Selected Specific Rates of Reactions of Transients From Water in Aqueous Solution. 1. Hydrated Electron

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Issued May 1973

Foreword

The National Standard Reference Data System provides access to the quantitative data of physical science, critically evaluated and compiled for convenience and readily accessible through a variety of distribution channels. The System was established in 1963 by action of the President's Office of Science and Technology and the Federal Council for Science and Technology, and responsibility to administer it was assigned to the National Bureau of Standards.

NSRDS receives advice and planning assistance from a Review Committee of the National Research Council of the National Academy of Sciences-National Academy of Engineering. A number of Advisory Panels, each concerned with a single technical area, meet regularly to examine major portions of the program, assign relative priorities, and identify specific key problems in need of further attention. For selected specific topics, the Advisory Panels sponsor subpanels which make detailed studies of users' needs, the present state of knowledge, and existing data resources as a basis for recommending one or more data compilation activities. This assembly of advisory services contributes greatly to the guidance of NSRDS activities.

The System now includes a complex of data centers and other activities in academic institutions and other laboratories. Components of the NSRDS produce compilations of critically evaluated data, reviews of the state of quantitative knowledge in specialized areas, and computations of useful functions derived from standard reference data. The centers and projects also establish criteria for evaluation and compilation of data and recommend improvements in experimental techniques. They are normally associated with research in the relevant field.

The technical scope of NSRDS is indicated by the categories of projects active or being planned: nuclear properties, atomic and molecular properties, solid state properties, thermodynamic and transport properties, chemical kinetics, and colloid and surface properties.

Reliable data on the properties of matter and materials is a major foundation of scientific and technical progress. Such important activities as basic scientific research, industrial quality control, development of new materials for building and other technologies, measuring and correcting environmental pollution depend on quality reference data. In NSRDS, the Bureau's responsibility to support American science, industry, and commerce is vitally fulfilled.

RICHARD W. ROBERTS, *Director*

Preface

This report is one of a series of data publications on radiation chemistry; the aim of the series is to compile, evaluate, and present the numerical results on processes occurring in systems which have been subjected to ionizing radiation. Various kinds of data are important in radiation chemistry. The quantities which were measured first were the observed radiation yields or G values (molecules formed or destroyed per 100 eV). Various indirect methods based on G values have been used to determine yields of transient species and relative rates of reactions. The spectral properties (optical, electron spin resonance) of transients have provided a direct method for their identification, and rates of the very fast reactions of transients which occur in irradiated systems have been measured directly by spectroscopic methods. Conductivity and luminescence methods have also provided a means of measuring properties of transients and their kinetics. Some reactions which occur in irradiated systems have also been studied by other methods, such as photochemistry, electric discharge, ultrasonics, chemical initiation, electron impact, etc. The emphasis in these publications is on the data of radiation chemistry, but where other pertinent data exist, they are included.

The data of radiation chemistry are voluminous; thousands of systems have been investigated. As a result there are certain collections, *e.g.* rate constants of particular types of reactions or certain properties of transients, for which tabulations of the data are considered essential, but for which critical assessment of each value is impossible. On the other hand, certain systems and properties have been studied so extensively that critical examination of these data is desirable and timely. Authors of this series of data publications have been asked to evaluate the extent to which the data can be critically assessed, to describe their criteria for evaluation, and to designate preferred values whenever possible.

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Rates of reactions of hydrated electrons with over 700 different organic and inorganic molecules, ions, and transients have been tabulated. Most of the data are derived from pulse radiolysis of aqueous solutions; results from photolysis and from steady-state radiolysis by competition kinetics are also included.

Key words: Aqueous solution; chemical kinetics; data compilation; hydrated electron; radiation chemistry; rates.

Introduction

The hydrated electron is unique not only by its nature and by its chemical properties, but also by the fact that its reactions have been quantitatively investigated with a larger number of different chemical species than any other reagent. A compilation of the rate constants of the reactions of the hydrated electron became a necessity as a result of the accumulation of data on the kinetic behavior of hundreds of different compounds. This was true already in 1965 when a compilation of rate data was first published (Anbar and Neta, 65–0245). Less than two years later two additional compilations were published (Hart, 66–0757, and Anbar and Neta, 67–0103). Three years later a new compilation appeared in Hart and Anbar's monograph, "The Hydrated Electron," 70–0482. The last compilation, which does not claim to be comprehensive, includes about 450 different compounds as compared with 410 in the 1967 compilation. The present tables, which are as comprehensive as possible, include close to 700 compounds and derive the information from about 180 references compared with 32, 59, and about 90 references in the 1966, 1967, and 1970 compilations, respectively. The rate of generation of new data has diminished in recent years, and the time has come for consolidation of the information which may now stimulate more systematic work on the chemistry of the hydrated electron.

Unlike the last two compilations, we have not limited ourselves to rate data obtained by pulse radiolysis, but have also included specific rates obtained by competition kinetics. This has been done primarily when no pulse radiolysis data were available and when a good agreement was found between pulse radiolysis and competition kinetic data. The latter type of data were included primarily in order to point out systems which are not complicated by secondary reactions. It may be stated in general that direct measurement of the decay of e^-_{aq} is by far the most reliable kinetic method whereas any rate constants derived by competition kinetics should be used with caution. Of the different reagents used in competition kinetics, one should avoid small molecules with high electron affinity such as O_2 or N_2O as specific competitors for e^-_{aq}. These reagents can easily abstract an electron from a long-lived electron adduct and thus lead to erroneous kinetic data. *p*-Bromophenol, nitrate ions and sulfur hexafluoride seem to be more reliable competitors,

* The Radiation Laboratory is operated under contract with The Atomic Energy Commission. The work of the Center is supported jointly by The National Bureau of Standards, Office of Standard Reference Data and The Atomic Energy Commission. This is AEC Document COO-38-759.

the latter having the advantage of enhanced analytical sensitivity by producing 6 fluoride ions per electron. Standard values have been chosen and used consistently throughout the tables for normalizing relative rates of the competitors, H^+, N_2O, O_2, SF_6, NO_3^-, acetone, *p*-bromophenol, chloroacetate ion and chloroacetic acid with other solutes.

In selecting the rate data from pulse radiolysis studies, we have included every rate constant reported except for some of those which have been superseded by more reliable measurements by the *same* author. We have avoided duplication of references in cases where it was obvious that two or more publications report one and the same experimental result.

In several cases unexplained discrepancies between reported values exist; if the solute concentration is greater then 10^{-1} *M*, the presence of reactive impurities could account for the variation in measured values. In most cases the specific rate included in the tables is the observed rate constant, k_{obs}, corrected only for the spontaneous decay of e_{aq}^- in the same solute-free matrix. Wherever a rate constant corrected for salt effects or for dissociation constant of an acid was reported, we introduced it into the specific rate column of the table, putting k_{obs} under *Comments*.

Wherever not specified, the reported rate constant is the value for ambient temperatures, 15–25°C. Since the activation energy of e_{aq}^- reactions is low, little uncertainty is introduced by the lack of information on the exact temperature of measurement. Unfortunately there are only a few studies in which the energy of activation was measured and even some of these are open to criticism (see for instance Anbar and Hart, 70–0482, Ch. VIIIA). Measured values of E_a have been included under *Comments*.

The ionic strength evidently has a pronounced effect on the reaction rates of e_{aq}^- with positive and negative ions, and moderate effects are expected even with neutral species. Many kinetic results were reported without specifying the ionic strengths, but wherever such data were available they have been included under *Comments*. No attempt was made, however, to calculate k_{cor} extrapolated to $\mu = 0$ because of the lack of exact information on the changes in activity coefficient of e_{aq}^- and of the other reagents with μ, especially in concentrated solutions. Wherever k_{cor} was calculated by an author, it was cited, leaving k_{obs} for *Comments*, otherwise k_{obs} was cited and any available information on the ionic strength was reported under *Comments*.

Arrangement of Tables

Solute and reaction. The reactions may involve electron attachment ($e_{aq}^- + AB \rightarrow AB^-$) or dissociative electron attachment ($e_{aq}^- + AB \rightarrow A^- + B$). If products have not been identified, no reaction has been included in the tables. In some cases the products of the electron attachment reaction have been identified and the reaction has been included. In some cases products have been identified after subsequent steps and an overall reaction has been included.

Table 2 contains the reactions of e_{aq}^- with transient species formed in water by irradiation. Arrangement in Table 3 (inorganic ions and molecules) is alphabetical by main element; in Table 4 arrangement of the organic ions and molecules is alphabetical by name. In most cases the IUPAC name has been used, however some complex materials are listed by a common name.

Solute concentrations were usually less than 10^{-3} *M*; if a higher concentration was reported it has been noted under *Comments*. Measurements were commonly made in the presence of a small concentration of an alcohol which acts as an OH scavenger. The absence of such a scavenger has been noted under *Comments* whenever that information was included in the reported experimental details.

Specific rate, k. In some cases the reported numerical values for *k* have been rounded off to two significant figures. Error limits have been given as reported; we have made no attempt to assess sources of error and assign limits. Values corrected to zero ionic strength have been marked (cor.). Values obtained indirectly from relative rates have been marked (rel.) and the reported rate ratios given under *Comments*. Values calculated for dissociated or undissociated acids using k_{obs}, the pH of the solutions and the p*K* of the acid have been marked (calcd.)

Method. Abbreviations used in the *Method* column include:

r.	radiolysis
γ-r.	gamma-radiolysis
X-r.	X-radiolysis
p.r.	pulse radiolysis
phot.	photoylsis
f. phot.	flash photolysis

Further details of the method used have been included in the *Comments* column with the aid of the following abbreviations.

c.k.	competition kinetics
d.k.	decay kinetics
p.b.k.	product buildup kinetics

Unless otherwise noted, measurements by pulse radiolysis or flash photolysis were made by observation of the decay of e^-_{aq} absorption at 540–720 nm.

Activation energy, E_a. The temperature range studied and activation energies measured have been given under *Comments*. Entries in which E_a are included are: 1.1, 1.3, 1.30, 1.55, 1.61, 1.62, 1.143, 1.146, 1.173, 1.175, 1.188, 1.189, 1.240, 1.265, 1.286, 1.299, 1.313, 1.326, 1.327, 1.331, 1.343, 1.348, 1.358, 1.366, 1.376, 1.386, 1.433, 1.499, 1.551, 1.559, 1.577, 1.578, 1.596, 1.650

References. The serial number used in Radiation Chemistry Data Center files has been used for citing references; the first two digits of the number represent year. In the citation the number is preceded by the first four letters of the first author's name followed by a period for additional authors, *e.g.* Buxt.68–0153 and Bark...70–0243. Four periods denote four or more co–authors.

Indexes. Since alphabetical arrangements were chosen for listing the solutes in the tables, indexes have been included as an aid in locating entries for individual compounds or groups of compounds. The chemical structure index is an aid for locating classes of solutes related by structural features. The formula index is an aid for locating a specific compound or ion. The formulas contain the elements arranged in alphabetical order except for carbon compounds, in which C and H precede the alphabetical arrangement. The indexes refer to entry numbers in the tables.

Abbreviations, symbols and units. Formulas for complex ions contain the following ligand abbreviations: EDTA = ethylenediaminetetracetato; en = ethylenediamine; dien = diethylenetriamine; bipy =2,2′–bipyridine; phen = 1,10–phenanthroline; gly = glycine; et_4dien =tetraethyldiethylenetriamine; NTA = nitrilotriacetato; acac =acetylacetone. Abbreviations used in describing *Method* have been listed above. Other abbreviations and symbols include the following:

addn.	addition
anal.	analysis
aq	aqueous
atm.	atmospheres
calcd.	calculated
compd.	compound
concn.	concentration
cor.	corrected
detd.	determined
e^-_d	hydrated electron in D_2O
E_a	activation energy
elec. condy.	electrical conductivity
equil.	equilibrium
estd.	estimated
g	primary radiation yield; (molecules or ions per 100 eV absorbed)
G	radiation yield; (molecules or ions per 100 eV absorbed)
k	specific rate
μ	ionic strength
mol. wt.	molecular weight
obs.	observed
rel.	relative
s	second
satd.	saturated
soln.	solution
$t_{1/2}$	half–life

The energy and pressure units in these tables do not conform to proposed international usage (SI units; Système International); therefore, conversion factors are listed below for the purpose of making these tables most generally useful. Concentration (mol/dm^3) has been designated by M for convenience and brevity.

1 kcal = 4.184 kJ
1 eV = 1.602×10^{-19} J
1 atm = 101 325 N/m^2
1 bar = 1×10^5 N/m^2

TABLE 1. *Properties of e^-_{aq} at 25 °C* [a]

Absorption maximum (nm)	715
Absorption maximum (eV)	1.73
Extinction coefficient, ϵ (715 nm) (dm^3·mol^{-1}cm^{-1}10^{-4})	1.85
$dh\nu/dT$ (0 to 100°C) (eV·deg^{-1}10^3)	−2.9
Half–width (eV)	0.93
Oscillator strength	0.71
ESR g–factor	2.0002
ESR line width (gauss)	< 0.5
Charge	−1
Radius of charge distribution (angstroms or cm·10^8)	2.5 to 3.0
Primary yield, $g(e^-_{aq})$, pH 7	2.65
Diffusion coefficient (cm^{2}s^{-1}10^5)	4.90
Equivalent conductivity (mho·cm^2)	190
Mobility (cm^{2}V^{-1}s^{-1}10^3)	1.98
ΔF hyd (kcal·mol^{-1})	−37.4
ΔS hyd (cal·mol^{-1}deg^{-1})	−1.9
ΔH hyd (kcal·mol^{-1})	−38.1
$E°$ (e^-_{aq} + H → 1/2 H_2) (V)	2.77

[a] Hart, E. J. and Anbar, M., *The Hydrated Electron*, New York, Wiley, 1970, p. 225.

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TABLE 2. *Reactions of e_{aq}^- with water and transients from water*

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.1	H_2O $e^-_{aq} + H_2O \Rightarrow H + OH^-$	8.3–9.0	$(1.6 \pm 0.1) \times 10^1$	p.r.	computer anal.; contains 7 x 10^{-4} M H_2.	Hart..66–0015
		8.3	–	p.r.	k detd. at 5–81°C to give $E_a = 4.5 \pm 1$ kcal mol^{-1}.	Fiel.67–0532
		11	$(2.2 \pm 0.6) \times 10^1$	p.r.	contains $Ba(OH)_2$ and 4 x 10^{-3} M formate ion; extrapolated to formate concn. = 0.	Swal68–0418
		> 7	2.7×10^1 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + NO_3^-)$ = 1.1 x 10^{10}, soln. contains 3 x 10^{-5} M $NaNO_3$ and 5 x 10^{-2} M glucose; pressures up to 8.85 kbar.	Hent.70–0056
1.2	D_2O $e^-_d + D_2O \Rightarrow D + OD^-$	9.39	1.25 ± 0.5	p.r.	computer anal., D_2O soln. satd. with D_2.	Hart.68–0025
1.3	e^-_{aq} $e^-_{aq} + e^-_{aq} \Rightarrow H_2 + 2OH^-$	–	$(6.5 \pm 1.0) \times 10^9$	p.r.	——	Dorf.63–0045
		13	5×10^9	p.r.	——	Gord....63–0050
		10.9	$(4.3 \pm 0.8) \times 10^9$	p.r.	——	Gord....63–0073
		13.3	$(5.5 \pm 0.7) \times 10^9$	p.r.	soln. in equil. with 100 atm. H_2.	Math.65–0009
		12	$(6.3 \pm 1) \times 10^9$	γ–r.	steady–state method, soln. H_2–satd., method less reliable, k detd. at 10 – 93°C to give $E_a = 5.2 \pm 0.3$ kcal mol^{-1}.	Gott.67–0109
		11	6×10^9	f.phot.	soln. H_2–satd.	Schm.68–7143
		12.7	5.0×10^9 (cor.)	p.r.	apparent change in k with pH has been obs.	Brus70–0749
1.4	e^-_d $e^-_d + e^-_d \Rightarrow D_2 + 2OD^-$	13.4	6.0×10^9	p.r.	computer anal., D_2O soln. contains 5.7 x 10^{-3} M D_2.	Hart.68–0025
1.5	H $e^-_{aq} + H \Rightarrow H_2 + OH^-$	10.9	$\sim 3 \times 10^{10}$	p.r.	——	Gord....63–0073
		10.5	$(2.5 \pm 0.6) \times 10^{10}$	p.r.	soln. is in equil. with 100 atm. H_2.	Math.65–0009
1.6	D $e^-_d + D \Rightarrow D_2 + OD^-$	9.39	$(2.8 \pm 0.2) \times 10^{10}$	p.r.	soln. contains 4.5 x 10^{-3} M D_2 in D_2O.	Hart.68–0025
1.7	OH $e^-_{aq} + OH \Rightarrow OH^-$	10.5	$(3.0 \pm 0.7) \times 10^{10}$	p.r.	soln. contains only NaOH.	Math.65 0009
		11	3×10^{10}	p.r.	——	Gord....63–00730
1.8	OD $e^-_d + OD \Rightarrow OD^-$	11.15	$(2.8 \pm 0.2) \times 10^{10}$	p.r.	computer anal., D_2O soln. of NaOD.	Hart.68–0025
1.9	O^- $e^-_{aq} + O^- \Rightarrow 2\ OH^-$	13	$(2.2 \pm 0.6) \times 10^{10}$	p.r.	soln. in equil. with 50 atm. H_2, contains NaOH; not very reliable value.	Math.65–0009
1.10	O_2^- $e^-_{aq} + O_2^- \Rightarrow O_2^{2-}$	11.1	1.3×10^{10}	p.r.	d.k. at 650 nm(e^-_{aq}); computer anal.	Grue...71–0171

TABLE 3. *Reactions of e_{aq}^- with inorganic solutes*

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.11	Ag^+	7	$(3.6 \pm 0.4) \times 10^{10}$	p.r.	——	Gord....63–0073
	$e_{aq}^- + Ag^+ \Rightarrow Ag^\circ$	7	3.5×10^{10}	p.r.	d.k. at 720 nm as well as at 360 nm (Ag°), counter ion SO_4^{2-}.	Puki..68–0431
		7	$(4.3 \pm 0.2) \times 10^{10}$	p.r.	counter ion SO_4^{2-}.	Beva68–0436
		7	$(4.5 \pm 0.5) \times 10^{10}$	p.r.	p.b.k. at 365 nm (Ag°), counter ion SO_4^{2-}.	Beva68–0436
1.12	$Ag(NH_3)_2^+$ $e_{aq}^- + Ag(NH_3)_2^+ \Rightarrow Ag^\circ + 2\ NH_3$	–	3.2×10^{10}	p.r.	d.k. at 720 nm as well as p.b.k. at 360 nm(Ag°), counter ion SO_4^{2-}; soln. contains 0.1 M NH_3.	Puki.68–0435
1.13	$Ag(CN)_2^-$	10	$(1.5 \pm 0.2) \times 10^9$	p.r.	contains 0.1 M CN^-, counter ion ClO_4^-.	Anba.65–0047
1.14	$Ag(NTA)^{2-}$	10.9	$(4.4 \pm 0.9) \times 10^9$	p.r	counter ion SO_4^{2-}; soln. contains 2×10^{-2} M nitrilotriacetic acid.	Meye.69–0277
1.15	$Ag(EDTA)^{3-}$	12	1.6×10^9	p.r.	$\mu = 0.2$.	Anba.69–0276
1.16	Al_{aq}^{3+}	6.8	$(2.0 \pm 0.3) \times 10^9$	p.r.	counter ion ClO_4^-.	Anba.65–0047
		11.2	$(4.0 \pm 1.0) \times 10^8$	p.r.	counter ions ClO_4^-, Na^+.	Anba.65–0047
1.17	$Al(OH)_4^-$	14	$(5.5 \pm 1.2) \times 10^6$	p.r.	counter ion ClO_4^-.	Anba.65–0047
1.18	$Al(gly)_3$	11.1	$\leq 1.8 \times 10^7$	p.r.	counter ion SO_4^{2-}; soln. contains 10^{-1} M glycine.	Meye.69–0277
1.19	$Al(NTA)$	10.9	$> 1 \times 10^8$	p.r.	soln. contains 2×10^{-2} M nitrilotriacetic acid, 10^{-2} M $Al_2(SO_4)_3$.	Meye69–0277
1.20	$Al(NTA)_2^{3-}$	10.9	$\leq 2 \times 10^7$	p.r.	soln. contains 2×10^{-2} M nitrilotriacetic acid, 10^{-3} M $Al_2(SO_4)_3$.	Meye.69–0277
1.21	$Al(EDTA)^-$	12	3.0×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.22	AsO_2^-	10.6	5.5×10^8 (cor.)	p.r.	counter ion Na^+; $\mu = 0.0075$ M; $k_{obs} = 5.9 \times 10^8$.	Anba.68–0295
1.23	$H_2AsO_4^- + HAsO_4^{2-}$	7.2	$(2.1 \pm 0.3) \times 10^8$	p.r.	~ 30% $H_2AsO_4^-$, thus $k(e_{aq}^- + H_2AsO_4^-) \cong (2.3 \pm 0.3) \times 10^8$ has been calcd.	Anba.65–0047
	$HAsO_4^{2-}$	11.0	1.9×10^8 (cor.)	p.r.	$\mu = 10^{-3}$ M; $k_{obs} = 2.0 \times 10^8$.	Anba.68–0295
1.24	AsF_6^-	7.0	$(9.0 \pm 0.9) \times 10^9$	p.r.	——	Anba.65–0047
1.25	$Au(CN)_2^-$ $e_{aq}^- + Au(I) \Rightarrow$	11	$(8.0 \pm 0.5) \times 10^9$	p.r.	p.b.k. at 410 nm $KAu(CN)_2$, 10^{-3} M NaOH.	Ghos.68–0302
	$(Au(I)e_{aq}^-)^\circ$	10.6	3.5×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 10^{-2}$ M; $k_{obs} = 4.2 \times 10^9$.	Anba.68–0295
1.26	BF_4^-	5.8	$< 2.3 \times 10^5$ (cor.)	p.r.	counter ion Na^+; $\mu = 0.2$; $k_{obs} = 4.0 \times 10^5$.	Anba.68–0295
1.27	Br_2^- $e_{aq}^- + Br_2^- \Rightarrow 2Br^-$	7	1.3×10^{10}	p.r.	d.k. at 365 nm (Br_2^-), computer anal., soln. contains $10^{-4} - 10^{-2}$ M KBr; assumed for competing reactions $k(e_{aq}^- + Br_2) = k(e_{aq}^- + Br_3^-) = 1 \times 10^{10}$.	Math...65–0425
1.28	BrO^- $e_{aq}^- + BrO^- \Rightarrow Br^- + O^-$	13	$(1.5 \pm 0.5) \times 10^{10}$ (cor.)	p.r.	counter ion Na^+; $\mu = 0.1$; $k_{obs} = (2.3 \pm 0.5) \times 10^{10}$; see also 68–0152 for c.k. with N_2O giving $k = (1.2–2.5) \times 10^{10}$ at pH 10–14.	Buxt..66–0184 Buxt.68–0153
1.29	BrO_2^- $e_{aq}^- + BrO_2^- \Rightarrow BrO + O^{2-}$	13	$(1.1 \pm 0.2) \times 10^{10}$ (cor.)	p.r.	counter ions Na^+, BrO_3^-, Br^-; $\mu = 0.1$; $k_{obs} = (1.8 \pm 0.2) \times 10^{10}$.	Buxt.68–0153
1.30	BrO_3^-	7	$(2.1 \pm 0.3) \times 10^9$	p.r.	counter ion K^+.	Anba.65–0047
	$e_{aq}^- + BrO_3^- \Rightarrow BrO_3^{2-}$	11	$(3.7 \pm 0.5) \times 10^9$	p.r.	counter ion K^+; k_{obs} =	Anba.65–0047

No.	Solute and Reaction	pH	k(dm^3 mol^{-1}s^{-1})	Method	Comments	Ref.
	$\rightarrow BrO_3H^- + OH^-$		(cor.)		$(3.8 \pm 0.5) \times 10^9$.	
	$\rightarrow BrO_2 + OH^-$	14	$(2.4 \pm 0.7) \times 10^9$ (cor.)	p.r.	counter ion K^+; $k_{obs} = (5.8 \pm 0.7) \times 10^9$.	Anba.65–0047
		3 M OH^-	$(5.3 \pm 0.6) \times 10^9$	p.r.	counter ions K^+; Na^+.	Anba.65–0047
		13	$(2.3 \pm 0.2) \times 10^9$ (cor.)	p.r.	counter ion K^+; $\mu = 0.1$; $k_{obs} = (4.1 \pm 0.2) \times 10^9$.	Buxt.68–0153
		–	7.8×10^9	p.r.	k detd. at 15–80°C; $E_a = 4.5$ kcal mol^{-1}.	Cerc69–0567
		~ 7	3.4×10^9 (cor.)	p.r.	counter ion Na^+; in the presence of 0.01, 0.1 and 1 M $NaClO_4$, k = 4.1, 5 and 6.15×10^9, resp.	Pele.70–0242
1.31	CO	–	1.0×10^9	p.r.	——	Hart..64–0048
1.32	CO_2	7	$(7.7 \pm 1.1) \times 10^9$	p.r.	——	Gord....63–0073
1.33	HCO_3^-	–	$< 10^6$	p.r.	concn. 10^{-3}M, no OH scavenger added; see also 67–0218 for c.k. with CO_2 giving $k \cong 6 \times 10^5$.	Thom..64–0046
1.34	CO_3^{2-}	> 9	$< 10^6$	p.r.	concn. 10^{-3}M, no OH scavenger added.	Thom..64–0046
1.35	CN^-	11.0	$< 10^6$	p.r.	value inferred from data reported in this paper.	Anba.65–0047
1.36	CNO^-	11	$\leq 1.3 \times 10^6$	p.r.	concn. 2×10^{-2}M	Anba.64–0282
1.37	CNS^-	7	$< 10^6$	p.r.	——	Thom..64–0046
1.38	Cd^{2+}	7	5.8×10^{10}	p.r.	——	Baxe..63–0187
		3	4.8×10^{10} (rel.)	γ–r.	c.k., Cd^{2+} concn. 10^{-3}–10^{-1} M; counter ion ClO_4^-; $k_{1.38}/k(e_{aq}^- + H^+) = 2.1$; assumed $k(e_{aq}^- + H^+) = 2.3 \times 10^{10}$.	Baxe.64–0153
		7	$(6.1 \pm 1.8) \times 10^{10}$	n.r.	counter ion NO_3^-; indirect; less reliable method.	Roze.65–0008
		7	5.2×10^{10}	p.r.	——	Baxe..65–0044
		6.5	$(4.8 \pm 0.6) \times 10^{10}$	p.r.	counter ion SO_4^{2-}.	Anba.65–0047
		–	6.4×10^{10}(cor.)	p.r.	counter ion SO_4^{2-}; in the presence of 0.1 and 1 M Na_2SO_4, k = 1.9 and 0.96×10^{10}, resp.	Pele.70–0242
		–	1.7–3.2×10^{10}	p.r.	k decreases with concn., 0.1–0.5 M $CdCl_2$, at high concn. soln. may contain $CdCl^+$ and $CdCl_3^-$ (see 1.40).	Aldr...71–0019
		–	3.8–4.3×10^{10}	p.r.	k decreases with concn., 0.1–0.5 M $Cd(ClO_4)_2$, Cd_2OH^{3+} may be present at high concn.	Aldr...71–0019
1.39	$Cd(NH_3)_4^{2+}$	6.5	$(3.1 \pm 0.3) \times 10^{10}$	p.r.	contains 0.2 M NH_3, counter ion SO_4^{2-}.	Anba.65–0047
1.40	$CdCl(H_2O)_3^+$ + $CdCl_2(H_2O)_2$ + $CdCl_3(H_2O)^-$	6.8	$(1.1 \pm 0.1) \times 10^{10}$	p.r.	contains 1.0 M Cl^-, counter ion SO_4^{2-}.	Anba.65–0047
1.41	CdI_4^{2-}	7.2	$(1.6 \pm 0.2) \times 10^{10}$	p.r.	contains 0.2 M I^-, counter ion SO_4^{2-}.	Anba.65–0047
1.42	$Cd(CN)_4^{2-}$	10	$(1.4 \pm 0.2) \times 10^8$	p.r.	contains 0.1 M CN^-, counter ions SO_4^{2-}. K^+.	Anba.65–0047
1.43	$Cd(gly)^+$	~ 9	$(1.85 \pm 0.3) \times 10^{10}$	p.r.	counter ion SO_4^{2-}, $\mu \cong 10^{-4}$.	Meye.69–0277
1.44	$Cd(gly)_2$	~ 10	$(1.4 \pm 0.2) \times 10^{10}$	p.r.	counter ion SO_4^{2-}, $\mu \cong 10^{-3}$.	Meye.69–0277
1.45	$Cd(gly)_3^-$	~ 11	4.8×10^9 (cor.)	p.r.	counter ion SO_4^{2-}, $\mu \cong 10^{-1}$.	Meye.69–0277

TABLE 3. *Reactions of e^-_{aq} with inorganic solutes* — Continued

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.46	$Cd(NTA)_2^{4-}$	10.9	$\leq 2.3 \times 10^7$	p.r.	counter ion SO_4^{2-}, soln. contains 2×10^{-2} M nitrilotriacetic acid.	Meye.69-0277
1.47	$Cd(EDTA)^{2-}$	12	3.9×10^8	p.r.	$\mu = 0.2$.	Anba.69-0276
1.48	$Cd(en)^{2+}$	~ 9	$(6.3 \pm 0.9) \times 10^{10}$ (cor.)	p.r.	$\mu \cong 10^{-4}$.	Meye.69-0277
1.49	$Cd(en)_2^{2+}$	~ 10	$(4.4 \pm 0.7) \times 10^{10}$ (cor.)	p.r.	$\mu \cong 10^{-3}$.	Meye.69-0277
1.50	$Cd(en)_3^{2+}$	~ 11	$(6.8 \pm 1.0) \times 10^{10}$ (cor.)	p.r.	$\mu \cong 10^{-1}$.	Meye.69-0277
1.51	Ce^{3+}	–	$< 10^9$	p.r.	——	Baxe....64-0132
1.52	$Ce(EDTA)^-$	11.5	$< 3.2 \times 10^7$	p.r.	$\mu = 0.2$.	Anba.69-0276
1.53	Cl^-	10	$< 10^5$	p.r.	values inferred from	Anba.64-0149
			$< 10^4$	p.r.	data reported in these papers.	Anba.65-0047
1.54	ClO^-	10.2	7.0×10^9 (cor.)	p.r.	counter ion Na^+; $\mu = 10^{-3}$ M; $k_{obs} = 7.2 \times 10^9$.	Anba.68-0295
1.55	ClO_3^-	~ 10	$< 4 \times 10^6$	p.r.	concn. 10^{-2} M.	Thom..64-0046
		–	3.5×10^8	p.r.	——	Baxe..65-0044
		9	$< 2 \times 10^6$	p.r.	——	Meye67-0750
		–	2.2×10^8	p.r.	k detd. at 15–80°C; $E_a = 3.2$ kcal mol⁻¹.	Cerc69-0567
			(Unexplained discrepancy in the above data)			
1.56	ClO_4^-	~ 10	$< 10^6$	p.r.	concn. 10^{-2} M.	Thom..64-0046
		–	$< 10^6$	p.r.	——	Baxe....64-0132
		–	$< 10^5$	p.r.	value inferred from data in this ref.	Anba.65-0001
1.57	Co^{2+}	–	1.35×10^{10}	p.r.	——	Baxe..63-0187
		–	1.2×10^{10}	p.r.	——	Baxe..65-0044
		–	1.2×10^{10}	p.r.	——	Baxe....64-0132
		–	9.5×10^9 (cor.)	p.r.	counter ion ClO_4^-; in the presence of 3 M $NaClO_4$, $k = 3.7 \times 10^9$.	Pele.70-0242
1.58	$Co(OH)_4^{2-} + Co(OH)_3^-$	14	1.6×10^9	p.r.	——	Anba.64-0282
1.59	$Co(CN)_5^{3-}$ $e^-_{aq} + Co(CN)_5^{3-} \to Co(CN)_5^{4-}$	13	$(1.4 \pm 0.1) \times 10^{10}$	p.r.	k same in D_2O soln.	Vene..69-0443
1.59a	$Co(NTA)_2^{4-}$	10.9	$\leq 1.4 \times 10^8$	p.r.	counter ion SO_4^{2-}; contains 2×10^{-2} M nitrilotriacetic acid.	Meye.69-0277
1.60	$Co(EDTA)^{2-}$	12	$< 5.2 \times 10^8$	p.r.	$\mu = 0.2$.	Anba.69-0276
1.61	$Co(NH_3)_6^{3+}$	3	7.6×10^{10} (rel.)	γ-r.	c.k., k calcd. from $k_{1.61}/k(e^-_{aq} + H^+) = 3.3$ assuming $k(e^-_{aq} + H^+) = 2.3 \times 10^{10}$; counter ion ClO_4^-.	Baxe.64-0153
		–	9×10^{10}	p.r.	k detd. at 21–77.5°C to give $E_a = 4.2 \pm 0.5$ kcal mol⁻¹	Baxe.65-0044
		11.1	$(9.0 \pm 1.3) \times 10^{10}$	p.r.	counter ion ClO_4^-; soln. contains 0.2 M NH_3.	Anba.65-0047
		6.7	8.2×10^{10} (cor.)	p.r.	counter ion ClO_4^-; $\mu = 6 \times 10^{-5}$ M.	Anba.68-0295
		~ 7	$(8.8 \pm 0.4) \times 10^{10}$	p.r.	counter ion Cl^-; soln. contains $< 10^{-3}$ M H_2.	Walt.69-0186
		5–6	8.5×10^{10}	p.r.	counter ion ClO_4^-.	Meye.69-0428
1.62	$Co(NH_3)_5H_2O^{3+} + Co(NH_3)_5OH^{2+}$	–	6.2×10^{10}	p.r.	——	Baxe.65-0044
		5.5–6	4.6×10^{10} (rel.)	γ-r.	c.k., k calcd. assuming $k(e^-_{aq} + p\text{-}BrC_6H_4OH) = 1.2 \times 10^{10}$; p$K$ of $Co(NH_3)_5H_2O^{3+}$ is 5.4.	Anba.67-0098

TABLE 3. *Reactions of e^-_{aq} with inorganic solutes* —Continued

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
		5.5–6	5.8×10^{10} (rel.)	γ–r.	c.k., k calcd. assuming $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$; k detd. by both methods at 20, 45 and 70°C. to give $E_a = 3.2$ kcal mol^{-1}.	Anba.67–0098
		4.9	8.1×10^{10}	p.r.	counter ion ClO_4^-; $\mu = 6 \times 10^{-5}$ M.	Anba.68–0295
		–	8.0×10^{10}	p.r.	unpubl. data cited.	Meye.69–0428
1.63	$Co(NH_3)_4(H_2O)_2^{3+}$	–	4.4×10^{10}	p.r.	——	Baxe..65–0044
1.64	$Co(NH_3)_5OH^{2+}$	10.0	$(6.0 \pm 0.9) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
1.65	$Co(NH_3)_5F^{2+}$	5–6	$(6.6 \pm 1) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
1.66	$Co(NH_3)_5Cl^{2+}$	–	5.4×10^{10}	p.r.	——	Baxe..65–0044
		7.3	6.1×10^{10}	p.r.	counter ion ClO_4^-; $\mu = 4 \times 10^{-5}$ M.	Anba.68–0295
		5–6	$(7.8 \pm 1.1) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
1.67	$Co(NH_3)_5Br^{2+}$	7.7	6.2×10^{10}	p.r.	counter ion ClO_4^-; $\mu = 4 \times 10^{-5}$ M.	Anba.68–0295
		5–6	$(8.0 \pm 1.2) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
1.68	$Co(NH_3)_5CN^{2+}$	6.1	6.3×10^{10}	p.r.	counter ion ClO_4^-; $\mu = 4 \times 10^{-5}$ M.	Anba.68–0295
		5–6	$(7.4 \pm 1.1) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
1.69	$Co(NH_3)_5NCS^{2+}$	5–6	$(7.3 \pm 1.1) \times 10^{10}$	p.r.	counter ion SO_4^{2-}.	Meye.69–0428
1.70	$Co(NH_3)_5N_3^{2+}$	6.3–8.2	6.3×10^{10}	p.r.	counter ion ClO_4^-; $\mu = 4 \times 10^{-5}$ M.	Anba.68–0295
1.71	$Co(NH_3)_4(CN)H_2O^{2+}$	6.1	5.6×10^{10}	p.r.	counter ion ClO_4^-; $\mu = 4 \times 10^{-5}$ M.	Anba.68–0295
1.72	$Co(NH_3)_5acetate^{2+}$	5–6	$(7.3 \pm 1.1) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
1.73	$Co(NH_3)_5fumarate^+$	5–6	$(6.5 \pm 0.9) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
1.74	$Co(NH_3)_5terephthalate^+$	–	6×10^{10}	p.r.	——	Brow...64–0045
1.75	$(NH_3)_5CoO_2Co(NH_3)_5^{5+}$	5.9	8.2×10^{10}	p.r.	counter ion Br^-; $\mu = 5 \times 10^{-5}$ M.	Anba.68–0295
1.76	$Co(CN)_6^{3-}$	–	2.7×10^9	p.r.	——	Baxe..65–0044
		10	$(1.0 \pm 0.2) \times 10^9$ (cor.)	p.r.	contains 0.1 M CN^-; $k_{obs} = (3.6 \pm 0.4) \times 10^9$.	Anba.65–0047
		13	$(5.0 \pm 0.5) \times 10^9$	p.r.	contains ~ 0.1 M H_2.	Vene..69–0443
1.77	$Co(CN)_5Cl^{3-}$	–	1.8×10^{10}	p.r.	——	Baxe..65–0044
1.78	$Co(CN)_5OH^{3-}$	–	1.1×10^{10}	p.r.	——	Baxe..65–0044
1.79	$Co(CN)_5N_3^{3-}$	–	1.3×10^{10}	p.r.	——	Baxe..65–0044
1.80	$Co(CN)_5NO_2^{3-}$	–	8.0×10^9	p.r.	——	Baxe..65–0044
1.81	$Co(NO_2)_6^{3-}$	–	5.8×10^{10}	p.r.	——	Baxe..65–0044
1.82	$Co(C_2O_4)_3^{3-}$	–	1.3×10^{10}	p.r.	——	Baxe..65–0044
1.83	omitted					
1.84	$Co(EDTA)^-$	–	2.9×10^{10}	p.r.	——	Baxe..65–0044
		11–12	2.9×10^{10}	p.r.	$\mu = 0.2$.	Anba.69–0276
1.85	$Co(en)_3^{3+}$	6.55	7.3×10^{10}	p.r.	counter ion Cl^-.	Szut......65–0018
		–	8.2×10^{10}	p.r.	——	Baxe..65–0044
		5–6	$(8.5 \pm 1.3) \times 10^{10}$	p.r.	counter ion Cl^-.	Meye.69–0428
1.86	*cis* –$Co(en)_2F_2^+$	5–6	$(4.9 \pm 0.7) \times 10^{10}$	p.r.	——	Meye.69–0428
1.87	$Co(en)_2Cl_2^+$	–	3.2×10^{10}	p.r.	——	Baxe..65–0044
	cis –$Co(en)_2Cl_2^+$	5–6	$(7.3 \pm 1.1) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Meye.69–0428
	trans –$Co(en)_2Cl_2^+$	5.55	7.1×10^{10}	p.r.	counter ion NO_3^-; k cor. for NO_3^-.	Szut......65–0018
		5–6	$(7.7 \pm 1.1) \times 10^{10}$	p.r.	counter ion Cl^-.	Meye.69–0428
1.88	$Co(en)_2CO_3^+$	7.2	4.9×10^{10}	p.r.	counter ion ClO_4^-; $\mu = 2 \times 10^{-5}$ M.	Anba.68–0295
		5–6	$(4.8 \pm 0.7) \times 10^{10}$	p.r.	——	Meye.69–0428
1.89	*cis* –$Co(en)_2NH_3Cl^{2+}$	5–6	$(6.6 \pm 1) \times 10^{10}$	p.r.	——	Meye.69–0428
1.90	*cis* –$Co(en)_2NH_3NO_2^{2+}$	5–6	$(6.6 \pm 1) \times 10^{10}$	p.r.	——	Meye.69–0428

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.91	$Co(en)_2FH_2O^{2+}$	5–6	$(6.3 \pm 0.9) \times 10^{10}$	p.r.	——	Meye.69–0428
1.92	*cis*–$Co(en)_2(CNS)_2^+$	6.00	6.9×10^{10}	p.r.	counter ion CNS^-.	Szut.65–0018
	trans–$Co(en)_2(CNS)_2^+$	6.50	5.4×10^{10}	p.r.	counter ion Cl^-.	Szut.65–0018
1.93	$Co(dien)_2^{3+}$	~ 7	$(7.6 \pm 0.4) \times 10^{10}$	p.r.	counter ion Cl^-; soln. contains < 10^{-3} M H_2.	Walt.69–0186
1.94	$(en)_2CoO_2(NH_2)Co(en)_2^{4+}$	6.2	9.6×10^{10}	p.r.	counter ion Br^-; $\mu = 10^{-4}$ M.	Anba.68–0295
1.95	$(CN)_5CoO_2Co(CN)_5^{5-}$	7.0	2.9×10^{10}	p.r.	counter ion K^+; $\mu = 10^{-4}$ M.	Anba.68–0295
1.96	$Co(bipy)_3^{3+}$	~ 7	$(8.3 \pm 0.7) \times 10^{10}$	p.r.	counter ion ClO_4^-; soln. contains < 10^{-3} M H_2.	Walt.69–0186
1.97	$Co(phen)_3^{3+}$	~ 7	$(7.5 \pm 0.5) \times 10^{10}$	p.r.	counter ion ClO_4^-; soln. contains < 10^{-3} M H_2.	Walt.69–0186
1.98	$Co(acac)_3^{3+}$	1.8–3.0	4.6×10^{10} (rel.)	r.	c.k., k calcd. from $k_{1.98}/k(e^-_{aq} + H^+) = 2.0$ assuming $k(e^-_{aq} + H^+) = 2.3 \times 10^{10}$; $k(H + Co(acac)_3^{3+})/k(H + iso\text{–}C_3H_7OH) = 17$, $g(H) = 0.56$, $g(e^-_{aq}) = 2.85$.	Rao..70–0094
		6–7	4.3×10^{10} (rel.)	r.	c.k., k calcd. from $k(e^-_{aq} + O_2)/k_{1.98} = 0.44$ assuming $k(e^-_{aq} + O_2) = 1.9 \times 10^{10}$; $g(OH) = 2.2$, $g(H) = 0.56$.	Rao..70–0094
1.99	Cr^{2+}	6.9	$(4.2 \pm 0.8) \times 10^{10}$	p.r.	Cr^{2+} soln. produced by electrolytic redn. of $Cr(ClO_4)_3$.	Anba.65–0047
		11.2	$(1.9 \pm 0.5) \times 10^{10}$			
1.100	$Cr(CN)_6^{4-}$	10.0	3.3×10^9 (cor.)	p.r.	counter ion K^+; μ = 5×10^{-2} M; $k_{obs} = 1.4 \times 10^{10}$.	Anba.68–0295
1.101	CrF_6^{4-}	8.5	4.1×10^9	p.r.	——	Anba.65–0780
1.102	Cr^{3+}					
	$Cr(H_2O)_5OH^{2+}$	7.1	$(6.0 \pm 0.5) \times 10^{10}$	p.r.	counter ion ClO_4^-; pK of $Cr(H_2O)_6^{3+}$ is 3.75.	Anba.65–0047
	$CrO_2(H_2O)_n^-$	10.9	$(4.6 \pm 0.5) \times 10^{10}$	p.r.	counter ion ClO_4^-;	Anba.65–0047
		14	$(2.0 \pm 0.2) \times 10^8$	p.r.	counter ion ClO_4^-; soln. contains 1 M NaOH.	Anba.65–0047
1.103	$Cr(NH_3)_5Cl^{2+}$	6.7	6.2×10^{10}	p.r.	counter ion Cl^-; $\mu = 10^{-4}$ M.	Anba.68–0295
1.104	CrF_6^{3-}	10	$(1.4 \pm 0.2) \times 10^{10}$	p.r.	soln. contains 0.2 M F^-.	Anba.65–0047
1.105	$Cr(CN)_6^{3-}$	10	4.2×10^9 (cor.)	p.r.	soln. contains 0.1 M CN^-; $k_{obs} = (1.5 \pm 0.2) \times 10^{10}$.	Anba.65–0047
1.106	$Cr(en)_3^{3+}$	6.83	5.3×10^{10}	p.r.	counter ion Cl^-.	Szut...65–0018
		–	7.5×10^{10}	p.r.	——	Baxe..65–0044
1.107	*cis*–$Cr(en)_2Cl_2^+$	5.55	7.1×10^{10}	p.r.	counter ion Cl^-.	Szut...65–0018
1.108	*cis*–$Cr(en)_2(CNS)_2^+$	5.65	4.2×10^{10}	p.r.	counter ion CNS^-.	Szut...65–0018
1.109	$Cr(EDTA)^-$	4.9–5.0	2.6×10^{10}	p.r.	k cor. for H^+ content.	Szut...65–0018
		11–12	2.6×10^{10}	p.r.	$\mu = 0.2$.	Anba.69–0276
1.110	$Cr(C_2O_4)_3^{3-}$	4.76–6.13	1.8×10^{10}	p.r.	counter ion K^+.	Szut...65–0018
1.111	*cis*–$Cr(C_2O_4)_2(H_2O)_2^-$	6.4	1.3×10^{10}	p.r.	counter ion K^+.	Szut...65–0018
	trans–$Cr(C_2O_4)_2(H_2O)_2$	6.18	1.5×10^{10}	p.r.	counter ion K^+.	Szut...65–0018
1.112	CrO_4^{2-}	–	1.8×10^{10}	p.r.	——	Baxe..65–0044
		–	1.8×10^{10} (cor.)	p.r.	counter ion Na^+; in the presence of 0.1 and 1 M Na_2SO_4, $k = 2.7$ and 2.6×10^{10}, resp.	Pele.70–02423
1.113	$Cr_2O_7^{2-}$	7.0	3.3×10^{10}	p.r.	contains no methanol.	Thom..64–0046
		–	6.0×10^{10} (cor.)	p.r.	counter ion Na^+; in the presence of 0.3 M $NaClO_4$, 0.1 and 1 M Na_2SO_4. k=7.5, 7 and 5.0×10^{10}, resp.	Pele. 70–02423
1.114	$Cr(CrO_4)_3^{3-}$	7	2.1×10^{10}	p.r.	There is an error in the reported charge on the ion.	Hart...66–0144

TABLE 3 *Reactions of* e_{aq}^- *with inorganic solutes* — Continued

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.115	Cu^{2+}					
	$Cu(H_2O)_4^{2+}$ $e_{aq}^- + Cu^{2+} \Rightarrow Cu^+$	6	4.0×10^{10} (rel.)	γ-r.	c.k., k calcd. from $k_{1.115}/k(e_{aq}^- + N_2O) = 4.7 \pm 0.4$ assuming $k(e_{aq}^- + N_2O) = 8.7 \times 10^9$.	Scho..63–0057 Scho.64–0095
		7	$(3.3 \pm 0.3) \times 10^{10}$	p.r.	counter ion SO_4^{2-}.	Gord....63–0073
		–	3.0×10^{10}	p.r.	——	Baxe..63–0187
		–	2.9×10^{10}	p.r.	——	Baxe..65–0044
		6.8	$(3.0 \pm 0.3) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Anba.65–0047
		1.5–4.5	3.8×10^{10} (rel.)	γ-r.	c.k., $\mu = 0.15$; k calcd. from $k_{1.115}/k(e_{aq}^- + H^+) = 1.64 \pm 0.03$ assuming $k(e_{aq}^- + H^+) = 2.3 \times 10^{10}$ and $g(H) = 0.55$.	Mici.66–0138
		–	4.5×10^{10} (cor.)	p.r.	counter ion ClO_4^- or SO_4^{2-}; in the presence of 0.03 and 0.3 M $NaClO_4$ and 1 M Na_2SO_4, k = 2.7, 1.7 and 0.91×10^{10}, resp.	Pele.70–0242
1.116	$Cu(OH)_4^{2-}$	14	$(5.8 \pm 0.6) \times 10^9$	p.r.	counter ions ClO_4^-, Na^+.	Anba.65–0047
		3 M OH^-	$(4.5 \pm 0.5) \times 10^9$	p.r.	counter ions ClO_4^-, Na^+.	Anba.65–0047
		5 M OH^-	$(3.4 \pm 0.5) \times 10^9$	p.r.	counter ions ClO_4^-, Na^+.	Anba.65–0047
1.116a	glycine, Cu (II) salt	6.7	3.5×10^8 (rel.)	γ-r.	c.k., assume $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Will.67–0310
1.117	$Cu(gly)_3^-$	11.1	$(1.4 \pm 0.2) \times 10^{10}$	p.r.	counter ion SO_4^{2-}; soln. contains 10^{-1} M glycine.	Meye.69–0277
1.118	$Cu(NTA)_2^{4-}$	10.9	$(1.0 \pm 0.2) \times 10^{10}$	p.r.	counter ion SO_4^{2-}; soln. contains 2×10^{-2} M nitrilotriacetic acid.	Meye.69–0277
1.119	$Cu(EDTA)^{2-}$	12	1.0×10^{10}	p.r.	$\mu = 0.2$.	Anba.69–0276
1.120	$Cu(NH_3)_4^{2+}$	11.1	$(1.8 \pm 0.3) \times 10^{10}$	p.r.	soln. contains 0.2 M NH_3.	Anba.65–0047
1.121	$Cu(en)_3^{2+}$	11.2	$(2.0 \pm 0.3) \times 10^{10}$	p.r.	counter ion SO_4^{2-}; soln. contains 10^{-1} M ethylene–diamine–diHCl.	Meye.69–0277
1.122	$Cu(CN)_4^{2-}$	10	3.0×10^8	p.r.	soln. contains 0.1 M CN^-.	Anba.65–0047
1.123	Dy^{3+}	5.90	4.6×10^8	p.r.	——	Thom..64 0046
1.124	$Dy(EDTA)^-$	12	9.3×10^6	p.r.	$\mu = 0.2$.	Anba.69–0276
1.125	Er^{3+}	–	7×10^7	p.r.	——	Baxe..65–0044
1.126	$Er(EDTA)^-$	12	1.1×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.127	Eu^{3+}	5.55	6.1×10^{10}	p.r.	——	Thom..64–0046
1.128	$Eu(EDTA)^-$	11.5	5.6×10^9	p.r.	$\mu = 0.2$.	Anba.69–0276
1.129	F^-	7.2	$< 2 \times 10^4$	p.r.	k calcd. from exptl. data in this ref.	Anba.65–0001
1.130	HF $e_{aq}^- + HF \Rightarrow HF^- \Rightarrow H + F^-$	5.02	6×10^7 (calcd.)	X-r.	calcd. from $k = 3 \times 10^7$ (65–0493), where HF_2^- is 95% of the acid present, and the pK of HF and HF_2^- differ by 0.6.	Anba.67–0099
1.131	HF_2^- $e_{aq}^- + HF_2^- \rightleftharpoons H + F_2^-$	5.03	4.3×10^7 (cor.)		c.k., soln. contains 9.6×10^{-3} M HF, 1.6×10^{-2} M HF_2^-, and 0 – 10^{-4} M acetone; $\mu = 0.46$; k calcd. from $k(e_{aq}^- + \text{acetone})/k_{1.131} = 80 \pm 20$; assuming $k(e_{aq}^- + \text{acetone}) = 6 \times 10^9$.	Jort...62–0021 Raba65–049
		5.03	1.8×10^7 (cor.)	phot.	c.k., soln. contains 9×10^{-3} M HF, 4.4×10^{-1} M F^-, 1.6×10^{-2} M HF_2^-, 1.5×10^{-1} M I^-; $\mu = 0.6$; k calcd. from	Jort...62–0021, Raba65–0493

No.	Solute and Reaction	pH	k(dm^3 mol^{-1}s^{-1})	Method	Comments	Ref.
					$k(e^-_{aq} + H^+)/ k_{1.131} = 250$ assuming $k(e^-_{aq} + H^+) = 2.3 \times 10^{10}$.	
1.132	Fe^{2+}	–	~ 3.5×10^8	p.r.	——	Baxe....64–0132
		5.0	1.2×10^8	p.r.	——	Anba.64–0282
		–	~ 1.6×10^8	p.r.	——	Baxe..65–0044
1.133	$Fe(EDTA)^{2-}$	12	$< 1.0 \times 10^9$	p.r.	$\mu = 0.2$; value probably high due to partial oxidation.	Anba.69–0276
1.134	$Fe(CN)_6^{4-}$	–	$< 10^5$	p.r.	——	Anba.66–0435
1.135	$Fe(CN)_5NH_3^{3-}$	8.6	$< 1.0 \times 10^7$	p.r.	counter ion Na^+; $\mu = 0.005$ *M*.	Anba.68–0295
1.136	FeF_6^{3-}	6.6	2.2×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 10^{-1}$ *M*; $k_{obs} = 1.1 \times 10^{10}$.	Anba.68–0295
1.137	$Fe(CN)_6^{3-}$	7; 10.3	$(3.0 \pm 0.4) \times 10^9$ (cor.)	p.r.	counter ion K^+; k detd. at various ionic strengths and extrapolated to $\mu = 0$.	Gord....63–0073 Gord....63–0050
1.138	$Fe(CN)_5NO^{2-}$	10.5	2.4×10^{10}	p.r.	counter ion Na^+; $\mu = 10^{-4}$ *M*.	Anba.68–0295
		–	2.2×10^{10}	p.r.	——	Buxt..69–0052
1.139	$Fe(EDTA)^-$	12	2.3×10^{10}	p.r.	$\mu = 0.2$.	Anba.69–0276
1.140	$Ga(EDTA)^-$	11	7.8×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.141	Gd^{3+}	6.05	5.5×10^8	p.r.	——	Thom..64–0046
1.142	$Gd(EDTA)^-$	12	6.0×10^6	p.r.	$\mu = 0.2$.	Anba.69–0276
1.143	H^+_{aq} $e^-_{aq} + H^+_{aq} \Rightarrow H$		*2.3–2.4 x 10*^{10}	The values listed have been used to calculate specific rates of the following reactions from relative rates: 1.38, 1.61, 1.98, 1.115, 1.131, 1.156, 1.178, 1.295, 1.333, 1.359, 1.390, 1.399a, 1.520, 1.552, 1.553, 1.562, 1.570, 1.571, 1.635.		
		4.1–4.7	$(2.3 \pm 0.2) \times 10^{10}$	p.r.	soln. contains H_2SO_4 or $HClO_4$.	Dorf.63–0045
		4–5	$(2.4 \pm 0.2) \times 10^{10}$	p.r.	——	Gord....63–0073
		2.1–4.3	$(2.0 \pm 0.2) \times 10^{10}$	p.r.	k cor. to $\mu = 0$.	Keen64–0091
		–	2.1×10^{10}	p.r.	——	Baxe....64–0132
		–	2.2×10^{10}	p.r.	k detd. at 26–57°C; $E_a = 3.8 \pm 0.5$ kcal mol^{-1}.	Baxe.65–0044
		–	2.2×10^{10}	p.r.	k detd. at 15–80°C; $E_a = 2.5_5$ kcal mol^{-1}.	Cerc69–0567, 68–0010
		–	2.0×10^{10} (rel.)	γ–r.	c.k., k calcd. assuming $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$; soln. contains 10^{-3} *M* $NaNO_3$, 5×10^{-2} *M* glucose and 2.3×10^{-4} *M* $HClO_4$; pressures up to 8.15 kbar.	Hent.70–0056
		5–6	$(2.8 \pm 0.2) \times 10^{10}$	p.r.	elec. condy., k detd. at 25–50°C to give $E_a = 2.44 \pm 0.20$ kcal mol^{-1}.	Bark...70–0243
		< 2	$(1.2 \pm 0.2) \times 10^{10}$	p.r.	concn. 0.5 – 5 *M*.	Bron..70–0605
1.144	D^+_{aq} $e^-_d + D^+_{aq} \Rightarrow D$	acid	$(1.7 \pm 0.1) \times 10^{10}$	p.r.	D_2O soln. contains H_2SO_4, HCl or $HClO_4$.	Fiel.68–0061
1.145	H_2	–	$< 10^7$	p.r.	——	Hart..64–0048
1.146	H_2O_2 $e^-_{aq} + H_2O_2 \Rightarrow OH + OH^-$		*1.2 x 10*^{10}	The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.156, 1.180.		
		7	$(1.2 \pm 0.1) \times 10^{10}$	p.r.	——	Gord....63–0050, Gord....63–0073
		–	1.4×10^{10}	p.r.	——	Baxe....64–0132 Keen64–0091
		11	1.3×10^{10}	p.r.	soln. H_2–satd.	Hart.65–0494
		–	1.1×10^{10}	p.r.	k detd. at 15–80°C; $E_a = 3.6$ kcal mol^{-1}.	Cerc69–0567
		~ 11	1.35×10^{10}	f. phot.	soln. H_2– satd., ~ 10^{-3} *M*	Hick.70–7116

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TABLE 3. *Reactions of e_{aq}^- with inorganic solutes* — Continued

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
					NaOH; pK (H_2O_2) = 11.75.	
		–	1.7×10^{10}	p.r.	concn. > 0.1 M.	Aldr...71–0019
1.147	D_2O_2 $e_d^- + D_2O_2 \Rightarrow OD + OD^-$	7	$(1.2 \pm 0.1) \times 10^{10}$	p.r.	D_2O soln.	Fiel.68–0061
1.148	HO_2^-	13.0	$(3.5 \pm 0.4) \times 10^9$	p.r.	soln. contains (4–13) x 10^{-4} M H_2O_2; pK (H_2O_2) = 11.8; $H_2O_2 \rightleftharpoons H^+ + HO_2^-$.	Feli..67–0132
1.149	$Hg(en)_3^{2+}$	11.2	$(1.6 \pm 0.2) \times 10^{10}$	p.r.	counter ion Cl^-; soln. contains 2 x 10^{-2} M ethylenediamine–diHCl.	Meye.69–0277
1.150	$Hg(CN)_4^{2-}$	10	1.9×10^8	p.r.	——	Anba.65–0780
1.151	$Hg(gly)_3^-$	11.1	$(1.5 \pm 0.2) \times 10^{10}$	p.r.	counter ion Cl^-; soln. contains 10^{-1} M glycine.	Meye.69–0277
1.152	$Hg(NTA)_2^{4-}$	10.9	$(3.9 \pm 0.6) \times 10^9$	p.r.	counter ion Cl^-; soln. contains 2 x 10^{-2} M nitrilotriacetic acid.	Meye.69–0277
1.153	$Hg(EDTA)^{2-}$	12	5.1×10^9	p.r.	μ = 0.2.	Anba.69–0276
1.154	Ho^{3+} $e_{aq}^- + Ho^{3+} \Rightarrow Ho^{2+}$	5.88	2.4×10^9	p.r.	We have no explanation	Thom..64–0046
		–	6.6×10^7	p.r.	for this large discrepancy	Baxe..65–0044
1.155	$Ho(EDTA)^-$	12	9.8×10^6	p.r.	μ = 0.2.	Anba.69–0276
1.156	I_2 $e_{aq}^- + I_2 \Rightarrow I_2^-$	7	$(5.1 \pm 0.3) \times 10^{10}$	p.r.	d.k.(e_{aq}^-) as well as p.b.k. (I_2^-).	Thom..64–0046
		5.3	5.9×10^{10} (rel.)	γ–r.	c.k., soln. contains 5 x 10^{-4} M KI; k calcd. from eq. based on H_2O_2 yield assuming $k(e_{aq}^- + H^+) = 2.36 \times 10^{10}$, $k(e_{aq}^- + H_2O_2) = 1.2 \times 10^{10}$, and $g(e_{aq}^-) = 2.8$.	Sawa..66–0113
		–	5.1×10^{10} (rel.)	γ–r.	c.k., k calcd. from $k_{1.156}/k$ ($e_{aq}^- + SF_6$) = 3.08, assuming $k(e_{aq}^- + SF_6) = 1.65 \times 10^{10}$.	Asmu.68–0159
1.157	I_3^- $e_{aq}^- + I_3^- \Rightarrow I^- + I_2^-$	7	2×10^{10} (rel., cor.)	phot.	c.k., soln. contains 0.23 M KI, (4–48) x 10^{-4} M I_3^-, and (8–64) x 10^{-4} M N_2O; k calcd. assuming $k(e_{aq}^- + N_2O)$ = 8.7×10^9.	Dain.65–7017
1.158	IO_3^-	7	$(7.7 \pm 0.9) \times 10^9$	p.r.	counter ion K^+.	Anba.65–0047
		11	$(8.3 \pm 1.0) \times 10^9$	p.r.	counter ion K^+.	Anba.65–0047
		14	$(9.6 \pm 1.2) \times 10^9$	p.r.	counter ion K^+.	Anba.65–0047
		3 M OH^-	$(8.1 \pm 0.8) \times 10^9$	p.r.	counter ion K^+.	Anba.65–0047
		–	8.5×10^9 (cor.)	p.r.	counter ion K^+; in the presence of 0.1 M $NaClO_4$, $k = 1.2 \times 10^{10}$.	Pele.70–0242
1.159	IO_4^-	7	$(1.1 \pm 0.2) \times 10^{10}$	p.r.	counter ion Na^+.	Anba.65 0047
		11	$(1.9 \pm 0.2) \times 10^{10}$	p.r.	counter ion Na^+.	Anba.65–0047
		14	$(2.1 \pm 0.3) \times 10^{10}$	p.r.	counter ion Na^+.	Anba.65–0047
		3 M OH^-	$(1.6 \pm 0.2) \times 10^{10}$	p.r.	counter ion Na^+.	Anba.65–0047
1.160	In^{3+} $e_{aq}^- + In^{3+} \Rightarrow In^{2+}$	1	$(5.6 \pm 1.0) \times 10^{10}$	p.r.	counter ion SO_4^{2-}.	Brow.66–0062
1.161	$In(EDTA)^-$	12	4.1×10^8	p.r.	μ = 0.2.	Anba.69–0276
1.162	$IrCl_6^{3-}$	–	4.7×10^9	p.r.	——	Dain.67–0063
		10.6	3.0×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 5 \times 10^{-2}$ M, $k_{obs} = 9.4 \times 10^9$.	Anba.68–0295
1.163	$Ir(NH_3)_6^{3+}$	~ 7	$(1.3 \pm 0.1) \times 10^{10}$	p.r.	counter ion Cl^-.	Walt67–0560
1.164	$IrCl_6^{2-}$	–	2.6×10^{10} (rel.)	γ–r.	c.k., $k_{1.164}/k(e_{aq}^- + N_2O)$ = (2.96 ± 0.03), assume k ($e_{aq}^- + N_2O$) = 8.7×10^9.	Dain.67–0063
		–	2.5×10^{10}	p.r.	——	Dain.67–0063
		10.2	9.3×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 5 \times 10^{-2}$	Anba.68–0295

TABLE 3. *Reactions of e_{aq}^- with inorganic solutes* — Continued

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
					M; $k_{obs} = 2.0 \times 10^{10}$.	
1.165	K^+	–	$< 5 \times 10^5$	p.r.	——	Baxe....64–0132
		–	$< 3 \times 10^4$	p.r.	k calcd. from the exptl. data in this ref.	Anba.65–0001
1.166	La^{3+}	6.98	3.4×10^8	p.r.	——	Thom..64–0046
		–	6.9×10^8	p.r.	——	Baxe..65–0044
1.167	$La(EDTA)^-$	12	$< 1.2 \times 10^6$	p.r.	$\mu = 0.2$.	Anba.69–0276
1.168	Lu^{3+}	6.20	2.5×10^8	p.r.	——	Thom..64–0046
1.169	$Lu(EDTA)^-$	12	1.5×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.170	Mn^{2+}	–	7.7×10^7	p.r.	——	Baxe....64–0132
		–	3.8×10^7	p.r.	——	Baxe..65–0044
1.171	$Mn(gly)_3^-$	11.1	$\leq 1.7 \times 10^7$	p.r.	counter ion SO_4^{2-}; soln. contains 10^{-1} M glycine.	Meye.69–0277
1.172	$Mn(NTA)_2^{4-}$	10.9	$\leq 5 \times 10^6$	p.r.	counter ion SO_4^{2-}; soln. contains 2×10^{-2} M nitrilotriacetic acid.	Meye.69–0277
1.173	$Mn(EDTA)^{2-}$	11.3	1.5×10^6	p.r.	soln. contains 0.05 M EDTA; k detd. at 2–62°, E_a = 4.0 ± 0.6 kcal mol^{-1}.	Anba.67–0299
		12	$< 2.2 \times 10^6$	p.r.	$\mu = 0.2$.	Anba.69–0276
1.174	$Mn(CN)_6^{4-}$	–	$(2.5 \pm 0.2) \times 10^{10}$	p.r.	——	Anba.66–0435
		9.0	5.9×10^9 (cor.)	p.r.	counter ion K^+; μ = 5×10^{-2}; $k_{obs} = 2.5 \times 10^{10}$.	Anba.68–0295
1.175	MnO_4^-	7.0	2.2×10^{10}	p.r.	——	Thom..64–0046
		13	3.7×10^{10}	p.r.	——	Thom..64–0046
		–	3×10^{10}	p.r.	——	Baxe..65–0044
		–	4.4×10^{10}	p.r.	k detd. at 15–80°C; E_a = 3.1 kcal mol^{-1}.	Cerc69–0567
1.176	$Mo(CN)_8^{4-}$	–	7.1×10^9	p.r.	——	Vene..69–0443
1.177	N_3^-	–	2.9×10^6 (rel.)	X–r.	c.k., assume $k(e_{aq}^- + \text{acetone}) = 5.9 \times 10^9$.	Kell.61–0019
		11	$< 5.6 \times 10^6$	p.r.	——	Anba.64–0282
		–	$< 5 \times 10^6$	f. phot.	e_{aq}^- decay not influenced by N_3^- concn. 10^{-4}–10^{-3} M.	Bura..70–7004
		~ 7	$\leq 1.5 \times 10^6$	p.r.	concn. 1 M.	Pele..71–0007
1.178	NH_4^+ $e_{aq}^- + NH_4^+ \Rightarrow H + NH_3$	7.8	2×10^6 (rel.)	phot.	c.k., soln. contains 0.15 M I^-, 5×10^{-3} – 4.0 M NH_4Cl; k calcd. from $k(e_{aq}^- + H^+)/k_{1.178} = 1.2 \times 10^4$ assuming $k(e_{aq}^- + H^+) = 2.3 \times 10^{10}$.	Jort...62–0021
		5.3	1.3×10^6	p.r.	——	Anba.64–0282
1.179	N_2H_4	–	$< 10^8$	p.r.	——	Baxe....64–0132
1.180	$N_2H_5^+$	–	$< 3.5 \times 10^8$	p.r.	——	Baxe....64–0132
	$e_{aq}^- + N_2H_5^+ \Rightarrow (N_2H_4 + H)$ $\Rightarrow N_2H_3 + H_2$	6	1.5×10^7 (rel.)	γ–r.	c.k., k calcd. assuming $k(e_{aq}^- + H_2O_2) = 1.2 \times 10^{10}$.	Bell.69–0598
1.181	NH_2OH	–	$< 2 \times 10^7$	p.r.	——	Baxe....64–0132
		~ 5–7	$(6.6 \pm 0.7) \times 10^8$ (calcd.)	p.r.	k calcd. from detns. at pH 5.37, 6.70 and 7.77 assuming pK = 5.83 for $NH_3OH^+ \rightleftharpoons NH_2OH + H^+$.	Beha..70–0197
			(Unexplained discrepancy in the above data)			
1.182	NH_3OH^+	~ 5–7	$(1 \pm 0.1) \times 10^{10}$ (calcd.)	p.r.	see 1.181.	Beha..70–0197
1.183	$NH_2SO_3^-$	11.7	$< 1.3 \times 10^6$ (cor.)	p.r.	counter ion Na^+; $\mu = 0.02$; $k_{obs} = < 1.7 \times 10^6$.	Anba.68–0295
1.184	$NO(SO_3)_2^{2-}$ (Fremy's salt)	6.25	4×10^9 (rel.)	γ–r.	c.k., k calcd. from $k_{1.184}/k(e_{aq}^- + H_2PO_4^-) = (5.2 \pm 0.3) \times 10^2$ assuming $k(e_{aq}^- + H_2PO_4^-) = 7.7 \times 10^6$.	More..69–0649

TABLE 3. *Reactions of e^-_{aq} with inorganic solutes* — Continued

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.185	$HON(SO_3)_2^{2-}$	12	$(4 \pm 0.8) \times 10^8$	p.r.	counter ion K^+.	Fel'..68-0460
1.186	N_2O $e^-_{aq} + N_2O \Rightarrow$ $N_2 + O^-$ or $\Rightarrow$ $N_2 + OH^- + OH$		*8.7×10^9*	The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.115, 1.157, 1.164, 1.188, 1.225, 1.234, 1.260, 1.301, 1.302, 1.333, 1.396, 1.399a(8.9), 1.409a, 1.486, 1.606, 1.635(8.9).		
		7	$(8.7 \pm 0.6) \times 10^9$	p.r.	——	Gord....63-0073
		–	$(5.6 \pm 2) \times 10^9$	p.r.	——	Keen64-0091
		–	$(2.4 \pm 0.3) \times 10^9$	p.r.	soln. contains 12.4 *M* KF.	Anba.65-0001
		11	5.6×10^9	p.r.	soln. H_2–satd.	Hart.65-0494
		~ 7	9.4×10^9 (rel.)	γ–r.	c.k., soln. contains 1–2 x $10^{-3}M$ SF_6 and $10^{-4}-10^{-3}$ *M* N_2O; *k* calcd. from $k_{1.186}/k(e^-_{aq} + SF_6) = 0.57$ assuming $k(e^-_{aq} + SF_6) = 1.65 \times 10^{10}$.	Asmu.68-0159
		> 11	9.1×10^9	f. phot.	soln. H_2–satd., $10^{-3}-10^{-1}$ *M* NaOH.	Hick.70-7116
1.187	NO $e^-_{aq} + NO \Rightarrow NO^- \Rightarrow HNO$	7	$(3.1 \pm 0.2) \times 10^{10}$	p.r.	——	Gord.63-0073
		7	2.8×10^{10} (rel.)	γ–r.	c.k., soln. contains ~ 10^{-3} *M* NO in phosphate buffer with added NO_2^- ~ 10^{-3} – 10^{-1} *M*; $k_{1.187}/k(e^-_{aq} + NO_2^-) \cong 7$ ($\mu = 0$), assumed $k(e^-_{aq} + NO_2^-) = 4 \times 10^9$.	Knig.67-0231
		7	$(2.3 \pm 0.4) \times 10^{10}$	p.r.	——	Sedd.70-0014
1.188	NO_2^-	7.0	4.3×10^9 (rel.)	γ–r.	c.k., $k_{1.188}/k(e^-_{aq} + N_2O) = 0.49 \pm 0.05$, assumed $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$.	Appl..63-0041
		~ 7.0	4.6×10^9	p.r.	——	Thom..64-0046
		–	3.5×10^9	p.r.	——	Baxe..65-0044
		5.5–6	3.4×10^9 (rel.)	γ–r.	c.k., assumed $k(e^-_{aq} + p-BrC_6H_4OH) = 1.2 \times 10^{10}$, *k detd. at 20, 45, and 70°C,* to give $E_a = 3.4$ kcal mol⁻¹.	Anba..67-0098
		–	3.4×10^9	p.r.	*k* detd. at 15–80°C; $E_a = 1.6_5$ kcal mol⁻¹.	Cerc69-0567
		–	4.5×10^9	p.r.	counter ion K^+; H_2–satd.	Fel'70-0417
		–	8.0×10^9	p.r.	concn. 0.1–1.8 *M*.	Aldr...71-0019
			(see also 1.187 and 1.569 for relative rates).			
1.189	NO_3^- $e^-_{aq} + NO_3^- \Rightarrow NO_3^{2-}$ $NO_3^{2-} + H_2O \Rightarrow$ $NO_2 + 2OH^-$ $2NO_2 + H_2O \Rightarrow$ $NO_2^- + NO_3^- + 2H^+$		*1.1×10^{10}*	The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.1, 1.62, 1.143, 1.286, 1.313, 1.326, 1.327, 1.331, 1.343, 1.386, 1.391, 1.401, 1.433, 1.577, 1.578, 1.596, 1.650.		
		7	*$(1.1 \pm 0.1) \times 10^{10}$*	p.r.	——	Gord....63-0073 Thom..64-0046
		–	$(1.9 \pm 0.3) \times 10^9$	p.r.	soln. contains 12.4 *M* KF.	Anba.65-0001
		–	8.2×10^9	p.r.	——	Baxe..65-0044
		7.0	7.5×10^9 (rel.)	γ–r.	c.k., counter ion Na^+; $k_{1.189}/k(e^-_{aq} + O_2) = 2.5 \pm 0.2$, assumed $k(e^-_{aq} + O_2) = 1.9 \times 10^{10}$.	Dani.67-0032
		5.5–6	1.1×10^{10} (rel.)	γ–r.	c.k., assumed $k(e^-_{aq} + p-BrC_6H_4OH) = 1.2 \times 10^{10}$; *k* detd. at 20, 45 and 70°C, $E_a = 3.9$ kcal mol⁻¹.	Anba.67-0098
		–	9.3×10^9	p.r.	*k* detd. at 15–80°C;	Cerc69-0567

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
					E_a = 2.3 kcal mol^{-1}.	
		–	9×10^9	p.r.	counter ion K^+; H_2–satd.	Fel'70–0417
		–	1.05×10^{10} (cor.)	p.r.	counter ion Na^+; in the presence of 0.1 and 1 *M* $NaClO_4$, *k* = 1.3 and 1.6 x 10^{10}, resp.	Pele.70–0242
		–	2.0×10^{10}	p.r.	concn. 0.1–0.7 *M*.	Aldr...71–0019
1.190	Na^+	–	$< 10^6$	p.r.	——	Baxe....64–0132
		–	$< 10^5$	p.r.	*k* calcd. from exptl. data in this ref.	Anba.65–0001
1.191	Nd^{3+}	4.66	5.9×10^8	p.r.	——	Thom..64–0046
1.192	$Nd(EDTA)^-$	12	2.8×10^6	p.r.	μ = 0.2.	Anba.69–0276
1.193	Ni^{2+}	–	2.3×10^{10}	p.r.	——	Baxe..63–0187
		–	2.2×10^{10} (cor.)	p.r.	counter ion SO_4^{2-}; in the presence of 1 *M* Na_2SO_4, *k* = 1.9×10^9.	Pele.70–0242
1.194	$NiF(H_2O)_3^+$	8.5	$< 1.2 \times 10^{10}$ (cor.)	p.r.	counter ion F^-, $\mu = 10^{-1}$ *M*, $k_{obs} = 7.2 \times 10^9$. The real value for NiF^+_{aq} is lower as the soln. contained 12% Ni^{2+}_{aq}.	Anba.68–0295
1.195	$Ni(CN)_4^{2-}$	11.0	4.1×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 5 \times 10^{-3}$ *M*, $k_{obs} = 5.5 \times 10^9$.	Anba.68–0295
1.196	Ni(gly)	> 8	$(1.6 \pm 0.2) \times 10^{10}$	p.r.	counter ion SO_4^{2-}, $\mu \cong 10^{-4}$.	Meye.69–0277
1.197	$Ni(gly)_2$	~ 9	$(2.7 \pm 0.4) \times 10^9$	p.r.	counter ion SO_4^{2-}, $\mu \cong 10^{-3}$.	Meye.69–0277
1.198	$Ni(gly)_3^-$	~ 10	$\leq 2.5 \times 10^7$ (cor.)	p.r.	counter ion SO_4^{2-}, $\mu \cong 10^{-1}$.	Meye.69–0277
1.199	$Ni(NTA)^-$	~ 8	$(6 \pm 0.9) \times 10^8$	p.r.	counter ion SO_4^{2-}; concn. ~ 10^{-4} *M*.	Meye.69–0277
1.200	$Ni(NTA)_2^{4-}$	~ 11	$\leq 1.8 \times 10^7$	p.r.	counter ion SO_4^{2-}; concn. ~ 10^{-2} *M*.	Meye.69–0277
1.201	$Ni(EDTA)^{2-}$	12	1.0×10^8	p.r.	μ = 0.2.	Anba.69–0276
1.202	$Ni(en)^{2+}$	~ 8	$(2.2 \pm 0.3) \times 10^{10}$ (cor.)	p.r.	counter ion SO_4^{2-}; $\mu \cong 10^{-4}$.	Meye.69–0277
1.203	$Ni(en)_2^{2+}$	~9	$(1.95 \pm 0.3) \times 10^{10}$ (cor.)	p.r.	counter ion SO_4^{2-}; μ ~10^{-4}.	Meye.69–0277
		11	7.5×10^9	p.r.	counter ion SO_4^{2-}; $\mu = 10^{-3}$. contained some $Ni(en)_3^{2+}$.	Anba.68–0295
1.204	$Ni(en)_3^{2+}$	~ 11	$\leq 2 \times 10^7$	p.r.	counter ion SO_4^{2-}, $\mu \cong 0.2$.	Meye.69–0277
1.205	O_2 $e^-_{aq} + O_2 \rightarrow O_2^-$		*1.9×10^{10}*	The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.98, 1.189, 1.310, 1.391, 1.549, 1.618.		
		7	$(1.9 \pm 0.2) \times 10^{10}$	p.r.	——	Gord....63–0073
		–	$(2.2 \pm 0.2) \times 10^{10}$	p.r.	——	Keen64–0091
		11	1.9×10^{10}	p.r.	——	Hart.65–0494
		13	$(1.7 \pm 0.2) \times 10^{10}$	p.r.	observed rate depends on O_2 concn. ($2 \times 10^{-6} - 2 \times 10^{-4}$ *M*), H_2 concn. 7×10^{-4} *M*.	Kaba..69–0582
1.206	O_2(in D_2O) $e^-_d + O_2 \rightarrow O_2^-$	7	$(1.5 \pm 0.1) \times 10^{10}$	p.r.	——	Fiel.68–0061
1.207	$Os(CN)_6^{4-}$	10.5	$< 1.0 \times 10^6$	p.r.	counter ion K^+; $\mu = 10^{-3}$ *M*.	Anba.68–0295
1.208	$Os(NH_3)_6^{3+}$	~ 7	$(7.2 \pm 0.2) \times 10^{10}$	p.r.	counter ion Br^-.	Walt67–0560
1.209	$H_2PO_2^-$	6.8	$< 1.0 \times 10^5$ (cor.)	p.r.	counter ion Na^+; $\mu = 10^{-2}$ *M*; $k_{obs} = 1.1 \times 10^5$.	Anba.68–0295
1.210	$H_2PO_3^-$	6.7	5.5×10^6 (cor.)	p.r.	counter ion K^+; $\mu = 2 \times 10^{-2}$ *M*; k_{obs} = 7.2×10^6.	Anba.68–0295
1.211	$H_2PO_4^-$ $e^-_{aq} + H_2PO_4^- \rightarrow H + HPO_4^{2-}$	7.1	4.2×10^6 (cor.)	p.r.	counter ion K^+; μ = 0.1; $k_{obs} = 7.7 \times 10^6$; see also 1.184 for relative rate.	Anba.68–0295

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.212	$P_2O_7^{2-}$	7.7	$< 3 \times 10^6$	p.r.	counter ions Na^+, Cl^-; $P_2O_7^{2-}$ concn. 10^{-2} *M*.	Land.68–0441
1.213	$P_2O_8^{4-}$	–	1.9×10^{10}	p.r.	counter ion Na^+; soln. contains 0.1 *M* H_2O_2, 10^{-2} *M* $P_4O_8^{4-}$.	Roeb..69–0158
1.214	Pb^{2+}	–	3.9×10^{10}	p.r.	——	Baxe..65–0044
		7	$(3.9 \pm 0.5) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Anba.65–0047
		11.2	$(1.3 \pm 0.1) \times 10^{10}$	p.r.	counter ions ClO_4^-, Na^+.	Anba.65–0047
1.215	PbO_2^{2-}	14	$(1.0 \pm 0.1) \times 10^{10}$	p.r.	counter ion ClO_4^-; soln. contains 1 *M* NaOH.	Anba.65–0047
		3 *M* OH^-	$(9.2 \pm 0.1) \times 10^9$	p.r.	counter ion ClO_4^-.	Anba.65–0047
1.216	$Pb(gly)_3^-$	11.1	$(1.6 \pm 0.2) \times 10^{10}$	p.r.	counter ion Cl^-; soln. contains 10^{-1} *M* glycine.	Meye.69–0277
1.217	$Pb(NTA)_2^{4-}$	10.9	$(3.2 \pm 0.5) \times 10^9$	p.r.	counter ion Cl^-; soln. contains 2×10^{-2} *M* nitrilotriacetic acid.	Meye.69–0277
1.218	$Pb(EDTA)^-$	12	3.8×10^9	p.r.	$\mu = 0.2$.	Anba.69–0276
1.219	$Pb(en)_3^{2+}$	11.2	$(2.3 \pm 0.3) \times 10^{10}$	p.r.	counter ion Cl^-; soln. contains 10^{-1} *M* ethylene–diamine – diHCl.	Meye.69–0277
1.220	$PdCl_4^{2-}$	7.1	$(1.2 \pm 0.15) \times 10^{10}$	p.r.	counter ion K^+; soln. contains 0.1 *M* Cl^-.	Anba.65–0047
1.221	$Pd(CN)_4^{2-}$	10.6	1.9×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 10^{-2}$ *M*; $k_{obs} = 2.8 \times 10^9$.	Anba.68–0295
		10	$(1.0 \pm 0.3) \times 10^9$ (cor.)	p.r.	counter ion K^+; soln. contains 0.1 *M* CN^-, $k_{obs} = (2.0 \pm 0.3) \times 10^9$.	Anba.65–0047
1.222	$Pd(et_4dien)Cl^+$	~ 7	$(4.4 \pm 0.5) \times 10^{10}$	p.r.	counter ion Cl^-.	Walt67–0560
1.223	Pr^{3+}	6	2.9×10^8	p.r.	——	Thom..64–0046
		–	1×10^7	p.r.	——	Baxe..65–0044
			(Unexplained discrepancy in the above data)			
1.224	$Pr(EDTA)^-$	11.5	3.6×10^6	p.r.	$\mu = 0.2$.	Anba.69–0276
1.225	$PtCl_4^{2-}$	7–11	1.5×10^{10} (rel.)	γ–r.	c.k., k calcd. from $k_{1.225}/k(e^-_{aq} + N_2O) =$ 1.76 (cor. to $\mu = 0$) assuming $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$.	Dain.67–0063
		–	9.0×10^9	p.r.	——	Baxe..65–0044
		11	$(6.7 \pm 0.9) \times 10^9$	p.r.	counter ion K^+; contains 0.1 *M* NaOH.	Dain.67–0063
		6.8	$(1.2 \pm 0.15) \times 10^{10}$	p.r.	counter ion K^+; soln. contains 0.1 *M* Cl^-.	Anba.65–0047
1.226	$Pt(CN)_4^{2-}$	10	$(1.3 \pm 0.3) \times 10^9$ (cor.)	p.r.	counter ion K^+; soln. contains 0.1 *M* CN^-; $k_{obs} = (3.2 \pm 0.4) \times 10^9$.	Anba.65–0047
		10.6	2.9×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 10^{-2}$ *M*, $k_{obs} = 3.9 \times 10^9$.	Anba.68–0295
1.227	$Pt(et_4dien)Cl^+$	~ 7	$(1.2 \pm 0.1) \times 10^{10}$	p.r.	counter ion Cl^-.	Walt67–0560
1.228	$PtCl_6^{2-}$	11	$(3.6 \pm 0.4) \times 10^{10}$	p.r.	counter ions K^+, Na^+.	Dain.67–0063
		10	1.4×10^{10} (cor.)	p.r.	counter ion K^+; $\mu = 10^{-2}$ *M*; $k_{obs} = 2.0 \times 10^{10}$.	Anba.68–0295
1.229	$Rh(NH_3)_6^{3+}$	7	$(7.9 \pm 0.2) \times 10^{10}$	p.r.	counter ion Cl^-.	Walt67–0560
1.230	$Rh(bipy)_3^{3+}$	7	$(8.4 \pm 0.1) \times 10^{10}$	p.r.	counter ion ClO_4^-.	Walt67–0560
1.231	$Ru(CN)_6^{4-}$	10.6	$< 1.0 \times 10^6$	p.r.	counter ion K^+; $\mu = 0.01$ *M*.	Anba.68–0295
1.231a	$Ru(NH_3)_5N_2^{2+}$ $e^-_{aq} + Ru(NH_3)_5N_2^{2+} \rightarrow Ru(NH_3)_5N_2^+$	~ 7	4.3×10^9	p.r.	——	Baxe70–0263
1.232	$Ru(NH_3)_6^{3+}$	~ 7	$(7.4 \pm 0.5) \times 10^{10}$	p.r.	counter ion Cl^-.	Walt67–0560
	$e^-_{aq} + Ru(NH_3)_6^{3+} \rightarrow Ru(NH_3)_6^{2+}$	–	$(6.8 \pm 0.1) \times 10^{10}$	p.r.	——	Baxe..70–0178

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.233	$Ru(NH_3)_5Cl^{2+}$ $e_{aq}^- + Ru(NH_3)_5Cl^{2+} \Rightarrow Ru(NH_3)_5Cl^+$	–	$(6.2 \pm 0.4) \times 10^{10}$	p.r.	——	Baxe..70–0178
1.234	H_2S $e_{aq}^- + H_2S \Rightarrow H + HS^-$ and $\Rightarrow H_2 + S^-$	5.5–6	1.6×10^{10} (rel.)	γ–r.	c.k., k calcd. from $k_{1.234}/k$ $(e_{aq}^- + N_2O) = (1.80 \pm 0.1)$ assuming $k(e_{aq}^- + N_2O) = 8.7 \times 10^9$.	Meis.65–0013
		5.5–6	$(1.35 \pm 0.1) \times 10^{10}$	p.r.	——	Meis.65–0013
		–	1.1×10^{10}	p.r.	——	Karm..67–0273
1.235	D_2S $e_d^- + D_2S \Rightarrow D + DS^-$ and $\Rightarrow D_2 + S^-$	–	1.35×10^{10}	p.r.	——	Meis.65–0013
1.236	HS^- $e_{aq}^- + SH^- \Rightarrow S^{2-} + H$	11	$< 6 \times 10^5$	p.r.	——	Karm67–0684
1.237	SF_6 $e_{aq}^- + SF_6 \Rightarrow 6F^- + SO_4^{2-} + 7H_3O^+$ (overall)		*1.65×10^{10}*		The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.143, 1.156, 1.186, 1.289, 1.367a.	
		–	$(1.65 \pm 0.1) \times 10^{10}$	p.r.	soln. air–satd.; overall reaction consists of fast steps $\Rightarrow SF_5 + F^-$, $SF_5 + 2H_2O \Rightarrow OH + SF_4 + F^- + H_3O^+$, followed by slow hydrolysis: $SF_4 + 9H_2O \Rightarrow SO_3^{2-} + 4F^- + 6H_3O^+$ (70–0107).	Asmu.68–0159
1.238	SO_3^{2-}	10.0	$\leq 1.3 \times 10^6$	p.r.	counter ion Na^+; $\mu = 10^{-3}\ M$.	Anba.68–0295
1.239	SO_4^{2-}	~ 7	$< 10^6$	p.r.	——	Baxe....64–0132 Thom..64–0046
1.240	$S_2O_3^{2-}$	11.9	$< 10^8$	p.r.	——	Thom..64–0046
		–	7.6×10^9	p.r.	——	Baxe....64–0132
		–	6.0×10^8	p.r.	k detd. at 15–80°C; $E_a = 3.8$ kcal mol^{-1}.	Cerc69–0567
		–	9×10^8 (cor.)	p.r.	counter ion Na^+; in the presence of 1 M Na_2SO_4, $k = 1.35 \times 10^9$.	Pele.70–0242
			(Unexplained discrepancy in the above data)			
1.241	HSO_5^- $e_{aq}^- + HSO_5^- \Rightarrow SO_4^{2-} + OH$ or $\Rightarrow SO_4^- + OH^-$	–	8.4×10^9	p.r.	——	Roeb..69–0158
1.242	$S_2O_8^{2-}$ $e_{aq}^- + S_2O_8^{2-} \Rightarrow SO_4^{2-} + SO_4^-$	~ 7	1.1×10^{10}	p.r.	——	Thom..64–0046
		–	7.6×10^9	p.r.	——	Baxe..65–0044
		–	1.1×10^{10}	p.r.	——	Roeb..69–0158
1.243	SbO_3^-	11.0	1.3×10^{10}	p.r.	counter ion K^+.	Anba.68–0295
		11.0	$(1.2 \pm 0.2) \times 10^{10}$	p.r.	——	Anba.65–0047
1.244	$Sc(EDTA)^-$	11.5	3.5×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.245	H_2Se $e_{aq}^- + H_2Se \Rightarrow HSe^- + H$	6.0	$(1.1 \pm 0.2) \times 10^{10}$	p.r.	cor. for $e_{aq}^- + H^+$.	Scho..69–0564
1.246	HSe^- $e_{aq}^- + HSe^- \Rightarrow Se^- + H_2 + OH$	9–12.6	$(4.8 \pm 0.2) \times 10^7$	p.r.	concn. 10^{-3}–$10^{-2}\ M$.	Scho..69–0564
1.247	SeO_3^{2-}	10.8	2.3×10^6 (cor.)	p.r.	counter ion Na^+; $\mu = 0.25\ M$, $k_{obs} = 1.2 \times 10^7$.	Anba.68–0295
1.248	SeO_4^{2-}	11.0	1.1×10^9	p.r.	counter ion Na^+; $\mu = 10^{-3}\ M$.	Anba.68–0295
1.249	SiF_6^{2-}	5.9	$< 5.5 \times 10^5$ (cor.)	p.r.	counter ion Li^+; $\mu = 0.15\ M$, $k_{obs} = 1.5 \times 10^6$.	Anba.68–0295
1.250	Sm^{3+}	5.96	2.5×10^{10}	p.r.	——	Thom..64–0046
1.251	$Sm(EDTA)^-$	11.5	2.6×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.252	SnO_2^{2-}	11	$(3.4 \pm 0.3) \times 10^9$	p.r.	counter ions Cl^-, Na^+.	Anba.65–0047
1.253	SnF_3^-	10	9.3×10^9	p.r.	counter ion K^+.	Anba.64–0282

No.	Solute and Reaction	pH	k(dm^3 mol^{-1}s^{-1})	Method	Comments	Ref.
1.254	$Sn(NTA)_2^{4-}$	10.9	$(1.7 \pm 0.3) \times 10^9$	p.r.	counter ion Cl^-; soln. 2×10^{-2} M nitrilotriacetic acid.	Meye.69–0277
1.255	$Sn(EDTA)^{2-}$	12	1.4×10^9	p.r.	$\mu = 0.2$.	Anba.69–0276
1.256	SnO_3^{2-}	11.0	6.3×10^8	p.r.	counter ion Na^+; $\mu = 10^{-3}$ M.	Anba.68–0295
1.257	SnF_6^{2-}	6.5	2.9×10^9 (cor.)	p.r.	counter ion K^+; $\mu = 10^{-2}$ M; $k_{obs} = 4.1 \times 10^9$.	Anba.68–0295
1.258	Tb^{3+}	6.15	3.7×10^8	p.r.	——	Thom..64–0046
		–	1.7×10^7	p.r.	——	Baxe..65–0044
			(Unexplained discrepancy in the above data)			
1.259	$Tb(EDTA)^-$	12	5.3×10^6	p.r.	$\mu = 0.2$.	Anba.69–0276
1.260	TeO_3^{2-}	7	6×10^8	p.r.	counter ion Na^+.	Brow...64–0045
		10.9	1.1×10^9	p.r.	counter ion Na^+; $\mu = 10^{-3}$ M.	Anba.68–0295
		12.6	8.7×10^8 (rel.)	γ–r.	c.k., $k_{1.260}/k(e_{aq}^- + N_2O) =$ 0.10 at pH 12.6 and 0.53 at	Dain.65–0073
		14	4.6×10^9 (rel.)		pH 14, assumed $k(e_{aq}^- + N_2O) =$ 8.7×10^9.	
1.261	TeO_4^{2-}	11.0	1.6×10^{10}	p.r.	counter ion Na^+, $\mu = 10^{-3}$ M.	Anba.68–0295
1.262	$Ti(EDTA)^-$	11.2	$< 4 \times 10^8$	p.r.	——	Anba.66–0825
1.263	TiO_3^{2-}	11.5	$< 5 \times 10^6$	p.r.	——	Anba.64–0282
1.264	TiF_6^{2-}	6.6	3.5×10^9 (cor.)	p.r.	counter ion Na^+; $\mu = 0.1$ M; $k_{obs} = 5.8 \times 10^9$.	Anba.68–0295
1.265	Tl_{aq}^+	–	$\sim 1.1 \times 10^{10}$	p.r.	——	Baxe....64–0132
		7	3.0×10^{10}	p.r.	——	Baxe..65–0044
		8.5	4.0×10^{10} (cor.)	p.r.	counter ion SO_4^{2-}; $\mu = 10^{-3}$ M; $k_{obs} = 3.7 \times 10^{10}$.	Anba.68–0295
		–	2.8×10^{10}	p.r.	k detd. at 15–80°C; $E_a = 2.6$ kcal mol^{-1}.	Cerc69–0567
1.266	Tm^{3+}	6.05	3×10^9	p.r.	——	Thom..64–0046
1.267	$Tm(EDTA)^-$	12	1.4×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.268	UO_2^{2+}	–	7.4×10^{10}	p.r.	——	Baxe..65–0044
1.269	VO_3^-	11.0	4.9×10^9	p.r.	counter ion NH_4^+, $\mu = 10^{-4}$ M.	Anba.68–0295
1.270	Y^{3+}	–	2×10^8	p.r.	——	Baxe..65–0044
1.271	$Y(EDTA)^-$	12	1.1×10^7	p.r.	$\mu = 0.2$.	Anba.69–0276
1.272	Yb^{3+}	6.03	4.3×10^{10}	p.r.	——	Thom..64–0046
		–	3.7×10^{10}	p.r.	——	Baxe..65–0044
1.273	$Yb(EDTA)^-$	12	2.0×10^9	p.r.	$\mu = 0.2$.	Anba.69–0276
1.274	Zn_{aq}^{2+}	–	1.7×10^9	p.r.	——	Baxe..63–0187
		–	1.5×10^9	p.r.	——	Baxe..65–0044
		6.8	$(1.0 \pm 0.3) \times 10^9$	p.r.	counter ion SO_4^{2-}.	Anba.65–0047
		9.7	$(5.6 \pm 0.7) \times 10^8$	p.r.	counter ions SO_4^{2-}, Na^+, soln. contains Zn^{2+} and $Zn(OH)_{aq}^+$ 1:1.	Anba.65–0047
1.275	$Zn(OH)_{aq}^+$	12	$(2.0 \pm 0.3) \times 10^8$	p.r.	counter ions SO_4^{2-}, Na^+.	Anba.65–0047
1.276	$Zn(OH)_4^{2-}$	14	$(1.6 \pm 0.3) \times 10^7$	p.r.	counter ions SO_4^{2-}, Na^+.	Anba.65–0047
		3 M OH^-	1.7×10^6 (cor.)	p.r.	counter ions SO_4^{2-}, Na^+; $k_{obs} = (7.5 \pm 1.5) \times 10^6$.	Anba.65–0047
1.277	$Zn(NH_3)_4^{2+}$	11.1	$(6.5 \pm 0.6) \times 10^8$	p.r.	soln. contains 0.2 M NH_3.	Anba.65–0047
1.278	$Zn(en)_3^{2+}$	11.2	$(5.2 \pm 0.8) \times 10^8$	p.r.	counter ion SO_4^{2-}; soln. contains 10^{-1} M ethylene–diamine di–HCl.	Meye.69–0277
1.279	$Zn(CN)_4^{2-}$	10	(7.2 ± 1.0) 10^7 (cor.)	p.r.	soln. contains 0.1 M CN^-; $k_{obs} = (1.8 \pm 0.2) \times 10^8$.	Anba.65–0047
1.280	$Zn(EDTA)^{2-}$	12	$< 1.8 \times 10^6$	p.r.	$\mu = 0.2$.	Anba.69–0276
1.281	$Zn(NTA)^-$	~ 10	$(7.5 \pm 1.1) \times 10^7$	p.r.	counter ion SO_4^{2-}; concn. ~ 10^{-4} M.	Meye.69–0277
1.282	$Zn(NTA)_2^{4-}$	~ 11	$\leq 1 \times 10^7$	p.r.	counter ion SO_4^{2-}, concn. ~ 10^{-2} M.	Meye.69–0277
1.283	$Zn(gly)_3^-$	11.1	$(4.8 \pm 0.7) \times 10^7$	p.r.	counter ion SO_4^{2-}; soln. contains 10^{-1} M glycine.	Meye.69–0277

TABLE 4. *Reactions of* e_{aq}^- *with organic solutes*

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.284	acetaldehyde	6.55, 11	3.5×10^9	p.r.	——	Gord....63–0073,
1.285	acetaldoxime	10.82	7.2×10^7	p.r.	——	Hart..67–0298
1.286	acetamide	5.5–6	4×10^7 (rel.)	γ–r.	c.k., assumed $k(e_{aq}^- + NO_3^-) = 1.1 \times 10^{10}$.	Anba.67–0098
			3×10^7 (rel.)	γ–r.	c.k., assumed $k(e_{aq}^- + p\text{–}BrC_6H_5OH) = 1.2 \times 10^{10}$; k detd. at 20, 45 and 70°C to give $E_a = 3.5 \pm 0.5$ kcal mol^{-1}.	
		10.9	1.7×10^7	p.r.	——	Hart..67–0298
1.287	acetate ion	~ 10	$< 10^6$	p.r.	solute concn. 1 M.	Gord....63–0073
		9.5–10.5	$\leq (1.2 \pm 0.4) \times 10^6$ (cor.)	p.r.	solute concn. $10^{-1}\ M$, $k_{obs} = < (2.0 \pm 0.5) \times 10^6$.	Anba.65–0015
1.288	acetic acid $e_{aq}^- + CH_3COOH \rightarrow CH_3COO^- + H$	5.4	$(1.8 \pm 0.3) \times 10^8$	p.r.	——	Gord....63–0073
1.289	acetone		*5.9×10^9*	The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.131, 1.177, 1.391		
		7	$(5.9 \pm 0.2) \times 10^9$	p.r.	——	Gord....63–0073
		–	$(1.6 \pm 0.2) \times 10^9$	p.r.	soln. contains 12.4 M KF.	Anba.65–0001
		7	$(5.9 \pm 0.2) \times 10^9$	p.r.	——	Anba.65–0047
		11	$(5.6 \pm 0.6) \times 10^9$	p.r.	soln. H_2–satd.	Anba.65–0047
		14	$(5.2 \pm 0.6) \times 10^9$	p.r.	——	Anba.65–0047
		3 M OH^-	$(4.2 \pm 0.5) \times 10^9$	p.r.	——	Anba.65–0047
		11	6.9×10^9	p.r.	soln. H_2–satd.	Hart.65–0494
		7	6.4×10^9 (rel.)	γ–r.	c.k., $k_{1.289}/k(e_{aq}^- + SF_6) = 0.39$, assumed $k(e_{aq}^- + SF_6) = 1.65 \times 10^{10}$.	Asmu.68–0159
		–	6.4×10^9 (rel.)	γ–r.	c.k., D_2O soln. $k_{1.289}/k(e_d^- + SF_6) = 0.39$, assumed $k(e_d^- + SF_6) = 1.65 \times 10^{10}$.	Asmu.69–0242
		–	7.6×10^9	p.r.	in concd. soln. (0.1–1.8 M), $k = 9.5 \times 10^9$.	Aldr...71–0019
1.290	acetone semicarbazone	10.7	3.4×10^8	p.r.	——	Hart64–0287
1.291	acetone oxime	7.75	3.0×10^8	p.r.	——	Hart..67–0298
1.292	acetonitrile	7.2	3.0×10^7	p.r.	——	Anba.64–0282
1.293	N–acetylalanine	3	1.3×10^8 (rel.)	γ–r.	c.k., assumed $k(e_{aq}^- + ClCH_2COOH) = 6.9 \times 10^9$.	Will.67–0310
1.294	N–acetylalanine (negative ion)	8.6–9.0	1.0×10^7	p.r.	——	Braa65–0390
		6.7	1.1×10^7 (rel.)	γ–r.	c.k., assumed $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Will.67–0310
		7	6.3×10^6 (rel.)	γ–r.	c.k., k calcd. from $k(e_{aq}^- + ClCH_2COO^-)/k_{1.294} = 1.9 \times 10^2$, assuming $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Rodg..68–0006
1.295	acetylene	3.3	$(3.5 \pm 0.45) \times 10^{10}$ (rel.)	γ–r.	c.k., assumed $k(e_{aq}^- + H^+) = 2.3 \times 10^{10}$	Fiti.68–0502
1.296	N–acetylglycine (negative ion)	5.95	2×10^7	p.r.	——	Braa65–0390
1.297	*cis*–aconitate ion	11	$(2.1 \pm 0.5) \times 10^8$ (rel.)	γ–r.	c.k., k calcd. from $k_{1.297}/k(e_{aq}^- + ClCH_2COO^-) = 0.18 \pm 0.04$ assuming $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66–0160
1.298	acridine orange	–	3.2×10^{10}	p.r.	Also studied effect of various polyanions on rate.	Bala...68–2104
1.298a	acriflavine	–	$(3.7 \pm 0.4) \times 10^{10}$	p.r.	——	Prue.70–0241
1.299	acrylamide	7	1.8×10^{10}	p.r.	——	Gord....63–0073

No.	Solute and Reaction	pH	$k(\text{dm}^3\ \text{mol}^{-1}\text{s}^{-1})$	Method	Comments	Ref.
		7	$(2.1 \pm 0.4) \times 10^{10}$	p.r.	one detn. from growth of absorption at 275 nm gave $k = (1.8 \pm 0.7) \times 10^{10}$.	Cham....67–0171 Cham...66–2058
		–	3.3×10^{10}	p.r.	k detd. at 15–80°C; E_a = 3.9 kcal mol^{-1}.	Cerc69–0567
1.300	adenine	6	3×10^{10}	p.r.	soln. buffered with KH_2PO_4 + Na_2SO_4; $\mu = 0.1$.	Gree..68–0316
1.301	adenosine	12	1.0×10^{10}	p.r.	——	Hart..64–0044
		–	1.3×10^{10} (rel.)	γ–r.	c.k., k calcd. from $k_{1.301}/k(e^-_{aq} + N_2O) = 1.54 \pm 0.15$ assuming $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$.	Scho.64–0094
		5.5	3.1×10^{10}	p.r.	——	Scho...65–0388
1.302	adenosine–5′–phosphate	–	4.4×10^9 (rel.)	γ–r.	c.k., k calcd. from $k_{1.302}/k(e^-_{aq} + N_2O) = 0.52 \pm 0.05$ assuming $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$.	Scho.64–0094
		7	3.8×10^9	p.r.	——	Scho...65–0388
		5.8	5.2×10^9	p.r.	phosphate may be at 3′ – or 5′–position.	Braa65–0778
		8.3	4.0×10^9	p.r.	soln. contains 10^{-1} *M* sodium formate.	Land.68–0441
1.303	DL–alanine (positive ion)	3	8.4×10^8 (rel.)	γ–r.	c.k., assumed $k(e^-_{aq} + ClCH_2COOH) = 6.9 \times 10^9$.	Will.67–0310
1.304	DL–alanine (negative ion)	6.4	5.9×10^6	p.r.	pH is above the isoelectric point.	Davi..65–0389
		6.8	$\leq 5 \times 10^6$	p.r.		Braa66–0011
1.305	β–alanine	6.85	$\leq 4 \times 10^6$	p.r.		Braa66–0011
1.306	DL–alanyl–DL–alanine (negative ion)	6.27	1.3×10^8	p.r.	——	Braa67–3005
1.307	DL–alanylgylcine (negative ion)	6.22	2.1×10^8	p.r.	——	Braa65–0390
1.308	DL–alanyl–DL–leucine (negative ion)	6.46	1.3×10^8	p.r.	——	Braa67–3005
1.308a	albumin (egg)	11.53	1.3×10^{10}	p.r.	——	Braa67–3005
1.308b	albumin (human serum)	9.0	$(8.2 \pm 0.1) \times 10^9$	p.r.	contains 10^{-2} *M* formate ion, 10^{-3} *M* $Na_2B_4O_7$; also studied complex with eosin.	Husa..70–0253
		12.0	$(3.3 \pm 0.3) \times 10^9$	p.r.	contains 10^{-2} *M* formate ion, 10^{-2} *M* NaOH.	Husa..70–0253
1.309	allyl alcohol	–	$< 10^6$ (rel.)	γ–r.	solute did not compete with N_2O.	Scho.64–0094
1.309a	allylamine	11.3	1.2×10^7	p.r.	——	Geto.70–0371
1.310	*p*–aminobenzoate ion	~ 11	2.1×10^9	p.r.	——	Anba.64–0138
		–	4.2×10^9 (rel.)	r.	c.k., k calcd. from $k_{1.310}/k(e^-_{aq} + O_2) = 0.22$ assuming $k(e^-_{aq} + O_2) = 1.9 \times 10^{10}$.	Nakk65–0739
1.311	*o*–aminobenzonitrile	10	1.1×10^{10}	p.r.	——	Anba.64–0282
1.312	4–aminobutyrate ion	6.65	$\leq 9 \times 10^6$	p.r.	——	Braa66–0011
1.313	2–aminopyrimidine	5.5–6	1.4×10^{10} (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$.	Anba..67–0098
			1.3×10^{10} (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + p\text{–}BrC_6H_4OH) = 1.2 \times 10^{10}$; k detd. at 20, 45 and 70°C to give E_a = 3.7 ± 0.5 kcal mol^{-1} (ave. of both methods).	
1.313a	4–aminopyrimidine	6.5–7	$(5.2 \pm 0.4) \times 10^9$	p.r.	no OH scavenger added.	Fiel.70–0226
1.313b	amylamine	11.8	$< 4 \times 10^5$	p.r.	——	Geto.70–0371
1.314	aniline	11.94	$< 2 \times 10^7$	p.r.	——	Hart..64–0044
1.315	arabinose	–	$< 10^7$	p.r.	——	Hart..64–0048

TABLE 4. *Reactions of e_{aq}^- with organic solutes*—Continued

No.	Solute and Reaction	pH	$k(dm^3 mol^{-1}s^{-1})$	Method	Comments	Ref.
1.316	L-arginine (positive ion)	6.10	1.5×10^8	p.r.	—	Braa66-0011
		8.0	1.2×10^8	p.r.	value of k from graph.	Braa66-0011
		8.7	1.2×10^8	p.r.	value of k from graph.	Braa66-0011
		8.9	1.1×10^8	p.r.	value of k from graph.	Braa66-0011
1.317	L-arginine (zwitterion)	9.9	6.0×10^7	p.r.	value of k from graph.	Braa66-0011
1.318	L-arginine (negative ion)	11.5	6.3×10^7	p.r.	isoelectric point of arginine is 10.76.	Braa66-0011
1.319	L-asparagine (zwitterion)	4.7	2×10^8	p.r.	—	Braa65-0778
		7.3	1.5×10^8	p.r.	—	Braa66-0011
1.320	L-asparagine (negative ion)	11.7	2.4×10^7	p.r.	—	Braa66-0011
1.321	aspartate ion (monoanion)	7.3	$< 10^7$	p.r.	$k < 10^7$ was also reported in 64-0048; pH not specified.	Braa66-0011
1.322	aspartate ion (dianion)	10.5	$< 5 \times 10^6$	p.r.	—	Braa66-0011
1.323	benzamide	~ 11	1.7×10^{10}	p.r.	—	Anba.64-0138
1.324	benzene	7	$< 7 \times 10^6$	p.r.	—	Hart..64-0044
		~ 11	1.4×10^7	p.r.	—	Anba.64-0138
		11	1.2×10^7	p.r.	—	Mich.70-0211
1.325	benzenesulfonamide	~ 11	1.6×10^{10}	p.r.	—	Anba.64-0138
1.326	benzenesulfonate ion	7	1.2×10^9 (rel.)	γ-r.	c.k., assume $k(e_{aq}^- + NO_3^-) = 1.1 \times 10^{10}$. k detd. at 20, 45 and 70°C by c.k. with NO_3^- and also p-bromophenol gives $E_a = 3.5 \pm 0.5$ kcal mol^{-1}.	Anba..67-0098
		~ 11	4.0×10^9	p.r.	—	Anba.64-0138
1.327	benzoate ion	~ 11	3.1×10^9	p.r.	—	Anba.64-0138
		–	$(1.7 \pm 0.15) \times 10^9$	p.r.	soln. contains 12.4 M KF.	Anba.65-0001
		5.35–5.45	5.4×10^9	p.r.	—	Szut...65-0018
		7.19–7.74	3.1×10^9	p.r.	—	Szut...65-0018
		12.3	2.8×10^9 (cor.)	p.r.	$k_{obs} = 3.6 \times 10^9$.	Szut...65-0018
		7	$(3.5 \pm 0.4) \times 10^9$	p.r.	—	Anba.65-0047
		11	$(3.1 \pm 0.3) \times 10^9$	p.r.	—	Anba.65-0047
		14	$(2.9 \pm 0.3) \times 10^9$	p.r.	—	Anba.65-0047
		3 M OH^-	$(2.4 \pm 0.3) \times 10^9$	p.r.	—	Anba.65-0047
		11	2.6×10^9 (rel.)	γ-r.	c.k., k calcd. from $k_{1.327}/k(e_{aq}^- + ClCH_2COO^-) = 2.2 \pm 0.4$ assuming $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66-0160
		7	3.6×10^9 (rel.)	γ-r.	c.k., with NO_3^- or p-bromophenol, k detd. by both methods at 20, 45, and 70°C to give $E_a = 3.6 \pm 0.5$ kcal mol^{-1}.	Anba..67-0098
1.327a	benzoic acid	5.4	3.3×10^{10} (calcd.)	p.r.	calcd. from $k_{obs} = 5.4 \times 10^9$ and pK (benzoic acid) = 4.19.	Szut...65-0018
1.328	benzonitrile	~ 11	1.6×10^{10}	p.r.	—	Anba.64-0138
		7.16	1.9×10^{10}	p.r.	soln. contains 5×10^{-2} M formate; d.k. at 600 nm; p.b.k. at 315 nm gave $k = 1.7 \times 10^{10}$.	Chut.70-0657
1.329	benzophenone	7 ± 1	$(3.0 \pm 0.5) \times 10^{10}$	p.r.	—	Land68-0727
1.330	p-benzoquinone	6.6	1.25×10^9	p.r.	—	Hart..64-0044
		–	2.7×10^{10}	p.r.	—	Land.70-0198
1.331	benzyl alcohol	~ 11	1.3×10^8	p.r.	—	Anba.64-0138

TABLE 4. *Reactions of e^-_{aq} with organic solutes*—Continued

No.	Solute and Reaction	pH	k(dm^3 mol^{-1}s^{-1})	Method	Comments	Ref.
		5.5–6	1.9×10^8 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$.	Anba..67–0098
			1.8×10^8 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + p\text{-}BrC_6H_4OH) = 1.2 \times 10^{10}$; k detd. at 20, 45 and 70°C by both methods to give $E_a = 3.7 \pm 0.5$ kcal mol^{-1}.	
1.331a	benzylamine	11.4	3.4×10^7	p.r.	——	Geto.70–0371
1.331b	benzylammonium ion	8.8	1.45×10^9 (calcd.)	p.r.	——	Geto.70–0371
1.332	benzyl chloride	~ 10	$(5.5 \pm 0.5) \times 10^9$	p.r.	——	Anba.65–0015
		~ 11	5.1×10^9	p.r.	——	Anba.64–0138
1.333	benzyltrimethyl–ammonium ion $e^-_{aq} + C_6H_5CH_2N(CH_3)_3^+ \rightarrow C_6H_5CH_2 + (CH_3)_3N$	–	1.2×10^{10} (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$ or $k(e^-_{aq} + H^+) = 2.3 \times 10^{10}$.	Kabi.68–0205
1.333a	biphenyl–4–carboxylate ion	9.1	9.6×10^9	p.r.	——	Eber.70–0411
1.334	2,2′–bipyridine	6.25–7.2	$(1.8 \pm 0.2) \times 10^{10}$	p.r.	——	Walt67–0560
		9.2	2.5×10^{10}	p.r.	——	Eber.70–0411
1.334a	4,4′–bipyridine	9.3	3.3×10^{10}	p.r.	——	Eber.70–0411
1.335	bromoacetate ion	~ 10	$(6.2 \pm 0.7) \times 10^9$	p.r.	——	Anba.65–0015
1.336	bromobenzene	~ 11	4.3×10^9	p.r.	——	Anba.64–0138
1.337	p–bromobenzoate ion	~ 11	7.7×10^9	p.r.	——	Anba.64–0138
1.338	1–bromobutane	6.57	1.0×10^{10}	p.r.	——	Szut...65–0018
	$e^-_{aq} + C_4H_9Br \rightarrow C_4H_9 + Br^-$	–	1.0×10^{10}	p.r.	——	Bull.70–0407
1.339	bromoethane	7.12	1.2×10^{10}	p.r.	——	Szut...65–0018
	$e^-_{aq} + C_2H_5Br \rightarrow C_2H_5 + Br^-$	–	1.2×10^{10}	p.r.	——	Bull.70–0407
1.340	2–bromoethanol	~ 10	$(1.6 \pm 0.2) \times 10^9$	p.r.	——	Anba.65–0015
1.341	o–bromophenoxide ion	~ 11	1.9×10^9	p.r.	——	Anba.64–0138
1.342	m–bromophenoxide ion	~ 11	2.7×10^9	p.r.	——	Anba.64–0138
1.343	p–bromophenol		*1.2×10^{10}*	The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.62, 1.188, 1.189, 1.286, 1.313, 1.326, 1.327, 1.331, 1.358, 1.386, 1.577, 1.578.		
		5.5–6	1.2×10^{10} (rel.)	γ–r.	c.k., k calcd. assuming $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$; k detd. at 20, 45, and 70°C to give $E_a = 3.0 \pm 0.5$ kcal mol^{-1}.	Anba..67–0098
		–	1.2×10^{10}	p.r.	k detd. at 15–80°C; $E_a = 3.0_8$ kcal mol^{-1}	Cerc69–0567
1.344	p–bromophenoxide ion	~ 11	2.9×10^9	p.r.	——	Anba.64–0138
1.345	1–bromopropane	6.15	8.5×10^9	p.r.	——	Szut...65–0018
1.346	2–bromopropionate ion	~ 10	$(5.3 \pm 0.8) \times 10^9$	p.r.	——	Anba.65–0015
1.347	3–bromopropionate ion	~ 10	$(2.7 \pm 0.3) \times 10^9$	p.r.	——	Anba.65–0015
1.347a	bromotrifluoromethane $e^-_{aq} + CF_3Br \rightarrow CF_3 + Br^-$	9–10	$(2.35 \pm 0.15) \times 10^{10}$	p.r.	——	Bull.70–0407
1.348	5 bromouracil		1.9×10^{10}	p.r.	k detd. at 15–80°C; $E_a = 3.9$ kcal mol^{-1}.	Cerc69–0567
		7.0	2.6×10^{10}	p.r.	——	Zimb..69–0826
1.349	butadiene	7	8×10^9	p.r.	see also 1.378 for relative rate.	Hart..64–0044
1.350	2,3–butanedione	–	1.0×10^{10}	p.r.	——	Lili..68–0249
1.351	3–butenenitrile	7.0	9.1×10^8	p.r.	——	Anba.64–0282

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.352	*tert*-butyl alcohol	6–12	~ 10^8 (rel.)	γ-r.	c.k., with metal ions, estimated from inhibition of tritium exchange, involves a number of assumptions.	Gold.70–0034
1.352a	*tert*-butylammonium ion	7.9	1.1×10^6	p.r.	—	Geto.70–0371
1.353	*tert*-butyl mercaptan $e_{aq}^- + (CH_3)_3CSH \Rightarrow (CH_3)_3C\cdot + SH^-$	7	$(3.0 \pm 0.45) \times 10^9$	p.r.	—	Karm...69–0553
1.354	carbon disulfide	7	$(3.1 \pm 0.15) \times 10^{10}$	p.r.	—	Gord....63–0073
		7.7	3.1×10^{10}	p.r.	—	Hart..64–0044
1.355	carbon tetrachloride	7	3.1×10^{10}	p.r.	—	Gord....63–0073
		7	3.0×10^{10}	p.r.	—	Hart..64–0044
1.356	catalase	> 7	3.7×10^9	p.r.	mol. wt. 2.5×10^5	Heng...66–0499
1.357	Omitted					
1.358	chloroacetate ion		*1.2×10^9*		The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.116a, 1.294, 1.297, 1.327, 1.416, 1.476, 1.500, 1.510, 1.558, 1.568, 1.573, 1.584, 1.607, 1.614.	
		~ 10	$(1.2 \pm 0.15) \times 10^9$	p.r.	—	Anba.65–0015
		7	1.1×10^9 (rel.)	γ-r.	c.k., k calcd. assuming $k(e_{aq}^- + p\text{-}BrC_6H_4OH) = 1.2 \times 10^{10}$; k detd. at 20, 45, and 70°C. to give $E_a = 3.8 \pm 0.5$ kcal mol^{-1}.	Anba..67–0098
		11	8.9×10^8	p.r.	k detd. at 2–62°C to give $E_a = 3.2 \pm 0.4$.	Anba.67–0299
		8.5	2.5×10^9	p.r.	concn. > 0.1 M.	Aldr...71–0019
1.359	chloroacetic acid $e_{aq}^- + ClCH_2COOH \Rightarrow Cl^- + \cdot CH_2COOH$		*6.9×10^9*		The value listed has been used to calculate specific rates of the following reactions from relative rates: 1.293, 1.303, 1.414, 1.417, 1.443, 1.450, 1.453.	
		1.0–1.5	6.9×10^9 (rel.)	γ-r.	c.k., k calcd. from $k_{1.359}/k(e_{aq}^- + H^+) = 3.34–3.49$ assuming $k(e_{aq}^- + H^+) = 2.3 \times 10^{10}$.	Hayo.61–0025
1.360	chlorobenzene	~ 11	5.0×10^8	p.r.	—	Anba.64–0138
1.361	*o*-chlorobenzoate ion	~ 11	1.2×10^9	p.r.	—	Anba.64–0138
1.362	*m*-chlorobenzoate ion	~ 11	5.5×10^9	p.r.	—	Anba.64–0138
1.363	*p*-chlorobenzoate ion	~ 11	6.0×10^9	p.r.	—	Anba.64–0138
1.364	1-chlorobutane $e_{aq}^- + C_4H_9Cl \Rightarrow C_4H_9 + Cl^-$	7.28	4.5×10^8	p.r.	—	Szut...65–0018
		~ 10	$(3.2 \pm 0.4) \times 10^8$	p.r.	—	Anba.65–0015
		–	4.5×10^8	p.r.	—	Bull.70–0407
1.365	2-chlorobutane	6.64	5.1×10^8	p.r.	—	Szut...65–0918
		~ 10	$(5.1 \pm 0.8) \times 10^8$	p.r.	—	Anba.65–0015
1.366	2-chloroethanol	~ 10	$(4.1 \pm 0.6) \times 10^8$	p.r.	—	Anba.65–0015
		11	3.3×10^8	p.r.	k detd. at 2–62°C to give $E_a = 3.1 \pm 0.6$ kcal mol^{-1}.	Anba.67–0299
1.367	chloroform	7	3.0×10^{10}	p.r.	—	Hart..64–0044
1.367a	chloromethane $e_{aq}^- + CH_3Cl \Rightarrow \cdot CH_3 + Cl^-$	–	1.1×10^9 (rel.)	γ-r.	c.k., CH_3Cl concn. 1.2×10^{-2} M; k calcd. assuming $k(e_{aq}^- + SF_6) = 1.65 \times 10^{10}$.	Balk..70–0225
		10	~ 8×10^8	p.r.	lower limit only because of volatility losses.	Balk..70–0225
1.368	1-chloro-2-methyl-propane (isobutyl chloride)	5.82	5.1×10^8	p.r.	—	Szut...65–0018
1.369	*o*-chlorophenoxide ion	~ 11	2.0×10^8	p.r.	—	Anba.64–0138
1.370	*m*-chlorophenoxide ion	~ 11	5.0×10^8	p.r.	—	Anba.64–0138

TABLE 4. *Reactions of e^-_{aq} with organic solutes*—Continued

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.371	p-chlorophenoxide ion	~ 11	6.4×10^8	p.r.	——	Anba.64-0138
1.372	1-chloropropane	6.27	6.9×10^8	p.r.	——	Szut...65-0018
	$e^-_{aq} + C_3H_7Cl \rightarrow C_3H_7 + Cl^-$	–	6.9×10^8	p.r.	——	Bull.70-0407
1.373	2-chloropropionamide	–	$(5.8 \pm 0.5) \times 10^9$	p.r.	soln. satd. with ethylene.	Cham..70-0052
1.374	3-chloropropionamide	–	$(1.8 \pm 0.2) \times 10^9$	p.r.	soln. satd. with ethylene.	Cham..70-0052
1.375	2-chloropropionate ion	~ 10	$(1.4 \pm 0.2) \times 10^9$	p.r.	——	Anba.65-0015
1.376	3-chloropropionate	~ 10	$(4.0 \pm 0.4) \times 10^8$	p.r.	——	Anba.65-0015
	ion	11	4.4×10^8	p.r.	k detd. at 2–62°C to give $E_a = 3.6 \pm 0.4$ kcal mol^{-1}.	Anba.67-0299
1.377	p-chlorotoluene	~ 11	4.5×10^8	p.r.	——	Anba.64-0138
1.378	chlorotrifluoro-	11	$(1.0 \pm 0.2) \times 10^{10}$	p.r.	——	Anba.64-0282
	methane	9–10	$(4.4 \pm 0.4) \times 10^9$	p.r.	——	Bull.70-0407
	$e^-_{aq} + CF_3Cl \rightarrow CF_3 + Cl^-$	9–10	$(4.6 \pm 0.7) \times 10^9$ (rel.)	γ-r.	c.k., $k(e^-_{aq}$ + butadiene)/$k_{1.378} = 1.75 \pm 0.3$, assume $k(e^-_{aq}$ + butadiene) = 8×10^9.	Bull.70-0407
1.379	cinnamate ion	7.22	6.8×10^9	p.r.	——	Szut...65-0018
		12.45	7.2×10^9(cor.)	p.r.	$k_{obs.} = 9.7 \times 10^9$.	Szut...65-0018
1.380	citrate ion	–	$< 10^5$	p.r.	10^{-1} M soln. unreactive.	Thom..64-0046
1.381	creatine (N-amidinosarcosine)	7.0	2.7×10^7	p.r.	——	Davi..65-0389
1.382	cyanoacetate ion	~ 11	4×10^7	p.r.	——	Anba.65-0047
1.383	p-cyanobenzoate ion	~ 11	1.0×10^{10}	p.r.	——	Anba.64-0138
1.384	1,3-cyclohexadiene	11	1×10^9	p.r.	——	Mich.70-0211
1.385	1,4-cyclohexadiene	11	$< 6.5 \times 10^5$	p.r.	——	Mich.70-0211
1.386	cyclohexanone	5.5–6	8×10^9 (rel.)	γ-r.	c.k., assume $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$.	Anba..67-0098
			7.8×10^9 (rel.)	γ-r.	c.k., assume $k(e^-_{aq} + p\text{-}BrC_6H_4OH) = 1.2 \times 10^{10}$; k detd. at 20, 45, and 70°C by both methods. $E_a = 3.6 \pm 0.5$ kcal mol^{-1}.	
1.387	cyclohexene	11	$< 2 \times 10^6$	p.r.	——	Mich.70-0211
1.387a	cyclohexylamine	11.8	1.7×10^6	p.r.	——	Geto.70-0371
1.388	cystamine	7.3	4×10^{10}	p.r.	——	Braa66-0011
	$e^-_{aq} + (NH_2CH_2CH_2S)_2 \rightarrow RSSR^- \leftrightarrow NH_2CH_2CH_2S^- + NH_2CH_2CH_2S\cdot$	4–9	$\sim 4 \times 10^{10}$	p.r.	p.b.k. at 410 nm, estimated value.	Adam..67-0554
1.389	cysteamine (2-amino-ethanethiol)	6.9	2×10^{10}	p.r.	——	Braa66-0011
1.390	cysteine (positive ion)	1	3×10^{10} (rel.)	γ-r.	c.k., assume $k(e^-_{aq} + H^+) = 2.3 \times 10^{10}$.	Al-T68-0540
1.391	cysteine	6.3	8.7×10^9	p.r.	——	Braa66-0011
	(zwitterion) $e^-_{aq} + SHCH_2CH(NH_3^+)COO^- \rightarrow \cdot CH_2CH(NH_3^+)COO^- + SH^-$	5.5	1.1×10^{10} (rel.)	γ-r.	c.k., $k_{1.391}/k(e^-_{aq}$ + acetone) = 1.95, assume $k(e^-_{aq}$ + acetone) = 5.9×10^9 or $k_{1.391}/k(e^-_{aq} + NO_3^-) = 1.03$ assuming $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$.	Wilk...68-0002
		7	$\sim 8 \times 10^9$ (rel.)	γ-r.	c.k., exptl. details not given.	Al-T68-0540, Trum67-0477
		7	4.9×10^9 (rel.)	γ-r.	c.k., $k(e^-_{aq} + O_2)/k_{1.391} = 3.8$, assume $k(e^-_{aq} + O_2) = 1.9 \times 10^{10}$ and $g(e^-_{aq}) = 2.8$.	Pack.70-0015
1.392	cysteine (negative ion)	11.6	7.5×10^7	p.r.	——	Braa66-0011
1.393	cystine (zwitterion)	6.1	1.3×10^{10}	p.r.	——	Braa66-0011

No.	Solute and Reaction	pH	$k(dm^3 mol^{-1}s^{-1})$	Method	Comments	Ref.
1.394	cystine (negative ion)	10.7	2.5×10^9	p.r.	——	Braa66–0011
		12.0	3.4×10^9	p.r.	——	Hart..64–0044
1.395	cytidine	12.0	1.2×10^{10}	p.r.	——	Hart..64–0044
1.395a	cytochrome–C (ferri)	7.0	$(1.3 \pm 0.1) \times 10^{11}$	p.r.	d.k. at 550 nm (e^-_{aq}) or 370 nm (ferricytochrome–C) as well as p.b.k. at 425 nm (ferrocytochrome–C); concn. 1–3 x 10^{-6} *M*, contains 5 x 10^{-4} *M* NaCl.	Pech.71–0018
1.396	cytosine	6	~ 7–8 x 10^9	p.r.	——	Hart..64–0048
		–	~ 1 x 10^{10} (rel.)	γ–r.	c.k., $k_{1.396}/k(e^-_{aq} + N_2O)$ = 1.26 ± 0.15, assume $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$.	Scho.64–0094
1.396a	dichloroacetate ion	11	4.2×10^9	p.r.	——	Aldr...71–0019
		7.5	1.0×10^{10}	p.r.	concn. > 0.1 *M*.	Aldr...71–0019
1.397	*o*–dichlorobenzene	~ 11	4.7×10^9	p.r.	——	Anba.64–0138
1.398	*m*–dichlorobenzene	~ 11	5.2×10^9	p.r.	——	Anba.64–0138
1.399	*p*–dichlorobenzene	~ 11	5.0×10^9	p.r.	——	Anba.64–0138
1.399a	dichlorodifluoromethane $e^-_{aq} + CF_2Cl_2 \rightarrow CF_2Cl + Cl^-$	~ 6	1.4×10^{10} (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + N_2O) = 8.9 \times 10^9$ or $k(e^-_{aq} + H^+) = 2.4 \times 10^{10}$.	Balk..71–0026
1.399b	1,1–dichloroethylene	–	2.3×10^{10}	p.r.	——	Koes.71–0030
1.399c	1,2–dichloroethylene	–	7.5×10^9	p.r.	——	Koes.71–0030
1.400	2,4–diethoxypyrimidine	7–11	3.0×10^9	p.r.	$\mu = 0.1$.	Gree..68–0316
1.401	diethylthallium ion $e^-_{aq} + (C_2H_5)_2Tl^+ \rightarrow Tl^+$ + organic prod.	–	3.5×10^{10} (rel.)	γ–r.	c.k., $k_{1.401}/k(e^-_{aq} + NO_3^-)$ = 3.19, assume $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$.	Sarr66–0629
1.402	3–(3,4–dihydroxyphenyl)–L–alanine	6.95	1.6×10^8	p.r.	——	Braa66–0011
1.403	*N*, *N*–dimethylformamide	–	$(5.2 \pm 1.3) \times 10^7$	p.r.	concn. 10^{-2}M .	Fel'..67–0054
1.404	dimethylsulfide	–	2.0×10^7	p.r.	——	Meis..67–0186
1.405	dimethylsulfoxide	–	1.7×10^6	p.r.	——	Meis..67–0186
1.406	1,3–dimethyluracil	7	1.65×10^{10}	p.r.	$\mu = 0.1$.	Gree..68–0316
1.407	1,6–dimethyluracil	6.5–7	$(7.9 \pm 0.7) \times 10^9$	p.r.	no OH scavenger added.	Fiel.70–0226
1.408	3,6–dimethyluracil	6.5–7	$(6.0 \pm 0.7) \times 10^9$	p.r.	no OH scavenger added.	Fiel.70–0226
1.408a	*o*,*o*'–diphenate ion	9.1	3.2×10^9	p.r.	——	Eber.70–0411
1.408b	*p*,*p*'–diphenate ion	9.1	1.2×10^{10}	p.r.	——	Eber.70–0411
1.408c	dipyridylamine	9.1	1.4×10^{10}	p.r.	——	Eber.70–0411
1.409	djenkolate ion 3,3'–methylenedithiobis(2–aminopropionate ion)	11	10^8	p.r.	——	Braa66–0011
1.409a	DNA	8	$> 10^{12}$	p.r.	mol. wt. 5 x 10^6.	Scho...65–0388
		–	10^{13} (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$.	Scho...65–0038
1.409b	dodecyl sodium sulfate	–	$< 2.3 \times 10^5$	p.r.	concn. 5 x 10^{-2} *M*.	Fend.70–0271
1.410	eosin(dianion)	11	1.5×10^{10}	p.r.	——	Hart.66–0818
		9.0	$(2.2 \pm 0.4) \times 10^{10}$	p.r.	contains formate ion.	Gros68–0309
		12.0	$(1.9 \pm 0.1) \times 10^{10}$	p.r.	contains 10^{-2}*M* formate ion.	Husa..70–0253
		12.0	$(1.0 \pm 0.2) \times 10^{10}$	p.r.	p.b.k. at 405 nm, also studied complex with human serum albumin.	Husa..70–0253

TABLE 4. *Reactions of* e_{aq}^- *with organic solutes*—Continued

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.411	ethanol	12	$< 10^5$	p.r.	solute concn. 0.2–1.0 *M*.	Dorf.63–0045
	$e_{aq}^- + C_2H_5OH \Rightarrow C_2H_5O^- + H$	–	≤ 400	f. phot.	concn. ~1–9 *M*, H_2– satd., ~ 10^{-3} *M* NaOH; assumed $k(e_{aq}^- + H_2O) = 16$ and cor. for $k(H + OH^-)$ and $k(H + C_2H_5OH)$.	Hick.70–7116
1.412	4–ethoxy–1–methyl–uracil	6.5–7	$(1.4 \pm 0.2) \times 10^{10}$	p.r.	no OH scavenger added.	Fiel.70–0226
1.413	4–ethoxyuracil	6.5–7	$(1.7 \pm 0.2) \times 10^{10}$	p.r.	no OH scavenger added.	Fiel.70–0226
1.414	*N*–ethylacetamide	3–6.7	1.6×10^7 (rel.)	γ–r.	c.k., assume $k(e_{aq}^- + ClCH_2COOH) = 6.9 \times 10^9$.	Will.67–0310
1.415	ethyl acetate	6.53	5.9×10^7	p.r.	——	Hart..67–0298
1.416	ethyl 2–aminoacetate (glycine, ethyl ester)	6.7	1.0×10^9 (rel.)	γ–r.	c.k., assume $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Will.67–0310
1.417	ethylammonium ion	3	$\sim 10^6$ (rel.)	γ–r.	c.k., assume $k(e_{aq}^- + ClCH_2COOH) = 6.9 \times 10^9$, cor. for $e_{aq}^- + H^+$.	Will.67–0310
		7.8	2.4×10^6 (calcd.)	p.r.	$k_{obs} = 2.7 \times 10^6$.	Geto.70–0371
1.418	ethyl cyanoacetate	10.92	3.2×10^9	p.r.	——	Hart..67–0298
1.419	ethylene	7	$< 2.5 \times 10^6$	p.r.	——	Cull..65.0053
1.420	ethylenediamine–tetraacetate ion	8–11	$< 1.5 \times 10^6$	p.r.	——	Anba.64–0282
1.421	ethyl ether	–	$< 10^7$	p.r.	——	Hart..64–0048
1.421a	*N*–ethylmaleimide	–	3.2×10^{10}	p.r.	——	Ward69–0562
1.422	fluorescein (anion)	9.2	$(1.4 \pm 0.2) \times 10^{10}$	p.r.	soln. contains 10^{-2} *M* formate ion.	Cord.68–0172
1.423	fluoroacetate ion	~ 10	$< (1.2 \pm 0.5) \times 10^6$ (cor.)	p.r.	$k_{obs} < (2.0 \pm 0.5) \times 10^6$.	Anba.65–0015
1.424	fluoroacetone	6.7–10.9	9.8×10^8	p.r.	——	Hart..67–0298
1.425	fluorobenzene	~ 11	6.0×10^7	p.r.	——	Anba.64–0138
		–	7.0×10^7	p.r.	——	Koes.71–0030
1.426	*o*–fluorobenzoate ion	~ 11	3.1×10^9	p.r.	——	Anba.64–0138
1.427	*m*–fluorobenzoate ion	~ 11	6.7×10^9	p.r.	——	Anba.64–0138
1.428	*p*–fluorobenzoate ion	~ 11	3.8×10^9	p.r.	——	Anba.64–0138
1.429	*o*–fluorophenoxide ion	~ 11	3.4×10^8	p.r.	——	Anba.64–0138
1.430	*m*–fluorophenoxide ion	~ 11	2.0×10^8	p.r.	——	Anba.64–0138
1.431	*p*–fluorophenoxide ion	~ 11	1.2×10^8	p.r.	——	Anba.64–0138
1.432	formaldehyde	7	$< 10^7$	p.r.	——	Gord....63–0073
1.433	formamide	–	$< 10^6$	p.r.	solute concn. 10^{-2} *M*.	Fel'..67–0054
		11	4.2×10^7	p.r.	solute concn. 10^{-3} *M*.	Hart..67–0298
		5.5–6	3.8×10^7 (rel.)	γ–r.	c.k., assume $k(e_{aq}^- + NO_3^-) = 1.1 \times 10^{10}$; k detd. at 20, 45 and 70° C, $E_a = 3.2 \pm 0.5$ kcal mol^{-1}.	Anba..67–0098
1.434	formate ion	~ 9	$\leq 1.4 \times 10^4$ (cor.)	p.r.	concn. 10^{-1} *M*; counter ion Na^+; $k_{obs} = \leq 2.5 \times 10^4$.	Keen..65–0396
		~ 11	$\leq 1 \times 10^4$ (cor.)	p.r.	solute concn. ≤ 0.2 *M*; $k_{obs} = 2.4 \times 10^4$; counter ions Na^+, Ba^{2+}	Swal68–0418
1.435	formic acid	5.0	$(1.4 \pm 0.1) \times 10^8$	p.r.	——	Gord....63–0073
1.436	fumarate ion	13	7.5×10^9	p.r.	——	Hart..64–0044
1.437	furan	7.94	3.0×10^6	p.r.	——	Szut...65–0018
1.437a	gelatin	5.85	6.1×10^{10}	p.r.	——	Braa67–3005
		6.2	5.0×10^{10}	p.r.	——	Braa67–3005
		6.22	4.9×10^{10}	p.r.	——	Braa67–3005
		5.97	6.4×10^{10}	p.r.	——	Braa67–3005

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
		10.39	3.0×10^{10}	p.r.	——	Braa67–3005
		11.12	2.6×10^{10}	p.r.	——	Braa67–3005
1.438	glucosamine	7.7	3.5×10^7	p.r.	——	Braa66–0011
1.439	D–glucose	–	$\sim 3 \times 10^5$	p.r.	solute concn. 5×10^{-4}–5×10^{-2} *M*.	Davi..65–0391 Phil..66–0211
1.439a	D–glucuronate ion	–	$\leq 10^6$	p.r.	concn. 10^{-1} *M*.	Phil.70–0509
1.440	L–glutamate ion	7	$< 10^7$	p.r.	——	Hart..64–0048
	(monoanion)	10.2	5×10^6	p.r.	at this pH solute is mixture of monoanion and dianion; estd. value for the dianion: $k < 1 \times 10^6$.	Braa65–0778
		5.7	$\cong 2 \times 10^7$	p.r.	——	Braa66–0011
1.441	glutathione(reduced form)	6.4	3.2×10^9	p.r.	——	Braa66–0011
1.442	glutathione (oxidized form; disulfide)	8.25	4.6×10^9	p.r.	——	Braa66–0011
1.443	glycine (positive ion)	3	4.7×10^8 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + ClCH_2COOH) = 6.9 \times 10^9$.	Will.67–0310
1.444	glycine (zwitterion)	6.4	8.3×10^6	p.r.	solute concn. 5×10^{-2} *M*.	Davi..65–0389
		8.5	5.5×10^6	p.r.	solute concn. 3×10^{-2} *M*.	Davi..65–0389
1.445	glycine (negative ion)	11	1.8×10^6	p.r.	solute concn. 3×10^{-2} *M*.	Davi.65–0389
1.446	omitted					
1.447	glycyl–DL–alanine (negative ion)	6.22	2.9×10^8	p.r.	——	Braa65–0390, 67–3005
1.448	glycyl–L–asparagine	5.33	5.4×10^8	p.r.	——	Braa67–3005
1.449	glycyl–L–asparagine (negative ion)	11.41	8×10^7	p.r.	——	Braa67–3005
1.450	glycylglycine (positive ion)	3	9.3×10^8 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + ClCH_2COOH) = 6.9 \times 10^9$.	Will.67–0310
1.451	glycylglycine (zwitterion)	6.38	2.5×10^8	p.r.	——	Braa65–0390, 67–3005
1.452	glycylglycine (negative ion)	11.75	5×10^7	p.r.	——	Braa65–0390, 67–3005
1.453	glycylglycylglycine (positive ion)	3	3.1×10^9 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + ClCH_2COOH) = 6.9 \times 10^9$.	Will.67–0310
1.454	glycylglycylclycine (zwitterion)	6.0	9.0×10^8	p.r.	——	Braa65–0390, 67–3005
1.455	glycylglycylglycine (negative ion)	11.1	9×10^7	p.r.	——	Braa65–0390, 67–3005
1.456	glycyl–L–leucine	5.9	1.5×10^8	p.r.	——	Davi..65–0389
	(zwitterion)	6.46	2.8×10^8	p.r.	——	Braa67–3005
		8.74	7×10^7	p.r.	——	Braa67–3005
1.457	glycyl–L–leucine (negative ion)	8.94	6.5×10^7	p.r.	——	Braa67–3005
1.458	glycyl–L–phenyl–alanine	6.7	1.6×10^8	p.r.	——	Davi..65–0389
1.459	glycyl–L–proline	6.66	1.1×10^9	p.r.	——	Braa65–0390, 67–3005
1.460	glycyl–L–tryptophan	6.37	4.5×10^8	p.r.	——	Braa65–0390, 67–3005
1.461	glycyl–L–tyrosine	6.13	4.1×10^8	p.r.	——	Braa65–0390, 67–3005
1.462	glycyl–DL–valine	5.97	2.6×10^8	p.r.	——	Braa65–0390, 67–3005
1.463	guanidine (positive ion)	6.1	2.5×10^8	p.r.	values for *k* from graph.	Braa66–0011

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TABLE 4. *Reactions of e^-_{aq} with organic solutes*—Continued

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.464	guanidine	11.1	1.9×10^8	p.r.	values for k from graph.	Braa66-0011
		11.9	1.6×10^8	p.r.	values for k from graph.	Braa66-0011
1.464a	hemin	–	6.0×10^9	p.r.	——	Davi..65-0781
1.465	hemoglobin	–	2.6×10^{10}	p.r.	——	Davi..65-0781
1.465a	hexadecyltrimethyl-ammonium bromide	–	$< 9.2 \times 10^5$	p.r.	concn. 5×10^{-2} *M*.	Fend.70-0271
1.465b	hexadecylpyridin-ium chloride	–	2.6×10^{10}	p.r.	also studied effect of heparin on rate.	Bala...68-2104
		–	5×10^{10}	p.r.	also studied effect of chondroitin 4-sulfate on rate.	Moor...67-0742
1.465c	hexafluorobenzene	–	2.0×10^{10}	p.r.	——	Koes.71-0030
1.466	DL-histidine (positive ion)	< 5	7×10^9	p.r.	at pH 5.96 $k_{obs} = 3.87 \times 10^9$; at pH 6.70 $k_{obs} = 1.41 \times 10^9$.	Braa66-0011
1.467	DL-histidine (zwitterion)	~ 7	6×10^7	p.r.	at pH 8.58, $k_{obs} = 4.5 \times 10^7$.	Braa66-0011
1.468	DL-histidine (negative ion)	< 11	$\sim 10^7$	p.r.	at pH 11.14 $k_{obs} = 1.2 \times 10^7$.	Braa66-0011
1.469	histidylhistidine	5.51	7.9×10^9	p.r.	——	Braa65-0390, 67-3005
		6.83	2.4×10^9	p.r.	——	
		7.3	1.3×10^9	p.r.	——	
		8.37	2.85×10^8	p.r.	——	
		11.0	5.1×10^7	p.r.	——	
1.470	homocystine	6.90	9×10^9	p.r.	——	Braa66-0011
1.471	hydrocinnamate ion	5.43	4.9×10^7	p.r.	At pH 5.4 the solute is ~ 10% in the acid form.	Szut...65-0018
		12.14	1.1×10^7	p.r.	——	Szut...65-0018
1.472	hydrocinnamic acid	5.43	4×10^8 (calcd.)	p.r.	calcd. from k_{obs} for mixture with hydrocinnamate ion, see above.	Szut...65-0018
1.472a	hydroorotate ion	7	1.6×10^{10}	p.r.	——	Gree70-0567
1.473	hydroquinone ion (*p*-hydroxyphenoxide ion)	13	$< 10^7$	p.r.	——	Hart..64-0044
1.473a	hydrothymine	7	5×10^9	p.r.	——	Phil..69-0012
1.474	hydrouracil	7	4.5×10^9	p.r.	$\mu = 0.1$.	Gree..68-0316
		7	1.0×10^{10}	p.r.	——	Phil..69-0012
1.475	*m*-hydroxybenzoate ion	~ 11	1.1×10^9	p.r.	——	Anba.64-0138
1.476	*p*-hydroxybenzoate ion	~ 11	4.0×10^8	p.r.	——	Anba.64-0138
		11	2.5×10^8 (rel.)	γ-r.	c.k., k calcd. from $k_{1.476}/k(e^-_{aq} + ClCH_2COO^-) = 0.21 \pm 20\%$ assuming $k(e^-_{aq} + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66-0160
1.477	*o*-hydroxybenzonitrile	~ 11	8.2×10^9	p.r.	——	Anba.64-0138
1.478	*m*-hydroxybenzonitrile	~ 11	4.8×10^9	p.r.	——	Anba.64-0138
1.479	*p*-hydroxybenzonitrile	~ 11	2.0×10^9	p.r.	——	Anba.64-0138
1.480	3-hydroxy-2-butanone (acetoin)	–	6.0×10^9	p.r.	——	Lili..68-0249
1.481	*p*-hydroxyphenylpro-pionate ion	11.0	$\leq (1.7 \pm 0.4) \times 10^7$	p.r.	——	Chry68-0062
1.482	L-hydroxyproline	10.8	1.1×10^7	p.r.	——	Braa66-0011
1.483	hypoxanthine	6.6	1.7×10^{10}	p.r.	——	Hart..64-0044
1.483a	Igepal CO-730 (nonylphenylpoly-oxyethylene: 15)	–	$< 1.3 \times 10^6$	p.r.	concn. 5×10^{-2} *M*.	Fend.70-0271
1.484	imidazolium ion	6.3	4.3×10^9	p.r.	——	Braa66-0011
		6	3.4×10^9	p.r.	$\mu = 0.1$.	Gree..68-0316
1.485	imidazole	9.16	3.7×10^7	p.r.	——	Szut...65-0018

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
		11.5	2.4×10^7	p.r.	——	Braa66-0011
1.486	indigotetrasul- fonate ion	6	6.8×10^9 (rel.)	γ-r.	c.k., assume $k(e_{aq}^- + N_2O) = 8.7 \times 10^9$; counter ion K^+.	Raki68-0059
1.487	indole	–	$\sim 7 \times 10^8$	p.r.	——	Baxe....64-0132
		7.7	$(1.9 \pm 0.2) \times 10^8$	p.r.	——	Arms.69-0459
1.487a	indole-2-carboxylate ion	10.5	3.8×10^9	p.r.	——	Eber.70-0411
1.487b	indole-3-carboxylate ion	10.5	1.6×10^9	p.r.	——	Eber.70-0411
1.487c	indole-5-carboxylate ion	9.2	2.0×10^9	p.r.	——	Eber.70-0411
1.488	iodoacetate ion	~ 10	$(1.2 \pm 0.1) \times 10^{10}$	p.r.	——	Anba.65-0015
1.489	iodobenzene	~ 11	1.2×10^{10}	p.r.	——	Anba.64-0138
1.490	*o*-iodobenzoate ion	~ 11	4.6×10^9	p.r.	——	Anba.64-0138
1.491	*m*-iodobenzoate ion	~ 11	1.3×10^{10}	p.r.	——	Anba.64-0138
1.492	*p*-iodobenzoate ion	~ 11	9.1×10^9	p.r.	——	Anba.64-0138
1.493	1-iodobutane	7.60	1.2×10^{10}	p.r.	——	Szut...65-0018
1.494	iodoethane	6.04-6.75	1.5×10^{10}	p.r.	——	Szut...65-0018
	$e_{aq}^- + C_2H_5I \Rightarrow C_2H_5 + I^-$	–	1.5×10^{10}	p.r.	——	Bull.70-0407
1.495	iodomethane	6.85	1.7×10^{10}	p.r.	——	Szut...65-0018
	$e_{aq}^- + CH_3I \Rightarrow CH_3 + I^-$	–	$(1.7 \pm 0.3) \times 10^{10}$	p.r.	d.k. at 600 nm as well as p.b.k. at 230 nm (I^-), soln. contains 10^{-3} *M* ethylene.	Thom67-0041
		–	1.65×10^{10}	p.r.	——	Bull.70-0407
1.496	1-iodopropane	6.21	1.3×10^{10}	p.r.	——	Szut...65-0018
1.497	2-iodopropionate ion	~ 10	$(6.6 \pm 0.9) \times 10^9$	p.r.	——	Anba.65-0015
1.498	*p*-iodotoluene	~ 11	1.3×10^{10}	p.r.	——	Anba.64-0138
1.499	iodouracil	–	1.7×10^{10}	p.r.	*k* detd. at 15-80°C; $E_a = 2.3$ kcal mol^{-1}.	Cerc69-0567
1.499a	isoamylamine	11.8	$< 1.0 \times 10^6$	p.r.	——	Geto.70-0371
1.500	isocitrate ion	11	$(2.4 \pm 0.5) \times 10^7$ (rel.)	γ-r.	c.k., *k* calcd. from $k_{1.500}/k(e_{aq}^- + ClCH_2COO^-) = (2 \pm 0.4) \times 10^2$ assuming $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66-0160
1.500a	isonicotinamide	9.0	3.2×10^{10}	p.r.	——	Eber.70-0411
1.500b	isonicotinate ion	10.5	2.4×10^{10}	p.r.	——	Eber.70-0411
1.500c	isoorotate ion	7	1.1×10^{10}	p.r.	——	Gree70-0567
1.500d	isopropylamine	12.3	$< 1.5 \times 10^6$	p.r.	——	Geto.70-0371
1.501	lactate ion	9	$< 10^7$	p.r.	——	Hart..64-0048
		11	$\leq 2 \times 10^6$	p.r.	——	Anba.64-0282
1.502	L-leucine	6.5	$< 10^7$	p.r.	solute concn. 10^{-2} *M*.	Braa66-0011
1.503	L-leucyl-L-alanine	6.1	1.65×10^8	p.r.	——	Braa67-3005
1.504	DL-leucylglycine	6.09	1.1×10^8	p.r.	——	Braa67-3005
1.505	leucylglycylglycine	6.0	2.0×10^8	p.r.	——	Davi..65-0389
		6.93	2.8×10^8	p.r.	——	Braa67-3005
		9.5	5×10^7	p.r.	——	Braa67-3005
1.506	L-leucyl-L-leucine	5.97	9×10^7	p.r.	——	Braa67-3005
1.507	lipoate ion	7	1.5×10^{10}	p.r.	——	Will70-0560
1.508	lysine (positive ion)	7, 7.8	$\sim 2 \times 10^7$	p.r.	——	Braa65-0390, 66-0011
1.509	lysozyme	6.2	7.5×10^{10}	p.r.	——	Eber.65-3013
		6.2	7.5×10^{10}	p.r.	mol. wt. 15,000.	Braa67-3005
		10.1	2.7×10^{10}	p.r.	——	Braa67-3005
		10.7	1.8×10^{10}	p.r.	——	Braa67-3005
		11.8	8.3×10^9	p.r.	——	Braa67-3005
		5.6	5.2×10^{10}	p.r.	mol. wt. 15,000.	Davi..68-0683

TABLE 4. *Reactions of e^-_{aq} with organic solutes* — Continued

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
		7.4	3.1×10^{10}	p.r.	concn. 0.8 mg/ml.	Adam...69–3039
1.510	malate ion	11	6×10^7 (rel.)	γ–r.	c.k., k calcd. from $k_{1.510}/k(e^-_{aq} + ClCH_2COO^-) = (5 \pm 1) \times 10^{-2}$ assuming $k(e^-_{aq} + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66–0160
1.511	maleate ion (monoanion)	6.5	3.9×10^{10} (calcd.)	p.r.	k calcd. from $k_{obs} = 1.2 \times 10^{10}$ assuming that $k(e^-_{aq} +$ dianion $= 1.7 \times 10^9$ and that soln. contains 28% monanion.	Hart..64–0044
1.512	maleate ion	8.45	1.7×10^9	p.r.	——	Hart..64–0044
	(dianion)	12.7	1.7×10^9 (cor.)	p.r.	$k_{obs} = 2.2 \times 10^9$.	Hart..64–0044
1.513	malonate ion (monoanion)	6.0	2.4×10^8	p.r.	——	Hart..66–0819
1.514	2–mercaptoethanol	10	$(1.0 \pm 0.15) \times 10^{10}$	p.r.	——	Karm...69–0553
	$e^-_{aq} + SHCH_2CH_2OH \Rightarrow \cdot CH_2CH_2OH + SH^-$ (I)	5.7–9.0	1.2×10^{10}	p.r.	——	Jays..71–0175
	or $\Rightarrow \cdot SCH_2CH_2OH + H_2 + OH^-$ (II)	5.5	–	X–r.	$k_I/k_{II} \cong 1$ from H_2S yields; concn. 10^{-2} M.	Jays..71–0175
1.515	mercaptoethylguanidine	6.74	2×10^{10}	p.r.	——	Braa66–0011
1.516	mercaptoethylguanidine (oxidized); bis–(2–guanidinoethyl)–disulfide)	7.4	2×10^{10}	p.r.	——	Braa66–0011
1.517	3–mercaptovaline (penincillamine)	6.5	5.1×10^9	p.r.	——	Braa66–0011
1.518	methacrylate ion	10.1	8.4×10^9	p.r.	counter ion Na^+.	Hart..64–0044
1.519	methane		$< 10^7$	p.r.	——	Hart..64–0048
1.520	methanethiol $e^-_{aq} + CH_3SH \Rightarrow \cdot CH_3 + SH^-$	0–6	$(1.8 \pm 0.2) \times 10^{10}$ (rel.)	γ–r.	c.k., k calcd. from $k_{1.520}/(e^-_{aq} + H^+) = 0.8 \pm 0.3$ assuming $k(e^-_{aq} + H^+) = 2.3 \times 10^{10}$.	Arms.64–0151
		7	$(7.5 \pm 1.1) \times 10^9$	p.r.	——	Karm...69–0553
1.521	methanol $e^-_{aq} + CH_3OH \Rightarrow CH_3O^- + H$	–	$< 10^4$	p.r.	addn. of 10–20% methanol did not alter the half-life of e^-_{aq} in aq. solns. of aromatic compds.	Anba.64–0138, Anba.64–0282
		–	≤ 400	f. phot.	concn. ~ 1–8 M, H_2–satd., 10^{-3} M NaOH; assumed $k(e^-_{aq} + H_2O) = 16$ and cor. for impurities.	Hick.70–7116
1.522	DL–methionine	6.0	3.5×10^7	p.r.	——	Braa66–0011
1.523	methyl 2–aminoacetate (glycine, methyl ester)	10.66	2.9×10^8	p.r.	——	Hart..67–0298
1.524	methylammonium ion	4.9	$\sim 2 \times 10^6$	p.r.	——	Ries.65–0188
	$e^-_{aq} + CH_3NH_3^+ \Rightarrow$	7.6	1.8×10^6	p.r.	——	Braa66–0011
	$H + CH_3NH_2$	7.8	1.9×10^6	p.r.	——	Geto.70–0371
1.525	Omitted					
1.526	methyl cyanoacetate	10.9	3.2×10^8	p.r.	——	Hart..66–0819
1.527	5–methylcytosine	7.72	1.0×10^{10}	p.r.	——	Hart..64–0044
1.528	methylene blue	7.8	$(2.5 \pm 0.3) \times 10^{10}$	p.r.	d.k. at 520 nm (e^-_{aq}) as well as d.k. at 580 nm (dye) and p.b.k. at 425 nm (semiquinone), soln. contains 10^{-1} M formate ion.	Keen..65–0396
		–	2.5×10^{10}	p.r.	——	Eber.65–3013
		–	2.4×10^{10}	p.r.	counter ion Cl^-.	Moor...67–0742

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
		–	2.4×10^{10}	p.r.	soln. contains 10^{-2} *M* glucose; also studied effect of various polyanions on rate.	Bala...68–0238, 68–2104
1.529	methyl fluoroacetate	6.7	$(1.0 \pm 0.1) \times 10^{9}$	p.r.	——	Hart..67–0298
		10.86	$(8.8 \pm 0.9) \times 10^{8}$	p.r.	——	Hart..67–0298
1.530	*N*–methylformamide	–	$(1.5 \pm 1.0) \times 10^{7}$	p.r.	solute concn. 10^{-2} *M*.	Fel'..67–0054
1.531	methyl green	–	4.3×10^{10}	p.r.	also studied effect of heparin on rate.	Bala...68–2104
1.532	methyl 2–hydroxy–acetate	10.65	4.8×10^{8}	p.r.	——	Hart..67–0298
1.533	2–methylindole	7.1	$(6 \pm 3) \times 10^{7}$	p.r.	——	Arms.69–0459
1.534	3–methylindole	8.2	$(2.6 \pm 0.3) \times 10^{8}$	p.r	——	Arms.69–0459
1.535	1–methylnicotinamide	8.5	4.1×10^{10}	p.r.	soln. contains 10^{-1} *M* sodium formate.	Land.68–0441
1.536	methyl propionate	6.81	9.0×10^{7}	p.r.	——	Hart..67–0298
1.537	methyl trifluoro–acetate	10.62	1.9×10^{9}	p.r.	——	Hart..67–0298
1.538	methyl trimethyl–acetate	5.91	2.3×10^{7}	p.r.	——	Hart..67–0298
1.539	6–methyluracil	6.5–7	$(1.3 \pm 0.3) \times 10^{10}$	p.r.	no OH scavenger added.	Fiel.70–0226
1.540	naphthalene	~ 11	5.4×10^{9}	p.r.	——	Anba.64–0138
1.541	1–naphthoate ion	~ 11	6.1×10^{9}	p.r.	——	Anba.64–0138
		9.1	1.0×10^{10}	p.r.	——	Eber.70–0411
1.542	2–naphthoate ion	~ 11	9.5×10^{9}	p.r.	——	Anba.64–0138
1.543	1–naphthyloxide ion	~ 11	9.6×10^{8}	p.r.	——	Anba.64–0138
1.544	2–naphthyloxide ion	11	1.8×10^{9}	p.r.	——	Hart..64–0044
		~ 11	1.2×10^{9}	p.r.	——	Anba.64–0138
1.545	1–naphthonitrile	~ 11	2.1×10^{10}	p.r.	——	Anba.64–0138
1.546	2–naphthonitrile	~ 11	2.1×10^{10}	p.r.	——	Anba.64–0138
1.546a	nicotinamide	7.5	2.4×10^{10}	p.r.	——	Eber.70–0411
1.547	nicotinamide–adenine dinucleotide (NAD^+)	6.4	2.5×10^{10}	p.r.	soln. contains 10^{-1} *M* sodium formate.	Land.68–0441
1.548	nicotinamide–adenine dinucleotide (enzy–matically reduced) (NADH)	7 ± 1	5.2×10^{9}	p.r.	soln. N_2O–satd.	Land.68–0441
1.549	nicotinate ion	–	1.9×10^{9} (rel.)	r.	c.k., $k_{1.549}/k(e^-_{aq} + O_2) = 10^{-1}$, assume $k(e^-_{aq} + O_2) = 1.9 \times 10^{10}$.	Nakk65–0739
		10.5	1.0×10^{10}	p.r.	——	Eber.70–0411
1.549a	nicotinuric acid	9.2	2.1×10^{10}	p.r.	——	Eber.70–0411
1.550	nitrilotriacetate ion	10	4×10^{6}	p.r.	——	Anba.64–0282
1.551	nitrobenzene	7	3.0×10^{10}	p.r.	——	Hart..64–0044
	$e^-_{aq} + C_6H_5NO_2 \Rightarrow$	~ 11	3.0×10^{10}	p.r.	——	Anba.64–0138
	$C_6H_5NO_2^-(+H^+) \rightleftharpoons C_6H_5NO_2H$	7	2.9×10^{10}	p.r.	d.k. at 720 nm as well as p.b.k. at 290 nm (nitrobenzene anion).	Wigg67–0688
		–	2.8×10^{10}	p.r.	k detd. at 15–80°C; $E_a = 2.1_8$ kcal mol⁻¹.	Cerc69–0567
1.552	nitroethane	0–6	$(2.7 \pm 0.1) \times 10^{10}$ (rel.)	γ–r.	c.k., $k_{1.552}/k(e^-_{aq} + H_3O^+) = 1.17 \pm 0.02$, assume $k(e^-_{aq} + H_3O^+) = 2.3 \times 10^{10}$.	Sutt.67–0180
1.553	nitromethane	–	2.1×10^{10}	p.r.	——	Asmu..66–0800
		0–6	$(2.9 \pm 0.1) \times 10^{10}$ (rel.)	γ–r.	c.k., $k_{1.553}/k(e^-_{aq} + H_3O^+) = 1.22 \pm 0.02$, assume $k(e^-_{aq} + H_3O^+) = 2.3 \times 10^{10}$.	Sutt.67–0180

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No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
1.554	*aci*-nitromethane (negative ion) $e_{aq}^- + CH_2NO_2^- \to CH_3NO_2^- + OH^-$	12	6.6×10^9	p.r.	—	Asmu..66-0080
1.555	2-nitro-2-methyl-1,3-propanediol	10	1.3×10^{10}	p.r.	—	Anba.64-0282
1.556	2-nitro-2-methyl-1-propanol	10	2.1×10^{10}	p.r.	—	Anba.64-0282
1.557	*o*-nitrophenoxide ion	~ 11	2.0×10^{10}	p.r.	—	Anba.64-0138
1.558	*m*-nitrophenoxide ion	~ 11	2.5×10^{10}	p.r.	—	Anba.64-0138
		11	1.7×10^{10} (rel.)	γ-r.	c.k., $k_{1.558}/k(e_{aq}^- + ClCH_2COO^-) = 14 \pm 2.8$, assume $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66-0160
1.559	*p*-nitrophenol	7	$(3.5 \pm 0.6) \times 10^{10}$	p.r.	d.k. at 650 nm or p.b.k. at 290 nm (radical anion), pK of solute is 7.15.	Cerc.68-0303
		–	3.6×10^{10}	p.r.	k detd. at 15–80 °C; $E_a = 2.5_4$ kcal mol⁻¹.	Cerc69-0567
1.560	*p*-nitrophenoxide ion	~ 11	2.5×10^{10}	p.r.	—	Anba.64-0138
1.561	*p*-nitrophenylacetate ion	7-11	$(1.85 \pm 0.2) \times 10^{10}$	p.r.	—	Anba.65-0047
		3 *M* OH⁻	$(1.7 \pm 0.2) \times 10^{10}$	p.r.	—	Anba.65-0047
1.562	1-nitropropane	0-6	$(2.7 \pm 0.1) \times 10^{10}$ (rel.)	γ-r.	c.k., $k_{1.562}/k(e_{aq}^- + H_3O^+) = 1.18 \pm 0.04$, assume $k(e_{aq}^- + H_3O^+) = 2.3 \times 10^{10}$.	Sutt.67-0180
1.563	nitrosobenzene	7	4.3×10^{10}	p.r.	—	Asmu...66-0433
1.564	*p*-nitrosodimethyl-aniline	–	$(3.4 \pm 0.2) \times 10^{10}$	p.r.	—	Dain.68-0066
		–	$(2.6 \pm 0.4) \times 10^{10}$ (rel.)	γ-r.	c.k., with N_2O, assumed values not given.	Dain..68-0066
1.565	*p*-nitrotoluene	~ 11	1.9×10^{10}	p.r.	—	Anba.64-0138
1.566	norleucine	–	3.3×10^6	p.r.	—	Davi..65-0389
1.567	orotate ion	6.56	1.5×10^{10}	p.r.	—	Hart..64-0044
		7.7	1.4×10^{10}	p.r.	d.k. at 600 nm as well as p.b.k. at 320 nm (e^- adduct).	Gree70-0567
1.567a	orotate ion (dianion)	~ 12	$\sim 8 \times 10^9$	p.r.	d.k. at 600 nm as well as p.b.k. at 320 nm (e^- adduct).	Gree70-0567
1.567b	orotidine	7	9×10^9	p.r.	d.k. at 600 nm as well as p.b.k. at 320 nm (e^- adduct).	Gree70-0567
1.568	oxalacetate ion	11	4.3×10^9 (rel.)	γ-r.	c.k., $k_{1.568}/k(e_{aq}^- + ClCH_2COO^-) = 3.6 \pm 0.7$, assume $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66-0160
1.569	oxalate ion (dianion)	10	$< 10^7$	p.r.	—	Hart..64-0048
		–	$< 10^8$	p.r.	—	Baxe....64-0132
		7.0-7.7	4.8×10^7 (rel.)	γ-r.	c.k., assume $k(e_{aq}^- + NO_2^-) = 4.58 \times 10^9$. soln. air-satd.: counter ion K^+.	Mici.69-0646
		–	$(1.7 \pm 0.5) \times 10^7$	p.r.	k detd. at pH 5 and 9; assumed p$K_1 = 1.25$ and p$K_2 = 4.28$ for oxalic acid dissoc. and cor. for $e_{aq}^- + H_3O^+$; see 1.570.	Geto....71-0041
1.570	oxalate ion (monanion)	2.8-4.0	$(3.4 \pm 0.7) \times 10^9$ (rel., cor.)	γ-r.	c.k., assume $k(e_{aq}^- + H^+) = 2.36 \times 10^{10}$, counter ions Na^+, ClO_4^-; k cor. to $\mu = 0$.	Mici.69-0646
		–	$(3.2 \pm 0.6) \times 10^9$	p.r.	see 1.569.	Geto....71-0041

No.	Solute and Reaction	pH	k(dm^3 mol^{-1}s^{-1})	Method	Comments	Ref.
1.571	oxalic acid	1.3	$(2.5 \pm 0.9) \times 10^{10}$ (rel., cor.)	γ-r.	c.k., assume $k(e^-_{aq} + H^+) = 2.36 \times 10^{10}$; counter ions Na^+, ClO_4^-; k cor. to $\mu = 0$.	Mici.69-0646
1.572	oxamate ion	~ 11	$(4.0 \pm 0.4) \times 10^9$	p.r.	counter ion Na^+.	Hart..67-0298
1.573	2-oxoglutarate ion	13	$(7 \pm 2) \times 10^9$ (rel.)	γ-r.	c.k., $k_{1.573}/k(e^-_{aq} + ClCH_2COO^-) = 6.1 \pm 1.2$, assume $k(e^-_{aq} + ClCH_2COO^-) = 1.2 \times 10^9$; counter ion Na^+.	Stoc.66-0160
1.573a	pentafluorobenzene	–	2.6×10^{10}		——	Koes.71-0030
1.574	1,10-phenanthroline	7.2	$(2.1 \pm 0.1) \times 10^{10}$	p.r.	——	Walt67-0560
1.574a	phenethylamine	11.8	2.0×10^7	p.r.	——	Geto.70-0371
1.575	phenol	6.3-6.8	$(1.8 \pm 0.2) \times 10^7$	p.r.	——	Land.67-0122
1.576	phenoxide ion	~ 11	4.0×10^6	p.r.	——	Anba.64-0138
1.577	phenylacetate ion	5.43	5.1×10^7	p.r.	——	Szut...65-0018
		7	$3.1-3.3 \times 10^7$ (rel.)	γ-r.	c.k., k calcd. assuming $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$ or $k(e^-_{aq} + p\text{-}BrC_6H_4OH) = 1.2 \times 10^{10}$; k detd. at 20, 45, and 70°C to give $E_a = 3.4$ kcal mol^{-1}.	Anba..67-0098
1.578	DL-phenylalanine (zwitterion)	6.7	1.5×10^8	p.r.	——	Davi..65-0389
		6.28	1.1×10^8	p.r.	——	Braa66-0011
		7.0	1.5×10^8	p.r.	——	Braa66-0011
		8.65	8.8×10^7	p.r.	——	Braa66-0011
		7	1.6×10^8 (rel.)	γ-r.	c.k., assume $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$.	Anba..67-0098
			1.35×10^8 (rel.)	γ-r.	c.k., assume $k(e^-_{aq} + BrC_6H_4OH) = 1.2 \times 10^{10}$; k detd. at 20, 45, and 70 °C to give $E_a = 3.4$ kcal mol^{-1} as ave. of both methods.	
1.579	DL-phenylalanine (negative ion)	11	$< 10^7$	p.r.	——	Hart..64-0044
		11.2	1.35×10^7 (cor.)	p.r.	$k_{obs} = 1.7 \times 10^7$.	Braa66-0011
		11	$\leq (1.6 \pm 0.3) \times 10^7$	p.r.	——	Chry68-0062
1.580	L-phenylalanyl-L-phenylalanine	5.66	4.5×10^8	p.r.	——	Braa67-3005
1.581	phenylarsonate ion	10	1.5×10^8	p.r.	——	Anba.64-0282
1.582	phenylhydroxylamine	–	1.8×10^9	p.r.	——	Wigg..67-0191
		13.5	1.4×10^9	p.r.	reactant is $C_6H_5NHO^-$.	Wigg..67-0191
1.583	o-phthalate ion (monoanion)	5.6	1.1×10^{10} (calcd.)	p.r.	k calcd. from $k_{obs} = 6.2 \times 10^9$ assuming solute is 1:1 mixture of mono- and dianion.	Szut...65-0018
1.584	o-phthalate ion (dianion)	13	1.8×10^9	p.r.	——	Gord..64-0043
		12.8	2.0×10^9	p.r.	——	Hart..64-0044
		6.78	1.2×10^9	p.r.	——	Szut...65-0018
		12.7	1.9×10^9	p.r.	——	Szut...65-0018
		11-13	1.7×10^9 (rel.)	γ-r.	c.k., $k_{1.584}/k(e^-_{aq} + ClCH_2COO^-) = 1.4 \pm 0.3$, assume $k(e^-_{aq} + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66-0160
1.585	*m*-phthalate ion	13	3.0×10^9	p.r.	——	Gord..64-0043
1.586	*p*-phthalate ion	13	7.3×10^9	p.r.	——	Gord..64-0043
1.586a	picolinate ion	9.1	1.1×10^{10}	p.r.	——	Eber.70-0411
1.587	picrate ion	5.36	3.9×10^{10}	p.r.	——	Hart..64-0044
		13	3.5×10^{10}	p.r.	——	Hart..64-0044
1.588	pivalic acid	5.0	9.7×10^7	p.r.	——	Hart..67-0298

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.589	polylysine hydro-bromide	–	5.0×10^9	p.r.	also studied effect of heparin and DNA on rate.	Bala...68–2104
1.590	L-proline (zwitterion)	6.7	2×10^7	p.r.	isoelectric point of proline is 6.3	Braa66–0011
1.591	L-proline (negative ion)	7–8	$< 10^7$	p.r.	——	Hart..64–0048
		10.1	$< 10^6$ (calcd.)	p.r.	k calcd. from $k_{obs} \cong 5 \times 10^6$ assuming solute contains 22% negative ion at this pH.	Braa66–0011
1.592	propionamide	–	$(3.9 \pm 0.5) \times 10^7$	p.r.	soln. satd. with ethylene.	Cham..70–0052
1.593	propionitrile	10.9	1.5×10^8	p.r.	——	Anba.64–0282
1.593a	propylammonium ion	7.8	3.2×10^6 (calcd.)	p.r.	$k_{obs} = 3.7 \times 10^6$.	Geto.70–0371
1.594	protamine sulfate	–	5.5×10^9	p.r.	also studied effect of heparin and DNA on rate.	Bala...68–2104
1.595	purine	7.2	1.7×10^{10}	p.r.	——	Hart..64–0044
1.596	pyridine	6.9–7.3	1.0×10^9	p.r.	——	Hart..64–0044
		5.5–6	3.0×10^9 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$; k detd. at 20, 45 and 70 °C to give $E_a = 3.9$ kcal mol^{-1}.	Anba..67–0098
		–	3.7×10^9	p.r.	k detd at 15–80°C; $E_a = 4.5$ kcal mol^{-1}.	Cerc69–0567
1.597	pyrrole	10.29	6.0×10^5	p.r.	——	Szut...65–0018
1.598	pyrrolidine	12.08	4.2×10^6	p.r.	——	Szut...65–0018
	$e^-_{aq} + C_4H_8NH \Rightarrow C_4H_8N\cdot + H_2 + OH^-_{aq}$	12.3	$(1.1 \pm 0.5) \times 10^6$ (calcd.)	p.r.	k calcd. from $k_{obs} = (2.4 \pm 0.3) \times 10^6$ assuming pyrrolidine is 20% protonated; concn. 10^{-1} M.	Geto.70–0006
1.599	pyrrolidine (positive ion) $e^-_{aq} + C_4H_8NH_2^+ \Rightarrow C_4H_8N\cdot + H_2$	< 8	$(7.5 \pm 1.5) \times 10^6$	p.r.	concn. 10^{-1} M; counter ion SO_4^{2-}.	Geto.70–0006
1.600	2-pyrrolidone	7.82	1.3×10^7	p.r.	——	Szut...65–0018
1.601	pyruvate ion	12.7	6.8×10^9	p.r.	——	Hart..64–0044, 67–0298
1.602	pyruvonitrile	7.15	3.0×10^7	p.r.	——	Hart..67–0298
1.602a	quinoline-2-carboxylate ion	9.1	1.4×10^{10}	p.r.	——	Eber.70–0411
1.603	riboflavin	5.9	2.3×10^{10}	p.r.	soln. contains 10^{-1} M Na formate.	Land.69–0283
		basic	1.7×10^{10}	p.r.	soln. contains 10^{-1} M Na formate and 3×10^{-3} M NaOH.	Land.69–0283
1.604	ribonuclease	5.5	2.9×10^{10} (cor.)	p.r.	——	Braa67–3005
		6.8	1.3×10^{10} (cor.)	p.r.	——	Braa67–3005, Eber.65–3013
		8.4	6×10^9 (cor.)	p.r.	——	Braa67–3005
		10.7	1.7×10^9 (cor.)	p.r.	——	Braa67–3005
		6.2	6×10^9	p.r.	soln. contains phosphate buffer and 10^{-2} M KCl.	Braa.68–3007
1.605	ribose	–	$< 10^7$	p.r.	——	Hart..64–0048
1.606	safranine T	6	4.7×10^{10} (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + N_2O) = 8.7 \times 10^9$.	Raki68–0059
1.607	salicylate ion	~ 11	3.2×10^9	p.r.	solute consists of ~ 33% dianion at this pH.	Anba.64–0138
		11	3.4×10^9 (rel.)	γ–r.	c.k., $k_{1.607}/k(e^-_{aq} + ClCH_2COO^-) = 2.8 \pm 0.6$, assume $k(e^-_{aq} + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66–0160

TABLE 4. *Reactions of e_{aq}^- with organic solutes*—Continued

No.	Solute and Reaction	pH	k(dm³ mol⁻¹s⁻¹)	Method	Comments	Ref.
		7	~ 1×10^{10}	p.r.	——	Amph..68–0305
1.608	sarcosine	6.5	1.9×10^7	p.r.	solute concn. 10^{-2} M.	Davi..65–0389
		7.6	1.4×10^7	p.r.	——	Braa66–0011
1.609	selenourea	6.5	4.0×10^9	p.r.	k independent of pH 6–11.	Badi.70–0240
1.610	DL-serine	7.1	1.5×10^7	p.r.	solute concn. 10^{-2} M.	Davi..65–0389
		6.1	< 3×10^7	p.r.	——	Braa66–0011
1.611	sorbitol	–	< 10^5	p.r.	——	Davi..65–0391
1.612	styrene	7	1.5×10^{10}	p.r.	——	Hart..64–0044
		12.7	1.1×10^{10}	p.r.	——	Hart..64–0044
1.613	succinate ion (monoanion)	6.0	$(3.4 \pm 1.0) \times 10^8$ (calcd.)	p.r.	k calcd. from $k_{obs} = 1.2 \times 10^8$ at this pH.	Hart..67–0298
1.614	succinate ion (dianion)	11	2.4×10^7 (rel.)	γ-r.	c.k., $k_{1.614}/k(e_{aq}^- + ClCH_2COO^-) = (2 \pm 0.4) \times 10^{-2}$, assume $k(e_{aq}^- + ClCH_2COO^-) = 1.2 \times 10^9$.	Stoc.66–0160
		10.0	3.1×10^7	p.r.	——	Hart..67–0298
1.615	succinimide	8.04	7.2×10^9	p.r.	——	Szut...65–0018
1.615a	sulfacetamide (Na)	–	4.1×10^{10}	p.r.	——	Phil..71–0128
1.615b	sulfanilamide	–	1.5×10^{10}	p.r.	——	Phil..71–0128
1.616	sulfanilate ion	~ 11	4.6×10^8	p.r.	——	Anba.64–0138
1.616a	sulfanilic acid	–	5.9×10^9	p.r.	——	Phil..71–0128
1.617	tetracyanoethylene	7	1.5×10^{10}	p.r.	——	Hart..64–0044
1.618	tetranitromethane	7	$(6.0 \pm 0.5) \times 10^{10}$	p.r.	——	Asmu...64–0133, Asmu.64–0136
	$e_{aq}^- + C(NO_2)_4 \rightarrow C(NO_2)_3^- + NO_2$	6	4.6×10^{10}	p.r.	d.k. at 578 nm as well as p.b.k. at 360 nm (nitroform anion).	Raba..65–0183
		5.5–6.0	4.4×10^{10} (rel.)	p.r.	c.k., p.b.k. at 366 nm (nitroform anion), $k_{1.618}/k(e_{aq}^- + O_2) = 2.3 \pm 0.7$, assume $k(e_{aq}^- + O_2) = 1.9 \times 10^{10}$.	Raba..65–0183
1.619	thiazole	6.59	2.5×10^9	p.r.	——	Szut...65–0018
1.620	thiobarbituric acid	–	~ 6×10^7	p.r.	——	Hart..64–0048
1.621	thioglycolate ion	10	8.2×10^7	p.r.	——	Anba.64–0282
1.622	thiophene	6.73	6.5×10^7	p.r.	——	Szut...65–0018
1.623	thiophenoxide ion	~ 11	4.7×10^7	p.r.	——	Anba.64–0138
1.624	thiourea	6.41	2.9×10^9	p.r.	——	Hart..64–0044
		7.6–9.0	3.1×10^9 (ave.)	p.r.	——	Char....65–0392
1.625	DL-threonine (negative ion)	7	2.0×10^7	p.r.	——	Davi..65–0389
		6.2	≤ 10^7	p.r.	——	Braa66–0011
		9.5	≤ 5×10^6	p.r.	——	Braa66–0011
1.626	thymidylic acid	6.7	1.5×10^9	p.r.	——	Scho...65–0388
1.627	thymine	6.0	1.7×10^{10}	p.r.	——	Hart..64–0044
		12	2.7×10^9	p.r.	——	Hart..64–0044
		5.5	1.8×10^{10}	p.r.	——	Scho...65–0388
		11	4.0×10^9	p.r.	soln. H_2-satd.	Hart.65–0494
1.628	o-toluate ion	~ 11	2.7×10^8	p.r.	——	Anba.64–0138
1.629	m-toluate ion	~ 11	2.6×10^9	p.r.	——	Anba.64–0138
1.630	p-toluate ion	~ 11	3.6×10^9	p.r.	——	Anba.64–0138
1.631	toluene	~ 11	1.2×10^7	p.r.	——	Anba.64–0138
1.632	p-toluenesulfonate ion	~ 11	1.7×10^9	p.r.	——	Anba.64–0138
1.633	p-tolunitrile	~ 11	1.4×10^{10}	p.r.	——	Anba.64–0138
1.633a	tetrachloroethylene	–	1.3×10^{10}	p.r.	——	Koes.71–0030
1.633b	tetrafluorobenzene	–	2.6×10^{10}	p.r.	——	Koes.71–0030

No.	Solute and Reaction	pH	$k(\mathrm{dm^3\ mol^{-1}s^{-1}})$	Method	Comments	Ref.
1.634	trichloroacetate ion	~ 10	6.2×10^9	p.r.	——	Hart..64–0044
		~ 10	$(8.5 \pm 1.0) \times 10^9$	p.r.	——	Anba.65–0015
		6.6	2.1×10^{10}	p.r.	concn. > 0.1 *M*.	Aldr...71–0019
1.634a	1,1,2–trichloroethylene	–	1.9×10^{10}	p.r.	——	Koes.71–0030
1.635	trichlorofluoromethane	~ 6	1.6×10^{10} (rel.)	γ–r.	c.k., elec. condy., assume $k(e^-_{aq} + N_2O) = 8.9 \times 10^9$ or $k(e^-_{aq} + H^+) = 2.4 \times 10^{10}$.	Balk..71–0026
1.636	α,α,α–trichlorotoluene	~ 10	$(8.3 \pm 0.9) \times 10^9$	p.r.	——	Anba.65–0015
1.637	trifluoroacetate ion	~ 10	$\leq(1.4 \pm 0.4) \times 10^6$ (cor.)	p.r.	$k_{obs} \leq (2.6 \pm 0.6) \times 10^6$.	Anba.65–0015
1.638	1,1,1–trifluoro–acetone	5.19	6.6×10^7	p.r.	——	Hart..67–0298
1.638a	trifluoroiodo–methane $e^-_{aq} + CF_3I \rightarrow CF_3 + I^-$	9–10	$(1.3 \pm 0.1) \times 10^{10}$	p.r.	——	Bull.70–0407
1.639	α,α,α–trifluorotoluene	~ 11	1.8×10^9	p.r.	——	Anba.64–0138
1.640	trimesate ion (trianion)	5.74	3.5×10^9	p.r.	*k* calcd. for the dianion is $(1.0 \pm 0.15) \times 10^{10}$.	Szut...65–0018
		6.96	2.5×10^9	p.r.	——	Szut...65–0018
		8.84	3.0×10^9	p.r.	——	Szut...65–0018
		12.39	2.8×10^9 (cor.)	p.r.	$k_{obs} = 4.2 \times 10^9$.	Szut...65–0018
1.641	1,3,5–trimethyluracil	6.5–7	$(4.8 \pm 0.6) \times 10^9$	p.r.	no OH scavenger added.	Fiel.70–0226
1.642	trinitromethyl ion (nitroform anion)	7	3.0×10^{10}	p.r.	counter ion K^+.	Raba..65–0183
1.643	tryptophan	7.3	2.6×10^8	p.r.	——	Davi..65–0389
		6.76	4.0×10^8	p.r.	——	Braa66–0011
		6.9	4.6×10^8	p.r.	solute is L–tryptophan.	Braa66–0011
		8.92	3.1×10^8	p.r.	——	Braa66–0011
		7.8	$(3.0 \pm 0.3) \times 10^8$	p.r.	solute is L–tryptophan.	Arms.69–0459
1.644	tryptophan (negative ion)	11.5	1.3×10^8	p.r.	——	Braa66–0011
1.645	tyrosine (zwitterion)	5.8	1.6×10^8	p.r.	solute is L–tyrosine.	Braa66–0011
		7.8	4.0×10^8	p.r.	——	Davi..65–0389
1.646	tyrosine (negative ion)	11.0	$\leq (1.7 \pm 0.4) \times 10^7$	p.r.	solute is L–tyrosine; 20% monoanion.	Chry68–0062
1.647	uracil	6.4	7.7×10^9	p.r.	——	Hart..64–0044
		7	9.3×10^9 (cor.)	p.r.	$\mu = 0.1$, $k_{obs} = 1.5 \times 10^{10}$.	Gree..68–0316
		6.5–7	$(1.6 \pm 0.3) \times 10^{10}$	p.r.	no OH scavenger added.	Fiel.70–0226
1.648	uracil (monoanion)	12.2	2.3×10^9	p.r.	——	Hart..64–0044
		11	1.9×10^9 (cor.)	p.r.	$\mu = 0.1$, $k_{obs} = 3 \times 10^9$.	Gree..68–0316
		13	1.6×10^9 (cor.)	p.r.	$\mu = 0.1$, $k_{obs} = 2.5 \times 10^9$.	Gree..68–0316
1.649	uracil polynucleotides	7	2.5×10^9	p.r.	$\mu = 0.1$.	Gree..68–0316
		12	8×10^8	p.r.	$\mu = 0.1$.	Gree..68–0316
1.650	urea	5.5–6	2.7×10^5 (rel.)	γ–r.	c.k., assume $k(e^-_{aq} + NO_3^-) = 1.1 \times 10^{10}$; *k* detd. at 20, 45 and 70 °C to give E_a = 3.4 kcal mol^{-1}.	Anba..67–0098
		7	3.0×10^5	p.r.	——	Hart..67–0298
1.651	uric acid	5	$\sim 6 \times 10^9$	p.r.	——	Hart..64–0048
1.652	uridine	6	1.4×10^{10}	p.r.	$\mu = 0.1$.	Gree..68–0316
1.653	uridine (monoanion)	11.8	2×10^9 (cor.)	p.r.	$\mu = 0.1$, $k_{obs} = 3 \times 10^9$.	Gree..68–0316
1.654	uridine monophosphate (dianion) (UMP^{2-})	7	2.2×10^9 (cor.)	p.r.	$\mu = 0.1$, $k_{obs} = 5 \times 10^9$.	Gree..68–0316
1.655	uridine monophosphate (trianion) (UMP^{3-})	13	1.9×10^8 (cor.)	p.r.	$\mu = 0.1$, $k_{obs} = 6.5 \times 10^8$.	Gree..68–0316

TABLE 4. *Reactions of e_{aq} with organic solutes*—Continued

No.	Solute and Reaction	pH	$k(dm^3\ mol^{-1}s^{-1})$	Method	Comments	Ref.
1.656	uridine monophosphate (2′,3′-cyclic, dianion)	6	4.5×10^9 (cor.)	p.r.	$\mu = 0.1$, $k_{obs} = 1 \times 10^{10}$.	Gree..68-0316
1.657	valine (zwitterion)	6.4	5.2×10^6	p.r.	solute concn. 10^{-1} *M*.	Davi..65-0389
			$\leq 5 \times 10^6$	p.r.	——	Braa66-0011
1.658	DL-valine (negative ion)	9.5	$< 2 \times 10^6$ (calcd.)	p.r.	k calcd. from $k_{obs} = < 5 \times 10^6$ at pH 9.5 assuming solute is 50% negative ion, 50% zwitterion.	Braa66-0011
1.658a	vinyl chloride	–	2.5×10^8	p.r.	——	Koes.71-0030
1.659	vinylpyridine	–	1.4×10^{10}	–	unpubl. data cited.	Swal68-0678
1.660	vinylpyridinium ion	–	3×10^{10}	–	unpubl. data cited.	Swal68-0678
1.661	xylose	–	$\leq 10^6$	p.r.	——	Davi..65-0391

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$C_3H_4ClO_2^-$ 2–Chloropropionate ion, 1.375; 3–Chloropropionate ion, 1.376
$C_3H_4IO_2^-$ 2–Iodopropionate ion, 1.497
$C_3H_4N_2$ Imidazole, 1.484
C_3H_5FO Fluoroacetone, 1.424
$C_3H_5FO_2$ Methyl fluoroacetate, 1.529
C_3H_5N Propionitrile, 1.593
C_3H_5NO Acrylamide, 1.299
C_3H_6ClNO 2–Chloropropionamide, 1.373; 3–Chloropropionamide, 1.374
C_3H_6O Acetone, 1.289; Allyl alcohol, 1.309
$C_3H_5O_3^-$ Lactate ion, 1.501
$C_3H_6O_3$ Methyl 2–hydroxyacetate, 1.532
C_3H_7Br 1–Bromopropane, 1.345
C_3H_7Cl 1–Chloropropane, 1.372
C_3H_7I 1–Iodopropane, 1.496
C_3H_7NO Acetone oxime, 1.291; *N*, *N*–Dimethylformamide, 1.403; Propionamide, 1.592
$C_3H_7NO_2$ Alanine, 1.303–1.304; β–Alanine, 1.305; Methyl 2–aminoacetate, 1.523; Sarcosine, 1.608
$C_3H_7NO_2S$ Cysteine, 1.390–1.392
$C_3H_7NO_3$ Serine, 1.610
C_3H_9N Isopropylamine, 1.500a
$C_3H_9N_3S$ Mercaptoethylguanidine, 1.515
$C_3H_{10}N^+$ Propylammonium ion, 1.593a
$C_4CdN_4^{2-}$ Tetracyanocadmate(II) ion, 1.42
$C_4H_2O_4^{2-}$ Fumarate ion, 1.436; Maleate ion, 1.512
$C_4H_3BrN_2O_2$ 5–Bromouracil, 1.348
$C_4H_3IN_2O_2$ Iodouracil, 1.499
$C_4H_3O_4^-$ Maleate ion, 1.510
$C_4H_3O_5^-$ Oxalacetate ion, 1.568
$C_4H_4CrO_{10}^-$ Dioxalatodiaquochromate(III) ion, 1.111
$C_4H_4N_2O_2$ Uracil, 1.647, 1.648
$C_4H_4N_2O_2S$ Thiobarbituric acid, 1.620
C_4H_4O Furan, 1.437
$C_4H_4O_4^{2-}$ Succinate ion, 1.614
$C_4H_4O_5^{2-}$ Malate ion, 1.510
C_4H_4S Thiophene, 1.622
C_4H_5N 3–Butenenitrile, 1.351; Pyrrole, 1.597
$C_4H_5NO_2$ Methyl cyanoacetate, 1.526; Succinimide, 1.615
$C_4H_5NO_4^{2-}$ Aspartate ion, 1.322
$C_4H_5N_3$ 2–Aminopyrimidine, 1.313
$C_4H_5N_3O$ Cytosine, 1.396
$C_4H_5O_2^-$ Methacrylate ion, 1.518
$C_4H_5O_4^-$ Succinate ion, 1.613
C_4H_6 Butadiene, 1.349
$C_4H_6NO_4^-$ Aspartate ion, 1.321
$C_4H_6N_2O_2$ Hydrouracil, 1.474
$C_4H_6O_2$ 2,3–Butanedione, 1.350
C_4H_7NO 2–Pyrrolidone, 1.600
$C_4H_7NO_3$ *N*–Acetylglycine, 1.296
$C_4H_8CdN_2O_4$ Bis(glycinato)cadmium(II), 1.44
$C_4H_8NO_2^-$ 4–Aminobutyrate ion, 1.312
$C_4H_8N_2NiO_4$ Bis(glycinato)nickel(II), 1.197
$C_4H_8N_2O_3$ Asparagine, 1.319, 1.320; Glycylglycine, 1.450–1.452
$C_4H_8O_2$ Ethyl acetate, 1.415; 3–Hydroxy–2–butanone, 1.480; Methyl propionate, 1.536
C_4H_9Br 1–Bromobutane, 1.338
C_4H_9Cl 1–Chlorobutane, 1.364; 2–Chlorobutane, 1.365; 1–Chloro–2–methylpropane, 1.368
C_4H_9I 1–Iodobutane, 1.493
C_4H_9N Pyrrolidine, 1.598, 1.599
C_4H_9NO *N*–Ethylacetamide, 1.414
$C_4H_9NO_2$ Ethyl 2–aminoacetate, 1.416; Threonine, 1.625
$C_4H_9NO_2S$ Homocystine, 1.470
$C_4H_9NO_3$ 2–Methyl–2–nitro–1–propanol, 1.556
$C_4H_9NO_4$ 2–Methyl–2–nitro–1,3–propanediol, 1.555
$C_4H_9N_3O$ Acetone semicarbazone, 1.290
$C_4H_9N_3O_2$ Creatine, 1.381
$C_4H_{10}N^+$ Pyrrolidinium ion, 1.599
$C_4H_{10}O$ *tert*–Butyl alcohol, 1.352; Ethyl ether, 1.421
$C_4H_{10}S$ *tert*–Butyl mercaptan, 1.353
$C_4H_{12}N^+$ *tert*–Butylammonium ion, 1.352a
$C_4H_{12}N_2S_2$ Cystamine, 1.388
$C_4H_{16}CdN_4^{2+}$ Bis(ethylenediamine)cadmium(II) ion 1.49
$C_4H_{16}Cl_2CoN_4^+$ Dichlorobis(ethylenediamine)cobalt(III) ion, 1.87
$C_4H_{16}Cl_2CrN_4^+$ Dichlorobis(ethylenediamine)chromium(III) ion, 1.107
$C_4H_{16}CoF_2N_4^+$ Difluorobis(ethylenediamine)cobalt(III) ion, 1.86
$C_4H_{16}N_4Ni^{2+}$ Bis(ethylenediamine)nickel(II) ion, 1.203
$C_4H_{18}ClCoN_5^{2+}$ Chloroamminebis(ethylenediamine)cobalt(III) ion, 1.89
$C_4H_{18}CoFN_4O^{2+}$ Fluoroaquobis(ethylenediamine)cobalt(III) ion, 1.91
$C_4H_{18}CoN_5O_4^+$ Fumaratopentamminecobalt(III) ion, 1.73
$C_4H_{18}CoN_6O_2^{2+}$ Nitroamminebis(ethylenediamine)cobalt(III) ion, 1.90
$C_4HgN_4^{2-}$ Tetracyanomercurate(II) ion, 1.150
$C_4N_4Ni^{2-}$ Tetracyanonickelate(II) ion, 1.195
$C_4N_4Pd^{2-}$ Tetracyanopalladate(II) ion, 1.221
$C_4N_4Pt^{2-}$ Tetracyanoplatinate(II) ion, 1.226
$C_4N_4Zn^{2-}$ Tetracyanozincate(II) ion, 1.279
$C_5ClCoN_5^{3-}$ Chloropentacyanocobaltate(III) ion, 1.77
$C_5CoN_5^{3-}$ Pentacyanocobaltate(II) ion, 1.59
$C_5CoN_6O_2^{3-}$ Nitropentacyanocobaltate(III) ion, 1.80
$C_5CoN_8^{3-}$ Azidopentacyanocobaltate(III) ion, 1.79
$C_5FeN_6O^{2-}$ Pentacyanonitrosylferrate(III) ion, 1.138
$C_5HCoN_5O^{3-}$ Hydroxypentacyanocobaltate(III) ion, 1.78
$C_5H_3FeN_6^{3-}$ Pentacyanoammineferrate(II) ion, 1.35
$C_5H_3N_2O_4^-$ Isoorotate ion, 1.500c; Orotate ion, 1.567
$C_5H_4N_4$ Purine, 1.595
$C_5H_4N_4O$ Hypoxanthine, 1.483
$C_5H_4N_4O_3$ Uric acid, 1.651
$C_5H_4O_5^{2-}$ 2–Oxoglutarate ion, 1.573
C_5H_5N Pyridine, 1.596
$C_5H_5N_2O_4^-$ Hydroorotate ion, 1.472a
$C_5H_5N_5$ Adenine, 1.300
$C_5H_6N_2O_2$ 6–Methyluracil, 1.539; Thymine, 1.627
$C_5H_7NO_2$ Ethylcyanoacetate, 1.418
$C_5H_7N_3O$ 5–Methylcytosine, 1.527
$C_5H_8NO_4^-$ Glutamate ion, 1.440

$C_5H_8N_2O_2$ Hydrothymine, 1.473a
$C_5H_9NO_2$ Proline, 1.590, 1.591
$C_5H_9NO_3$ *N*-Acetylalanine, 1.293, 1.294; Hydroxyproline, 1.482
$C_5H_{10}N_2O_3$ Alanylglycine, 1.307; Glycylalanine, 1.447
$C_5H_{10}O_2$ Pivalic acid, 1.588
$C_5H_{10}O_5$ Arabinose, 1.315; Ribose, 1.605; Xylose, 1.661
$C_5H_{11}NO_2$ Valine, 1.657, 1.658
$C_5H_{11}NO_2S$ 3-Mercaptovaline (Penicillamine), 1.517; Methionine, 1.522
$C_5H_{13}N$ Amylamine, 1.313b; Isoamylamine, 1.499a
$C_5H_{16}CoN_4O_3^+$ Carbonatobis(ethylenediamine)cobalt(III) ion, 1.88
$C_6CoN_6^{3-}$ Hexacyanocobaltate(III) ion, 1.76
$C_6CoO_{12}^{3-}$ Trioxalatocobaltate(III) ion, 1.82
$C_6CrN_6^{3-}$ Hexacyanochromate(III) ion, 1.105
$C_6CrN_6^{4-}$ Hexacyanochromate(II) ion, 1.100
C_6F_6 Hexafluorobenzene, 1.465c
$C_6FeN_6^{3-}$ Hexacyanoferrate(III) ion, 1.137
$C_6FeN_6^{4-}$ Hexacyanoferrate(II) ion, 1.134
C_6HF_5 Pentafluorobenzene, 1.573a
$C_6H_2F_4$ Tetrafluorobenzene, 1.633b
$C_6H_2N_3O_7^-$ Picrate ion, 1.587
$C_6H_3O_6^{3-}$ *cis*-Aconitate ion, 1.297
$C_6H_4BrO^-$ *o*-Bromophenoxide ion, 1.341; *m*-Bromophenoxide ion, 1.342;
    p-Bromophenoxide, 1.344
$C_6H_4ClO^-$ *o*-Chlorophenoxide ion, 1.369; *m*-Chlorophenoxide ion, 1.370;
    p-Chlorophenoxide ion, 1.371
$C_6H_4FO^-$ *o*-Fluorophenoxide ion, 1.429; *m*-Fluorophenoxide ion, 1.430;
    p-Fluorophenoxide ion, 1.431
$C_6H_4Cl_2$ *o*-Dichlorobenzene, 1.397; *m*-Dichlorobenzene, 1.398; *p*-Dichlorobenzene, 1.399
$C_6H_4NO_2^-$ Isonicotinate ion, 1.500b; Nicotinate ion, 1.549; Picolinate ion, 1.586a
$C_6H_4NO_3^-$ *o*-Nitrophenoxide ion, 1.557; *m*-Nitrophenoxide ion, 1.558;
    p-Nitrophenoxide ion, 1.560
$C_6H_4O_2$ *p*-Benzoquinone, 1.330
C_6H_5Br Bromobenzene, 1.336
C_6H_5BrO *p*-Bromophenol, 1.343
C_6H_5Cl Chlorobenzene, 1.360
C_6H_5F Fluorobenzene, 1.425
C_6H_5I Iodobenzene, 1.489
C_6H_5NO Nitrosobenzene, 1.563
$C_6H_5NO_2$ Nitrobenzene, 1.551
$C_6H_5NO_3$ *p*-Nitrophenol, 1.559
$C_6H_5O^-$ Phenoxide ion, 1.576
$C_6H_5O_2^-$ *p*-Hydroxyphenoxide ion, 1.473
$C_6H_5O_3S^-$ Benzenesulfonate ion, 1.326
$C_6H_5S^-$ Thiophenoxide ion, 1.623
C_6H_6 Benzene, 1.324
$C_6H_6AsO_3^-$ Phenylarsonate(V) ion, 1.581
$C_6H_6NO_3S^-$ Sulfanilate ion, 1.616
$C_6H_6N_2O$ Isonicotinamide, 1.500a; Nicotinamide, 1.546a
C_6H_6O Phenol, 1.575
$C_6H_8O_6N^{3-}$ Nitrilotriacetate ion, 1.550
C_6H_7N Aniline, 1.314

C_6H_7NO Phenylhydroxylamine, 1.582
$C_6H_7NO_2$ *N*-Ethylmaleimide, 1.421a
$C_6H_7NO_2S$ Benzenesulfonamide, 1.325
$C_6H_7NO_3S$ Sulfanilic acid, 1.616a
$C_6H_7O_7^-$ Citrate ion, 1.380; Isocitrate ion, 1.500
C_6H_8 1,3-Cyclohexadiene, 1.384; 1,4-Cyclohexadiene, 1.385
$C_6H_8N_2O_2$ 1,3-Dimethyluracil, 1.406; 1,6-Dimethyluracil, 1.407;
    3,6-Dimethyluracil, 1.408; 4-Ethoxyuracil, 1.413
$C_6H_9N_3O_2$ Histidine, 1.466–1.468
C_6H_{10} Cyclohexene, 1.387
$C_6H_{10}N_3O_6$ Glycylasparagine, 1.448, 1.449
$C_6H_{10}O$ Cyclohexanone, 1.386
$C_6H_{11}N_3O_4$ Glycylglycylglycine, 1.453
$C_6H_{11}O_7^-$ D-Glucuronate ion, 1.439a
$C_6H_{12}AlN_3O_6$ Tris(glycinato)aluminum(III), 1.18
$C_6H_{12}CdN_3O_6^-$ Tris(glycinato)cadmate(II) ion, 1.45
$C_6H_{12}CuN_3O_6^-$ Tris(glycinato)cuprate(II) ion, 1.117
$C_6H_{12}HgN_3O_6^-$ Tris(glycinato)mercurate(II) ion, 1.151
$C_6H_{12}MnN_3O_6^-$ Tris(glycinato)manganate(II) ion, 1.171
$C_6H_{12}N_2O_3$ Alanylalanine, 1.306
$C_6H_{12}N_2O_4S_2$ Cystine, 1.393, 1.394
$C_6H_{12}N_3NiO_6^-$ Tris(glycinato)nickelate(II) ion, 1.198
$C_6H_{12}N_3O_6Pb^-$ Tris(glycinato)plumbate(II) ion, 1.216
$C_6H_{12}N_3O_6Zn^-$ Tris(glycinato)zincate(II) ion, 1.283
$C_6H_{12}O_2$ Methyl trimethylacetate, 1.538
$C_6H_{12}O_6$ Glucose, 1.439
$C_6H_{13}N$ Cyclohexylamine, 1.387a
$C_6H_{13}NO_2$ Leucine, 1.502; Norleucine, 1.566
$C_6H_{13}NO_5$ Glucosamine, 1.438
$C_6H_{14}N_2O_2$ Lysine, 1.508
$C_6H_{14}N_4O_2$ Arginine, 1.316–1.318
$C_6H_{14}O_6$ Sorbitol, 1.611
$C_6H_{16}CoN_6S_2^+$ Dithiocyanatobis(ethylenediamine)cobalt(III) ion, 1.92
$C_6H_{16}CrN_2S_2^+$ Dithiocyanatobis(ethylenediamine)chromium(III) ion, 1.108
$C_6H_{16}N_6S_2$ Bis(2-guanidinoethyl)disulfide, 1.516
$C_6H_{24}CdN_6^{2+}$ Tris(ethylenediamine)cadmium(II) ion, 1.50
$C_6H_{24}CoN_6^{3+}$ Tris(ethylenediamine)cobalt(III) ion, 1.85
$C_6H_{24}CrN_6^{3+}$ Tris(ethylenediamine)chromium(III) ion, 1.106
$C_6H_{24}CuN_6^{2+}$ Tris(ethylenediamine)copper(II) ion, 1.121
$C_6H_{24}HgN_6^{2+}$ Tris(ethylenediamine)mercury(II) ion, 1.149
$C_6H_{24}N_5Ni^{2+}$ Tris(ethylenediamine)nickel(II) ion, 1.204
$C_6H_{24}N_5Pb^{2+}$ Tris(ethylenediamine)lead(II) ion, 1.219
$C_6H_{24}N_5Zn^{2+}$ Tris(ethylenediamine)zinc(II) ion, 1.278
$C_6MnN_6^{4-}$ Hexacyanomanganate(II) ion, 1.174
C_6N_4 Tetracyanoethylene, 1.617
$C_6N_6Os^{4-}$ Hexacyanoosmate(II) ion, 1.207
$C_6N_6Ru^{4-}$ Hexacyanoruthenate(II) ion, 1.231
$C_7H_4BrO_2^-$ *p*-Bromobenzoate ion, 1.337
$C_7H_4ClO_2^-$ *o*-Chlorobenzoate ion, 1.361; *m*-Chlorobenzoate ion, 1.362;
    p-Chlorobenzoate ion, 1.363
$C_7H_4FO_2^-$ *o*-Fluorobenzoate ion, 1.426; *m*-Fluorobenzoate ion, 1.427;
    p-Fluorobenzoate ion, 1.428

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