-61
 Photoionization cross section 642-44, 1926
 Polarizability 216-17, 1156
 Refractive indices 696
 Secondary electron spectrum from electron
 impact ionization 2248-52
 Secondary electron spectrum from proton
 impact ionization 2299-3009
 Stopping power for heavy ions 2171-72

He^*

Photoionization cross section 1926, 2039-40

$\text{He}(2^1\text{S})$

Diffusion data in helium 752
 Dynamic polarizability 219
 Low-energy collisions 1523
 Photoionization 659-60, 2039
 Quenching by electric field 774

$\text{He}(2^3\text{S})$

Diffusion data in helium 752
 Dynamic polarizability 219
 Low-energy collisions 1523
 Photoionization cross section 658-60, 2040

He(4p)

Field ionization spectrum 768

He($n^{1,3}p$)

Photoionization 661

He³(2¹S_o)

Quenching rate in external electric field 773

He⁴(2¹S_o)

Quenching rate in external electric field 773

He⁺

Drift velocity in helium 742

Energy level and Grotrian diagrams 909-10

Energy parameters 152

Equilibrium fractions in Kr and Ne 2228

Ion-molecule reactions 1395, 1507-8, 1523

Low-energy collisions 229-33, 245, 249, 319-20, 1523

Mobility in helium 737-38

Mobility in neon 739

On Ag, sputtering coefficients 882-83

sputtering yields 844

On Al, sputtering coefficients 830-31

On Ar, equilibrium fractions 824-25

high-energy electron capture 1604-5
 high-energy emission cross sections 421, 426
 high-energy production of free electrons 1581
 high-energy production of slow positive ions 1582
 high-energy stripping 1599
 ionization, secondary electron spectra 2356-58
 range 808-9, 2161, 2164
 stopping cross-section 798-99
 stopping power 2152, 2156
 On Au, sputtering coefficients 832-33
 On Be, sputtering coefficients 830-31
 On Br, stopping power 2154, 2158
 On C, sputtering coefficients 830-31
 stopping power 2153, 2157
 On CH₄, high-energy production of slow positive ions 1588
 On CO, high-energy production of slow positive ions 1588
 On CO₂, high-energy electron capture 1608
 high-energy production of slow positive ions 1588
 On Cd, stopping power 2154, 2160
 On Cl, stopping power 2154, 2158
 On Cl₂, range 2162, 2165
 On Cr, sputtering coefficients 834-35
 On Cs, stopping power 2153, 2159
 On Cu, sputtering coefficients 834-35
 On D⁻, two-body recombination 368-69, 1356, 1365-66
 On F, stopping power 2154, 2158
 On F⁻, three-body recombination 1360, 1375-76
 On F₂, range 2162, 2165
 On Fe, sputtering coefficients 834-35
 On H, stopping cross section 800-1
 stopping power 2152, 2155
 On H⁻, two-body recombination 368-69, 1356, 1365-66
 On H₂, equilibrium fractions 820-21
 high-energy electron capture 374-75, 1606

high-energy excitation 1617-20, 1648
 high-energy one electron loss 378-79
 high-energy production of positive ions 382-83, 1587, 1594
 high-energy production of slow electrons 380-81
 range 810-11, 2161, 2163
 On H₂O, high-energy electron capture 1608
 On Hg, stopping power 2153, 2159
 On He, equilibrium fractions 820-21
 high-energy electron capture 374-75, 1604
 high-energy excitation 370-73
 high-energy ionization rate 427
 high-energy one electron loss 378-79
 high-energy production of positive ions 382-83, 1594
 high-energy production of slow electrons 380-81
 range 810-11, 2161, 2163
 stopping cross section 800-1
 stopping power 2152, 2155
 On I, stopping power 2154, 2158
 On Kr, high-energy electron capture 413, 416, 1604-5
 high-energy production of free electrons 411, 1581
 high-energy emission cross sections 421-23, 426
 high-energy excitation 425
 high-energy Kr⁺ production 411
 high-energy Krⁿ⁺ production 410
 high-energy production of slow ions 410, 1582
 high-energy stripping 1600
 range 808-9, 2161, 2164
 stopping cross section 798-99
 stopping power 2152, 2156
 On Mo, electron yields 864, 866-67
 scattering 882-83
 secondary electron emission 858-59, 867
 sputtering coefficients 834-35
 On N, stopping cross section 800-1
 stopping power 2153, 2157

On N₂, equilibrium fractions 822-23
 high-energy electron capture 1606-7
 high-energy excitation 1620
 high-energy production of free electrons 1581
 high-energy production of slow positive
 ions 1582, 1585-86, 1594
 high-energy stripping 1603
 range 810-11, 2162, 2165
 On Nb, sputtering coefficients 832-33
 On Ne, high-energy electron capture 1604-5
 high-energy emission cross sections 421, 426
 high-energy production of free electrons 1581
 high-energy production of slow positive ions 1582, 1594
 range 808-9, 2162, 2163
 stopping cross section 798-99
 stopping power 2152, 2155
 high-energy stripping 1598
 On Ni, secondary electron emission 856-57
 sputtering coefficients 834-35
 On O, stopping cross sections 800-1
 stopping power 2153, 2157
 On O₂, equilibrium fractions 822-23
 high-energy electron capture 1606-7
 high-energy production of free electrons 1581
 high-energy production of slow positive ions 1582-84
 range 2162, 2165
 On Pt, sputtering coefficients 832-33
 On S, stopping power 2153, 2159
 On Si, sputtering coefficients 830-31
 On Ta, electron yields 865
 sputtering coefficients 834-35
 On Ti, sputtering coefficients 830-31
 On U, stopping power 2154, 2160
 On V, sputtering coefficients 834-35

On W, electron yields 864-66
 scattering from surface 884-86
 secondary electron emission 860-61
 sputtering coefficients 834-35
 On Xe, high-energy electron capture 416-17, 1604
 high-energy emission cross sections 421, 423-24, 426
 high-energy excitation 425-26
 range 808-9, 2161, 2164
 stopping cross section 798-99
 stopping power 2152, 2156
 On Zr, sputtering coefficient 832-33
 Polarizability 220

He^{2+}

Emission of light in passage of He^{2+} through He-CO mixtures 2216
 Energy to create ion-pair in binary gas mixtures 2209
 Energy to create ion-pair in pure gas 814, 2207
 Ion-molecule reactions 1507, 1512, 1522
 Low-energy collisions 321-22
 Mobility in He 737-38
 Mobility in Ne 739
 On Ar, high-energy electron capture 1609
 high-energy production of free electrons 1589
 high-energy production of slow positive ions 1590
 ionization, secondary electron spectra 2359-2361
 On CO, high-energy production of slow positive ions 1591
 On H, high-energy electron capture 1610-11
 On H_2 , high-energy electron capture 1610-11, 1613
 high-energy production of free electrons 386-87, 1589
 high-energy production of slow positive ions 384-85, 1590-91
 On He, high-energy electron capture 376-77
 high-energy production of free electrons 386-87, 1589

high-energy production of slow positive ions 384-85, 1590
 ionization of He with admixtures of Ar, Kr, Xe, and CO₂ 427
 On Kr, high-energy electron capture 413, 1612
 high-energy He production 411
 high-energy Krⁿ⁺ production 412
 On Mo, electron yields 864
 secondary electron emission 858-59
 On N₂, high-energy electron capture 1613-14
 high-energy production of free electrons 1589
 high-energy production of slow positive ions 1590
 On O₂, high-energy electron capture 1613-14
 On Ta, electron yields 865
 On W, electron yields versus ion energy 865
 On Xe, high-energy Xeⁿ⁺ production 418
 Polarizability 220

Heⁿ⁺

On Kr, high-energy He^{m+} production 413

He⁻

Beam attenuation in an electric field 767
 Detachment of electron by external electric field 771
 Electric field ionization spectrum 768

HeAr

Interaction energy 1181
 Potential energy curves 187, 1181

HeAr⁺

Low-energy collisions 243

He₂

Diabatic and adiabatic potential energy curves of

$^3\Delta_g$ symmetry 164

Diabatic and adiabatic potential curves of

$^3\Pi_u$ symmetry 163

Interaction energy 1180

Low-energy collisions 241, 1511-12

Photoionization cross section 2038-40

Potential curves of $^3\Pi_g$ symmetry 162

Potential curves of $^3\Sigma_g^+$ symmetry 160

Potential curves of $^3\Sigma_u^+$ symmetry 161

Potential energy curves 124, 158-59, 187, 189, 1180

He₂⁺

Asymptotic energies 123

Avoided crossings 123

Energy level difference parameters 153

Energy parameters 152

Ground state potential curve characteristics 121

Ion-molecule reactions 1395-96, 1512

Low-energy collisions 241-42, 246

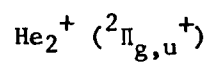
Mobility in helium 737-38

On He, high-energy positive ion production 384-85

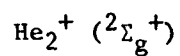
Potential curves 121, 122, 124

Symmetries and excitation energies of the lower
symmetry states 123

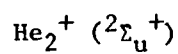
Three-body ion-ion recombination 321-22, 1360, 1377-78



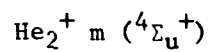
Potential energy curves 122



Potential energy curves 122



Potential energy curves 122



Mobility in helium 737



Interaction energy 1181

Potential energy curves 187, 1181



Low-energy collisions 243



Interaction energy 1181

Potential energy curves 187, 1181

HeNe^+

Ion-molecule reactions 1395
Low-energy collisions 243
Mobility in helium 737

HeXe

Potential energy curves 187, 189

Hf

Polarizability 1157

Hg

Electron affinity 1160
Electronic energies 1322-24, 1326
Orbital energies 1321, 1323
Photoionization cross section 1962-64
Polarizability 1157
Stopping power for heavy ions 2201-2

Hg^+

Mobility in argon 740
Mobility in helium 737
Mobility in neon 739
On Br^- , Cl^- , F^- , I^- , three-body recombination 1362, 1386-87

HgBr

Emission data 1281
Potential energy curves 1275-78
Spectroscopic constants 1280

HgBr₂

Photoabsorption cross section 2003

HgCl

Emission data 1281
Potential energy curves 1271-74
Spectroscopic constants 1279

HgCl₂

Bond lengths 1331
Dissociation energies 1331
Ionization potential 1332-33
Orbital energies 1333

HgH

Potential energy curves 1334
Spectroscopic constants 1335

HgI₂

Photoabsorption cross section 2003

2480

Ho

Polarizability 1157

I

Electron affinity 214, 1160
 Low-energy collisions 251, 253, 1520-21
 Photoionization cross section 652-53, 1941, 1945
 Polarizability of ground state 216, 1157
 Spin-orbit parameter 73
 Stopping power for heavy ions 2187-88

I*

On He, Ar, N₂, CO, CCl₂, SF₆, CF₂Cl₂, CF₃I,
 i-C₃F₇I, CF₃BR, (CF₃)₂CO, I: cross sections
 for collisional deactivation 1453
 On Cl₂, Br₂, I₂, BrCl, ICl, IBr: collisional
 deactivation 1520-21

I⁺

Equilibrium fractions in H₂, He, N₂, and O₂ 2234
 Equilibrium fractions in Ar and Ne 2235
 Equilibrium fractions in Kr, Xe, and Hg vapor jet 2236
 On Ar, high-energy electron capture 1631
 high-energy electron loss 1631
 On N₂, high-energy electron capture 1631
 high-energy electron loss 1631
 On O₂, high-energy electron capture 1631
 high-energy electron loss 1631

I^{n+}

On Air, high-energy electron capture	16 39-43
high-energy electron loss	16 39-43
On Ar, high-energy electron capture	19 39-43
high-energy electron loss	16 39-43
On CH ₄ , high-energy electron capture	16 39-43
high-energy electron loss	16 39-43
On CO ₂ , high-energy electron capture	16 39-43
high-energy electron loss	16 39-43
On Cl, high-energy electron capture	16 39-43
high-energy electron loss	16 39-43
On H ₂ , high-energy electron capture	16 39-44
high-energy electron loss	16 39-43
On He, high-energy electron capture	16 39-44
high-energy electron loss	16 39-43
On N ₂ , high-energy electron capture	16 39-43
high-energy electron loss	16 39-43
On N ₂ O, high-energy electron capture	16 39-43
high-energy electron loss	16 39-43
On O ₂ , high-energy electron capture	16 39-44
high-energy electron loss	16 39-43

I^-

Electron photodetachment cross-section	682-83
Ion-molecule reactions	1403
Mobility in argon	744
Mobility in helium	743
Polarizability	220

IBr

Electron affinity 214, 1161

Extinction coefficient for continuous absorption 702, 2032

ICN

Photoabsorption cross section 2004

Photoionization cross section (relative) 2027

ICl

Electron affinity 214, 1161

Extinction coefficient for continuous absorption 702, 2032

I₂

Electron affinity 214, 1161

Extinction coefficient for continuous absorption 702-4

Photoabsorption cross section 1968

Photoionization cross section 652-53, 655

Refractive indices 697

I₂^{*}

Low-energy collisions 253

I₂⁺

On I⁻, two-body recombination 1359



Low-energy collision 253-54
Photodissociation cross section 688-89, 2066

Ion-Molecule Reactions

Positive Ions 1392-1400
Negative Ions 1401-7



Electron affinity 1160
Electronic energies 1304
Ionization potential 1304
Polarizability 1157



Absorption data 1313
Emission data 1313
Potential energy curves 1307



Potential energy curves 1307



Polarizability 1157

Ions

References to transport data as of August 1, 1978 2113-15

K

Electron affinity 1160
Polarizability 217, 1156

K⁺

Diffusion, (longitudinal) 747-48
Mobility in argon 740
Mobility in krypton 739
Mobility in neon 739
Mobility in xenon 739
On H₂, high-energy excitation 1648
Polarizability 220

Kr

Average energy expended by a charged particle to create
an ion pair 814
Continuous free - free absorption coefficients 692
Electron affinity 214, 1160
Free - free absorption cross section 2078
General wavelength ranges for observed emission continua 711
Interaction parameters 1187
Ionizations per volt per mm Hg at 0° C 732
Lifetimes 204, 209, 211
Low-energy collisions 238-39, 247, 249-50, 1510-11, 1513
Mobilities of ions in Kr 739
Multiphoton ionization 700

On Ar, high-energy electron capture 1626
 high-energy production of free electrons 1621
 high-energy production of slow positive ions 1623
 high-energy electron loss 1626
 On He, high-energy production of free electrons 1621
 high-energy production of slow positive ions 1623
 On Kr, high-energy ionization 1624
 high-energy production of free electrons 1621
 high-energy production of slow positive ions 1623
 On N₂, high-energy electron capture 1626
 high-energy electron loss 1626
 On Ne, high-energy electron capture 1626
 high-energy production of free electrons 1621
 high-energy production of slow positive ions 1623
 high-energy electron loss 1626
 On O₂, high-energy electron capture 1626
 high-energy electron loss 1626
 On Xe, high-energy ionization 1624
 high-energy production of free electrons 1621
 high-energy production of slow positive ions 1623
 Oscillator strengths 211
 Photoionization cross section 642-44, 1926
 Polarizabilities $\alpha_{zz}(m_J=1)$ and $\alpha_{zz}(m_J=2)$
 of the $3p_2$ atom 216
 Polarizability of ground state 216, 1156
 Refractive indices 696
 Secondary electron spectra from electron impact
 ionization 2260-61
 Stopping power for heavy ions 2177-78
 Total absorption cross section 648-49
 V_0 in the equation $i = i_0 e^{n(V-V_0)}$ 732

Kr*

Autoionization in the photoionization cross section 664
Low-energy collisions 246, 254, 1514-16
Photoionization cross section 658, 662, 1929, 1931-34

Kr(5p)

Photoionization cross section 667, 669

Kr(5s)

Photoionization cross section 667, 669

Kr(5s₀₀)

Diffusion coefficient in krypton 753
Three-body reaction rate constant in krypton 753
Two-body reaction rate constant in krypton 753

Kr(5s₁₂)

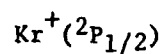
Diffusion coefficient in krypton 753
Three-body reaction rate constant in krypton 753
Two-body reaction rate constant in krypton 753

Kr (³P₂)

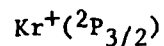
Diffusion and reactions in Ar 2119
Diffusion and reactions in Kr 2119

Kr⁺

Equilibrium fractions in H ₂ and He	2232
Equilibrium fractions in Ar, Kr, N ₂ , and Ne	2233
Interaction parameters	1187
Ion-molecule reactions	1396, 1511
Low-energy collisions	239, 246, 255, 319-20, 1523
Mobility in argon	740
Mobility in helium	737
On Ar, high-energy electron capture	1626
high-energy production electron	1621
high-energy production of slow positive ions	1623
high-energy electron loss	1626
On F ⁻ , three-body recombination	1361, 1375-76, 1382-83
On He, high-energy excitation	1646
high-energy production of free electrons	1621
high-energy production of slow positive ions	1623
On Kr, high-energy ionization	1624
high-energy production of free electrons	1621-22
high-energy production of slow positive ions	1623
On Mo, electron yields from surface	864, 866
On N ₂ , high-energy electron capture	1626
high-energy electron loss	1626
On Ne, high-energy electron capture	1626
high-energy production of free electrons	1621-22
high-energy production of slow positive ions	1623
high-energy electron loss	1626
On O ₂ , high-energy electron capture	1626
high-energy electron loss	1626
On W, electron yields from surface	864-66
On Xe, high-energy ionization	1624
high-energy production of free electrons	1621
high-energy production of slow positive ions	1623
Spin-orbit parameter	73



Mobility in krypton 739, 741



Mobility in krypton 739, 741



Low-energy collisions 238, 310-13, 321-22, 1511, 1513

On Kr, high-energy ionization 1624

high-energy production of free electrons 1622

On Me, electron yields from surface 864

On Ne, high-energy production of free electrons 1622

On W, electron yields from surface 865

On Xe, high-energy ionization 1624



On He, high-energy electron capture 1639

high-energy electron loss 1639

On Kr, high-energy electron capture 1639

high-energy electron loss 1639

On N₂, high-energy electron capture 1639

high-energy electron loss 1639

On Ne, high-energy production of free electrons 1622



On He, high-energy electron capture 1639

high-energy electron loss 1639

On Kr, high-energy electron capture 1639
high-energy electron loss 1639
On N₂, high-energy electron capture 1639
high-energy electron loss 1639

KrAr

Photoionization cross section (relative) 2041
Photoionization efficiency curve 675

KrBr

Laser and Fluorescent wavelengths 12

KrCl

Einstein coefficients 1234-36
Emission data 1238
Fluorescence 1237
Laser and fluorescent wavelengths 12
Potential energy curves 1233
Transition probabilities 1234
Vibrational levels 1233

KrF

Crossing points and energies of the III(1/2)-
II(3/2) curve crossings 53
Dipole moments of the covalent states 78-79
Dipole moments of the ionic states 80-81
Einstein coefficients 107, 111, 1228, 1230-31

Emission data 1238
 Emission energies and wavelengths 107,111
 Fluorescence 1229, 1232
 Laser and fluorescent wavelengths 12
 Lifetimes 107, 111
 Potential energy curves for the covalent states 39,52
 Potential energy curves for the covalent and
 ionic states 22-23, 1227
 Separated atom limits for the ionic states 54
 Spectroscopic constants 67, 70, 1264
 Total energies of the covalent and ionic states 48-49
 Transition moments for the ionic-covalent
 transitions 82-83, 88-89, 107, 111
 Transition probabilities 1228, 1230-31
 Vibrational levels 1227

KrF*

Dominant quenching processes 1485
 Low-energy collisions 256-57

KrI

Laser and fluorescent wavelengths 12

Kr₂

Interaction energies 179, 1180
 Photoionization cross section (relative) 2041
 Photoionization efficiency curve 673
 Potential energy curves 188, 1180

Kr_2^*

Lifetimes 212
Low-energy collisions 242, 255, 1512
Photoabsorption cross sections 713

$\text{Kr}_2(^1\Sigma_g^+)$

Interaction energy 181

Kr_2^+

Absorption data 142, 1206-7, 1267
Absorption spectra for the $\text{I}(1/2)_u \rightarrow \text{II}(1/2)_g$
transition 150, 1207
Low-energy collisions 242, 255
On F^- , three-body recombination 321-22, 1361-62, 1377-78, 1384-85
two-body recombination 1358
Photodissociation cross-section 686-87
Potential energy curves 138-39, 143, 1191, 1197-98
Spectroscopic constants 1203, 1205, 1264
Spectroscopic data for the ground state 142
Theoretical photoabsorption cross sections 712
Total energies 140-41

$\text{Kr}_2^+ \text{I}(1/2)_u$

Dissociation energy 149



Low-energy collisions 242



Diatomics-in-molecules potential surfaces 38



Absorption data 1266-67

Diatomics-in-molecules potential surfaces 37

Electronic energies 1268

Emission data 1265-66

Spectroscopic constants 1264

Transition moments 1265

Vertical transition energies 1257



Low-energy collisions 256



Crossing points 1296

Dipole moments 1299

Energies of states 1289

Potential energy curves 1291

Radiative lifetimes 1297

Spectroscopic constants 1293

Transition moments 1296, 1298

KrXe

Interatomic potential curve 188

KrXe⁺

Low-energy collisions 244

La

Polarizability 1157

Li

Electron affinity 1160

Polarizability 217, 1156

Li⁺

Diffusion (longitudinal) 746

Mobility in argon 740

Mobility in neon 739

Polarizability 220

LiCl

Electron affinity 1161

Lu

Polarizability 1157

Lw

Polarizability 1157

Md

Polarizability 1157

Mg

Polarizability 1156

Mg²⁺

Polarizability 220

Mn

Polarizability 1156

AD-A082 665

ARMY MISSILE COMMAND REDSTONE ARSENAL AL HIGH ENERG--ETC F/G 20/5
CUMULATIVE REACTANT SPECIES INDEX FOR VOLUMES I-V OF THE COMPIL--ETC(U)
SEP 79 E W MCDANIEL, M R FLANNERY, S T MANSON

UNCLASSIFIED

DRSMI-H-78-1-VOL-6

NL

2 x 2

2 x 2

■

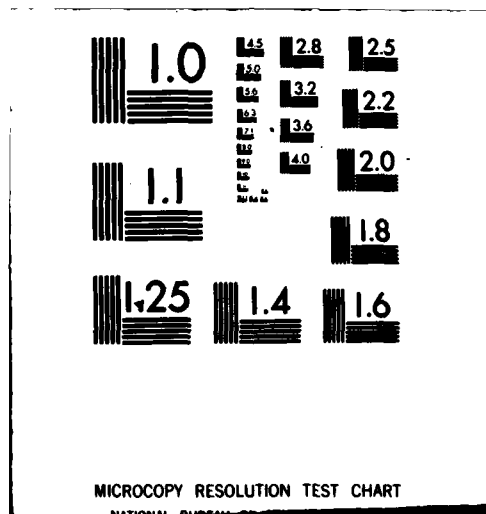
END

DATE

FORMED

5-80

DTIC



Mo

Energy distribution of photoelectrons	892
Photoelectric yields	888
Polarizability	1157
Self-sputtering coefficients	843

n

Moderating ratios of various moderators	2398
Number of neutrons emitted per fission	2400
On B^{10} , thermal reaction cross section	2401
On He^3 , thermal reaction cross section	2401
On ^{239}Pu , mass-yield curve for thermal fission	2380
mass-yield curve for fast fission	2386
neutron yield per neutron absorbed	2397
On ^{241}Pu , mass-yield curve for thermal fission	2381
On ^{232}Th , fission cross section as function of neutron energy	2395
mass-yield curve for fast fission	2382
mass-yield curve for 14 MeV fission	2387
On ^{233}U , mass-yield curve for thermal fission	2378
mass-yield curve for fast fission	2383
mass-yield curve for 14 MeV fission	2388
neutron yield per neutron absorbed	2397
On ^{235}U , end products and energies from fission	2399
fission cross section as function of neutron energy	2394
fission neutron energy spectrum	2396
mass-yield curve for thermal fission	2379
mass-yield curve for fast fission	2384
mass-yield curve for 14 MeV fission	2389
neutron yield per neutron absorbed	2397
On ^{238}U , fission cross section as function of neutron energy	2394-95
mass-yield curve for fast fission	2385
mass-yield curve for 14 MeV fission	2390

N

Electron affinity 1160
Energy level and Grotrian diagrams 933-42
Photoionization cross section 1951-54
Polarizability 1156
Stopping power for heavy ions 2191-92

N*

Photoionization cross section 1951, 1953-54

N⁺

Energy level and Grotrian diagrams 943-54
Ion-molecule reactions 1396
Mobility in helium 737
On Ag, sputtering coefficients 836-37
On Cu, sputtering coefficients 836-37
On N₂, high-energy excitation 1650-51
On O⁻, two-body recombination 1356, 1367-68

NCO

Electron affinity 1162

NH

Electron affinity 1161

NH₂

Electron affinity 1161

NH₂⁻

Photodetachment cross section 2060

Photodetachment cross section (relative) 2059

NH₃

Photoabsorption cross section 2005

Secondary electron spectrum from electron impact
ionization 2286, 2373

Secondary electron spectrum from proton impact
ionization 2349

N₂

Average energy expended by a charged particle
to create an ion pair 814

Dipole and quadrupole moments 221

Fluorescent efficiencies for excitation 2217

On CO, CO₂: rates for deactivation of N₂^{*} 1460

On O₂: rates for deactivation of N₂^{*} 1467-8

Photoabsorption cross section 1975-77

Polarizability 221

Secondary electron spectrum from electron impact
ionization 2268-71, 2373

Secondary electron spectrum from proton impact
ionization 2336-45

N_2^+

Ion-molecule reactions	1397
Mobility in neon	739
On Au, sputtering coefficients	836-37
On Cu, sputtering coefficients	836-37
On NO_2^- , two-body recombination	1357
On O^- , two-body recombination	1357
On O_2^- , two-body recombination	1357, 1370-71

N_2O

Dipole and quadrupole moments	221
Electron affinity	1162
Photoabsorption cross section	2006
Polarizability	221

N_2O^-

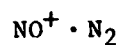
Ion-molecule reactions	1404
------------------------	------

$(NO_2)_2$

Polarizability	221
----------------	-----

N_3^+

Ion-molecule reactions	1397
------------------------	------



Ion-molecule reactions 1397



Ion-molecule reactions 1397-98



Dipole and quadrupole moments 221

Electron affinity 1162

Photoabsorption cross section 2007

Polarizability 221

Secondary electron spectra from electron impact
ionization 2286, 2373



On NO_2^- , two-body recombination 1357-58, 1372

On NO_3^- , two-body recombination 1358

On O^- , two-body recombination 1357, 1373-74

On O_2^- , two-body recombination 1357



Ion-molecule reactions 1403

NO_2

Dipole and quadrupole moments 221
Electron affinity 1162
Photoabsorption cross section 2008
Photoionization cross section (relative) 2028-30
Polarizability 221

NO_2^+

Ion-molecule reactions 1397

NO_2^-

Ion-molecule reactions 1404
Photodetachment cross section 2065

NO_2^{-*}

Photodetachment cross section 2065

NO_3

Electron affinity 1162

$\text{NO}^+ \cdot \text{O}_2$

Ion-molecule reactions 1397

NO_3^-

Ion-molecule reactions 1404

2501

Na

Electron affinity 1160
Polarizability 217, 220, 1156

Na⁺

Diffusion (longitudinal) 746-47
Mobility in argon 740
Mobility in neon 739
On H₂, high-energy excitation 1648
On O⁻, two-body recombination 1356, 1369

Nb

Polarizability 1157
Self-sputtering coefficient 843

Nd

Polarizability 1157

Ne

Average energy expended by a charged particle
to create an ion pair 814
Continuous free - free absorption coefficients 692
Dynamic polarizability 218
Electron affinity 214, 1160
Energy level and Grotrian diagrams 991-1001

Energy parameters	152
Free - free absorption cross section	2078
General wavelegnths for observed emission continua	711
Interaction parameters	1187
Ionizations per volt per mm Hg at 0° C	732
Lifetimes	198-200
Low-energy collisions	233-35, 247, 250, 304-5, 314, 316
Mobilities of ions in Ne	739
Multiphoton ionization	700
On Ar, high-energy production of free electrons	1621
high-energy production of slow positive ions	1623
On He, high-energy production of free electrons	1621
high-energy production of slow positive ions	1623
On Kr, high-energy production of free electrons	1621
high-energy production of slow positive ions	1623
On Ne, high-energy production of free electrons	1621
high-energy production of slow positive ions	1623
On Xe, high-energy production of free electrons	1621-22
high-energy production of slow positive ions	1623
Photoionization cross section	642-44, 1926
Polarizabilities $\alpha_{zz}(m_J=1)$ and $\alpha_{zz}(m_J=2)$ of the $3p_2$ atom	216
Polarizabilities of $1,3p_J$ states	173
Polarizability	216-17, 1156
Polarizability of ground state	216
Refractive indices	696
Secondary electron spectra from electron impact ionization	2253-54
Secondary electron spectra from proton impact ionization	2310-12, 2348
Secondary electron spectra from Ne^+ impact ionization	2364-66

Stopping power for heavy ions 2173-74
Transition probabilities 201
Van der Waals C_6 coefficients 173
 V_0 in the equation $i = i_0 e^{n(V-V_0)}$ 732

Ne ($1s_3$)

Diffusion data in neon 753
Three-body destruction rate in neon 753

Ne ($1s_5$)

Diffusion data in neon 753
Three-body destruction rate 753

Ne*

Photoionization cross sections 658, 662, 1927, 1931-35

Ne⁺

Drift velocity in Ne 742
Energy level and Grotrian diagrams 1002-8
Energy parameters 152
Interaction parameters 1187
Ion-molecule reactions 1398, 1523
Low-energy collisions 235, 245, 294-95, 315, 319-20, 1513, 1523
Mobility in helium 737-38
Mobility in neon 739
On Ar, high-energy production of free electrons 1621
high-energy production of slow positive ions 1623

On F^- , three-body recombination 1360, 1375-76
 two-body recombination 1356
 On He, high-energy production of free electrons 1621
 high-energy production of slow positive ions 1623
 On Kr, high-energy production of free electrons 1621-22
 high-energy production of slow positive ions 1623
 On Mo, electron yields 864, 866
 On Ne, high-energy production of free electrons 1621-22
 high-energy production of slow positive ions 1623
 ionization, secondary electron spectra 2364-66
 On W, electron yields 864-5
 scattering 886
 On Xe, high-energy production of free electrons 1621-22
 high-energy production of slow positive ions 1623
 Polarizability 220
 Spin-orbit parameters 73

Ne²⁺

Ion-molecule reactions 1508, 1512, 1522, 1524
 Low-energy collisions 235, 296-99, 308-9, 321-22
 On Kr, high-energy production of free electrons 1622
 On Mo, electron yields 864
 On Ne, high-energy production of free electrons 1622
 On W, electron yields 865-66
 On Xe, high-energy production of free electrons 1622
 Polarizability 220

Ne³⁺

On Kr, high-energy production of free electrons 1622
 On Ne, high-energy production of free electrons 1622
 On Xe, high-energy production of free electrons 1622

Ne⁴⁺

On Xe, high-energy production of free electrons 1622

NeAr

Interaction energy 1182

Potential energy curves 187, 1182

NeAr⁺

Low-energy collisions 243

NeBr

Laser and fluorescent wavelengths 12

NeCl

Laser and fluorescent wavelengths 12

NeF

Crossing points and energies of the III(1/2) - II(3/2)
curve crossing 53

Dipole moments of the covalent states 78

Dipole moments of the ionic states 80

Einstein coefficients 107, 109

Emission energies and wavelengths 107, 109

Fluorescence 1217
Laser and fluorescent wavelengths 12
Lifetimes 107, 109
Potential energy curves for the covalent states 39,52
Potential energy curves for the covalent and
ionic states 18, 19, 1215
Separated atom limits for the ionic states 54
Spectroscopic constants for the ionic states 67-68
Total energies of the covalent and ionic states 44-45
Transition moments 1216
Transition moments for the ionic-covalent
transitions 82, 84, 107, 109
Vibrational levels 1216
Vibrational wavefunctions 1216

NeI

Laser and fluorescent wavelengths 12

NeKr

Interaction energy 1182
Potential energy curves 188, 1182

NeKr⁺

Low-energy collisions 243

Ne₂

Ground state energies 169
Interaction energy 1180
Potential energy curves 187, 1180

Ne₂^{*}

Dissociation energy 172
Equilibrium position 172
Height of barrier, V_{max} 172
Photoabsorption cross sections 713
Position of potential maximum, R_{max} 172
Potential energies 170-71
Potential energy curves 165-68

Ne₂ O_u⁺(³P₁)

Radiative levels 177
Vibrational levels 177

Ne₂ (¹Σ_u⁺)

Dipole transition matrix elements 178
Radiative lifetimes 175
Vibrational levels 175

Ne₂ (³Σ_u⁺)

Vibrational levels 174

$\text{Ne}_2 \text{ } u(^3\text{P}_2)$

Radiative lifetimes 176
Vibrational levels 176

$\text{Ne}_2 \text{ } w/\Omega = 0$

Potential curves of excited states 166

$\text{Ne}_2 \text{ } w/\Omega = 1$

Potential curves of excited states 167

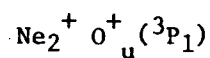
$\text{Ne}_2 \text{ } w/\Omega = 2$

Potential curves of excited states 168

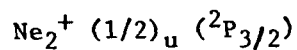
Ne_2^+

Absorption data 1206-7
Absorption spectra for the $\text{I}(1/2)_u \rightarrow \text{II}(1/2)_g$
transition 150, 1207
Dissociation energy 172
Energy level difference parameters 154
Energy parameters 152
Equilibrium position 172
Ground state potential curve characteristics 121
Ion-molecule reactions 1398

Low-energy collisions 242, 1512
 Mobility in helium 737
 Mobility in neon 738-9
 On F^- , three-body recombination 321-22, 1360, 1377-78
 Potential curves 125-26, 1189, 1193-94
 Potential curves for the ground state 121
 Potential energies 127-28
 Spectroscopic constants 1201, 1205
 Theoretical photoabsorption cross sections 712



Radiative lifetimes 177
 Vibrational levels 177



Vibrational levels 129



Crossing points 1296
 Energies of states 1285
 Potential energy curves 1287



Interatomic potential 188

Ne/Xe/NF₃ Mixtures (e-beam pumped)

Energy flow pathways 1492

Reaction rates 1493-4

Ni

Photoelectric yield 890

Polarizability 1156

Self-sputtering coefficients 838-39

No

Polarizability 1157

Np

Polarizability 1157

O

Electron affinity 1160

Energy level and Grotrian diagrams 955-62

On Ag, sputtering coefficient 842

On Au, sputtering coefficient 842

Photoionization cross section 1955-58

Polarizability 1156

Stopping power for heavy ions 2193-94

O^+

Energy level and Grotrian diagrams	963-69
Ion-molecule reactions	1398-99
On Ag, sputtering coefficient	842
On Cu, sputtering coefficient	842
On Mo, scattering from surface	882-83
secondary electron emission	862-63
On O^- , two-body recombination	1356, 1367-68
On Ta, sputtering coefficient	842
On W, secondary electron emission	860-61
Polarizability	220

O^-

Beam attenuation in an electric field	767
Ion-molecule reactions	1404-5
Longitudinal diffusion	747
On Mo, secondary electron emission	862-63
Photodetachment cross section	2049, 2056
Polarizability	220

$O^- \cdot H_2O$

Ion-molecule reactions	1405
------------------------	------

$O-CS_2$ Chemical Laser System

24 low energy reactions involving various combinations of O, C, and S atoms	1446
--	------

OD

Electron affinity 1162

OD⁻

Photodetachment cross section 2058

OH

Electron affinity 1162

OH⁻

Photodetachment cross section 2057-58

O₂

Average energy expended by a charged particle to create
an ion pair 814

Dipole and quadrupole moments 221

Electron affinity 1162

Equilibrium values 1348

Molecular constants 1347

On Ag, sputtering coefficient 842

On Au, sputtering coefficient 842

Photoabsorption cross section 1978-85

Polarizability 221

Potential energy curves 1339-46

Secondary electron spectra for electron impact ionization 2265-67

Secondary electron spectra for proton impact ionization 2346
Separated-atom energy levels 1348

O_2^*

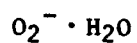
Rates for deactivation 1465-66

O_2^+

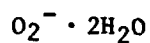
Diffusion (longitudinal) in O_2 748
Diffusion (transverse) in O_2 748
Ion-molecule reactions 1399-1440
On Mo, secondary electron emission 862-63
On NO_2^- , two-body recombination 1358, 1372
On NO_3^- , two-body recombination 1358
On O^- , two-body recombination 1358, 1373-74
On O_2^- , two-body recombination 1358, 1370-71
On W, secondary electron emission 860-61
Potential energy curves 1339

O_2^-

Ion-molecule reactions 1405-6
On Mo, secondary electron emission 862-63
Photodestruction cross section 2072
Photodetachment cross section 2052-54
Potential energy curves 1339



Ion-molecule reactions 1406



Ion-molecule reactions 1406



Electron affinity 1162

On Ag, sputtering coefficient 842

Photoabsorption cross section 1993

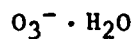


Ion-molecule reactions 1406

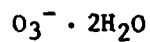
Photodestruction cross section 2074-75

Photodetachment cross section 2056

Photodissociation cross section 2068



Ion-molecule reactions 1406



Ion-molecule reactions 1406

O_4

Electron affinity 1162

O_4^+

Ion-molecule reactions 1400

On O_2^- , three-body recombination 1360, 1379

On O_4^- , three-body recombination 1360, 1379

O_4^-

Ion-molecule reactions 1406-7

Photodestruction cross section 2076

O_5^+

Ion-molecule reactions 1400

O_s

Polarizability 1157

Photons

See target species

P

Electron affinity 1160

Polarizability 1156

P⁻

Beam attenuation in an electric field 767

PH

Electron affinity 1161

PH₂

Electron affinity 1161

PO

Electron affinity 1161

Pa

Polarizability 1157

Pb

Polarizability 1157

2517

Pd

Photoelectric yields 883

Polarizability 1157

Pm

Polarizability 1157

Po

Polarizability 1157

Pr

Polarizability 1157

Pt

Polarizability 1157

Spectral distribution curves 889, 892

Pu

Polarizability 1157

Ra

Polarizability 1157

Rare Gas Ions

Recombination energies 622

Rb

Electron affinity 1160

Polarizability 220, 1156

Rb⁺

Diffusion (longitudinal) 746

Mobility in argon 740

Mobility in krypton 739

Mobility in neon 739

Mobility in xenon 739

On Ar, high-energy electron capture 1628

high-energy electron loss 1628

On H₂, high-energy excitation 1648

On N₂, high-energy electron capture 1628

high-energy electron loss 1628

On O₂, high-energy electron capture 1628

high-energy electron loss 1628

Polarizability 220

Re

Polarizability 1157

Rh

Polarizability 1157

Rn

Polarizability 1157

Ru

Polarizability 1157

RI Photodissociation Laser

22 low energy reactions involving combinations
of I, rare gas, O atoms 1452

S

Electron affinity 1160

Energy level and Grotrian diagrams 1019-27

Polarizability 1156

Stopping power for heavy ions 2195

S^+

Energy level and Grotrian diagrams 1028-31
Ion-molecule reactions 1400

S^-

Ion-molecule reactions 1407

SF_3

Electron affinity 1161

SF_4

Electron affinity 1161

SF_5

Electron affinity 1161

SF_6

Electron affinity 1161
Polarizability 221

SH

Electron affinity 116?

2521

SO

Electron affinity 1162

SO₂

Dipole and quadrupole moments 221

Electron affinity 1162

Polarizability 221

S₂

Electron affinity 1162

Sb

Polarizability 1157

Sb⁺

On Ar, high-energy electron capture 1629

high-energy electron loss 1629

On N₂, high-energy electron capture 1629

high-energy electron loss 1629

On O₂, high-energy electron capture 1629

high-energy electron loss 1629

Sc

Polarizability 1156

2522

Se

Electron affinity 1160

Equilibrium fractions in Ar, Kr, O₂, and Xe 2229

Polarizability 1156

SeF₆

Electron affinity 1161

Si

Polarizability 1156

Self-sputtering coefficients 840-41

Si⁻

Beam attenuation in an electric field 767

SiH

Electron affinity 1162

SiH₂

Electron affinity 1162

2523

Sm

Polarizability 1157

Sn

Polarizability 1157

Sr

On Ar, high-energy electron capture 1627
high-energy electron loss 1627
On N₂, high-energy electron capture 1627
high-energy electron loss 1627
On O₂, high-energy electron capture 1627
high-energy electron loss 1627
Polarizability 1156

Sr⁺

On Ar, high-energy electron capture 1627
high-energy electron loss 1627
On N₂, high-energy electron capture 1627
high-energy electron loss 1627
On O₂, high-energy electron capture 1627
high-energy electron loss 1627

Ta

Photoelectric yields 888

Polarizability 1157
Self-sputtering coefficient 843

Tb

Polarizability 1157

Tc

Polarizability 1157

Te

Electron affinity 1160
Polarizability 1157
Spectral distribution curve 892

TeF₆

Electron affinity 1161

Th

Polarizability 1157

Ti

Polarizability 1156

Tl

Excitation energies 1304

Ionization potential 1304

Polarizability 1157

TlKr

Absorption data 1315

Emission data 1315

Potential energy curves 1308

Transition moments 1312

TlKr⁺

Potential energy curves 1308

Tm

Polarizability 1157

U

Electron affinity 1160

On Ar, N₂, Ne, O₂ high-energy electron loss 1635

Polarizability 1157

Stopping power for heavy ions 2203-4

U^+

On Ar, high-energy electron capture 1635

high-energy electron loss 1635

On N_2 , high-energy electron capture 1635

high-energy electron loss 1635

On Ne, high-energy electron capture 1635

high-energy electron loss 1635

On O_2 , high-energy electron capture 1635

high-energy electron loss 1635

UF_5

Electron affinity 1161

UF_6

Electron affinity 1161

Photoabsorption cross section 2009

V

Polarizability 1156

Self-sputtering coefficients 843

W

Photoelectric yields 888, 891
 Polarizability 1157
 Self-sputtering coefficient 843

Xe

Average energy expended by a charged particle
 to create an ion pair 814
 Continuous free - free absorption coefficients 693
 Critical electric field strength, F_c 760
 Electron affinity 214, 1160
 Free - free absorption cross section 2078
 General wavelength ranges for observed emission continua 711
 Interaction parameters 1187
 Ionizations per volt per mm Hg at 0° C 732
 Lifetimes 205-6, 211
 Low-energy collisions 240-41, 249-50, 1511, 1513
 Mobilities at ions in Xe 739
 Multiphoton ionization 700
 On Ar, high-energy electron capture 1630
 high-energy electron loss 1630
 On N₂, high-energy electron capture 1630
 high-energy electron loss 1630
 On Ne, high-energy electron capture 1630
 high-energy production of free electrons 1622
 high-energy electron loss 1630
 On O₂, high-energy electron capture 1630
 high-energy electron loss 1630
 Oscillator strengths 211
 Photoionization cross section 642-44, 1926
 Polarizabilities $\alpha_{zz}(m_j=1)$ and $\alpha_{zz}(m_j=2)$
 of the 3p₂ atom 216

Polarizability of ground state 216, 1157
 Refractive indices 696
 Stopping power for heavy ions 2179-80
 Total absorption coefficient 650-51
 V_0 in the equation $i = i_0 e^{n(V-V_0)}$ 732

Xe (Metastable)

Autoionization structure in the photoionization cross section 665-66

Xe*

Low-energy collisions 241, 246, 254-5, 1511, 1513-18
 Photoionization cross section 658, 662, 1930-34

Xe (28f)

Quenching by E field 759

Xe (3P_2)

Diffusion and reactions in argon 2119
 Diffusion and reactions in xenon 2119
 Diffusion coefficient in xenon 753

Xe**

Low-energy collisions 241, 246

Xe^+

Excitation cross sections	207
Interaction parameters	1187
Low-energy collisions	241, 246, 255, 302-3, 319-20
Mobility in helium	737
Mobility in xenon	742
On Ar, high-energy electron capture	1630
high-energy electron loss	1630
On F^- , three-body recombination	1362, 1375-76
two-body recombination	1357
On He, high-energy excitation	1647
On Kr, high-energy production of free electrons	1622
On Mo, electron yields	864, 866
On Ne, high-energy electron capture	1630
high-energy production of free electrons	1622
high-energy electron loss	1630
On N_2 , high-energy electron capture	1630
high-energy excitation	1650-51
high-energy electron loss	1630
On O_2 , high-energy electron capture	1630
high-energy electron loss	1630
On W, electron yields	864-66
On Xe, high-energy production of free electrons	1622
Secondary electron spectrum from electron impact	
ionization	2260-61
Secondary electron spectrum from proton impact	
ionization	2319-22, 2374
Spin-orbit parameters	73
Transition probabilities	207

$\text{Xe}^+(2\text{P}_{1/2})$

Mobility in xenon	739, 742
-------------------	----------

$\text{Xe}^+(\text{}^2\text{P}_{3/2})$

Mobility in xenon 739, 742

Xe^{2+}

Ion-molecule reactions 1513
Low-energy collisions 321-22, 1511
On Kr, high-energy production of free electrons 1622
On Mo, electron yields 864
On Ne, high-energy production of free electrons 1622
On W, electron yields 865
On Xe, high-energy production of free electrons 1622

Xe^{3+}

On Kr, high-energy production of free electrons 1622
On Ne, high-energy production of free electrons 1622
On Xe, high-energy production of free electrons 1622

Xe^{4+}

On Kr, high-energy production of free electrons 1622
On Ne, high-energy production of free electrons 1622

XeAr

Photoionization efficiency curve 676
Photoionization cross section (relative) 2041

XeBr

Coefficients (C_{Π}) of the $1^2\Pi$ state in the covalent I(1/2) state	61
Coefficients (C_{Π}) of the $2^2\Pi$ state in the ionic III(1/2) state	62
Dipole moments for the covalent states	92
Dipole moments for the ionic states	93
Dipole moment for the $1^2\Sigma^+$ state	91
Dipole moment for the $1^2\Pi'$ state	91
Einstein coefficients	108, 114
Electronic states	28-29
Emission energies and wavelengths	108, 114
Laser and fluorescent wavelengths	12
Lifetimes	108, 114
Spectroscopic constants for the ionic states	65-66
Spectroscopic constants of the III(1/2) state	72
Spin-orbit coupling parameters	73
Total energies as a function of R for the covalent and ionic states	57
Total energies as a function of R for the electronic states	58
Transition moments for the ionic-covalent transitions	94, 103, 108, 114
Transition moments ($2^2\Pi - 1^2\Pi$)	96
Transition moments ($2^2\Sigma^+ - 1^2\Sigma^+$)	95

XeCl

Coefficients (C_{Π}) of the $1^2\Pi$ state in the covalent I(1/2) state	61
Coefficients (C_{Π}) of the $2^2\Pi$ state in the ionic III(1/2) state	62
Dipole moments for the covalent states	92
Dipole moments for the ionic states	93
Dipole moment for the $1^2\Pi$ state	91
Dipole moment for the $1^2\Sigma^+$ state	91
Einstein coefficients	108, 113

Electronic states	26-27
Emission energies and wavelengths	108, 113
Laser and fluorescent wavelengths	12
Lifetimes	108, 113
Spectroscopic constants for the ionic states	65, 66
Spectroscopic constants for the III(1/2) states	72
Spin-orbit coupling parameters	73
Total energies as a function of R for the electronic states	55-56
Transition moments	113
Transition moments for the ionic-covalent transitions	94, 102, 108
Transition moments ($2^2\Sigma^+ - 1^2\Sigma^+$)	95
Transition moments ($2^2\Pi - 1^2\Pi$)	96

XeF

Coefficient (C_{II}) of the $1^2\Pi$ state in the covalent I(1/2) state	61
Coefficient (C_{II}) of the $2^2\Pi$ state in the ionic III(1/2) state	62
Crossing points and energies of the III(1/2) - II(3/2) curve crossings	53
Dipole moments of the covalent states	78-79, 92
Dipole moments of the ionic states	80-81, 93
Dipole moment for the $1^2\Pi$ state	91
Dipole moment for the $1^2\Sigma^+$ state	91
Einstein coefficients	107-8, 112
Emission energies and wavelengths	107-8, 112
Franck-Condon factors	1241-42
Laser and fluorescent wavelengths	12
Lifetimes	107-8, 112
Low-energy collisions	1519-20
Potential energy curves for covalent states	39, 52
Potential energy curves for the covalent and ionic states	24-25, 1244

R centroids 1243
 Rotational level diagram 1239
 Separated atom limits for the ionic states 54
 Spectroscopic constants 1245-46
 Spectroscopic constants for the ionic states 65-67, 71
 Spectroscopic constants of the III(1/2) state 72
 Spin-orbit coupling parameters 73
 Total energies of the covalent and ionic states 50-51
 Transition moments 112
 Transitional moments for the ionic-covalent
 transitions 82-83, 87, 90, 94, 107-8
 Vibrational levels 1244
 Wavenumbers 1240
 Transition moments ($2^2\Pi - 1^2\Pi$) 96
 Transition moments ($2^2\Sigma^+ - 1^2\Sigma^+$) 95

XeF*

Dominant quenching processes 1485
 Low-energy collisions 256-57

XeF₂

Photoionization cross section (relative) 2041
 Photoionization efficiency curves of mass-identified ions 678

XeF₄

Photoionization cross section (relative) 2041
 Photoionization efficiency curves of mass-identified ions 679

XeF₆

Photoionization cross section (relative)	2041
Photoionization efficiency curves of mass-identified ions	680

Xenon Halides

Transition moments (III 1/2 - I 1/2)	99
Transition moments (III 1/2 - II 1/2)	100
Transition moments (IV 1/2 - I 1/2)	98
Transition moments (IV 1/2 - II 1/2)	101
Schematic representation of the strongest emission bands	97

Xe-Hg System

Energy flow diagram	1490
Reaction rates	1491

XeI

Coefficients (C_{Π}) of the $1^2\Pi$ state in the covalent I(1/2) states	61
Coefficients (C_{Π}) of the $2^2\Pi$ state in the ionic III(1/2) states	62
Dipole moments for the covalent states	92
Dipole moments for the ionic states	93
Dipole moment for the $1^2\Pi$ state	91
Dipole moment for the $1^2\Sigma^+$ state	91
Einstein coefficients	108, 115
Electronic states	30-31
Emission energies and wavelengths	108, 115
Laser and fluorescent wavelengths	12
Lifetimes	108, 115

Spectroscopic constants for the ionic states	65-66
Spectroscopic constants for the III(1/2) states	72
Spin-orbit coupling parameters	73
Total energies as a function of R for the covalent and ionic states	59
Total energies as a function of R for the electronic states	60
Transition moments for the ionic-covalent transitions	94, 104, 108, 115
Transition moments ($2^2\Pi - 1^2\Pi$)	96
Transition moments ($2^2\Sigma^+ - 1^2\Sigma^+$)	95

XeKr

Photoionization cross section (relative)	2041
Photoionization efficiency curve	677

XeO

Crossing points	1296
Dipole moments	1299
Energies of states	1290
Potential energy curves	1292
Radiative lifetimes	1297
Spectroscopic constants	1293
Transition moments	1296, 1298
Vibrational levels	1294

Xe₂

Energies of states 1176
Fluorescence lifetimes 212
Interaction energies 179
Low-energy collisions 1512
Photoionization cross section (relative) 2041
Photoionization efficiency curve 674
Potential energy curves 186, 188, 189, 1170, 1177

Xe₂^{*}

Energies of states 1176
Low-energy collisions 242-43
Photoabsorption cross sections 713
Potential energy curves 1174-75, 1177
Spectroscopic constants 1171
Transition moments 1179
Vertical transition energies 1178

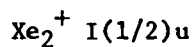
Xe₂ (¹Σ_g⁺)

Interaction energies 182

Xe₂⁺

Absorption data 147, 1206-7
Absorption spectra for the I(1/2)_u + II(1/2)_g
transition 150, 1207
Energies of states 1176
Mobility in xenon 739

On F^- , three-body recombination 1362, 1377-78
 two-body recombination 1359
 Photoabsorption cross sections 712
 Photodissociation cross section 686-87
 Potential energy curves 143-44, 148, 1172-73, 1177, 1192, 1199, 1200
 Spectroscopic constants 1171, 1204, 1205
 Spectroscopic data 147
 Three-body ion - ion recombination 321-22
 Total energies 145-46
 Vertical transition energies 1178



Dissociation energy 149

Xenon kinetic model

Rate coefficients 1489

Y

Polarizability 1156

Yb

Polarizability 1157

Zn

Photoelectric yields 889
Polarizability 1156
Self-sputtering coefficients 840-41

Zr

Polarizability 1156
Self-sputtering coefficients 843

DISTRIBUTION

	No. of Copies
School of Physics	
Georgia Institute of Technology	
ATTN: Dr. E. W. McDaniel	50
K. J. McCann	10
Dr. F. L. Eisele	10
E. W. Thomas	10
Dr. W. M. Pope	10
Dr. M. R. Flannery	10
Atlanta, Georgia 30332	
Joint Institute for Laboratory Astrophysics	
University of Colorado	
ATTN: J. W. Gallagher	10
J. R. Rumble	10
E. C. Beaty	10
Boulder, Colorado 80302	
Eckerd College	
ATTN: Dr. H. W. Ellis	10
St. Petersburg, Florida 33733	
Physics Department	
Georgia State University	
ATTN: S. T. Manson	10
Atlanta, Georgia 30303	
Defense Technical Information Center	
Cameron Station	
Alexandria, Virginia 22314	12
Director	
Ballistic Missile Defense Advanced Technology Center	
ATTN: ATC, Mr. J. D. Carlson	1
ATC-O, Mr. W. Davies	1
Mr. G. Sarraann	1
Mr. J. Hagefstration	1
-T, Dr. E. Wilkinson	1
-R, Mr. Don Schenk	1
P. O. Box 1500	
Huntsville, Alabama 35807	
Defense Advanced Research Project	
ATTN: Director, Laser Division	1
1400 Wilson Boulevard	
Arlington, Virginia 22209	

DISTRIBUTION (Continued)

	No. of Copies
Lawrence Livermore Laboratory	
ATTN: Dr. Joe Fleck	1
Dr. John Emmet	1
P. O. Box 808	
Livermore, California 94550	
Los Alamos Scientific Laboratory	
ATTN: Dr. Keith Boyer (MS 550)	1
P. O. Box 1663	
Los Alamos, New Mexico 87544	
Central Intelligence Agency	
ATTN: Mr. Julian C. Nall (OSI/PSTD)	1
Washington, DC 20505	
US Army Research Office	
ATTN: Dr. Robert Lontz	2
P. O. Box 12211	
Research Triangle Park, North Carolina 27709	
DRSMI-LP, Mr. Voigt	1
DRSMI-R, Dr. Kobler	1
-RH, COL W. R. DeLeuil	1
-RHS, Dr. Honeycutt	1
Mr. Cason	1
-RHB, Dr. Roberts (Additional Distribution)	485
-RA	1
-RPR	3
-RPT (Record Set)	1
(Reference Copy)	1