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TRANSPORT PROPERTIES OF GASEOUS IONS OVER A WIDE ENERGY RANGE*

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A compilation of experimental data is presented for the mobilities of mass-identified ions in neutral gases at room temperature as a function of the ionic energy parameter E/N, the ratio of electric field strength to neutral gas number density. The literature has been covered to February 1976. In addition, a recently developed theory of gaseous ion mobility is used to compute, for each ion-gas combination, the zero-field reduced mobility as a function of the common ion-gas temperature. Finally, it is shown how the tabulated data can be used to estimate the ionic diffusion coefficients and to obtain information about the ion-neutral interaction potential.

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CONTENTS

INTRODUCTION

Research on the mobility and diffusion of trace amounts of ions through neutral gases under the influence of an electric field began more than 75 years ago. With the introduction of drift-tube mass spectrometers about 1960 and with recent improvements in experimental techniques, data of good accuracy have become available for a number of systems over a large range of electric field strength E and neutral gas number density N. It is easy to show that in the dilute gas region where only binary ion-neutral collisions occur, the ion transport coefficients depend only on the ratio E/N, since this ratio determines the balance between the energy the ions gain from the field and the energy they lose due to collisions with the neutral gas. Intuition suggests that there should also be a connection between the way the transport coefficients vary with E/N and with the gas temperature T, since both quantities affect the relative kinetic energy between the ion swarm and the neutral gas. Recently, Viehland and Mason[1] have developed a general theory of gaseous ion mobility which provides such a connection. The purpose of this paper is to update the survey of experimental mobility data given by McDaniel and Mason[2] while making full use of this general theory. This paper is a more extensive and more comprehensive treatment than that which was recently presented[3] for K^+ ions in various gases.

THEORY OF GASEOUS ION MOBILITY

The general kinetic theory of Viehland and Mason[1] leads to a series of successive approximations to the ion mobility K. When only a single neutral gas is present, this theory predicts in first approximation that NK does not vary with T and E/N separately but is instead a function only of the effective temperature corresponding to the kinetic energy between the ion swarms and the neutral gas in the center-of-mass frame. This is important from a theoretical viewpoint because values of K obtained over a wide range of relative kinetic energies can lead to accurate information about the ion-neutral interaction potential over a wide range of separation distances.[4] For our purposes, however, the experimental implications of this prediction are more important; it greatly simplifies the presentation and correlation of experimental results.

In first approximation the effective temperature upon which K depends is given by Eq. (1) with $\beta = 0$

$$\frac{3}{2}kT_{\rm eff} = \frac{3}{2}kT + \frac{1}{2}M(v_d)^2(1 + \beta). \qquad (1)$$

Here k is Boltzmann's constant, M is the mass of the neutral molecules, and the quantity

$$v_d = KE \qquad (2)$$

is the drift velocity, the terminal velocity that the ions attain as they are pulled through the neutral gas by the electrostatic field. It has been shown in Ref. 1 and verified in this work that experimental mobility data do seem to trace a single curve when plotted against $T_{\rm eff}$ as given by Eq. 1, despite the fact that such data were taken by a number of different groups at different combinations of T and E/N. It seems well established therefore that K is a function only of $T_{\rm eff}$.

Although setting $\beta = 0$ in Eq. 1 suffices for most purposes—and is used to obtain the tables to be presented in this paper—a more accurate expression for β is[1]

$$\beta = \frac{mM(5 - 2A^*)}{5(m^2 + M^2) + 4mMA^*}\frac{d\ln(K)}{d\ln(E/N)} \qquad (3)$$

where m is the ion mass. The quantity A^* is a ratio of collision integrals[1] which varies only slowly with $T_{\rm eff}$ and which depends only weakly upon the details of the ion-neutral interaction potential; for most purposes A^* may be assumed to lie within the range 1.1–1.2, the high-field values corresponding to repulsive potentials ranging from $V(r) \propto r^{-8}$ to r^{-12}. Finally, the logarithmic derivative in Eq. 3 can be obtained from the relation

$$1 + \frac{d\ln(K)}{d\ln(E/N)} = \left[1 - 2\left(1 - \frac{T}{T_{\rm eff}}\right)\frac{d\ln(K)}{d\ln(T_{\rm eff})}\right]^{-1}. \qquad (4)$$

Since β is a small correction factor, little error arises by evaluating $d\ln(K)/d\ln(T_{\rm eff})$ from a plot of K versus the first approximation ($\beta = 0$) to $T_{\rm eff}$ as given by Eq. 1.

Mobility in Mixtures of Neutral Gases

The mobility of ions in a mixture of neutral gases can be related[1,5-7] to the mobilities K_j measured in the pure neutral gases j at the same E, N, and T as in the mixture. Thus

$$\frac{1}{K} = \sum_j \frac{X_j}{K_j} + \frac{1}{2}\sum_j \frac{X_j}{K_j}(1 - \Delta_j)\frac{d\ln(K_j)}{d\ln(E/N)} \times \left[1 + \frac{d\ln(K_j)}{d\ln(E/N)}\right]^{-1}; \qquad (5)$$

$$\Delta_j = (m + M_j)K_j^2\left(\sum_i \frac{X_i}{K_i}\right)\left(\sum_i \frac{X_i}{K_i(m + M_i)}\right), \qquad (6)$$

where X_j is the mole fraction of species j. When the second term is neglected, Eq. 5 reduces to the familiar expression known as Blanc's law.[2] Equations 5 and 6 have been shown[8] to be in accord with experimental results.

Relation between Gaseous Ion Mobility and Diffusion

A general theory of gaseous ion diffusion in electric fields of arbitrary strength has not been developed, despite the considerable effort devoted to the subject. However, two *ad hoc* theories of moderate accuracy[9,10] are suggested for the case where only a single neutral gas is present. Both theories relate the gaseous ion-diffusion coefficients to the ion mobility by generalized Einstein relations of the form[11-13]

$$\frac{qD_L}{K} = kT_L\left[1 + \frac{d\ln K}{d\ln(E/N)}\right]; \qquad (7)$$

$$\frac{qD_T}{K} = kT_T. \qquad (8)$$

Here q is the ionic charge and D_L and D_T are the coefficients describing diffusion parallel and perpendicular to the direction of the electrostatic field. Viehland and Mason[9] suggest that T_L and T_T be determined by the equations

$$kT_L = kT + \left[\frac{5m - (2m - M)A^*}{5m + 3MA^*}\right]\frac{Mv_d^2}{(1 - \gamma)^2}; \qquad (9)$$

$$kT_T = kT + \left[\frac{(m + M)A^*}{5m + 3MA^*}\right]\frac{Mv_d^2}{(1 - \gamma)^2}; \qquad (10)$$

$$\gamma = \begin{cases} 0 & v_d \le v_d^0 \\ \gamma_\infty(v_d - v_d^0)/v_d & v_d^0 \le v_d \le 2v_d^0 \\ \gamma_\infty & v_d \ge 2v_d^0 \end{cases} \qquad (11)$$

where v_d^0 is the value of the drift velocity at the point where the logarithmic derivative in Eq. 4 equals zero and where γ_∞ has the mass dependence shown in the following Table. On the other hand, Skullerud[10] suggests that

$$kT_L = kT + \left[\frac{5m - (2m - M)A^*}{5m + 3MA^*}\right] \times \left[1 + \alpha\frac{d\ln K}{d\ln(E/N)}\right]Mv_d^2; \qquad (12)$$

$$kT_T = kT + \left[\frac{(m + M)A^*}{5m + 3MA^*}\right]Mv_d^2, \qquad (13)$$

where α depends on the mass ratio shown in the Table. These *ad hoc* theories of relation between gaseous

Mass Dependence of γ_∞ and α as Obtained by Model Calculations[9,10]

$\frac{M}{m+M}$	γ_∞	$\frac{m}{M}$	α
0	−0.12	0	0
0.1	−0.10	0.1	0.05
0.2	−0.095	0.2	0.16
0.3	−0.083	0.5	0.45
0.4	−0.071	0.8	0.64
0.5	−0.055	1.0	0.72
0.6	−0.040	1.5	0.82
0.7	−0.023	2.0	0.88
0.8	−0.007	3.0	0.94
0.9	+0.011	4.0	0.96
1.0	+0.028	∞	1.00

ion mobility and diffusion give similar results and seem to do a good job of reproducing the experimental data[9,14-16] especially in view of the rather large experimental uncertainties and the approximate nature of the theories.

Connection with Ion-Neutral Interaction Potentials

The general theory of Viehland and Mason[1] allows the ionic mobility in a single-component neutral gas to be calculated entirely from knowledge of the ion-neutral reduced mass μ and interaction potential. In first approximation the drift velocity v_d is given by

$$v_d = \frac{3}{8}\frac{qE}{N}\left(\frac{\pi}{2\mu k\,T_{\mathrm{eff}}}\right)^{1/2}\frac{1}{\Omega^{(1,1)}(T_{\mathrm{eff}})}, \qquad (14)$$

where the momentum-transfer collision integral is

$$\Omega^{(1,1)}(T_{\mathrm{eff}}) = \frac{1}{2}(kT_{\mathrm{eff}})^{-3}\int_0^\infty \epsilon^2\, Q^{(1)}(\epsilon)\exp(-\epsilon/kT_{\mathrm{eff}})\,d\epsilon, \qquad (15)$$

where $Q^{(1)}$ is the momentum-transfer (diffusion) cross section

$$Q^{(1)}(\epsilon) = 2\pi\int_0^\pi (1-\cos\theta)\,\sigma(\epsilon,\theta)\sin\theta\,d\theta. \qquad (16)$$

In these equations ϵ and θ are the kinetic energy and scattering angle, respectively, for an ion-neutral collision in the center-of-mass system, and $\sigma(\epsilon,\theta)$ is the differential cross section for elastic scattering, a quantity which can be calculated from the ion-neutral interaction potential.[2] As a final note, both $\Omega^{(1,1)}$ and $Q^{(1)}$ are equal to πd^2 for the collision of classical rigid spheres of diameter d.

Equation 14 shows that values of $\Omega^{(1,1)}$ can be readily obtained from an analysis of experimental measurements of v_d. One way in which such values can be used[4] is to assess the accuracy of ion-neutral interaction potentials obtained from an *ab initio* calculation or from an analysis of other experimental properties. It is also possible to use these values of $\Omega^{(1,1)}$ to infer the ion-neutral potential directly; this is a well-known problem in the interpretation of transport property data and will not be discussed in detail here. We only wish to point out that the range of T_{eff} over which $\Omega^{(1,1)}$ values can be obtained far exceeds that usually available for the transport properties of neutral gases, and that the latter are still sufficiently good to be a major source of our present quantitative information on intermolecular forces.

SELECTION OF MOBILITY DATA

Contained in this paper is a collection of experimental data on the mobility of ions in gases. The data compilation is by no means exhaustive. In fact, an effort has been made to include only those data that are considered reliable in the light of recent developments. Omitted are the results of many experiments that were useful in the development of the subject of ionic transport but which have been superseded by later results or proved to be difficult to interpret.

The main criterion imposed on the data selected is that they refer to ions whose identity was unambiguously established in the measurement, in most cases by mass analysis of the ions at the end of their flight through the drift tube. A concomitant requirement is that ionic reactions with the drift-tube gas did not change the identity of the charge carriers in such a way as to affect the measured mobility significantly. Even though the identities of the primary ions produced by an ion source are usually known, reactions of these ions with molecules of the gas filling the drift tube can produce an unexpected assortment of ions, and the interrelationships among the drifting ions can be complicated. Usually it is impossible to disentangle the behavior of the individual species without use of mass selection and careful analysis of the shapes of the separate arrival-time spectra. In most cases the use of a drift-tube mass spectrometer is essential if unambiguous results are to be obtained. This matter is discussed at considerable length in Ref. 17.

Another requirement imposed on the data selected for presentation is that they have reasonably high accuracy. In approximately 45% of the ion-gas combinations, the accuracy is ±3% or better throughout most of the E/N range covered. A final requirement was that the data be available to us before February 1, 1976.

Acknowledgment

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EXPLANATION OF TABLES

E/N	The ratio of electric field strength to the neutral-gas number density. The unit employed is the Townsend (Td), 1 Td = 10^{-17} V-cm^2
v_d	The ionic drift velocity in the neutral gas, in units of 10^4 cm/sec
K_0	The reduced mobility of the ions in the neutral gas, in units of cm^2/V-sec. The reduced mobility is related to the mobility $K = v_d/E$ by $K_0 = K(P/760)(273.16/T) = NK/(2.69 \times 10^{19})$, where P and T are the neutral gas pressure and temperature in torr and °K, respectively
T_{eff}	The effective ion-gas temperature in °K obtained from Eq. (1) with $\beta = 0$
$K_0(0)$	The reduced ionic mobility as a function of T_{eff}, in the limit of vanishing electric field strength ($E/N \to 0$). The units are cm^2/V-sec. The tabulated numbers have been read from a smootn curve drawn through experimental mobility values plotted as a function of the (calculated) effective temperature
$\Omega^{(1,1)}$	The momentum-transfer collision integral in square angstroms (10^{-16} cm^2) as obtained from v_d measurements and Eq. (14)

Structure of Tables

Each table is divided into two independent parts. The first three columns on the left present the measured drift velocities and mobilities of the ions in the neutral gas as a function of the experimental parameter E/N. Both v_d and K_0 are given merely for convenience to facilitate use of the tables as a quick reference. All these data were collected at *or near* room temperature. We have labeled the experimental data $T = 300$ °K in order to stress the fixed temperature of the experimental data.

In most cases, the precision of the data was greater than the accuracy. Often the variation in the mobility as a function of E/N was significant even though the magnitude of the variation was within the limits of error. Thus, in most cases, three significant figures are given, although the estimated error may only allow two of them to be meaningful in the absolute sense.

In the four right-hand columns the independent variable is T_{eff}, obtained from theory, in first approximation. The quantity K_0 (0) is interpreted as the reduced ionic mobility in the zero-field limit ($E/N \to 0$), but at the ion-gas temperature T_{eff}. Calculation of $\Omega^{(1,1)}$ (T_{eff}) is allowed by this interpretation as explained above. The results are presented. The logarithmic derivative of K_0 (0) with respect to T_{eff} is included to allow the user of the tables to make higher-order corrections to the calculated effective temperature if greater accuracy is desired and to aid in the calculation of diffusion coefficients [see Eqs. (7)-(13)]. The error in the derivative is estimated at $\pm$ 10%, although it may actually be larger (~20%) at the highest and lowest values of T_{eff}. Finally, we note that

$$\frac{d\ln(K_0)}{d\ln x} = \frac{d\ln(K)}{d\ln x}.$$

Use of Tables

The first three columns on the left of each Table, which constitute a compilation of experimental data, are intended to provide a convenient "handbook" source of mobility data on mass-identified ions in neutral gases. The numbers presented were taken from a smooth curve drawn through the experimental data and represent our best estimate of the true mobility function.

The right-hand part (four columns) of each Table presents results derived from the application of theory to the experimental data on the left. Of direct experimental interest is the ability to read the zero-field reduced mobility $K_0(E/N \to 0)$ as a function of the temperature T_{eff}. Of theoretical interest is that, having acquired K_0 (T_{eff}), one may obtain information about the ion-neutral potential and calculate the ionic diffusion coefficients.

TABLES. Positive Ions in Helium

Li^+ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	23.1	1.24	300	22.9	29.2	0.32
3.00	23.1	1.86	400	25.0	23.2	0.27
4.00	23.1	2.48	500	26.4	19.7	0.24
6.00	23.3	3.76	600	27.5	17.2	0.21
8.00	23.8	5.12	800	29.1	14.1	0.18
10.0	24.4	6.56	1000	30.2	12.1	0.16
12.0	25.0	8.06	1200	31.0	10.8	0.14
15.0	26.1	10.5	1500	31.9	9.39	0.10
20.0	28.1	15.1	2000	32.5	7.98	0.03
25.0	30.0	20.2	2500	32.6	7.12	0.00
30.0	31.4	25.3	3000	32.6	6.50	-0.01
40.0	32.6	35.0	4000	32.4	5.66	-0.04
50.0	32.6	43.8	5000	32.0	5.13	-0.06
60.0	32.2	51.9	6000	31.6	4.74	-0.07
80.0	31.1	66.9	8000	30.9	4.20	-0.10
100	30.0	80.6	10000	30.1	3.85	-0.12
120	28.9	93.2	12000	29.4	3.60	-0.15
150	27.2	110	15000	28.4	3.34	-0.17
200	24.6	132	20000	26.9	3.05	-0.20
			25000	24.6	2.98	-0.23

Reference: 1

Accuracy: The total error in the experimental data is believed not to exceed ± 2% for E/N ≤ 150 Td. and ± 5% for E/N > 150 Td.

Na^+ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
1.00	22.8	0.613	300	22.6	25.6	0.24
2.00	22.8	1.23	400	24.0	20.9	0.17
4.00	22.8	2.45	500	24.7	18.2	0.13
6.00	22.8	3.68	600	25.2	16.2	0.09
8.00	23.1	4.97	800	25.8	13.7	0.06
10.0	23.4	6.29	1000	26.0	12.2	0.02
12.0	23.8	7.67	1200	26.0	11.1	-0.03
15.0	24.3	9.79	1500	25.6	10.1	-0.06
20.0	25.1	13.5	2000	25.0	8.97	-0.11
25.0	25.8	17.3	2500	24.4	8.22	-0.14
30.0	25.9	20.9	3000	23.7	7.72	-0.16
40.0	25.6	27.5	4000	22.5	7.05	-0.21
50.0	25.0	33.6	5000	21.4	6.63	-0.23
60.0	24.2	39.0	6000	20.5	6.31	-0.25
80.0	22.4	48.2	8000	19.1	5.87	-0.26
100	21.0	56.4	10000	18.0	5.57	-0.25
120	19.7	63.5				
150	18,4	74.2				
180	17.4	84.2				

Reference: 1

Accuracy: The total error in the experimental data is believed not to exceed ± 2%

Rb^+ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	20.0	2.15	300	20.0	27.3	0.00
7.00	20.0	3.76	350	20.0	25.3	-0.02
10.0	20.0	5.37	400	19.9	23.8	-0.04
15.0	19.9	8.02	500	19.6	21.6	-0.07
20.0	19.7	10.6	600	19.3	20.0	-0.10
25.0	19.5	13.1	800	18.6	18.0	-0.15
30.0	19.2	15.5	1000	17.9	16.7	-0.18
40.0	18.4	19.8	1200	17.4	15.7	-0.18
50.0	17.6	23.6	1500	16.7	14.6	-0.19
60.0	16.9	27.2	2000	15.7	13.5	-0.20
80.0	15.7	33.7	2500	15.1	12.5	-0.21
100	14.7	39.5	3000	14.5	11.9	-0.22
120	14.0	45.1	3500	14.0	11.4	-0.23
140	13.3	50.0	4000	13.6	11.0	-0.24

Reference: 33

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

K^+ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
1.00	21.6	0.580	300	21.5	26.1	0.06
2.00	21.6	1.16	400	21.8	22.3	0.02
4.00	21.6	2.32	500	21.7	20.0	-0.03
6.00	21.6	3.48	600	21.6	18.4	-0.06
8.00	21.6	4.64	800	21.1	16.3	-0.10
10.0	21.6	5.80	1000	20.5	15.0	-0.13
12.0	21.7	7.00	1200	20.0	14.0	-0.16
15.0	21.7	8.75	1500	19.3	13.0	-0.18
20.0	21.6	11.6	1800	18.6	12.3	-0.20
25.0	21.4	14.4	2000	18.2	11.9	-0.22
30.0	21.0	16.9	2500	17.3	11.2	-0.23
40.0	20.3	21.8	3000	16.6	10.7	-0.25
50.0	19.5	26.2	3500	15.9	10.3	-0.28
60.0	18.7	30.1	4000	15.3	10.0	-0.29
80.0	17.2	37.0	5000	14.4	9.54	-0.25
100	16.0	43.0	6000	13.7	9.16	-0.26
120	15.2	49.0				
150	14.0	56.4				

Reference: 17 and 9

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

See page 182 for Explanation of Tables

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TABLES. Positive Ions in Helium

H^+ - He

Experimental Data
T = 300° K

E/N	K_o	v_d
4.00	30.9	3.32
5.00	31.0	4.16
6.00	31.0	5.00
7.00	30.9	5.81
8.00	30.8	6.62
10.0	30.6	8.22
12.0	30.3	9.77
14.0	30.1	11.3
16.0	29.8	12.8
18.0	29.6	14.3
20.0	29.4	15.8

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
325	31.0	37.0	0.01
350	30.9	35.8	-0.04
375	30.8	34.7	-0.07
400	30.6	33.8	-0.08
450	30.3	32.2	-0.09
500	30.0	30.8	-0.07
550	29.8	29.6	-0.06
600	29.7	28.4	-0.06
700	29.4	26.6	-0.04

Reference 21 and 26

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

N^+ - He

Experimental Data
T = 300° K

E/N	K_o	v_d
6.00	19.9	3.21
8.00	20.0	4.30
10.0	20.0	5.37
12.0	20.1	6.48
15.0	20.2	8.14
20.0	20.4	11.0
25.0	20.6	13.8
30.0	20.8	16.8
40.0	21.0	22.6
50.0	21.2	28.5
60.0	21.4	34.5
70.0	21.6	40.6

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	19.9	30.4	0.06
350	20.1	27.9	0.05
400	20.2	26.0	0.05
500	20.4	23.0	0.04
600	20.6	20.8	0.04
700	20.7	19.2	0.04
800	20.8	17.8	0.03
1000	20.9	15.9	0.03
1200	21.1	14.4	0.03
1500	21.2	12.8	0.03
2000	21.4	11.0	0.03
2500	21.5	9.76	0.03
3000	21.6	8.87	0.02

Reference: 21

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

He^+ - He

Experimental Data
T = 300° K

E/N	K_o	v_d
6.00	10.3	1.66
8.00	10.2	2.19
10.0	10.2	2.74
12.0	10.1	3.26
15.0	10.0	4.03
20.0	9.90	5.32
25.0	9.74	6.54
30.0	9.60	7.74
40.0	9.28	9.97
50.0	8.97	12.1
60.0	8.67	14.0
80.0	8.12	17.5
100	7.67	20.6
120	7.25	23.4
150	6.78	27.3
200	6.12	32.9
250	5.60	37.6
300	5.19	41.8
400	4.58	49.2
500	4.17	56.0
600	3.81	61.4
700	3.57	67.1

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	10.3	73.4	-0.32
350	9.84	71.1	-0.30
400	9.48	69.0	-0.26
500	9.04	64.8	-0.22
600	8.67	61.6	-0.23
800	8.08	57.3	-0.25
1000	7.62	54.3	-0.28
1200	7.22	52.3	-0.29
1500	6.79	49.8	-0.31
2000	6.20	47.2	-0.32
2500	5.75	45.5	-0.35
3000	5.39	44.3	-0.38
3500	5.08	43.6	-0.39
4000	4.80	43.1	-0.42
5000	4.37	42.4	-0.48
6000	3.99	42.4	-0.51
7000	3.67	42.6	-0.55
8000	3.40	43.0	-0.59

Reference: 4 and 15

Accuracy: The total error in the experimental data is believed not to exceed ± 1% for E/N ≤ 20 and ± 3% for E/N > 20.

D^+ - He

Experimental Data
T = 300° K

E/N	K_o	v_d
4.00	24.3	2.61
5.00	24.3	3.26
6.00	24.2	3.90
7.00	24.2	4.55
8.00	24.1	5.18
10.0	24.0	6.45
12.0	23.8	7.67
14.0	23.7	8.92
16.0	23.5	10.1
18.0	23.3	11.3
20.0	23.0	12.4

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
310	24.3	37.5	-0.10
325	24.2	36.7	-0.10
350	24.0	35.7	-0.08
375	23.9	34.6	-0.08
400	23.8	33.7	-0.08
450	23.5	32.2	-0.10
500	23.3	30.8	-0.13
550	22.9	29.8	-0.20

Reference: 21 and 27

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

See page 182 for Explanation of Tables

TABLES. Positive Ions in Helium

Ar^+ - He

Experimental Data T = 300°K | Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	20.8	2.79	300	20.7	27.1	0.19
10.0	21.3	5.72	350	21.2	24.5	0.13
15.0	21.5	8.67	400	21.5	22.6	0.07
20.0	21.6	11.6	500	21.6	20.1	0.00
25.0	21.4	14.4	600	21.5	18.4	-0.03
30.0	21.2	17.1	700	21.4	17.1	-0.06
35.0	20.9	19.7	800	21.2	16.2	-0.09
40.0	20.6	22.1	900	20.9	15.5	-0.11
45.0	20.0	24.2	1000	20.7	14.8	-0.13
50.0	19.6	26.3	1200	20.1	13.9	-0.16
60.0	18.7	30.1	1500	19.3	13.0	-0.21
70.0	18.0	33.9	1800	18.5	12.4	-0.24
80.0	17.1	36.8	2000	18.1	12.0	-0.26
90.0	16.4	39.7	2500	17.0	11.4	-0.29
100	15.7	42.2	3000	16.1	11.0	-0.33
110	15.2	44.9	3500	15.2	10.8	-0.36
120	14.6	47.1	4000	14.5	10.6	-0.39
130	14.3	50.0				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

O^+ - He

Experimental Data T = 300° K | Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	22.6	3.04	300	22.5	26.5	0.20
10.0	23.4	6.29	400	23.8	21.7	0.17
15.0	24.2	9.75	500	24.6	18.8	0.13
20.0	24.9	13.4	600	25.1	16.8	0.10
25.0	25.5	17.1	800	25.6	14.3	0.05
30.0	25.8	20.8	1000	25.8	12.7	0.01
35.0	25.7	24.2	1200	25.7	11.6	-0.04
40.0	25.4	27.3	1500	25.3	10.6	-0.08
45.0	24.9	30.1	2000	24.6	9.40	-0.14
50.0	24.5	32.9	2500	23.7	8.73	-0.17
60.0	23.6	38.0	3000	23.0	8.21	-0.18
70.0	22.5	42.3	3500	22.3	7.84	-0.20
80.0	21.7	46.6	4000	21.7	7.54	-0.21
90.0	21.1	51.0	4500	21.1	7.31	-0.22
100	20.5	55.1	5000	20.7	7.07	-0.23
110	19.9	58.8	6000	19.8	6.75	-0.24
120	19.4	62.6	7000	19.1	6.47	-0.25
130	18.9	66.0				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

H_g^+ - He

Experimental Data T = 300° K | Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	19.7	2.12	300	19.7	27.4	-0.10
5.00	19.7	2.65	350	19.5	25.6	-0.06
6.00	19.6	3.16	400	19.4	24.1	-0.04
8.00	19.6	4.21	450	19.3	22.8	-0.03
10.0	19.5	5.24	500	19.2	21.8	-0.02
12.0	19.5	6.29	600	19.2	19.9	0.00
15.0	19.4	7.82	700	19.2	18.4	0.03
20.0	19.2	10.3	800	19.3	17.1	0.06
25.0	19.2	12.9	900	19.5	16.0	0.10
30.0	19.2	15.5				
35.0	19.3	18.2				

Reference: 8

Accuracy: The total error in the experimental data is believed not to exceed ± 4%.

U^+ - He

Experimental Data T = 300° K | Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	15.8	1.27	300	15.9	33.9	-0.12
4.00	15.8	1.70	325	15.7	33.0	-0.16
5.00	15.8	2.12	350	15.5	32.2	-0.19
6.00	15.8	2.55	400	15.1	30.9	-0.24
8.00	15.7	3.37	450	14.6	30.1	-0.28
10.0	15.6	4.19	500	14.1	29.6	-0.32
12.0	15.5	5.00	550	13.7	29.0	-0.34
15.0	15.4	6.21	600	13.3	28.6	-0.37
20.0	15.0	8.06	650	12.9	28.4	-0.40
25.0	14.6	9.81				
30.0	14.1	11.4				
35.0	13.6	12.8				
40.0	13.1	14.1				

Reference: 18

Accuracy: The total error in the experimental data is believed not to exceed ± 4%.

See page 182 for Explanation of Tables

TABLES. Positive Ions in Helium

He_2^+ - He

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
1.50	16.7	0.673	300	16.7	39.2	-0.09
2.00	16.7	0.897	350	17.0	35.6	-0.14
3.00	16.8	1.35	400	17.4	32.6	-0.17
4.00	16.8	1.81	450	17.8	30.0	-0.19
5.00	16.8	2.26	500	18.1	28.0	-0.19
6.00	16.8	2.71	550	18.5	26.1	-0.20
8.00	16.9	3.63				
10.0	16.9	4.54				
12.0	17.0	5.48				
14.0	17.2	6.47				
16.0	17.3	7.44				
18.0	17.5	8.46				
20.0	17.7	9.51				
22.0	18.0	10.6				
24.0	18.3	11.8				

Reference: 4

Accuracy: The total error in the experimental data is believed not to exceed ± 1%.

H_2^+ - He

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	24.5	1.97	300	24.5	37.8	0.08
4.00	24.5	2.63	325	24.7	36.0	0.20
5.00	24.5	3.29	350	25.2	34.0	0.28
6.00	24.6	3.97	400	26.2	30.6	0.29
7.00	24.8	4.66	450	27.1	27.9	0.30
8.00	25.1	5.40	500	28.0	25.6	0.30
10.0	25.7	6.91	550	28.9	23.6	0.31
12.0	26.5	8.54	600	29.6	22.1	0.31
14.0	27.6	10.4	650	30.4	20.7	0.32
16.0	28.8	12.4				
18.0	30.2	14.6				

Reference: 21

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

N_2^+ - He

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
8.00	20.8	4.47	350	20.9	25.3	0.08
9.00	20.9	5.05	400	20.9	23.7	-0.02
10.0	21.0	5.64	500	20.7	21.4	-0.08
12.0	21.0	6.77	600	20.3	19.9	-0.11
15.0	20.9	8.42	700	19.9	18.8	-0.12
20.0	20.7	11.1	800	19.6	17.8	-0.13
25.0	20.3	13.6	1000	19.0	16.5	-0.14
30.0	19.9	16.0	1200	18.5	15.4	-0.16
40.0	19.1	20.5	1500	17.8	14.4	-0.22
50.0	18.3	24.6	1800	17.0	13.7	-0.27
60.0	17.5	28.2	2000	16.5	13.4	-0.31
70.0	16.8	31.6	2500	15.3	12.9	-0.38
80.0	16.2	34.8				
90.0	15.6	37.7				

Reference: 21

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

CO^+ - He

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	19.9	2.67	300	19.8	28.8	0.29
10.0	20.6	5.54	350	20.6	25.7	0.17
15.0	20.8	8.38	400	20.8	23.8	0.06
20.0	20.8	11.2	500	20.8	21.3	-0.04
25.0	20.5	13.8	600	20.6	19.6	-0.06
30.0	20.3	16.4	700	20.3	18.4	-0.08
35.0	19.9	18.7	800	20.1	17.4	-0.11
40.0	19.5	21.0	900	19.8	16.7	-0.13
45.0	19.1	23.1	1000	19.5	16.0	-0.15
50.0	18.7	25.1	1200	19.0	15.0	-0.16
60.0	17.7	28.5	1500	18.2	14.0	-0.21
70.0	16.9	31.8	2000	16.9	13.1	-0.25
80.0	16.3	35.0	2500	15.9	12.4	-0.29
90.0	15.7	38.0	3000	15.1	12.0	-0.25
100	15.2	40.8	3500	14.6	11.5	-0.21
110	14.8	43.7				
120	14.4	46.4				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Positive Ions in Helium

NO^+ - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	21.5	2.89	300	21.3	26.7	0.19
10.0	21.8	5.86	350	21.8	24.2	0.08
15.0	21.7	8.75	400	21.9	22.5	-0.01
20.0	21.6	11.6	500	21.6	20.4	-0.09
25.0	21.0	14.1	600	21.1	19.1	-0.13
30.0	20.5	16.5	700	20.7	18.0	-0.16
35.0	20.0	18.8	800	20.2	17.2	-0.17
40.0	19.6	21.1	900	19.8	16.6	-0.18
45.0	18.9	22.9	1000	19.4	16.1	-0.19
50.0	18.4	24.7	1200	18.8	15.1	-0.21
60.0	17.6	28.4	1500	17.8	14.3	-0.24
70.0	16.8	31.6	1800	17.1	13.6	-0.26
80.0	16.1	34.6	2000	16.6	13.3	-0.27
90.0	15.6	37.7	2500	15.6	12.6	-0.29
100	15.0	40.3	3000	14.8	12.2	-0.29
110	14.4	42.6	3500	14.2	11.7	-0.28
120	14.1	45.5	4000	13.7	11.4	-0.24
130	13.7	47.9				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceet ± 7%.

O_2^+ - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	21.8	2.93	300	21.8	26.0	0.02
10.0	21.9	5.88	350	21.9	24.0	0.00
15.0	21.8	8.79	400	21.8	22.5	-0.02
20.0	21.6	11.6	500	21.6	20.3	-0.07
25.0	21.1	14.2	600	21.3	18.8	-0.09
30.0	20.8	16.8	700	20.9	17.8	-0.12
35.0	20.3	19.1	800	20.6	16.8	-0.14
40.0	19.7	21.2	900	20.2	16.2	-0.16
50.0	18.9	25.4	1000	19.8	15.7	-0.17
60.0	17.9	28.9	1200	19.2	14.8	-0.19
70.0	17.1	32.2	1500	18.3	13.8	-0.22
80.0	16.3	35.0	1800	17.6	13.1	-0.24
90.0	15.7	38.0	2000	17.1	12.8	-0.26
100	15.3	41.1	2500	16.1	12.2	-0.29
110	14.8	43.7	3000	15.2	11.8	-0.32
120	14.2	45.8	3500	14.5	11.4	-0.35
130	13.8	48.2	4000	13.8	11.2	-0.38

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

ArH^+ - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
10.0	19.5	5.24	350	19.5	26.6	0.07
15.0	19.6	7.90	400	19.6	24.7	0.03
20.0	19.7	10.6	450	19.7	23.2	-0.01
25.0	19.5	13.1	500	19.6	22.1	-0.03
30.0	19.1	15.4	600	19.4	20.4	-0.07
35.0	18.8	17.7	700	19.1	19.2	-0.11
40.0	18.5	19.9	800	18.8	18.2	-0.13
50.0	17.7	23.8	900	18.5	17.5	-0.15
60.0	16.8	27.1	1000	18.2	16.8	-0.17
70.0	16.1	30.3	1200	17.6	15.9	-0.20
80.0	15.5	33.3	1500	16.8	14.9	-0.23
90.0	14.9	36.0	1800	16.0	14.3	-0.25
100	14.4	38.7	2000	15.6	13.9	-0.27
110	13.9	41.1	2500	14.7	13.2	-0.29
120	13.5	43.5	3000	13.9	12.7	-0.31

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

H_3^+ - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	31.6	4.25	300	30.8	26.5	0.27
10.0	33.1	8.89	350	32.1	23.5	0.22
15.0	34.5	13.9	400	32.9	21.5	0.17
20.0	34.6	18.6	500	33.9	18.6	0.11
25.0	34.4	23.1	600	34.4	16.8	0.06
30.0	33.6	27.1	700	34.7	15.4	0.03
35.0	32.8	30.8	800	34.7	14.4	0.00
40.0	31.9	34.3	1000	34.6	12.9	-0.04
45.0	30.9	37.4	1500	33.6	10.9	-0.11
55.0	29.5	43.6	1800	32.8	10.2	-0.14
60.0	28.4	45.8	2000	32.3	9.79	-0.15
65.0	27.8	48.6	2500	31.2	9.06	-0.19
			3000	30.0	8.60	-0.22
			3500	29.0	8.24	-0.25
			4000	28.0	7.98	-0.29

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Positive Ions in Helium

COH^+ - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	20.2	2.71	300	20.2	28.2	0.10
10.0	20.4	5.48	350	20.4	25.9	0.03
15.0	20.3	8.18	400	20.4	24.2	-0.03
20.0	19.9	10.7	500	20.1	22.0	-0.08
25.0	19.7	13.2	600	19.7	20.5	-0.12
30.0	19.4	15.6	700	19.3	19.3	-0.14
35.0	18.9	17.8	800	18.9	18.5	-0.16
40.0	18.5	19.9	900	18.5	17.8	-0.18
45.0	18.0	21.8	1000	18.2	17.2	-0.20
50.0	17.5	23.5	1200	17.5	16.3	-0.24
60.0	16.7	26.9	1500	16.5	15.4	-0.27
70.0	15.9	29.9	1800	15.7	14.8	-0.27
80.0	15.3	32.9	2000	15.3	14.4	-0.27
90.0	14.7	35.5	2500	14.4	13.7	-0.25
100	14.3	38.4	3000	13.8	13.1	-0.23
110	13.8	40.8	3500	13.4	12.5	-0.20
120	13.5	43.5				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

O_2H^+ - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	19.4	2.61	300	19.4	29.2	0.04
10.0	19.4	5.21	350	19.5	26.9	0.01
15.0	19.4	7.86	400	19.5	25.1	-0.01
20.0	19.4	10.4	500	19.3	22.7	-0.05
25.0	19.4	13.0	600	19.1	20.9	-0.07
30.0	18.9	15.2	700	18.9	19.6	-0.10
35.0	18.7	17.6	800	18.6	18.6	-0.12
40.0	18.3	19.7	900	18.3	17.8	-0.14
50.0	17.6	23.6	1000	18.0	17.2	-0.16
60.0	16.9	27.2	1200	17.5	16.2	-0.18
70.0	16.1	30.3	1500	16.7	15.2	-0.20
80.0	15.5	33.3	1800	16.1	14.3	-0.23
90.0	15.0	36.3	2000	15.7	14.0	-0.24
100	14.5	39.0	2500	14.8	13.2	-0.26
110	14.1	41.7	3000	14.1	12.7	-0.28
120	13.7	44.2	3500	13.5	12.3	-0.30

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

CO_2^+ - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	19.8	2.66	300	19.8	28.2	-0.13
10.0	19.5	5.24	350	19.4	26.6	-0.14
15.0	19.1	7.70	400	19.1	25.3	-0.15
20.0	18.6	10.0	500	18.4	23.5	-0.17
25.0	18.2	12.2	600	17.8	22.2	-0.18
30.0	17.7	14.3	700	17.3	21.1	-0.19
35.0	17.3	16.3	800	16.9	20.2	-0.21
40.0	16.9	18.2	900	16.5	19.5	-0.22
45.0	16.4	19.8	1000	16.1	19.0	-0.22
50.0	16.1	21.6	1200	15.4	18.1	-0.25
60.0	15.3	24.7	1500	14.6	17.1	-0.27
70.0	14.5	27.3	1800	13.9	16.4	-0.28
80.0	14.0	30.1	2000	13.5	16.0	-0.29
90.0	13.4	32.4	2500	12.6	15.3	-0.32
100	13.0	34.9	3000	11.9	14.8	-0.31
110	12.5	36.9				
120	12.2	39.3				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

NH_3^+ - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
10.0	23.0	6.18	350	23.0	23.9	-0.03
15.0	22.9	9.23	400	22.9	22.5	-0.04
20.0	22.5	12.1	450	22.8	21.3	-0.06
25.0	22.0	14.8	500	22.6	20.4	-0.08
30.0	21.5	17.3	600	22.2	18.9	-0.10
35.0	20.9	19.7	700	21.8	17.8	-0.12
40.0	20.5	22.0	800	21.4	17.0	-0.14
45.0	19.9	24.1	900	21.0	16.3	-0.16
50.0	19.4	26.1	1000	20.7	15.7	-0.17
60.0	18.5	29.8	1200	20.0	14.8	-0.19
70.0	17.6	33.1	1500	19.2	13.8	-0.21
80.0	16.9	36.3	1800	18.4	13.2	-0.23
90.0	16.4	39.7	2000	18.0	12.8	-0.24
100	15.9	42.7	2500	17.0	12.1	-0.27
110	15.3	45.2	3000	16.1	11.7	-0.30
120	14.8	47.7	3500	15.4	11.3	-0.32
			4000	14.7	11.1	-0.33

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Positive Ions in Helium

NH_4^+ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	21.9	2.94	300	21.9	27.0	-0.03
10.0	21.8	5.86	350	21.8	25.1	-0.05
15.0	21.6	8.71	400	21.6	23.7	-0.07
20.0	21.2	11.4	500	21.2	21.6	-0.10
25.0	20.8	14.0	600	20.8	20.1	-0.12
30.0	20.3	16.4	700	20.4	19.0	-0.14
35.0	19.8	18.6	800	20.0	18.1	-0.16
40.0	19.3	20.7	900	19.6	17.4	-0.17
45.0	18.7	22.6	1000	19.2	16.9	-0.19
50.0	18.3	24.6	1200	18.5	16.0	-0.21
60.0	17.4	28.1	1500	17.6	15.0	-0.25
70.0	16.7	31.4	1800	16.8	14.4	-0.27
80.0	15.9	34.2	2000	16.3	14.0	-0.27
90.0	15.4	37.2	2500	15.4	13.3	-0.27
100	14.9	40.0	3000	14.7	12.7	-0.24
110	14.5	42.9	3500	14.2	12.2	-0.23
120	14.1	45.5	4000	13.8	11.7	-0.19
130	13.7	47.9				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

N_2OH^+ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	17.2	2.31	300	17.2	32.4	0.06
10.0	17.3	4.65	350	17.3	29.8	0.00
15.0	17.3	6.97	400	17.2	28.1	-0.05
20.0	17.1	9.19	500	16.8	25.7	-0.14
25.0	16.8	11.3	600	16.3	24.2	-0.18
30.0	16.4	13.2	700	15.9	23.0	-0.18
35.0	16.1	15.1	800	15.5	22.0	-0.19
45.0	15.3	18.5	1000	14.8	20.6	-0.21
50.0	15.0	20.2	1200	14.2	19.6	-0.24
60.0	14.3	23.1	1500	13.5	18.5	-0.26
70.0	13.7	25.8	1800	12.8	17.8	-0.28
80.0	13.1	28.2	2000	12.4	17.4	-0.29
90.0	12.7	30.7	2500	11.6	16.6	-0.32
100	12.3	33.1				
110	11.9	35.2				
120	11.6	37.4				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

$O_2H_2^+$ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	18.5	2.49	300	18.5	30.5	0.15
10.0	18.8	5.05	350	18.8	27.8	0.08
15.0	18.9	7.62	400	18.9	25.9	0.00
20.0	18.8	10.1	500	18.8	23.3	-0.05
25.0	18.8	12.6	600	18.5	21.6	-0.09
30.0	18.4	14.8	700	18.2	20.3	-0.12
35.0	17.9	16.8	800	17.9	19.3	-0.14
40.0	17.6	18.9	900	17.6	18.5	-0.16
45.0	17.3	20.9	1000	17.3	17.9	-0.17
50.0	17.0	22.8	1200	16.7	16.9	-0.21
60.0	16.2	26.1	1500	15.9	15.9	-0.26
70.0	15.5	29.2	1800	15.1	15.3	-0.30
80.0	14.8	31.8	2000	14.6	15.0	-0.29
90.0	14.2	34.3	2500	13.8	14.2	-0.21
100	13.8	37.1	3000	13.4	13.3	-0.14
110	13.5	39.9				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

$NO^+\cdot H_2O$ - He

Experimental Data T = 300° K — Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	16.8	1.81	300	16.8	33.1	-0.08
6.00	16.8	2.71	325	16.7	32.0	-0.11
8.00	16.8	3.61	350	16.6	31.0	-0.14
10.0	16.7	4.49	400	16.2	29.7	-0.18
12.0	16.7	5.38	450	15.8	28.7	-0.21
15.0	16.5	6.65	500	15.5	27.8	-0.24
20.0	16.1	8.65	550	15.1	27.2	-0.26
25.0	15.7	10.5				
30.0	15.2	12.3				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Positive and Negative Ions in Helium

CH_5^+ - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	21.0	2.82	300	21.0	28.3	-0.08
10.0	20.8	5.59	350	20.7	26.6	-0.10
15.0	20.4	8.22	400	20.4	25.2	-0.12
20.0	19.9	10.7	500	19.9	23.1	-0.14
25.0	19.4	13.0	600	19.3	21.8	-0.17
30.0	19.0	15.3	700	18.8	20.7	-0.18
35.0	18.4	17.3	800	18.3	19.9	-0.20
40.0	18.0	19.3	900	17.9	19.2	-0.21
45.0	17.4	21.0	1000	17.5	18.6	-0.23
50.0	17.0	22.8	1200	16.7	17.8	-0.26
60.0	16.2	26.1	1500	15.7	16.9	-0.30
70.0	15.3	28.8	1800	14.8	16.4	-0.33
80.0	14.6	31.4	2000	14.3	16.1	-0.35

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

H^- - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	38.8	4.17	325	38.8	29.6	-0.17
5.00	38.6	5.19	350	38.3	28.9	-0.16
6.00	38.3	6.17	400	37.5	27.6	-0.15
7.00	37.9	7.13	450	36.8	26.5	-0.14
8.00	37.4	8.04	500	36.3	25.5	-0.13
10.0	36.7	9.86	600	35.5	23.8	-0.11
12.0	36.2	11.7	700	35.0	22.3	-0.09
15.0	35.5	14.3	800	34.6	21.1	-0.08
20.0	34.6	18.6	1000	34.1	19.2	-0.07
25.0	33.9	22.8	1200	33.7	17.7	-0.06
30.0	33.3	26.8	1400	33.3	16.6	-0.06
			1600	33.1	15.6	-0.06

Reference: 21

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

$CH_3O_2^+$ - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	17.0	1.83	300	17.0	32.7	-0.09
6.00	16.9	2.72	350	16.7	30.9	-0.11
7.00	16.9	3.18	400	16.4	29.4	-0.13
10.0	16.8	4.51	450	16.1	28.2	-0.15
12.0	16.7	5.38	500	15.9	27.1	-0.17
15.0	16.6	6.69	600	15.4	25.6	-0.19
20.0	16.3	8.76	700	14.9	24.5	-0.22
25.0	16.0	10.7	800	14.5	23.5	-0.23
30.0	15.6	12.6	1000	13.7	22.3	-0.27
40.0	14.9	16.0	1200	13.0	21.4	-0.32
50.0	14.2	19.1	1400	12.3	20.9	-0.41
60.0	13.5	21.8	1600	11.5	21.0	-0.59
70.0	12.8	24.1				
80.0	12.2	26.2				
90.0	11.6	28.1				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

Cl^- - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	20.3	2.18	300	20.3	27.8	-0.05
7.00	20.3	3.27	350	20.0	26.1	-0.19
10.0	20.1	5.40	400	19.5	25.0	-0.22
12.0	19.8	6.38	450	19.0	24.2	-0.20
15.0	19.5	7.86	500	18.6	23.5	-0.19
20.0	18.9	10.2	600	18.0	22.2	-0.20
25.0	18.3	12.3	700	17.4	21.2	-0.20
30.0	17.8	14.3	800	16.9	20.4	-0.21
40.0	16.9	18.2	1000	16.2	19.1	-0.22
50.0	16.0	21.5	1200	15.5	18.2	-0.23
60.0	15.3	24.7	1500	14.7	17.2	-0.25
70.0	14.7	27.6	1800	14.1	16.3	-0.26
80.0	14.1	30.3	2000	13.7	15.9	-0.27
90.0	13.6	32.9	2500	12.9	15.1	-0.29
100	13.2	35.5	3000	12.2	14.6	-0.30
110	12.8	37.6				
120	12.4	40.0				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Negative Ions in Helium

O^- - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	28.2	2.27	300	28.2	20.1	-0.32
4.00	27.8	2.99	400	26.0	18.9	-0.24
5.00	27.6	3.71	500	24.8	17.7	-0.22
6.00	27.4	4.42	600	23.8	16.8	-0.21
8.00	26.9	5.78	700	23.1	16.1	-0.21
10.0	26.5	7.12	800	22.4	15.5	-0.20
12.0	26.0	8.38	1000	21.4	14.5	-0.21
15.0	25.3	10.2	1200	20.7	13.7	-0.20
20.0	24.2	13.0	1500	19.8	12.8	-0.20
25.0	23.2	15.6	2000	18.7	11.7	-0.21
30.0	22.3	18.0	2500	17.8	11.0	-0.20
40.0	20.9	22.5	3000	17.2	10.4	-0.19
50.0	19.8	26.6	4000	16.3	9.52	-0.17
60.0	19.0	30.6	5000	15.8	8.79	-0.18
80.0	17.8	38.3	6000	15.5	8.18	-0.17
100	16.8	45.1	7000	15.3	7.67	-0.14
120	16.1	51.9				
140	15.5	58.3				
160	14.9	64.1				

Reference: 21

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

O_2^- - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	21.5	1.73	300	21.5	26.4	-0.15
5.00	21.4	2.88	350	21.0	25.0	-0.17
8.00	21.2	4.56	400	20.5	23.9	-0.18
10.0	21.1	5.67	500	19.7	22.3	-0.19
12.0	20.8	6.71	600	19.0	21.1	-0.21
15.0	20.5	8.26	700	18.4	20.2	-0.22
20.0	19.8	10.6	800	17.8	19.5	-0.22
25.0	19.2	12.9	1000	16.9	18.4	-0.24
30.0	18.6	15.0	1200	16.2	17.5	-0.26
40.0	17.5	18.8	1500	15.3	16.6	-0.28
50.0	16.6	22.3	1800	14.5	16.0	-0.29
60.0	15.8	25.5	2000	14.0	15.7	-0.30
70.0	15.1	28.4	2400	13.3	15.1	-0.32
80.0	14.4	31.0				
90.0	13.9	33.6				
100	13.3	35.7				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

OH^- - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
7.00	24.5	4.61	350	24.3	22.6	-0.21
10.0	24.1	6.48	400	23.6	21.8	-0.21
15.0	23.3	9.39	500	22.6	20.4	-0.21
20.0	22.4	12.0	600	21.8	19.3	-0.21
30.0	20.9	16.8	800	20.5	17.7	-0.21
40.0	19.6	21.1	1000	19.6	16.6	-0.21
60.0	17.7	28.5	1500	18.0	14.8	-0.22
80.0	16.4	35.3	2000	16.8	13.7	-0.24
100	15.3	41.1	3000	15.3	12.3	-0.25
120	14.4	46.4	4000	14.2	11.5	-0.26
140	13.7	51.5	5000	13.4	10.9	-0.27

Reference: 21

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

O_3^- - He

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	18.6	1.50	300	18.6	29.9	-0.23
5.00	18.6	2.50	350	18.0	28.6	-0.21
8.00	18.3	3.93	400	17.5	27.5	-0.22
10.0	18.2	4.89	450	17.1	26.6	-0.22
12.0	18.0	5.80	500	16.7	25.8	-0.22
15.0	17.8	7.17	600	16.1	24.4	-0.23
20.0	17.3	9.30	700	15.5	23.5	-0.24
25.0	16.7	11.2	800	15.0	22.7	-0.25
30.0	16.2	13.1	900	14.5	22.1	-0.27
40.0	15.3	16.4	1000	14.1	21.6	-0.28
50.0	14.5	19.5	1100	13.7	21.2	-0.29
60.0	13.8	22.2				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Negative Ions in Helium

NO_2^- - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	18.6	2.00	300	18.6	29.9	-0.16
7.00	18.4	3.46	350	18.1	28.5	-0.18
10.0	18.3	4.92	400	17.7	27.3	-0.20
12.0	18.2	5.87	450	17.3	26.3	-0.20
15.0	17.9	7.21	500	17.0	25.4	-0.20
20.0	17.4	9.35	600	16.3	24.2	-0.22
25.0	16.9	11.4	700	15.7	23.2	-0.24
30.0	16.4	13.2	800	15.2	22.4	-0.25
40.0	15.5	16.7	1000	14.4	21.2	-0.26
50.0	14.8	19.9	1200	13.7	20.3	-0.26
60.0	14.0	22.6	1500	13.0	19.2	-0.25
70.0	13.4	25.2	1800	12.4	18.3	-0.27
80.0	12.9	27.7	2000	12.0	18.0	-0.26
90.0	12.5	30.2	2500	11.4	16.9	-0.26
100	12.1	32.5				
110	11.7	34.6				
120	11.4	36.8				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

CO_3^- - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	16.9	0.908	300	16.9	32.7	-0.38
5.00	16.7	2.24	350	16.1	31.7	-0.23
8.00	16.5	3.55	400	15.7	30.4	-0.21
10.0	16.3	4.38	450	15.3	29.4	-0.22
12.0	16.2	5.22	500	14.9	28.7	-0.23
15.0	16.0	6.45	600	14.3	27.3	-0.24
20.0	15.6	8.38	700	13.8	26.2	-0.24
25.0	15.2	10.2	800	13.3	25.4	-0.25
30.0	14.8	11.9	1000	12.5	24.2	-0.27
40.0	14.0	15.0	1200	12.0	23.0	-0.27
50.0	13.3	17.9	1400	11.5	22.2	-0.28
60.0	12.7	20.5	1600	11.0	21.7	-0.28
70.0	12.2	22.9	1800	10.7	21.1	-0.29
80.0	11.7	25.2	2000	10.3	20.7	-0.30
90.0	11.3	27.3				
100	10.9	29.3				
110	10.6	31.3				
120	10.2	32.9				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

SO_2F^- - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	14.9	1.20	300	14.9	36.7	-0.11
5.00	14.9	2.00	325	14.8	35.5	-0.12
8.00	14.8	3.18	350	14.6	34.7	-0.16
10.0	14.8	3.98	400	14.3	33.1	-0.19
12.0	14.7	4.74	450	13.9	32.1	-0.22
15.0	14.6	5.88	500	13.6	31.2	-0.24
20.0	14.3	7.68	550	13.3	30.4	-0.25
25.0	14.0	9.40	600	13.0	29.8	-0.27
30.0	13.6	11.0	700	12.4	28.9	-0.30
35.0	13.2	12.4	800	11.9	28.1	-0.33
40.0	12.9	13.9	900	11.5	27.5	-0.35
50.0	12.2	16.4	1000	11.0	27.2	-0.36
60.0	11.6	18.7				
70.0	11.1	20.9				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

$C_2H_2^-$ - He

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	17.4	2.34	300	17.5	32.8	-0.18
7.00	17.3	3.25	325	17.2	32.1	-0.19
10.0	17.2	4.62	350	17.0	31.3	-0.20
12.0	17.0	5.48	400	16.5	30.1	-0.21
15.0	16.8	6.77	450	16.1	29.1	-0.22
20.0	16.3	8.76	500	15.7	28.3	-0.23
25.0	15.8	10.6	550	15.4	27.5	-0.24
30.0	15.4	12.4	600	15.1	26.9	-0.24
35.0	14.9	14.0	700	14.5	25.9	-0.26
40.0	14.5	15.6	800	14.0	25.1	-0.27
50.0	13.8	18.5	900	13.6	24.4	-0.30
60.0	13.1	21.1	1000	13.1	24.0	-0.36
70.0	12.3	23.1	1100	12.6	23.8	-0.46

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Ions in Helium, Neon

SO_3^- - He

Experimental Data: T = 300° K. Derived Quantities.

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	15.4	1.66	300	15.4	35.6	-0.24
7.00	15.3	2.88	350	14.8	34.2	-0.24
10.0	15.1	4.06	400	14.4	32.9	-0.24
12.0	15.0	4.84	450	14.0	31.9	-0.24
15.0	14.8	5.97	500	13.6	31.2	-0.24
20.0	14.5	7.79	600	13.0	29.8	-0.25
25.0	14.1	9.47	700	12.5	28.7	-0.26
30.0	13.8	11.1	800	12.1	27.7	-0.26
40.0	13.0	14.0	1000	11.4	26.3	-0.27
50.0	12.3	16.5	1200	10.9	25.1	-0.28
60.0	11.8	19.0	1400	10.4	24.4	-0.29
70.0	11.3	21.3	1600	10.0	23.7	-0.29
80.0	10.9	23.4	1800	9.7	23.0	-0.29
90.0	10.6	25.6				
100	10.2	27.4				
110	9.9	29.3				
120	9.6	31.0				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

SF_6^- - He

Experimental Data: T = 300° K. Derived Quantities.

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	12.9	0.693	300	12.9	42.0	-0.44
4.00	12.8	1.38	325	12.5	41.6	-0.34
7.00	12.7	2.39	350	12.2	41.1	-0.27
10.0	12.6	3.39	400	11.8	39.7	-0.28
12.0	12.4	4.00	450	11.4	38.8	-0.27
15.0	12.3	4.96	500	11.1	37.8	-0.28
20.0	12.1	6.50	550	10.8	37.0	-0.28
25.0	11.8	7.93	600	10.5	36.5	-0.28
30.0	11.5	9.27	700	10.1	35.1	-0.29
35.0	11.2	10.5	800	9.7	34.2	-0.30
40.0	11.0	11.8	900	9.3	33.6	-0.30
50.0	10.5	14.1	1000	9.0	33.0	-0.31
60.0	10.0	16.1				
70.0	9.6	18.1				
80.0	9.2	19.8				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

SF_5^- - He

Experimental Data: T = 300° K. Derived Quantities.

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
10.0	13.1	3.52	325	13.0	40.1	-0.30
12.0	13.0	4.19	350	12.7	39.6	-0.27
15.0	12.8	5.16	400	12.3	38.2	-0.24
20.0	12.6	6.77	450	12.0	36.9	-0.22
25.0	12.3	8.26	500	11.7	35.9	-0.23
30.0	12.0	9.67	550	11.5	34.8	-0.24
35.0	11.8	11.1	600	11.2	34.3	-0.25
40.0	11.5	12.4	700	10.8	32.9	-0.28
50.0	11.0	14.8	800	10.4	32.0	-0.31
60.0	10.5	16.9	900	10.0	31.3	-0.33
70.0	10.1	19.0	1000	9.6	31.0	-0.33
80.0	9.7	20.9				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

Ne_2^+ - Ne

Experimental Data: T = 300° K. Derived Quantities.

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
6.00	6.16	0.993	300	6.13	47.5	0.30
7.00	6.17	1.16	350	6.40	42.1	0.23
8.00	6.20	1.33	400	6.54	38.6	0.15
10.0	6.26	1.68	500	6.71	33.6	0.09
12.0	6.32	2.04	600	6.80	30.3	0.05
15.0	6.42	2.59	700	6.84	27.9	0.02
20.0	6.56	3.53	800	6.85	26.0	-0.01
25.0	6.66	4.47	1000	6.77	23.6	-0.11
30.0	6.74	5.43	1200	6.58	22.1	-0.17
40.0	6.83	7.34	1400	6.38	21.1	-0.24
50.0	6.84	9.19	1600	6.16	20.5	-0.27
60.0	6.58	10.6	1800	5.97	19.9	-0.26
70.0	6.31	11.9				
80.0	6.05	13.0				

Reference: 5

Accuracy: The total error in the experimental data is believed not to exceed ± 1%.

See page 182 for Explanation of Tables

TABLES. Ions in Neon

H^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	22.2	1.79	325	22.2	47.4	-0.05
4.00	22.1	2.38	350	22.1	45.9	-0.05
5.00	22.0	2.96	400	21.9	43.3	-0.06
6.00	22.0	3.55	450	21.8	41.0	-0.06
7.00	21.8	4.10	500	21.6	39.3	-0.07
8.00	21.7	4.66	600	21.3	36.3	-0.08
10.0	21.4	5.75	700	21.1	34.0	-0.09
12.0	21.1	6.80	800	20.8	32.2	-0.11
14.0	20.8	7.82	900	20.5	30.8	-0.15
16.0	20.4	8.77	1000	20.1	29.8	-0.20
17.0	20.1	9.18				

Reference: 28

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

Rb^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	6.50	0.524	300	6.50	40.7	0.13
5.00	6.50	0.873	350	6.59	37.2	0.09
7.00	6.53	1.23	400	6.66	34.4	0.06
10.0	6.55	1.76	500	6.72	30.5	0.03
15.0	6.60	2.66	600	6.75	27.7	0.01
20.0	6.66	3.58	700	6.74	25.7	-0.02
25.0	6.72	4.51	800	6.71	24.1	-0.04
30.0	6.75	5.44	1000	6.62	21.9	-0.07
40.0	6.73	7.23	1200	6.51	20.3	-0.11
50.0	6.66	8.95	1500	6.30	18.8	-0.18
60.0	6.51	10.5	2000	5.96	17.2	-0.19
80.0	6.12	13.2	2500	5.70	16.1	-0.21
100	5.79	15.6	3000	5.49	15.2	-0.21
120	5.53	17.8	4000	5.16	14.0	-0.22
150	5.20	21.0	5000	4.90	13.2	-0.24
200	4.78	25.7	6000	4.69	12.6	-0.24
250	4.45	29.9	8000	4.36	11.7	-0.27
300	4.18	33.7	10000	4.10	11.2	-0.28
400	3.76	40.4	12000	3.89	10.8	-0.30
500	3.45	46.4	15000	3.63	10.3	-0.32

Reference: 33

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

Li^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	10.7	0.863	300	10.6	44.2	0.30
4.00	10.7	1.15	400	11.4	35.6	0.27
6.00	10.7	1.73	500	12.0	30.3	0.24
8.00	10.8	2.32	600	12.5	26.5	0.22
10.0	11.0	2.96	800	13.2	21.7	0.18
12.0	11.2	3.61	1000	13.7	18.7	0.16
15.0	11.8	4.76	1200	14.1	16.6	0.14
20.0	12.8	6.88	1500	14.5	14.5	0.12
25.0	13.8	9.72	2000	14.9	12.2	0.08
30.0	14.5	11.7	2500	15.1	10.8	0.05
40.0	15.1	16.2	3000	15.2	9.75	0.02
50.0	15.0	20.2	4000	15.1	8.50	-0.04
60.0	14.9	24.0	5000	15.0	7.65	-0.06
80.0	14.5	31.2	6000	14.8	7.08	-0.07
100	14.0	37.6	8000	14.4	6.30	-0.09
120	13.5	43.5	10000	14.1	5.76	-0.10
			12000	13.9	5.33	-0.11
			15000	13.5	4.91	-0.13

Reference: 1

Accuracy: The total error in the experimental data is believed not to exceed ±2%.

Na^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	8.25	0.887	300	8.16	39.9	0.25
6.00	8.25	1.33	400	8.69	32.5	0.19
8.00	8.27	1.78	500	9.02	28.0	0.15
10.0	8.34	2.24	600	9.23	25.0	0.12
12.0	8.43	2.72	800	9.48	21.0	0.07
15.0	8.58	3.46	1000	9.61	18.6	0.04
20.0	8.87	4.77	1200	9.65	16.9	0.01
25.0	9.19	6.17	1500	9.64	15.1	-0.02
30.0	9.46	7.63	2000	9.53	13.2	-0.05
40.0	9.67	10.4	2500	9.38	12.0	-0.09
50.0	9.62	12.9	3000	9.22	11.2	-0.11
60.0	9.48	15.3	4000	8.90	10.0	-0.14
80.0	9.12	19.6	5000	8.58	9.30	-0.18
100	8.68	23.3	6000	8.29	8.79	-0.21
120	8.26	26.6	8000	7.77	8.12	-0.25
150	7.65	30.8	10000	7.32	7.71	-0.29
200	7.02	37.7	12000	6.92	7.45	-0.32

Reference: 1

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

See page 182 for Explanation of Tables

TABLES. Ions in Neon

Ne^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
6.00	4.07	0.656	300	4.08	82.5	-0.36
8.00	4.05	0.871	350	3.84	81.1	-0.37
10.0	4.04	1.09	400	3.67	79.4	-0.36
12.0	4.02	1.30	500	3.40	76.6	-0.32
15.0	3.98	1.60	600	3.21	74.1	-0.32
20.0	3.91	2.10	800	2.93	70.3	-0.31
25.0	3.84	2.58	1000	2.73	67.5	-0.32
30.0	3.76	3.03	1200	2.58	65.2	-0.33
40.0	3.61	3.88	1500	2.40	62.7	-0.34
50.0	3.48	4.68	2000	2.18	59.8	-0.34
60.0	3.35	5.40	2500	2.01	58.0	-0.37
80.0	3.13	6.73	3000	1.89	56.3	-0.37
100	2.96	7.95	4000	1.69	54.5	-0.41
120	2.81	9.06	5000	1.53	53.9	-0.41
150	2.61	10.5	6000	1.41	53.3	-0.47
200	2.36	12.7	8000	1.24	52.5	-0.51
250	2.17	14.6	10000	1.10	53.0	-0.53
300	2.02	16.3	12000	1.00	53.2	-0.61
400	1.80	19.3	15000	0.87	54.7	-0.70
500	1.63	21.9				
600	1.51	24.3				
800	1.32	28.4				
1000	1.19	32.0				
1200	1.09	35.1				
1500	0.99	39.9				

Reference: 15 and 5

Accuracy: The total error in the experimental data is believed not to exceed ± 1% for E/N ≤ 60 Td. and ± 3% for E/N > 60 Td.

K^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	7.45	0.400	300	7.43	39.5	0.10
4.00	7.45	0.801	400	7.62	33.3	0.08
6.00	7.45	1.20	500	7.75	29.3	0.07
8.00	7.45	1.60	600	7.82	26.5	0.04
10.0	7.46	2.00	800	7.84	22.9	-0.02
12.0	7.49	2.42	1000	7.78	20.6	-0.05
15.0	7.56	3.05	1200	7.69	19.1	-0.08
20.0	7.67	4.12	1500	7.53	17.4	-0.11
25.0	7.78	5.23	1800	7.36	16.3	-0.14
30.0	7.83	6.31	2000	7.25	15.7	-0.15
35.0	7.82	7.35	2500	6.98	14.6	-0.18
40.0	7.81	8.39	3000	6.72	13.8	-0.23
50.0	7.69	10.3	3500	6.48	13.2	-0.24
60.0	7.50	12.1	4000	6.28	12.8	-0.24
80.0	7.10	15.3	5000	5.94	12.1	-0.24
100	6.72	18.1	6000	5.70	11.5	-0.23
120	6.41	20.7	8000	5.40	10.5	-0.16
150	6.01	24.2				
200	5.47	29.4				

Reference: 17

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

D^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	16.1	1.73	325	16.1	47.3	-0.04
5.00	16.1	2.16	350	16.0	45.8	-0.04
6.00	16.1	2.60	400	16.0	42.9	-0.05
7.00	16.0	3.01	450	15.9	40.7	-0.06
8.00	16.0	3.44	500	15.7	39.1	-0.07
10.0	15.9	4.27	600	15.5	36.1	-0.11
12.0	15.7	5.06	700	15.2	34.1	-0.18
14.0	15.5	5.83				
16.0	15.3	6.58				
17.0	15.2	6.94				

Reference: 28

Accuracy: The total error in the experimental data is believed not to exceed ±3%.

Hg^+ - Ne

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
9.00	5.96	1.44	325	5.97	40.1	0.06
10.0	5.96	1.60	350	5.99	38.6	0.04
12.0	5.97	1.92	400	6.00	36.0	0.01
15.0	5.98	2.41	450	6.00	33.9	-0.01
20.0	6.00	3.22	500	5.98	32.3	-0.03
25.0	6.00	4.03	550	5.96	30.9	-0.04
30.0	5.98	4.82	600	5.94	29.7	-0.06
35.0	5.95	5.60	700	5.88	27.8	-0.08
40.0	5.91	6.35	800	5.81	26.3	-0.09
45.0	5.87	7.10	900	5.75	25.0	-0.10
50.0	5.81	7.81				
55.0	5.76	8.51				

Reference: 8

Accuracy: The total error in the experimental data is believed not to exceed ± 4%.

See page 182 for Explanation of Tables

TABLES. Ions in Argon

Ar^+ - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
8.00	1.53	0.329
10.0	1.53	0.411
12.0	1.53	0.493
15.0	1.52	0.613
20.0	1.51	0.811
25.0	1.49	1.00
30.0	1.47	1.18
40.0	1.44	1.55
50.0	1.41	1.89
60.0	1.38	2.22
80.0	1.32	2.84
100	1.27	3.41
120	1.22	3.93
150	1.16	4.68
200	1.06	5.70
250	0.99	6.65
300	0.95	7.66
400	0.85	9.14
500	0.78	10.5
600	0.72	11.6
800	0.63	13.5
1000	0.56	15.0
1200	0.51	16.4
1500	0.46	18.5
2000	0.40	21.5

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	1.52	157	-0.43
350	1.41	157	-0.41
400	1.35	153	-0.36
500	1.25	148	-0.34
600	1.17	145	-0.33
800	1.07	137	-0.34
1000	0.99	132	-0.34
1200	0.93	129	-0.36
1500	0.86	124	-0.36
2000	0.77	120	-0.39
2500	0.71	117	-0.41
3000	0.66	115	-0.45
4000	0.57	115	-0.50
5000	0.51	115	-0.55
6000	0.46	116	-0.59
7000	0.42	118	-0.65
8000	0.38	122	-0.69
9000	0.35	125	-0.74

Reference: 15 and 3

Accuracy: The total error in the experimental data is believed not to exceed ± 1% for E/N ≤ 250 Td. and ± 3% for E/N ≥ 250 Td.

Ar^{++} - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
40.0	2.49	2.68
50.0	2.47	3.32
60.0	2.45	3.95
70.0	2.42	4.55
80.0	2.39	5.14
90.0	2.37	5.73
100	2.34	6.29
120	2.28	7.35
140	2.23	8.39
160	2.19	9.42
180	2.15	10.4
200	2.11	11.3

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
400	2.50	166	-0.05
450	2.48	157	-0.06
500	2.46	151	-0.07
600	2.43	139	-0.08
700	2.40	130	-0.09
800	2.37	124	-0.10
900	2.34	118	-0.10
1000	2.32	113	-0.11
1200	2.27	105	-0.11
1400	2.23	99.3	-0.11
1600	2.20	94.1	-0.12
1800	2.17	90.0	-0.12
2000	2.14	86.5	-0.12
2500	2.08	79.6	-0.12

Reference: 3

Accuracy: The total error in the experimental data is believed not to exceed ± 1%.

See page 182 for Explanation of Tables

Li^+ - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
6.00	4.62	0.745
8.00	4.62	0.993
10.0	4.62	1.24
12.0	4.62	1.49
15.0	4.62	1.86
20.0	4.62	2.48
25.0	4.67	3.14
30.0	4.73	3.81
40.0	5.02	5.40
50.0	5.49	7.38
60.0	5.98	9.64
80.0	6.71	14.4
100	7.12	19.1
120	7.29	23.5
150	7.23	29.1
200	6.79	36.5

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	4.59	95.4	0.04
400	4.64	81.7	0.07
500	4.72	71.9	0.09
600	4.82	64.2	0.12
800	5.04	53.2	0.18
1000	5.26	45.6	0.20
1200	5.47	40.0	0.20
1500	5.71	34.3	0.21
2000	6.08	27.9	0.21
2500	6.39	23.7	0.22
3000	6.60	21.0	0.15
4000	6.86	17.5	0.13
5000	7.03	15.3	0.11
6000	7.15	13.7	0.09
8000	7.29	11.6	0.04
10000	7.31	10.4	-0.01
12000	7.27	9.52	-0.05
15000	7.15	8.66	-0.09
20000	6.91	7.76	-0.14

Reference: 1

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

Na^+ - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
6.00	3.08	0.497
8.00	3.08	0.662
10.0	3.08	0.828
12.0	3.08	0.993
15.0	3.08	1.24
25.0	3.09	2.08
30.0	3.12	2.52
40.0	3.23	3.47
50.0	3.36	4.51
60.0	3.50	5.64
80.0	3.79	8.15
100	4.04	10.9
120	4.14	13.3
150	4.14	16.7
200	4.01	21.5
250	3.86	25.9
300	3.70	29.8
400	3.42	36.8
500	3.15	42.3

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	3.07	91.1	0.08
400	3.15	76.9	0.10
500	3.23	67.1	0.12
600	3.31	59.8	0.15
800	3.46	49.5	0.15
1200	3.71	37.7	0.17
1500	3.84	32.6	0.15
2000	3.99	27.1	0.12
2500	4.08	23.7	0.08
3000	4.13	21.4	0.05
4000	4.17	18.4	0.01
5000	4.15	16.5	-0.04
6000	4.10	15.3	-0.07
8000	3.99	13.6	-0.11
10000	3.89	12.5	-0.12
12000	3.80	11.6	-0.13
15000	3.68	10.7	-0.15
20000	3.52	9.73	-0.17
25000	3.37	9.09	-0.21
30000	3.23	8.66	-0.27

Reference: 1

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

TABLES. Ions in Argon

K^+ - Ar

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
1.00	2.66	0.071	300	2.67	90.1	0.05
2.00	2.66	0.143	400	2.74	76.0	0.13
4.00	2.66	0.286	500	2.85	65.4	0.21
6.00	2.66	0.429	600	2.96	57.4	0.17
8.00	2.66	0.572	800	3.09	47.7	0.14
10.0	2.66	0.715	1000	3.18	41.4	0.11
12.0	2.67	0.861	1200	3.23	37.2	0.08
15.0	2.68	1.08	1500	3.29	32.7	0.06
20.0	2.70	1.45	1800	3.31	29.7	0.02
25.0	2.72	1.83	2000	3.32	28.1	-0.01
30.0	2.74	2.21	2500	3.28	25.4	-0.06
40.0	2.80	3.01	3000	3.24	23.5	-0.07
50.0	2.90	3.90	3500	3.21	21.9	-0.08
60.0	3.02	4.87	4000	3.18	20.7	-0.09
80.0	3.18	6.84	5000	3.10	19.0	-0.13
100	3.29	8.84	6000	3.03	17.7	-0.14
120	3.31	10.7	8000	2.90	16.1	-0.16
150	3.24	13.1	10000	2.79	14.9	-0.19
200	3.09	16.6	12000	2.69	14.1	-0.20
250	2.96	19.9	15000	2.57	13.2	-0.22
300	2.84	22.9	18000	2.47	12.6	-0.23
400	2.62	28.2	20000	2.41	12.2	-0.25
500	2.43	32.6				
600	2.32	37.4				

Reference: 16, 9 and 30

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

Hg^+ - Ar

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
35.0	1.85	1.74	350	1.85	92.7	-0.08
40.0	1.84	1.98	400	1.83	87.6	-0.04
50.0	1.83	2.46	450	1.83	82.6	0.01
60.0	1.83	2.95	500	1.84	77.9	0.03
70.0	1.84	3.46	600	1.85	70.8	0.05
80.0	1.84	3.96	700	1.87	64.8	0.07
90.0	1.86	4.50	800	1.89	60.0	0.08
100	1.87	5.02	1000	1.93	52.5	0.11
120	1.91	6.16	1200	1.97	47.0	0.13
140	1.96	7.37	1400	2.01	42.6	0.13
160	2.03	8.73	1600	2.05	39.1	0.14
180	2.11	10.2	1800	2.08	36.3	0.15
			2000	2.11	34.0	0.15
			2100	2.13	32.9	0.16

Reference: 8

Accuracy: The total error in the experimental data is believed not to exceed ± 4%.

Rb^+ - Ar

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	2.26	0.121	300	2.26	90.7	0.10
4.00	2.26	0.243	350	2.30	82.5	0.10
7.00	2.26	0.425	400	2.33	76.2	0.10
10.0	2.26	0.607	500	2.38	66.7	0.10
15.0	2.26	0.911	600	2.42	59.9	0.09
20.0	2.27	1.22	800	2.49	50.4	0.09
25.0	2.28	1.53	1000	2.54	44.2	0.08
30.0	2.29	1.85	1200	2.58	39.7	0.09
40.0	2.32	2.49	1500	2.62	35.0	0.08
50.0	2.36	3.17	2000	2.67	29.7	0.03
60.0	2.41	3.89	2500	2.66	26.7	-0.06
80.0	2.49	5.35	3000	2.62	24.7	-0.09
100	2.56	6.88	3500	2.58	23.3	-0.11
120	2.63	8.48	4000	2.54	22.1	-0.12
150	2.67	10.8	5000	2.47	20.3	-0.15
200	2.58	13.9	6000	2.40	19.1	-0.17
250	2.47	16.6	7000	2.33	18.2	-0.19
300	2.38	19.2	8000	2.27	17.5	-0.22
350	2.28	21.4	10000	2.15	16.5	-0.26
400	2.20	23.6	12000	2.04	15.9	-0.30
500	2.05	27.5				

Reference: 33

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

O^+ - Ar

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	3.43	0.461	300	3.43	73.9	-0.10
6.00	3.42	0.551	400	3.35	65.5	-0.07
7.00	3.42	0.643	500	3.30	59.5	-0.07
8.00	3.42	0.735	600	3.26	55.0	-0.06
10.0	3.41	0.916	800	3.21	48.4	-0.05
12.0	3.40	1.10	1000	3.18	43.7	-0.03
15.0	3.39	1.37	1200	3.17	40.0	-0.01
20.0	3.38	1.82	1500	3.17	35.8	0.02
25.0	3.36	2.26	2000	3.22	30.5	0.07
30.0	3.34	2.69	2500	3.28	26.8	0.09
40.0	3.30	3.55	3000	3.33	24.1	0.10
50.0	3.26	4.38	4000	3.45	20.1	0.12
60.0	3.22	5.19	5000	3.55	17.5	0.13
80.0	3.19	6.86	6000	3.63	15.6	0.12
100	3.17	8.52	7000	3.70	14.2	0.11
120	3.22	10.4	8000	3.75	13.1	0.09
150	3.34	13.5	10000	3.81	11.5	0.07
200	3.62	19.5				
250	3.82	25.7				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Ions in Argon

O_2^+ - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
8.00	2.57	0.552
10.0	2.57	0.691
15.0	2.57	1.04
20.0	2.57	1.38
25.0	2.58	1.73
30.0	2.62	2.11
40.0	2.68	2.88
50.0	2.79	3.75
60.0	2.92	4.71
70.0	3.05	5.74
80.0	3.15	6.77
100	3.26	8.76
120	3.29	10.6
140	3.27	12.3
160	3.22	13.8
180	3.14	15.2
200	3.06	16.4
220	2.96	17.5
240	2.85	18.4

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	2.57	98.6	0.00
350	2.58	91.0	0.08
400	2.63	83.5	0.17
450	2.69	76.9	0.20
500	2.75	71.4	0.21
600	2.86	62.7	0.21
700	2.95	56.3	0.20
800	3.03	51.2	0.18
1000	3.13	44.4	0.13
1200	3.20	39.6	0.10
1500	3.26	34.8	0.06
2000	3.29	29.8	0.01
2500	3.28	26.8	-0.03
3000	3.25	24.7	-0.08
4000	3.14	22.1	-0.17
5000	2.99	20.8	-0.29
6000	2.80	20.2	-0.42

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

Ar_2^+ - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
5.00	1.83	0.246
6.00	1.83	0.295
8.00	1.83	0.393
10.0	1.83	0.492
12.0	1.83	0.590
15.0	1.83	0.738
20.0	1.83	0.983
25.0	1.84	1.24
30.0	1.84	1.48
40.0	1.85	1.99
50.0	1.86	2.50
60.0	1.88	3.03
80.0	1.91	4.11
100	1.93	5.19
120	1.93	6.22
140	1.90	7.15
160	1.86	8.00
170	1.80	8.22

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	1.83	113	0.04
350	1.85	104	0.06
400	1.86	96.4	0.08
500	1.90	84.4	0.07
600	1.92	76.3	0.04
700	1.93	70.2	0.02
800	1.93	65.7	0.01
900	1.93	61.9	-0.01
1000	1.92	59.1	-0.07
1100	1.90	56.9	-0.13
1200	1.88	55.1	-0.20
1300	1.84	54.1	-0.30

Reference: 3

Accuracy: The total error in the experimental data is believed not to exceed ± 1%.

COH^+ - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
10.0	2.50	0.672
20.0	2.53	1.36
30.0	2.59	2.09
40.0	2.67	2.87
50.0	2.77	3.72
60.0	2.90	4.68
70.0	3.01	5.66
80.0	3.11	6.69
90.0	3.18	7.69
100	3.23	8.68
110	3.25	9.61
120	3.26	10.5
130	3.23	11.3
140	3.19	12.0
150	3.15	12.7
160	3.09	13.3

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	2.49	105	0.17
350	2.56	94.3	0.19
400	2.63	85.8	0.20
500	2.75	73.4	0.21
600	2.86	64.4	0.19
700	2.94	58.0	0.18
800	3.01	53.0	0.16
900	3.06	49.2	0.15
1000	3.11	45.9	0.14
1200	3.18	41.0	0.11
1500	3.24	36.0	0.06
1800	3.26	32.6	0.01
2000	3.26	31.0	-0.03
2500	3.21	28.1	-0.11
3000	3.12	26.4	-0.21

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

CO_2^+ - Ar

Experimental Data
T = 300° K

E/N	K_o	v_d
10.0	2.14	0.575
20.0	2.14	1.15
30.0	2.15	1.73
40.0	2.19	2.35
50.0	2.23	3.00
60.0	2.29	3.69
70.0	2.38	4.48
80.0	2.47	5.31
90.0	2.60	6.29
100	2.73	7.34
110	2.83	8.36
120	2.88	9.29
130	2.90	10.1
140	2.92	11.0
150	2.93	11.8
160	2.93	12.6

Derived Quantities

T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
300	2.14	109	0.05
350	2.16	100	0.09
400	2.19	92.3	0.13
500	2.27	79.7	0.18
600	2.36	69.9	0.21
700	2.44	62.6	0.22
800	2.51	57.0	0.23
900	2.58	52.2	0.23
1000	2.64	48.4	0.22
1200	2.74	42.6	0.19
1500	2.85	36.6	0.12
1800	2.90	32.9	0.07
2000	2.90	31.2	0.05
2500	2.92	27.7	0.02
3000	2.93	25.2	0.00

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

See page 182 for Explanation of Tables

TABLES. Ions in Argon and Krypton

N_2OH^+ - Ar

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
20.0	2.12	1.14	300	2.10	111	0.19
30.0	2.15	1.73	350	2.16	99.5	0.18
40.0	2.19	2.35	400	2.21	91.0	0.18
50.0	2.25	3.02	500	2.29	78.5	0.17
60.0	2.31	3.72	600	2.36	69.6	0.16
70.0	2.37	4.46	700	2.43	62.6	0.16
80.0	2.44	5.25	800	2.49	57.1	0.15
90.0	2.53	6.12	900	2.53	53.0	0.14
100	2.57	6.91	1000	2.56	49.7	0.12
110	2.59	7.66	1200	2.59	44.8	0.06
120	2.60	8.38	1500	2.60	39.9	0.00
130	2.60	9.08	1800	2.59	36.6	-0.11
140	2.58	9.71	2000	2.54	35.4	-0.24
150	2.56	10.3	2400	2.31	35.5	-0.85
160	2.49	10.7				
170	2.43	11.1				
180	2.36	11.4				
190	2.25	11.5				

Reference: 19

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

CO_3^- - Ar

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	2.40	0.258	300	2.40	90.9	0.02
7.00	2.40	0.451	350	2.44	82.8	0.17
10.0	2.40	0.645	400	2.50	75.6	0.17
15.0	2.40	0.967	450	2.54	70.1	0.15
20.0	2.41	1.30	500	2.58	65.5	0.13
25.0	2.43	1.63	600	2.64	58.4	0.10
30.0	2.45	1.97	700	2.67	53.5	0.07
40.0	2.52	2.71	800	2.69	49.7	0.04
50.0	2.57	3.45	1000	2.70	44.3	-0.02
60.0	2.62	4.22	1200	2.68	40.7	-0.06
70.0	2.67	5.02	1400	2.64	38.3	-0.10
80.0	2.69	5.78	1600	2.60	36.3	-0.14
100	2.68	7.20	1800	2.57	34.7	-0.17
120	2.63	8.48	2000	2.50	33.8	-0.21
140	2.56	9.63	2200	2.45	32.9	-0.23
160	2.47	10.6	2500	2.38	31.8	-0.25
180	2.39	11.6				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

O_3^- - Ar

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	2.42	0.130	300	2.42	94.6	0.16
5.00	2.42	0.325	325	2.46	89.4	0.18
8.00	2.42	0.520	350	2.49	85.1	0.19
10.0	2.43	0.653	400	2.56	77.4	0.22
15.0	2.44	0.983	450	2.62	71.3	0.20
20.0	2.46	1.32	500	2.68	66.1	0.18
25.0	2.48	1.67	600	2.76	58.6	0.16
30.0	2.51	2.02	700	2.82	53.1	0.14
40.0	2.59	2.78	800	2.87	48.8	0.11
50.0	2.68	3.60	900	2.90	45.6	0.07
60.0	2.77	4.47	1000	2.91	43.1	0.03
70.0	2.86	5.38	1200	2.92	39.2	-0.02
80.0	2.90	6.23	1400	2.89	36.7	-0.09
90.0	2.92	7.06	1600	2.85	34.8	-0.13
100	2.91	7.82	1800	2.80	33.4	-0.18
120	2.84	9.16				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

Kr^+ - Kr

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
40.0	0.838	0.901	350	0.823	186	-0.32
45.0	0.833	1.01	400	0.789	181	-0.32
50.0	0.828	1.11	500	0.736	174	-0.31
60.0	0.816	1.32	600	0.696	168	-0.31
70.0	0.803	1.51	800	0.635	159	-0.33
80.0	0.791	1.70	1000	0.591	153	-0.32
100	0.767	2.06	1200	0.557	148	-0.34
120	0.743	2.40	1500	0.515	143	-0.36
150	0.711	2.87	2000	0.463	138	-0.39
200	0.666	3.58	2500	0.423	135	-0.42
250	0.627	4.21	3000	0.391	134	-0.45
300	0.592	4.77	4000	0.342	132	-0.48
400	0.546	5.87	5000	0.308	131	-0.50
500	0.491	6.60	6000	0.280	132	-0.52
600	0.453	7.30	7000	0.260	131	-0.51
800	0.398	8.56	8000	0.244	131	-0.52
1000	0.359	9.65	10000	0.219	131	-0.45
1200	0.329	10.6				
1500	0.294	11.8				
2000	0.259	13.9				
2500	0.234	15.7				
3000	0.220	17.7				

Reference: 6 and 35

Accuracy: The total error in the experimental data is believed not to exceed ± 5%.

See page 182 for Explanation of Tables

TABLES. Ions in Krypton, Hydrogen

Kr_2^+ - Kr

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
35.0	1.22	1.15	350	1.22	108	0.07
40.0	1.22	1.31	400	1.23	101	0.05
50.0	1.23	1.65	500	1.24	89.3	0.01
60.0	1.24	2.00	600	1.24	81.5	-0.04
80.0	1.24	2.67	700	1.22	76.7	-0.11
100	1.23	3.31	800	1.19	73.6	-0.36
120	1.19	3.84	900	1.10	75.0	-1.35
140	1.13	4.25				
160	1.05	4.51				

Reference: 6

Accuracy: The total error in the experimental data is believed not to exceed ± 5%.

H^+ - H_2

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	16.0	1.72	300	16.0	81.8	-0.10
5.00	16.0	2.15	400	15.6	72.7	-0.11
6.00	16.0	2.58	500	15.2	66.7	-0.12
8.00	16.0	3.44	600	14.9	62.1	-0.12
10.0	16.0	4.30	800	14.4	55.7	-0.13
12.0	16.0	5.16	1000	13.9	51.6	-0.15
15.0	15.9	6.41	1200	13.6	48.1	-0.13
20.0	15.8	8.49	1500	13.3	44.0	-0.08
25.0	15.7	10.5	2000	13.1	38.7	-0.04
30.0	15.5	12.5	2500	13.0	34.9	-0.03
40.0	15.2	16.3	3000	13.0	31.8	-0.02
50.0	14.9	20.0	4000	12.9	27.8	-0.01
60.0	14.5	23.4	5000	12.9	24.9	0.00
80.0	13.9	29.9	6000	12.9	22.7	0.03
100	13.4	36.0	8000	13.1	19.3	0.04
120	13.2	42.6	10000	13.2	17.2	0.06
150	13.1	52.8	12000	13.4	15.4	0.06
200	13.1	70.4	15000	13.6	13.6	0.07
250	13.2	88.7	20000	13.8	11.6	0.07
300	13.3	107				
400	13.7	147				

Reference: 14 and 2

Accuracy: The total error in the experimental data is believed not to exceed ± 2% for E/N ≤ 100 Td. and ± 6% for E/N > 100 Td.

H_3^+ - H_2

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	11.3	1.52	300	11.3	86.3	0.02
6.00	11.3	1.82	400	11.4	74.1	0.09
8.00	11.3	2.43	500	11.7	64.6	0.14
10.0	11.3	3.04	600	12.0	57.5	0.18
12.0	11.3	3.64	800	12.8	46.7	0.22
15.0	11.3	4.55	1000	13.5	39.6	0.25
20.0	11.3	6.07	1200	14.1	34.6	0.23
25.0	11.3	7.59	1500	14.7	29.7	0.18
30.0	11.3	9.11	2000	15.3	24.7	0.12
40.0	11.4	12.3	2500	15.7	21.5	0.08
50.0	11.7	15.7	3000	15.8	19.5	0.05
60.0	12.1	19.5	4000	16.0	16.7	0.00
80.0	13.4	28.8	5000	15.8	15.1	-0.09
100	14.7	39.5	6000	15.4	14.2	-0.22
120	15.5	50.0	8000	14.4	13.1	-0.22
150	16.0	64.5	10000	13.8	12.2	-0.09
200	15.5	83.3	12000	13.7	11.3	-0.04
250	14.3	96.1	15000	13.7	10.1	0.02
300	13.8	111	20000	13.9	8.60	0.11
400	13.9	149				

Reference: 14 and 2

Accuracy: The total error in the experimental data is believed not to exceed ± 2% for E/N ≤ 100 Td. and ± 6% for E/N > 100 Td.

H^- - H_2

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	42.7	3.44	300	42.7	30.6	0.05
4.00	42.8	4.60	400	43.1	26.3	0.00
6.00	43.0	6.93	500	42.9	23.6	-0.04
8.00	43.1	9.26	600	42.5	21.8	-0.05
10.0	43.1	11.6	700	42.1	20.4	-0.06
12.0	43.0	13.9	800	41.8	19.2	-0.06
15.0	42.7	17.2	1000	41.2	17.4	-0.06
20.0	42.2	22.7	1200	40.7	16.1	-0.07
25.0	41.5	27.9	1500	40.1	14.6	-0.07
30.0	40.9	33.0	2000	39.3	12.9	-0.08
40.0	39.7	42.7	2500	38.6	11.7	-0.08
50.0	38.7	52.0	3000	38.1	10.9	-0.08
60.0	37.8	60.9	4000	37.2	9.63	-0.09
70.0	37.0	69.6				

Reference: 14

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

See page 182 for Explanation of Tables

TABLES. Ions in Hydrogen, Nitric Oxide

$Li^+ - H_2$

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	12.4	1.67	300	12.4	69.1	-0.01
10.0	12.4	3.33	400	12.4	59.8	0.00
15.0	12.4	5.00	500	12.6	52.7	0.10
20.0	12.4	6.66	600	12.9	47.0	0.14
30.0	12.4	10.0	800	13.5	38.9	0.20
40.0	12.4	13.3	1000	14.2	33.0	0.24
50.0	12.6	16.9	1200	14.9	28.8	0.28
60.0	13.0	21.0	1500	15.9	24.1	0.32
70.0	13.7	25.8	2000	17.5	19.0	0.35
80.0	14.6	31.4	2500	18.9	15.7	0.31
90.0	16.2	39.2	3000	19.9	13.6	0.27
100	18.9	50.8	4000	21.3	11.0	0.20
120	21.6	69.6	5000	22.2	9.45	0.16
140	22.8	85.8	6000	22.7	8.44	0.03
160	23.3	100	8000	23.3	7.12	0.16
180	23.6	114	10000	23.6	6.29	0.04
200	23.8	128	12000	23.7	5.72	0.02
220	23.8	141	15000	23.7	5.11	-0.01
240	23.7	153	20000	23.5	4.47	-0.06
260	23.4	163	25000	23.1	4.06	-0.10
280	23.1	174	30000	22.6	3.79	-0.14
300	22.7	183	35000	22.0	3.61	-0.19
320	22.4	193				
340	22.0	201				

Reference: 12 and 22

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

$Na^+ - H_2$

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	12.2	1.31	300	12.2	64.6	0.06
6.00	12.2	1.97	400	12.6	54.1	0.13
8.00	12.2	2.62	500	13.1	46.6	0.18
10.0	12.3	3.31	600	13.6	41.0	0.22
12.0	12.3	3.97	800	14.5	33.3	0.25
15.0	12.4	5.00	1000	15.3	28.2	0.26
20.0	12.5	6.72	1200	16.1	24.5	0.26
25.0	12.6	8.46	1500	17.0	20.7	0.24
30.0	12.7	10.2	2000	18.2	16.8	0.21
40.0	13.0	14.0	2500	19.0	14.4	0.17
50.0	13.4	18.0	3000	19.4	12.8	0.07
60.0	14.1	22.7	4000	19.5	11.1	-0.01
80.0	16.2	34.8	5000	19.4	9.95	-0.06
100	18.5	49.7	6000	19.0	9.27	-0.10
120	19.3	62.2	7000	18.7	8.72	-0.13
140	19.4	73.0	8000	18.4	8.29	-0.15
160	19.2	82.5	9000	18.0	7.99	-0.17
180	18.8	90.9	10000	17.7	7.71	-0.19
200	18.4	98.9				
220	18.1	107				
240	17.8	115				

Reference: 12 and 22

Accuracy: The total error in the experimental data is believed not to exceed ± 2% for E/N ≤ 100 Td. and ± 3% for E/N > 100 Td.

$N_2O_2^+ - NO$

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
8.00	1.78	0.383	300	1.77	135	0.26
9.00	1.78	0.430	310	1.78	132	0.27
10.0	1.78	0.478	320	1.80	129	0.27
12.0	1.78	0.574	330	1.81	126	0.27
15.0	1.78	0.717	340	1.82	123	0.27
20.0	1.78	0.957	350	1.84	120	0.26
25.0	1.79	1.20				
30.0	1.80	1.45				
35.0	1.82	1.71				
40.0	1.84	1.98				

Reference: 36

Accuracy: The total error in the experimental data is believed not to exceed ±3%.

See page 182 for Explanation of Tables

TABLES. Ions in Hydrogen, Deuterium

$K^+ - H_2$

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	13.1	0.704	300	13.1	59.1	0.06
4.00	13.1	1.41	400	13.5	49.7	0.13
6.00	13.1	2.11	500	14.0	42.9	0.19
10.0	13.1	3.52	600	14.5	37.8	0.21
12.0	13.1	4.22	800	15.4	30.8	0.19
15.0	13.2	5.32	1000	16.0	26.5	0.18
20.0	13.3	7.15	1200	16.5	23.5	0.15
25.0	13.4	9.00	1500	17.0	20.4	0.07
30.0	13.5	10.9	1800	17.1	18,5	0.04
40.0	14.0	15.0	2000	17.2	17.4	0.00
60.0	15.3	24.7	2500	17.1	15.7	-0.05
80.0	16.8	36.1	3000	16.8	14.6	-0.10
100	17.3	46.5	3500	16.5	13.7	-0.12
120	16.9	54.5	4000	16.2	13.1	-0.16
150	16.3	65.7	5000	15.6	12.2	-0.21
200	15.3	82.2	6000	15.0	11.5	-0.24
250	14.1	94.7	8000	13.8	10.9	-0.29
300	13.2	106	10000	13.1	10.2	-0.23
400	12.2	131	12000	12.6	9.72	-0.19
			15000	12.2	8.98	-0.12
			18000	12.0	8.33	-0.03

Reference: 17 and 22

Accuracy: The total error in the experimental data is believed not to exceed ± 2% for E/N ≤ 300 Td. and ± 6% for E/N > 300 Td.

$Na^+ - D_2$

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	8.8	0.709	300	8.8	65.8	0.11
4.00	8.8	0.946	400	9.2	54.5	0.15
5.00	8.8	1.18	500	9.5	47.2	0.18
6.00	8.8	1.42	600	9.8	41.8	0.21
8.00	8.8	1.89	800	10.5	33.8	0.23
10.0	8.9	2.39	1000	11.0	28.8	0.24
12.0	8.9	2.87	1200	11.5	25.2	0.25
15.0	8.9	3.59	1500	12.1	21.2	0.22
20.0	9.0	4.84	2000	12.9	17.4	0.18
25.0	9.1	6.11	2500	13.3	15.1	0.12
30.0	9.2	7.42	3000	13.3	13.8	0.03
40.0	9.5	10.2	4000	13.2	12.0	-0.12
50.0	9.8	13.2	5000	13.0	10.9	-0.20
60.0	10.3	16.6	6000	12.8	10.1	-0.24
80.0	11.7	25.2	8000	12.3	9.11	-0.13
100	13.2	35.5	10000	11.9	8.43	-0.08
120	13.5	43.5	12000	11.4	8.03	-0.05
150	13.1	52.8	15000	10.9	7.51	-0.03
200	12.0	64.5				
250	11.4	76.6				
300	10.9	87.9				
400	10.3	111				

Reference: 22

Accuracy: The total error in the experimental data is believed not to exceed ± 5% for E/N ≤ 50 Td. and ± 10% for E/N > 50 Td.

$D_3^+ - D_2$

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	8.06	1.08	300	8.06	85.6	0.03
6.00	8.06	1.30	400	8.17	73.1	0.10
8.00	8.06	1.73	500	8.40	63.6	0.15
10.0	8.06	2.17	600	8.64	56.5	0.18
12.0	8.06	2.60	800	9.17	46.1	0.22
15.0	8.06	3.25	1000	9.65	39.2	0.25
20.0	8.06	4.33	1200	10.1	34.1	0.25
25.0	8.06	5.41	1500	10.7	28.8	0.21
30.0	8.09	6.52	2000	11.1	24.1	0.12
40.0	8.25	8.87	2500	11.3	21.1	0.06
50.0	8.52	11.4	3000	11.4	19.1	0.01
60.0	8.88	14.3	4000	11.4	16.6	-0.04
80.0	9.72	20.9	5000	11.2	15.1	-0.10
100	10.3	27.7	6000	11.0	14.0	-0.15
120	11.3	36.4	8000	10.3	13.0	-0.22
150	11.4	45.9	10000	10	12.6	-0.15
200	11.1	59.7				
250	10.6	71.2				
300	10	80.2				

Reference: 14 and 22

Accuracy: The total error in the experimental data is believed not to exceed ± 4% for E/N ≤ 50 Td. and ± 6% for E/N > 50 Td.

$D^+ - D_2$

Experimental Data, T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
6.00	11.7	1.89	300	11.7	79.1	-0.06
8.00	11.7	2.52	400	11.4	70.3	-0.14
10.0	11.7	3.14	500	11.0	65.2	-0.15
12.0	11.7	3.77	600	10.7	61.2	-0.14
15.0	11.7	4.72	800	10.3	55.0	-0.13
20.0	11.7	6.29	1000	10.1	50.2	-0.12
25.0	11.5	7.73	1200	9.9	46.7	-0.11
30.0	11.4	9.19	1500	9.6	43.1	-0.09
40.0	11.0	11.8	2000	9.4	38.1	-0.06
50.0	10.7	14.4	2500	9.3	34.5	-0.03
60.0	10.4	16.8	3000	9.3	31.5	-0.01
80.0	10.0	21.5	4000	9.3	27.3	0.01
100	9.7	26.1	5000	9.3	24.4	0.03
120	9.5	30.6	6000	9.4	22.0	0.04
150	9.4	37.9	8000	9.5	18.9	0.05
200	9.4	50.5	10000	9.6	16.7	0.06
250	9.5	63.8	12000	9.8	14.9	0.07
300	9.6	77.4	15000	9.9	13.2	0.08
400	10.2	110	20000	10.1	11.2	0.08

Reference: 14 and 22

Accuracy: The total error in the experimental data is believed not to exceed ± 4% for E/N ≤ 50 Td. and ± 6% for E/N > 50 Td.

See page 182 for Explanation of Tables

TABLES. Ions in Deuterium, Nitrogen

$K^+ - D_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	9.40	0.758	300	9.35	60.0	0.08
4.00	9.40	1.01	400	9.60	50.6	0.12
6.00	9.40	1.52	500	9.90	43.9	0.17
8.00	9.40	2.02	600	10.3	38.5	0.22
10.0	9.45	2.55	800	11.0	31.2	0.25
12.0	9.49	3.06	1000	11.6	26.5	0.25
15.0	9.54	3.83	1200	12.1	23.2	0.19
20.0	9.65	5.16	1500	12.5	20.1	0.10
25.0	9.76	6.58	1800	12.6	18.2	0.05
30.0	9.88	7.98	2000	12.7	17.1	0.02
40.0	10.1	10.9	2500	12.6	15.4	-0.03
60.0	11.4	18.4	3000	12.5	14.2	-0.07
80.0	12.6	27.1	3500	12.3	13.4	-0.12
100	12.9	34.7	4000	12.1	12.7	-0.18
120	12.8	41.3	5000	11.5	11.9	-0.25
150	12.2	49.2	6000	10.9	11.5	-0.33
200	10.8	54.8	8000	9.8	11.1	-0.45
250	9.7	65.2	10000	8.8	11.0	-0.47
300	8.9	71.7	12000	8.1	11.0	-0.47
400	8.0	86.0				

Reference: 22

Accuracy: The total error in the experimental data is believed not to exceed $\pm$ 4% for E/N $\leq$ 80 Td. and $\pm$ 6% for E/N > 80 Td.

$Li^+ - D_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	9.6	0.774	300	9.6	69.8	0.00
4.00	9.6	1.03	400	9.7	59.8	0.09
6.00	9.6	1.55	500	10.0	51.9	0.16
8.00	9.6	2.06	600	10.3	46.0	0.20
10.0	9.6	2.58	800	11.0	37.3	0.24
12.0	9.6	3.10	1000	11.6	31.6	0.27
15.0	9.6	3.87	1200	12.2	27.4	0.28
20.0	9.6	5.16	1500	13.0	23.0	0.26
25.0	9.6	6.45	2000	13.9	18.7	0.23
30.0	9.7	7.82	2500	14.6	15.9	0.21
40.0	9.9	10.6	3000	15.2	13.9	0.19
50.0	10.3	13.8	4000	15.9	11.5	0.16
60.0	10.8	17.4	5000	16.5	9.94	0.14
80.0	12.9	27.7	6000	16.9	8.86	0.13
100	15.0	40.3	8000	17.5	7.41	0.09
120	16.4	52.9	10000	17.8	6.52	0.05
150	17.4	70.1	12000	17.8	5.95	-0.02
200	17.8	95.7	15000	17.5	5.41	-0.14
250	16.6	112	20000	16.1	5.10	-0.51
300	14.5	117				

Reference: 22

Accuracy: The total error in the experimental data is believed not to exceed $\pm$ 5% for E/N $\leq$ 50 Td. and $\pm$ 10% for E/N > 50 Td.

$N_2^+ - N_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
6.00	1.90	0.306	300	1.90	150	-0.44
8.00	1.89	0.406	400	1.70	145	-0.32
10.0	1.88	0.505	500	1.59	139	-0.29
12.0	1.88	0.606	600	1.51	134	-0.28
15.0	1.87	0.754	800	1.40	125	-0.28
20.0	1.85	0.994	1000	1.32	119	-0.28
25.0	1.84	1.24	1200	1.25	114	-0.29
30.0	1.83	1.48	1500	1.17	109	-0.29
40.0	1.80	1.93	2000	1.07	103	-0.31
50.0	1.76	2.36	2500	1.00	98.9	-0.31
60.0	1.72	2.77	3000	0.94	96.1	-0.34
80.0	1.66	3.57	4000	0.86	90.9	-0.37
100	1.60	4.30				
120	1.54	4.97				
150	1.47	5.92				
200	1.37	7.36				
250	1.28	8.60				
300	1.20	9.67				
400	1.10	11.8				
500	1.02	13.7				
600	0.95	15.3				
800	0.85	18.3				

Reference: 24

Accuracy: The total error in the experimental data is believed not to exceed $\pm$ 3%.

$N_2H^+ - N_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
6.00	2.12	0.342	300	2.12	134	-0.33
8.00	2.12	0.456	325	2.08	131	-0.23
10.0	2.12	0.570	350	2.05	128	-0.11
15.0	2.12	0.854	400	2.04	120	-0.02
20.0	2.10	1.13	450	2.04	113	0.00
25.0	2.08	1.40	500	2.04	108	0.00
30.0	2.07	1.67	600	2.04	98.1	0.00
40.0	2.04	2.19	700	2.04	90.9	0.01
50.0	2.04	2.74	800	2.04	85.0	0.01
60.0	2.04	3.29	900	2.04	80.1	0.01
80.0	2.04	4.39	1000	2.05	75.6	0.01
100	2.04	5.48	1200	2.05	69.1	0.02
120	2.04	6.58	1400	2.06	63.6	0.03
140	2.04	7.67				
160	2.05	8.81				
180	2.06	9.96				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed $\pm$ 7%.

See page 182 for Explanation of Tables

TABLES. Ions in Nitrogen

$K^+ - N_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	2.53	0.272	300	2.53	105	0.07
6.00	2.53	0.408	400	2.58	88.8	0.06
8.00	2.53	0.544	500	2.62	78.3	0.08
10.0	2.54	0.682	600	2.66	70.4	0.08
12.0	2.54	0.819	800	2.72	59.6	0.10
15.0	2.54	1.02	1000	2.78	52.1	0.10
20.0	2.55	1.37	1200	2.84	46.6	0.10
25.0	2.55	1.71	1500	2.89	41.0	0.08
30.0	2.56	2.06	1800	2.93	36.9	0.07
40.0	2.58	2.77	2000	2.95	34.8	0.07
50.0	2.59	3.48	2500	2.99	30.7	0.06
60.0	2.62	4.22	3000	3.02	27.7	0.04
80.0	2.68	5.76	3500	3.03	25.6	0.04
100	2.76	7.42	4000	3.05	23.8	0.01
120	2.84	9.16	5000	3.04	21.3	-0.02
150	2.95	11.9	6000	3.03	19.5	-0.05
200	3.04	16.3	8000	2.96	17.3	-0.09
250	3.05	20.5	10000	2.89	15.9	-0.12
300	3.00	24.2	12000	2.82	14.8	-0.15
400	2.86	30.7	15000	2.72	13.8	-0.17
500	2.71	36.4	18000	2.63	13.0	-0.21
600	2.56	41.3	20000	2.57	12.6	-0.22

Reference: 34

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

$CO_2^+ - N_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
6.00	2.15	0.347	300	2.15	120	-0.28
8.00	2.15	0.462	325	2.12	117	-0.17
10.0	2.15	0.578	350	2.10	114	-0.06
15.0	2.15	0.867	400	2.10	107	0.01
20.0	2.14	1.15	450	2.11	100	0.08
30.0	2.11	1.70	500	2.14	93.5	0.14
40.0	2.10	2.26	600	2.20	83.0	0.16
50.0	2.10	2.82	700	2.25	75.2	0.17
60.0	2.10	3.39	800	2.30	68.8	0.17
70.0	2.12	3.99	900	2.35	63.5	0.17
80.0	2.16	4.64	1000	2.39	59.2	0.17
100	2.26	6.07	1200	2.47	52.3	0.18
120	2.38	7.67	1500	2.56	45.1	0.14
140	2.50	9.40	2000	2.64	37.9	0.08
160	2.60	11.2	2500	2.68	33.4	0.04
180	2.66	12.9	3000	2.70	30.3	0.02
200	2.69	14.5	3500	2.70	28.0	0.00
220	2.70	16.0				
240	2.70	17.4				

Reference: 10

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

$N^+ - N_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
7.00	3.01	0.566	300	3.01	116	-0.07
8.00	3.01	0.647	400	2.95	103	-0.05
10.0	3.01	0.809	500	2.92	92.8	-0.05
12.0	3.00	0.967	600	2.90	85.3	-0.03
15.0	2.99	1.21	800	2.88	74.4	-0.02
20.0	2.98	1.60	1000	2.87	66.8	-0.01
25.0	2.97	2.00	1200	2.86	61.2	-0.01
30.0	2.96	2.39	1500	2.86	54.7	0.00
40.0	2.94	3.16	2000	2.86	47.4	0.00
50.0	2.92	3.92	2500	2.86	42.4	0.00
60.0	2.91	4.69	3000	2.86	38.7	0.00
80.0	2.89	6.21	4000	2.86	33.5	0.00
100	2.88	7.74	5000	2.86	30.0	-0.01
120	2.87	9.25	6000	2.85	27.4	-0.01
150	2.87	11.6	8000	2.84	23.9	-0.02
200	2.86	15.4	10000	2.83	21.4	-0.02
250	2.86	19.2	12000	2.82	19.6	-0.03
300	2.86	23.1	15000	2.80	17.7	-0.03
400	2.83	30.4	20000	2.77	15.5	-0.03
500	2.79	37.5				

Reference: 24

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

$N_3^+ - N_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	2.26	0.121	300	2.26	115	0.01
4.00	2.26	0.243	350	2.27	106	0.06
10.0	2.26	0.607	400	2.30	98.2	0.10
20.0	2.26	1.21	450	2.33	91.4	0.15
30.0	2.27	1.83	500	2.37	85.2	0.19
40.0	2.28	2.45	600	2.47	74.6	0.23
50.0	2.31	3.10	700	2.56	66.7	0.20
60.0	2.35	3.79	800	2.62	60.9	0.18
70.0	2.40	4.51	900	2.67	56.4	0.15
80.0	2.48	5.33	1000	2.71	52.7	0.13
90.0	2.57	6.22	1200	2.77	47.1	0.10
100	2.66	7.15	1500	2.81	41.5	0.07
120	2.77	8.93	2000	2.86	35.3	0.03
140	2.82	10.6	2500	2.86	31.6	-0.03
160	2.86	12.3	3000	2.83	29.1	-0.08
180	2.86	13.8	3500	2.78	27.5	-0.13
200	2.83	15.2				
220	2.80	16.6				
240	2.75	17.7				

Reference: 20 and 24

Accuracy: The total error in the experimental data is believed not to exeeed ± 7%.

See page 182 for Explanation of Tables

TABLES. Ions in Nitrogen, Oxygen

$N_4^+ - N_2$

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	2.31	0.124	300	2.31	107	0.14
4.00	2.31	0.248	325	2.35	101	0.17
7.00	2.31	0.434	350	2.38	96.2	0.20
10.0	2.32	0.623	375	2.41	91.8	0.21
12.0	2.33	0.751				
15.0	2.34	0.943				
20.0	2.35	1.26				
25.0	2.36	1.59				
30.0	2.37	1.91				
35.0	2.39	2.25				
40.0	2.41	2.59				

Reference: 24

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

$K^+ - O_2$

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	2.73	0.220	300	2.72	93.7	0.04
4.00	2.73	0.293	400	2.75	80.3	0.10
6.00	2.73	0.440	500	2.85	69.3	0.15
8.00	2.73	0.587	600	2.94	61.3	0.17
10.0	2.73	0.734	800	3.09	50.5	0.16
12.0	2.73	0.880	1000	3.20	43.6	0.14
15.0	2.73	1.10	1200	3.27	39.0	0.12
20.0	2.73	1.47	1500	3.34	34.1	0.08
25.0	2.73	1.83	1800	3.39	30.7	0.07
30.0	2.75	2.22	2000	3.42	28.9	0.06
40.0	2.80	3.01	2500	3.46	25.5	0.05
50.0	2.87	3.86	3000	3.48	23.2	0.03
60.0	2.94	4.74	3500	3.49	21.4	-0.01
80.0	3.12	6.71	4000	3.48	20.1	-0.03
100	3.31	8.89	5000	3.45	18.1	-0.07
120	3.42	11.0	6000	3.37	16.9	-0.13
150	3.48	14.0	8000	3.24	15.2	-0.15
200	3.44	18.5	10000	3.13	14.1	-0.19
250	3.33	22.4				
300	3.20	25.8				

Reference: 17

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

$O_2^+ - O_2$

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	2.23	0.240	300	2.23	120	-0.12
5.00	2.23	0.300	400	2.17	107	-0.13
6.00	2.23	0.360	500	2.11	98.1	-0.14
8.00	2.23	0.479	600	2.05	92.1	-0.14
10.0	2.23	0.599	800	1.97	83.0	-0.16
12.0	2.23	0.719	1000	1.90	77.0	-0.17
15.0	2.23	0.899	1200	1.84	72.6	-0.18
20.0	2.23	1.20	1500	1.76	67.9	-0.21
25.0	2.23	1.50	2000	1.65	62.7	-0.23
30.0	2.23	1.80	2500	1.56	59.3	-0.26
40.0	2.21	2.38	3000	1.49	56.7	-0.29
50.0	2.18	2.93	4000	1.36	53.8	-0.33
60.0	2.14	3.45				
80.0	2.08	4.47				
100	2.02	5.43				
120	1.96	6.32				
150	1.88	7.58				
200	1.77	9.51				
250	1.67	11.2				
300	1.59	12.8				
400	1.45	15.6				
500	1.34	18.0				

Reference: 32

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

$O_4^+ - O_2$

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	2.08	0.112	300	2.08	111	0.00
4.00	2.08	0.224	305	2.08	110	0.00
6.00	2.08	0.335	310	2.08	109	0.00
8.00	2.08	0.447				
10.0	2.08	0.559				
12.0	2.08	0.671				
15.0	2.08	0.838				
20.0	2.08	1.12				

Reference: 23 and 32

Accuracy: The total error in the experimental data is believed not to exceed ± 4%.

See page 182 for Explanation of Tables

TABLES. Ions in Oxygen

$O^- - O_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	3.20	0.344	300	3.20	102	0.29
5.00	3.20	0.430	400	3.43	82.6	0.25
6.00	3.20	0.516	500	3.62	70.0	0.24
8.00	3.20	0.688	600	3.77	61.4	0.22
10.0	3.20	0.860	800	3.99	50.2	0.19
12.0	3.20	1.03	1000	4.16	43.1	0.17
15.0	3.20	1.29	1200	4.32	37.9	0.17
20.0	3.23	1.74	1500	4.44	33.0	0.15
25.0	3.31	2.22	2000	4.62	27.4	0.14
30.0	3.40	2.74	2500	4.75	23.9	0.09
40.0	3.60	3.87	3000	4.80	21.6	0.04
50.0	3.81	5.12	4000	4.77	18.8	-0.07
60.0	4.04	6.51	5000	4.67	17.2	-0.11
80.0	4.43	9.52	6000	4.57	16.0	-0.14
100	4.73	12.7				
120	4.82	15.5				
150	4.70	18.9				
200	4.41	23.7				

Reference: 32 and 7

Accuracy: The total error in the experimental data is believed not to exceed ± 3 %.

$O_3^- - O_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	2.56	0.344	300	2.56	95.3	0.26
6.00	2.56	0.413	350	2.66	84.9	0.25
7.00	2.56	0.482	400	2.75	76.8	0.24
8.00	2.57	0.552	500	2.89	65.4	0.23
10.0	2.57	0.691	600	3.01	57.3	0.19
12.0	2.58	0.832	700	3.09	51.7	0.17
15.0	2.59	1.04	800	3.15	47.4	0.15
20.0	2.62	1.41	1000	3.24	41.2	0.10
25.0	2.65	1.78	1200	3.29	37.1	0.06
30.0	2.68	2.16	1400	3.31	34.1	0.02
35.0	2.72	2.56	1600	3.31	31.9	-0.02
40.0	2.77	2.98	1800	3.29	30.3	-0.08
50.0	2.89	3.88				
60.0	3.01	4.85				
70.0	3.12	5.87				
80.0	3.22	6.92				
100	3.31	8.89				
120	3.30	10.6				

Reference: 11, 32 and 7

Accuracy: The total error in the experimental data is believed not to exceed ± 1%.

$O_2^- - O_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	2.17	0.175	300	2.17	123	-0.02
4.00	2.17	0.233	400	2.15	108	-0.03
5.00	2.17	0.292	500	2.13	97.2	-0.06
6.00	2.17	0.350	600	2.10	90.0	-0.09
8.00	2.17	0.466	700	2.07	84.5	-0.13
10.0	2.17	0.583	800	2.02	81.0	-0.17
12.0	2.17	0.700	900	1.98	77.9	-0.19
15.0	2.17	0.875	1000	1.94	75.4	-0.19
20.0	2.17	1.17				
25.0	2.17	1.46				
30.0	2.16	1.74				
40.0	2.16	2.32				
50.0	2.15	2.89				
60.0	2.14	3.45				
80.0	2.11	4.54				
100	2.06	5.54				
120	2.01	6.48				
140	1.93	7.26				

Reference: 32 and 7

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

$CO_3^- - O_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	2.51	0.202	300	2.52	92.8	0.25
4.00	2.51	0.270	325	2.57	87.4	0.23
5.00	2.51	0.337	350	2.61	83.0	0.21
6.00	2.51	0.405	400	2.68	75.6	0.18
7.00	2.51	0.472	450	2.73	70.0	0.14
8.00	2.52	0.542	500	2.77	65.4	0.11
10.0	2.52	0.677	550	2.79	61.9	0.08
12.0	2.53	0.816	600	2.81	58.9	0.05
15.0	2.54	1.02	700	2.81	54.5	-0.01
20.0	2.56	1.38				
25.0	2.58	1.73				
30.0	2.61	2.10				
35.0	2.64	2.48				
40.0	2.67	2.87				
50.0	2.72	3.65				
60.0	2.76	4.45				
70.0	2.80	5.27				

Reference: 11 and 31

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

See page 182 for Explanation of Tables

TABLES. Ions in Carbon Monoxide, Oxygen

K^+ - CO

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
4.00	2.30	0.247	300	2.31	115	0.02
6.00	2.30	0.371	400	2.33	98.4	0.03
8.00	2.30	0.494	500	2.35	87.2	0.05
10.0	2.30	0.618	600	2.38	78.6	0.07
12.0	2.30	0.742	800	2.43	66.7	0.08
15.0	2.30	0.927	1000	2.48	58.5	0.09
20.0	2.30	1.24	1200	2.52	52.5	0.09
25.0	2.30	1.55	1500	2.57	46.1	0.10
30.0	2.30	1.85	1800	2.62	41.2	0.10
40.0	2.32	2.49	2000	2.65	38.7	0.10
50.0	2.32	3.12	2500	2.70	34.0	0.08
60.0	2.34	3.77	3000	2.73	30.7	0.06
80.0	2.38	5.12	3500	2.75	28.2	0.04
100	2.43	6.53	4000	2.76	26.3	0.02
120	2.50	8.06	5000	2.77	23.4	0.00
150	2.58	10.4	6000	2.76	21.4	-0.03
200	2.72	14.6	8000	2.72	18.8	-0.06
250	2.74	18.4	10000	2.67	17.2	-0.08
300	2.74	22.1	12000	2.63	15.9	-0.11
400	2.68	28.8	15000	2.55	14.7	-0.15
500	2.60	34.9	18000	2.48	13.8	-0.15
600	2.49	40.1	20000	2.44	13.3	-0.15

Reference: 34

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

CO^+ - CO

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
15.0	1.74	0.701	300	1.75	163	-0.35
20.0	1.73	0.930	400	1.59	156	-0.32
25.0	1.72	1.16	500	1.48	149	-0.30
30.0	1.71	1.38	600	1.41	143	-0.29
40.0	1.68	1.81	800	1.30	135	-0.30
50.0	1.65	2.22	1000	1.21	129	-0.30
60.0	1.62	2.61	1200	1.15	124	-0.30
80.0	1.56	3.35	1500	1.07	119	-0.31
100	1.50	4.03	2000	0.98	113	-0.33
120	1.45	4.68	2500	0.91	109	-0.35
150	1.38	5.56	3000	0.85	106	-0.35
200	1.29	6.93				
250	1.20	8.06				
300	1.14	9.19				
400	1.01	10.9				
500	0.95	12.8				
600	0.89	14.3				
700	0.84	15.8				

Reference: 29

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

$C_2O_2^+$ - CO

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
8.00	1.90	0.408	300	1.90	130	0.03
10.0	1.90	0.511	350	1.92	119	0.09
12.0	1.90	0.613	400	1.95	110	0.12
15.0	1.90	0.766	450	1.98	102	0.15
20.0	1.90	1.02	500	2.01	95.3	0.13
25.0	1.90	1.28	550	2.03	90.0	0.09
30.0	1.90	1.53	600	2.04	85.7	0.07
40.0	1.91	2.05				
50.0	1.93	2.59				
60.0	1.96	3.16				
70.0	1.99	3.74				
80.0	2.01	4.32				
90.0	2.03	4.91				
100	2.06	5.54				

Reference: 29

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

CO_4^- - O_2

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
3.00	2.38	0.192	300	2.38	94.6	0.17
4.00	2.38	0.256	350	2.45	85.1	0.17
5.00	2.38	0.320	400	2.50	78.0	0.16
6.00	2.38	0.384	450	2.55	72.1	0.16
8.00	2.38	0.512	500	2.59	67.3	0.15
10.0	2.38	0.640	600	2.67	59.6	0.19
12.0	2.39	0.771	800	2.87	48.0	0.27
15.0	2.39	0.963	900	2.96	43.9	0.17
20.0	2.40	1.29	1000	2.98	41.4	0.06
25.0	2.42	1.63	1200	2.99	37.7	0.01
30.0	2.44	1.97				
40.0	2.49	2.68				
50.0	2.54	3.41				
60.0	2.62	4.22				
80.0	2.85	6.13				
100	2.99	8.03				

Reference: 11 and 31

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

See page 182 for Explanation of Tables

TABLES. Ions in Carbon Monoxide, Nitric Oxide, Carbon Dioxide

C^+ - CO

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
20	2.73	1.47	300	2.72	136	-0.06
25	2.72	1.83	400	2.67	120	-0.06
30	2.71	2.18	500	2.63	109	-0.06
40	2.69	2.89	600	2.60	100	-0.06
50	2.66	3.57	800	2.56	88.2	-0.05
60	2.64	4.26	1000	2.54	79.5	-0.04
80	2.60	5.59	1200	2.52	73.2	-0.04
100	2.56	6.88	1500	2.50	66.0	-0.03
120	2.52	8.13	2000	2.48	57.6	-0.02
150	2.50	10.1	2500	2.47	51.7	-0.01
200	2.48	13.3	3000	2.47	47.2	0.00
250	2.47	16.6	4000	2.47	40.9	0.01
300	2.48	20.0	6000	2.50	33.0	0.05
350	2.50	23.5	8000	2.54	28.1	0.06
400	2.55	27.4	10000	2.57	24.8	0.07
500	2.65	35.6	12000	2.61	22.3	0.08
600	2.76	44.5	15000	2.66	19.6	0.09
700	2.86	53.8	20000	2.73	16.5	0.10
			30000	2.84	13.0	0.10

Reference: 29

Accuracy: The total error in the experimental data is believed not to exceed ± 4%.

NO^+ - NO

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
10.0	1.90	0.511	300	1.91	144	-0.19
15.0	1.90	0.766	350	1.86	137	-0.18
20.0	1.90	1.02	400	1.82	131	-0.17
30.0	1.89	1.52	500	1.76	121	-0.16
40.0	1.87	2.01	600	1.71	114	-0.15
50.0	1.85	2.49	700	1.67	108	-0.15
60.0	1.83	2.95	800	1.63	104	-0.16
70.0	1.81	3.40	1000	1.57	96.3	-0.20
80.0	1.79	3.85	1200	1.51	91.4	-0.22
100	1.74	4.68	1500	1.44	85.7	-0.25
120	1.70	5.48	1700	1.39	83.4	-0.27
150	1.63	6.57				
200	1.53	8.22				
250	1.45	9.74				
300	1.38	11.1				

Reference: 36

Accuracy: The total error in the experimental data is believed not to exceed ± 3%.

K^+ - NO

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
2.00	2.28	0.123	300	2.28	114	0.01
4.00	2.28	0.245	400	2.29	98.1	0.04
6.00	2.28	0.368	500	2.33	86.3	0.08
8.00	2.28	0.490	600	2.37	77.4	0.11
10.0	2.28	0.613	800	2.44	65.1	0.11
12.0	2.28	0.735	1000	2.50	56.9	0.11
15.0	2.28	0.919	1200	2.56	50.7	0.13
20.0	2.28	1.23	1500	2.63	44.1	0.13
25.0	2.28	1.53	1800	2.70	39.2	0.12
30.0	2.28	1.84	2000	2.73	36.8	0.11
40.0	2.28	2.45	2500	2.79	32.2	0.09
50.0	2.28	3.06	3000	2.83	29.0	0.08
60.0	2.30	3.71	3500	2.87	26.5	0.06
80.0	2.37	5.09	4000	2.88	24.7	0.04
100	2.46	6.61	5000	2.89	22.0	-0.01
120	2.56	8.25	6000	2.88	20.1	-0.03
150	2.69	10.8	8000	2.84	17.7	-0.06
200	2.84	15.3	10000	2.80	16.1	-0.10
250	2.89	19.4	12000	2.75	14.9	-0.11
300	2.88	23.2	15000	2.68	13.7	-0.12
400	2.77	29.8	18000	2.62	12.8	-0.14
500	2.67	35.9	20000	2.58	12.3	-0.14
600	2.57	41.4				
700	2.48	46.6				

Reference: 17

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

Rb^+ - CO_2

Experimental Data T = 300° K; Derived Quantities

E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
10.0	1.23	0.331	300	1.23	161	-0.09
12.0	1.23	0.397	350	1.21	152	-0.08
15.0	1.23	0.496	400	1.20	143	-0.06
20.0	1.23	0.661	500	1.19	129	-0.03
25.0	1.23	0.826	600	1.19	118	-0.02
30.0	1.23	0.992	800	1.18	103	0.01
40.0	1.22	1.31	1000	1.19	91.3	0.04
50.0	1.22	1.64	1200	1.20	82.7	0.05
60.0	1.21	1.95	1500	1.22	72.7	0.07
80.0	1.20	2.58	2000	1.25	61.5	0.08
100	1.20	3.22	3000	1.29	48.6	0.09
150	1.18	4.76	4000	1.33	40.9	0.10
200	1.18	6.34	5000	1.36	35.7	0.10
250	1.21	8.13	6000	1.38	32.2	0.10
300	1.25	10.1	8000	1.42	27.1	0.07
400	1.32	14.2	10000	1.43	24.0	0.05
500	1.39	18.7	12000	1.44	21.8	0.03
600	1.43	23.1	15000	1.45	19.4	0.01
700	1.45	27.3	20000	1.45	16.8	-0.03
800	1.45	31.2				
900	1.44	34.8				

Reference: 33

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

See page 182 for Explanation of Tables
See page 201 for other Ions in Nitric Oxide

TABLES. Ions in Carbon Dioxide

$Na^+ - CO_2$

Experimental Data T = 300°			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
50	1.63	2.19	400	1.63	146	-0.11
60	1.62	2.61	500	1.59	134	-0.12
70	1.61	3.03	600	1.55	125	-0.12
80	1.60	3.44	800	1.50	112	-0.09
100	1.56	4.19	1000	1.48	102	-0.06
120	1.52	4.90	1200	1.47	93.5	-0.04
150	1.49	6.01	1500	1.46	84.2	0.00
200	1.47	7.90	1800	1.47	76.4	0.05
250	1.50	10.1	2000	1.48	72.0	0.08
300	1.60	12.9	2500	1.52	62.7	0.15
350	1.75	16.5	3000	1.56	55.7	0.17
400	1.91	20.5	3500	1.61	50.0	0.19
500	2.11	28.4	4000	1.65	45.6	0.21
600	2.22	35.8	5000	1.73	38.9	0.23
700	2.29	43.1	6000	1.81	34.0	0.23
			8000	1.92	27.7	0.18
			10000	1.99	23.9	0.16
			12000	2.04	21.3	0.15
			15000	2.11	18.4	0.13
			18000	2.16	16.4	0.12
			20000	2.18	15.4	0.11
			25000	2.23	13.5	0.09
			30000	2.27	12.1	0.08
			40000	2.31	10.3	0.04

Reference: 1

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

$K^+ - CO_2$

Experimental Data T = 300°			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
10	1.45	0.390	300	1.45	162	-0.06
15	1.45	0.585	400	1.42	143	-0.08
20	1.45	0.779	500	1.39	131	-0.10
25	1.45	0.974	600	1.37	121	-0.07
30	1.45	1.17	800	1.35	107	-0.04
40	1.44	1.55	1000	1.34	96.1	-0.01
50	1.43	1.92	1200	1.34	87.7	0.02
60	1.42	2.29	1500	1.36	77.3	0.04
80	1.40	3.01	1800	1.37	70.0	0.09
100	1.38	3.71	2000	1.39	65.5	0.10
120	1.37	4.42	2500	1.43	56.9	0.12
150	1.36	5.48	3000	1.46	50.9	0.12
200	1.35	7.26	3500	1.49	46.2	0.12
250	1.39	9.34	4000	1.51	42.6	0.13
300	1.44	11.6	5000	1.56	36.9	0.13
400	1.57	16.9	6000	1.60	32.8	0.14
500	1.68	22.6	8000	1.66	27.4	0.12
600	1.72	27.7	10000	1.70	23.9	0.09
700	1.74	32.7	12000	1.72	21.6	0.05
			15000	1.73	19.2	0.02
			18000	1.73	17.5	0.00
			20000	1.73	16.6	-0.01

Reference: 17

Accuracy: The total error in the experimental data is believed not to exceed ± 2%.

$O^- - CO_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
25.0	1.92	1.29	325	1.92	162	-0.04
30.0	1.92	1.55	350	1.91	151	-0.04
40.0	1.92	2.06	400	1.91	141	-0.02
50.0	1.91	2.57	500	1.91	127	0.01
60.0	1.91	3.08	600	1.92	115	0.02
80.0	1.92	4.13	700	1.92	106	0.03
100	1.93	5.19	800	1.93	99.0	0.04
120	1.96	6.32	1000	1.95	87.6	0.05
140	1.99	7.49	1200	1.98	78.8	0.07
160	2.03	8.73	1500	2.01	69.4	0.08
180	2.07	10.0	2000	2.06	58.7	0.10
200	2.11	11.3	2500	2.11	51.2	0.10
220	2.16	12.8	3000	2.15	45.9	0.11
240	2.23	14.4	3500	2.19	41.7	0.11
			4000	2.22	38.5	0.12

Reference: 25

Accuracy: The total error in the experimental data is believed not to exceed ± 7%.

$CO_3^- - CO_2$

Experimental Data T = 300° K			Derived Quantities			
E/N	K_o	v_d	T_{eff}	$K_o(0)$	$\Omega^{(1,1)}$	$\frac{d\ln K_o}{d\ln T_{eff}}$
5.00	1.29	0.173	300	1.29	164	0.15
8.00	1.29	0.277	350	1.31	150	0.16
10.0	1.29	0.347	400	1.34	137	0.15
15.0	1.29	0.520	450	1.37	126	0.16
20.0	1.29	0.693	500	1.39	118	0.16
25.0	1.29	0.867	600	1.43	105	0.15
30.0	1.30	1.05	700	1.46	95.1	0.16
40.0	1.31	1.41	800	1.49	87.2	0.16
50.0	1.32	1.77	900	1.52	80.6	0.16
60.0	1.34	2.16	1000	1.55	74.9	0.16
80.0	1.37	2.94				
100	1.41	3.79				
120	1.46	4.71				
140	1.52	5.72				
150	1.55	6.25				

Reference: 13 and 25

Accuracy: The total error in the experimental data is believed not to exceed ± 5%.

See page 182 for Explanation of Tables

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