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Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions

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UNITED STATES DEPARTMENT OF COMMERCE

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U.S. NATIONAL BUREAU OF STANDARDS · A. V. ASTIN, *Director*

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions

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Foreword

The National Standard Reference Data System is a Government-wide effort to provide for the technical community of the United States effective 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.

The responsibility to administer the System was assigned to the National Bureau of Standards and an Office of Standard Reference Data was set up at the Bureau for this purpose. Since 1963, this Office has developed systematic plans for meeting high-priority needs for reliable reference data. It has undertaken to coordinate and integrate existing data evaluation and compilation activities (primarily those under sponsorship of Federal agencies) into a comprehensive program, supplementing and expanding technical coverage when necessary, establishing and maintaining standards for the output of the participating groups, and providing mechanisms for the dissemination of the output as required.

The System now comprises a complex of data centers and other activities, carried on in Government agencies, academic institutions, and nongovernmental laboratories. The independent operational status of existing critical data projects is maintained and encouraged. Data centers that are components of the NSRDS produce compilations of critically evaluated data, critical reviews of the state of quantitative knowledge in specialized areas, and computations of useful functions derived from standard reference data. In addition, the centers and projects establish criteria for evaluation and compilation of data and make recommendations on needed modifications or extensions of experimental techniques.

Data publications of the NSRDS take a variety of physical forms, including books, pamphlets, loose-leaf sheets and computer tapes. While most of the compilations have been issued by the Government Printing Office, several have appeared in scientific journals. Under some circumstances, private publishing houses are regarded as appropriate primary dissemination mechanisms.

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

An important aspect of the NSRDS is the advice and planning assistance which the National Research Council of the National Academy of Sciences-National Academy of Engineering provides. These services are organized under an overall Review Committee which considers the program as a whole and makes recommendations on policy, long-term planning, and international collaboration. 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 NSRDS-NBS series of publications is intended primarily to include evaluated reference data and critical reviews of long-term interest to the scientific and technical community.

A. V. ASTIN, *Director.*

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This is a compilation of ionization and appearance potentials of positive ions published from 1955 through June 1966. The compilation lists the ion formed, the parent species from which it was formed, the other products of the process, the threshold energy for the formation of this ion, and the method by which this data was obtained.

Where feasible, the heat of formation at 298 K of the positive ion has been computed for each entry using auxiliary thermochemical data. From these computed values "best" values have been chosen.

Key Words: Appearance potential; compilation; data; heat of formation; ionization potential; ions; positive ions.

1. Introduction

1.1. General

Since the publication of "Electron Impact Phenomena and the Properties of Gaseous Ions" by F. H. Field and J. L. Franklin [1],¹ which contained a compilation of ionization and appearance potentials reported through 1955, the study of gaseous ionization phenomena has undergone an explosive growth in the number and variety of pertinent research studies. This field now includes aspects of vacuum ultraviolet spectroscopy, inelastic electron scattering, photoionization, photoelectron spectroscopy, mass spectrometry, charge exchange, and theoretical chemistry.

The present volume is intended to cover the literature published since 1955. It is our hope that it will serve several purposes. First, it will present essentially all of the values of appearance potentials of positive ions obtained since 1955; second it will provide a set of "best" values of heats of formation of gaseous ions; third, it will serve as a guide to the literature.

As there is considerable variation in the quality of the data in this field it would have been simpler to include only the well-determined numbers. However, in some cases the only values available were obtained by imprecise methods, and in the belief that an approximate value is better than none we decided to include all available data in the compilation.

1.2. Literature Coverage

Literature references were obtained initially from unpublished annual bibliographies compiled by volunteers for ASTM Committee E-14 on Mass Spectrometry, the compilations of Kiser [2], bibliographies published in "Advances in Mass Spectrometry" [3], references given in various review articles, and since 1964, by scanning "Current Content, Physical Sciences" and "Physics Abstracts." The cutoff date was June 30, 1966. We feel that coverage is reasonably thorough for experimental papers but rather spotty for theoretical and semiempirical treatments.

¹ Figures in brackets indicate the literature references on page 4.

1.3. Order of Presentation

The heart of this work is table 1, which gives ionization potentials, appearance potentials, probable mechanisms, the method by which the data was obtained, and computed heats of formation of the various positive ions. The order of presentation of the ions is that of increasing atomic number (except for the rare gases, which are given together) and molecular complexity. Section 2, "Order of Presentation," lists the ions and the order and page of their appearance.

For each ion, the various processes of ion formation are arranged in order of increasing complexity, and for each order of complexity, in order of decreasing reliability of method. Thus direct ionization processes are given before fragmentation processes and spectroscopic measurements before electron impact measurements. The mechanisms listed are usually, but not necessarily, those given in the original paper. Where more than one neutral product is proposed, we have usually considered the mechanism to be too speculative to warrant using the resulting heat of formation in arriving at a "best" value. Appearance potentials are given along with the investigator's estimate of the precision of their measurements. These are usually average deviations from the average appearance potential and in no sense limits of accuracy of the measurement.

The method of measurement is indicated in an abbreviated form along with each appearance potential. Table A lists the abbreviations, their meaning, and at least one reference in which the method is discussed in some detail. Theoretical calculations are included for completeness. The table also includes an estimate of the reliability of the methods, which is discussed later.

For most measurements for which a reasonably unambiguous mechanism could be devised by either the investigator or, in a few instances, ourselves, a heat of formation of the product ion has been computed and listed in table 1. This calculation will be discussed below. In some instances where the heat of formation of the ion is well established but that of the neutral species, either reactant or product, is not, we have computed the heat of formation of the neutral. The heats of formation of the neutrals thus determined are collected for convenience in table 2.

Finally, for each appearance potential given in table 1, a numerical reference to the bibliography of appearance potentials is listed. This bibliography follows table 2. The numbers were assigned in the order in which the papers were read and, to simplify the problem of seeking results by a particular author, an author index is included.

TABLE A. *Experimental techniques*

Abbreviation	Method	Reference	Estimated precision in measurement of—	
			IP(eV)	AP(eV)
S	Optical spectroscopy	27	± 0.01	—
PI	Photoionization	19, 20-24	± 0.01	± 0.05
EM	Electron monochromator	9, 10	± 0.05	± 0.05
RPD	Retarding potential difference.	25, 26	± 0.05	± 0.1
PE	Photoelectron spectroscopy.	16, 17, 18	± 0.1	—
SI	Surface ionization	29	± 0.1	—
CS	Critical slope	4	± 0.2	± 0.3
SL	Semi-log plot	8, 28	± 0.2	± 0.3
EVD	Extrapolated voltage difference.	1, 8, 11	± 0.2	± 0.3
FDP	First differential plot	12	± 0.2	± 0.3
MSD	Morrison 2nd differential plot.	12	± 0.2	± 0.3
VC	Vanishing current or initial break.	1, 8	± 0.2	± 0.3
VDF	Voltage difference at fixed percent of ion current at standard intensity.	7, 28	± 0.3	± 0.4
EC	Energy compensation	7, 8	± 0.3	± 0.5
LE	Linear extrapolation	1, 8	± 0.4	± 0.5
NRE	N^{\prime} th root extrapolation	13, 14, 15	?	?
CTS	Charge transfer spectra	5, 6	?	—
TC	Theoretical calculation	8	?	—
NS	Unspecified electron impact method.	—	—	—
D	Derived	—	—	—

1.4. Reliability of Data and Criteria for Evaluation

As noted above, the basic information is of quite variable quality. The responsibility for this rests partly with the molecules and partly with the experiments and their interpretation. A detailed discussion of these factors will not be given here; some pertinent review articles are cited in references [1, 30, 31]. The following general remarks are offered. Above the ionization threshold there exists a wide variety of cross-section behavior both for atoms and molecules. In the former case an important factor is autoionization from Rydberg levels leading to electronically excited states of the ions. For molecules, in addition, there may be differences between the equilibrium configuration of the molecule and the molecule ion. Because of the Franck-Condon principle this produces additional vibrational structure in the cross-section curve. Thus, in some cases doubt arises as to whether the ionization

onset corresponds to an ion without vibrational excitation.

Turning to the experimental techniques, the identification of a molecular Rydberg series, together with investigation of vibrational structure by isotopic substitution almost always leads to a very good value for ionization potentials. Although such data have been obtained for ammonia and ethylene, for example, no corresponding structure has yet been found in the absorption spectrum of many other molecules including oxygen and methane. In photoionization, molecule ions formed with only small equilibrium geometry changes produce sharp photoionization thresholds; whereas molecules having featureless absorption spectra yield gradually rising photoionization curves which are difficult to interpret.

The various electron impact techniques are somewhat poorer because some suffer from lack of an absolute energy scale and some from a wide energy spread in the electron beam, or both. Furthermore a sharp onset at the ionization threshold is not predicted by theory or experimentally observed. Thus, the majority of the methods employing electron impact use a calibrating gas (usually argon) to fix the energy scale with the hope that the cross-section behavior of argon and the molecule under study are not too dissimilar. Examination of the tables will show that for ionization potentials the results in the best cases are frequently, but not always, within a few tenths of a volt or better of the spectroscopic onset.

Because of the widespread occurrence of autoionization, the determination of higher ionization potentials is far more difficult. Reliable information has been obtained essentially only from those vacuum ultraviolet absorption spectra which have yielded identifiable higher Rydberg spectra and from the recently developed technique of photoelectron spectroscopy, which eliminates interference from autoionization. Higher ionization potentials are very difficult to identify in photoionization curves or from electron impact studies.

The determinations of energy thresholds for fragmentation processes suffer the same difficulties as determinations of ionization thresholds. In addition, some fragmentation processes involve production of fragment ions with kinetic energy or electronic excitation. In only a few cases have such phenomena been clearly identified and studied. However, in large molecules experience suggests that these factors may not be very significant and that reasonable thermochemical quantities may be derived from the threshold data. On the basis of existing data it is to be expected that in many, but by no means all cases, fragmentation threshold energies obtained by photoionization will be up to 0.5 eV lower than those determined by electron

impact. Unfortunately relatively few appearance potentials of fragment ions have been obtained by photoionization methods so that we must rely to a large extent upon electron impact determinations.

These considerations have led us to the evaluation of the reliability of the various methods given in table A. This ordering has been a significant basis of the choosing of "best" values. The placement of theoretical calculations was difficult and perhaps incorrect, but reflects our feeling that, at present, theoretical calculations have only moderate predictive value.

It should be emphasized that this table is intended as a general guide to the current reliability of these methods. Some measurements will be better and others worse than indicated in this table.

1.5. Thermochemical Considerations

The heats of formation of ions presented here do not represent equilibrium thermochemical properties. They are the results of measurements on isolated molecules, and were arrived at by employing known heats of formation of neutral species in conventional thermochemical equations employing the measured appearance potential as the heat of reaction. Evidently this treatment is not rigorous. Unfortunately at this time it would be impractical and usually impossible to derive rigorously correct equilibrium values from available information and in many instances the quality of the data does not justify such treatment. Furthermore, the temperature at which the measurements were made is not usually known. Thus although spectroscopic measurements refer to processes at 0 K, photon impact measurements are normally carried out at about 300 K, and electron impact measurements at temperatures considerably greater than 300 K.

Fortunately the temperature effect is not large, and accordingly we have treated all the reported ionization and appearance potentials as heats of reaction at 298 K. The heat of formation of the electron has been taken to be zero at all temperatures.

In computing heats of formation from appearance potentials it is of course necessary to know the heats of formation of the appropriate neutral species. When possible we have taken these from standard compilations, notably Technical Note 270-3 [32] and Circular 500 [33] of the National Bureau of Standards, The JANAF Tables [34] and the API Tables of Thermodynamic Properties of Hydrocarbons [35]. Otherwise, the data was taken from research papers. Unfortunately, values were not always available and in a number of cases we have resorted to the method of Franklin [36] for estimating heats of formation.

1.6. Selection of "Best" Values

Wherever possible we have given our conclusion as to the most reliable heat of formation of an ion. In choosing the heats of formation to be assigned to the various ions we were forced to rely heavily upon internal consistency of the measurements on a given ion and on subjective criteria.

In general, values derived from spectroscopic or photon impact measurements have been given greatest weight, as were values based on direct rather than dissociative ionization processes.

The values of the heats of formation used in arriving at a "best" value are labeled with an asterisk. In those cases where a large number of measurements were involved or where there was any degree of ambiguity, the heats of formation are given beside the formula for the ion in a separate heading preceding each set of data.

1.7. Units

The conversion factors used here are
1 eV = 96487.0 J = 23060.9 cal.

1.8. Concluding Remarks

The authors recognize all too well that in a work of this scope there will be errors of omission and commission and that some choices of "best" values were more subjective than self-evident. We solicit comments, criticism, differences of opinion and additional factual information.

We thank Georgia L. Apostolou, Emma Lou Bageant, Wilma Bell, Robert Cobb, Deborah Ann Copes and William A. Seitz for their assistance in the preparation of this compilation. Our special thanks go to Frederic N. Harllee, who contributed much energy and imagination to the initial phases of this project, to Dr. D. Garvin and J. Hilsenrath for numerous helpful suggestions and to Dr. S. Rossmassler and Dr. E. L. Brady for support and encouragement.

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2. Order of Ion Presentation

The ions in table 1 are arranged in this order: hydrogen first, the rare gases, and then the remaining elements in order of increasing atomic number. Molecules containing two or more elements are found under the element of highest atomic number, except for the rare gas halides, which are listed under the halogens.

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

	Page		Page		Page		Page
H		Xe					
H ⁺	14	Xe ⁺	17	B ₂ D ₄ [‡]	21	B ₆ H ₅ ⁺	25
D ⁺	14	Xe ⁺²	18	B ₂ H ₅ [‡]	21	B ₆ H ₆ ⁺	25
H ₂ ⁺	14	Xe ⁺³	18	B ₂ H ₆ ⁺	21	B ₆ H ₇ ⁺	25
HD ⁺	14	Xe ⁺⁴	18	B ₂ D ₆ ⁺	21	B ₆ H ₈ ⁺	25
D ₂ ⁺	14	Xe ⁺⁵	18	B ₃ H ⁺	21	B ₆ H ₉ ⁺	25
		Xe ⁺⁶	18	B ₃ H ₂ ⁺	22	B ₆ H ₁₀ ⁺	25
		Xe ⁺⁷	19	B ₃ H ₃ ⁺	22	B ₁₀ H ₇ [‡]	25
He		Xe ⁺⁸	19	B ₃ D ₃ ⁺	22	B ₁₀ H ₈ [‡]	25
		Xe ⁺⁹	19	B ₃ H ₅ ⁺	22	B ₁₀ H ₁₀ ⁺	25
He ⁺	15			B ₃ D ₅ ⁺	22	B ₁₀ H ₁₁ ⁺	25
		Li		B ₄ H ⁺	22	B ₁₀ H ₁₂ [‡]	26
Ne		Li ⁺	19	B ₄ H ₂ ⁺	22	B ₁₀ H ₁₄ [‡]	26
		LiH ⁺	19	B ₄ H ₃ ⁺	22	B ₁₀ H ₁₆ ⁺	26
Ne ⁺	15			B ₄ H ₄ ⁺	22		
Ne ⁺²	15			B ₄ D ₄ ⁺	22	C	
Ne ⁺³	15			B ₄ H ₅ ⁺	22		
Ne ⁺⁴	15			B ₄ D ₅ ⁺	23		
Ne ⁺⁵	15	Be ⁺	19	B ₄ H ₆ ⁺	23	C ⁺	26
				B ₄ D ₆ ⁺	23	C ₂ [‡]	26
Ar		B		B ₄ H ₇ ⁺	23	C ₃ [‡]	27
				B ₄ D ₇ ⁺	23	C ₄ [‡]	27
				B ₄ H ₈ ⁺	23	C ₅ [‡]	27
Ar ⁺	15	B ⁺	19	B ₄ D ₈ ⁺	23	C ₆ [‡]	27
Ar ⁺²	16	B ₂ [‡]	20	B ₄ H ₉ ⁺	23	CH ⁺	27
Ar ⁺³	16	BH ⁺	20	B ₄ D ₉ ⁺	23	CH ₂ [‡]	28
Ar ⁺⁴	16	BD ⁺	20	B ₅ H ₄ ⁺	23	CD ₂ [‡]	29
Ar ⁺⁵	16	BH ₂ [‡]	20	B ₅ H ₅ ⁺	23	CH ₃ [‡]	29
Ar ⁺⁶	16	BD ₂ [‡]	20	B ₅ D ₅ ⁺	23	CD ₃ [‡]	33
		BH ₃ [‡]	20	B ₅ H ₆ ⁺	24	CH ₄ [‡]	33
		BD ₃ [‡]	20	B ₅ D ₆ ⁺	24	CD ₄ [‡]	33
Kr		B ₂ H ⁺	20	B ₅ H ₇ ⁺	24	C ₂ H ⁺	33
		B ₂ D ⁺	20	B ₅ D ₇ ⁺	24	C ₂ D ⁺	34
Kr ⁺	16	B ₂ H ₂ ⁺	20	B ₅ D ₈ ⁺	24	C ₂ H ₂ ⁺	34
Kr ⁺²	17	B ₂ HD ⁺	20	B ₅ H ₈ ⁺	24	C ₂ D ₂ [‡]	35
Kr ⁺³	17	B ₂ D ₂ ⁺	20	B ₅ D ₈ ⁺	24	C ₂ H ₃ ⁺	36
Kr ⁺⁴	17	B ₂ H ₃ [‡]	21	B ₅ H ₉ ⁺	24	C ₂ H ₂ D ⁺	37
Kr ⁺⁵	17	B ₂ HD ₂ [‡]	21	B ₅ D ₉ ⁺	24	C ₂ HD ₂ [‡]	37
Kr ⁺⁶	17	B ₂ D ₃ [‡]	21	B ₅ H ₁₀ ⁺	24	C ₂ D ₃ [‡]	37
Kr ⁺⁷	17	B ₂ H ₄ [‡]	21	B ₅ D ₁₀ ⁺	25	C ₂ H ₄ [‡]	37
Kr ⁺⁸	17	B ₂ HD ₃ [‡]	21	B ₆ H ₄ ⁺	25	C ₂ H ₅ ⁺	38

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Page	Page	Page	Page
C ₂ H ₆ ⁺	40	C ₇ H ₇ ⁺	66
C ₃ H ⁺	41	C ₇ H ₅ D ₂ ⁺	67
C ₃ H ₂ ⁺	41	C ₇ H ₈ ⁺	68
C ₃ H ₃ ⁺	41	C ₇ H ₈ ⁺²	69
C ₃ HD ₂ ⁺	42	C ₇ H ₈ ⁺³	69
C ₃ D ₃ ⁺	42	C ₇ H ₉ ⁺	69
C ₃ H ₄ ⁺	43	C ₇ H ₁₀ ⁺	69
C ₃ HD ₃ ⁺	43	C ₇ H ₁₁ ⁺	70
C ₃ H ₅ ⁺	43	C ₇ H ₁₂ ⁺	70
C ₃ H ₆ ⁺	44	C ₇ H ₁₃ ⁺	70
C ₃ H ₇ ⁺	45	C ₇ H ₁₄ ⁺	70
C ₃ H ₈ ⁺	47	C ₇ H ₁₅ ⁺	70
C ₄ H ⁺	47	C ₇ H ₁₆ ⁺	70
C ₄ H ₂ ⁺	47	C ₈ H ₅ ⁺	71
C ₄ H ₃ ⁺	48	C ₈ H ₆ ⁺	71
C ₄ H ₄ ⁺	48	C ₈ H ₇ ⁺	71
C ₄ H ₅ ⁺	49	C ₈ H ₈ ⁺	72
C ₄ H ₆ ⁺	49	C ₈ H ₉ ⁺	72
C ₄ H ₇ ⁺	49	C ₈ H ₁₀ ⁺	73
C ₄ H ₈ ⁺	50	C ₈ H ₁₂ ⁺	74
C ₄ H ₉ ⁺	51	C ₈ H ₁₆ ⁺	74
C ₄ H ₁₀ ⁺	52	C ₈ H ₁₈ ⁺	74
C ₅ H ₃ ⁺	52	C ₉ H ₅ ⁺	75
C ₅ H ₅ ⁺	53	C ₉ H ₇ ⁺	75
C ₅ H ₆ ⁺	53	C ₉ H ₈ ⁺	75
C ₅ H ₅ D ⁺	53	C ₉ H ₁₀ ⁺	75
C ₅ H ₇ ⁺	53	C ₉ H ₁₁ ⁺	76
C ₅ H ₈ ⁺	54	C ₉ H ₈ D ₃ ⁺	76
C ₅ H ₉ ⁺	54	C ₉ H ₁₂ ⁺	76
C ₅ H ₁₀ ⁺	55	C ₉ H ₁₄ ⁺	77
C ₅ H ₁₁ ⁺	56	C ₉ H ₁₆ ⁺	77
C ₅ H ₁₂ ⁺	57	C ₉ H ₂₀ ⁺	77
C ₆ H ⁺	57	C ₁₀ H ₆ ⁺	77
C ₆ H ₂ ⁺	57	C ₁₀ H ₇ ⁺	77
C ₆ H ₃ ⁺	58	C ₁₀ H ₈ ⁺	77
C ₆ H ₄ ⁺	58	C ₁₀ H ₈ ⁺²	78
C ₆ H ₅ ⁺	58	C ₁₀ H ₈ ⁺³	78
C ₆ H ₆ ⁺	60	C ₁₀ H ₁₃ ⁺	78
C ₆ H ₅ D ⁺	62	C ₁₀ H ₁₄ ⁺	79
C ₆ H ₅ D ⁺²	62	C ₁₀ H ₁₆ ⁺	79
C ₆ H ₅ D ⁺³	62	C ₁₀ H ₁₈ ⁺	79
C ₆ D ₆ ⁺	62	C ₁₀ H ₂₂ ⁺	80
C ₆ H ₇ ⁺	63	C ₁₁ H ₇ ⁺	80
C ₆ H ₈ ⁺	63	C ₁₁ H ₉ ⁺	80
C ₆ H ₉ ⁺	63	C ₁₁ H ₁₀ ⁺	80
C ₆ H ₁₀ ⁺	63	C ₁₁ H ₁₅ ⁺	80
C ₆ H ₁₁ ⁺	64	C ₁₁ H ₁₆ ⁺	80
C ₆ H ₁₂ ⁺	64	C ₁₁ H ₁₈ ⁺	81
C ₆ H ₁₃ ⁺	65	C ₁₁ H ₂₄ ⁺	81
C ₆ H ₁₄ ⁺	65	C ₁₂ H ₇ ⁺	81
C ₇ H ₅ ⁺	66	C ₁₂ H ₈ ⁺	81
		C ₁₂ H ₈ ⁺	81
		C ₁₂ H ₉ ⁺	81
		C ₁₂ H ₁₀ ⁺	81
		C ₁₂ H ₁₀ ⁺²	82
		C ₁₂ H ₁₈ ⁺	82
		C ₁₂ H ₂₆ ⁺	82
		C ₁₃ H ₉ ⁺	82
		C ₁₃ H ₁₀ ⁺	82
		C ₁₄ H ₈ ⁺	82
		C ₁₄ H ₉ ⁺	82
		C ₁₄ H ₁₁ ⁺	82
		C ₁₃ H ₁₉ ⁺	82
		C ₁₃ H ₂₈ ⁺	82
		C ₁₄ H ₈ ²	82
		C ₁₄ H ₉ ²	82
		N ⁺	82
		N ₂ ⁺	89
		N ₂ ²	90
		N ₂ ⁺²	90
		N ₃ ⁺	90
		NH ⁺	90
		NH ₂ ⁺	90
		NH ₃ ⁺	91
		NH ₃ ⁺²	91
		N ₂ H ⁺	91
		N ₂ H ₂ ⁺	91
		N ₂ H ₃ ⁺	92
		N ₂ H ₄ ⁺	92
		N ₃ H ⁺	92
		N ₃ H ₃ ⁺	92
		CN ⁺	92
		C ₂ N ⁺	92
		C ₄ N ⁺	93
		C ₅ N ⁺	93
		C ₆ N ⁺	93
		C ₂ N ₂ ⁺	93
		C ₄ N ₂ ⁺	93
		C ₆ N ₂ ⁺	93
		CHN ⁺	93
		CH ₂ N ⁺	93
		CH ₄ N ⁺	93
		CH ₂ D ₂ N ⁺	93
		CH ₅ N ⁺	94
		C ₂ HN ⁺	94
		C ₂ H ₂ N ⁺	94
		C ₂ H ₃ N ⁺	94
		C ₂ H ₄ N ⁺	94
		C ₂ H ₅ N ⁺	95
		C ₂ H ₆ N ⁺	95
		C ₂ H ₇ N ⁺	96
		C ₃ HN ⁺	96
		C ₃ HN ⁺²	96
		C ₃ H ₂ N ⁺	96
		C ₃ H ₃ N ⁺	96
		C ₃ H ₄ N ⁺	96
		C ₃ H ₅ N ⁺	96
		C ₃ H ₆ N ⁺	96
		C ₃ H ₇ N ⁺	96
		C ₃ H ₉ N ⁺	96
		C ₄ H ₄ N ⁺	97
		C ₄ H ₅ N ⁺	97

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Page	Page	Page	Page	Page			
C ₄ H ₆ N ⁺	97	C ₅ H ₁₂ N ₂ ⁺	109	C ₂ H ₄ DO ⁺	123	C ₃ H ₃ D ₂ O ₂ ⁺	135
C ₄ H ₇ N ⁺	97	C ₅ H ₁₃ N ₂ ⁺	109	C ₂ H ₆ O ⁺	124	C ₃ H ₆ O ₂ ⁺	135
C ₄ H ₈ N ⁺	97	C ₅ H ₁₄ N ₂ ⁺	109	C ₃ HO ⁺	124	C ₃ H ₄ D ₂ O ₂ ⁺	135
C ₄ H ₉ N ⁺	97	C ₆ H ₈ N ₂ ⁺	109	C ₃ H ₃ O ⁺	124	C ₃ H ₇ O ₂ ⁺	135
C ₄ H ₁₁ N ⁺	98	C ₁₀ H ₁₆ N ₂ ⁺	109	C ₃ H ₄ O ⁺	124	C ₃ H ₈ O ₂ ⁺	136
C ₅ H ₃ N ⁺	98	CHN ₃ ⁺²	109	C ₃ H ₅ O ⁺	125	C ₄ H ₆ O ₂ ⁺	136
C ₅ H ₄ N ⁺	98	CH ₃ N ₃ ⁺	109	C ₃ H ₆ O ⁺	125	C ₄ H ₈ O ₂ ⁺	136
C ₅ H ₂ D ₂ N ⁺	99	CH ₃ N ₃ ⁺	109	C ₃ H ₇ O ⁺	126	C ₄ H ₉ O ₂ ⁺	136
C ₅ H ₅ N ⁺	99	C ₁₀ H ₁₅ BN ₂ ⁺²	110	C ₃ H ₈ O ⁺	126	C ₄ H ₁₀ O ₂ ⁺	136
C ₅ H ₆ N ⁺	99	C ₆ H ₁₈ BN ₃ ⁺²	110	C ₄ H ₄ O ⁺	126	C ₅ H ₄ O ₂ ⁺	136
C ₅ H ₁₁ N ⁺	100			C ₄ H ₆ O ⁺	126	C ₅ H ₈ O ₂ ⁺	137
C ₅ H ₁₂ N ⁺	100	O		C ₄ H ₇ O ⁺	127	C ₅ H ₁₀ O ₂ ⁺	137
C ₅ H ₁₃ N ⁺	100			C ₄ H ₈ O ⁺	127	C ₅ H ₁₂ O ₂ ⁺	137
C ₆ H ₄ N ⁺	100			C ₄ H ₉ O ⁺	127	C ₆ H ₄ O ₂ ⁺	137
C ₆ H ₆ N ⁺	100	O ⁺	110	C ₄ H ₁₀ O ⁺	127	C ₆ H ₆ O ₂ ⁺	137
C ₆ H ₇ N ⁺	101	O ₂ ⁺	111	C ₅ H ₆ O ⁺	127	C ₆ H ₈ O ₂ ⁺	137
C ₆ H ₁₃ N ⁺	102	O ₃ ⁺	112	C ₅ H ₈ O ⁺	128	C ₇ H ₆ O ₂ ⁺	137
C ₆ H ₁₅ N ⁺	102	OH ⁺	113	C ₅ H ₉ O ⁺	128	C ₇ H ₈ O ₂ ⁺	138
C ₇ H ₅ N ⁺	102	H ₂ O ⁺	113	C ₅ H ₁₀ O ⁺	128	C ₈ H ₈ O ₂ ⁺	138
C ₇ H ₇ N ⁺	103	D ₂ O ⁺	113	C ₆ H ₅ O ⁺	128	C ₉ H ₁₀ O ₂ ⁺	138
C ₇ H ₈ N ⁺	103	H ₃ O ⁺	113	C ₆ H ₆ O ⁺	129	C ₁₃ H ₁₀ O ₂ ⁺	138
C ₇ H ₉ N ⁺	103	H ₃ O ⁺	113	C ₆ H ₈ O ⁺	129	C ₁₄ H ₁₀ O ₂ ⁺	138
C ₈ H ₆ N ⁺	104	HO ₂ ⁺	113	C ₆ H ₁₀ O ⁺	129	C ₁₄ H ₁₂ O ₂ ⁺	138
C ₈ H ₇ N ⁺	104	H ₂ O ₂ ⁺	114	C ₆ H ₁₂ O ⁺	129	C ₆ H ₁₄ O ₂ ⁺	138
C ₈ H ₁₀ N ⁺	104	Li ₂ O ⁺	114	C ₆ H ₇ D ₅ O ⁺	129	C ₇ H ₅ O ₂ ⁺	139
C ₈ H ₁₁ N ⁺	104	BeO ⁺	114	C ₆ H ₁₄ O ⁺	130	C ₇ H ₆ O ₂ ⁺	139
C ₈ H ₁₉ N ⁺	104	Be ₂ O ⁺	114	C ₇ H ₅ O ⁺	130	C ₈ H ₈ O ₂ ⁺	139
C ₉ H ₁₃ N ⁺	105	Be ₂ O ₂ ⁺	114	C ₇ H ₆ O ⁺	130	C ₉ H ₁₀ O ₂ ⁺	139
C ₉ H ₂₁ N ⁺	105	Be ₃ O ₂ ⁺	114	C ₇ H ₇ O ⁺	131	C ₁₃ H ₁₀ O ₃ ⁺	139
C ₁₀ H ₁₅ N ⁺	105	Be ₃ O ₃ ⁺	114	C ₇ H ₈ O ⁺	131	C ₁₃ H ₁₂ O ₃ ⁺	139
C ₁₁ H ₁₇ N ⁺	105	BO ₂ ⁺	114	C ₇ H ₁₄ O ⁺	131	C ₁₄ H ₁₀ O ₃ ⁺	139
C ₁₂ H ₁₁ N ⁺	105	BO ₃ ⁺	114	C ₈ H ₆ O ⁺	132	C ₆ H ₁₁ O ₅ ⁺	139
C ₁₂ H ₁₉ N ⁺	105	CO ⁺	114	C ₈ H ₇ O ⁺	132	HNO ₃ ⁺	139
C ₁₄ H ₂₃ N ⁺	105	CO ⁺²	114	C ₈ H ₈ O ⁺	132	C ₂ H ₆ BO ⁺	139
C ₁₈ H ₁₅ N ⁺	105	CO ₂ ⁺	115	C ₈ H ₉ O ⁺	132	C ₂ H ₅ BO ₂ ⁺	139
CHN ₂ ⁺	106	CO ₂ ⁺	115	C ₈ H ₇ D ₂ O ⁺	132	C ₂ H ₆ BO ₂ ⁺	139
CH ₂ N ₂ ⁺	106	CO ₂ ⁺²	116	C ₈ H ₆ D ₃ O ⁺	132	C ₂ H ₇ BO ₂ ⁺	139
CH ₃ N ₂ ⁺	106	NO ⁺	116	C ₈ H ₁₀ O ⁺	133	C ₂ H ₆ BO ₃ ⁺	139
CH ₄ N ₂ ⁺	106	NO ⁺²	117	C ₉ H ₁₀ O ⁺	133	C ₃ H ₉ BO ₃ ⁺	140
CH ₅ N ₂ ⁺	106	N ₂ O ⁺	117	C ₁₂ H ₈ O ⁺	133	CH ₃ NO ⁺	140
CH ₆ N ₂ ⁺	107	NO ₂ ⁺	118	C ₁₂ H ₉ O ⁺	133	C ₂ H ₅ NO ⁺	140
C ₂ H ₅ N ₂ ⁺	107	B ₃ H ₂ O ₃ ⁺	119	C ₁₃ H ₁₀ O ⁺	133	C ₃ H ₇ NO ⁺	140
C ₂ H ₆ N ₂ ⁺	107	B ₃ H ₃ O ₃ ⁺	119	C ₁₄ H ₁₂ O ⁺	134	C ₄ H ₉ NO ⁺	140
C ₂ H ₇ N ₂ ⁺	107	CHO ⁺	119	CHO ₂ ⁺	134	C ₅ H ₅ NO ⁺	140
C ₂ H ₈ N ₂ ⁺	107	CDO ⁺	119	CH ₂ O ₂ ⁺	134	C ₅ H ₁₁ NO ⁺	140
C ₃ H ₇ N ₂ ⁺	108	CH ₂ O ⁺	119	CH ₃ O ₂ ⁺	134	C ₆ H ₅ NO ⁺	140
C ₃ H ₈ N ₂ ⁺	108	CD ₂ O ⁺	120	C ₂ H ₂ O ₂ ⁺	134	C ₆ H ₇ NO ⁺	140
C ₃ H ₉ N ₂ ⁺	108	CH ₃ O ⁺	120	C ₂ H ₃ O ₂ ⁺	134	C ₆ H ₁₃ NO ⁺	140
C ₃ H ₁₀ N ₂ ⁺	108	CH ₂ DO ⁺	121	C ₂ H ₄ O ₂ ⁺	134	C ₇ H ₅ NO ⁺	140
C ₄ H ₃ N ₂ ⁺	108	CH ₄ O ⁺	121	C ₂ HD ₃ O ₂ ⁺	134	C ₇ H ₇ NO ⁺	141
C ₄ H ₄ N ₂ ⁺	108	C ₂ HO ⁺	121	C ₂ H ₅ O ₂ ⁺	135	C ₇ H ₉ NO ⁺	141
C ₄ H ₁₀ N ₂ ⁺	108	C ₂ H ₂ O ⁺	121	C ₃ H ₄ O ₂ ⁺	135	C ₈ H ₅ NO ⁺	141
C ₄ H ₁₁ N ₂ ⁺	108	C ₂ H ₃ O ⁺	122	C ₃ H ₄ O ₂ ⁺	135	C ₈ H ₉ NO ⁺	141
C ₄ H ₁₂ N ₂ ⁺	109	C ₂ D ₃ O ⁺	122	C ₃ H ₅ O ₂ ⁺	135	C ₈ H ₉ NO ⁺	141
C ₅ H ₆ N ₂ ⁺	109	C ₂ H ₄ O ⁺	123	C ₃ H ₄ DO ₂ ⁺	135	C ₉ H ₇ NO ⁺	141
	109	C ₂ H ₅ O ⁺	123				

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions – Continued

	Page		Page		Page		Page
C ₁₃ H ₁₁ NO ⁺	141	C ₃ F ₂ ⁺	147	OF ⁺	154	C ₂ H ₃ BF ⁺	160
C ₁₄ H ₉ NO ⁺	141	C ₄ F ₂ ⁺	147	O ₂ F ⁺	154	C ₂ H ₄ BF ⁺	160
C ₂ HN ₂ O ⁺	141	C ₅ F ₂ ⁺	147	OF ₂ ⁺	154	C ₂ H ₅ BF ⁺	160
C ₃ H ₄ N ₂ O ⁺	142	CF ₃ ⁺	148	CHF ⁺	154	CH ₃ BF ₂ ⁺	160
		CF ₃ ⁺	148	CH ₂ F ⁺	154	C ₂ H ₃ BF ₂ ⁺	160
C ₈ H ₅ N ₂ O ⁺	142	C ₂ F ₃ ⁺	149	CH ₃ F ⁺	154	C ₂ H ₄ BF ₂ ⁺	160
C ₈ H ₆ N ₂ O ⁺	142	C ₃ F ₃ ⁺	149	C ₂ HF ⁺	155	C ₂ H ₅ BF ₂ ⁺	160
C ₁₄ H ₁₀ N ₂ O ⁺	142	C ₅ F ₃ ⁺	149	C ₂ H ₂ F ⁺	155	C ₈ H ₁₀ NF ⁺	160
CH ₂ NO ₂ ⁺	142	CF ₄ ⁺	149	C ₂ H ₃ F ⁺	155	C ₆ H ₅ OF ⁺	160
CH ₃ NO ₂ ⁺	142	C ₂ F ₄ ⁺	149	C ₂ H ₄ F ⁺	155	C ₇ H ₅ OF ⁺	160
C ₂ H ₅ NO ₂ ⁺	142	C ₃ F ₄ ⁺	149	C ₃ H ₂ F ⁺	155	C ₈ H ₅ OF ₃ ⁺	160
C ₃ H ₇ NO ₂ ⁺	142	C ₅ F ₄ ⁺	149	C ₃ H ₄ F ⁺	155	C ₈ H ₃ OF ₅ ⁺	161
C ₄ H ₅ NO ₂ ⁺	143	C ₂ F ₅ ⁺	150	C ₄ H ₃ F ⁺	155	C ₅ H ₃ OF ₇ ⁺	161
C ₆ H ₅ NO ₂ ⁺	143	C ₃ F ₅ ⁺	150	C ₅ H ₄ F ⁺	155	C ₇ H ₂ NOF ₅ ⁺	161
C ₆ H ₁₃ NO ₂ ⁺	143	C ₄ F ₅ ⁺	150	C ₆ H ₄ F ⁺	155	C ₁₉ H ₁₀ N ₄ O ₂ F ₆ ⁺	161
C ₇ H ₆ NO ₂ ⁺	143	C ₅ F ₅ ⁺	150	C ₆ H ₅ F ⁺	156	C ₁₁ H ₅ N ₂ OF ₇ ⁺	161
C ₇ H ₇ NO ₂ ⁺	143	C ₆ F ₅ ⁺	150	C ₇ H ₆ F ⁺	156	C ₁₅ H ₅ N ₂ OF ₁₅ ⁺	161
C ₈ H ₉ NO ₂ ⁺	143	C ₃ F ₆ ⁺	151	C ₇ H ₇ F ⁺	156		
C ₉ H ₇ NO ₂ ⁺	143	C ₄ F ₆ ⁺	151	CHF ₂ ⁺	156	Na	
C ₆ H ₈ N ₂ O ₂ ⁺	143	C ₆ F ₆ ⁺	151	CH ₂ F ₂ ⁺	156		
CH ₂ NO ₃ ⁺	143	C ₃ F ₇ ⁺	151	C ₂ HF ₂ ⁺	156		
C ₂ H ₅ NO ₃ ⁺	143	C ₄ F ₇ ⁺	151	C ₂ H ₂ F ₂ ⁺	157	Na ⁺	161
C ₃ H ₇ NO ₃ ⁺	144	C ₅ F ₇ ⁺	151	C ₂ H ₃ F ₂ ⁺	157	Na ⁺²	161
C ₆ H ₅ NO ₃ ⁺	144	C ₁₁ F ₇ ⁺	151	C ₂ H ₄ F ₂ ⁺	157	Na ⁺³	161
C ₇ H ₅ NO ₃ ⁺	144	C ₄ F ₈ ⁺	151	C ₃ HF ₂ ⁺	157	Na ₂ ⁺	161
C ₈ H ₇ NO ₃ ⁺	144	C ₇ F ₈ ⁺	151	C ₃ H ₂ F ₂ ⁺	157		
C ₁₃ H ₉ NO ₃ ⁺	144	C ₁₂ F ₈ ⁺	152	C ₃ H ₃ F ₂ ⁺	157	Mg	
C ₈ H ₇ NO ₄ ⁺	144	C ₅ F ₉ ⁺	152	C ₃ H ₄ F ₂ ⁺	157		
		C ₆ F ₉ ⁺	152	C ₃ H ₅ F ₂ ⁺	157	Mg ⁺	161
F		C ₁₂ F ₉ ⁺	152	C ₄ H ₂ F ₂ ⁺	157	MgF ⁺	162
		C ₅ F ₁₀ ⁺	152	C ₆ H ₃ F ₂ ⁺	157	MgF ₂ ⁺	162
F ⁺	144	C ₆ F ₁₀ ⁺	152	C ₆ H ₄ F ₂ ⁺	158	Mg ₂ F ₃ ⁺	162
F ₂ ⁺	145	C ₁₂ F ₁₀ ⁺	152	C ₂ HF ₃ ⁺	158		
HF ⁺	145	C ₆ F ₁₁ ⁺	152	C ₂ H ₂ F ₃ ⁺	158	Al	
XeF ⁺	145	C ₁₇ F ₁₁ ⁺	152	C ₃ H ₂ F ₃ ⁺	158		
XeF ₂ ⁺	145	C ₆ F ₁₂ ⁺	152	C ₃ H ₃ F ₃ ⁺	158	Al ⁺	162
XeF ₃ ⁺	145	C ₁₈ F ₁₂ ⁺	152	C ₆ H ₂ F ₃ ⁺	158	AlO ⁺	162
XeF ₄ ⁺	145	C ₇ F ₁₃ ⁺	153	C ₆ H ₃ F ₃ ⁺	158	Al ₂ O ⁺	162
LiF ⁺	145	C ₁₈ F ₁₃ ⁺	153	C ₇ H ₅ F ₃ ⁺	158	Al ₂ O ₂ ⁺	162
Li ₂ F ⁺	145	C ₇ F ₁₄ ⁺	153	C ₇ H ₁₁ F ₃ ⁺	159	AlF ⁺	162
BeF ⁺	145	C ₇ F ₁₄ ⁺	153	C ₆ HF ₄ ⁺	159	AlF ₂ ⁺	162
BeF ₂ ⁺	145	C ₁₈ F ₁₄ ⁺	153	C ₆ H ₂ F ₄ ⁺	159		
BF ⁺	145	C ₂₄ F ₁₈ ⁺	153	C ₆ HF ₅ ⁺	159	Si	
BF ₂ ⁺	146	NF ⁺	153	C ₇ H ₃ F ₅ ⁺	159		
BF ₃ ⁺	146	N ₂ F ⁺	153	C ₆ F ₁₅ N ⁺	159	Si ⁺	162
CF ⁺	146	NF ₃ ⁺	153	C ₇ F ₅ O ⁺	159	Si ₂ ⁺	163
C ₃ F ⁺	146	N ₂ F ₂ ⁺	153	C ₈ F ₈ O ⁺	159	SiH ⁺	163
C ₅ F ⁺	146	NF ₃ ⁺	153	CH ₂ BF ⁺	159	SiH ₂ ⁺	163
CF ₂ ⁺	147	N ₂ F ₃ ⁺	154	CH ₃ BF ⁺	159	SiH ₃ ⁺	163
CF ₂ ⁺	147	N ₂ F ₃ ⁺	154	CH ₂ BF ⁺	160	Si ₂ H ₆ ⁺	163
C ₂ F ₂ ⁺	147	N ₂ F ₄ ⁺	154	C ₂ H ₂ BF ⁺	160	SiB ⁺	163

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

	Page		Page		Page		Page
SiC ⁺	163	P ₂ H ⁺	168	H ₂ S ₂ ⁺	173	C ₄ H ₈ S ₂ ⁺	181
SiC ₂ ⁺	164	P ₂ H ₂ ⁺	168	CS ⁺	173	C ₄ H ₁₀ S ₂ ⁺	181
Si ₂ C ⁺	164	P ₂ H ₃ ⁺	168	CS ₂ ⁺	174	CH ₃ S ₃ ⁺	182
Si ₂ C ₂ ⁺	164	P ₂ H ₄ ⁺	169	CS ₂ ⁺²	174	C ₂ H ₆ S ₃ ⁺	182
Si ₂ C ₃ ⁺	164	P ₂ H ₃ D ⁺	169	CS ₂ ⁺³	174	CNS ⁺	182
Si ₃ C ⁺	164	P ₂ H ₂ D ₂ ⁺	169	NS ⁺	174	C ₂ NS ⁺	182
SiO ⁺	164	PC ⁺	169	SO ⁺	175	COS ⁺	182
SiF ⁺	164	PO ⁺	169	SO ₂ ⁺	175	SOF ⁺	182
SiF ₄ ⁺	164	PO ₃ ⁺	169	S ₂ O ⁺	175	SO ₂ F ⁺	182
CHSi ⁺	164	PF ₃ ⁺	169	SF ₃ ⁺	175	SO ₂ F ₂ ⁺	182
CH ₂ Si ⁺	164	AlP ⁺	169	SF ₄ ⁺	175	CHNS ⁺	183
CH ₃ Si ⁺	164	CHP ⁺	169	SF ₅ ⁺	175	CH ₂ NS ⁺	183
CH ₄ Si ⁺	164	CH ₂ P ⁺	169	CHS ⁺	175	C ₂ HNS ⁺	183
CH ₅ Si ⁺	164	CH ₃ P ⁺	169	CDS ⁺	176	C ₂ HNS ⁺²	183
C ₂ H ₆ Si ⁺	164	CH ₄ P ⁺	170	CH ₂ S ⁺	176	C ₂ H ₂ NS ⁺	183
C ₂ H ₇ Si ⁺	165	CH ₅ P ⁺	170	CH ₃ S ⁺	176	C ₂ H ₃ NS ⁺	183
C ₂ H ₈ Si ⁺	165	C ₂ H ₂ P ⁺	170	CH ₂ DS ⁺	177	C ₃ H ₅ NS ⁺	183
C ₃ H ₉ Si ⁺	165	C ₂ H ₃ P ⁺	170	CHD ₂ S ⁺	177	C ₄ H ₁₀ NS ⁺	183
C ₃ H ₁₀ Si ⁺	165	C ₂ H ₄ P ⁺	170	CD ₃ S ⁺	177	C ₇ H ₅ NS ⁺	183
C ₄ H ₁₁ Si ⁺	165	C ₂ H ₅ P ⁺	170	CH ₄ S ⁺	177	C ₈ H ₇ NS ⁺	183
C ₄ H ₁₂ Si ⁺	165	C ₂ H ₆ P ⁺	170	CH ₅ S ⁺	177	CH ₄ N ₂ S ⁺	183
C ₅ H ₁₄ Si ⁺	165	C ₂ H ₇ P ⁺	170	C ₂ H ₂ S ⁺	177	C ₂ H ₆ N ₂ S ⁺	183
C ₆ H ₁₆ Si ⁺	165	C ₃ H ₈ P ⁺	170	C ₂ H ₃ S ⁺	177	C ₃ H ₆ N ₂ S ⁺	184
C ₇ H ₁₈ Si ⁺	165	C ₃ H ₉ P ⁺	170	C ₂ H ₄ S ⁺	178	C ₃ H ₈ N ₂ S ⁺	184
C ₅ H ₁₅ Si ₂ ⁺	166	C ₄ H ₁₀ P ⁺	171	C ₂ H ₅ S ⁺	178	C ₄ H ₁₀ N ₂ S ⁺	184
C ₆ H ₁₈ Si ₂ ⁺	166	C ₄ H ₁₁ P ⁺	171	C ₂ H ₆ S ⁺	178	C ₅ H ₁₂ N ₂ S ⁺	184
BCSi ⁺	166	C ₅ H ₁₂ P ⁺	171	C ₂ H ₃ D ₃ S ⁺	178	C ₂ H ₄ SO ⁺	184
C ₇ H ₁₉ SiN ⁺	166	C ₆ H ₁₅ P ⁺	171	C ₄ H ₅ S ⁺	178	C ₄ H ₁₀ SO ₃ ⁺	184
C ₃ H ₉ SiO ⁺	166	C ₁₈ H ₁₅ P ⁺	171	C ₃ H ₆ S ⁺	178		
C ₄ H ₁₂ SiO ⁺	166	HPO ₃ ⁺	171	C ₃ H ₇ S ⁺	179	Cl	
C ₅ H ₁₅ Si ₂ O ⁺	166	C ₃ F ₉ P ⁺	171	C ₃ H ₈ S ⁺	179	Cl ⁺	184
C ₆ H ₁₈ Si ₂ O ⁺	166	SiPH ₅ ⁺	171	C ₄ H ₄ S ⁺	179	Cl ₂ ⁺	185
C ₂ H ₆ SiF ⁺	166	CH ₄ PO ₃ ⁺	171	C ₄ H ₃ DS ⁺	179	Cl ₂ ²	185
C ₃ H ₉ SiF ⁺	166	C ₂ H ₆ PO ₃ ⁺	171	C ₄ H ₇ S ⁺	179	C ₅ H ₅ S ⁺	185
		C ₂ H ₇ PO ₃ ⁺	171	C ₄ H ₈ S ⁺	179	C ₅ H ₉ S ⁺	185
			171	C ₄ H ₁₀ S ⁺	179	C ₅ H ₁₁ S ⁺	185
P				C ₆ H ₅ S ⁺	180	HCl ⁺	185
		S		C ₆ H ₆ S ⁺	180	HCl ₂ ⁺	185
P ⁺	166	S ⁺	171	C ₆ H ₅ DS ⁺	180	XeCl ₄ ⁺	185
P ⁺²	167	S ₂ ⁺	172	C ₆ H ₈ S ⁺	180	LiCl ⁺	185
P ₂ ⁺	167	S ₃ ⁺	172	C ₆ H ₁₄ S ⁺	180	Li ₂ Cl ⁺	185
P ₃ ⁺	167	S ₄ ⁺	172	C ₇ H ₇ S ⁺	180	BCl ⁺	185
P ₄ ⁺	167	S ₅ ⁺	172	C ₇ H ₈ S ⁺	180	BCl ₂ ⁺	185
PH ⁺	167	S ₆ ⁺	172	C ₇ H ₁₀ S ⁺	180	BCl ₃ ⁺	186
PH ⁺²	167	S ₇ ⁺	172	C ₈ H ₁₀ S ⁺	181	CCl ⁺	186
PH ₂ ⁺	167	HS ⁺	172	C ₈ H ₁₂ S ⁺	181	CCl ₂ ⁺	186
PH ₂ ⁺²	168	H ₂ S ⁺	173	CH ₃ S ₂ ⁺	181	CCl ₃ ⁺	186
PH ₃ ⁺²	168	H ₃ S ⁺	173	CH ₄ S ₂ ⁺	181	CCl ₄ ⁺	186
PH ₂ D ⁺	168	H ₂ DS ⁺	173	C ₂ H ₅ S ₂ ⁺	181	C ₂ Cl ₄ ⁺	186
PHD ₂ ⁺	168	HD ₂ S ⁺	173	C ₂ H ₆ S ₂ ⁺	181	ClO ⁺	186
PD ₃ ⁺	168	D ₃ S ⁺	173	C ₂ H ₆ S ₂ ⁺	181	ClO ₂ ⁺	186
PH ₃ ⁺²	168				181	ClO ₃ ⁺	187
PH ₄ ⁺	168				181	FCl ⁺	187

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Page	Page	Page	Page	Page
F ₂ Cl ⁺	187	ClO ₃ F ⁺	194	V
F ₃ Cl ⁺	187	POCl ₂ ⁺	194	
MgCl ⁺	187	POCl ₃ ⁺	194	V ⁺
MgCl ₂ ⁺	187	C ₅ H ₄ NCl ⁺	194	C ₃ H ₃ V ⁺
Mg ₂ Cl ₃ ⁺	187	C ₈ H ₁₀ NCl ⁺	195	C ₅ H ₅ V ⁺
SiCl ₃ ⁺	187	C ₂ H ₂ OCl ⁺	195	C ₆ H ₅ OV ⁺
PCl ⁺	187	C ₂ H ₃ OCl ⁺	195	C ₇ H ₅ O ₂ V ⁺
P ₂ Cl ⁺	187	C ₃ H ₅ OCl ⁺	195	C ₉ H ₅ O ₄ V ⁺
PCl ₂ ⁺	187	C ₆ H ₅ OCl ⁺	195	
P ₂ Cl ₂ ⁺	188	C ₇ H ₅ OCl ⁺	195	
PCl ₃ ⁺	188	C ₈ H ₇ OCl ⁺	195	Cr
P ₂ Cl ₃ ⁺	188	C ₁₃ H ₉ OCl ⁺	195	Cr ⁺
P ₂ Cl ₄ ⁺	188	C ₂ H ₄ O ₂ Cl ⁺	196	CrO ⁺
CHCl ⁺	188	C ₃ H ₅ O ₂ Cl ⁺	196	CrO ₂ ⁺
CH ₂ Cl ⁺	188	C ₈ H ₇ O ₂ Cl ⁺	196	CrO ₃ ⁺
CH ₃ Cl ⁺	188	C ₇ H ₄ OCl ₂ ⁺	196	CrF ⁺
C ₂ HCl ⁺	189	CHFCl ⁺	196	CrF ₂ ⁺
C ₂ H ₂ Cl ⁺	189	C ₂ H ₂ FCl ⁺	196	CrCl ⁺
C ₂ H ₃ Cl ⁺	189	C ₆ H ₄ FCl ⁺	196	CrCl ₂ ⁺
C ₂ D ₃ Cl ⁺	189	CHF ₂ Cl ⁺	196	CrCO ⁺
C ₂ H ₅ Cl ⁺	189	C ₂ HF ₂ Cl ⁺	196	CrC ₂ O ₂ ⁺
C ₃ H ₃ Cl ⁺	189	C ₂ H ₃ F ₂ Cl ⁺	197	CrC ₃ O ₃ ⁺
C ₃ H ₄ Cl ⁺	189	C ₄ H ₂ F ₇ Cl ⁺	197	CrC ₄ O ₄ ⁺
C ₃ H ₇ Cl ⁺	190	CHFCl ₂ ⁺	197	CrC ₅ O ₅ ⁺
C ₄ H ₉ Cl ⁺	190	C ₂ H ₆ SiCl ⁺	197	CrC ₆ O ₆ ⁺
C ₅ H ₄ Cl ⁺	190	C ₃ H ₉ SiCl ⁺	197	CrOF ⁺
C ₆ H ₅ Cl ⁺	190	CH ₃ SiCl ₃ ⁺	197	CrO ₂ F ⁺
C ₇ H ₆ Cl ⁺	191	C ₂ H ₃ SiCl ₃ ⁺	197	CrOF ₂ ⁺
C ₇ H ₇ Cl ⁺	191	C ₂ H ₅ SiCl ₃ ⁺	197	CrO ₂ F ₂ ⁺
CHCl ₂ ⁺	191	C ₃ H ₇ SiCl ₃ ⁺	197	CrOCl ⁺
CH ₂ Cl ₂ ⁺	192	C ₄ H ₃ ClS ⁺	197	CrO ₂ Cl ⁺
C ₂ H ₂ Cl ₂ ⁺	192	C ₃ H ₃ N ₂ OCl ⁺	197	CrOCl ₂ ⁺
C ₂ H ₄ Cl ₂ ⁺	192	C ₇ H ₄ NO ₃ Cl ⁺	197	CrO ₂ Cl ₂ ⁺
C ₃ H ₄ Cl ₂ ⁺	192	C ₃ HN ₂ OCl ₃ ⁺	197	
C ₃ H ₆ Cl ₂ ⁺	192			Mn
C ₆ H ₄ Cl ₂ ⁺	193	K		
CHCl ₃ ⁺	193	K ⁺	197	Mn ⁺
C ₂ HCl ₃ ⁺	193			MnF ⁺
C ₂ H ₂ Cl ₄ ⁺	193			MnF ₂ ⁺
CNCI ⁺	193	Ca		C ₅ H ₅ Mn ⁺
CFCl ⁺	193			C ₆ H ₅ OMn ⁺
CF ₂ Cl ⁺	193			C ₈ H ₅ O ₃ Mn ⁺
CF ₃ Cl ⁺	193	Ca ⁺	198	
C ₂ F ₃ Cl ⁺	194	Ca ⁺²	198	Fe
C ₃ F ₅ Cl ⁺	194	CaO ⁺	198	Fe ⁺
C ₆ F ₅ Cl ⁺	194	CaF ⁺	198	FeF ⁺
CFCl ₂ ⁺	194			FeF ₂ ⁺
CF ₂ Cl ₂ ⁺	194	Sc		FeCl ⁺
C ₂ F ₂ Cl ₂ ⁺	194			FeCl ₂ ⁺
C ₄ F ₆ Cl ₂ ⁺	194	Sc ⁺	198	Fe ₂ Cl ₃ ⁺
CFCl ₃ ⁺	194	ScF ⁺	198	Fe ₂ Cl ₄ ⁺
C ₂ F ₃ Cl ₃ ⁺	194	ScF ₂ ⁺	198	FeCo ⁺
				FeCo ⁺²
				FeC ₂ O ₂ ⁺
				FeC ₃ O ₃ ⁺
				FeC ₄ O ₄ ⁺
				FeC ₅ O ₅ ⁺
				Co ⁺
				C ₃ H ₃ Co ⁺
				C ₅ H ₅ Co ⁺
				CoCO ⁺
				C ₆ H ₅ OCO ⁺
				C ₇ H ₅ O ₂ Co ⁺
				Ni
				Ni ⁺
				NiO ⁺
				NiF ⁺
				NiF ₂ ⁺
				NiCl ⁺
				NiCl ₂ ⁺
				NiCO ⁺
				NiC ₂ O ₂ ⁺
				NiC ₃ O ₃ ⁺
				NiC ₄ O ₄ ⁺
				Cu
				Cu ⁺
				CuF ⁺
				CuF ₂ ⁺
				Ge
			201	Mn ⁺
			201	MnF ⁺
			201	Ge ⁺
			201	Ge ₂ ⁺
			201	Ge ₃ ⁺
			201	GeH ⁺
			201	GeH ₂ ⁺
			201	GeH ₃ ⁺
			201	Ge ₂ H ⁺
			201	Ge ₂ H ₂ ⁺
			201	Ge ₂ H ₃ ⁺
			201	Ge ₂ H ₄ ⁺
			201	Ge ₂ H ₅ ⁺
			201	Ge ₂ H ₆ ⁺
			201	Ge ₃ H ⁺
			201	Ge ₃ H ₂ ⁺
			201	Ge ₃ H ₃ ⁺
			201	Ge ₃ H ₄ ⁺
			201	Ge ₃ H ₅ ⁺
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			201	Ge ₃ H ₁₀ ⁺
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			201	Ge ₃ H ₅₈ ⁺
			201	Ge ₃ H ₅₉ ⁺
			201	Ge ₃ H ₆₀ ⁺
			201	Ge ₃ H ₆₁ ⁺
			201	Ge ₃ H ₆₂ ⁺
			201	Ge ₃ H ₆₃ ⁺
			201	Ge ₃ H ₆₄ ⁺
			201	Ge ₃ H ₆₅ ⁺
			201	Ge ₃ H ₆₆ ⁺
			201	Ge ₃ H ₆₇ ⁺
			201	Ge ₃ H ₆₈ ⁺
			201	Ge ₃ H ₆₉ ⁺
			201	Ge ₃ H ₇₀ ⁺
			201	Ge ₃ H ₇₁ ⁺
			201	Ge ₃ H ₇₂ ⁺
			201	Ge ₃ H ₇₃ ⁺
			201	Ge ₃ H ₇₄ ⁺
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			201	Ge ₃ H ₇₆ ⁺
			201	Ge ₃ H ₇₇ ⁺
			201	Ge ₃ H ₇₈ ⁺
			201	Ge ₃ H ₇₉ ⁺
			201	Ge ₃ H ₈₀ ⁺
			201	Ge ₃ H ₈₁ ⁺
			201	Ge ₃ H ₈₂ ⁺
			201	Ge ₃ H ₈₃ ⁺
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			201	Ge ₃ H ₈₇ ⁺
			201	Ge ₃ H ₈₈ ⁺
			201	Ge ₃ H ₈₉ ⁺
			201	Ge ₃ H ₉₀ ⁺
			201	Ge ₃ H ₉₁ ⁺
			201	Ge ₃ H ₉₂ ⁺
			201	Ge ₃ H ₉₃ ⁺
			201	Ge ₃ H ₉₄ ⁺
			201	Ge ₃ H ₉₅ ⁺
			201	Ge ₃ H ₉₆ ⁺
			201	Ge ₃ H ₉₇ ⁺
			201	Ge ₃ H ₉₈ ⁺
			201	Ge ₃ H ₉₉ ⁺
			201	Ge ₃ H ₁₀₀ ⁺
			201	Ge ₃ H ₁₀₁ ⁺
			201	Ge ₃ H ₁₀₂ ⁺
			201	Ge ₃ H ₁₀₃ ⁺
			201	Ge ₃ H ₁₀₄ ^{+</}

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

	Page		Page		Page		Page
Ge ₃ H ₄ ⁺	205	BBr ₂ ⁺	209	C ₈ H ₅ O ₂ Br ⁺	215	MoC ₄ O ₄ ⁺	218
Ge ₃ H ₅ ⁺	205	BBr ₃ ⁺	209	C ₈ H ₇ O ₂ Br ⁺	215	MoC ₅ O ₅ ⁺	218
Ge ₃ H ₆ ⁺	205	CBr ⁺	209	C ₆ H ₄ FBr ⁺	215	MoC ₆ O ₆ ⁺	218
Ge ₃ H ₇ ⁺	205	CBr ₂ ⁺	209	C ₂ H ₃ FBr ₂ ⁺	215	SrMoO ₂ ⁺	218
Ge ₃ H ₈ ⁺	205	CBr ₃ ⁺	209	C ₂ H ₂ F ₂ Br ₂ ⁺	215	SrMoO ₃ ⁺	218
GeO ⁺	205	CBr ₄ ⁺	209	C ₂ H ₆ SiBr ⁺	215	SrMoO ₄ ⁺	218
Ge ₂ O ⁺	205	BrF ⁺	209	C ₃ H ₉ SiBr ⁺	215		
Ge ₂ O ₂ ⁺	206	BrF ₂ ⁺	209	C ₄ H ₃ BrS ⁺	215	Ru	
Ge ₃ O ₃ ⁺	206	BrF ₃ ⁺	210	CH ₂ ClBr ⁺	215	Ru ⁺	218
CH ₃ Ge ⁺	206	BrF ₄ ⁺	210	C ₂ H ₄ ClBr ⁺	215	RuO ⁺	218
C ₂ H ₆ Ge ⁺	206	MgBr ⁺	210	CHCl ₂ Br ⁺	215	RuO ₂ ⁺	219
C ₃ H ₉ Ge ⁺	206	MgBr ₂ ⁺	210	CHClBr ₂ ⁺	215	RuO ₃ ⁺	219
C ₄ H ₁₂ Ge ⁺	206	Mg ₂ Br ₃ ⁺	210			RuO ₄ ⁺	219
GeSiH ₆ ⁺	206	BrCl ⁺	210	Rb			
		FeBr ⁺	210	Rb ⁺	215	Rh	
As		Fe ₂ Br ₂ ⁺	210			Rh ⁺	219
As ⁺	206	Fe ₂ Br ₄ ⁺	210	Sr		RhO ⁺	219
As ₂ ⁺	206	B ₅ H ₈ Br ⁺	210	Sr ⁺	215	RhO ₂ ⁺	219
AsH ⁺	206	CH ₂ Br ⁺	210	Sr ⁺²	216		
AsH ₂ ⁺	206	CH ₃ Br ⁺	211	SrO ⁺	216	Pd	
AsH ₃ ⁺	206	C ₂ H ₂ Br ⁺	211	Sr ₂ O ⁺	216		
As ₂ H ⁺	207	C ₂ H ₃ Br ⁺	211	SrF ⁺	216	Pd ⁺	219
As ₂ H ₂ ⁺	207	C ₂ H ₅ Br ⁺	211	Y		PdO ⁺	219
As ₂ H ₃ ⁺	207	C ₃ H ₃ Br ⁺	211				
As ₂ H ₄ ⁺	207	C ₃ H ₅ Br ⁺	211	Y ⁺	216	Cd	
AsCl ₃ ⁺	207	C ₃ H ₇ Br ⁺	212	YC ⁺	216		
CH ₅ As ⁺	207	C ₄ H ₉ Br ⁺	212	YC ₂ ⁺	216	Cd ⁺	219
C ₂ H ₇ As ⁺	207	C ₅ H ₄ Br ⁺	212	YO ⁺	216	CdCl ⁺	219
C ₃ H ₉ As ⁺	207	C ₅ H ₁₁ Br ⁺	212	YF ⁺	216	CdCl ₂ ⁺	219
C ₁₈ H ₁₅ As ⁺	207	C ₆ H ₅ Br ⁺	212	YF ₂ ⁺	216		
C ₃ F ₉ As ⁺	207	C ₇ H ₇ Br ⁺	212	YCl ⁺	216	In	
C ₃ H ₆ F ₃ As ⁺	207	CHBr ₂ ⁺	213	YCl ₂ ⁺	216		
C ₂ HF ₆ As ⁺	207	CH ₂ Br ₂ ⁺	213	YCl ₃ ⁺	217	In ⁺	219
C ₃ H ₃ F ₆ As ⁺	207	C ₂ H ₂ Br ₂ ⁺	213	Y ₂ Cl ₅ ⁺	217	In ₂ ⁺	219
C ₂ H ₆ ClAs ⁺	207	C ₂ H ₄ Br ₂ ⁺	213	Mo		In ₂ O ⁺	219
CH ₃ Cl ₂ As ⁺	207	C ₃ H ₆ Br ₂ ⁺	213				
C ₂ F ₆ ClAs ⁺	208	CHBr ₃ ⁺	213	Mo ⁺	217	Sn	
		C ₂ HBr ₃ ⁺	213	MoC ⁺	217	Sn ⁺	220
Se		CNBr ⁺	213	MoO ⁺	217	Sn ₂ ⁺	220
		CF ₂ Br ⁺	213	MoO ₂ ⁺	217	SnH ⁺	220
Se ⁺	208	CF ₃ Br ⁺	213	MoO ₂ ⁺	217	SnH ₂ ⁺	220
		C ₆ F ₅ Br ⁺	214	MoO ₃ ⁺	217	SnH ₃ ⁺	220
Br		CF ₂ Br ₂ ⁺	214	Mo ₂ O ₅ ⁺	217	Sn ₂ H ⁺	220
		CFBr ₃ ⁺	214	Mo ₂ O ₆ ⁺	217	Sn ₂ H ₂ ⁺	220
Br ⁺	208	C ₅ H ₄ NBr ⁺	214	Mo ₃ O ₈ ⁺	217	Sn ₂ H ₂ ⁺	220
Br ₂ ⁺	208	C ₈ H ₁₀ NBr ⁺	214	Mo ₃ O ₉ ⁺	217	Sn ₂ H ₃ ⁺	220
Br ₂ ⁺²	208	C ₁₀ H ₁₄ NBr ⁺	214	MoCO ⁺	217	Sn ₂ H ₅ ⁺	220
HBr ⁺	208	C ₂ H ₃ OBr ⁺	214	MoCO ₂ ⁺	217	Sn ₂ H ₆ ⁺	221
DBr ⁺²	209	C ₆ H ₅ OBr ⁺	214	MoC ₂ O ₂ ⁺	218	SnO ⁺	221
LiBr ⁺	209	C ₇ H ₅ OBr ⁺	214	MoC ₂ O ₂ ⁺	218	Sn ₂ O ⁺	221
Li ₂ Br ⁺	209	C ₈ H ₇ OBr ⁺	214	MoC ₃ O ₃ ⁺	218	Sn ₂ O ₂ ⁺	221
BBR ⁺	209	C ₁₃ H ₉ OBr ⁺	214	MoC ₃ O ₃ ⁺²	218	Sn ₃ O ₃ ⁺	221

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

	Page		Page		Page		Page
Sn_4O_4^+	221	Na_3I_2^+	225	Nd		Re	
SnS^+	221	MgI^+	225	Nd^+	230	ReCl_3^+	232
Sn_2S	221	Mg_2I_2^+	225	Sm		ReCl_4^+	232
Sn_2S_2^+	221	Mg_2I_3^+	225	Sm^+	230	Re_2Cl_5^+	232
SnSe^+	221	ICl^+	225			Re_2Cl_6^+	232
Sn_2Se_2^+	221	KI^+	225			Re_3Cl_8^+	232
CH_3Sn^+	221	K_2I^+	225	Eu		Re_3Cl_9^+	232
$\text{C}_2\text{H}_6\text{Sn}^+$	221	IBr^+	226	Eu^+	230		
$\text{C}_3\text{H}_9\text{Sn}^+$	221	RbI^+	226			Os	
$\text{C}_4\text{H}_{12}\text{Sn}^+$	222	Rb_2I^+	226			Os^+	232
		$\text{B}_5\text{H}_8\text{I}^+$	226	Dy		OsO^+	233
Sb		CH_2I^+	226	Dy^+	230	OsO_2^+	233
Sb^+	222	CH_3I^+	226			OsO_3^+	233
Sb_2^+	222	$\text{C}_2\text{H}_5\text{I}^+$	227	Ho		OsO_4^+	233
Sb_3^+	222	$\text{C}_3\text{H}_7\text{I}^+$	227	Ho^+	230		
Sb_4^+	222	$\text{C}_4\text{H}_9\text{I}^+$	227			Ir	
SbH^+	222	$\text{C}_5\text{H}_{11}\text{I}^+$	227	Er		Ir^+	233
SbH_2^+	222	$\text{C}_6\text{H}_5\text{I}^+$	227			IrO^+	233
SbH_3^+	222	$\text{C}_7\text{H}_7\text{I}^+$	227	Er^+	230	IrO_2^+	233
Sb_2H^+	222	CNI^+	228			IrO_3^+	233
Sb_2H_2^+	222	CF_2I^+	228	Tm			
Sb_2H_2^+	222	CF_3I^+	228	Tm^+	230		
Sb_2H_3^+	222	$\text{C}_6\text{F}_5\text{I}^+$	228			Hg	
Sb_2H_4^+	222	$\text{C}_3\text{F}_7\text{I}^+$	228	Lu		Hg^+	233
InSb^+	223	LiNaI^+	228			Hg^{+2}	233
InSb_2^+	223	LiKI^+	228	Lu^+	230	Hg^{+3}	233
$\text{C}_{18}\text{H}_{15}\text{Sb}^+$	223	LiRbI^+	228	Ta		Hg^{+4}	233
		$\text{C}_8\text{H}_{10}\text{NI}^+$	228			Hg^{+5}	234
Te		$\text{C}_2\text{H}_2\text{F}_3\text{I}^+$	228	TaO^+	230	Hg^{+6}	234
Te^+	223	$\text{C}_4\text{H}_2\text{F}_7\text{I}^+$	228	TaO_2^+	230	CH_3Hg^+	234
Te_2^+	223	$\text{C}_6\text{H}_4\text{ClI}^+$	228			$\text{C}_2\text{H}_5\text{Hg}^+$	234
GeTe^+	223			W		$\text{C}_2\text{H}_6\text{Hg}^+$	234
GeTe_2^+	223					$\text{C}_3\text{H}_7\text{Hg}^+$	234
SnTe^+	223					$\text{C}_4\text{H}_{10}\text{Hg}^+$	234
I						$\text{C}_6\text{H}_{14}\text{Hg}^+$	234
I^+	223	CsCdCl^+	229			CH_3HgCl^+	234
I_2^+	224	LiCsI^+	229				
HI^+	224					Tl	
HI^{+2}	224					W_3O_8^+	234
LiI^+	224					W_3O_9^+	231
Li_2I^+	224					WCO^+	231
Li_3I_2^+	224					WC_2O^+	231
BI^+	224					WC_2O_2^+	231
BI_2^+	224					WC_3O_3^+	231
BI_3^+	224					WC_4O_4^+	231
CI^+	224					WC_5O_5^+	231
IF^+	225					WC_6O_6^+	232
IF_2^+	225					CaWO_3^+	232
IF_3^+	225					CaWO_4^+	232
IF_4^+	225					SrWO_3^+	232
IF_5^+	225					SrWO_4^+	232
NaI^+	225					SnWO_4^+	232
Na_2I^+	225					Sn_2WO_5^+	232
						Pb_4O_4^+	235

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Page	Page	Page	Page
PbS ⁺	235	Bi	Pu
Pb ₂ S ₂ ⁺	235	Bi ⁺	236 Pu ⁺
PbCl ⁺	235	Bi ₂ ⁺	237
PbCl ₂ ⁺	235	BiH ⁺	Am
CH ₃ Pb ⁺	235	BiH ₂ ⁺	237
C ₂ H ₆ Pb ⁺	235	BiH ₃ ⁺	Am ⁺
C ₃ H ₉ Pb ⁺	236	BiS ⁺	237
C ₄ H ₁₂ Pb ⁺	236	Bi ₂ S ⁺	237
RbPbCl ₂ ⁺	236	C ₁₈ H ₁₅ Bi ⁺	237
CsPbCl ⁺	236		
		236 U	
		236 U ⁺	
		236 UO ⁺	
		236 UO ₂ ⁺	
		236 UO ₃ ⁺	

3. TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions

Computed heats of formation used in arriving at a recommended value are indicated with an asterisk. Where only one such value is so indicated and there is no ambiguity as to the structure of the ion, this corresponds to the recommended value. In those cases where the recommended value is based on the average of several measurements or where there is any ambiguity as to the structure of the

ion, the recommended values are listed in a separate heading preceding each set of data.

The letters (a) and (b) indicate that the heat of formation of a neutral reactant or product has been calculated instead of that of an ion. These are listed separately in table 2.

All cyclic reactants are named.

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
H⁺ Heat of formation 366 kcal mol⁻¹						
H ⁺	H		13.598	S	366*	2113
H ⁺	H (EI on neutral fragment from benzene)		13.5 ± 0.2	NS	363	87
H ⁺	H (EI on neutral fragment from n-C ₄ H ₁₀)		13.6 ± 0.2	NS	366	87
H ⁺	H ₂	H ⁻	17.3	VC	200	
H ⁺	C ₃ H ₈		20.0 ± 0.3	VC	1408	
H ⁺	C ₃ H ₈		22.0 ± 0.5	VC	1408	
H ⁺	HF	F ⁻	15.9	RPD	286	
H ⁺	HCl	Cl ⁻	14.5	RPD	199	
D⁺ Heat of formation 367 kcal mol⁻¹						
D ⁺	D		13.602	S	367*	2113
D ⁺	D ₂ (Excess KE ion)		25.3 ± 0.2	SRP		1264
H₂⁺ Heat of formation 356 kcal mol⁻¹						
H ₂ ⁺	H ₂		15.427 ± 0.002	S	356*	2095
H ₂ ⁺	H ₂		15.42 ± 0.01	PI	356	1118, 1143
H ₂ ⁺	H ₂		15.3 ± 0.3	PI	353	230
H ₂ ⁺	H ₂		15.41	PE	355	248
H ₂ ⁺	H ₂		15.44 ± 0.01	PE	356	1050
H ₂ ⁺	H ₂		15.50 ± 0.03	RPD	357	1012
H ₂ ⁺	H ₂		15.4	RPD	355	1121
H ₂ ⁺	H ₂		17.3 ± 0.2	RPD		119
H ₂ ⁺	H ₂		15.51 ± 0.10	CS	358	383
H ₂ ⁺	H ₂		15.43	MSD	356	1251
H ₂ ⁺	C ₃ H ₈		16.4 ± 0.5	VC		1408
H ₂ ⁺	C ₃ H ₈		25.7 ± 0.5	VC		1408
H ₂ ⁺	C ₃ H ₈		27.6 ± 0.5	VC		1408
HD⁺ Heat of formation 356 kcal mol⁻¹						
HD ⁺	HD		15.46	PI	356*	1143
D₂⁺ Heat of formation 356 kcal mol⁻¹						
D ₂ ⁺	D ₂		15.46 ± 0.01	PI	356*	1118, 1143
D ₂ ⁺	D ₂		15.5	RPD	357	1121

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
He⁺ Heat of formation 567 kcal mol⁻¹						
He ⁺	He		24.586 ± 0.002	S	567*	2113
He ⁺	He		24.6 ± 0.1	PI	567	163
He ⁺	He		24.59 ± 0.03	RPD	567	1012
He ⁺	He		24.65 ± 0.1	FDP	568	1051
He ⁺	He		24.65 ± 0.1	FDP	568	1172
He ⁺	He		24.53 ± 0.08	LE	566	2032
Ne⁺ Heat of formation 497 kcal mol⁻¹						
Ne ⁺	Ne		21.564	S	497*	2113
Ne ⁺	Ne		21.8 ± 0.5	PI	503	163
Ne ⁺	Ne		21.52 ± 0.03	RPD	496	1012
Ne ⁺	Ne		21.61 ± 0.2	EVD	498	52
Ne ⁺	Ne		21.75 ± 0.3	EVD	502	52
Ne ⁺	Ne		21.62 ± 0.05	CS	499	383
Ne ⁺	Ne		21.75 ± 0.05	FDP	502	1051
Ne ⁺	Ne		21.75 ± 0.05	FDP	502	1172
Ne ⁺	Ne		21.60 ± 0.08	LE	498	2032
Ne⁺² Heat of formation 1445 kcal mol⁻¹						
Ne ⁺²	Ne		62.64	S	1445*	2113
Ne ⁺²	Ne		62.5	LE	1441	1240
Ne⁺³ Heat of formation 2906 kcal mol⁻¹						
Ne ⁺³	Ne		126	S	2906*	2113
Ne ⁺³	Ne		129	LE	2975	1240
Ne⁺⁴ Heat of formation 5166 kcal mol⁻¹						
Ne ⁺⁴	Ne		224	S	5166*	2113
Ne ⁺⁴	Ne		246	LE	5673	1240
Ne⁺⁵ Heat of formation 8071 kcal mol⁻¹						
Ne ⁺⁵	Ne		350	S	8071*	2113
Ne ⁺⁵	Ne		900	LE	20755	1240
Ar^{+(2P_{3/2})} Heat of formation 363 kcal mol ⁻¹						
Ar^{+(2P_{1/2})} Heat of formation 368 kcal mol ⁻¹						
Ar ^{+(2P_{3/2})}	Ar		15.759	S	363*	2113
Ar ^{+(2P_{3/2})}	Ar		15.74	PI	363	2034
Ar ^{+(2P_{3/2})}	Ar		15.76 ± 0.01	PI	363	1118
Ar ^{+(2P_{3/2})}	Ar		15.76	PI	363	2200
Ar ^{+(2P_{3/2})}	Ar		15.7 ± 0.1	PI	362	230
Ar ^{+(2P_{3/2})}	Ar		15.79	PE	364	248
Ar ^{+(2P_{3/2})}	Ar		15.74 ± 0.2	RPD	363	224
Ar ⁺	Ar		15.60 ± 0.2	EVD	360	52
Ar ⁺	Ar		15.720	LE	363	35
Ar ⁺	Ar		15.739	LE	363	35
Ar ⁺	Ar		15.83 ± 0.08	LE	365	3
Ar ⁺	Ar		15.83 ± 0.08	LE	365	2032

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Ar ^{+(2P_{1/2})}	Ar		15.937	S	368*	2113
Ar ^{+(2P_{1/2})}	Ar		15.93	PI	367	1118
Ar ^{+(2P_{1/2})}	Ar		15.94	PI	368	2200
Ar ^{+(2P_{1/2})}	Ar		15.95	PI	368	2034
Ar ^{+(2P_{1/2})}	Ar		16.0 ± 0.2	PI	369	163
Ar ^{+(2P_{1/2})}	Ar		15.93	PE	367	248
Ar⁺² Heat of formation 1001 kcal mol⁻¹						
Ar ⁺²	Ar		43.39	S	1001*	2113
Ar ⁺²	Ar		43.4 ± 0.3	RPD	1001	198
Ar ⁺²	Ar		43.3	NRE	999	211
Ar ⁺²	Ar		43	LE	992	1240
Ar⁺³ Heat of formation 1944 kcal mol⁻¹						
Ar ⁺³	Ar		84.30	S	1944*	2113
Ar ⁺³	Ar		84.8 ± 0.5	RPD	1956	198
Ar ⁺³	Ar		83.7 ± 0.5	NRE	1930	25
Ar ⁺³	Ar		84.0	NRE	1937	211
Ar ⁺³	Ar		84.3	LE	1944	1040
Ar ⁺³	Ar		85	LE	1960	1240
Ar⁺⁴ Heat of formation 3323 kcal mol⁻¹						
Ar ⁺⁴	Ar		144.1	S	3323*	2113
Ar ⁺⁴	Ar		150.0 ± 5	RPD	3459	198
Ar ⁺⁴	Ar		147	LE	3390	1240
Ar⁺⁵ Heat of formation 5053 kcal mol⁻¹						
Ar ⁺⁵	Ar		219.1	S	5053*	2113
Ar ⁺⁵	Ar		285	LE	6572	1240
Ar⁺⁶ Heat of formation 7158 kcal mol⁻¹						
Ar ⁺⁶	Ar		310.4	S	7158*	2113
Ar ⁺⁶	Ar		430	LE	9916	1240
Kr^{+(2P_{3/2})} Heat of formation 323 kcal mol ⁻¹						
Kr^{+(2P_{1/2})} Heat of formation 338 kcal mol ⁻¹						
Kr ^{+(2P_{3/2})}	Kr		13.999	S	323*	2113
Kr ^{+(2P_{3/2})}	Kr		13.999 ± 0.002	PI	323	1253
Kr ^{+(2P_{3/2})}	Kr		14.01 ± 0.01	PI	323	1118
Kr ^{+(2P_{3/2})}	Kr		14.05	PE	324	248
Kr ^{+(2P_{3/2})}	Kr		14.00 ± 0.02	RPD	323	224
Kr ^{+(2P_{3/2})}	Kr		14.00 ± 0.03	RPD	323	1012
Kr ⁺	Kr		14.01 ± 0.03	SL	323	1047
Kr ⁺	Kr		13.979	LE	322	35
Kr ⁺	Kr		14.012	LE	323	35
Kr ⁺	Kr		14.01 ± 0.08	LE	323	2032
Kr ⁺	Kr	(Autoionizing level?)	14.35 ± 0.1	RPD	331	224
Kr ^{+(2P_{1/2})}	Kr		14.665	S	338*	2113
Kr ^{+(2P_{1/2})}	Kr		14.69 ± 0.01	PI	339	1118
Kr ^{+(2P_{1/2})}	Kr		14.69	PE	339	248
Kr ^{+(2P_{1/2})}	Kr		14.70 ± 0.1	RPD	339	224

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Kr⁺² Heat of formation 889 kcal mol⁻¹						
Kr ⁺²	Kr		38.57	S	889*	2113
Kr ⁺²	Kr		38.45 ± 0.1	RPD	887	198
Kr ⁺²	Kr		38.5	VC	888	201
Kr ⁺²	Kr		38.5	VC	888	211
Kr ⁺²	Kr		38.1 ± 0.1	NRE	879	211
Kr ⁺²	Kr		38.0 ± 0.5	NRE	876	201
Kr ⁺²	Kr		38	LE	876	1240
Kr⁺³ Heat of formation 1741 kcal mol⁻¹						
Kr ⁺³	Kr		75.5	S	1741*	2113
Kr ⁺³	Kr		75.6 ± 0.5	RPD	1743	198
Kr ⁺³	Kr		77	VC	1776	211
Kr ⁺³	Kr		73.3 ± 0.2	NRE	1690	211
Kr ⁺³	Kr		76	LE	1753	1240
Kr⁺⁴						
Kr ⁺⁴	Kr		130.0	VC	2998	201
Kr ⁺⁴	Kr		130	VC	2998	211
Kr ⁺⁴	Kr		147 ± 2	VC	3390	198
Kr ⁺⁴	Kr		118 ± 1	NRE	2721	211
Kr ⁺⁴	Kr		117.5 ± 2	NRE	2710	201
Kr ⁺⁴	Kr		134	LE	3090	1240
Kr⁺⁵						
Kr ⁺⁵	Kr		195	VC	4497	211
Kr ⁺⁵	Kr		218 ± 10	VC	5027	198
Kr ⁺⁵	Kr		181 ± 2	NRE	4174	211
Kr ⁺⁵	Kr		204	LE	4704	1240
Kr⁺⁶						
Kr ⁺⁶	Kr		310	VC	7149	211
Kr ⁺⁶	Kr		350 ± 10	VC	8071	198
Kr ⁺⁶	Kr		275 ± 10	NRE	6342	211
Kr ⁺⁶	Kr		302	LE	6964	1240
Kr⁺⁷						
Kr ⁺⁷	Kr		470	LE	10839	1240
Kr⁺⁸						
Kr ⁺⁸	Kr		670	LE	15451	1240
Xe^{+(2P_{3/2}) Heat of formation 280 kcal mol⁻¹}						
Xe^{+(2P_{1/2}) Heat of formation 310 kcal mol⁻¹}						
Xe ^{+(2P_{3/2})}	Xe		12.130	S	280*	2113
Xe ^{+(2P_{3/2})}	Xe		12.129 ± 0.002	PI	280	1032
Xe ^{+(2P_{3/2})}	Xe		12.12 ± 0.01	PI	279	1118
Xe ^{+(2P_{3/2})}	Xe		12.17	PE	281	248
Xe ^{+(2P_{3/2})}	Xe		12.05 ± 0.1	EVD	278	52

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Xe ⁺	Xe		12.082	LE	279	35
Xe ⁺	Xe		12.120	LE	279	35
Xe ⁺	Xe		12.10 ± 0.08	LE	279	2032
Xe ⁺	Xe		12.0 ± 0.1	LE	277	2053
Xe ^{+(2P_{1/2})}	Xe		13.436	S	310*	2113
Xe ^{+(2P_{1/2})}	Xe		13.426 ± 0.007	PI	310	1032
Xe ^{+(2P_{1/2})}	Xe		13.44 ± 0.01	PI	310	1118
Xe ^{+(2P_{1/2})}	Xe		13.49	PE	311	248
Xe ⁺	XeF ₂	F + F ⁻ ?	12.0 ± 0.1	LE	297	2053
Xe ⁺	XeF ₄	F ₂ + F + F ⁻ ?	12.4 ± 0.1	LE	280	2053
Xe⁺² Heat of formation 769 kcal mol⁻¹						
Xe ⁺²	Xe		33.33	S	769*	2113
Xe ⁺²	Xe		33.3	VC	768	211
Xe ⁺²	Xe		33.5	VC	773	201
Xe ⁺²	Xe		33.5 ± 0.2	NRE	773	211
Xe ⁺²	Xe		33.3 ± 0.5	NRE	768	201
Xe ⁺²	Xe		33.5 ± 0.5	NRE	773	25
Xe ⁺²	Xe		33	LE	761	1240
Xe ⁺²	Xe		34.3 ± 0.5	NRE	25	
Xe ⁺²	Xe		35.3 ± 0.5	NRE	25	
Xe⁺³ Heat of formation 1508 kcal mol⁻¹						
Xe ⁺³	Xe		65.4	S	1508*	2113
Xe ⁺³	Xe		65.4	VC	1508	211
Xe ⁺³	Xe		66.5	VC	1534	201
Xe ⁺³	Xe		64.8 ± 0.5	NRE	1494	25
Xe ⁺³	Xe		64.8 ± 0.5	NRE	1494	211
Xe ⁺³	Xe		64.3 ± 1	NRE	1483	201
Xe ⁺³	Xe		65	LE	1499	1240
Xe ⁺³	Xe		67.3 ± 0.5	NRE	25	
Xe⁺⁴						
Xe ⁺⁴	Xe		107	VC	2468	201
Xe ⁺⁴	Xe		111	VC	2560	211
Xe ⁺⁴	Xe		107 ± 1	NRE	2468	25
Xe ⁺⁴	Xe		107 ± 1	NRE	2468	211
Xe ⁺⁴	Xe		103 ± 2	NRE	2375	201
Xe ⁺⁴	Xe		110	LE	2537	1240
Xe⁺⁵						
Xe ⁺⁵	Xe		170	VC	3920	201
Xe ⁺⁵	Xe		171	VC	3943	211
Xe ⁺⁵	Xe		160 ± 1	NRE	3690	25
Xe ⁺⁵	Xe		160 ± 1	NRE	3690	211
Xe ⁺⁵	Xe		157 ± 3	NRE	3621	201
Xe ⁺⁵	Xe		172	LE	3966	1240
Xe⁺⁶						
Xe ⁺⁶	Xe		246	VC	5673	211
Xe ⁺⁶	Xe		218 ± 1	NRE	5027	25
Xe ⁺⁶	Xe		218 ± 1	NRE	5027	211
Xe ⁺⁶	Xe		248	LE	5719	1240

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Xe⁺⁷						
Xe ⁺⁷	Xe		362	LE	8348	1240
Xe⁺⁸						
Xe ⁺⁸	Xe		535	LE	12337	1240
Xe⁺⁹						
Xe ⁺⁹	Xe		820	LE	18910	1240
Li⁺ Heat of formation 163 kcal mol⁻¹						
Li ⁺	Li		5.392	S	163*	2113
Li ⁺	Li		5.5±0.3	LE	165	1112
Li ⁺	(C ₂ H ₅ Li) ₄		14±2	NS	1	
Li ⁺	LiF	F	11.5	VC	167	2179
Li ⁺	LiCl	Cl	10.6	VC	169	2179
Li ⁺	LiBr	Br	9.9	VC	167	2179
Li ⁺	LiI	I	9.5±0.3	VC	174	2001
Li ⁺	Li ₂ I ₂ ?	LiI + I?	11.6±0.3	VC	179	2001
LiH⁺						
LiH ⁺	LiH		7.81	TC	212	1093
LiH ⁺	LiH		7.91	TC	215	1093
Be⁺ Heat of formation 293 kcal mol⁻¹						
Be ⁺	Be		9.322	S	293*	2113
Be ⁺	Be		9.2±0.2	VC	290	2141
Be ⁺	Be		9.3±0.2	VC	293	1106
Be ⁺	BeF ₂	2F	28.3±1.0	VC	425	2142
Be ⁺	BeCl ₂	2Cl	26	VC	456	2195
B⁺ Heat of formation 326 kcal mol⁻¹						
B ⁺	B		8.298	S	326*	2113
B ⁺	B		8.3	NS	326	1116
B ⁺	B ₂ H ₆	BH ₃ + H + H ₂ ?	19.5±0.2	SL	382	102
B ⁺	B ₂ H ₆	BH ₃ + H + H ₂ ?	18.7±0.1	VC	364	209
B ⁺	B ₂ H ₆	BH ₃ + H + H ₂ ?	18.9±0.2	VC	368	209
B ⁺	B ₂ D ₆	BD ₃ + D + D ₂ ?	18.6±0.1	VC	362	209
B ⁺	(CH ₃) ₃ B		23.1±0.3	SL	364	
B ⁺	(C ₂ H ₅) ₃ B		30.1±0.5	SL	364	
B ⁺	(CH ₃ O) ₂ BH		23.4±0.5	SL	364	
B ⁺	(CH ₃ O) ₃ B		31.6±1.0	SL	364	
B ⁺	BF ₃	3F	30.6±1	EVD	377	440
B ⁺	BF ₃	3F	30.1±0.5	SL	366	364
B ⁺	BF ₃	3F	31.3±0.4	VC	393	40
B ⁺	BCl	Cl	13.6±0.2	LE	320	440
B ⁺	BCl ₃	3Cl	22.35±0.06	EVD	332	440
B ⁺	BCl ₃	Cl ₂ + Cl	19.5±1.0	SL	324	364
B ⁺	BCl ₃	Cl ₂ + Cl	19.5±0.2	VC	324	206
B ⁺	BCl ₃		20.8±0.5	VC		206
B ⁺	BCl ₃		18.4±0.2	LE		440
B ⁺	BBr ₃	3Br	19.6±0.2	VC	323	206
B ⁺	BI ₃	3I	16.6±0.5	VC	323	206

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
B₂⁺						
B ₂ ⁺	B ₂ H ₆	2H ₂ + 2H?	26.3 ± 0.5	SL	511	102
B ₂ ⁺	B ₂ H ₆	3H ₂	21.1 ± 0.1	VC	495	209
B ₂ ⁺	B ₂ D ₆	3D ₂	21.8 ± 0.2	VC	511	209
BH⁺ Heat of formation 333 kcal mol⁻¹						
BH ⁺	BH		9.77 ± 0.05	S	333*	1109
BH ⁺	B ₂ H ₆		16.6 ± 0.2	SL		102
BH ⁺	B ₂ H ₆	2H ₂ + H	14.9 ± 0.1	VC	300	209
BH ⁺	(CH ₃ O) ₂ BH		28.3 ± 2.0	SL		364
BD⁺						
BD ⁺	B ₂ D ₆	2D ₂ + D	14.8 ± 0.1	VC		209
BH₂⁺						
BH ₂ ⁺	BH ₂		9.8 ± 0.2	SL	274	2030
BH ₂ ⁺	B ₂ H ₆		13.5 ± 0.5	SL		102
BH ₂ ⁺	B ₂ H ₆		13.4 ± 0.1	VC		209
BD₂⁺						
BD ₂ ⁺	B ₂ D ₆		13.6 ± 0.1	VC		209
BH₃⁺ Heat of formation 279 kcal mol⁻¹						
BH ₃ ⁺	BH ₃		11.4 ± 0.2	SL	287*	2030
BH ₃ ⁺	B ₂ H ₆	BH ₃ ?	12.1 ± 0.2	SL	264*	102
BH ₃ ⁺	B ₂ H ₆	BH ₃ ?	13.1 ± 0.2	VC	287*	209
BD₃⁺						
BD ₃ ⁺	B ₂ D ₆	BD ₃ ?	12.7 ± 0.2	VC		209
B₂H⁺						
B ₂ H ⁺	B ₂ H ₆	2H ₂ + H	21.4 ± 0.5	SL	450	102
B ₂ H ⁺	B ₂ H ₆	2H ₂ + H	20.1 ± 0.1	VC	420	209
B₂D⁺						
B ₂ D ⁺	B ₂ D ₆	2D ₂ + D	18.3 ± 0.1	VC		209
B₂H₂⁺ Heat of formation 329 kcal mol⁻¹						
B ₂ H ₂ ⁺	B ₂ H ₆	2H ₂	13.8 ± 0.2	SL	327*	102
B ₂ H ₂ ⁺	B ₂ H ₆	2H ₂	13.8 ± 0.1	VC	327*	209
B ₂ H ₂ ⁺	B ₂ H ₆	2H ₂	14.1 ± 0.2	VC	334*	1024
B₂HD⁺						
B ₂ HD ⁺	B ₂ D ₅ H?	2D ₂	14.0 ± 0.1	VC		209
B₂D₂⁺						
B ₂ D ₂ ⁺	B ₂ D ₆	2D ₂	14.0 ± 0.1	VC		209

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
B₂H₃⁺ Heat of formation 285 kcal mol⁻¹						
B ₂ H ₃ ⁺	B ₂ H ₆	H ₂ + H	14.8 ± 0.5	SL	298	102
B ₂ H ₃ ⁺	B ₂ H ₆	H ₂ + H	14.2 ± 0.1	VC	284*	209
B ₂ H ₃ ⁺	B ₂ H ₆	H ₂ + H	14.3 ± 0.2	VC	286*	1024
B₂HD₂⁺						
B ₂ HD ₂ ⁺	B ₂ D ₅ H?	D ₂ + D	14.2 ± 0.1	VC		209
B₂D₃⁺						
B ₂ D ₃ ⁺	B ₂ D ₆	D ₂ + D	14.3 ± 0.1	VC		209
B ₂ D ₃ ⁺	B ₂ D ₆	D ₂ + D	14.5 ± 0.2	VC		1024
B₂H₄⁺ Heat of formation 293 kcal mol⁻¹						
B ₂ H ₄ ⁺	B ₂ H ₆	H ₂	12.4 ± 0.3	SL	294*	102
B ₂ H ₄ ⁺	B ₂ H ₆	H ₂	12.3 ± 0.1	VC	292*	209
B ₂ H ₄ ⁺	B ₂ H ₆	H ₂	12.3 ± 0.2	VC	292*	1024
B₂HD₃⁺						
B ₂ HD ₃ ⁺	B ₂ D ₅ H?	D ₂	12.3 ± 0.1	VC		209
B₂D₄⁺						
B ₂ D ₄ ⁺	B ₂ D ₆	D ₂	12.3 ± 0.1	VC		209
B ₂ D ₄ ⁺	B ₂ D ₆	D ₂	12.3 ± 0.2	VC		1024
B₂H₅⁺ Heat of formation 232 kcal mol⁻¹						
B ₂ H ₅ ⁺	B ₂ H ₆	H	12.0 ± 0.3	SL	233*	102
B ₂ H ₅ ⁺	B ₂ H ₆	H	11.9 ± 0.1	VC	231*	209
B ₂ H ₅ ⁺	B ₂ H ₆	H	12.0 ± 0.1	VC	233*	1024
B₂HD₄⁺						
B ₂ HD ₄ ⁺	B ₂ D ₅ H?	D	12.0 ± 0.1	VC		209
B₂D₅⁺						
B ₂ D ₅ ⁺	B ₂ D ₆	D	12.0 ± 0.1	VC		1024
B ₂ D ₅ ⁺	B ₂ D ₆	D	12.1 ± 0.1	VC		209
B₂H₆⁺ Heat of formation 286 kcal mol⁻¹						
B ₂ H ₆ ⁺	B ₂ H ₆		12.1 ± 0.2	SL	288*	102
B ₂ H ₆ ⁺	B ₂ H ₆		11.9 ± 0.1	VC	283*	209
B₂D₆⁺						
B ₂ D ₆ ⁺	B ₂ D ₆		12.0 ± 0.1	VC		209
B₃H⁺						
B ₃ H ⁺	B ₄ H ₁₀		16.5 ± 0.8	VC		1119

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
B₃H₂⁺						
B ₃ H ₂ ⁺	B ₄ H ₁₀		17.8±0.8	VC		1119
B₃H₃⁺						
B ₃ H ₃ ⁺	B ₄ H ₁₀		14.2±0.3	VC		1119
B₃D₃⁺						
B ₃ D ₃ ⁺	B ₄ D ₁₀		13.8±0.3	VC		1119
B₃H₅⁺						
B ₃ H ₅ ⁺	B ₄ H ₁₀		12.1±0.2	VC		1119
B₃D₅⁺						
B ₃ D ₅ ⁺	B ₄ D ₁₀		12.8±0.3	VC		1119
B₄H⁺						
B ₄ H ⁺	B ₅ H ₉		19.97±1.0	SL		205
B₄H₂⁺						
B ₄ H ₂ ⁺	B ₅ H ₉		17.99±0.2	SL		205
B ₄ H ₂ ⁺	B ₅ H ₉		17.59±0.2	VDF		205
B₄H₃⁺						
B ₄ H ₃ ⁺	B ₅ H ₉		15.96±0.5	SL		205
B ₄ H ₃ ⁺	B ₅ H ₉		15.52±0.5	VDF		205
B ₄ H ₃ ⁺	B ₄ H ₁₀		14.0±0.4	VC		1119
B₄D₃⁺						
B ₄ D ₃ ⁺	B ₄ D ₁₀		14.8±0.4	VC		1119
B₄H₄⁺						
B ₄ H ₄ ⁺	B ₅ H ₉		14.06±0.1	SL		205
B ₄ H ₄ ⁺	B ₄ H ₁₀		12.4±0.2	VC		1119
B₄D₄⁺						
B ₄ D ₄ ⁺	B ₄ D ₁₀		12.5±0.2	VC		1119
B ₄ D ₄ ⁺	B ₅ D ₉		13.7±0.2	VC		1024
B ₄ D ₄ ⁺	B ₅ D ₁₁		12.4±0.5	VC		1024
B₄H₅⁺						
B ₄ H ₅ ⁺	B ₄ H ₁₀		12.5±0.3	VC		1119
B ₄ H ₅ ⁺	B ₅ H ₉		15.07±0.3	SL		205
B ₄ H ₅ ⁺	B ₅ H ₉		14.50±0.3	VDF		205

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
B₄D₅⁺						
B ₄ D ₅ ⁺	B ₄ D ₁₀		12.5±0.2	VC		1119
B₄H₆⁺ Heat of formation 275 kcal mol⁻¹						
B ₄ H ₆ ⁺	B ₄ H ₁₀	2H ₂	11.2±0.1	VC	274*	1119
B ₄ H ₆ ⁺	B ₅ H ₉	BH ₃	12.25±0.2	SL	276*	205
B₄D₆⁺						
B ₄ D ₆ ⁺	B ₄ D ₁₀	2D ₂	11.1±0.1	VC		1119
B ₄ D ₆ ⁺	B ₅ D ₉	BD ₃	12.4±0.2	VC		1024
B ₄ D ₆ ⁺	B ₅ D ₁₁	BD ₃ +D ₂	11.4±0.5	VC		1024
B₄H₇⁺						
B ₄ H ₇ ⁺	B ₄ H ₁₀	H ₂ +H	12.5±0.2	VC	252	1119
B₄D₇⁺						
B ₄ D ₇ ⁺	B ₄ D ₁₀	D ₂ +D	12.2±0.1	VC		1119
B₄H₈⁺						
B ₄ H ₈ ⁺	B ₄ H ₁₀	H ₂	10.4±0.1	VC	256	1119
B₄D₈⁺						
B ₄ D ₈ ⁺	B ₄ D ₁₀	D ₂	9.9±0.1	VC		1119
B₄H₉⁺						
B ₄ H ₉ ⁺	B ₄ H ₁₀	H	12.2±0.2	VC	245	1119
B₄D₉⁺						
B ₄ D ₉ ⁺	B ₄ D ₁₀	D	11.9±0.2	VC		1119
B₅H₄⁺						
B ₅ H ₄ ⁺	B ₅ H ₉	2H ₂ +H	13.01±0.3	SL	265	205
B ₅ H ₄ ⁺	B ₅ H ₉	2H ₂ +H	13.20±0.3	VDF	270	205
B ₅ H ₄ ⁺	B ₅ H ₁₁		14.2±0.4	VC		1024
B₅H₅⁺ Heat of formation 311 kcal mol⁻¹						
B ₅ H ₅ ⁺	B ₅ H ₉	2H ₂	12.67±0.03	SL	310*	205
B ₅ H ₅ ⁺	B ₅ H ₉	2H ₂	12.8±0.2	VC	313*	1024
B ₅ H ₅ ⁺	B ₅ H ₁₁		12.7±0.2	VC		1024
B ₅ H ₅ ⁺	B ₆ H ₁₀		13.6±0.2	VC		1024
B₅D₅⁺						
B ₅ D ₅ ⁺	B ₅ D ₉	2D ₂	12.92±0.03	SL		205
B ₅ D ₅ ⁺	B ₅ D ₉	2D ₂	12.4±0.4	VC		1024
B ₅ D ₅ ⁺	B ₅ D ₁₁	3D ₂	12.3±0.2	VC		1024

TABLE I. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
B₅H₆⁺						
B ₅ H ₆ ⁺	B ₅ H ₉	H ₂ + H	12.13 ± 0.3	SL	245	205
B ₅ H ₆ ⁺	B ₅ H ₉	H ₂ + H	12.48 ± 0.3	VDF	253	205
B ₅ H ₆ ⁺	B ₅ H ₁₁	2H ₂ + H?	12.6 ± 0.3	VC	263	1024
B₅D₆⁺						
B ₅ D ₆ ⁺	B ₅ D ₉	D ₂ + D	12.4 ± 0.2	VC		1024
B ₅ D ₆ ⁺	B ₅ D ₁₁	2D ₂ + D	12.2 ± 0.3	VC		1024
B₅H₇⁺ Heat of formation 283 kcal mol⁻¹						
B ₅ H ₇ ⁺	B ₅ H ₉	H ₂	11.43 ± 0.1	SL	281*	205
B ₅ H ₇ ⁺	B ₅ H ₉	H ₂	11.6 ± 0.2	VC	285*	1024
B ₅ H ₇ ⁺	B ₅ H ₁₁	2H ₂	11.5 ± 0.2	VC	290*	1024
B ₅ H ₇ ⁺	B ₆ H ₁₀	BH ₃	12.0 ± 0.2	VC	275*	1024
B₅D₇⁺						
B ₅ D ₇ ⁺	B ₅ D ₉	D ₂	10.93 ± 0.2	SL		205
B ₅ D ₇ ⁺	B ₅ D ₉	D ₂	11.2 ± 0.2	VC		1024
B ₅ D ₇ ⁺	B ₅ D ₉	D ₂	11.14 ± 0.2	VDF		205
B ₅ D ₇ ⁺	B ₅ D ₁₁	2D ₂	11.1 ± 0.2	VC		1024
B₅H₈⁺						
B ₅ H ₈ ⁺	B ₅ H ₉	H	10.50 ± 0.1	SL	208	205
B ₅ H ₈ ⁺	B ₅ H ₁₁		12.0 ± 0.3	VC		1024
B ₅ H ₈ ⁺	B ₁₀ H ₁₆		11.6 ± 0.2	EVD		1102
B ₅ H ₈ ⁺	B ₅ H ₈ Br	Br	12.0 ± 0.2	VC		1102
B ₅ H ₈ ⁺	B ₅ H ₈ I	I	11.1 ± 0.1	EVD		1102
B₅D₈⁺						
B ₅ D ₈ ⁺	B ₅ D ₁₁	D ₂ + D	11.4 ± 0.3	VC		1024
B₅H₉⁺ Heat of formation 262 kcal mol⁻¹						
B ₅ H ₉ ⁺	B ₅ H ₉		10.38 ± 0.05	SL	257*	205
B ₅ H ₉ ⁺	B ₅ H ₉		10.8 ± 0.5	SL	267*	103
B ₅ H ₉ ⁺	B ₅ H ₉		10.5 ± 0.1	VC	260*	1024
B ₅ H ₉ ⁺	B ₅ H ₁₁	H ₂	10.3 ± 0.2	VC	262*	1024
B₅D₉⁺						
B ₅ D ₉ ⁺	B ₅ D ₉		9.77 ± 0.1	SL		205
B ₅ D ₉ ⁺	B ₅ D ₉		9.38 ± 0.15	SL		205
B ₅ D ₉ ⁺	B ₅ D ₉		10.0 ± 0.1	VC		1024
B ₅ D ₉ ⁺	B ₅ D ₁₁	D ₂	10.4 ± 0.2	VC		1024
B₅H₁₀⁺						
B ₅ H ₁₀ ⁺	B ₅ H ₁₁	H	11.8 ± 0.4	VC	245	1024

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
		B₅D₁₀⁺				
B ₅ D ₁₀ ⁺	B ₅ D ₁₁	D	11.3 ± 0.4	VC	232	1024
		B₆H₄⁺				
B ₆ H ₄ ⁺	B ₆ H ₁₀		13.4 ± 0.3	VC		1024
		B₆H₅⁺				
B ₆ H ₅ ⁺	B ₆ H ₁₀		12.0 ± 0.3	VC		1024
		B₆H₆⁺				
B ₆ H ₆ ⁺	B ₆ H ₁₀		11.9 ± 0.1	VC		1024
		B₆H₇⁺				
B ₆ H ₇ ⁺	B ₆ H ₁₀		11.5 ± 0.3	VC		1024
		B₆H₈⁺				
B ₆ H ₈ ⁺	B ₆ H ₁₀		11.2 ± 0.1	VC		1024
		B₆H₉⁺				
B ₆ H ₉ ⁺	B ₆ H ₁₀	H	11.1 ± 0.4	VC	227	1024
		B₆H₁₀⁺ Heat of formation 237 kcal mol⁻¹				
B ₆ H ₁₀ ⁺	B ₆ H ₁₀		9.3 ± 0.1	VC	237*	1024
		B₆D₁₀⁺				
B ₆ D ₁₀ ⁺	B ₆ D ₁₀		9.7 ± 0.2	VC		1024
		B₁₀H₆⁺				
B ₁₀ H ₆ ⁺	B ₁₀ H ₁₄	4H ₂	13.56 ± 0.3	SL	320	189
B ₁₀ H ₆ ⁺	B ₁₀ H ₁₄	4H ₂	13.14 ± 0.3	VDF	311	189
		B₁₀H₇⁺				
B ₁₀ H ₇ ⁺	B ₁₀ H ₁₄	3H ₂ + H	12.51 ± 0.5	VDF	244	189
		B₁₀H₈⁺				
B ₁₀ H ₈ ⁺	B ₁₀ H ₁₄	3H ₂	12.66 ± 0.3	SL	299	189
B ₁₀ H ₈ ⁺	B ₁₀ H ₁₄	3H ₂	12.67 ± 0.3	VDF	300	189
		B₁₀H₁₀⁺				
B ₁₀ H ₁₀ ⁺	B ₁₀ H ₁₄	2H ₂	11.62 ± 0.2	SL	276	189
		B₁₀H₁₁⁺				
B ₁₀ H ₁₁ ⁺	B ₁₀ H ₁₄	H ₂ + H	10.81 ± 0.5	VDF	205	189

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
B₁₀H₁₂⁺						
B ₁₀ H ₁₂ ⁺	B ₁₀ H ₁₄	H ₂	10.90 ± 0.2	SL	259	189
B ₁₀ H ₁₂ ⁺	B ₁₀ H ₁₄	H ₂	10.87 ± 0.2	VDF	258	189
B₁₀H₁₄⁺						
B ₁₀ H ₁₄ ⁺	B ₁₀ H ₁₄		11.0 ± 0.5	SL	261	103
B ₁₀ H ₁₄ ⁺	B ₁₀ H ₁₄		10.26 ± 0.5	VDF	244	189
B₁₀H₁₆⁺						
B ₁₀ H ₁₆ ⁺	B ₁₀ H ₁₆		10.1 ± 0.2	EVD		1102
C⁺ Heat of formation 431 kcal mol⁻¹						
C ⁺	C		11.267	S	431*	2113
C ⁺	C		11.3 ± 0.2	NS	432	333, 1155
C ⁺	CH ₃ CN		27.0 ± 0.3	NS		131
C ⁺	CO	O ⁻	20.89 ± 0.09	RPD	431	2180
C ⁺	CO	O ⁻	20.89 ± 0.09	RPD	431	2191
C ⁺	CO	O ⁻	21.0 ± 0.1	FDP	434	2014
C ⁺	CO	O ⁻	20.5 ± 0.7	NS	422	2016
C ⁺	CO	O ⁻	20.902 ± 0.02	D	431	6
C ⁺	CO	O	22.57 ± 0.20	RPD	435	2180
C ⁺	CO	O	22.57 ± 0.20	RPD	435	2191
C ⁺	CO	O	22.4 ± 0.1	FDP	431	2014
C ⁺	CO	O	22.6 ± 0.6	NS	435	2016
C ⁺	CH ₃ NO ₂		22.83 ± 0.05	VC		90
C ⁺	CF ₄		31.5 ± 0.5	SL		24
C ⁺	CH ₃ Cl		26.25 ± 0.1	NS		131
C ⁺	CH ₂ Cl ₂		25.45 ± 0.1	NS		131
C ⁺	CHCl ₃		24.62 ± 0.05	NS		131
C ⁺	CF ₃ Cl		31 ± 1	SL		24
C ⁺	CBr ₄	4Br?	23.1 ± 0.4	EVD	445	1246
C ⁺	CBr ₄	4Br?	25.3 ± 0.5	EVD		1246
C ⁺	CBr ₄	4Br?	27.1 ± 0.5	EVD		1246
C ⁺	CH ₂ Br ₂		24.52 ± 0.05	NS		131
C ⁺	CHBr ₃		23.55 ± 0.05	NS		131
C ⁺	CF ₃ Br		33 ± 1	SL		24
C ⁺	CF ₃ I		32.6 ± 1	SL		24
C ⁺	CO	O ⁻	20.8 ± 0.5	PI	429	163
C ⁺	CO	O	22.3 ± 0.4	PI	428	163
C ⁺	CO	O	24.8 ± 0.5	PI		163
C ⁺	CO	O	26.4 ± 0.3	PI		163
C₂⁺ Heat of formation 475 kcal mol⁻¹						
C ₂ ⁺	C ₂		13	VC	499	2102
C ₂ ⁺	C ₂		12.0 ± 0.6	NS	476*	333, 1155
C ₂ ⁺	C ₂ H ₂	H ₂	18.2	VC	474*	2102
C ₂ ⁺	C ₂ H ₂	2H	22.7	VC	474*	2102
C ₂ ⁺	C ₂ H ₂	2H	23.3 ± 0.5	VC	487	13
C ₂ ⁺	C ₂ N ₂	N ₂	18.4 ± 0.3	SL	498	154
C ₂ ⁺	CNC≡CCN	C ₂ N ₂	18.5 ± 0.3	SL	481	154
C ₂ ⁺	CNC≡CC≡CCN	C ₄ N ₂	18.4 ± 1.0	SL	479	154
C ₂ ⁺	CH≡CCN	HCN	18.6 ± 0.2	SL	488	154

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃⁺ Heat of formation 480 kcal mol⁻¹						
C ₃ ⁺	C ₃		14.4 ± 0.3	SL	521	154
C ₃ ⁺	C ₃		13.6	SL	503	154
C ₃ ⁺	C ₃		14.0	SL	513	154
C ₃ ⁺	C ₃		12.6 ± 0.6	NS	480*	333, 1155
C ₃ ⁺	CH ₃ C≡CH	H ₂ +2H?	26.0 ± 1	VC	540	13
C ₃ ⁺	CNC≡CCN	CN+N?	24.6 ± 0.5	SL	482	154
C ₃ ⁺	CNC≡CC≡CCN	C ₃ N+N?	23.0 ± 2.0	SL	474	154
C ₃ ⁺	CH≡CCN	N+H?	24.5 ± 0.5	SL	491	154
C₄⁺						
C ₄ ⁺	C ₄		12.6	NS	533	333, 1155
C ₄ ⁺	CNC≡CCN	N ₂	17.2 ± 0.2	SL	525	154
C ₄ ⁺	CNC≡CC≡CCN	C ₂ N ₂	17.8 ± 0.4	SL	520	154
C₅⁺						
C ₅ ⁺	C ₅		12.7 ± 0.5	SL	535	154
C ₅ ⁺	C ₅		12.5 ± 1	NS	531	333, 1155
C ₅ ⁺	CNC≡CC≡CCN	CN+N	24.0 ± 0.5	SL	523	154
C₆⁺						
C ₆ ⁺	C ₆		12.5 ± 0.3	SL		154
CH⁺ Heat of formation 399 kcal mol⁻¹						
CH ⁺	CH		11.13 ± 0.22	S	399*	2114
CH ⁺	CH ₃	H ₂	15.58 ± 0.30	LE	393	414
CH ⁺	C ₂ H ₂	CH	21.68	VC	412	2102
CH ⁺	C ₃ H ₈		26.0 ± 1	VC		1408
CH ⁺	C ₃ H ₈		31.8 ± 1.5	VC		1408
CH ⁺	CH ₃ CN	HCN + H?	22.4 ± 0.2	NS	453	131
CH ⁺	CH≡CCN	C ₂ N?	21.9 ± 0.3	SL	485	154
CH ⁺	CH ₃ OH	H ₂ O + H?	22.31 ± 0.09	NS	472	131
CH ⁺	C ₂ H ₄ O (Ethylene oxide)		22.8 ± 0.4	EVD		50
CH ⁺	CH ₃ Cl	H ₂ + Cl?	22.5 ± 0.06	NS	470	131
CH ⁺	CH ₂ Cl ₂	Cl + HCl?	21.72 ± 0.04	NS	472	131
CH ⁺	CHCl ₃	3Cl?	23.9 ± 0.3	EVD	438	43
CH ⁺	CHCl ₃	3Cl?	22.90 ± 0.04	NS	416	131
CH ⁺	CH ₃ Br	H ₂ + Br?	21.41 ± 0.05	NS	459	131
CH ⁺	CH ₂ Br ₂	H + 2Br?	21.55 ± 0.05	NS	390	131
CH ⁺	CHBr ₃	3Br?	21.70 ± 0.05	NS	424	131
CH ⁺	CH ₃ I	H ₂ + I?	21.2 ± 0.2	NS	466	131

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₂⁺ Heat of formation 333 kcal mol⁻¹						
CH ₂ ⁺	CH ₂		10.396 ± 0.003	S	(a)	1078
CH ₂ ⁺	CH ₂		11.82 ± 0.05	VC	(a)	327
CH ₂ ⁺	CH ₂ (EI on neutral fragment from C ₃ H ₈)		10.7 ± 0.5	NS	(a)	87
CH ₂ ⁺	CH ₂ (EI on neutral fragment from n-C ₄ H ₁₀)		11.0 ± 0.5	NS	(a)	87
CH ₂ ⁺	CH ₃	H	15.29 ± 0.08	VC	334*	414
CH ₂ ⁺	CH ₃	H	15.41 ± 0.15	LE	337	414
CH ₂ ⁺	CH ₄	H ₂	15.16 ± 0.04	PI	332*	1128
CH ₂ ⁺	CH ₄	H ₂	15.6 ± 0.2	RPD	342	160
CH ₂ ⁺	CH ₄	H ₂	16.3 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₄	H ₂	16.8 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₄	H ₂	17.7 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₄	H + H ⁻ ?	19.4	RPD	344	160
CH ₂ ⁺	CH ₄	2H	20.0	RPD	339	160
CH ₂ ⁺	C ₂ H ₂		21	VC		2136
CH ₂ ⁺	C ₂ H ₄	CH ₂	19.0	VC	357	419
CH ₂ ⁺	CH ₂ N ₂ (Diazomethane)	N ₂	12.3 ± 0.1	VC	(a)	314
CH ₂ ⁺	CH ₂ N ₂ (Diazirine)	N ₂	11.0 ± 0.1	VC	(a)	314
CH ₂ ⁺	C ₂ H ₄ O (Ethylene oxide)	CHO + H?	16.5 ± 0.4	EVD	320	50
CH ₂ ⁺	C ₃ H ₆ O (Propylene oxide)	C ₂ H ₃ O + H	18.8 ± 0.5	EVD	364	50
CH ₂ ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)		21.3 ± 0.5	EVD		153
CH ₂ ⁺	CH ₂ =CF ₂	CF ₂	17.8	VC	367	419
CH ₂ ⁺	CH ₃ CF ₃	HCF ₃	16.2 ± 0.3	SL	362	1075
CH ₂ ⁺	CH ₃ BF ₂	HBF ₂	16.9 ± 0.1	VC	(b)	1076
CH ₂ ⁺	C ₂ H ₄ S (Ethylene sulfide)	CS + 2H	20.4 ± 0.5	EVD	(b)	51
CH ₂ ⁺	CH ₃ Cl	HCl	14.6 ± 0.2	RPD	339	160
CH ₂ ⁺	CH ₃ Cl	HCl	15.3 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₃ Cl	HCl	15.9 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₃ Cl	HCl	16.8 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₃ Cl	H + Cl ⁻ ?	15.3 ± 0.2	RPD	340	160
CH ₂ ⁺	CH ₃ Cl	Cl + H ⁻ ?	18.4 ± 0.2	RPD	343	160
CH ₂ ⁺	CH ₃ Cl	H ⁺ Cl	19.1 ± 0.2	RPD	340	160
CH ₂ ⁺	C ₃ H ₅ OCl (Epichlorohydrin)		21.6 ± 0.5	EVD		153
CH ₂ ⁺	CH ₃ Br	HBr	14.9 ± 0.2	RPD	344	160
CH ₂ ⁺	CH ₃ Br	HBr	15.6 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₃ Br	HBr	16.1 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₃ Br	HBr	17.0 ± 0.2	RPD	160	160
CH ₂ ⁺	CH ₃ Br	H + Br ⁻ ?	15.15 ± 0.2	RPD	345	160
CH ₂ ⁺	CH ₃ Br	Br + H ⁻ ?	18.1 ± 0.2	RPD	349	160
CH ₂ ⁺	CH ₃ Br	H + Br	18.7	RPD	344	160
CH ₂ ⁺	C ₃ H ₅ OB ₂ (Epibromohydrin)		21.4 ± 0.5	EVD		153

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH ₂ ⁺	CH ₃ I	HI	14.6 ± 0.2	RPD	333	160
CH ₂ ⁺	CH ₃ I	HI	15.3 ± 0.2	RPD		160
CH ₂ ⁺	CH ₃ I	HI	15.9 ± 0.2	RPD		160
CH ₂ ⁺	CH ₃ I	HI	16.7 ± 0.2	RPD		160
CH ₂ ⁺	CH ₃ I	H + I ⁻ ?	14.6 ± 0.2	RPD	335	160
CH ₂ ⁺	CH ₃ I	I + H ⁻ ?	17.0 ± 0.2	RPD	336	160
CH ₂ ⁺	CH ₃ I	I + H ⁻ ?	18.1	RPD		160
CH ₂ ⁺	CH ₃ I	H + I	17.7 ± 0.2	RPD	334	160
CD₂⁺						
CD ₂ ⁺	CD ₄	D ₂	15.25 ± 0.04	PI		1128
CH₃⁺ Heat of formation 260 kcal mol⁻¹						
CH ₃ ⁺	CH ₃		9.840 ± 0.002	S	260*	349
CH ₃ ⁺	CH ₃		9.82 ± 0.04	PI	260*	1068
CH ₃ ⁺	CH ₃		9.80 ± 0.1	RPD	259	2158
CH ₃ ⁺	CH ₃		10.3 ± 0.1	RPD		2158
CH ₃ ⁺	CH ₃		10.7 ± 0.1	RPD		2158
CH ₃ ⁺	CH ₃		11.4 ± 0.1	RPD		2158
CH ₃ ⁺	CH ₃		9.86 ± 0.02	VC	261	327
CH ₃ ⁺	CH ₃		10.11 ± 0.10	VC	266	414
CH ₃ ⁺	CH ₃		10.04 ± 0.12	LE	265	414
CH ₃ ⁺	CH ₃		9.8 ± 0.1	NS	259	87, 1129
(EI on neutral fragment from C ₃ H ₈)						
CH ₃ ⁺	CH ₃		9.8 ± 0.1	NS	259	87
(EI on neutral fragment from benzene)						
CH ₃ ⁺	CH ₃		10.0 ± 0.1	NS	264	87
(EI on neutral fragment from n-C ₄ H ₁₀)						
CH ₃ ⁺	CH ₃		10.0 ± 0.2	NS	264	87
(EI on neutral fragment from n-C ₆ H ₁₄)						
CH ₃ ⁺	CH ₃		10.0 ± 0.3	NS	264	464
CH ₃ ⁺	CH ₄	H	14.25 ± 0.02	PI	259*	1128
CH ₃ ⁺	CH ₄	H	14.23 ± 0.05	PI	258*	2013
CH ₃ ⁺	CH ₄	H	14.3 ± 0.05	RPD	260	224
CH ₃ ⁺	CH ₄	H	14.75 ± 0.1	RPD		224
CH ₃ ⁺	CH ₄	H	15.3 ± 0.1	RPD		224
CH ₃ ⁺	CH ₄	H	14.3 ± 0.05	RPD	260	2154
CH ₃ ⁺	CH ₄	H	14.28 ± 0.08	RPD	259	1072
CH ₃ ⁺	CH ₄	H	20.85 ± 0.27	RPD		1072
CH ₃ ⁺	CH ₄	H	14.3 ± 0.1	MSD	260	1451
CH ₃ ⁺	CH ₄	H ⁻ ?	13.7 ± 0.05	RPD	265	2154
HC ₃ ⁺	CH ₄	H ⁻ ?	14.7 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₄	H ⁻ ?	15.4 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₄	H ⁻ ?	16.4 ± 0.05	RPD		2154
CH ₃ ⁺	C ₂ H ₆	CH ₃	13.6	RPD	260	160
CH ₃ ⁺	C ₂ H ₆	CH ₃ ?	12.6	RPD		160
CH ₃ ⁺	C ₂ H ₆	CH ₃ ?	13.6	RPD		160
CH ₃ ⁺	C ₂ H ₆	CH ₃ ?	14.3	RPD		160
CH ₃ ⁺	C ₂ H ₆	CH ₃ ?	15.3	RPD		160
CH ₃ ⁺	C ₂ H ₆	CH ₃ ?	16.0	RPD		160
CH ₃ ⁺	CH ₃ C≡CH	C ₂ H	15.4 ± 0.5	VC	(b)	13

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅	15.2 ± 1	VC	301	1408
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅	20.2 ± 0.5	VC		1408
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅	14.0 ± 0.5	LE	273	2021
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅	17.5 ± 0.5	LE		2021
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅	20.0 ± 0.5	LE		2021
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅ ⁺	22.0 ± 0.5	VC	263	1408
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅ ⁺	22.4 ± 0.5	LE	273	2021
CH ₃ ⁺	C ₃ H ₈	H ₂ + C ₂ H ₃ ⁺	25.0 ± 0.5	VC	269	1408
CH ₃ ⁺	CH ₃ CH=C=CH ₂	C ₃ H ₃	14.4 ± 0.2	SL	(b)	462
CH ₃ ⁺	CH ₃ C≡CCH ₃	C ₃ H ₃	17.6 ± 0.5	VC	(b)	13
CH ₃ ⁺	neo-C ₅ H ₁₂	tert-C ₄ H ₉	13.14	VC	259	2101
CH ₃ ⁺	neo-C ₅ H ₁₂		20.07	VC		2101
CH ₃ ⁺	C ₂ H ₅ C≡CC≡CH		18.50	EVD		1197
CH ₃ ⁺	CH ₃ C≡CC≡CCH ₃		25.70	EVD		1197
CH ₃ ⁺	(CH ₃) ₃ B	(CH ₃) ₂ B	15.1 ± 0.3	SL	(b)	364
CH ₃ ⁺	C ₂ H ₅ N (Ethylenimine)	HCN + H	15.5 ± 0.3	EVD	299	51
CH ₃ ⁺	(CH ₂) ₃ NH (Azetidine)	C ₂ H ₃ N + H	14.4 ± 1.0	EVD	275	52
CH ₃ ⁺	CH ₃ N ₂ H ₃	N ₂ H ₃	14.1 ± 0.3	SL	(b)	424
CH ₃ ⁺	CH ₃ N=NCH ₃	CH ₃ ⁺ N ₂	11.5 ± 0.1	SL	275	304
CH ₃ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	CH ₃ NNH ₂	14.5 ± 0.3	SL	(b)	424
CH ₃ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,2-Dimethylhydrazine)	CH ₃ NHNH	13.9 ± 0.3	SL	(b)	424
CH ₃ ⁺	(CH ₃) ₃ N ₂ H	(CH ₃) ₂ N ₂ H	14.0 ± 0.5	SL	(b)	424
CH ₃ ⁺	(CH ₃) ₃ N ₂	(CH ₃) ₃ N ₂	14 ± 1	SL	(b)	424
CH ₃ ⁺	CH ₃ N ₃	N ₂ + N?	14.1 ± 0.1	SL	269	340
CH ₃ ⁺	CH ₃ OH	OH	13.7	RPD	259	2018
CH ₃ ⁺	CH ₃ OH	OH	14.7	RPD		2018
CH ₃ ⁺	CH ₃ OH	OH	15.3	RPD		2018
CH ₃ ⁺	CH ₃ OH	OH	13.5	NS	254	46
CH ₃ ⁺	CH ₃ OH	OH?	11.9	RPD		2018
CH ₃ ⁺	CH ₃ OH	OH?	13.0	RPD		2018
CH ₃ ⁺	CH ₃ OH	OH?	13.7	RPD		2018
CH ₃ ⁺	CH ₃ OH	OH?	14.7	RPD		2018
CH ₃ ⁺	CH ₃ OH	OH?	15.3	RPD		2018
CH ₃ ⁺	CH ₃ CHO	CHO	13.12 ± 0.06	EVD	267	127
CH ₃ ⁺	CH ₃ CHO	CO + H	14.55	SL	270	298
CH ₃ ⁺	C ₂ H ₄ O (Ethylene oxide)	CO + H	14.3 ± 0.2	EVD	292	50
CH ₃ ⁺	(CH ₃) ₂ O	CH ₃ O	13.1	RPD	(b)	2018
CH ₃ ⁺	(CH ₃) ₂ O	CH ₃ O?	10.5	RPD		2018
CH ₃ ⁺	(CH ₃) ₂ O	CH ₃ O?	11.6	RPD		2018
CH ₃ ⁺	(CH ₃) ₂ CO	CO + CH ₃ ?	15.20	SL	292	298
CH ₃ ⁺	(CH ₃) ₂ CO	CH ₃ CO	13.15 ± 0.17	VC	256	2174
CH ₃ ⁺	C ₃ H ₆ O (Propylene oxide)	CH ₃ CO?	13.9 ± 0.2	EVD	303	50
CH ₃ ⁺	CH ₃ COC ₂ H ₅	CO + C ₂ H ₅	15.20	SL	294	298
CH ₃ ⁺	CH ₃ COOH	COOH	16.08	LE	306	171
CH ₃ ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)		16.0 ± 0.3	EVD		153

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH ₃ ⁺	(CH ₃ O) ₂ BH		13.4 ± 0.5	SL		364
CH ₃ ⁺	(CH ₃ O) ₃ B		21.4 ± 0.5	EVD		115
CH ₃ ⁺	(CH ₃ O) ₃ B		13.6 ± 0.5	SL		364
CH ₃ ⁺	CH ₃ COCHN ₂	COCHN ₂	13.2 ± 0.06	LE		2174
CH ₃ ⁺	CH ₃ NO ₂	NO ₂	12.6	RPD	265	2018
CH ₃ ⁺	CH ₃ NO ₂	NO ₂ ⁻ ?	8.7	RPD		2018
CH ₃ ⁺	CH ₃ NO ₂	NO ₂ ⁻ ?	9.8	RPD		2018
CH ₃ ⁺	CH ₃ NO ₂	NO ₂ ⁻ ?	10.4	RPD		2018
CH ₃ ⁺	CH ₃ NO ₂	NO ₂ ⁻ ?	11.5	RPD		2018
CH ₃ ⁺	CH ₃ NO ₂	NO ₂ ⁻ ?	12.1	RPD		2018
CH ₃ ⁺	C ₂ H ₅ ONO ₂	CH ₂ ONO ₂	13.75 ± 0.50	VC	(b)	1013
CH ₃ ⁺	CH ₃ F	F	14.5 ± 0.05	RPD	249	2154
CH ₃ ⁺	CH ₃ F	F	14.7 ± 0.3	SL	253	1136
CH ₃ ⁺	CH ₃ F	F	16.3 ± 0.3	SL		1136
CH ₃ ⁺	CH ₃ F	F	16.5 ± 0.5	SL		1136
CH ₃ ⁺	CH ₃ F	F ⁻ ?	10.8 ± 0.05	RPD	247	2154
CH ₃ ⁺	CH ₃ F	F ⁻ ?	11.9 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ F	F ⁻ ?	12.6 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ F	F ⁻ ?	13.4 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ F	F ⁻	12.7 ± 0.5	SL	291	1136
CH ₃ ⁺	CH ₃ CHF ₂	CHF ₂	18.6	VC	(b)	1288
CH ₃ ⁺	CH ₃ CF ₃	CF ₃	15.0 ± 0.1	SL	284	1075
CH ₃ ⁺	CH ₃ BF ₂	BF ₂	14.8 ± 0.1	VC	278	1076
CH ₃ ⁺	CH ₃ COCF ₃	CO + CF ₃	14.60	SL	(a)	298
CH ₃ ⁺	CH ₃ SiH ₃	SiH ₃	15.1 ± 0.3	SL		2182
CH ₃ ⁺	(CH ₃) ₃ SiH	(CH ₃) ₂ SiH	14.8 ± 0.5	EVD	(b)	83
CH ₃ ⁺	CH ₃ PH ₂	PH ₂	14.8 ± 0.2	EVD	304	2045
CH ₃ ⁺	(CH ₃) ₃ P	(CH ₃) ₂ P ⁺	21.7 ± 0.5	VC	263	1036
CH ₃ ⁺	(CH ₃) ₂ S	CH ₂ + SH	17.0 ± 0.4	EVD		84
CH ₃ ⁺	(CH ₃) ₂ S	CH ₃ S	13.0	SL	(b)	307
CH ₃ ⁺	CH ₃ SCD ₃	CD ₃ S	13.1	SL		307
CH ₃ ⁺	C ₃ H ₆ S (Propylene sulfide)		18.1 ± 0.4	EVD		188
CH ₃ ⁺	C ₂ H ₅ SCH ₃		17.6 ± 0.5	EVD		176
CH ₃ ⁺	CH ₃ SCH ₂ CH=CH ₂		17.7 ± 0.5	EVD		186
CH ₃ ⁺	n-C ₃ H ₇ SCH ₃		16.6 ± 0.5	EVD		176
CH ₃ ⁺	iso-C ₃ H ₇ SCH ₃		19.4 ± 0.5	EVD		186
CH ₃ ⁺	CH ₃ SSCH ₃		15.7 ± 0.3	EVD		176
CH ₃ ⁺	CH ₃ NCS	NCS	15.3 ± 0.3	EVD	(b)	315
CH ₃ ⁺	C ₂ H ₅ NCS		19.6 ± 0.5	EVD		315
CH ₃ ⁺	CH ₃ Cl	Cl	13.6 ± 0.05	RPD	265	2154
CH ₃ ⁺	CH ₃ Cl	Cl	13.4 ± 0.1	SL	261	364
CH ₃ ⁺	CH ₃ Cl	Cl	13.6 ± 0.1	SL	265	364
CH ₃ ⁺	CH ₃ Cl	Cl	13.7 ± 0.2	SL	267	1136

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (keal mol ⁻¹)	Ref.
CH ₃ ⁺	CH ₃ Cl	Cl ⁻	10.07	PI	272	1399
CH ₃ ⁺	CH ₃ Cl	Cl ⁻ ?	9.8 ± 0.05	RPD	265	2154
CH ₃ ⁺	CH ₃ Cl	Cl ⁻ ?	10.8 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ Cl	Cl ⁻ ?	11.5 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ Cl	Cl ⁻ ?	12.4 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ Cl	Cl ⁻ ?	13.2 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ Cl	Cl ⁻	10.2 ± 0.5	SL	275	1136
CH ₃ ⁺	CH ₃ Cl	Cl ⁻	11.1 ± 0.1	FDP	295	1378
CH ₃ ⁺	C ₂ H ₅ Cl	CH ₂ Cl?	15.9 ± 0.3	VC	(b)	356
CH ₃ ⁺	CH ₃ COCH ₂ Cl	CO + CH ₂ Cl	13.9 ± 0.2	VC	(b)	2174
CH ₃ ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	CO + CH ₂ Cl?	14.6 ± 0.5	EVD	(b)	153
CH ₃ ⁺	CH ₃ SiCl ₃	SiCl ₃	15.0 ± 0.2	SL	(b)	2182
CH ₃ ⁺	(CH ₃) ₄ Ge	Ge + 3CH ₃	20.1 ± 0.5	EVD	239	83
CH ₃ ⁺	CH ₃ Br	Br	13.0 ± 0.05	RPD	265	2154
CH ₃ ⁺	CH ₃ Br	Br	12.9 ± 0.1	SL	262	1136
CH ₃ ⁺	CH ₃ Br	Br ⁻ ?	10.7 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ Br	Br ⁻ ?	11.4 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ Br	Br ⁻ ?	12.3 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ Br	Br ⁻ ?	13.0 ± 0.05	RPD		2154
CH ₃ ⁺	C ₂ H ₅ Br	CH ₂ Br	16.9 ± 0.3	VC	(b)	356
CH ₃ ⁺	C ₃ H ₅ OBr (Epibromohydrin)	CO + CH ₂ Br?	15.6 ± 0.5	EVD	(b)	153
CH ₃ ⁺	CH ₃ I	I(² P _{3/2})	12.2 ± 0.05	RPD	259	2154
CH ₃ ⁺	CH ₃ I	I(² P _{1/2})	13.1 ± 0.05	RPD	258	2154
CH ₃ ⁺	CH ₃ I	I	12.4 ± 0.2	SL	264	1136
CH ₃ ⁺	CH ₃ I	I ⁻ ?	9.1 ± 0.05	RPD	260	2154
CH ₃ ⁺	CH ₃ I	I ⁻ ?	10.1 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ I	I ⁻ ?	10.8 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ I	I ⁻ ?	11.8 ± 0.05	RPD		2154
CH ₃ ⁺	CH ₃ I	I ⁻ ?	12.6 ± 0.05	RPD		2154
CH ₃ ⁺	C ₂ H ₅ I	CH ₂ I	16.3 ± 0.3	VC	(b)	356
CH ₃ ⁺	(CH ₃) ₂ Hg	CH ₃ Hg	13.4 ± 0.1	SL	(b)	306
CH ₃ ⁺	CH ₃ HgCl	HgCl	14.8 ± 0.2	SL	(b)	306

CH₃⁺ High kinetic energy ions

CH ₃ ⁺	C ₂ H ₆		30.3 ± 0.2	NRE	1264
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅ ⁺	27.8 ± 0.2	NRE	1451
CH ₃ ⁺	C ₃ H ₈		30.8 ± 0.2	NRE	1264
CH ₃ ⁺	C ₃ H ₈	C ₂ H ₅ ⁺	34.5 ± 0.5	NRE	1451
CH ₃ ⁺	n-C ₄ H ₁₀		29.7 ± 0.2	NRE	1264
CH ₃ ⁺	iso-C ₄ H ₁₀		29.4 ± 0.2	NRE	1264
CH ₃ ⁺	neo-C ₅ H ₁₂		29.5 ± 0.2	NRE	1264
CH ₃ ⁺	C ₆ H ₆ (Benzene)		28.2 ± 0.2	NRE	1264
CH ₃ ⁺	n-C ₇ H ₁₆		27.9 ± 0.2	NRE	1264
CH ₃ ⁺	iso-C ₃ H ₇ OH		30.2 ± 0.2	NRE	1264
CH ₃ ⁺	iso-C ₃ H ₇ Cl		29.7 ± 0.2	NRE	1264

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CD₃⁺						
CD ₃ ⁺	CD ₃		9.832 ± 0.002	S		349
CD ₃ ⁺	CD ₄	D	14.38 ± 0.03	PI		1128
CD ₃ ⁺	CD ₃ COOH	COOH	15.56	LE		171
CH₄⁺ Heat of formation 274 kcal mol⁻¹						
CH ₄ ⁺	CH ₄		12.704 ± 0.008	PI	275*	1253
CH ₄ ⁺	CH ₄		12.99 ± 0.01	PI	282	416
CH ₄ ⁺	CH ₄		12.71 ± 0.02	PI	275*	1128
CH ₄ ⁺	CH ₄		12.98 ± 0.02	PI	282	182
CH ₄ ⁺	CH ₄		12.55 ± 0.05	PI	272*	2013
CH ₄ ⁺	CH ₄		13.1 ± 0.1	PI	284	331
CH ₄ ⁺	CH ₄		12.8 ± 0.2	PI	278	230
CH ₄ ⁺	CH ₄		12.9 ± 0.4	S	280	138
CH ₄ ⁺	CH ₄		12.99	PE	282	1130
CH ₄ ⁺	CH ₄		13.00 ± 0.02	RPD	282	224
CH ₄ ⁺	CH ₄		13.6 ± 0.1	RPD		224
CH ₄ ⁺	CH ₄		14.2 ± 0.1	RPD		224
CH ₄ ⁺	CH ₄		14.7 ± 0.1	RPD		224
CH ₄ ⁺	CH ₄		13.16 ± 0.02	RPD	286	289
CH ₄ ⁺	CH ₄		13.18 ± 0.02	RPD	286	1072
CH ₄ ⁺	CH ₄		13.1	VC	284	2136
CH ₄ ⁺	CH ₄		13.21 ± 0.1	NS	287	1129
(EI on neutral fragment from C ₃ H ₈)						
CH ₄ ⁺	CH ₄		13.04	TC	283	1352, 2020
CH ₄ ⁺	CH ₄		13.25	TC	288	136
CH ₄ ⁺	CH ₄		14.06	TC	306	1006
CH ₄ ⁺	CH ₄		19.42 ± 0.08	RPD	430	289
CH ₄ ⁺	CH ₄		19.35 ± 0.40	RPD	428	1072
CH ₄ ⁺	CH ₄		19.30	TC	427	1352, 2020
CH ₄ ⁺	C ₂ H ₄ O (Ethylene oxide)	CO	12.3 ± 0.2	EVD	297	50
CD₄⁺						
CD ₄ ⁺	CD ₄		12.882 ± 0.008	PI		1253
CD ₄ ⁺	CD ₄		12.87 ± 0.02	PI		1128
CD ₄ ⁺	CD ₄		13.1	VC		2136
C₂H⁺ Heat of formation 399 kcal mol⁻¹						
C ₂ H ⁺	C ₂ H ₂	H	17.22	PI	399*	1400
C ₂ H ⁺	C ₂ H ₂	H	17.3	VC	401	2102
C ₂ H ⁺	C ₂ H ₂	H	17.3	VC	401	2136
C ₂ H ⁺	C ₂ H ₂	H	17.8 ± 0.5	VC	413	13
C ₂ H ⁺	C ₂ H ₂	H	17.4	MSD	403	1451
C ₂ H ⁺	C ₂ H ₂	H	17.56 ± 0.1	NS	407	1129
(EI on neutral fragment from C ₃ H ₈)						

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₂ H ⁺	CH ₃ C≡CH	CH ₃	17.2 ± 0.5	VC	408	13
C ₂ H ⁺	C ₃ H ₈	2H ₂ + CH ₃ ⁺	30.4 ± 0.5	VC	417	1408
C ₂ H ⁺	CH≡CC≡CH	C ₂ H	20.1 ± 0.5	VC	454	13
C ₂ H ⁺	CH≡CCN	CN	19.0 ± 0.2	SL	429	154
C ₂ H ⁺	C ₂ H ₄ O (Ethylene oxide)	2H + OH	24.0 ± 0.3	EVD	427	50
C ₂ H ⁺	CH ₃ COCH≡CH	CH ₃ + CO?	17.95	SL	418	298
C ₂ H ⁺	C ₂ H ₅ SSC ₂ H ₅		11.35	SL		307

C₂D⁺

C ₂ D ⁺	C ₂ D ₂	D	17.34	PI	1400
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C₂H₂⁺ Heat of formation 317 kcal mol⁻¹

C ₂ H ₂ ⁺	C ₂ H ₂		11.396 ± 0.003	PI	317*	1253
C ₂ H ₂ ⁺	C ₂ H ₂		11.400 ± 0.005	PI	317*	2013
C ₂ H ₂ ⁺	C ₂ H ₂		11.406 ± 0.006	PI	317*	54, 1019, 1118, 1400
C ₂ H ₂ ⁺	C ₂ H ₂		11.41 ± 0.01	PI	317*	182, 162, 416, 1022
C ₂ H ₂ ⁺	C ₂ H ₂		11.25 ± 0.05	PI	314	156
C ₂ H ₂ ⁺	C ₂ H ₂		11.36	PE	316	1108
C ₂ H ₂ ⁺ (4Π _u)	C ₂ H ₂		16.27	PE	429	1108
C ₂ H ₂ ⁺ (4Σ _g ⁻)	C ₂ H ₂		18.33	PE	477	1108
C ₂ H ₂ ⁺	C ₂ H ₂		11.41	PE	317*	1130
C ₂ H ₂ ⁺	C ₂ H ₂		16.41	PE		1130
C ₂ H ₂ ⁺	C ₂ H ₂		18.56	PE		1130
C ₂ H ₂ ⁺	C ₂ H ₂		20.51	PE		1130
C ₂ H ₂ ⁺	C ₂ H ₂		11.40 ± 0.02	RPD	317	224
C ₂ H ₂ ⁺	C ₂ H ₂		11.7 ± 0.1	RPD		224
C ₂ H ₂ ⁺	C ₂ H ₂		12.1 ± 0.1	RPD		224
C ₂ H ₂ ⁺	C ₂ H ₂		13.2 ± 0.1	RPD		224
C ₂ H ₂ ⁺	C ₂ H ₂		14.5 ± 0.1	RPD		224
C ₂ H ₂ ⁺	C ₂ H ₂		17.0 ± 0.1	RPD		224
C ₂ H ₂ ⁺	C ₂ H ₂		11.50 ± 0.10	RPD	319	166
C ₂ H ₂ ⁺	C ₂ H ₂		13.25 ± 0.19	RPD		166
C ₂ H ₂ ⁺	C ₂ H ₂		16.95 ± 0.30	RPD		166
C ₂ H ₂ ⁺	C ₂ H ₂		11.41 ± 0.01	VC	317	13
C ₂ H ₂ ⁺	C ₂ H ₂		11.36	TC	316	136
C ₂ H ₂ ⁺	C ₂ H ₄	H ₂	12.96 ± 0.02	PI	311	2013
C ₂ H ₂ ⁺	C ₂ H ₄	H ₂	13.40 ± 0.08	RPD	321	166
C ₂ H ₂ ⁺	C ₂ H ₄	H ₂	15.00 ± 0.08	RPD		166
C ₂ H ₂ ⁺	C ₂ H ₄	H ₂	13.2 ± 0.1	VC	317	419
C ₂ H ₂ ⁺	C ₂ H ₄	2H	17.55 ± 0.20	RPD	313	166
C ₂ H ₂ ⁺	C ₂ H ₄	2H	21.41 ± 0.31	RPD		166
C ₂ H ₂ ⁺	C ₂ H ₄	2H	25.20 ± 1.0	RPD		166
C ₂ H ₂ ⁺	C ₃ H ₈	CH ₄ + H ₂	14.1 ± 0.15	VC	318	1408
C ₂ H ₂ ⁺	C ₃ H ₈		21.8 ± 1	VC		1408
C ₂ H ₂ ⁺	C ₃ H ₈	H ₂ + H + CH ₃ ⁺	28.5 ± 1	VC	321	1408
C ₂ H ₂ ⁺	C ₆ H ₆ (Benzene)	2C ₂ H ₂	18.6 ± 0.3	EVD	340	1238
C ₂ H ₂ ⁺	C ₆ H ₆ (Benzene-excess KE ion)		32.6 ± 0.2	SRP		1264

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₂ H ₂ ⁺ (Ethlyenimine)	C ₂ H ₅ N	NH + H ₂	16.4 ± 0.4	EVD	325	51
C ₂ H ₂ ⁺	C ₂ H ₃ CN	HCN	13.13 ± 0.10	EVD	315	1406
C ₂ H ₂ ⁺ (Azetidine)	(CH ₂) ₃ NH	CH ₃ + NH ₂	16.6 ± 0.5	EVD	324	52
C ₂ H ₂ ⁺ (Pyrrolidine)	(CH ₂) ₄ NH	C ₂ H ₅ + NH ₂ ?	17.3 ± 1.0	EVD	331	52
C ₂ H ₂ ⁺ (Orthodiazine)	C ₄ H ₄ N ₂		14.94 ± 0.10	EVD		1406
C ₂ H ₂ ⁺ (Metadiazine)	C ₄ H ₄ N ₂		15.79 ± 0.05	EVD		1406
C ₂ H ₂ ⁺ (Paradiazine)	C ₄ H ₄ N ₂		15.23 ± 0.10	EVD		1406
C ₂ H ₂ ⁺ (Ethylene oxide)	C ₂ H ₄ O	H ₂ O?	15.7 ± 0.3	EVD	407	50
C ₂ H ₂ ⁺ (Propylene oxide)	C ₃ H ₆ O	CH ₂ O + H ₂	13.9 ± 0.2	EVD	327	50
C ₂ H ₂ ⁺ (Trimethylene oxide)	(CH ₂) ₃ O	CO + 2H ₂	15.2 ± 0.2	EVD	353	52
C ₂ H ₂ ⁺ (3,4-Epoxy-1-butene)	C ₄ H ₆ O		13.8 ± 0.3	EVD		153
C ₂ H ₂ ⁺ (Tetrahydrofuran)	(CH ₂) ₄ O		17.3 ± 0.3	EVD		52
C ₂ H ₂ ⁺ (1,2-Epoxy-3-methoxypropane)	C ₄ H ₈ O ₂		16.2 ± 0.3	EVD		153
C ₂ H ₂ ⁺	C ₂ H ₃ F	HF	13.73 ± 0.1	VC	353	419
C ₂ H ₂ ⁺	CH ₂ =CF ₂	2F	19.78 ± 0.1	VC	340	419
C ₂ H ₂ ⁺	C ₂ H ₃ CF ₃	HCF ₃	13.3 ± 0.15	SL	(a)	1075
C ₂ H ₂ ⁺	C ₂ H ₃ BF ₂	HBF ₂	13.75 ± 0.1	VC	(b)	1076
C ₂ H ₂ ⁺ (Ethylene sulfide)	C ₂ H ₄ S	SH + H	17.9 ± 0.5	EVD	346	51
C ₂ H ₂ ⁺ (Propylene sulfide)	C ₃ H ₆ S		17.7 ± 0.4	EVD		188
C ₂ H ₂ ⁺ (Trimethylene sulfide)	(CH ₂) ₃ S		17.1 ± 0.4	EVD		52
C ₂ H ₂ ⁺	C ₂ H ₅ SCH ₃		17.8 ± 0.5	EVD		176
C ₂ H ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅		19.5 ± 0.5	EVD		186
C ₂ H ₂ ⁺	C ₂ H ₅ NCS		18.1 ± 0.2	EVD		315
C ₂ H ₂ ⁺ (Epichlorohydrin)	C ₃ H ₅ OCl		16.6 ± 0.1			153
C ₂ H ₂ ⁺ (Epibromohydrin)	C ₃ H ₅ OB _{Br}		16.7 ± 0.6	EVD		153
C₂D₂⁺						
C ₂ D ₂ [±]	C ₂ D ₂		11.416 ± 0.006	PI		54, 1019, 1118, 1400

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₃⁺ Heat of formation 269 kcal mol⁻¹						
C ₂ H ₃ ⁺	C ₂ H ₃		9.45 ± 0.05	SL	283	70
C ₂ H ₃ ⁺	C ₂ H ₃		9.35 ± 0.15	NS	281	1129
	(EI on neutral fragment from n-C ₆ H ₁₄)					
C ₂ H ₃ ⁺	C ₂ H ₃		9.4 ± 0.2	NS	282	87
	(EI on neutral fragment from n-C ₆ H ₁₄)					
C ₂ H ₃ ⁺	C ₂ H ₃		9.9 ± 0.5	NS	293	87
	(EI on neutral fragment from C ₃ H ₈)					
C ₂ H ₃ ⁺	C ₂ H ₄	H	13.37 ± 0.03	PI	269*	2013
C ₂ H ₃ ⁺	C ₂ H ₄	H	14.10 ± 0.15	RPD	286	166
C ₂ H ₃ ⁺	C ₂ H ₄	H	15.58 ± 0.15	RPD		166
C ₂ H ₃ ⁺	C ₂ H ₄	H	17.35 ± 0.28	RPD		166
C ₂ H ₃ ⁺	C ₂ H ₄	H	18.53 ± 0.28	RPD		166
C ₂ H ₃ ⁺	C ₂ H ₄	H(2s?)	24.35 ± 0.55	RPD	287	166
C ₂ H ₃ ⁺	C ₂ H ₄	H	14.00 ± 0.05	EVD	283	70
C ₂ H ₃ ⁺	C ₂ H ₄	H	14.06	VC	285	419
C ₂ H ₃ ⁺	C ₃ H ₆	CH ₃	13.80	LE	290	194
C ₂ H ₃ ⁺	C ₃ H ₈	CH ₃ + H ₂	14.5 ± 0.15	VC	276	1408
C ₂ H ₃ ⁺	C ₃ H ₈	CH ₃ + 2H	19.5 ± 0.3	VC	287	1408
C ₂ H ₃ ⁺	C ₃ H ₈	H ₂ + CH ₃ ⁺	25.0 ± 0.5	VC	293	1408
C ₂ H ₃ ⁺	C ₃ H ₈		30.8 ± 0.2	SRP		1264
	(Excess KE ion)					
C ₂ H ₃ ⁺	CH ₂ =CHCH=CH ₂	C ₂ H ₂ + H	15.72 ± 0.08	SL	283	462
C ₂ H ₃ ⁺	CH ₃ C≡CCH ₃	C ₂ H ₃	14.7 ± 0.2	VC	309	13
C ₂ H ₃ ⁺	1-C ₄ H ₈	C ₂ H ₅	13.6	LE	289	194
C ₂ H ₃ ⁺	neo-C ₅ H ₁₂	3CH ₃	17.95	VC	275	2101
C ₂ H ₃ ⁺	C ₆ H ₆		31.1 ± 0.2	SRP		1264
	(Benzene-excess KE ion)					
C ₂ H ₃ ⁺	C ₂ H ₅ N (Ethylenimine)	NH + H	16.9 ± 0.3	EVD	285	51
C ₂ H ₃ ⁺	(CH ₂) ₃ NH (Azetidine)	CH ₂ + NH ₂ ?	16.6 ± 0.5	EVD	264	52
C ₂ H ₃ ⁺	(CH ₂) ₄ NH (Pyrrolidine)	C ₂ H ₅ + NH?	16.7 ± 0.3	EVD	279	52
C ₂ H ₃ ⁺	C ₂ H ₄ O (Ethylene oxide)	OH	14.3 ± 0.2	EVD	308	50
C ₂ H ₃ ⁺	C ₂ H ₅ OH	H ₂ O + H	14.7	NS	288	46
C ₂ H ₃ ⁺	CH ₂ =CHCHO	CHO?	13.69 ± 0.13	NS	297	130
C ₂ H ₃ ⁺	C ₃ H ₆ O (Propylene oxide)	CH ₂ O + H	14.3 ± 0.1	EVD	284	50
C ₂ H ₃ ⁺	(CH ₂) ₃ O (Trimethylene oxide)	CH ₂ O + H	14.9 ± 0.3	EVD	296	52
C ₂ H ₃ ⁺	n-C ₃ H ₇ OH	CH ₄ + OH	14.7	NS	286	46
C ₂ H ₃ ⁺	iso-C ₃ H ₇ OH	CH ₄ + OH	14.6	NS	280	46
C ₂ H ₃ ⁺	CH ₃ COCH=CH ₂	CH ₃ + CO	13.75	SL	284	298
C ₂ H ₃ ⁺	C ₄ H ₆ O (3,4-epoxy-1-butene)	CH ₃ CO	12.6 ± 0.3	EVD	305	153
C ₂ H ₃ ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		16.1 ± 0.3	EVD		52
C ₂ H ₃ ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)		16.3 ± 0.2	EVD		153

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₂ H ₃ [‡]	C ₂ H ₃ F	F	14.38 ± 0.1	VC	285	419
C ₂ H ₃ [‡]	C ₂ H ₃ CF ₃	CF ₃	14.20 ± 0.05	EVD	287	1075
C ₂ H ₃ ⁺	C ₂ H ₅ CF ₃	CF ₃ + H ₂	15.3 ± 0.1	SL	276	1075
C ₂ H ₃ ⁺	C ₂ H ₃ BF ₂	BF ₂	14.25 ± 0.05	VC	(a)	1076
C ₂ H ₃ [‡]	<i>iso</i> -C ₃ H ₇ BF ₂	CH ₄ + BF ₂	14.8 ± 0.1	VC	271	1076
C ₂ H ₃ ⁺	(CH ₃) ₃ SiH		15.3 ± 0.5	EVD		83
C ₂ H ₃ [‡]	C ₂ H ₄ S (Ethylene sulfide)	SH	14.6 ± 0.2	EVD	322	51
C ₂ H ₃ ⁺	(CH ₃) ₂ S	H ₂ S + H	15.4 ± 0.3	EVD	299	84
C ₂ H ₃ ⁺	(CH ₃) ₂ S	HS + H ₂	14.7	SL	299	307
C ₂ H ₃ ⁺	CH ₃ SCD ₃	D ₂ S + D	16.7	SL		307
C ₂ H ₃ [‡]	C ₃ H ₆ S (Propylene sulfide)	CH ₂ S + H	17.2 ± 0.3	EVD		188
C ₂ H ₃ [‡]	(CH ₂) ₃ S (Trimethylene sulfide)	CHS + H ₂	16.7 ± 0.2	EVD	(b)	52
C ₂ H ₃ [‡]	C ₂ H ₅ SCH ₃	CH ₃ S + H ₂	16.0 ± 0.4	EVD	322	176
C ₂ H ₃ [‡]	CH ₃ SCH ₂ CH=CH ₂	CH ₃ S + CH ₂	16.5 ± 0.4	EVD	265	186
C ₂ H ₃ ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)		18.0 ± 0.4	EVD		52
C ₂ H ₃ ⁺	<i>n</i> -C ₃ H ₇ SCH ₃		15.8 ± 0.4	EVD		176
C ₂ H ₃ [‡]	<i>iso</i> -C ₃ H ₇ SCH ₃		16.5 ± 0.5	EVD		186
C ₂ H ₃ ⁺	(C ₂ H ₅) ₂ S		16.7 ± 0.5	EVD		84
C ₂ H ₃ ⁺	C ₂ H ₅ SSC ₂ H ₅		17.2 ± 0.4	EVD		186
C ₂ H ₃ ⁺	C ₂ H ₅ NCS	NCS + H ₂	15.6 ± 0.3	LE	(b)	315
C ₂ H ₃ ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	CH ₂ O + Cl	14.0 ± 0.4	EVD	295	153
C ₂ H ₃ ⁺	C ₃ H ₅ OBr (Epibromohydrin)	CH ₂ O + Br	14.4 ± 0.2	EVD	305	153
C₂H₂D⁺						
C ₂ H ₂ D ⁺	CH ₃ SCD ₃	D ₂ S + H?	15.05	SL		307
C₂HD₂⁺						
C ₂ HD ₂ ⁺	CH ₃ SCD ₃		13.5	SL		307
C₂D₃⁺						
C ₂ D ₃ [‡]	CH ₃ SCD ₃		12.1	SL		307
C₂H₄⁺ Heat of formation 253 kcal mol⁻¹						
C ₂ H ₄ ⁺	C ₂ H ₄		10.45	S	253*	2059
C ₂ H ₄ ⁺	C ₂ H ₄		10.507 ± 0.004	PI	255	1253
C ₂ H ₄ ⁺	C ₂ H ₄		10.511 ± 0.005	PI	255	2013
C ₂ H ₄ ⁺	C ₂ H ₄		10.515 ± 0.01	PI	255	182, 416
C ₂ H ₄ ⁺	C ₂ H ₄		10.45 ± 0.02	PI	253*	2059
C ₂ H ₄ ⁺	C ₂ H ₄		10.50 ± 0.02	PI	255	268
C ₂ H ₄ ⁺	C ₂ H ₄		10.46 ± 0.05	PI	254	156
C ₂ H ₄ ⁺	C ₂ H ₄		10.48	PE	254*	1130
C ₂ H ₄ ⁺	C ₂ H ₄		12.50	PE		1130
C ₂ H ₄ ⁺	C ₂ H ₄		14.39	PE		1130
C ₂ H ₄ ⁺	C ₂ H ₄		15.63	PE		1130
C ₂ H ₄ ⁺	C ₂ H ₄		19.13	PE		1130

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₂ H ₄ ⁺	C ₂ H ₄		10.5 ± 0.25	EM	255	2187
C ₂ H ₄ ⁺	C ₂ H ₄		10.48 ± 0.13	RPD	254	166
C ₂ H ₄ ⁺	C ₂ H ₄		11.74 ± 0.17	RPD		166
C ₂ H ₄ ⁺	C ₂ H ₄		13.31 ± 0.20	RPD		166
C ₂ H ₄ ⁺	C ₂ H ₄		14.64 ± 0.58	RPD		166
C ₂ H ₄ ⁺	C ₂ H ₄		19.28 ± 0.30	RPD		166
C ₂ H ₄ ⁺	C ₂ H ₄		10.56 ± 0.05	EVD	256	268
C ₂ H ₄ ⁺	C ₂ H ₄		10.66	VC	258	419
C ₂ H ₄ ⁺	C ₂ H ₄		10.4 ± 0.3	NS	252	1129
	(EI on neutral fragment from C ₃ H ₈)					
C ₂ H ₄ ⁺	C ₃ H ₆	CH ₂	12.85	LE	207	194
C ₂ H ₄ ⁺	C ₃ H ₈	CH ₄	11.35 ± 0.15	VC	255	1408
C ₂ H ₄ ⁺	C ₃ H ₈	H ₂ + CH ₂ ⁺	27.2 ± 0.5	VC	269	1408
C ₂ H ₄ ⁺	CH ₂ =CHCH=CH ₂	C ₂ H ₂	12.45 ± 0.1	PI	259	2013
C ₂ H ₄ ⁺	1-C ₄ H ₈	C ₂ H ₄	12.38	LE	273	194
C ₂ H ₄ ⁺	cis-2-C ₄ H ₈	C ₂ H ₄	12.19	LE	267	194
C ₂ H ₄ ⁺	C ₂ H ₅ N (Ethylenimine)	NH	13.3 ± 0.2	EVD	254	51
C ₂ H ₄ ⁺	C ₃ H ₆ O (Propylene oxide)	CO + H ₂	11.6 ± 0.2	EVD	272	50
C ₂ H ₄ ⁺	(CH ₂) ₃ O (Trimethylene oxide)	CH ₂ O	12.4 ± 0.3	EVD	290	52
C ₂ H ₄ ⁺	C ₂ H ₅ CF ₃	HCF ₃	13.0 ± 0.2	EVD	273	1075
C ₂ H ₄ ⁺	C ₂ H ₅ BF ₂	HBF ₂	12.08 ± 0.01	VC	(b)	1076
C ₂ H ₄ ⁺	(CH ₂) ₃ S (Trimethylene sulfide)	CH ₂ S	13.6 ± 0.2	EVD	(b)	52
C ₂ H ₄ ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	CHO + Cl	13.6 ± 0.4	EVD	262	153
C ₂ H ₄ ⁺	C ₂ H ₅ SiCl ₃	HSiCl ₃ ?	12.48 ± 0.05	SL	279	2182

C₂H₅⁺ Heat of formation 219 kcal mol⁻¹

C ₂ H ₅ ⁺	C ₂ H ₅		8.4	PI	219*	1068
C ₂ H ₅ ⁺	C ₂ H ₅		8.25 ± 0.1	RPD	215	2158
C ₂ H ₅ ⁺	C ₂ H ₅		8.7 ± 0.1	RPD		2158
C ₂ H ₅ ⁺	C ₂ H ₅		9.3 ± 0.1	RPD		2158
C ₂ H ₅ ⁺	C ₂ H ₅		8.78 ± 0.05	EVD	228	59
C ₂ H ₅ ⁺	C ₂ H ₅		8.80 ± 0.05	EVD	228	1129
	(EI on neutral fragment from n-C ₆ H ₁₄)					
C ₂ H ₅ ⁺	C ₂ H ₅		8.7 ± 0.1	NS	226	87
	(EI on neutral fragment from n-C ₄ H ₁₀)					
C ₂ H ₅ ⁺	C ₂ H ₅		8.8 ± 0.1	NS	228	87
	(EI on neutral fragment from n-C ₆ H ₁₄)					
C ₂ H ₅ ⁺	C ₂ H ₅		8.5 ± 0.6	NS	221	1129
	(EI on neutral fragment from C ₃ H ₈)					
C ₂ H ₅ ⁺	C ₂ H ₅		8.67	TC	225	136, 2038
C ₂ H ₅ ⁺	C ₂ H ₅		11.42	TC	288	353
C ₂ H ₅ ⁺	C ₂ H ₆	H	12.8	RPD	223	160
C ₂ H ₅ ⁺	C ₂ H ₆	H	14.0	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₆	H	12.8	MSD	223	1451
C ₂ H ₅ ⁺	C ₂ H ₆	H	12.97	LE	227	195

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₂ H ₅ ⁺	C ₂ H ₆	H ⁻ ?	12.2	RPD	228	160
C ₂ H ₅ ⁺	C ₂ H ₆	H ⁻ ?	13.3	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₆	H ⁻ ?	14.0	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₆	H ⁻ ?	15.0	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₆	H ⁻ ?	15.6	RPD		160
C ₂ H ₅ ⁺	C ₃ H ₈	CH ₃	12.15 ± 0.15	VC	222	1408
C ₂ H ₅ ⁺	C ₃ H ₈	CH ₃	12.2	MSD	223	1451
C ₂ H ₅ ⁺	C ₃ H ₈	CH ₃	12.24	LE	224	195
C ₂ H ₅ ⁺	C ₃ H ₈	CH ₃ ⁺	21 ± 2	VC	200	1408
C ₂ H ₅ ⁺	C ₃ H ₈		26.9 ± 0.5	VC		1408
C ₂ H ₅ ⁺	C ₂ H ₅ C≡CH	C ₂ H	12.9 ± 0.1	VC	(b)	13
C ₂ H ₅ ⁺	cis-2-C ₄ H ₈	C ₂ H ₃	12.25	LE	216	194, 195
C ₂ H ₅ ⁺	n-C ₄ H ₁₀	C ₂ H ₅	12.55	LE	234	195
C ₂ H ₅ ⁺	iso-C ₄ H ₁₀	C ₂ H ₅	13.80	LE	261	195
C ₂ H ₅ ⁺	n-C ₅ H ₁₂		28.1 ± 0.2	SRP		1264
(Excess KE ion)						
C ₂ H ₅ ⁺	neo-C ₅ H ₁₂	CH ₃ + C ₂ H ₄	13.81	VC	233	2101
C ₂ H ₅ ⁺	n-C ₇ H ₁₆		24.3 ± 0.2	SRP		1264
(Excess KE ion)						
C ₂ H ₅ ⁺	C ₂ H ₅ N=NC ₂ H ₅	C ₂ H ₅ + N ₂	10.45 ± 0.2	SL	249	304
C ₂ H ₅ ⁺	C ₂ H ₅ OH	OH	12.4	RPD	220	2018
C ₂ H ₅ ⁺	C ₂ H ₅ OH	OH ⁻ ?	10.5	RPD	220	2018
C ₂ H ₅ ⁺	C ₂ H ₅ OH	OH ⁻ ?	11.6	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ OH	OH ⁻ ?	12.4	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ OH	OH ⁻ ?	13.2	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ OH	OH ⁻ ?	13.8	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ CHO	CHO	11.48 ± 0.11	NS	220	130
C ₂ H ₅ ⁺	(CH ₂) ₃ O	CO + H	12.6 ± 0.2	EVD	241	52
(Trimethylene oxide)						
C ₂ H ₅ ⁺	CH ₃ COC ₂ H ₅	CH ₃ + CO?	12.95 ± 0.1	SL	235	298
C ₂ H ₅ ⁺	(CH ₂) ₄ O		15.8 ± 0.2	EVD		52
(Tetrahydrofuran)						
C ₂ H ₅ ⁺	CH ₃ COOC ₂ H ₅	CH ₃ + CO ₂	12.1	RPD	243	2018
C ₂ H ₅ ⁺	CH ₃ COOC ₂ H ₅	CH ₃ CO ₂ ?	8.9	RPD		2018
C ₂ H ₅ ⁺	CH ₃ COOC ₂ H ₅	CH ₃ CO ₂ ?	10.0	RPD		2018
C ₂ H ₅ ⁺	CH ₃ COOC ₂ H ₅	CH ₃ CO ₂ ?	10.6	RPD		2018
C ₂ H ₅ ⁺	CH ₃ COOC ₂ H ₅	CH ₃ CO ₂ ?	11.6	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ NO ₂	NO ₂	11.0	RPD	222	2018
C ₂ H ₅ ⁺	C ₂ H ₅ NO ₂	NO ₂ ?	7.0	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ NO ₂	NO ₂ ?	8.1	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ NO ₂	NO ₂ ?	8.8	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ NO ₂	NO ₂ ?	9.8	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ NO ₂	NO ₂ ?	10.4	RPD		2018
C ₂ H ₅ ⁺	C ₂ H ₅ ONO ₂	NO ₃ ?	11.86 ± 0.25	VC	(b)	1013
C ₂ H ₅ ⁺	n-C ₅ H ₁₁ F		14.67	SL		2029
C ₂ H ₅ ⁺	C ₂ H ₅ CF ₃	CF ₃	12.82 ± 0.02	SL	(a)	1075
C ₂ H ₅ ⁺	C ₂ H ₅ BF ₂	BF ₂	13.1 ± 0.2	VC	(a)	1076
C ₂ H ₅ ⁺	C ₂ H ₅ SiH ₃	SiH ₃	12.6 ± 0.2	SL	(b)	2182
C ₂ H ₅ ⁺	C ₂ H ₅ SCH ₃	CH ₃ + S	14.1 ± 0.2	EVD	226	176
C ₂ H ₅ ⁺	n-C ₃ H ₇ SCH ₃		15.3 ± 0.5	EVD		176
C ₂ H ₅ ⁺	(C ₂ H ₅) ₂ S	C ₂ H ₅ + S	14.5 ± 0.3	EVD	237	84
C ₂ H ₅ ⁺	C ₆ H ₅ SC ₂ H ₅	C ₆ H ₅ + S	13.7	SL	(b)	307
(Phenyl ethyl sulfide)						

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₂ H ₅ ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₅ S + S	14.2 ± 0.2	EVD	218	186
C ₂ H ₅ ⁺	C ₂ H ₅ NCS	NCS	12.9 ± 0.2	EVD	(b)	315
C ₂ H ₅ ⁺	C ₂ H ₅ Cl	Cl	12.3	RPD	229	160
C ₂ H ₅ ⁺	C ₂ H ₅ Cl	Cl	12.2 ± 0.2	VC	227	356
C ₂ H ₅ ⁺	C ₂ H ₅ Cl	Cl ⁻ ?	8.5	RPD	228	160
C ₂ H ₅ ⁺	C ₂ H ₅ Cl	Cl ⁻ ?	9.6	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ Cl	Cl ⁻ ?	10.4	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ Cl	Cl ⁻ ?	11.4	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ Cl	Cl ⁻ ?	11.9	RPD		160
C ₂ H ₅ ⁺	n-C ₃ H ₇ Cl	CH ₂ Cl	12.48 ± 0.1	SL	(b)	72
C ₂ H ₅ ⁺	C ₂ H ₅ SiCl ₃	SiCl ₃	12.77 ± 0.05	SL	(b)	2182
C ₂ H ₅ ⁺	C ₂ H ₅ Br	Br	11.5	RPD	226	160
C ₂ H ₅ ⁺	C ₂ H ₅ Br	Br	11.4 ± 0.1	VC	223	356
C ₂ H ₅ ⁺	C ₂ H ₅ Br	Br ⁻ ?	8.2	RPD	230	160
C ₂ H ₅ ⁺	C ₂ H ₅ Br	Br ⁻ ?	9.3	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ Br	Br ⁻ ?	10.0	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ Br	Br ⁻ ?	11.1	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ Br	Br ⁻ ?	11.5	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ I	I(² P _{3/2})	11.0	RPD	228	160
C ₂ H ₅ ⁺	C ₂ H ₅ I	I	11.0 ± 0.3	VC	228	356
C ₂ H ₅ ⁺	C ₂ H ₅ I	I(² P _{1/2})	12.0	RPD	230	160
C ₂ H ₅ ⁺	C ₂ H ₅ I	I ⁻ ?	7.8	RPD	225	160
C ₂ H ₅ ⁺	C ₂ H ₅ I	I ⁻ ?	8.9	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ I	I ⁻ ?	9.7	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ I	I ⁻ ?	10.6	RPD		160
C ₂ H ₅ ⁺	C ₂ H ₅ I	I ⁻ ?	11.3	RPD		160
C ₂ H ₅ ⁺	(C ₂ H ₅) ₂ Hg		10.25 ± 0.1	SL		306

C₂H₆⁺ Heat of formation 245 kcal mol⁻¹

C ₂ H ₆ ⁺	C ₂ H ₆		11.521 ± 0.007	PI	245*	1253
C ₂ H ₆ ⁺	C ₂ H ₆		11.65 ± 0.03	PI	248*	182
C ₂ H ₆ ⁺	C ₂ H ₆		11.49	PE	245*	1130
C ₂ H ₆ ⁺	C ₂ H ₆		14.74	PE		1130
C ₂ H ₆ ⁺	C ₂ H ₆		19.18	PE		1130
C ₂ H ₆ ⁺	C ₂ H ₆		20.13	PE		1130
C ₂ H ₆ ⁺	C ₂ H ₆		11.65	TC	248	2038
C ₂ H ₆ ⁺	C ₂ H ₆		11.76	TC	251	1352, 2020
C ₂ H ₆ ⁺	C ₂ H ₆		12.64	TC		1352, 2020
C ₂ H ₆ ⁺	C ₂ H ₆		17.33	TC		1352, 2020
C ₂ H ₆ ⁺	C ₂ H ₆		24.02	TC		1352, 2020
C ₂ H ₆ ⁺	C ₂ H ₆		11.78	TC	251	136
C ₂ H ₆ ⁺	C ₂ H ₆		12.04	TC	257	1006
C ₂ H ₆ ⁺	C ₂ H ₆		12.21	TC	261	473
C ₂ H ₆ ⁺	C ₂ H ₆		12.57	TC	270	353
C ₂ H ₆ ⁺	(CH ₂) ₃ O (Trimethylene oxide)	CO	10.8 ± 0.3	EVD	252	52

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H⁺						
C ₃ H ⁺	CH ₃ C≡CH	H ₂ + H?	15.4 ± 0.3	VC	347	13
C ₃ H ⁺	CH ₂ =CHC≡CH		18.71	VC		2102
C ₃ H ⁺	CH ₂ =CHCH=CH ₂	CH ₃ + H ₂	12.44	VC	280	2102
C ₃ H ⁺	CH ₂ =CHCH=CH ₂	CH ₃ + 2H	18.96	VC	326	2102
C ₃ H ⁺	C ₂ H ₅ C≡CH	CH ₃ + H ₂	12.59	VC	297	2102
C ₃ H ⁺	C ₂ H ₅ C≡CH	CH ₃ + 2H	17.62	VC	308	2102
C ₃ H ⁺	C ₃ H ₆ S (Propylene sulfide)		22.2 ± 0.5	EVD		188
C ₃ H ⁺	CH ₃ SCH ₂ CH=CH ₂	CH ₃ S + 2H ₂ ?	16.6 ± 0.5	EVD	360	186
C₃H₂⁺ Heat of formation 365 kcal mol⁻¹						
C ₃ H ₂ ⁺	CH ₃ C≡CH	H ₂	14.0 ± 0.1	VC	367*	13
C ₃ H ₂ ⁺	C ₄ H ₆ O (3,4-Epoxy-1-butene)	CH ₂ O + H ₂	15.8 ± 0.5	EVD	402	153
C ₃ H ₂ ⁺	C ₃ H ₆ S (Propylene sulfide)	H ₂ S + 2H?	19.2 ± 0.4	EVD	363*	188
C ₃ H ₂ ⁺	CH ₃ SCH ₂ CH=CH ₂	CH ₃ S + H + H ₂ ?	20.3 ± 0.5	EVD	394	186
C₃H₃⁺ Heat of formation 255 kcal mol⁻¹						
C ₃ H ₃ ⁺	CH ₂ C≡CH		8.34	TC	267	136
C ₃ H ₃ ⁺	C ₃ H ₃ (Cyclopropenyl radical)		5.80	TC		136
C ₃ H ₃ ⁺	CH ₂ =C=CH ₂	H	12.02 ± 0.03	SL	271	165
C ₃ H ₃ ⁺	CH ₃ C≡CH	H	12.00 ± 0.05	SL	269	462
C ₃ H ₃ ⁺	CH ₃ C≡CH	H	12.06 ± 0.06	SL	270	17
C ₃ H ₃ ⁺	CH ₃ C≡CH	H	11.8 ± 0.1	VC	264	13
C ₃ H ₃ ⁺	C ₃ H ₄ (Cyclopropene)	H	11.15 ± 0.06	NS	272	165
C ₃ H ₃ ⁺	C ₃ H ₆	H ₂ + H	14.21	LE	280	194
C ₃ H ₃ ⁺	CH ₃ CH=C=CH ₂	CH ₃	11.00 ± 0.03	SL	259	462
C ₃ H ₃ ⁺	CH ₂ =CHCH=CH ₂	CH ₃	11.35 ± 0.05	PI	255*	2013
C ₃ H ₃ ⁺	CH ₂ =CHCH=CH ₂	CH ₃	11.71 ± 0.02	SL	263	462
C ₃ H ₃ ⁺	C ₂ H ₅ C≡CH	CH ₃	11.02 ± 0.05	SL	260	462
C ₃ H ₃ ⁺	C ₂ H ₅ C≡CH	CH ₃	10.8 ± 0.2	VC	255	13
C ₃ H ₃ ⁺	CH ₃ C≡CCH ₃	CH ₃	11.4 ± 0.2	VC	265	13
C ₃ H ₃ ⁺	1-C ₄ H ₈	CH ₃ + H ₂	13.82	LE	285	195
C ₃ H ₃ ⁺	cis-2-C ₄ H ₈	CH ₃ + H ₂	13.75	LE	282	195
C ₃ H ₃ ⁺	neo-C ₅ H ₁₂	CH ₃ + 2H ₂	17.08	VC	321	2101
C ₃ H ₃ ⁺	CH≡CCH=CHCH=CH ₂	C ₃ H ₃	14.57	EVD	349	1197
C ₃ H ₃ ⁺	C ₂ H ₅ C≡CC≡CH	C ₃ H ₃	12.20	EVD	(b)	1197
C ₃ H ₃ ⁺	CH ₃ C≡CCH ₂ C≡CH	C ₃ H ₃	12.05	EVD	(b)	1197
C ₃ H ₃ ⁺	CH ₃ C≡CC≡CCH ₃	C ₃ H ₃	11.99	EVD	(b)	1197
C ₃ H ₃ ⁺	CH≡CCH ₂ CH ₂ C≡CH	C ₃ H ₃	12.17	EVD	(b)	1197
C ₃ H ₃ ⁺	C ₆ H ₆ (Benzene)	C ₃ H ₃	15.17 ± 0.1	EVD	(b)	1238
C ₃ H ₃ ⁺	C ₆ H ₆ (Benzene)	C ₃ H ₃	16	EVD	(b)	1197
C ₃ H ₃ ⁺	C ₆ H ₆ (Benzene)	C ₃ H ₃	16.1 ± 0.3	SL	316	2103
C ₃ H ₃ ⁺	C ₈ H ₈ (Cubane)	C ₃ H ₃ + C ₂ H ₂	11.14 ± 0.18	EVD	(b)	2105

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₃ H ₃ ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		18.9 ± 0.4	EVD		52
C ₃ H ₃ ⁺ (Pyridine)	C ₅ H ₅ N	C ₂ H ₂ N?	14.00 ± 0.10	EVD	(b)	1406
C ₃ H ₃ ⁺ (Trimethylene oxide)	(CH ₂) ₃ O	OH + H ₂	14.5 ± 0.2	EVD	301	52
C ₃ H ₃ ⁺	<i>n</i> -C ₃ H ₇ OH	OH + 2H ₂	15.6 ± 0.3	LE	288	46
C ₃ H ₃ ⁺ (3,4-Epoxy-1-butene)	C ₄ H ₆ O	CH ₂ O + H	13.5 ± 0.3	EVD	297	153
C ₃ H ₃ ⁺ (Tetrahydrofuran)	(CH ₂) ₄ O	CH ₃ O + 2H?	18.7 ± 0.6	EVD	284	52
C ₃ H ₃ ⁺ (1,2-Epoxy-3-methoxypropane)	C ₄ H ₈ O ₂		15.9 ± 0.4	EVD		153
C ₃ H ₃ ⁺ (Fluorobenzene)	C ₆ H ₅ F		14.27 ± 0.1	SL		2103
C ₃ H ₃ ⁺ (Propylene sulfide)	C ₃ H ₆ S	H ₂ + H + S	15.9 ± 0.2	EVD	268	188
C ₃ H ₃ ⁺ (Trimethylene sulfide)	(CH ₂) ₃ S	H ₂ + H + S	15.3 ± 0.4	EVD	249	52
C ₃ H ₃ ⁺ (Thiophene)	C ₄ H ₄ S	CHS	12.8 ± 0.2	EVD	(b)	2166
C ₃ H ₃ ⁺	CH ₃ SCH ₂ CH=CH ₂		16.5 ± 0.4	EVD		186
C ₃ H ₃ ⁺ (Tetrahydrothiophene)	(CH ₂) ₄ S	CHS + 2H ₂	17.2 ± 0.2	EVD	(b)	52
C ₃ H ₃ ⁺ <i>n</i> -C ₃ H ₇ SCH ₃			18.4 ± 0.5	EVD		176
C ₃ H ₃ ⁺ <i>iso</i> -C ₃ H ₇ SCH ₃			21.0 ± 0.5	EVD		186
C ₃ H ₃ ⁺	CH ₃ C≡CCl	Cl	11.0 ± 0.2	VC	262	13
C ₃ H ₃ ⁺ (Cyclopentadienylvanadium tetracarbonyl)	C ₅ H ₅ V(CO) ₄		13.5 ± 0.3	EVD		1381
C ₃ H ₃ ⁺ (Cyclopentadienylmanganese tricarbonyl)	C ₅ H ₅ Mn(CO) ₃		20.3 ± 0.4	EVD		1381
C ₃ H ₃ ⁺	CH ₃ C≡CBr	Br	11.1 ± 0.2	VC	278	13
C₃HD₂⁺						
C ₃ HD ₂ ⁺	CD ₃ C≡CH	D	12.22 ± 0.05	SL		17
C₃D₃⁺						
C ₃ D ₃ ⁺	CD ₃ C≡CH	H	12.16 ± 0.06	SL		17

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
	CH₂=C=CH₂⁺	Heat of formation 280 kcal mol⁻¹				
	CH₃C≡CH⁺		283 kcal mol⁻¹			
	cyclo-C₃H₄⁺		296 kcal mol⁻¹			
C ₃ H ₄ ⁺	CH ₂ =C=CH ₂		10.16 ± 0.02	SL	280*	462
C ₃ H ₄ ⁺	CH ₂ =C=CH ₂		10.19	TC	281	136
C ₃ H ₄ ⁺	CH ₃ C≡CH		10.36 ± 0.01	PI	283*	162, 182, 416, 22
C ₃ H ₄ ⁺	CH ₃ C≡CH		10.54 ± 0.03	SL	287	17
C ₃ H ₄ ⁺	CH ₃ C≡CH		10.3 ± 0.1	VC	282	13
C ₃ H ₄ ⁺	CH ₃ C≡CH		10.44	TC	285	136
C ₃ H ₄ ⁺	C ₃ H ₄ (Cyclopropene)		9.95	SL	296*	62
C ₃ H ₄ ⁺	C ₃ H ₄ (EI on neutral fragment from C ₃ H ₈)		10.28 ± 0.1	NS		1129
C ₃ H ₄ ⁺	C ₃ H ₄ (EI on neutral fragment from n-C ₄ H ₁₀)		8.2 ± 0.2	NS		87
C ₃ H ₄ ⁺	C ₃ H ₄ (EI on neutral fragment from n-C ₆ H ₁₄)		8.2 ± 0.4	NS		87
C ₃ H ₄ ⁺	C ₃ H ₄ (EI on neutral fragment from benzene)		8.7 ± 0.5	NS		87
C ₃ H ₄ ⁺	C ₃ H ₆	H ₂	12.52	LE	294	194, 195
C ₃ H ₄ ⁺	C ₄ H ₆ O (3,4-Epoxy-1-butene)	CO + H ₂	11.3 ± 0.3	EVD	297	153
C ₃ H ₄ ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		15.2 ± 0.3	EVD		52
C ₃ H ₄ ⁺	C ₃ H ₆ S (Propylene sulfide)	S + H ₂	14.4 ± 0.3	EVD	285	188

C₃HD₃⁺

C ₃ HD ₃ ⁺	CD ₃ C≡CH	10.62 ± 0.05	SL	17
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C₃H₅⁺ Heat of formation 216 kcal mol⁻¹
cyclo-C₃H₅⁺ 239 kcal mol⁻¹

C ₃ H ₅ ⁺	CH ₂ =CHCH ₂	8.15 ± 0.03	SL	(a)	2114	
C ₃ H ₅ ⁺	C ₃ H ₅ (Cyclopropyl radical)	8.05 ± 0.1	SL	(a)	123	
C ₃ H ₅ ⁺	C ₃ H ₅ (Cyclopropyl radical)	8.05	TC	254	2184	
C ₃ H ₅ ⁺	C ₃ H ₅ (Cyclopropyl radical)	8.31	TC	260	123	
C ₃ H ₅ ⁺	C ₃ H ₅ (EI on neutral fragment from C ₃ H ₈)	8.0 ± 0.1	NS		87, 1129	
C ₃ H ₅ ⁺	C ₃ H ₅ (EI on neutral fragment from n-C ₆ H ₁₄)	8.15 ± 0.1	NS		1129	
C ₃ H ₅ ⁺	C ₃ H ₅ (EI on neutral fragment from n-C ₄ H ₁₀)	8.2 ± 0.1	NS		87	
C ₃ H ₅ ⁺	C ₃ H ₅ (EI on neutral fragment from n-C ₆ H ₁₄)	8.2 ± 0.1	NS		87	
C ₃ H ₅ ⁺	C ₃ H ₆	H	11.4 ± 0.5	MSD	216*	1451
C ₃ H ₅ ⁺	C ₃ H ₆	H	12.11	LE	232	194, 195
C ₃ H ₅ ⁺	C ₃ H ₆ (Cyclopropane)	H	12.06	SL	239*	123

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₃ H ₅ ⁺	C ₃ H ₈	H ₂ + H	14.76	LE	263	195
C ₃ H ₅ ⁺	1-C ₄ H ₈	CH ₃	11.4 ± 0.5	MSD	230	1451
C ₃ H ₅ ⁺	1-C ₄ H ₈	CH ₃	11.73	LE	237	194, 195
C ₃ H ₅ ⁺	cis-2-C ₄ H ₈	CH ₃	11.60	LE	233	194, 195
C ₃ H ₅ ⁺	n-C ₄ H ₁₀	CH ₃ + H ₂	13.40	LE	246	195
C ₃ H ₅ ⁺	iso-C ₄ H ₁₀	CH ₃ + H ₂	14.55	LE	270	195
C ₃ H ₅ ⁺	neo-C ₅ H ₁₂	CH ₃ + CH ₄	13.13	VC	248	2101
C ₃ H ₅ ⁺	n-C ₇ H ₁₆		12.7 ± 0.1	PI	248	2013
C ₃ H ₅ ⁺	C ₃ H ₅ CN (Cyclopropyl cyanide)	CN	12.70 ± 0.15	EVD	236	202
C ₃ H ₅ ⁺	(CH ₂) ₃ O (Trimethylene oxide)	OH	11.8 ± 0.2	EVD	239	52
C ₃ H ₅ ⁺	C ₄ H ₆ O (3,4-Epoxy-1-butene)	CO + H	11.1 ± 0.2	EVD	240	153
C ₃ H ₅ ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		15.5 ± 0.3	EVD		52
C ₃ H ₅ ⁺	n-C ₅ H ₁₁ F		14.12	SL	252	2029
C ₃ H ₅ ⁺	C ₃ H ₆ S (Propylene sulfide)	SH	11.5 ± 0.2	EVD	251	188
C ₃ H ₅ ⁺	(CH ₂) ₃ S (Trimethylene sulfide)	SH	12.2 ± 0.2	EVD	262	52
C ₃ H ₅ ⁺	CH ₃ SCH ₂ CH=CH ₂		12.7 ± 0.3	EVD		186
C ₃ H ₅ ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)		15.5 ± 0.2	EVD		52
C ₃ H ₅ ⁺	n-C ₃ H ₇ SCH ₃		14.8 ± 0.2	EVD		176
C ₃ H ₅ ⁺	iso-C ₃ H ₇ SCH ₃		15.2 ± 0.2	EVD		186

C₃H₆⁺ Heat of formation 229 kcal mol⁻¹
cyclo-C₃H₆⁺ 245 kcal mol⁻¹

C ₃ H ₆ ⁺	C ₃ H ₆	9.74	S	229*	133
C ₃ H ₆ ⁺	C ₃ H ₆	9.80	S		133
C ₃ H ₆ ⁺	C ₃ H ₆	9.727 ± 0.01	PI	229*	1253
C ₃ H ₆ ⁺	C ₃ H ₆	9.73 ± 0.01	PI	229*	182, 416
C ₃ H ₆ ⁺	C ₃ H ₆	9.73 ± 0.02	PI	229*	1120
C ₃ H ₆ ⁺	C ₃ H ₆	9.73	PI	229*	133
C ₃ H ₆ ⁺	C ₃ H ₆	9.80	PI		133
C ₃ H ₆ ⁺	C ₃ H ₆	9.73	PI	229*	168
C ₃ H ₆ ⁺	C ₃ H ₆	9.81 ± 0.09	SL	231	411
C ₃ H ₆ ⁺	C ₃ H ₆	9.74	LE	229	194, 195
C ₃ H ₆ ⁺	C ₃ H ₆	9.96	TC	235	136
C ₃ H ₆ ⁺	C ₃ H ₆	10.14	TC	239	353
C ₃ H ₆ ⁺	C ₃ H ₆	10.09 ± 0.02	PI	245*	182, 416
	(Cyclopropane)				
C ₃ H ₆ ⁺	C ₃ H ₆	10.53	SL	256	123
	(Cyclopropane)				
C ₃ H ₆ ⁺	C ₃ H ₆	11.29	TC	273	136
	(Cyclopropane)				
C ₃ H ₆ ⁺	C ₃ H ₆	11.45	TC	277	473
	(Cyclopropane)				
C ₃ H ₆ ⁺	C ₃ H ₆	9.81 ± 0.15	NS		1129
	(EI on neutral fragment from C ₃ H ₈)				

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₃ H ₆ ⁺	C ₃ H ₈	H ₂	12.2	LE	256	195
C ₃ H ₆ ⁺	n-C ₄ H ₁₀	CH ₄	11.095 ± 0.005	PI	244	1120
C ₃ H ₆ ⁺	n-C ₄ H ₁₀	CH ₄	10.77	LE	236	195
C ₃ H ₆ ⁺	iso-C ₄ H ₁₀	CH ₄	10.89 ± 0.01	PI	237	1120
C ₃ H ₆ ⁺	iso-C ₄ H ₁₀	CH ₄	10.88	LE	237	195
C ₃ H ₆ ⁺	C ₅ H ₁₀ (1,1-Dimethylcyclopropane)	C ₂ H ₄	11.23 ± 0.07	EVD	239	1146
C ₃ H ₆ ⁺	C ₅ H ₁₀ (cis-1,2-Dimethylcyclopropane)	C ₂ H ₄	11.24 ± 0.03	EVD	239	1146
C ₃ H ₆ ⁺	C ₅ H ₁₀ (trans-1,2-Dimethylcyclopropane)	C ₂ H ₄	11.30 ± 0.05	EVD	241	1146
C ₃ H ₆ ⁺	n-C ₅ H ₁₂	C ₂ H ₆	10.89 ± 0.01	PI	236	1120
C ₃ H ₆ ⁺	iso-C ₅ H ₁₂	C ₂ H ₆	10.745 ± 0.01	PI	231	1120
C ₃ H ₆ ⁺	n-C ₆ H ₁₄	C ₃ H ₈	10.95 ± 0.02	PI	237	1120
C ₃ H ₆ ⁺	iso-C ₆ H ₁₄	C ₃ H ₈	10.86 ± 0.015	PI	234	1120
C ₃ H ₆ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂	C ₃ H ₈	10.595 ± 0.005	PI	227	1120
C ₃ H ₆ ⁺	n-C ₇ H ₁₆	n-C ₄ H ₁₀	10.96 ± 0.015	PI	238	1120
C ₃ H ₆ ⁺	n-C ₇ H ₁₆	n-C ₄ H ₁₀	10.65 ± 0.1	PI	231	2013
C ₃ H ₆ ⁺	n-C ₃ H ₇ OH	H ₂ O	10.50	PI	238	11
C ₃ H ₆ ⁺	(CH ₂) ₄ O (Tetrahydrofuran)	CH ₂ O	12.7 ± 0.2	EVD	278	52
C ₃ H ₆ ⁺	n-C ₅ H ₁₁ F	C ₂ H ₅ F	11.47	SL	250	2029
C ₃ H ₆ ⁺	iso-C ₃ H ₇ BF ₂	HBF ₂	11.48 ± 0.02	LE	(b)	1076
C ₃ H ₆ ⁺	iso-C ₃ H ₇ SiH ₃	SiH ₄	10.81 ± 0.04	SL	211	2182
C ₃ H ₆ ⁺	n-C ₃ H ₇ SCH ₃	CH ₄ + S	12.5 ± 0.4	EVD	220	176
C ₃ H ₆ ⁺	iso-C ₃ H ₇ SCH ₃	CH ₂ + H ₂ S	13.5 ± 0.2	EVD	201	186
C ₃ H ₆ ⁺	iso-C ₃ H ₇ SiCl ₃	HSiCl ₃	10.92 ± 0.1	SL	236	2182

n-C₃H₇⁺ Heat of formation 209 kcal mol⁻¹
iso-C₃H₇⁺ 190 kcal mol⁻¹

C ₃ H ₇ ⁺	n-C ₃ H ₇	8.1	PI	209*	1068	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.15 ± 0.1	RPD	210	2158	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.6 ± 0.1	RPD		2158	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.8 ± 0.1	RPD		2158	
C ₃ H ₇ ⁺	n-C ₃ H ₇	9.2 ± 0.1	RPD		2158	
C ₃ H ₇ ⁺	n-C ₃ H ₇	9.5 ± 0.1	RPD		2158	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.69 ± 0.05	SL	222	141, 145	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.20	TC	211	1439	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.51	TC	218	1006	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.61	TC	221	2038	
C ₃ H ₇ ⁺	n-C ₃ H ₇	8.68	TC	222	141, 145	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	7.5	PI	190*	1068	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	7.52 ± 0.1	RPD	190	2158	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	8.1 ± 0.1	RPD		2158	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	8.6 ± 0.1	RPD		2158	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	7.5	TC	190	1439	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	7.76	TC	196	1006	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	7.78	TC	196	136	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	7.97	TC	201	141, 145	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	8.14	TC	204	2038	
C ₃ H ₇ ⁺	iso-C ₃ H ₇	8.25	TC	207	2038	
C ₃ H ₇ ⁺	C ₃ H ₈	H	11.53 ± 0.01	PI	189	1120
C ₃ H ₇ ⁺	C ₃ H ₈	H	11.76	LE	194	195

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₃ H ₇ ⁺	<i>n</i> -C ₄ H ₁₀	CH ₃	11.10 ± 0.01	PI	193	1120
C ₃ H ₇ ⁺	<i>n</i> -C ₄ H ₁₀	CH ₃	11.23 ± 0.04	PI		1120
C ₃ H ₇ ⁺	<i>n</i> -C ₄ H ₁₀	CH ₃	10.86	LE	187	195
C ₃ H ₇ ⁺	<i>iso</i> -C ₄ H ₁₀	CH ₃	11.155 ± 0.015	PI	192	1120
C ₃ H ₇ ⁺	<i>iso</i> -C ₄ H ₁₀	CH ₃	11.16	LE	192	195
C ₃ H ₇ ⁺	<i>n</i> -C ₅ H ₁₂	C ₂ H ₅	11.04 ± 0.03	PI	195	1120
C ₃ H ₇ ⁺	<i>n</i> -C ₅ H ₁₂	C ₂ H ₅	11.29 ± 0.04	PI		1120
C ₃ H ₇ ⁺	<i>iso</i> -C ₅ H ₁₂	C ₂ H ₅	11.145 ± 0.02	PI	196	1120
C ₃ H ₇ ⁺	<i>n</i> -C ₆ H ₁₄	<i>n</i> -C ₃ H ₇	11.14 ± 0.03	PI	195	1120
C ₃ H ₇ ⁺	<i>n</i> -C ₆ H ₁₄	<i>n</i> -C ₃ H ₇	11.345 ± 0.04	PI		1120
C ₃ H ₇ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂	<i>iso</i> -C ₃ H ₇	11.24 ± 0.04	PI	200	1120
C ₃ H ₇ ⁺	<i>n</i> -C ₇ H ₁₆	C ₃ H ₆ + CH ₃	11.05 ± 0.05	PI	172	2013
C ₃ H ₇ ⁺	(CH ₃) ₃ N ₂ H	N ₂ H?	10.7 ± 0.3	SL		424
C ₃ H ₇ ⁺	(CH ₃) ₄ N ₂	CH ₃ N ₂ H ₂	10.9 ± 0.2	SL		424
C ₃ H ₇ ⁺	(CH ₃) ₄ N ₂		13.2 ± 0.3	SL		424
C ₃ H ₇ ⁺	(CH ₃) ₂ CHN=NCH(CH ₃) ₂	<i>iso</i> -C ₃ H ₇ + N ₂ ?	9.35 ± 0.1	SL	221	304
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH	11.8	RPD	201	2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH	12.8	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH-?	10.0	RPD	202	2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH-?	11.2	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH-?	11.8	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH-?	12.5	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH-?	12.8	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ OH	OH-?	13.4	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ NO ₂	NO ₂	10.6	RPD	201	2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ NO ₂	NO ₂ ?	6.7	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ NO ₂	NO ₂ ?	8.1	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ NO ₂	NO ₂ ?	8.6	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ NO ₂	NO ₂ ?	9.0	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ NO ₂	NO ₂ ?	9.5	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ NO ₂	NO ₂ ?	10.1	RPD		2018
C ₃ H ₇ ⁺	<i>n</i> -C ₅ H ₁₁ F	C ₂ H ₄ F?	12.02	SL	(b)	2029
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ BF ₂	BF ₂	12.05 ± 0.05	VC	(a)	1076
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ SiH ₃	SiH ₃	11.33 ± 0.03	SL	(b)	2182
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ SCH ₃	CH ₃ S	12.3 ± 0.4	EVD	232	176
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃	CH ₃ S	12.7 ± 0.2	EVD	239	186
C ₃ H ₇ ⁺	(<i>n</i> -C ₃ H ₇) ₂ S	<i>n</i> -C ₃ H ₃ S?	12.0	SL	(b)	307
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ Cl	Cl	11.3	RPD	195	160
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ Cl	Cl-	7.7	RPD	200	160
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ Cl	Cl-	9.1	RPD		160
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ Cl	Cl-	9.6	RPD		160
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ Cl	Cl-	10.0	RPD		160
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ Cl	Cl-	10.7	RPD		160
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ Cl	Cl-	11.0	RPD		160
C ₃ H ₇ ⁺	<i>n</i> -C ₄ H ₉ Cl	CH ₂ Cl	11.92 ± 0.1	SL	210	72
C ₃ H ₇ ⁺	<i>iso</i> -C ₄ H ₉ Cl	CH ₂ Cl	11.26 ± 0.1	SL	(b)	72
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ SiCl ₃	SiCl ₃	11.36 ± 0.1	SL	(b)	2182
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ Br	Br	11.3	RPD	215	160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ Br	Br-	7.8	RPD	217	160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ Br	Br-	9.6	RPD		160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ Br	Br-	9.9	RPD		160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ Br	Br-	10.3	RPD		160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ Br	Br-	10.75	RPD		160

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ I	I	10.4	RPD	208	160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ I	I-	7.2	RPD	207	160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ I	I-	8.6	RPD		160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ I	I-	9.1	RPD		160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ I	I-	9.6	RPD		160
C ₃ H ₇ ⁺	<i>n</i> -C ₃ H ₇ I	I-	10.0	RPD		160
C ₃ H ₇ ⁺	(<i>iso</i> -C ₃ H ₇) ₂ Hg	<i>iso</i> -C ₃ H ₇ Hg	9.65 ± 0.1	SL	(b)	306

C₃H₈⁺ Heat of formation 231 kcal mol⁻¹

C ₃ H ₈ ⁺	C ₃ H ₈		11.140 ± 0.007	PI	232*	1253
C ₃ H ₈ ⁺	C ₃ H ₈		11.08 ± 0.03	PI	231*	416
C ₃ H ₈ ⁺	C ₃ H ₈		11.07 ± 0.05	PI	230*	182
C ₃ H ₈ ⁺	C ₃ H ₈		11.07	PE	230*	1130
C ₃ H ₈ ⁺	C ₃ H ₈		13.17	PE		1130
C ₃ H ₈ ⁺	C ₃ H ₈		15.17	PE		1130
C ₃ H ₈ ⁺	C ₃ H ₈		15.70	PE		1130
C ₃ H ₈ ⁺	C ₃ H ₈		18.57	PE		1130
C ₃ H ₈ ⁺	C ₃ H ₈		20.26	PE		1130
C ₃ H ₈ ⁺	C ₃ H ₈		11.20	LE	233	195
C ₃ H ₈ ⁺	C ₃ H ₈		10.98	TC	228	2038
C ₃ H ₈ ⁺	C ₃ H ₈		11.00	TC	229	2038
C ₃ H ₈ ⁺	C ₃ H ₈		11.04	TC	230	136
C ₃ H ₈ ⁺	C ₃ H ₈		11.21	TC	234	1352, 2020
C ₃ H ₈ ⁺	C ₃ H ₈		11.72	TC		1352, 2020
C ₃ H ₈ ⁺	C ₃ H ₈		12.24	TC		1352, 2020
C ₃ H ₈ ⁺	C ₃ H ₈		12.64	TC		1352, 2020
C ₃ H ₈ ⁺	C ₃ H ₈		16.60	TC		1352, 2020
C ₃ H ₈ ⁺	C ₃ H ₈		20.38	TC		1352, 2020
C ₃ H ₈ ⁺	C ₃ H ₈		26.22	TC		1352, 2020
C ₃ H ₈ ⁺	C ₃ H ₈		11.22	TC	234	473

C₄H⁺

C ₄ H ⁺	CH≡CC≡CH	H	12.1 ± 0.3	VC	329	13
C ₄ H ⁺	CH ₂ =CHC≡CH	H ₂ +H	12.13	VC	297	2102
C ₄ H ⁺	CH ₂ =CHC≡CH	3H	17.02	VC	305	2102
C ₄ H ⁺	CH ₂ =CHCH=CH ₂	2H ₂ +H	15.75	VC	337	2102
C ₄ H ⁺	CH ₂ =CHCH=CH ₂	5H	25.30	VC	349	2102
C ₄ H ⁺	C ₂ H ₅ C≡CH	2H ₂ +H	13.20	VC	291	2102
C ₄ H ⁺	C ₂ H ₅ C≡CH	5H	22.68	VC	302	2102

C₄H₂⁺ Heat of formation 337 kcal mol⁻¹

C ₄ H ₂ ⁺	CH≡CC≡CH		10.2 ± 0.1	VC	337*	13
C ₄ H ₂ ⁺	CH≡CC≡CH		9.78	TC	328	136
C ₄ H ₂ ⁺	CH ₂ =CHC≡CH	H ₂	12.84	VC	365	2102
C ₄ H ₂ ⁺	CH ₃ C≡CCH ₃	H ₂ +2H	16.7 ± 0.3	VC	316	13
C ₄ H ₂ ⁺	CH≡CCH=CHCH=CH ₂		17.55	EVD		1197
C ₄ H ₂ ⁺	C ₂ H ₅ C≡CC≡CH	C ₂ H ₂ +H ₂	14.15	EVD	366	1197
C ₄ H ₂ ⁺	CH ₃ C≡CCH ₂ C≡CH	C ₂ H ₂ +H ₂	15.10	EVD	388	1197
C ₄ H ₂ ⁺	CH≡CCH ₂ CH ₂ C≡CH	C ₂ H ₂ +H ₂	15.02	EVD	391	1197
C ₄ H ₂ ⁺	C ₈ H ₈	2C ₂ H ₂ +H ₂	16.85 ± 0.08	EVD	429	2105
(Cubane)						
C ₄ H ₂ ⁺	C ₅ H ₅ N	HCN+H ₂	16.17 ± 0.10	EVD	374	1406
(Pyridine)						
C ₄ H ₂ ⁺	C ₄ H ₄ N ₂	H ₂ +N ₂	13.67 ± 0.10	EVD	382	1406
(Orthodiazine)						

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₃⁺ Heat of formation 307 kcal mol⁻¹						
C ₄ H ₃ ⁺	CH ₂ =CHC≡CH	H	12.59	VC	307*	2102
C ₄ H ₃ ⁺	C ₂ H ₅ C≡CH	H ₂ + H	14.6 ± 0.2	VC	324	13
C ₄ H ₃ ⁺	CH ₃ C≡CCH ₃	H ₂ + H	15.1 ± 0.2	VC	331	13
C ₄ H ₃ ⁺	CH≡CCH=CHCH=CH ₂		18.27	EVD		1197
C ₄ H ₃ ⁺	C ₂ H ₅ C≡CC≡CH		15.50	EVD		1197
C ₄ H ₃ ⁺	CH ₃ C≡CCH ₂ C≡CH		15.70	EVD		1197
C ₄ H ₃ ⁺	CH ₃ C≡CC≡CCH ₃		15.04	EVD		1197
C ₄ H ₃ ⁺	CH≡CCH ₂ CH ₂ C≡CH		15.45	EVD		1197
C ₄ H ₃ ⁺	C ₆ H ₆ (Benzene)		18.4	EVD		1197
C ₄ H ₃ ⁺	C ₈ H ₈ (Cubane)		16.74 ± 0.21	EVD		2105
C ₄ H ₃ ⁺	C ₅ H ₅ N (Pyridine)	HCN + H	16.61 ± 0.10	EVD	332	1406
C ₄ H ₃ ⁺	C ₄ H ₄ N ₂ (Orthodiazine)	N ₂ + H	13.84 ± 0.10	EVD	334	1406
C₄H₄⁺ Heat of formation 294 kcal mol⁻¹						
C ₄ H ₄ ⁺	CH ₂ =C=C=CH ₂		9.28	TC		136
C ₄ H ₄ ⁺	CH ₂ =C=C=CH ₂		9.64	TC		136
C ₄ H ₄ ⁺	CH ₂ =CHC≡CH		9.87	SL	297*	411
C ₄ H ₄ ⁺	CH ₂ =CHC≡CH		9.49	TC	288	136
C ₄ H ₄ ⁺	C ₂ H ₅ C≡CH	H ₂	10.9 ± 0.2	VC	291*	13
C ₄ H ₄ ⁺	CH ₃ C≡CCH ₃	H ₂	14.0 ± 0.1	VC	358	13
C ₄ H ₄ ⁺	C≡CCH=CHCH=CH ₂	C ₂ H ₂	14.77	EVD	375	1197
C ₄ H ₄ ⁺	C ₂ H ₅ C≡CC≡CH	C ₂ H ₂	12	EVD	317	1197
C ₄ H ₄ ⁺	CH ₃ C≡CCH ₂ C≡CH	C ₂ H ₂	11.82	EVD	312	1197
C ₄ H ₄ ⁺	CH ₃ C≡CC≡CCH ₃	C ₂ H ₂	12.12	EVD	315	1197
C ₄ H ₄ ⁺	CH≡CCH ₂ CH ₂ C≡CH	C ₂ H ₂	11.4	EVD	308	1197
C ₄ H ₄ ⁺	C ₆ H ₆ (Benzene)	C ₂ H ₂	14.95 ± 0.05	EVD	310	1238
C ₄ H ₄ ⁺	C ₆ H ₆ (Benzene)	C ₂ H ₂	15.55	EVD	324	1197
C ₄ H ₄ ⁺	C ₆ H ₆ (Benzene)	C ₂ H ₂	15.55 ± 0.1	SL	324	2103
C ₄ H ₄ ⁺	C ₈ H ₈ (Cubane)	2C ₂ H ₂	13.78 ± 0.08	EVD	356	2105
C ₄ H ₄ ⁺	C ₁₀ H ₈ (Azulene)		17.8 ± 0.10	SL		2112
C ₄ H ₄ ⁺	C ₁₀ H ₈ (Naphthalene)		19.6 ± 0.20	SL		2112
C ₄ H ₄ ⁺	C ₅ H ₅ N (Pyridine)	HCN	13.60 ± 0.10	EVD	315	1406
C ₄ H ₄ ⁺	C ₄ H ₄ N ₂ (Orthodiazine)	N ₂	11.64 ± 0.05	EVD	335	1406
C ₄ H ₄ ⁺	C ₆ H ₅ F (Fluorobenzene)	C ₂ HF	17.00 ± 0.1	SL	(b)	2103
C ₄ H ₄ ⁺	C ₆ H ₅ Cl (Chlorobenzene)	C ₂ HCl	17.57 ± 0.1	SL	(b)	2103
C ₄ H ₄ ⁺	C ₆ H ₅ Br (Bromobenzene)	C ₂ HBr	16.77 ± 0.1	SL	(b)	2103

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₅⁺ Heat of formation 237 kcal mol⁻¹						
C ₄ H ₅ ⁺	CH ₃ CHC≡CH		7.88	TC	249	136
C ₄ H ₅ ⁺	CH ₂ =CHCH=CH ₂	H	11.39 ± 0.05	PI	237*	2013
C ₄ H ₅ ⁺	C ₂ H ₅ C≡CH	H	11.6 ± 0.1	VC	255	13
C ₄ H ₅ ⁺	CH ₃ C≡CCH ₃	H	12.2 ± 0.1	VC	264	13
CH₃CH=C=CH₂⁺ Heat of formation 259 kcal mol⁻¹						
	CH ₂ =CHCH=CH ₂ ⁺				236 kcal mol ⁻¹	
	C ₂ H ₅ C≡CH ⁺				274 kcal mol ⁻¹	
	CH ₃ C≡CCH ₃ ⁺				263 kcal mol ⁻¹	
C ₄ H ₆ ⁺	CH ₃ CH=C=CH ₂		9.57 ± 0.02	SL	259*	462
C ₄ H ₆ ⁺	CH ₃ CH=C=CH ₂		9.53	TC	259	136
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		9.07 ± 0.01	PI	236*	182, 416
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		9.075 ± 0.05	PI	236*	2013
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		9.08	PE	236*	1130
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		11.25	PE		1130
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		12.14	PE		1130
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		13.23	PE		1130
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		15.14	PE		1130
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		18.78	PE		1130
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		20.57	PE		1130
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		8.80 ± 0.02	RPD	229	224
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		9.1 ± 0.1	RPD		224
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		10.4 ± 0.1	RPD		224
C ₄ H ₆ ⁺	CH ₂ =CHCH=CH ₂		9.18 ± 0.02	SL	238	462
C ₄ H ₆ ⁺	C ₂ H ₅ C≡CH		10.18 ± 0.01	PI	274*	162, 182, 416, 22
C ₄ H ₆ ⁺	C ₂ H ₅ C≡CH		10.2 ± 0.1	VC	275	13
C ₄ H ₆ ⁺	CH ₃ C≡CCH ₃		9.9 ± 0.1	VC	263*	13
C ₄ H ₆ ⁺	CH ₃ C≡CCH ₃		9.69	TC	258	136
C ₄ H ₆ ⁺	(CH ₂) ₄ S	H ₂ S	11.9 ± 0.2	EVD	271	52
(Tetrahydrothiophene)						
n-C₄H₇⁺ Heat of formation 203 kcal mol⁻¹						
	cyclo-C₄H₇⁺		213 kcal mol⁻¹			
	cyclo-C₃H₄CH₃⁺		221 kcal mol⁻¹			
C ₄ H ₇ ⁺	CH ₃ CH=CHCH ₂		7.71 ± 0.05	EVD	(a)	108
C ₄ H ₇ ⁺	CH ₃ CH=CHCH ₂		7.75	TC	205	136
C ₄ H ₇ ⁺	CH ₂ =C(CH ₃)CH ₂		8.03 ± 0.05	EVD	(a)	108
C ₄ H ₇ ⁺	CH ₂ =C(CH ₃)CH ₂		8.01	VC	206	108
C ₄ H ₇ ⁺	CH ₂ =C(CH ₃)CH ₂		8.04	TC	206	136
C ₄ H ₇ ⁺	C ₄ H ₇ (Cyclobutyl radical)		7.88 ± 0.05	SL	(a)	123
C ₄ H ₇ ⁺	C ₄ H ₇ (Cyclobutyl radical)		7.93	TC		2184
C ₄ H ₇ ⁺	1-C ₄ H ₈	H	11.07 ± 0.1		203*	2114
C ₄ H ₇ ⁺	1-C ₄ H ₈	H	12.01	LE	225	194, 195
C ₄ H ₇ ⁺	cis-2-C ₄ H ₈	H	11.20	LE	205	194, 195
C ₄ H ₇ ⁺	C ₄ H ₈ (Cyclobutane)	H	11.24	SL	213*	123
C ₄ H ₇ ⁺	C ₅ H ₁₀ (1,1-Dimethylcyclopropane)	CH ₃	11.38 ± 0.02	EVD	221*	1146

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₄ H ₇ ⁺	C ₅ H ₁₀ (<i>cis</i> -1,2-Dimethylcyclopropane)	CH ₃	11.35 ± 0.05	EVD	220*	1146
C ₄ H ₇ ⁺	C ₅ H ₁₀ (<i>trans</i> -1,2-Dimethylcyclopropane)	CH ₃	11.41 ± 0.04	EVD	222*	1146
C ₄ H ₇ ⁺	<i>n</i> -C ₇ H ₁₆	<i>n</i> -C ₃ H ₇ + H ₂ ?	11.5 ± 0.1	PI	198	2013
C ₄ H ₇ ⁺	<i>n</i> -C ₅ H ₁₁ F	CH ₃ + HF?	11.42	SL	220	2029
C ₄ H ₇ ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)	SH	12.4 ± 0.2	EVD	244	52
C ₄ H ₇ ⁺	CH ₃ CH=CHCH ₂ I	I	9.15 ± 0.05	EVD	200*	108
C ₄ H ₇ ⁺	CH ₂ =C(CH ₃)CH ₂ I	I	9.40 ± 0.05	EVD	205*	108
1-C₄H₈⁺ Heat of formation 221 kcal mol⁻¹						
<i>cis</i>-2-C₄H₈⁺ 209 kcal mol⁻¹						
<i>trans</i>-2-C₄H₈⁺ 208 kcal mol⁻¹						
<i>iso</i>-C₄H₈⁺ 209 kcal mol⁻¹						
cyclo-C₄H₈⁺ 250 kcal mol⁻¹						
C ₄ H ₈ ⁺	1-C ₄ H ₈		9.58 ± 0.01	PI	221*	182, 416
C ₄ H ₈ ⁺	1-C ₄ H ₈		9.61 ± 0.02	PI	222*	1120
C ₄ H ₈ ⁺	1-C ₄ H ₈		9.58	PI	221*	133
C ₄ H ₈ ⁺	1-C ₄ H ₈		9.76	SL	225	62
C ₄ H ₈ ⁺	1-C ₄ H ₈		9.72	LE	224	194, 195
C ₄ H ₈ ⁺	<i>cis</i> -2-C ₄ H ₈		9.13 ± 0.01	PI	209*	182
C ₄ H ₈ ⁺	<i>cis</i> -2-C ₄ H ₈		9.13 ± 0.02	PI	209*	168
C ₄ H ₈ ⁺	<i>cis</i> -2-C ₄ H ₈		9.34	SL	214	62
C ₄ H ₈ ⁺	<i>cis</i> -2-C ₄ H ₈		9.25	LE	212	194, 195
C ₄ H ₈ ⁺	<i>trans</i> -2-C ₄ H ₈		9.13 ± 0.01	PI	208*	182
C ₄ H ₈ ⁺	<i>trans</i> -2-C ₄ H ₈		9.13 ± 0.02	PI	208*	168
C ₄ H ₈ ⁺	<i>trans</i> -2-C ₄ H ₈		9.27	SL	211	62
C ₄ H ₈ ⁺	2-C ₄ H ₈		9.23	SL		411
C ₄ H ₈ ⁺	2-C ₄ H ₈		9.33	TC		136
C ₄ H ₈ ⁺	<i>iso</i> -C ₄ H ₈		9.23 ± 0.02	PI	209*	168
C ₄ H ₈ ⁺	<i>iso</i> -C ₄ H ₈		9.23 ± 0.02	PI	209*	182
C ₄ H ₈ ⁺	<i>iso</i> -C ₄ H ₈		9.26	SL	209	62
C ₄ H ₈ ⁺	<i>iso</i> -C ₄ H ₈		9.44	TC	214	136
C ₄ H ₈ ⁺	C ₄ H ₈ (Methylcyclopropane)		10.34	TC	245	473
C ₄ H ₈ ⁺	C ₄ H ₈ (Cyclobutane)		10.58	SL	250*	123
C ₄ H ₈ ⁺	C ₄ H ₈ (Cyclobutane)		10.05	TC	238	473
C ₄ H ₈ ⁺	C ₄ H ₈ (Cyclobutane)		11.04	TC	261	136
C ₄ H ₈ ⁺	<i>n</i> -C ₅ H ₁₂	CH ₄	10.845 ± 0.005	PI	233	1120
C ₄ H ₈ ⁺	<i>iso</i> -C ₅ H ₁₂	CH ₄	10.685 ± 0.005	PI	227	1120
C ₄ H ₈ ⁺	<i>neo</i> -C ₅ H ₁₂	CH ₄	10.37 ± 0.01	PI	217	1120
C ₄ H ₈ ⁺	<i>n</i> -C ₆ H ₁₄	C ₂ H ₆	10.82 ± 0.005	PI	230	1120
C ₄ H ₈ ⁺	<i>iso</i> -C ₆ H ₁₄	C ₂ H ₆	10.54 ± 0.005	PI	222	1120
C ₄ H ₈ ⁺	(C ₂ H ₅) ₂ CHCH ₃	C ₂ H ₆	10.495 ± 0.005	PI	221	1120
C ₄ H ₈ ⁺	C ₂ H ₅ C(CH ₃) ₃	C ₂ H ₆	10.19 ± 0.05	PI	211	1120

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₄ H ₈ ⁺	<i>n</i> -C ₇ H ₁₆	C ₃ H ₈ ?	10.87 ± 0.005	PI	231	1120
C ₄ H ₈ ⁺	<i>n</i> -C ₇ H ₁₆	C ₃ H ₈ ?	10.56 ± 0.05	PI	223	2013
C ₄ H ₈ ⁺	<i>n</i> -C ₈ H ₁₈	<i>n</i> -C ₄ H ₁₀	10.985 ± 0.02	PI	234	1120
C ₄ H ₈ ⁺	<i>tert</i> -C ₄ H ₉ SiH ₃	SiH ₄ ?	9.89 ± 0.05	SL		2182
C ₄ H ₈ ⁺	<i>tert</i> -C ₄ H ₉ SiCl ₃	HSiCl ₃ ?	10.26 ± 0.2	SL		2182
<i>n</i>-C₄H₉⁺ Heat of formation 218 kcal mol⁻¹						
<i>sec</i>-C₄H₉⁺ 192 kcal mol⁻¹						
<i>iso</i>-C₄H₉⁺ 205 kcal mol⁻¹						
<i>tert</i>-C₄H₉⁺ 176 kcal mol⁻¹						
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉		8.64 ± 0.05	SL	218*	141, 145
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉		8.0	TC	203	1439
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉		8.47	TC	214	1006
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉		8.60	TC	217	2038
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉		8.64	TC	218	141, 145
C ₄ H ₉ ⁺	<i>sec</i> -C ₄ H ₉		7.93 ± 0.05	SL	192*	141, 145
C ₄ H ₉ ⁺	<i>sec</i> -C ₄ H ₉		7.6	TC	184	1439
C ₄ H ₉ ⁺	<i>sec</i> -C ₄ H ₉		7.67	TC	186	1006
C ₄ H ₉ ⁺	<i>sec</i> -C ₄ H ₉		7.87	TC	190	141, 145
C ₄ H ₉ ⁺	<i>sec</i> -C ₄ H ₉		8.11	TC	196	2038
C ₄ H ₉ ⁺	<i>sec</i> -C ₄ H ₉		8.22	TC	198	2038
C ₄ H ₉ ⁺	<i>iso</i> -C ₄ H ₉		8.35 ± 0.05	SL	205*	141, 145
C ₄ H ₉ ⁺	<i>iso</i> -C ₄ H ₉		7.8	TC	193	1439
C ₄ H ₉ ⁺	<i>iso</i> -C ₄ H ₉		8.55	TC	210	141, 145
C ₄ H ₉ ⁺	<i>iso</i> -C ₄ H ₉		8.57	TC	210	2038
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		7.42 ± 0.07	SL	176*	141, 145
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		6.94	TC	164	1006
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		7.07	TC	168	136
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		7.3	TC	173	1439
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		7.32	TC	173	141, 145
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		7.79	TC	184	2038
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		7.97	TC	188	2038
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₁₀	H	11.11	LE	174	195
C ₄ H ₉ ⁺	<i>iso</i> -C ₄ H ₁₀	H	11.6	LE	183	195
C ₄ H ₉ ⁺	<i>n</i> -C ₅ H ₁₂	CH ₃	10.955 ± 0.04	PI	184	1120
C ₄ H ₉ ⁺	<i>n</i> -C ₅ H ₁₂	CH ₃	11.095 ± 0.04	PI		1120
C ₄ H ₉ ⁺	<i>iso</i> -C ₅ H ₁₂	CH ₃	10.975 ± 0.04	PI	183	1120
C ₄ H ₉ ⁺	<i>iso</i> -C ₅ H ₁₂	CH ₃	11.325 ± 0.04	PI		1120
C ₄ H ₉ ⁺	<i>neo</i> -C ₅ H ₁₂	CH ₃	10.55 ± 0.005	PI	170	1120
C ₄ H ₉ ⁺	<i>neo</i> -C ₅ H ₁₂	CH ₃	10.83	VC	177	2101
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉ SiCl ₃	HSiCl ₃ ?	10.26 ± 0.2	SL		2182
C ₄ H ₉ ⁺	<i>n</i> -C ₆ H ₁₄	C ₂ H ₅	10.86 ± 0.04	PI	185	1120
C ₄ H ₉ ⁺	<i>n</i> -C ₆ H ₁₄	C ₂ H ₅	11.115 ± 0.04	PI		1120
C ₄ H ₉ ⁺	<i>iso</i> -C ₆ H ₁₄	C ₂ H ₅	10.59 ± 0.005	PI	178	1120
C ₄ H ₉ ⁺	(C ₂ H ₅) ₂ CHCH ₃	C ₂ H ₅	10.785 ± 0.04	PI	183	1120
C ₄ H ₉ ⁺	(C ₂ H ₅) ₂ CHCH ₃	C ₂ H ₅	11.125 ± 0.04	PI		1120
C ₄ H ₉ ⁺	C ₂ H ₅ C(CH ₃) ₃	C ₂ H ₅	10.495 ± 0.01	PI	173	1120
C ₄ H ₉ ⁺	<i>n</i> -C ₇ H ₁₆	<i>n</i> -C ₃ H ₇	10.95 ± 0.04	PI	186	1120
C ₄ H ₉ ⁺	<i>n</i> -C ₇ H ₁₆	<i>n</i> -C ₃ H ₇	10.56 ± 0.05	PI	177	2013
C ₄ H ₉ ⁺	<i>n</i> -C ₈ H ₁₈	<i>n</i> -C ₄ H ₉	11.19 ± 0.04	PI	190	1120

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉ ONO	NO ₂	10.6	RPD	201	2018
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉ ONO	NO ₂	11.6	RPD		2018
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉ ONO	NO ₂ ⁻ ?	6.7	RPD		2018
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉ ONO	NO ₂ ⁻ ?	7.9	RPD		2018
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉ ONO	NO ₂ ⁻ ?	8.9	RPD		2018
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉ ONO	NO ₂ ⁻ ?	9.5	RPD		2018
C ₄ H ₉ ⁺	<i>n</i> -C ₄ H ₉ ONO	NO ₂ ⁻ ?	9.9	RPD		2018
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉ SiH ₃	SiH ₃	10.25 ± 0.02	SL		2182
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉ SiCl ₃	SiCl ₃	10.72 ± 0.1	SL		2182
C ₄ H ₉ ⁺	(<i>n</i> -C ₄ H ₉) ₂ Hg	<i>n</i> -C ₄ H ₉ Hg	10.55 ± 0.1	SL	(b)	506
<i>n</i>-C₄H₁₀⁺ Heat of formation 215 kcal mol⁻¹						
<i>iso</i>-C₄H₁₀⁺ 212 kcal mol⁻¹						
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.63 ± 0.03	PI	215*	416, 182
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.50	PE	212	1130
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		12.36	PE		1130
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		14.13	PE		1130
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		15.69	PE		1130
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		19.96	PE		1130
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.23	LE	206	195
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.66	TC	216	2038
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.68	TC	216	2038
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.71	TC	217	136
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.77	TC	218	473
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		10.81	TC	219	1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		11.56	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		11.71	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		12.24	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		12.64	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		16.21	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		18.64	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		22.98	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>n</i> -C ₄ H ₁₀		27.23	TC		1352, 2020
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		10.57	PI	212*	182
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		10.78	PE	216	1130
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		12.54	PE		1130
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		14.51	PE		1130
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		18.63	PE		1130
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		19.86	PE		1130
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		10.79	SL	217	62
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		10.23	LE	204	195
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		10.79	TC	217	136
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		10.94	TC	220	1352, 2020
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		10.98	TC	221	2038
C ₄ H ₁₀ ⁺	<i>iso</i> -C ₄ H ₁₀		11.00	TC	222	2038
C₅H₃⁺						
C ₅ H ₃ ⁺	CH ₃ C≡CC≡CCH ₃	CH ₃	13.55	EVD	368	1197
C ₅ H ₃ ⁺	C ₈ H ₈		14.59 ± 0.24	EVD		2105
(Cubane)						

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₅H₅⁺						
C ₅ H ₅ ⁺	C ₅ H ₅ (Cyclopentadienyl radical)		8.69 ± 0.1	SL		68
C ₅ H ₅ ⁺	C ₅ H ₅ (Cyclopentadienyl radical)		8.82	TC		136
C ₅ H ₅ ⁺	C ₅ H ₆ (Cyclopentadiene)	H	12.6	SL	270	68
C ₅ H ₅ ⁺	C ₅ H ₆ (Cyclopentadiene)	H	11.9 ± 0.5	MSD	254	1451
C ₅ H ₅ ⁺	C ₇ H ₈ (Cycloheptatriene)	C ₂ H ₂ + H	16.0	SL	306	219
C ₅ H ₅ ⁺	C ₇ H ₈ (Bicyclo(3·2·0)heptadiene-2,6)	C ₂ H ₂ + H	14.89	SL	299	219
cyclo-C₅H₆⁺ Heat of formation 239 kcal mol⁻¹						
C ₅ H ₆ ⁺	C ₅ H ₆ (Cyclopentadiene)		8.93 ± 0.05	SL	238*	2163
C ₅ H ₆ ⁺	C ₅ H ₆ (Cyclopentadiene)		9.00 ± 0.1	SL	239*	68
C ₅ H ₆ ⁺	C ₅ H ₆ (Cyclopentadiene)		8.91	TC	237	136
C ₅ H ₆ ⁺	C ₇ H ₈ (Bicyclo(3·2·0)heptadiene-2,6)	C ₂ H ₂	10.45	SL	249	219
C ₅ H ₆ ⁺	C ₇ H ₈ (Bicyclo(3·2·0)heptadiene-2,6)	C ₂ H ₂	10.02	VC	239	219
C ₅ H ₆ ⁺	C ₇ H ₁₀ (Cycloheptadiene)	C ₂ H ₄	10.70	SL	256	219
C ₅ H ₆ ⁺	C ₇ H ₁₀ (Norbornene)	C ₂ H ₄	9.58 ± 0.15	SL	(a)	2155
C ₅ H ₆ ⁺	C ₇ H ₁₀ (Bicyclo(3·2·0)heptene-6)	C ₂ H ₄	10.15	SL	252	219
C ₅ H ₆ ⁺	C ₆ H ₅ NH ₂ (Aniline)	HCN	12.3 ± 0.1	PI	276	1160
C ₅ H ₆ ⁺	C ₇ H ₉ Cl (Endo-5-chloro-2-norbornene)	C ₂ H ₃ Cl	9.75 ± 0.15	SL	(a)	2155
C ₅ H ₆ ⁺	C ₇ H ₉ Cl (Exo-5-chloro-2-norbornene)	C ₂ H ₃ Cl	9.77 ± 0.15	SL	(a)	2155
C ₅ H ₆ ⁺	C ₇ H ₉ Cl (3-chloronortricyclene)	C ₂ H ₃ Cl	10.15 ± 0.15	SL	(a)	2155
C₅H₅D⁺						
C ₅ H ₅ D ⁺	C ₆ H ₅ SD (Deuterated benzenethiol)	CS	11.9 ± 0.2	SL		1039
C₅H₇⁺						
C ₅ H ₇ ⁺	C ₉ H ₁₆ (<i>cis</i> -Hexahydroindane)		12.21 ± 0.05	EVD		1184, 2028
C ₅ H ₇ ⁺	C ₉ H ₁₆ (<i>trans</i> -Hexahydroindane)		12.19 ± 0.03	EVD		1184, 2028

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
	C₂H₅CH=C=CH₂⁺ Heat of formation 252 kcal mol⁻¹					
	CH₃CH=CHCH=CH₂⁺		219 kcal mol⁻¹			
	CH₃CH=C=CHCH₃⁺		247 kcal mol⁻¹			
	CH₂=CHCH₂CH=CH₂⁺		246 kcal mol⁻¹			
	CH₂=CHC(CH₃)=CH₂⁺		235 kcal mol⁻¹			
	cyclo-C₅H₈⁺		216 kcal mol⁻¹			
C ₅ H ₈ ⁺	C ₂ H ₅ CH=C=CH ₂		9.42	SL	252*	62
C ₅ H ₈ ⁺	CH ₃ CH=CHCH=CH ₂		8.68	SL	219*	62
C ₅ H ₈ ⁺	CH ₃ CH=CHCH=CH ₂		8.84	TC	223	136
C ₅ H ₈ ⁺	CH ₃ CH=C=CHCH ₃		9.26	SL	247*	62
C ₅ H ₈ ⁺	CH ₂ =CHCH ₂ CH=CH ₂		9.58	SL	246*	62
C ₅ H ₈ ⁺	CH ₂ =CHCH ₂ CH=CH ₂		8.94	TC	231	136
C ₅ H ₈ ⁺	CH ₂ =C=C(CH ₃) ₂		9.02	TC	239	136
C ₅ H ₈ ⁺	CH ₂ =CHC(CH ₃)=CH ₂		8.845 ± 0.005	PI	235*	182
C ₅ H ₈ ⁺	CH ₂ =CHC(CH ₃)=CH ₂		8.96	TC	237	136
C ₅ H ₈ ⁺	C ₅ H ₈ (Cyclopentene)		9.01 ± 0.01	PI	216*	182
C ₅ H ₈ ⁺	C ₅ H ₈ (Cyclopentene)		9.09	SL	217	411
C ₅ H ₈ ⁺	C ₅ H ₈ (Cyclopentene)		9.27	SL	222	62
C ₅ H ₈ ⁺	C ₅ H ₉ F (Fluorocyclopentane)	HF	10.56	SL	247	2029
C ₅ H ₈ ⁺	C ₅ H ₉ Cl (Chlorocyclopentane)	HCl	10.53	SL	239	2029
	cyclo-C₅H₉⁺ Heat of formation 194 kcal mol⁻¹					
C ₅ H ₉ ⁺	CH ₃ CH=CHCHCH ₃		7.34	TC	182	136
C ₅ H ₉ ⁺	(CH ₃) ₂ C=CHCH ₂		7.34	TC	184	136
C ₅ H ₉ ⁺	C ₅ H ₉ (Cyclopentyl radical)		7.79 ± 0.03	SL	(a)	123
C ₅ H ₉ ⁺	C ₅ H ₉ (Cyclopentyl radical)		7.83	TC		2184
C ₅ H ₉ ⁺	C ₆ H ₁₂ (Methylcyclopentane)	CH ₃	10.95	SL	194*	123
C ₅ H ₉ ⁺	C ₈ H ₁₆ (cis-1,2-Dimethylcyclohexane)	n-C ₃ H ₇ ?	12.12 ± 0.05	EVD	216	1145
C ₅ H ₉ ⁺	C ₈ H ₁₆ (trans-1,2-Dimethylcyclohexane)	n-C ₃ H ₇ ?	12.00 ± 0.05	EVD	212	1145

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
	1-C₅H₁₀⁺ Heat of formation 214 kcal mol⁻¹					
	cis-2-C₅H₁₀⁺		203 kcal mol⁻¹			
	trans-2-C₅H₁₀⁺		201 kcal mol⁻¹			
	(CH ₃) ₂ CHCH=CH ⁺		212 kcal mol⁻¹			
	C ₂ H ₅ C(CH ₃)=CH ₂ ⁺		202 kcal mol⁻¹			
	(CH ₃) ₂ C=CHCH ₃ ⁺		189 kcal mol⁻¹			
	cyclo-C₃H₄(CH₃)₂⁺		225 kcal mol⁻¹			
	cyclo-C₅H₁₀⁺		224 kcal mol⁻¹			
C ₅ H ₁₀ ⁺	1-C ₅ H ₁₀		9.50 ± 0.02	PI	214*	182, 1120
C ₅ H ₁₀ ⁺	1-C ₅ H ₁₀		9.67	SL	218	62
C ₅ H ₁₀ ⁺	cis-2-C ₅ H ₁₀		9.11	SL	203*	62
C ₅ H ₁₀ ⁺	trans-2-C ₅ H ₁₀		9.06	SL	201*	62
C ₅ H ₁₀ ⁺	(CH ₃) ₂ CHCH=CH ₂		9.51 ± 0.03	PI	212*	182
C ₅ H ₁₀ ⁺	(CH ₃) ₂ CHCH=CH ₂		9.60	SL	214	62
C ₅ H ₁₀ ⁺	C ₂ H ₅ C(CH ₃)=CH ₂		9.12 ± 0.02	PI	202*	182
C ₅ H ₁₀ ⁺	C ₂ H ₅ C(CH ₃)=CH ₂		9.20	SL	204	62
C ₅ H ₁₀ ⁺	(CH ₃) ₂ C=CHCH ₃		8.67 ± 0.02	PI	189*	182
C ₅ H ₁₀ ⁺	(CH ₃) ₂ C=CHCH ₃		8.68	PI	190*	168
C ₅ H ₁₀ ⁺	(CH ₃) ₂ C=CHCH ₃		8.89	SL	194	62
C ₅ H ₁₀ ⁺	(CH ₃) ₂ C=CHCH ₃		8.86	TC	194	136
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		9.78 ± 0.02	EVD	225*	1146
	(1,1-Dimethylcyclopropane-)					
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		9.76 ± 0.02	EVD	225*	1146
	(cis-1,2-Dimethylcyclopropane)					
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		9.77 ± 0.02	EVD	225*	1146
	(trans-1,2-Dimethylcyclopropane)					
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		10.53 ± 0.05	PI	224*	182
	(Cyclopentane)					
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		10.92	SL	233	123
	(Cyclopentane)					
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		10.53	TC	224	1352, 2020
	(Cyclopentane)					
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		10.64	TC	227	473
	(Cyclopentane)					
C ₅ H ₁₀ ⁺	C ₅ H ₁₀		10.89	TC	233	136
	(Cyclopentane)					
C ₅ H ₁₀ ⁺	n-C ₆ H ₁₄	CH ₄	10.855 ± 0.03	PI	228	1120
C ₅ H ₁₀ ⁺	iso-C ₆ H ₁₄	CH ₄	10.67 ± 0.015	PI	222	1120
C ₅ H ₁₀ ⁺	(C ₂ H ₅) ₂ CHCH ₃	CH ₄	10.63 ± 0.03	PI	222	1120
C ₅ H ₁₀ ⁺	C ₂ H ₅ C(CH ₃) ₃	CH ₄	10.265 ± 0.01	PI	210	1120
C ₅ H ₁₀ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂	CH ₄	10.47 ± 0.02	PI	217	1120
C ₅ H ₁₀ ⁺	n-C ₇ H ₁₆	C ₂ H ₆	10.81 ± 0.01	PI	225	1120
C ₅ H ₁₀ ⁺	n-C ₇ H ₁₆	C ₂ H ₆	10.40 ± 0.05	PI	215	2013
C ₅ H ₁₀ ⁺	C ₈ H ₁₆	C ₃ H ₆	11.62 ± 0.08	EVD	216	1145
	(cis-1,2-Dimethylcyclohexane)					
C ₅ H ₁₀ ⁺	C ₈ H ₁₆	C ₃ H ₆	11.60 ± 0.07	EVD	212	1145
	(trans-1,2-Dimethylcyclohexane)					
C ₅ H ₁₀ ⁺	n-C ₈ H ₁₈	C ₃ H ₈	10.90 ± 0.015	PI	226	1120
C ₅ H ₁₀ ⁺	n-C ₅ H ₁₁ F	HF	10.07	SL	222	2029
C ₅ H ₁₀ ⁺	n-C ₅ H ₁₁ Cl	HCl	10.63	SL	227	2029

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
		<i>n-C₅H₁₁⁺</i>	Heat of formation	171 kcal mol⁻¹		
		C₂H₅CH₂CHCH₃⁺	173 kcal mol⁻¹			
		(C₂H₅)₂CH⁺	174 kcal mol⁻¹			
		CH(CH₃)₂CHCH₃⁺	168 kcal mol⁻¹			
		<i>tert-C₅H₁₁⁺</i>	164 kcal mol⁻¹			
		<i>neo-C₅H₁₁⁺</i>	196 kcal mol⁻¹			
C ₅ H ₁₁ ⁺	<i>n-C₅H₁₁</i>		7.7	TC	187	1439
C ₅ H ₁₁ ⁺	<i>n-C₅H₁₁</i>		8.49	TC	205	1006
C ₅ H ₁₁ ⁺	<i>n-C₅H₁₁</i>		8.60	TC	207	2038
C ₅ H ₁₁ ⁺	<i>n-C₃H₇CHCH₃</i>		7.73 ± 0.1	EVD	(a)	151
C ₅ H ₁₁ ⁺	<i>n-C₃H₇CHCH₃</i>		7.66	TC	182	1006
C ₅ H ₁₁ ⁺	<i>n-C₃H₇CHCH₃</i>		8.11	TC	193	2038
C ₅ H ₁₁ ⁺	<i>n-C₃H₇CHCH₃</i>		8.22	TC	196	2038
C ₅ H ₁₁ ⁺	(C ₂ H ₅) ₂ CH		7.86 ± 0.05	EVD	(a)	151
C ₅ H ₁₁ ⁺	(C ₂ H ₅) ₂ CH		7.58	TC	179	1006
C ₅ H ₁₁ ⁺	(C ₂ H ₅) ₂ CH		8.08	TC	190	2038
C ₅ H ₁₁ ⁺	(C ₂ H ₅) ₂ CH		8.20	TC	193	2038
C ₅ H ₁₁ ⁺	<i>iso-C₅H₁₁</i>		8.60	TC	206	2038
C ₅ H ₁₁ ⁺	<i>iso-C₃H₇CHCH₃</i>		8.09	TC	189	2038
C ₅ H ₁₁ ⁺	<i>iso-C₃H₇CHCH₃</i>		8.20	TC	192	2038
C ₅ H ₁₁ ⁺	C ₂ H ₅ CH(CH ₃)CH ₂		8.56	TC	205	2038
C ₅ H ₁₁ ⁺	C ₂ H ₅ CH(CH ₃)CH ₂		8.57	TC	205	2038
C ₅ H ₁₁ ⁺	<i>tert-C₅H₁₁</i>		7.12 ± 0.1	EVD	(a)	151
C ₅ H ₁₁ ⁺	<i>tert-C₅H₁₁</i>		6.94	TC	161	1006
C ₅ H ₁₁ ⁺	<i>tert-C₅H₁₁</i>		7.77	TC	180	2038
C ₅ H ₁₁ ⁺	<i>tert-C₅H₁₁</i>		7.96	TC	185	2038
C ₅ H ₁₁ ⁺	<i>neo-C₅H₁₁</i>		8.33 ± 0.1	EVD	196*	151
C ₅ H ₁₁ ⁺	<i>neo-C₅H₁₁</i>		8.54	TC	201	2038
C ₅ H ₁₁ ⁺	<i>neo-C₅H₁₁</i>		8.55	TC	201	2038
C ₅ H ₁₁ ⁺	<i>n-C₆H₁₄</i>	CH ₃	10.89 ± 0.05	PI	178	1120
C ₅ H ₁₁ ⁺	<i>iso-C₆H₁₄</i>	CH ₃	10.735 ± 0.05	PI	173*	1120
C ₅ H ₁₁ ⁺	(C ₂ H ₅) ₂ CHCH ₃	CH ₃	10.75 ± 0.05	PI	174*	1120
C ₅ H ₁₁ ⁺	C ₂ H ₅ C(CH ₃) ₃	CH ₃	10.475 ± 0.03	PI	164*	1120
C ₅ H ₁₁ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂	CH ₃	10.58 ± 0.05	PI	168*	1120
C ₅ H ₁₁ ⁺	<i>n-C₇H₁₆</i>	C ₂ H ₅	10.43 ± 0.05	PI	171*	2013
C ₅ H ₁₁ ⁺	<i>n-C₇H₁₆</i>	C ₂ H ₅	10.80 ± 0.05	PI	179	1120
C ₅ H ₁₁ ⁺	<i>n-C₈H₁₈</i>	n-C ₃ H ₇	11.045 ± 0.05	PI	183	1120

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
					<i>n</i>-C₅H₁₂⁺ Heat of formation 204 kcal mol⁻¹	
					<i>iso</i>-C₅H₁₂⁺ 201 kcal mol⁻¹	
					<i>neo</i>-C₅H₁₂⁺ 199 kcal mol⁻¹	
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.35	PI	204*	182
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.25	TC	201	1439
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.49	TC	207	2038
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.51	TC	207	2038
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.54	TC	208	136
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.55	TC	208	473
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.56	TC	208	1006
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		10.58	TC	209	1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		11.31	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		11.64	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		11.71	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		12.24	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		12.64	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		15.97	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		17.70	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		20.79	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		24.68	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>n</i> -C ₅ H ₁₂		27.76	TC		1352, 2020
C ₅ H ₁₂ ⁺	<i>iso</i> -C ₅ H ₁₂		10.32	PI	201*	182
C ₅ H ₁₂ ⁺	<i>iso</i> -C ₅ H ₁₂		10.60	SL	208	62
C ₅ H ₁₂ ⁺	<i>iso</i> -C ₅ H ₁₂		9.96	TC	193	473
C ₅ H ₁₂ ⁺	<i>iso</i> -C ₅ H ₁₂		10.49	TC	205	1352, 2020
C ₅ H ₁₂ ⁺	<i>iso</i> -C ₅ H ₁₂		10.50	TC	205	136
C ₅ H ₁₂ ⁺	<i>iso</i> -C ₅ H ₁₂		10.61	TC	208	2038
C ₅ H ₁₂ ⁺	<i>iso</i> -C ₅ H ₁₂		10.63	TC	208	2038
C ₅ H ₁₂ ⁺	<i>neo</i> -C ₅ H ₁₂		10.35	PI	199*	182
C ₅ H ₁₂ ⁺	<i>neo</i> -C ₅ H ₁₂		10.30	TC	198	473
C ₅ H ₁₂ ⁺	<i>neo</i> -C ₅ H ₁₂		10.66	TC	206	1352, 2020
C ₅ H ₁₂ ⁺	<i>neo</i> -C ₅ H ₁₂		10.67	TC	206	136
					C₆H⁺	
C ₆ H ⁺	C ₆ H ₅ SCH ₃ (Phenyl methyl sulfide)		14.4	SL		307
					C₆H₂⁺	
C ₆ H ₂ ⁺	C ₆ H ₂ (EI on neutral fragment from benzene)		9.8 ± 0.1	NS		87

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆H₃⁺ Heat of formation 453 kcal mol⁻¹						
C ₆ H ₃ ⁺	C ₂ H ₅ C≡CC≡CH	H ₂ + H	17.92	EVD	455*	1197
C ₆ H ₃ ⁺	CH ₃ C≡CC≡CCH ₃	H ₂ + H	17.99	EVD	452*	1197
C ₆ H ₃ ⁺ (Azulene)	C ₁₀ H ₈		19.2 ± 0.15	SL		2112
C ₆ H ₃ ⁺ (Naphthalene)	C ₁₀ H ₈		20.77 ± 0.01	SL		2112
C ₆ H ₃ ⁺ (o-Chlorofluorobenzene)	C ₆ H ₄ FCl		16.67	EVD		1185
C ₆ H ₃ ⁺ (m-Chlorofluorobenzene)	C ₆ H ₄ FCl		16.78	EVD		1185
C ₆ H ₃ ⁺ (p-Chlorofluorobenzene)	C ₆ H ₄ FCl		16.81	EVD		1185
C₆H₄⁺ Heat of formation 352 kcal mol⁻¹						
C ₆ H ₄ ⁺ (Benzyne)	C ₆ H ₄		9.75	NS	389	29
C ₆ H ₄ ⁺	C ₆ H ₄		9.5 ± 0.1	NS	383	87
(EI on neutral fragment from benzene)						
C ₆ H ₄ ⁺	CH≡CCH=CHCH=CH ₂	H ₂	13.72	EVD	405	1197
C ₆ H ₄ ⁺	C ₂ H ₅ C≡CC≡CH	H ₂	11.07	EVD	349*	1197
C ₆ H ₄ ⁺	CH ₃ C≡CCH ₂ C≡CH	H ₂	11.02	EVD	348	1197
C ₆ H ₄ ⁺	CH ₃ C≡CC≡CCH ₃	H ₂	11.35	EVD	351*	1197
C ₆ H ₄ ⁺	CH≡CCH ₂ CH ₂ C≡CH	H ₂	11.17	EVD	357*	1197
C ₆ H ₄ ⁺ (Benzene)	C ₆ H ₆	H ₂	14.59	EVD	356*	1197
C ₆ H ₄ ⁺ (Benzene)	C ₆ H ₆	H ₂	14.09 ± 0.07	SL	345*	1238
C ₆ H ₄ ⁺ (Benzene)	C ₆ H ₆	H ₂	14.59 ± 0.1	SL	356*	2103
C ₆ H ₄ ⁺ (Azulene)	C ₁₀ H ₈		16.7 ± 0.15	SL		2112
C ₆ H ₄ ⁺ (Naphthalene)	C ₁₀ H ₈		18.2 ± 0.15	SL		2112
C ₆ H ₄ ⁺ (Biphenyl)	(C ₆ H ₅) ₂	C ₆ H ₅ + H	18.05 ± 0.3	SL	332	1238
C ₆ H ₄ ⁺ (Fluorobenzene)	C ₆ H ₅ F	HF	15.37 ± 0.1	SL	393	2103
C ₆ H ₄ ⁺ (Chlorobenzene)	C ₆ H ₅ Cl	HCl	14.87 ± 0.2	SL	378	2103
C ₆ H ₄ ⁺ (Bromobenzene)	C ₆ H ₅ Br	HBr	14.20 ± 0.2	SL	360	2103
cyclo-C₆H₅⁺ Heat of formation 285 kcal mol⁻¹						
C ₆ H ₅ ⁺ (Phenyl radical)	C ₆ H ₅		9.20	SL	284*	1079
C ₆ H ₅ ⁺	C ₆ H ₅		9.35 ± 0.1	NS	288	87
(EI on neutral fragment from triphenylstilbene)						
C ₆ H ₅ ⁺	CH≡CCH=CHCH=CH ₂	H	13.52	EVD	348	1197
C ₆ H ₅ ⁺	C ₂ H ₅ C≡CC≡CH	H	11.50	EVD	307	1197
C ₆ H ₅ ⁺	CH ₃ C≡CCH ₂ C≡CH	H	11.50	EVD	307	1197
C ₆ H ₅ ⁺	CH ₃ C≡CC≡CCH ₃	H	11.57	EVD	304	1197
C ₆ H ₅ ⁺	CH≡CCH ₂ CH ₂ C≡CH	H	11.47	EVD	311	1197

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₆ H ₅ ⁺ (Benzene)	C ₆ H ₆	H	13.8±0.1	PI	286*	2013
C ₆ H ₅ ⁺ (Benzene)	C ₆ H ₆	H	14.37	EVD	299	1197
C ₆ H ₅ ⁺ (Benzene)	C ₆ H ₆	H	14.44±0.05	SL	301	1238
C ₆ H ₅ ⁺ (Benzene)	C ₆ H ₆	H	14.37±0.1	SL	299	2103
C ₆ H ₅ ⁺ (Toluene)	C ₆ H ₅ CH ₃	CH ₃	13.7±0.1	SL	295	301
C ₆ H ₅ ⁺ (Norbornene)	C ₇ H ₁₀	CH ₃ +H ₂	13.8±0.3	LE	316	2155
C ₆ H ₅ ⁺ (Cubane)	C ₈ H ₈	C ₂ H ₂ +H	12.21±0.10	EVD	324	2105
C ₆ H ₅ ⁺ (Azulene)	C ₁₀ H ₈		16.9±0.10	SL		2112
C ₆ H ₅ ⁺ (Naphthalene)	C ₁₀ H ₈		18.45±0.04	SL		2112
C ₆ H ₅ ⁺ (Biphenyl)	(C ₆ H ₅) ₂	C ₆ H ₅	18.2±0.5	SL	387	1238
C ₆ H ₅ ⁺ (Diphenylacetylene)	(C ₆ H ₅) ₂ C ₂	C ₈ H ₅ ?	20.7±0.1	SL		1238
C ₆ H ₅ ⁺ (Benzaldehyde)	C ₆ H ₅ CHO	CO+H	14.54±0.05	SL	299	1237
C ₆ H ₅ ⁺ (Benzaldehyde)	C ₆ H ₅ CHO	CO+H	14.0	SL	287	308
C ₆ H ₅ ⁺ (Benzaldehyde)	C ₆ H ₅ CHO	CHO	13.51±0.12	NS	305	130
C ₆ H ₅ ⁺ (Phenoxyacetylene)	C ₆ H ₅ OC≡CH	OC ₂ H	12.2±0.1	VC		13
C ₆ H ₅ ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃	CO+CH ₃	14.23±0.05	SL	299	1237
C ₆ H ₅ ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃	CO+CH ₃	13.5	SL	282	308
C ₆ H ₅ ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃	CO+CH ₃	13.42±0.07	VC	280	2174
C ₆ H ₅ ⁺ (Benzyl methyl ketone)	C ₆ H ₅ CH ₂ COCH ₃	CH ₂ CO+CH ₃	13.66±0.02	VC	269	2174
C ₆ H ₅ ⁺ (Phenyl ether)	(C ₆ H ₅) ₂ O	C ₆ H ₅ O	14.85±0.05	SL	350	1237
C ₆ H ₅ ⁺ (Benzophenone)	(C ₆ H ₅) ₂ CO	C ₆ H ₅ +CO?	16.22±0.07	SL	341	1237
C ₆ H ₅ ⁺ (Phenyl benzoate)	(C ₆ H ₅) ₂ CO ₂	C ₆ H ₅ O+CO	15.46±0.05	SL	344	1237
C ₆ H ₅ ⁺ (Benzil)	(C ₆ H ₅) ₂ C ₂ O ₂	C ₆ H ₅ +2CO?	15.12±0.2	SL	308	1237
C ₆ H ₅ ⁺ (Diphenyl carbonate)	(C ₆ H ₅) ₂ CO ₃	C ₅ H ₅ +CO+CO ₂	12.1±0.1	SL	(b)	1237
C ₆ H ₅ ⁺ (Benzamide)	C ₆ H ₅ CONH ₂	CO+NH ₂	13.5±0.1	SL	269	1168
C ₆ H ₅ ⁺ (Diazoacetophenone)	C ₆ H ₅ COCHN ₂	CO+CHN ₂ ?	14.07±0.14	VC		2174
C ₆ H ₅ ⁺ (Fluorobenzene)	C ₆ H ₅ F	F	15.47±0.1	SL	311	2103
C ₆ H ₅ ⁺ (Fluorobenzene)	C ₆ H ₅ F	F	14.5±0.1	SL	289	301
C ₆ H ₅ ⁺ (Benzotrifluoride)	C ₆ H ₅ CF ₃	CF ₃	15.2±0.1	SL	326	301

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₆ H ₅ ⁺ (Trifluoroacetophenone)	C ₆ H ₅ COCF ₃	CO + CF ₃	12.0	SL		308
C ₆ H ₅ ⁺ (Deuterated benzenethiol)	C ₆ H ₅ SD	SD	13.3 ± 0.2	SL		1039
C ₆ H ₅ ⁺ (Chlorobenzene)	C ₆ H ₅ Cl	Cl	13.2 ± 0.1	SL	288	301
C ₆ H ₅ ⁺ (Chlorobenzene)	C ₆ H ₅ Cl	Cl	13.57 ± 0.12	SL	297	2103
C ₆ H ₅ ⁺ (endo-5-Chloro-2-norbornene)	C ₇ H ₉ Cl	CH ₂ Cl + H ₂	13.0 ± 0.3	LE	294	2155
C ₆ H ₅ ⁺ (exo-5-Chloro-2-norbornene)	C ₇ H ₉ Cl	CH ₂ Cl + H ₂	13.0 ± 0.3	LE	294	2155
C ₆ H ₅ ⁺ (3-Chloronortricyclene)	C ₇ H ₉ Cl	CH ₂ Cl + H ₂	12.7 ± 0.3	LE	279	2155
C ₆ H ₅ ⁺ (Bromobenzene)	C ₆ H ₅ Br	Br	12.62 ± 0.05	SL	288	2103
C ₆ H ₅ ⁺ (Bromobenzene)	C ₆ H ₅ Br	Br	12.6 ± 0.1	SL	288	301
C ₆ H ₅ ⁺ (Iodobenzene)	C ₆ H ₅ I	I	12.47 ± 0.05	SL	299	2103

cyclo-C₆H₆⁺ Heat of formation 233 kcal mol⁻¹

C ₆ H ₆ ⁺	CH≡CCH=CHCH=CH ₂	9.50	EVD	307	1197
C ₆ H ₆ ⁺	C ₂ H ₅ C≡CC≡CH	9.25	EVD	307	1197
C ₆ H ₆ ⁺	CH ₃ C≡CCH ₂ C≡CH	9.75	EVD	319	1197
C ₆ H ₆ ⁺	CH ₃ C≡CC≡CCH ₃	9.20	EVD	301	1197
C ₆ H ₆ ⁺	CH≡CCH ₂ CH ₂ C≡CH	10.35	EVD	338	1197
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.247 ± 0.002	S	233*	422
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.190 ± 0.005	S	232*	1114
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.247	S	233*	423
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.248	S	233*	1115
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.246 ± 0.005	PI	233*	2013
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.241 ± 0.006	PI	233*	1253
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.242 ± 0.01	PI	233*	54, 1118
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.245 ± 0.01	PI	233*	182, 416
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.24 ± 0.02	PI	233*	1142, 1166
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.20 ± 0.05	PI	232*	1160
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.25	PI	233*	1159
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.25	PE	233*	1130
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆	9.39	PE	236	2015

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.20 ± 0.1	RPD	232	2158
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.40 ± 0.1	RPD		2158
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.65 ± 0.1	RPD		2158
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.24	EVD	233	1197
C ₆ H ₆ ⁺ 1132 (Benzene)	C ₆ H ₆		9.14	SL	231	1132
C H ₆ ⁺ (Benzene)	C ₆ H ₆		9.22 ± 0.05	SL	232	1238
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.38	SL	236	413
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.50	SL	239	1079
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.56	SL	240	1066
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.60 ± 0.05	SL	241	2163
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.9 ± 0.1	SL	248	301
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.46 ± 0.1	CS	238	381
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.52 ± 0.10	CS	239	383
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.7	EC	243	218
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.37	TC	236	348
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		9.53	TC	240	136
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		10.35 ± 0.1	PI		1160
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		10.75 ± 0.1	PE		1159
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		11.489	S	285	1115
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		11.7 ± 0.3	S	290	1114
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		11.53	PI		54
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		11.5 ± 0.1	PI		1160
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		11.49	PE	285	1130
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		11.91	PE		2015
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		12.19	PE		1130
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		13.67	PE		1130
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		14.44	PE		1130

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		16.84	S	408	1115
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		16.73	PE		1130
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		16.93	PE		2015
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		18.75	PE		1130
C ₆ H ₆ ⁺ (Benzene)	C ₆ H ₆		19.82	PE		1130
C ₆ H ₆ ⁺ (Fulvene)	C ₆ H ₆		9.07	TC		136
C ₆ H ₆ ⁺ (Fulvene)	C ₆ H ₆		9.38	TC		
C ₆ H ₆ ⁺ (Cubane)	C ₈ H ₈	C ₂ H ₂	9.15 ± 0.10	EVD	306	2105
C ₆ H ₆ ⁺ (Azulene)	C ₁₀ H ₈	C ₄ H ₂	13.86 ± 0.05	SL	(b)	2112
C ₆ H ₆ ⁺ (Naphthalene)	C ₁₀ H ₈	C ₄ H ₂	15.20 ± 0.05	SL	(b)	2112
C ₆ H ₅ SCH ₃ (Phenyl methyl sulfide)		CH ₂ S	12.0	SL	249	307
C₆H₅D⁺						
C ₆ H ₅ D ⁺ (Benzene-d ₁)	C ₆ H ₅ D		9.44	SL		413
C₆H₅D⁺²						
C ₆ H ₅ D ⁺² (Benzene-d ₁)	C ₆ H ₅ D		26.0 ± 0.2	FDP		212
C₆H₅D⁺³						
C ₆ H ₅ D ⁺³ (Benzene-d ₁)	C ₆ H ₅ D		44 ± 5	NRE		212
C₆D₆⁺						
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		9.251 ± 0.002	S		422
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		9.190 ± 0.005	S		1114
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		9.251	S		423
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		9.251	S		1115
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		9.245 ± 0.01	PI		54
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		9.245 ± 0.01	PI		1118
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		11.520	S		1115
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		11.59	PI		54
C ₆ D ₆ ⁺ (Benzene-d ₆)	C ₆ D ₆		16.87	S		1115

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆H₇⁺						
C ₆ H ₇ ⁺	C ₅ H ₄ CH ₃ (Methylcyclopentadienyl radical)		8.54	SL		126
C ₆ H ₇ ⁺	C ₇ H ₁₀ (Norbornene)	CH ₃	11.2 ± 0.15	SL	256	2155
C ₆ H ₇ ⁺	C ₇ H ₉ Cl (<i>endo</i> -5-Chloro-2-norbornene)	CH ₂ Cl	10.9 ± 0.15	SL	245	2155
C ₆ H ₇ ⁺	C ₇ H ₉ Cl (<i>exo</i> -5-Chloro-2-norbornene)	CH ₂ Cl	10.8 ± 0.15	SL	243	2155
C ₆ H ₇ ⁺	C ₇ H ₉ Cl (3-Chloronortricyclene)	CH ₂ Cl	10.25 ± 0.15	SL	222	2155
cyclo-C₅H₅CH₃⁺ Heat of formation 218 kcal mol⁻¹						
C ₆ H ₈ ⁺	CH ₂ =CHCH=CHCH=CH ₂		8.62	TC	248	136
C ₆ H ₈ ⁺	C ₆ H ₈ (1-Methylcyclopentadiene)		8.43 ± 0.05	SL	218*	2163
C ₆ H ₈ ⁺	C ₆ H ₈ (2-Methylcyclopentadiene)		8.46 ± 0.05	SL	219*	2163
C₆H₉⁺						
C ₆ H ₉ ⁺	C ₉ H ₁₆ (<i>cis</i> -Hexahydroindane)	<i>n</i> -C ₃ H ₇ ?	11.99 ± 0.05	EVD	220	1184, 2028
C ₆ H ₉ ⁺	C ₉ H ₁₆ (<i>trans</i> -Hexahydroindane)	<i>n</i> -C ₃ H ₇ ?	12.07 ± 0.04	EVD	222	1184, 2028
cyclo-C₆H₁₀⁺ Heat of formation 199 kcal mol⁻¹						
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		8.945 ± 0.01	PI	204	182, 416
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		8.72	PE	199*	1130
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		10.29	PE		1130
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		10.98	PE		1130
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		12.47	PE		1130
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		16.25	PE		1130
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		18.48	PE		1130
C ₆ H ₁₀ ⁺	C ₆ H ₁₀ (Cyclohexene)		8.85 ± 0.09	SL	202	411
C ₆ H ₁₀ ⁺	C ₈ H ₁₆ (<i>cis</i> -1,2-Dimethylcyclohexane)	C ₂ H ₆	10.62 ± 0.04	EVD	224	1145
C ₆ H ₁₀ ⁺	C ₈ H ₁₆ (<i>trans</i> -1,2-Dimethylcyclohexane)	C ₂ H ₆	10.87 ± 0.08	EVD	228	1145
C ₆ H ₁₀ ⁺	C ₉ H ₁₆ (<i>cis</i> -Hexahydroindane)	C ₃ H ₆ ?	10.79 ± 0.03	EVD	210	1184, 2028
C ₆ H ₁₀ ⁺	C ₉ H ₁₆ (<i>trans</i> -Hexahydroindane)	C ₃ H ₆ ?	11.00 ± 0.02	EVD	215	1184, 2028
C ₆ H ₁₀ ⁺	C ₁₀ H ₁₈ (<i>cis</i> -Decaline)	<i>cis</i> -C ₄ H ₈ ?	10.89 ± 0.02	EVD	212	1182, 1183
C ₆ H ₁₀ ⁺	C ₁₀ H ₁₈ (<i>trans</i> -Decaline)	<i>trans</i> -C ₄ H ₈ ?	11.29 ± 0.02	EVD	220	1182, 1183

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
cyclo-C₆H₁₁⁺ Heat of formation 185 kcal mol⁻¹						
C ₆ H ₁₁ ⁺	C ₆ H ₁₁ (Cyclohexyl radical)		7.66 ± 0.05	SL	(a)	123
C ₆ H ₁₁ ⁺	C ₆ H ₁₁ (Cyclohexyl radical)		7.75	TC		2184
C ₆ H ₁₁ ⁺	C ₆ H ₁₂ (Cyclohexane)	H	11.66	SL	187*	123
C ₆ H ₁₁ ⁺	C ₇ H ₁₄ (Methylecyclohexane)	CH ₃	10.95	SL	183*	123
C ₆ H ₁₁ ⁺	C ₈ H ₁₆ (cis-1,2-Dimethylcyclohexane)	C ₂ H ₅	11.06 ± 0.02	EVD	189	1145
C ₆ H ₁₁ ⁺	C ₈ H ₁₆ (trans-1,2-Dimethylcyclohexane)	C ₂ H ₅	11.27 ± 0.02	EVD	192	1145
1-C₆H₁₂⁺ Heat of formation 208 kcal mol⁻¹						
(CH₃)₂C=C(CH₃)₂⁺			175 kcal mol⁻¹			
cyclo-C₆H₁₂⁺			197 kcal mol⁻¹			
C ₆ H ₁₂ ⁺	1-C ₆ H ₁₂		9.45 ± 0.02	PI	208*	1120
C ₆ H ₁₂ ⁺	1-C ₆ H ₁₂		9.46 ± 0.02	PI	208*	182
C ₆ H ₁₂ ⁺	trans-2-C ₆ H ₁₂		9.16		198	2114
C ₆ H ₁₂ ⁺	trans-3-C ₆ H ₁₂		9.12		197	2114
C ₆ H ₁₂ ⁺	(C ₂ H ₅) ₂ C=CH ₂		9.21		199	2114
C ₆ H ₁₂ ⁺	(CH ₃) ₂ C=C(CH ₃) ₂		8.30	PI	175*	168
C ₆ H ₁₂ ⁺	(CH ₃) ₂ C=C(CH ₃) ₂		8.40	TC	178	136
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Methylcyclopentane)		10.45	SL	216	123
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Methylcyclopentane)		10.28	TC	212	1352, 2020
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		9.88 ± 0.02	PI	198*	182, 416
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		9.79	PE	196*	1130
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		11.33	PE		1130
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		12.22	PE		1130
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		14.37	PE		1130
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		19.43	PE		1130
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		10.50	SL	213	123
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		10.05	TC	202	473
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		10.06	TC	203	1352, 2020
C ₆ H ₁₂ ⁺	C ₆ H ₁₂ (Cyclohexane)		10.79	TC	219	136
C ₆ H ₁₂ ⁺	n-C ₇ H ₁₆	CH ₄	10.875 ± 0.02	PI	224	1120
C ₆ H ₁₂ ⁺	C ₈ H ₁₆ (cis-1,2-Dimethylcyclohexane)	C ₂ H ₄	11.17 ± 0.02	EVD	204	1145
C ₆ H ₁₂ ⁺	C ₈ H ₁₆ (trans-1,2-Dimethylcyclohexane)	C ₂ H ₄	11.25 ± 0.04	EVD	204	1145
C ₆ H ₁₂ ⁺	n-C ₈ H ₁₈	C ₂ H ₆	10.62 ± 0.01	PI	215	1120

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
<i>n-C₆H₁₃⁺</i> Heat of formation 170 kcal mol⁻¹						
C ₆ H ₁₃ ⁺	<i>n-C₇H₁₆</i>	CH ₃	10.79 ± 0.06	PI	171*	1120
C ₆ H ₁₃ ⁺	<i>n-C₇H₁₆</i>	CH ₃	10.7 ± 0.1	PI	169*	2013
C ₆ H ₁₃ ⁺	<i>n-C₈H₁₈</i>	C ₂ H ₅	10.705 ± 0.01	PI	172	1120
<i>n-C₆H₁₄⁺</i> Heat of formation 195 kcal mol⁻¹						
	<i>iso-C₆H₁₄⁺</i>		192 kcal mol⁻¹			
	(C₂H₅)₂CHCH₃⁺		191 kcal mol⁻¹			
	C₂H₅C(CH₃)₂⁺		188 kcal mol⁻¹			
	(CH₃)₂CHCH(CH₃)₂⁺		189 kcal mol⁻¹			
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.18	PI	195*	182
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.12	TC	193	1439
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.15	TC	194	1439
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.40	TC	200	2038
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.41	TC	200	473
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.41	TC	200	2038
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.42	TC	200	1006
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.46	TC	201	136
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		10.43	TC	201	1352
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		11.09	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		11.50	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		11.67	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		11.70	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		12.24	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		12.64	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		15.83	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		17.13	TC		1352, 2020
C ₂ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		19.40	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		22.57	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		25.77	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>n-C₆H₁₄</i>		28.07	TC		1352, 2020
C ₆ H ₁₄ ⁺	<i>iso-C₆H₁₄</i>		10.12	PI	192*	182
C ₆ H ₁₄ ⁺	<i>iso-C₆H₁₄</i>		10.32	TC	196	1352, 2020
C ₆ H ₁₄ ⁺	<i>iso-C₆H₁₄</i>		10.41	TC	198	136
C ₆ H ₁₄ ⁺	<i>iso-C₆H₁₄</i>		10.45	TC	199	2038
C ₆ H ₁₄ ⁺	<i>iso-C₆H₁₄</i>		10.46	TC	199	2038
C ₆ H ₁₄ ⁺	(C ₂ H ₅) ₂ CHCH ₃		10.08	PI	191*	182
C ₆ H ₁₄ ⁺	(C ₂ H ₅) ₂ CHCH ₃		9.81	TC	185	473
C ₆ H ₁₄ ⁺	(C ₂ H ₅) ₂ CHCH ₃		10.31	TC	197	1352, 2020
C ₆ H ₁₄ ⁺	(C ₂ H ₅) ₂ CHCH ₃		10.46	TC	200	136
C ₆ H ₁₄ ⁺	(C ₂ H ₅) ₂ CHCH ₃		10.49	TC	201	2038
C ₆ H ₁₄ ⁺	(C ₂ H ₅) ₂ CHCH ₃		10.51	TC	201	2038
C ₆ H ₁₄ ⁺	C ₂ H ₅ C(CH ₃) ₃		10.06	PI	188*	182
C ₆ H ₁₄ ⁺	C ₂ H ₅ C(CH ₃) ₃		9.93	TC	185	473
C ₆ H ₁₄ ⁺	C ₂ H ₅ C(CH ₃) ₃		10.18	TC	190	1352, 2020
C ₆ H ₁₄ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂		10.02	PI	189*	182
C ₆ H ₁₄ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂		10.13	TC	191	1352, 2020
C ₆ H ₁₄ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂		10.54	TC	201	2038
C ₆ H ₁₄ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂		10.55	TC	201	136
C ₆ H ₁₄ ⁺	(CH ₃) ₂ CHCH(CH ₃) ₂		10.56	TC	201	2038

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇H₅⁺						
C ₇ H ₅ ⁺ (Biphenyl)	(C ₆ H ₅) ₂		20.85 ± 0.2	EVD		1238
cyclo-C₆H₅CH₂⁺ Heat of formation 216 kcal mol⁻¹						
cyclo-C₇H₇⁺ 209 kcal mol⁻¹						
C ₇ H ₇ ⁺	C ₅ H ₄ CH=CH ₂ (Vinylcyclopentadienyl radical)		8.44	SL		126
C ₇ H ₇ ⁺	C ₆ H ₅ CH ₂ (Benzyl radical)		7.76 ± 0.08	SL	216*	69
C ₇ H ₇ ⁺	C ₇ H ₇ (Cycloheptatrienyl radical)		6.240 ± 0.01	S	209*	2189
C ₇ H ₇ ⁺	C ₇ H ₇ (Cycloheptatrienyl radical)		6.60 ± 0.1	SL	217	68
C ₇ H ₇ ⁺	C ₇ H ₇ (Cycloheptatrienyl radical)		6.41	TC	213	136
C ₇ H ₇ ⁺	C ₆ H ₅ CH ₃ (Toluene)	H	11.80	CS	232	2109
C ₇ H ₇ ⁺	C ₇ H ₈ (Cycloheptatriene)	H	10.73	SL	239	219
C ₇ H ₇ ⁺	C ₇ H ₈ (Cycloheptatriene)	H	10.1 ± 0.2	SL	224	68
C ₇ H ₇ ⁺	C ₇ H ₈ (Cycloheptatriene)	H	10.68	VC	238	219
C ₇ H ₇ ⁺	C ₇ H ₈ (Cycloheptatriene)	H	10.46	CS	233	2109
C ₇ H ₇ ⁺	C ₇ H ₈ (Spiroheptadiene)	H	10.4 ± 0.1	CS	231	2108
C ₇ H ₇ ⁺	C ₇ H ₈ (Bicyclo(2·2·1)heptadiene-2,4)	H	10.45 ± 0.1	SL	241	1122
C ₇ H ₇ ⁺	C ₇ H ₈ (Bicyclo(2·2·1)heptadiene-2,5)	H	9.75	EVD		2185
C ₇ H ₇ ⁺	C ₇ H ₈ (Bicyclo(3·2·0)heptadiene-2,6)	H	9.6	CS	236	2109
C ₇ H ₇ ⁺	C ₇ H ₈ (Bicyclo(3·2·0)heptadiene-2,6)	H	9.88	SL	238	219
C ₇ H ₇ ⁺	C ₇ H ₈ (Quadricyclene)	H	9.66	VC	233	219
C ₇ H ₇ ⁺	C ₇ H ₈ (Quadricyclene)	H	9.56	EVD		2185
C ₇ H ₇ ⁺	C ₇ H ₁₀ (1,3-Cycloheptadiene)	H ₂ + H	13.37	SL	278	219
C ₇ H ₇ ⁺	C ₇ H ₁₀ (Norbornene)	H ₂ + H	13.6 ± 0.3	LE	293	2155
C ₇ H ₇ ⁺	CH ₂ =C(CH ₃)C≡CC(CH ₃)=CH ₂	CH ₃	10.5 ± 0.1	SL	277	1122
C ₇ H ₇ ⁺	C ₆ H ₅ C ₂ H ₅ (Ethylbenzene)	CH ₃	11.2 ± 0.1	SL	232	1122
C ₇ H ₇ ⁺	C ₆ H ₅ C ₂ H ₅ (Ethylbenzene)	CH ₃	11.25 ± 0.1	NS	233	135
C ₇ H ₇ ⁺	C ₆ H ₄ (CH ₃) ₂ (m-xylene)	CH ₃	11.6 ± 0.1	SL	238	1122

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₇ H ₇ ⁺	C ₈ H ₁₀ (7-Methylcycloheptatriene)	CH ₃	10.0 ± 0.1	SL	235	1122
C ₇ H ₇ ⁺	C ₈ H ₁₀ (7-Methylcycloheptatriene)	CH ₃	9.5 ± 0.2	SL	223	68
C ₇ H ₇ ⁺	C ₈ H ₁₀ (1-Methylspiroheptadiene)	CH ₃	9.8 ± 0.1	SL	237	1122
C ₇ H ₇ ⁺	C ₈ H ₁₀ (2-Methylspiroheptadiene)	CH ₃	9.8 ± 0.1	SL	237	1122
C ₇ H ₇ ⁺	C ₈ H ₁₀ (6-Methylspiroheptadiene)	CH ₃	9.7 ± 0.1	SL	236	1122
C ₇ H ₇ ⁺	C ₁₈ H ₃₀ (1-Phenyldecane)		11.82 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₁₈ H ₃₀ (3-Phenyldecane)		12.05 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₁₉ H ₃₂ (7-Phenyltridecane)		12.21 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₂₆ H ₄₆ (1-Phenyleicosane)		11.83 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₂₆ H ₄₆ (2-Phenyleicosane)		12.28 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₂₆ H ₄₆ (3-Phenyleicosane)		12.24 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₂₆ H ₄₆ (4-Phenyleicosane)		12.33 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₂₆ H ₄₆ (5-Phenyleicosane)		12.34 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₂₆ H ₄₆ (7-Phenyleicosane)		12.60 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₂₆ H ₄₆ (9-Phenyleicosane)		12.09 ± 0.1	EVD		2153
C ₇ H ₇ ⁺	C ₆ H ₅ CH ₂ ND ₂ (N,N-d ₂ -Benzylamine)	ND ₂	11.7 ± 0.1	PI		1160
C ₇ H ₇ ⁺	C ₆ H ₅ SCH ₃ (Phenyl methyl sulfide)	SH	12.0	SL	266	307
C ₇ H ₇ ⁺	C ₇ H ₉ Cl (endo-5-Chloro-2-norbornene)	HCl + H	12.5 ± 0.3	LE	281	2155
C ₇ H ₇ ⁺	C ₇ H ₉ Cl (exo-5-Chloro-2-norbornene)	HCl + H	12.6 ± 0.3	LE	284	2155
C ₇ H ₇ ⁺	C ₇ H ₉ Cl (3-Chloronortricyclene)	HCl + H	12.2 ± 0.3	LE	266	2155
C₇H₅D₂⁺						
C ₇ H ₅ D ₂ ⁺	C ₆ H ₅ CD ₂ (α-d ₂ -benzyl radical)		7.71	SL		0124

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
					Heat of formation 215 kcal mol⁻¹	
					cyclo-C₆H₅CH₃⁺	
					240 kcal mol⁻¹	
					bicyclo(2 · 2 · 1)-C₇H₈⁺	
					267 kcal mol⁻¹	
					bicyclo(3 · 2 · 0)-C₇H₈⁺	
					268 kcal mol⁻¹	
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		8.82 ± 0.01	PI	215*	158, 182, 416
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		8.81 ± 0.02	PI	215*	1142, 1166
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		8.82	PI	215*	1159
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		10.12 ± 0.2	PE		1159
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		8.82	PI	215*	168
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		8.80 ± 0.1	RPD	215	2158
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.2 ± 0.1	RPD		2158
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.5 ± 0.1	RPD		2158
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.23 ± 0.05	SL	225	2163
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.18	SL	224	1066
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.12 ± 0.05	CS	222	2025
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.20 ± 0.05	CS	224	383
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.15 ± 0.1	CS	223	381
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.03	CS	220	2109
C ₇ H ₈ ⁺ (Toluene)	C ₆ H ₅ CH ₃		9.01	TC	220	136
C ₇ H ₈ ⁺ (Cycloheptatriene)	C ₇ H ₈		8.55 ± 0.1	SL	241*	68
C ₇ H ₈ ⁺ (Cycloheptatriene)	C ₇ H ₈		8.52	SL	240*	219
C ₇ H ₈ ⁺ (Cycloheptatriene)	C ₇ H ₈		8.47	VC	239	219
C ₇ H ₈ ⁺ (Cycloheptatriene)	C ₇ H ₈		8.51	CS	240*	2109
C ₇ H ₈ ⁺ (Cycloheptatriene)	C ₇ H ₈		7.89	TC	225	136
C ₇ H ₈ ⁺ (Bicyclo(2 · 2 · 1)heptadiene-2,4)	C ₇ H ₈		8.60	EVD		2185
C ₇ H ₈ ⁺ (Bicyclo(2 · 2 · 1)heptadiene-2,5)	C ₇ H ₈		8.67	CS	267*	2109
C ₇ H ₈ ⁺ (Bicyclo(3 · 2 · 0)heptadiene-2,6)	C ₇ H ₈		8.92	SL	268*	219
C ₇ H ₈ ⁺ (Quadracyclene)	C ₇ H ₈		8.70	EVD		2185
C ₇ H ₈ ⁺ (Quadracyclene)	C ₇ H ₈		8.85	EVD		2185

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₇ H ₈ ⁺	C ₇ H ₁₀ (1,3-Cycloheptadiene)	H ₂	10.8	SL	271	219
C ₇ H ₈ ⁺	C ₇ H ₁₀ (Bicyclo(3·2·0)heptene-6)	H ₂	9.4	SL	247	219
C ₇ H ₈ ⁺	C ₁₈ H ₃₀ (1-Phenyldodecane)		10.75 ± 0.1	EVD		2153
C ₇ H ₈ ⁺	C ₂₆ H ₄₆ (1-Phenyleicosane)		11.35 ± 0.1	EVD		2153
C₇H₈⁺²						
C ₇ H ₈ ⁺ ²	C ₆ H ₅ CH ₃ (Toluene)		24.5 ± 0.2	FDP	577	212
C₇H₈⁺³						
C ₇ H ₈ ⁺ ³	C ₆ H ₅ CH ₃ (Toluene)		42 ± 5	NRE	981	212
C₇H₉⁺						
C ₇ H ₉ ⁺	C ₇ H ₁₀ (1,3-Cycloheptadiene)	H	11.30	SL	231	219
C ₇ H ₉ ⁺	C ₇ H ₁₀ (Bicyclo(3·2·0)heptene-6)	H	10.67	SL	224	219
C ₇ H ₉ ⁺	C ₇ H ₁₀ (Norbornene)	H	11.5 ± 0.15	SL	244	2155
C ₇ H ₉ ⁺	C ₇ H ₉ Cl (endo-5-Chloro-2-norbornene)	Cl	11.0 ± 0.15	SL	248	2155
C ₇ H ₉ ⁺	C ₇ H ₉ Cl (exo-5-Chloro-2-norbornene)	Cl	11.1 ± 0.15	SL	250	2155
C ₇ H ₉ ⁺	C ₇ H ₉ Cl (3-Chloronortricyclene)	Cl	10.7 ± 0.15	SL	233	2155
C₇H₁₀⁺ (1,2-Dimethylcyclopentadiene) Heat of formation 204 kcal mol⁻¹						
C₇H₁₀⁺ (5,5-Dimethylcyclopentadiene) 206 kcal mol⁻¹						
C₇H₁₀⁺ (1,3-Cycloheptadiene) 219 kcal mol⁻¹						
C₇H₁₀⁺ (Bicyclo(3·2·0)heptene-6) 246 kcal mol⁻¹						
C₇H₁₀⁺ (Norbornene) 237 kcal mol⁻¹						
C ₇ H ₁₀ ⁺	C ₇ H ₁₀ (1,2-Dimethylcyclopentadiene)		8.1 ± 0.1	SL	204*	2163
C ₇ H ₁₀ ⁺	C ₇ H ₁₀ (5,5-Dimethylcyclopentadiene)		8.22 ± 0.05	SL	206*	2163
C ₇ H ₁₀ ⁺	C ₇ H ₁₀ (1,3-Cycloheptadiene)		8.40	SL	216*	219
C ₇ H ₁₀ ⁺	C ₇ H ₁₀ (1,3-Cycloheptadiene)		8.69	VC	223*	219
C ₇ H ₁₀ ⁺	C ₇ H ₁₀ (Bicyclo(3·2·0)heptene-6)		9.37	SL	246*	219
C ₇ H ₁₀ ⁺	C ₇ H ₁₀ (Bicyclo(3·2·0)heptene-6)		9.38	VC	246*	219
C ₇ H ₁₀ ⁺	C ₇ H ₁₀ (Norbornene)		8.95 ± 0.15	SL	237*	2155

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇H₁₁⁺						
C ₇ H ₁₁ ⁺ (<i>cis</i> -Hexahydroindane)	C ₉ H ₁₆	C ₂ H ₅	11.71 ± 0.05	EVD	211* 1184, 2028	
C ₇ H ₁₁ ⁺ (<i>trans</i> -Hexahydroindane)	C ₉ H ₁₆	C ₂ H ₅	11.80 ± 0.05	EVD	213* 1184, 2028	
C₇H₁₂⁺ (4-Methylcyclohexane) Heat of formation 198 kcal mol⁻¹						
C ₇ H ₁₂ ⁺ (4-Methylcyclohexene)	C ₇ H ₁₂		8.91 ± 0.01	PI	198*	182
C ₇ H ₁₂ ⁺ (<i>cis</i> -Hexahydroindane)	C ₉ H ₁₆	C ₂ H ₄	10.96 ± 0.03	EVD	206 1184, 2028	
C ₇ H ₁₂ ⁺ (<i>trans</i> -Hexahydroindane)	C ₉ H ₁₆	C ₂ H ₄	11.16 ± 0.03	EVD	211 1184, 2028	
C ₇ H ₁₂ ⁺ (<i>cis</i> -Decaline)	C ₁₀ H ₁₈	C ₃ H ₆	10.72 ± 0.02	EVD	202 1182, 1183	
C ₇ H ₁₂ ⁺ (<i>trans</i> -Decaline)	C ₁₀ H ₁₈	C ₃ H ₆	11.04 ± 0.02	EVD	206 1182, 1183	
cyclo-C₆H₁₀CH₃⁺ Heat of formation 174 kcal mol⁻¹						
C ₇ H ₁₃ ⁺ (<i>cis</i> -1,2-Dimethylcyclohexane)	C ₈ H ₁₆	CH ₃	10.78 ± 0.02	EVD	174* 1145	
C ₇ H ₁₃ ⁺ (<i>trans</i> -1,2-Dimethylcyclohexane)	C ₈ H ₁₆	CH ₃	10.84 ± 0.02	EVD	174* 1145	
cyclo-C₆H₁₁CH₃⁺ Heat of formation 190 kcal mol⁻¹						
C ₇ H ₁₄ ⁺ (Methylcyclohexane)	C ₇ H ₁₄		9.85 ± 0.03	PI	190* 182	
C ₇ H ₁₄ ⁺ (Methylcyclohexane)	C ₇ H ₁₄		10.19	SL	198 123	
C ₇ H ₁₄ ⁺ (Methylcyclohexane)	C ₇ H ₁₄		9.91	TC	192 1352, 2020	
C ₇ H ₁₄ ⁺ (Cycloheptane)	C ₇ H ₁₄		10.32	TC	209 1352, 2020	
C ₇ H ₁₄ ⁺ (Cycloheptane)	C ₇ H ₁₄		10.72	TC	219 136	
n-C₇H₁₅⁺ Heat of formation 164 kcal mol⁻¹						
C ₇ H ₁₅ ⁺ (C ₃ H ₇) ₂ CH	n-C ₈ H ₁₈	CH ₃	10.705 ± 0.075	PI	164* 1120	
			7.56	TC	168 1006	
n-C₇H₁₆⁺ Heat of formation 183 kcal mol⁻¹						
C ₇ H ₁₆ ⁺ .	n-C ₇ H ₁₆		9.90 ± 0.05	PI	183* 2013	
C ₇ H ₁₆ ⁺	n-C ₇ H ₁₆		10.08	PI	188 182	
C ₇ H ₁₆ ⁺	n-C ₇ H ₁₆		10.20	PE	190 1130	
C ₇ H ₁₆ ⁺	n-C ₇ H ₁₆		14.38	PE	1130	
C ₇ H ₁₆ ⁺	n-C ₇ H ₁₆		15.18	PE	1130	
C ₇ H ₁₆ ⁺	n-C ₇ H ₁₆		18.63?	PE	1130	
C ₇ H ₁₆ ⁺	n-C ₇ H ₁₆		19.86?	PE	1130	

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.05	TC	187	1439
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.07	TC	187	1439
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.33	TC	193	473
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.33	TC	193	1006
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.34	TC	194	1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.90	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		11.34	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		11.57	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		11.68	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		11.70	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		12.24	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		12.64	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		15.72	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		16.74	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		18.49	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		21.00	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		23.89	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		26.50	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		28.27	TC		1352, 2020
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.34	TC	194	2038
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.35	TC	194	2038
C ₇ H ₁₆ ⁺	<i>n</i> -C ₇ H ₁₆		10.41	TC	195	136
C₈H₅⁺						
C ₈ H ₅ ⁺ (Naphthalene)	C ₁₀ H ₈		18.07 ± 0.05	SL		2112
C ₈ H ₅ ⁺ (Azulene)	C ₁₀ H ₈		16.3 ± 0.15	SL		2112
cyclo-C₆H₅C≡CH⁺ Heat of formation 279 kcal mol⁻¹						
C ₈ H ₆ ⁺ (Phenylacetylene)	C ₆ H ₅ C≡CH		8.815 ± 0.005	PI	279*	182
C ₈ H ₆ ⁺ (Phenylacetylene)	C ₆ H ₅ C≡CH		9.10	TC	286	136
C ₈ H ₆ ⁺ (Cubane)	C ₈ H ₈	H ₂ ?	10.26 ± 0.21	EVD	385	2105
C ₈ H ₆ ⁺ (Naphthalene)	C ₁₀ H ₈	C ₂ H ₂ ?	15.4 ± 0.10	SL	334	2112
C ₈ H ₆ ⁺ (Azulene)	C ₁₀ H ₈	C ₂ H ₂ ?	13.6 ± 0.10	SL	332	2112
C ₈ H ₆ ⁺ (Biphenyl)	(C ₆ H ₅) ₂	2C ₂ H ₂ ?	18.10 ± 0.05	SL	349	1238
C ₈ H ₆ ⁺ (Diphenylacetylene)	(C ₆ H ₅) ₂ C ₂	C ₆ H ₄ ?	17.8 ± 0.1	SL	346	1238
C₈H₇⁺						
C ₈ H ₇ ⁺ (Cubane)	C ₈ H ₈	H	9.50 ± 0.11	EVD	316	2105

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₈H₈⁺ (Styrene)	C₆H₅CH=CH₂		8.47 ± 0.02	PI	232*	182
C₈H₈⁺ (Styrene)	C₆H₅CH=CH₂		9.00	SL	244	1066
C₈H₈⁺ (Cyclooctatetraene)			7.99 ± 0.02	PI	255*	182
C₈H₈⁺ (Cubane)			8.04	PE	256*	1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		9.49	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		10.84	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		11.49?	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		12.09	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		14.49	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		16.44?	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		17.69?	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		18.56?	PE		1130
C₈H₈⁺ (Cyclooctatetraene)	C₈H₈		8.63 ± 0.15	CS	270	381
C₈H₈⁺ (Cubane)	C₈H₈		8.74 ± 0.15	EVD	350*	2105
C₈H₈⁺ (1-Phenyleicosane)	C₂₆H₄₆		12.2 ± 0.1	EVD		2153
m-C₆H₄CH₃CH₂⁺ Heat of formation 206 kcal mol⁻¹						
p-C₆H₄CH₃CH₂⁺ 202 kcal mol⁻¹						
C₈H₉⁺ (m-Methylbenzyl radical)	C₆H₄CH₃CH₂		7.65 ± 0.03	SL	206*	69
C₈H₉⁺ (m-Methylbenzyl radical)	C₆H₄CH₃CH₂		7.65	TC	206	136
C₈H₉⁺ (p-Methylbenzyl radical)	C₆H₄CH₃CH₂		7.46 ± 0.03	SL	202*	69
C₈H₉⁺ (p-Methylbenzyl radical)	C₆H₄CH₃CH₂		7.56	TC	204	136
C₈H₉⁺ (7-Methylcycloheptatriene)	CH₂=C(CH₃)C≡CC(CH₃)=CH₂	H	10.4 ± 0.1	SL	256	1122
C₈H₉⁺ (Ethylbenzene)	C₆H₅C₂H₅	H	11.4 ± 0.1	SL	218	1122
C₈H₉⁺ (7-Methylcycloheptatriene)	C₈H₁₀	H	11.0 ± 0.1	SL	239	1122
C₈H₉⁺ (1-Methylspiroheptadiene)	C₈H₁₀	H	9.9 ± 0.1	SL	220	1122
C₈H₉⁺ (2-Methylspiroheptadiene)	C₈H₁₀	H	9.9 ± 0.1	SL	220	1122
C₈H₉⁺ (6-Methylspiroheptadiene)	C₈H₁₀	H	10.65 ± 0.1	SL	239	1122

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₈ H ₉ ⁺ (<i>p</i> -Ethyltoluene)	C ₆ H ₄ CH ₃ C ₂ H ₅	CH ₃	11.2 ± 0.1	SL	224	1122
C ₈ H ₉ ⁺ (<i>p</i> -Methyl- <i>d</i> ₃ -ethylbenzene)	C ₆ H ₄ CD ₃ C ₂ H ₅	CD ₃	11.2 ± 0.1	SL		2144
C ₈ H ₉ ⁺ (<i>p</i> -Ethyl- β - <i>d</i> ₃ -toluene)	C ₆ H ₄ CH ₃ CH ₂ CD ₃	CD ₃	11.2 ± 0.1	SL		2144
C ₈ H ₉ ⁺ (2-Phenyleicosane)	C ₂₆ H ₄₆		10.83 ± 0.1	EVD		2153
C ₈ H ₉ ⁺ (3-Phenyleicosane)	C ₂₆ H ₄₆		11.28 ± 0.1	EVD		2153
cyclo-C₆H₅C₂H₅⁺ Heat of formation 209 kcal mol⁻¹						
<i>o</i>-C₆H₄(CH₃)₂⁺ 202 kcal mol⁻¹						
<i>m</i>-C₆H₄(CH₃)₂⁺ 202 kcal mol⁻¹						
<i>p</i>-C₆H₄(CH₃)₂⁺ 199 kcal mol⁻¹						
7-cyclo-C₇H₇CH₃⁺ 231 kcal mol⁻¹						
1-spiro-C₇H₇CH₃⁺ 229 kcal mol⁻¹						
2-spiro-C₇H₇CH₃⁺ 230 kcal mol⁻¹						
6-spiro-C₇H₇CH₃⁺ 239 kcal mol⁻¹						
C ₈ H ₁₀ ⁺	CH ₂ =C(CH ₃)C≡CC(CH ₃)=CH ₂		8.95 ± 0.1	SL	275	1122
C ₈ H ₁₀ ⁺ (Ethylbenzene)	C ₆ H ₅ C ₂ H ₅		8.76 ± 0.01	PI	209*	182
C ₈ H ₁₀ ⁺ (<i>o</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.555	PI	202*	168
C ₈ H ₁₀ ⁺ (<i>o</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.56 ± 0.01	PI	202*	182, 416
C ₈ H ₁₀ ⁺ (<i>o</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.56 ± 0.02	PI	202*	1142, 1166, 1159
C ₈ H ₁₀ ⁺ (<i>o</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		9.86 ± 0.2	PE		1159
C ₈ H ₁₀ ⁺ (<i>o</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.88 ± 0.05	SL	209	2163
C ₈ H ₁₀ ⁺ (<i>o</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		9.04	SL	213	1066
C ₈ H ₁₀ ⁺ (<i>o</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.76	TC	207	136
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.56 ± 0.01	PI	202*	182, 416
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.59 ± 0.02	PI	202*	1142, 1166, 1159
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		9.89 ± 0.2	PE		1159
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.56	PI	202*	168
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.88 ± 0.05	SL	209	2163
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.85 ± 0.1	SL	208	1122
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		9.05	SL	213	1066
C ₈ H ₁₀ ⁺ (<i>m</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.77	TC	206	136

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₈ H ₁₀ ⁺ (<i>p</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.445 ± 0.01	PI	199*	182, 416
C ₈ H ₁₀ ⁺ (<i>p</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.445	PI	199*	168
C ₈ H ₁₀ ⁺ (<i>p</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.44 ± 0.02	PI	199*	1142, 1166, 1159
C ₈ H ₁₀ ⁺ (<i>p</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		9.74 ± 0.2	PE		1159
C ₈ H ₁₀ ⁺ (<i>p</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.78 ± 0.05	SL	207	2163
C ₈ H ₁₀ ⁺ (<i>p</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.99	SL	212	1066
C ₈ H ₁₀ ⁺ (<i>p</i> -Xylene)	C ₆ H ₄ (CH ₃) ₂		8.83	TC	208	136
C ₈ H ₁₀ ⁺ (Xylene)	C ₆ H ₄ (CH ₃) ₂		8.88	TC	209	2194
C ₈ H ₁₀ ⁺ (7-Methylcycloheptatriene)	C ₈ H ₁₀		8.39 ± 0.1	SL	231*	1122
C ₈ H ₁₀ ⁺ (1-Methylspiroheptadiene)	C ₈ H ₁₀		8.02 ± 0.1	SL	229*	1122
C ₈ H ₁₀ ⁺ (2-Methylspiroheptadiene)	C ₈ H ₁₀		8.07 ± 0.1	SL	230*	1122
C ₈ H ₁₀ ⁺ (6-Methylspiroheptadiene)	C ₈ H ₁₀		8.40 ± 0.1	SL	239*	1122
C₈H₁₂⁺						
C ₈ H ₁₂ ⁺ (1,2,3-Trimethylcyclopentadiene)	C ₈ H ₁₂		7.96 ± 0.05	SL	194*	2163
C ₈ H ₁₂ ⁺ (1,5,5-Trimethylcyclopentadiene)	C ₈ H ₁₂		8.00 ± 0.1	SL	193*	2163
C ₈ H ₁₂ ⁺ (4-Vinylcyclohexene)	C ₆ H ₉ CH=CH ₂		8.93 ± 0.02	PI	224*	182
cis-1,2-cyclo-C₆H₁₀(CH₃)₂⁺ Heat of formation 191 kcal mol⁻¹						
trans-1,2-cyclo-C₆H₁₀(CH₃)₂⁺ 189 kcal mol⁻¹						
C ₈ H ₁₆ ⁺ (<i>cis</i> -1,2-Dimethylcyclohexane)	C ₈ H ₁₆		10.08 ± 0.02	EVD	191*	1145
C ₈ H ₁₆ ⁺ (<i>trans</i> -1,2-Dimethylcyclohexane)	C ₈ H ₁₆		10.08 ± 0.03	EVD	189*	1145
C ₈ H ₁₆ ⁺ (Cyclooctane)	C ₈ H ₁₆		10.06	TC	202	1352, 2020
C ₈ H ₁₆ ⁺ (Cyclooctane)	C ₈ H ₁₆		10.67	TC	216	136
iso-C₄H₉C(CH₃)₃⁺ Heat of formation 174 kcal mol⁻¹						
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			10.03	TC	181	1439
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			10.25	TC	187	473
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			10.27	TC	187	1006
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			10.28	TC	187	1352, 2020
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			10.76	TC		1352, 2020
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			11.20	TC		1352, 2020
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			11.47	TC		1352, 2020
C ₈ H ₁₈ ⁺ <i>n</i> -C ₈ H ₁₈			11.62	TC		1352, 2020

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		11.69	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		11.70	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		12.24	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		12.64	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		15.65	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		16.47	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		17.86	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		19.87	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		22.35	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		24.87	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		27.00	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		28.41	TC	1352, 2020	
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		10.29	TC	187	2038
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		10.30	TC	188	2038
C ₈ H ₁₈ ⁺	<i>n</i> -C ₈ H ₁₈		10.38	TC	190	136
C ₈ H ₁₈ ⁺	<i>iso</i> -C ₄ H ₉ C(CH ₃) ₃		9.86	PI	174*	182
C ₈ H ₁₈ ⁺	<i>iso</i> -C ₄ H ₉ C(CH ₃) ₃		9.91	PE	175	1130
C ₈ H ₁₈ ⁺	<i>iso</i> -C ₄ H ₉ C(CH ₃) ₃		11.95?	PE		1130
C ₈ H ₁₈ ⁺	<i>iso</i> -C ₄ H ₉ C(CH ₃) ₃		14.09?	PE		1130
C ₈ H ₁₈ ⁺	<i>iso</i> -C ₄ H ₉ C(CH ₃) ₃		19.74?	PE		1130
C₉H₅⁺						
C ₉ H ₅ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	cyclo-C ₅ H ₅ ?	21.3 ± 0.2	SL		1238
C₉H₇⁺						
C ₉ H ₇ ⁺	C ₆ H ₅ CHC≡CH (γ-Phenylpropargyl radical)		7.69	TC	269	136
C ₉ H ₇ ⁺	C ₉ H ₇ (Indenyl radical)		8.35	SL		126
C ₉ H ₇ ⁺	(C ₆ H ₅) ₂ (Biphenyl)	CH ₂ C≡CH?	16.08 ± 0.05	SL	335	1238
C ₉ H ₇ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	C ₅ H ₃ ?	17.5 ± 0.1	SL		1238
C ₉ H ₇ ⁺	(C ₆ H ₅) ₂ O (Phenyl ether)	C ₃ H ₃ O?	16.68 ± 0.15	SL		1237
C₉H₈⁺ (Indene) Heat of formation 246 kcal mol⁻¹						
C ₉ H ₈ ⁺	C ₆ H ₅ C≡CCH ₃ (Methylphenylacetylene)		8.79	TC	269	136
C ₉ H ₈ ⁺	C ₉ H ₈ (Indene)		8.81	SL	246*	126
C ₉ H ₈ ⁺	C ₉ H ₈ (Indene)		8.63	TC	242	136
C₉H₁₀⁺						
C ₉ H ₁₀ ⁺	C ₆ H ₅ C(CH ₃)=CH ₂ (α-Methylstyrene)		8.35 ± 0.01	PI	220*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₉H₁₁⁺						
C ₉ H ₁₁ ⁺	C ₆ H ₃ (CH ₃) ₂ CH ₂ CD ₃ (2,5-Dimethylethyl-β-d ₃ -benzene)	CD ₃	10.5	SL	2144	
C ₉ H ₁₁ ⁺	C ₆ H ₃ (CH ₃) ₂ CH ₂ CD ₃ (3,4-Dimethylethyl-β-d ₃ -benzene)	CD ₃	10.5	SL	2144	
C ₉ H ₁₁ ⁺	C ₆ H ₃ (CH ₃) ₂ CH ₂ CD ₃ (3,5-Dimethylethyl-β-d ₃ -benzene)	CD ₃	10.5	SL	2144	
C ₉ H ₁₁ ⁺	C ₁₈ H ₃₀		10.42 ± 0.1	EVD	2153	
C ₉ H ₁₁ ⁺	(3-Phenyldodecane)		10.69 ± 0.1	EVD	2153	
C ₉ H ₁₁ ⁺	C ₂₆ H ₄₆		11.36 ± 0.1	EVD	2153	
(3-Phenyleicosane)						
(3-Phenyleicosane)						
C₉H₈D₃⁺						
C ₉ H ₈ D ₃ ⁺	C ₆ H ₃ (CH ₃) ₂ CH ₂ CD ₃ (2,5-Dimethylethyl-β-d ₃ -benzene)	CH ₃	10.5	SL	2144	
C ₉ H ₈ D ₃ ⁺	C ₆ H ₃ (CH ₃) ₂ CH ₂ CD ₃ (3,4-Dimethylethyl-β-d ₃ -benzene)	CH ₃	10.5	SL	2144	
C ₉ H ₈ D ₃ ⁺	C ₆ H ₃ (CH ₃) ₂ CH ₂ CD ₃ (3,5-Dimethylethyl-β-d ₃ -benzene)	CH ₃	10.5	SL	2144	
cyclo-C₆H₅(n-C₃H₇)⁺ Heat of formation 203 kcal mol⁻¹						
cyclo-C₆H₅(iso-C₃H₇)⁺ 210 kcal mol⁻¹						
1,2,3-cyclo-C₆H₃(CH₃)₃⁺ 193 kcal mol⁻¹						
1,2,4-cyclo-C₆H₃(CH₃)₃⁺ 187 kcal mol⁻¹						
1,3,5-cyclo-C₆H₃(CH₃)₃⁺ 190 kcal mol⁻¹						
C ₉ H ₁₂ ⁺	C ₆ H ₅ C ₃ H ₇		8.72 ± 0.01	PI	203*	182, 416
(n-Propylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₅ C ₃ H ₇		8.69 ± 0.01	PI	201*	182, 416
(Isopropylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.48	PI	193*	168
(1,2,3-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.67 ± 0.05	SL	198	2163
(1,2,3-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.49	TC	193	136
(1,2,3-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.27	PI	187*	168
(1,2,4-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.55 ± 0.05	SL	194	2163
(1,2,4-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.40 ± 0.01	PI	190*	182
(1,3,5-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.39 ± 0.02	PI	190*	416
(1,3,5-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.41 ± 0.02	PI	190* 1142, 1159, 1166	
(1,3,5-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.39	PI	190*	168
(1,3,5-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		9.71 ± 0.2	PE	•	1159
(1,3,5-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.64 ± 0.05	SL	195	2163
(1,3,5-Trimethylbenzene)						
C ₉ H ₁₂ ⁺	C ₆ H ₃ (CH ₃) ₃		8.74	SL	198	1066
(1,3,5-Trimethylbenzene)						

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₉H₁₄⁺						
C ₉ H ₁₄ ⁺	C ₉ H ₁₄ (1,2,3,4-Tetramethylcyclopentadiene)		7.8 ± 0.1	SL	181*	2163
C ₉ H ₁₄ ⁺	C ₉ H ₁₄ (1,4,5,5-Tetramethylcyclopentadiene)		7.84 ± 0.05	SL	182*	2163
C₉H₁₆⁺						
C ₉ H ₁₆ ⁺	C ₉ H ₁₆ (<i>cis</i> -Hexahydroindane)		10.13 ± 0.03	EVD	200* 1184, 2028	
C ₉ H ₁₆ ⁺	C ₉ H ₁₆ (<i>trans</i> -Hexahydroindane)		10.18 ± 0.03	EVD	201* 1184, 2028	
C₉H₂₀⁺						
C ₉ H ₂₀ ⁺	<i>n</i> -C ₉ H ₂₀		10.02	TC	176	1439
C ₉ H ₂₀ ⁺	<i>n</i> -C ₉ H ₂₀		10.22	TC	181	1006
C ₉ H ₂₀ ⁺	<i>n</i> -C ₉ H ₂₀		10.23	TC	181	1352, 2020
C ₉ H ₂₀ ⁺	<i>n</i> -C ₉ H ₂₀		10.26	TC	182	2038
C ₉ H ₂₀ ⁺	<i>n</i> -C ₉ H ₂₀		10.27	TC	182	2038
C ₉ H ₂₀ ⁺	<i>n</i> -C ₉ H ₂₀		10.36	TC	184	136
C₁₀H₆⁺ Heat of formation 409 kcal mol⁻¹						
C ₁₀ H ₆ ⁺	C ₁₀ H ₈ (Naphthalene)	H ₂	16.2 ± 0.15	SL	407*	2112
C ₁₀ H ₆ ⁺	C ₁₀ H ₈ (Azulene)	H ₂	14.7 ± 0.10	SL	411*	2112
C ₁₀ H ₆ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	2C ₂ H ₂	18.23 ± 0.1	SL	411	1238
C ₁₀ H ₆ ⁺	H ₁₄ H ₁₀ (Phenanthrene)	2C ₂ H ₂	20.9 ± 0.3	SL	421	1238
C₁₀H₇⁺ Heat of formation 339 kcal mol⁻¹						
C ₁₀ H ₇ ⁺	C ₁₀ H ₈ (Naphthalene)	H	15.4 ± 0.10	SL	336*	2112
C ₁₀ H ₇ ⁺	C ₁₀ H ₈ (Azulene)	H	14.0 ± 0.10	SL	343*	2112
C₁₀H₈⁺ (Naphthalene) Heat of formation 220 kcal mol⁻¹						
C₁₀H₈⁺ (Azulene) 243 kcal mol⁻¹						
C ₁₀ H ₈ ⁺	C ₁₀ H ₈ (Naphthalene)		8.12 ± 0.01	PI	220*	182, 416
C ₁₀ H ₈ ⁺	C ₁₀ H ₈ (Naphthalene)		8.14 ± 0.02	PI	221*	1166
C ₁₀ H ₈ ⁺	C ₁₀ H ₈ (Naphthalene)		8.26 ± 0.05	SL	223	2112, 413
C ₁₀ H ₈ ⁺	C ₁₀ H ₈ (Naphthalene)		8.15	TC	221	1064
C ₁₀ H ₈ ⁺	C ₁₀ H ₈ (Naphthalene)		8.63	TC	232	136

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
$C_{10}H_8^+$ (Azulene)	$C_{10}H_8$		7.431 ± 0.006	S	244*	1420
$C_{10}H_8^+$ (Azulene)	$C_{10}H_8$		7.412	S	243*	1459
$C_{10}H_8^+$ (Azulene)	$C_{10}H_8$		7.72 ± 0.05	SL	251	2112
$C_{10}H_8^+$ (Azulene)	$C_{10}H_8$		7.4	CTS	243	2037
$C_{10}H_8^+$ (Azulene)	$C_{10}H_8$		7.5	CTS	245	2037
$C_{10}H_8^+$ (Azulene)	$C_{10}H_8$		7.43	TC	244	1315
$C_{10}H_8^+$ (Azulene)	$C_{10}H_8$		8.32	TC	264	136
$C_{10}H_8^+$ (Biphenyl)	$(C_6H_5)_2$	C_2H_2	14.81 ± 0.05	SL	327	1238
$C_{10}H_8^{+2}$ (Naphthalene) Heat of formation 557 kcal mol⁻¹						
$C_{10}H_8^{+2}$ (Naphthalene)	$C_{10}H_8$		22.8 ± 0.2	FDP	559*	212
$C_{10}H_8^{+2}$ (Naphthalene)	$C_{10}H_8$		22.7	NS	556*	413
$C_{10}H_8^{+3}$						
$C_{10}H_8^{+3}$ (Naphthalene)	$C_{10}H_8$		40 ± 5	NRE	955	212
$C_{10}H_{13}^+$						
$C_{10}H_{13}^+$ (<i>p</i> -Isopropylbenzyl radical)	$C_6H_4C_3H_7CH_2$		7.42 ± 0.1	SL	188*	69
$C_{10}H_{13}^+$ (1-Phenyldodecane)	$C_{18}H_{30}$		11.07 ± 0.1	EVD		2153
$C_{10}H_{13}^+$ (1-Phenyleicosane)	$C_{26}H_{46}$		10.86 ± 0.1	EVD		2153
$C_{10}H_{13}^+$ (4-Phenyleicosane)	$C_{26}H_{46}$		10.58 ± 0.1	EVD		2153

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
		cyclo-C₆H₅(n-C₄H₉)⁺	Heat of formation	197 kcal mol⁻¹		
		cyclo-C₆H₅(sec-C₄H₉)⁺			196 kcal mol⁻¹	
		cyclo-C₆H₅(tert-C₄H₉)⁺			193 kcal mol⁻¹	
		1,2,3,5-cyclo-C₆H₂(CH₃)₄⁺			185 kcal mol⁻¹	
		1,2,4,5-cyclo-C₆H₂(CH₃)₄⁺			174 kcal mol⁻¹	
C ₁₀ H ₁₄ ⁺	C ₆ H ₅ C ₄ H ₉ (n-Butylbenzene)		8.69 ± 0.01	PI	197*	182, 416
C ₁₀ H ₁₄ ⁺	C ₆ H ₅ C ₄ H ₉ (sec-Butylbenzene)		8.68 ± 0.1	PI	196*	182
C ₁₀ H ₁₄ ⁺	C ₆ H ₅ C ₄ H ₉ (tert-Butylbenzene)		8.68 ± 0.01	PI	193*	182
C ₁₀ H ₁₄ ⁺	C ₆ H ₂ (CH ₃) ₄ (1,2,3,5-Tetramethylbenzene)		8.47 ± 0.05	SL	185*	2163
C ₁₀ H ₁₄ ⁺	C ₆ H ₂ (CH ₃) ₄ (1,2,4,5-Tetramethylbenzene)		8.025 ± 0.005	PI	174*	182
C ₁₀ H ₁₄ ⁺	C ₆ H ₂ (CH ₃) ₄ (1,2,4,5-Tetramethylbenzene)		8.05 ± 0.02	PI	175*	1142, 1159, 1166
C ₁₀ H ₁₄ ⁺	C ₆ H ₂ (CH ₃) ₄ (1,2,4,5-Tetramethylbenzene)		8.03	PI	174*	168
C ₁₀ H ₁₄ ⁺	C ₆ H ₂ (CH ₃) ₄ (1,2,4,5-Tetramethylbenzene)		9.35 ± 0.2	PE		1159
C ₁₀ H ₁₄ ⁺	C ₆ H ₂ (CH ₃) ₄ (1,2,4,5-Tetramethylbenzene)		8.50 ± 0.05	SL	185	2163
C₁₀H₁₆⁺						
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (1,2,3,5,5 and 1,2,4,5,5-Pentamethylcyclopentadiene mixture)		7.77 ± 0.05	SL	173	2163
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (α -Pinene)		8.07	PE		1130
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (α -Pinene)		9.25	PE		1130
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (α -Pinene)		11.43	PE		1130
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (α -Pinene)		13.12	PE		1130
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (α -Pinene)		14.53	PE		1130
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (α -Pinene)		15.74?	PE		1130
C ₁₀ H ₁₆ ⁺	C ₁₀ H ₁₆ (α -Pinene)		18.57?	PE		1130
C₁₀H₁₈⁺						
C ₁₀ H ₁₈ ⁺	C ₁₀ H ₁₈ (<i>cis</i> -Decaline)		9.61 ± 0.02	EVD	181* 1182, 1183	
C ₁₀ H ₁₈ ⁺	C ₁₀ H ₁₈ (<i>trans</i> -Decaline)		9.61 ± 0.02	EVD	178* 1182, 1183	

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₀H₂₂⁺						
C ₁₀ H ₂₂ ⁺	n-C ₁₀ H ₂₂		9.95	TC	170	1439
C ₁₀ H ₂₂ ⁺	n-C ₁₀ H ₂₂		10.19	TC	175	473
C ₁₀ H ₂₂ ⁺	n-C ₁₀ H ₂₂		10.19	TC	175	1006
C ₁₀ H ₂₂ ⁺	n-C ₁₀ H ₂₂		10.20	TC	176	1352, 2020
C ₁₀ H ₂₂ ⁺	n-C ₁₀ H ₂₂		10.24	TC	176	2038
C ₁₀ H ₂₂ ⁺	n-C ₁₀ H ₂₂		10.25	TC	177	2038
C ₁₀ H ₂₂ ⁺	n-C ₁₀ H ₂₂		10.33	TC	179	0136
C₁₁H₇⁺						
C ₁₁ H ₇ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	CH ₂ C≡CH?	17.52 ± 0.1	SL	428	1238
C ₁₁ H ₇ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	CH ₂ C≡CH?	21.1 ± 0.3	SL	459	1238
C₁₁H₉⁺						
C ₁₁ H ₉ ⁺	C ₁₀ H ₇ CH ₂ (1-Naphthylmethyl radical)		7.35 ± 0.1	SL		71
C ₁₁ H ₉ ⁺	C ₁₀ H ₇ CH ₂ (2-Naphthylmethyl radical)		7.56 ± 0.05	SL		69, 71
C ₁₁ H ₉ ⁺	(C ₆ H ₅) ₂ O (Phenyl ether)	CO + H	14.02 ± 0.05	SL	315	1237
C ₁₁ H ₉ ⁺	(C ₆ H ₅) ₂ CO ₃ (Diphenyl carbonate)		13.90 ± 0.05	SL		1237
C₁₁H₁₀⁺ (Methylnaphthalene) Heat of formation 209 kcal mol⁻¹						
C ₁₁ H ₁₀ ⁺	C ₁₁ H ₁₀ (1-Methylnaphthalene)		7.96 ± 0.01	PI	209*	182, 416
C ₁₁ H ₁₀ ⁺	C ₁₁ H ₁₀ (1-Methylnaphthalene)		8.41	TC	219	136
C ₁₁ H ₁₀ ⁺	C ₁₁ H ₁₀ (2-Methylnaphthalene)		7.955 ± 0.01	PI	209*	182
C ₁₁ H ₁₀ ⁺	C ₁₁ H ₁₀ (2-Methylnaphthalene)		8.48	TC	221	136
C ₁₁ H ₁₀ ⁺	(C ₆ H ₅) ₂ O (Phenyl ether)	CO	12.56 ± 0.08	SL	333	1237
C ₁₁ H ₁₀ ⁺	(C ₆ H ₅) ₂ CO ₃ (Diphenyl carbonate)	CO + CO ₂	12.41 ± 0.1	SL	321	1237
C₁₁H₁₅⁺						
C ₁₁ H ₁₅ ⁺	C ₂₆ H ₄₆ (5-Phenyleicosane)		10.43 ± 0.1	EVD		2153
cyclo-C₆H(CH₃)₅⁺ Heat of formation 155 kcal mol⁻¹						
C ₁₁ H ₁₆ ⁺	C ₆ H(CH ₃) ₅ (Pentamethylbenzene)		7.92 ± 0.02	PI	155*	1142, 1166
C ₁₁ H ₁₆ ⁺	C ₆ H(CH ₃) ₅ (Pentamethylbenzene)		7.92	PI	155*	168
C ₁₁ H ₁₆ ⁺	C ₆ H(CH ₃) ₅ (Pentamethylbenzene)		8.30 ± 0.05	SL	164	2163

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₁H₁₈⁺						
C ₁₁ H ₁₈ ⁺	C ₁₁ H ₁₈ (Hexamethylcyclopentadiene)		7.74 ± 0.05	SL	165*	2163
C₁₁H₂₄⁺						
C ₁₁ H ₂₄ ⁺	n-C ₁₁ H ₂₄		9.93	TC	164	1439
C₁₂H₇⁺						
C ₁₂ H ₇ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	C ₂ H ₂ + H	17.46 ± 0.06	SL	395	1238
C ₁₂ H ₇ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	C ₂ H ₂ + H	19.63 ± 0.05	SL	394	1238
C₁₂H₈⁺						
C ₁₂ H ₈ ⁺	C ₁₂ H ₈ (Biphenylene)		8.15	TC	348	
C ₁₂ H ₈ ⁺	C ₁₂ H ₈ (Acenaphthylene)		8.73	TC	136	
C ₁₂ H ₈ ⁺	(C ₆ H ₅) ₂ (Biphenyl)	H ₂	16.89 ± 0.08	SL	429	1238
C ₁₂ H ₈ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	C ₂ H ₂	15.58 ± 0.05	SL	404	1238
C ₁₂ H ₈ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	C ₂ H ₂	16.63 ± 0.05	SL	377	1238
C ₁₂ H ₈ ⁺	(C ₆ H ₅) ₂ CO (Benzophenone)	CO + H ₂ ?	17.48 ± 0.12	SL	442	1237
C₁₂H₈⁺²						
C ₁₂ H ₈ ⁺²	(C ₆ H ₅) ₂ (Biphenyl)	H ₂	22.0 ± 1.0	NS	547	1238
C ₁₂ H ₈ ⁺²	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	C ₂ H ₂	20.5 ± 0.1	NS	518	1238
C₁₂H₉⁺						
C ₁₂ H ₉ ⁺	(C ₆ H ₅) ₂ (Biphenyl)	H	14.36 ± 0.05	SL	319	1238
C ₁₂ H ₉ ⁺	(C ₆ H ₅) ₂ CO (Benzophenone)	CO + H?	15.28 ± 0.05	SL	339	1237
C₁₂H₁₀⁺ (Biphenyl) Heat of formation 230 kcal mol⁻¹						
C ₁₂ H ₁₀ ⁺	(C ₆ H ₅) ₂ (Biphenyl)		8.27 ± 0.01	PI	230*	182
C ₁₂ H ₁₀ ⁺	(C ₆ H ₅) ₂ (Biphenyl)		8.96 ± 0.05	SL	246	1238
C ₁₂ H ₁₀ ⁺	(C ₆ H ₅) ₂ (Biphenyl)		8.53	TC	236	348
C ₁₂ H ₁₀ ⁺	(C ₆ H ₅) ₂ (Biphenyl)		8.79	TC	242	136
C ₁₂ H ₁₀ ⁺	(C ₆ H ₅) ₂ CO (Benzophenone)	CO	12.24 ± 0.13	SL	321	1237

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₂H₁₀⁺2						
C ₁₂ H ₁₀ ⁺ ₂ (Biphenyl)	(C ₆ H ₅) ₂		21.9 ± 0.3	NS	545	1238
cyclo-C₆(CH₃)₆⁺ Heat of formation 152 kcal mol⁻¹						
C ₁₂ H ₁₈ ⁺ (Hexamethylbenzene)	C ₆ (CH ₃) ₆		7.85 ± 0.02	PI	152*	1142
C ₁₂ H ₁₈ ⁺ (Hexamethylbenzene)	C ₆ (CH ₃) ₆		7.85	PI	152*	168
C₁₂H₂₆⁺						
C ₁₂ H ₂₆ ⁺	n-C ₁₂ H ₂₆		9.93	TC	159	1439
C₁₃H₉⁺						
C ₁₃ H ₉ ⁺ (Fluorenyl radical)	C ₁₃ H ₉		7.07	SL		126
C ₁₃ H ₉ ⁺ (Perinaphthalenyl radical)	C ₁₃ H ₉		7.31	TC		136
C₁₃H₁₀⁺						
C ₁₃ H ₁₀ ⁺ (Fluorene)	C ₁₃ H ₁₀		8.63	SL	243*	126
C ₁₃ H ₁₀ ⁺ (Fluorene)	C ₁₃ H ₁₀		8.56	TC	241	136
C₁₃H₁₁⁺						
C ₁₃ H ₁₁ ⁺ (Diphenylmethyl radical)	(C ₆ H ₅) ₂ CH		7.32 ± 0.1	SL	217*	71
C ₁₃ H ₁₁ ⁺ (Diphenylmethyl radical)	(C ₆ H ₅) ₂ CH		7.42	TC	219	136
C₁₃H₁₉⁺						
C ₁₃ H ₁₉ ⁺ (7-Phenyltridecane)	C ₁₉ H ₃₂	n-C ₆ H ₁₃	10.15 ± 0.1	EVD	181	2153
C ₁₃ H ₁₉ ⁺ (7-Phenyleicosane)	C ₂₆ H ₄₆		10.28 ± 0.1	EVD		2153
C₁₃H₂₈⁺						
C ₁₃ H ₂₈ ⁺	n-C ₁₃ H ₂₈		9.92	TC	154	1439
C₁₄H₈⁺						
C ₁₄ H ₈ ⁺ (Diphenylacetylene)	(C ₆ H ₅) ₂ C ₂	H ₂	16.66 ± 0.05	SL	483	1238
C ₁₄ H ₈ ⁺ (Phenanthrene)	C ₁₄ H ₁₀	H ₂	18.58 ± 0.1	SL	476	1238

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₄H₉⁺						
C ₁₄ H ₉ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	H	15.13 ± 0.1	SL	396	1238
C ₁₄ H ₉ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	H	16.25 ± 0.1	SL	370	1238
C₁₄H₁₀⁺ (Diphenylacetylene) Heat of formation 303 kcal mol⁻¹						
C₁₄H₁₀⁺ (Anthracene) 228 kcal mol⁻¹						
C₁₄H₁₀⁺ (Phenanthrene) 233 kcal mol⁻¹						
C ₁₄ H ₁₀ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	8.85 ± 0.05	SL	303*	1238	
C ₁₄ H ₁₀ ⁺	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	8.55	TC	296	136	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Anthracene)	7.55	SL	228*	413	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Anthracene)	7.2	CTS	220	2037	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Anthracene)	7.25	TC	221	348	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Anthracene)	7.42	TC	225	1064	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Anthracene)	8.11	TC	241	136	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	8.10 ± 0.04	SL	234*	1238	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	8.03	SL	233*	413	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	7.94	TC	231	348	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	8.07	TC	234	1064	
C ₁₄ H ₁₀ ⁺	C ₁₄ H ₁₀ (Phenanthrene)	8.50	TC	244	136	
C₁₄H₁₀⁺²						
C ₁₄ H ₁₀ ⁺²	(C ₆ H ₅) ₂ C ₂ (Diphenylacetylene)	23.35 ± 0.1	NS	637	1238	
C ₁₄ H ₁₀ ⁺²	C ₁₄ H ₁₀ (Anthracene)	21.1	NS	540	413	
C ₁₄ H ₁₀ ⁺²	C ₁₄ H ₁₀ (Phenanthrene)	23.1	NS	580	413	
C₁₄H₃₀⁺						
C ₁₄ H ₃₀ ⁺	n·C ₁₄ H ₃₀	9.92	TC	149	1439	
C₁₅H₂₃⁺						
C ₁₅ H ₂₃ ⁺	C ₂₆ H ₄₆ (9-Phenyleicosane)	10.30 ± 0.1	EVD		2153	
C₁₅H₃₂⁺						
C ₁₅ H ₃₂ ⁺	n·C ₁₅ H ₃₂	9.91	TC	144	1439	

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₆H₁₀⁺						
C ₁₆ H ₁₀ ⁺ (Fluoranthene)	C ₁₆ H ₁₀		8.54	TC		136
C ₁₆ H ₁₀ ⁺ (Pyrene)	C ₁₆ H ₁₀		7.72	SL		1069
C ₁₆ H ₁₀ ⁺ (Pyrene)	C ₁₆ H ₁₀		7.31	CTS		2037
C ₁₆ H ₁₀ ⁺ (Pyrene)	C ₁₆ H ₁₀		8.35	CTS		2037
C ₁₆ H ₁₀ ⁺ (Pyrene)	C ₁₆ H ₁₀		7.06	TC		348
C ₁₆ H ₁₀ ⁺ (Pyrene)	C ₁₆ H ₁₀		7.70	TC		1064
C ₁₆ H ₁₀ ⁺ (Pyrene)	C ₁₆ H ₁₀		8.13	TC		136
C₁₆H₂₅⁺						
C ₁₆ H ₂₅ ⁺ (3-Phenylododecane)	C ₁₈ H ₃₀	C ₂ H ₅ ?	9.26 ± 0.1	EVD	145	2153
C₁₆H₃₄⁺						
C ₁₆ H ₃₄ ⁺	n-C ₁₆ H ₃₄		9.91	TC	139	1439
C₁₇H₃₆⁺						
C ₁₇ H ₃₆ ⁺	n-C ₁₇ H ₃₆		9.89	TC	134	1439
C₁₈H₁₂⁺ (1,2-Benzophenanthrene) Heat of formation 251 kcal mol⁻¹						
C ₁₈ H ₁₂ ⁺ (1,2-Benzanthracene)	C ₁₈ H ₁₂		7.53	SL		1069
C ₁₈ H ₁₂ ⁺ (1,2-Benzanthracene)	C ₁₈ H ₁₂		7.11	TC		348
C ₁₈ H ₁₂ ⁺ (1,2-Benzanthracene)	C ₁₈ H ₁₂		7.52	TC		1064
C ₁₈ H ₁₂ ⁺ (2,3-Benzanthracene)	C ₁₈ H ₁₂		6.95	SL		1069
C ₁₈ H ₁₂ ⁺ (2,3-Benzanthracene)	C ₁₈ H ₁₂		6.92	TC		348
C ₁₈ H ₁₂ ⁺ (2,3-Benzanthracene)	C ₁₈ H ₁₂		6.94	TC		1064
C ₁₈ H ₁₂ ⁺ (2,3-Benzanthracene)	C ₁₈ H ₁₂		7.81	TC		136
C ₁₈ H ₁₂ ⁺ (1,2-Benzophenanthrene)	C ₁₈ H ₁₂		8.01	SL	251*	1069
C ₁₈ H ₁₂ ⁺ (1,2-Benzophenanthrene)	C ₁₈ H ₁₂		7.70	TC	244	348
C ₁₈ H ₁₂ ⁺ (1,2-Benzophenanthrene)	C ₁₈ H ₁₂		7.82	TC	247	1064
C ₁₈ H ₁₂ ⁺ (3,4-Benzophenanthrene)	C ₁₈ H ₁₂		7.88	TC		348
C ₁₈ H ₁₂ ⁺ (3,4-Benzophenanthrene)	C ₁₈ H ₁₂		8.36	TC		136
C ₁₈ H ₁₂ ⁺ (9,10-Benzophenanthrene)	C ₁₈ H ₁₂		8.19	SL		1069
C ₁₈ H ₁₂ ⁺ (9,10-Benzophenanthrene)	C ₁₈ H ₁₂		8.02	TC		348

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₈H₁₄⁺						
C ₁₈ H ₁₄ ⁺ (<i>o</i> -Diphenylbenzene)	C ₁₈ H ₁₄		8.09	TC		348
C ₁₈ H ₁₄ ⁺ (<i>m</i> -Diphenylbenzene)	C ₁₈ H ₁₄		8.25	TC		348
C₁₈H₂₉⁺						
C ₁₈ H ₂₉ ⁺ (9-Phenyleicosane)	C ₂₆ H ₄₆		10.12 ± 0.1	EVD		2153
C₁₈H₃₀⁺						
C ₁₈ H ₃₀ ⁺ (1-Phenyldodecane)	C ₁₈ H ₃₀		9.05 ± 0.1	EVD	165*	2153
C ₁₈ H ₃₀ ⁺ (3-Phenyldodecane)	C ₁₈ H ₃₀		8.95 ± 0.1	EVD	163*	2153
C₁₉H₁₅⁺						
C ₁₉ H ₁₅ ⁺ (C ₆ H ₅) ₃ C (Triphenylmethyl radical)			7.26	TC		136
C₁₉H₃₂⁺						
C ₁₉ H ₃₂ ⁺ (7-Phenyltridecane)	C ₁₉ H ₃₂		8.91 ± 0.1	EVD	157*	2153
C₂₀H₁₂⁺						
C ₂₀ H ₁₂ ⁺ (Perylene)	C ₂₀ H ₁₂		6.85	CTS		2037
C ₂₀ H ₁₂ ⁺ (Perylene)	C ₂₀ H ₁₂		6.94	TC		348
C ₂₀ H ₁₂ ⁺ (Perylene)	C ₂₀ H ₁₂		7.10	TC		1064
C₂₀H₃₃⁺						
C ₂₀ H ₃₃ ⁺ (7-Phenyleicosane)	C ₂₆ H ₄₆		9.94 ± 0.1	EVD		2153
C₂₁H₁₅⁺						
C ₂₁ H ₁₅ ⁺ (C ₆ H ₅) ₃ C ₃ (1,2,3-Triphenylcyclopropenyl radical)			6.38	TC		136
C₂₂H₁₂⁺						
C ₂₂ H ₁₂ ⁺ (Anthanthrene)	C ₂₂ H ₁₂		7.10	TC		1064
C ₂₂ H ₁₂ ⁺ (1,12-Benzoperylene)	C ₂₂ H ₁₂		7.24	TC		348

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂₂H₁₄⁺						
C ₂₂ H ₁₄ ⁺ (Pentacene)	C ₂₂ H ₁₄		6.61	TC		1064
C ₂₂ H ₁₄ ⁺ (Pentacene)	C ₂₂ H ₁₄		6.73	TC		348
C ₂₂ H ₁₄ ⁺ (1,2,3,4-Dibenzanthracene)	C ₂₂ H ₁₄		8.18	TC		348
C ₂₂ H ₁₄ ⁺ (1,2,5,6-Dibenzanthracene)	C ₂₂ H ₁₄		7.09	TC		348
C ₂₂ H ₁₄ ⁺ (1,2,5,6-Dibenzanthracene)	C ₂₂ H ₁₄		7.57	TC		1064
C ₂₂ H ₁₄ ⁺ (1,2,7,8-Dibenzanthracene)	C ₂₂ H ₁₄		6.99	TC		348
C ₂₂ H ₁₄ ⁺ (Pentaphene)	C ₂₂ H ₁₄		7.11	TC		348
C ₂₂ H ₁₄ ⁺ (Picene)	C ₂₂ H ₁₄		7.51	TC		348
C₂₂H₃₇⁺						
C ₂₂ H ₃₇ ⁺ (5-Phenyleicosane)	C ₂₆ H ₄₆	n-C ₄ H ₉	9.99 ± 0.1	EVD	129	2153
C₂₃H₃₉⁺						
C ₂₃ H ₃₉ ⁺ (4-Phenyleicosane)	C ₂₆ H ₄₆	n-C ₃ H ₇	9.76 ± 0.1	EVD	120	2153
C₂₄H₁₂⁺						
C ₂₄ H ₁₂ ⁺ (Coronene)	C ₂₄ H ₁₂		7.56	TC		348
C ₂₄ H ₁₂ ⁺ (Coronene)	C ₂₄ H ₁₂		7.64	TC		1064
C₂₄H₄₁⁺						
C ₂₄ H ₄₁ ⁺ (3-Phenyleicosane)	C ₂₆ H ₄₆	C ₂ H ₅	9.68 ± 0.1	EVD	115	2153
C₂₅H₄₃⁺						
C ₂₅ H ₄₃ ⁺ (2-Phenyleicosane)	C ₂₆ H ₄₆	CH ₃	10.14 ± 0.1	EVD	117	2153

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂₆H₄₆⁺						
C ₂₆ H ₄₆ ⁺ (1-Phenyleicosane)	C ₂₆ H ₄₆		9.34 ± 0.1	EVD	134*	2153
C ₂₆ H ₄₆ ⁺ (2-Phenyleicosane)	C ₂₆ H ₄₆		9.22 ± 0.1	EVD	129*	2153
C ₂₆ H ₄₆ ⁺ (3-Phenyleicosane)	C ₂₆ H ₄₆		8.95 ± 0.1	EVD	123*	2153
C ₂₆ H ₄₆ ⁺ (4-Phenyleicosane)	C ₂₆ H ₄₆		9.01 ± 0.1	EVD	125*	2153
C ₂₆ H ₄₆ ⁺ (5-Phenyleicosane)	C ₂₆ H ₄₆		9.04 ± 0.1	EVD	125*	2153
C ₂₆ H ₄₆ ⁺ (7-Phenyleicosane)	C ₂₆ H ₄₆		8.97 ± 0.1	EVD	124*	2153
C ₂₆ H ₄₆ ⁺ (9-Phenyleicosane)	C ₂₆ H ₄₆		9.06 ± 0.1	EVD	126*	2153
C₂₈H₁₄⁺						
C ₂₈ H ₁₄ ⁺ (Mesonaphthodianthrene)	C ₂₈ H ₁₄		6.42	TC		1064
C₃₀H₁₆⁺						
C ₃₀ H ₁₆ ⁺ (Pyranthrene)	C ₃₀ H ₁₆		6.98	TC		1064
C₃₂H₁₄⁺						
C ₃₂ H ₁₄ ⁺ (Ovalene)	C ₃₂ H ₁₄		7.01	TC		1064
C₃₄H₂₀⁺						
C ₃₄ H ₂₀ ⁺ (Violanthrene)	C ₃₄ H ₂₀		6.86	TC		1064
C ₃₄ H ₂₀ ⁺ (Isoviolanthrene)	C ₃₄ H ₂₀		6.76	TC		1064

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CB⁺						
CB ⁺	CB		10.0 ± 0.6	LE	430	2176
CB ⁺	CB		10.5	NS	441	1116
CB₂⁺						
CB ₂ ⁺	CB ₂		10.2 ± 0.6	LE	418	2176
CB ₂ ⁺	CB ₂		10.7	NS	430	1116
C₂B⁺						
C ₂ B ⁺	C ₂ B		10.4 ± 0.6	LE	423	2176
C ₂ B ⁺	C ₂ B		10.7	NS	430	1116
C₂H₅Li₂⁺						
C ₂ H ₅ Li ₂ ⁺	(C ₂ H ₅ Li) ₄		11.7 ± 0.5	NS		1
C₄H₁₀Li₃⁺						
C ₄ H ₁₀ Li ₃ ⁺	(C ₂ H ₅ Li) ₄		11.7 ± 0.5	NS		1
C₆H₁₅Li₄⁺						
C ₆ H ₁₅ Li ₄ ⁺	(C ₂ H ₅ Li) ₄	C ₂ H ₅	8.0 ± 0.5	NS		1
C₈H₂₀Li₅⁺						
C ₈ H ₂₀ Li ₅ ⁺	(C ₂ H ₅ Li) ₆		12.5 ± 0.5	NS		1
C₁₀H₂₅Li₆⁺						
C ₁₀ H ₂₅ Li ₆ ⁺	(C ₂ H ₅ Li) ₆	C ₂ H ₅	7.7 ± 0.5	NS		1
CH₃B⁺						
CH ₃ B ⁺	(CH ₃) ₃ B	2CH ₃ ?	17.0 ± 0.5	SL	296	364
C₂H₆B⁺						
C ₂ H ₆ B ⁺	(CH ₃) ₃ B	CH ₃	10.3 ± 0.2	SL	175	364
C₃H₉B⁺						
C ₃ H ₉ B ⁺	(CH ₃) ₃ B		8.8 ± 0.2	SL	173*	364
C₄H₁₀B⁺						
C ₄ H ₁₀ B ⁺	(C ₂ H ₅) ₃ B	C ₂ H ₅	9.6 ± 0.2	SL	159	364
C₆H₁₅B⁺						
C ₆ H ₁₅ B ⁺	(C ₂ H ₅) ₃ B		9.0 ± 0.2	SL	170*	364
C₂H₁₈B₁₀⁺						
C ₂ H ₁₈ B ₁₀ ⁺	C ₂ H ₅ B ₁₀ H ₁₃		9.0 ± 0.5	SL		103

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
N⁺ Heat of formation 448 kcal mol⁻¹						
N ⁺	N		14.549	S	448*	2113
N ⁺	N		14.53 ± 0.12	SL	448	78
N ⁺	N		15	SL	459	154
N ⁺	N		14.8	CS	454	2
N ⁺	N		14.72 ± 0.26	LE	452	1133
N ⁺	N		16.1 ± 0.3	LE		1133
N ⁺	N ₂	N	24.3 ± 0.2	PI	447	163
N ⁺	N ₂	N	24.32 ± 0.02	RPD	448	49
N ⁺	N ₂	N(² D)	26.66 ± 0.05	RPD	447	49
N ⁺	N ₂	N(² P)	27.93 ± 0.05	RPD	449	49
N ⁺	N ₂	N	24.60 ± 0.1	SL	454	364
N ⁺	N ₂	N	23.5	SL	429	78
N ⁺	N ₂	N	23.8 ± 0.5	LE	436	2021
N ⁺	N ₂	N(² D)	25.6 ± 0.5	LE	422	2021
N ⁺	N ₂	N(² P)	28.3 ± 0.2	LE	457	2021
N ⁺	NH ₃	H ₂ + H	22.6 ± 0.1	NS	458	132
N ⁺	NH ₃	3H	26.65 ± 0.1	NS	447	132
N ^{+(1D)}	NH ₃	H ₂ + H	24.1 ± 0.1	NS	493	132
N ^{+(1D)}	NH ₃	3H	28.6 ± 0.1	NS	492	132
N ⁺	HN ₃	N ₂ + H?	19.7 ± 0.3	SL	473	340
N ⁺	CNC≡CCN	C ₃ + CN?	26.0 ± 1.0	SL	438	154
N ⁺	CNC≡CC≡CCN		19	SL		154
N ⁺	CNC≡CC≡CCN		26.8 ± 0.3	SL		154
N ⁺	NO	O ⁻	19.55 ± 0.04	RPD	448	328
N ⁺	NO	O ⁻	19.8 ± 0.2	FDP	454	1378
N ⁺	NO	O ⁻	19.573 ± 0.02	D	449	6
N ⁺	NO	O	21.8 ± 0.4	PI	465	163
N ⁺	NO	O	21.11 ± 0.04	RPD	449	328
N ⁺	NO	O	23.03 ± 0.04	RPD		328
N ⁺	NO	O	21.2 ± 0.5	LE	451	2021
N ⁺	NO	O	23.2 ± 0.5	LE		2021
N ⁺	NO		26.1 ± 0.5	LE		2021
N ⁺	NO	O ⁺	34.1 ± 0.7	LE	434	2021
N ⁺	N ₂ O	NO	20.0 ± 0.3	PI	459	163
N ⁺	N ₂ O	NO	20.1	RPD	462	2018
N ⁺	N ₂ O	NO	20.8	RPD		2018
N ⁺	N ₂ O	NO	21.8	RPD		2018
N ⁺	N ₂ O	NO	23.3	RPD		2018
N ⁺	NF ₃	F ₂ + F	22.2 ± 0.2	SL	463	401

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
					359 kcal mol⁻¹	
					385 kcal mol⁻¹	
					432 kcal mol⁻¹	
					544 kcal mol⁻¹	
N ₂ ⁺ (X 2Σ _g ⁺)	N ₂		15.576	S	359*	2100
N ₂ ⁺ (X 2Σ _g ⁺)	N ₂		15.56	PI	359	2033
N ₂ ⁺ (X 2Σ _g ⁺)	N ₂		15.6 ± 0.1	PI	360	163
N ₂ ⁺ (X 2Σ _g ⁺)	N ₂		15.57	PE	359	248
N ₂ ⁺ (X 2Σ _g ⁺)	N ₂		15.63 ± 0.02	RPD	360	1012
N ₂ ⁺ (X 2Σ _g ⁺)	N ₂		15.56 ± 0.10	CS	359	383
N ₂ ⁺	N ₂		15.7	EC	362	218
N ₂ ⁺	N ₂		16.2 ± 0.1	RPD		1012
(Autoionization)						
N ₂ ⁺ (A 2Π _u)	N ₂		16.693	S	385*	2100
N ₂ ⁺ (A 2Π _u)	N ₂		16.9 ± 0.3	PI	390	163
N ₂ ⁺ (A 2Π _u)	N ₂		16.72	PE	386	248
N ₂ ⁺ (A 2Π _u)	N ₂		17.00 ± 0.05	RPD	392	1012
N ₂ ⁺ (B 2Σ _u ⁺)	N ₂		18.745	S	432*	2100
N ₂ ⁺ (B 2Σ _u ⁺)	N ₂		18.8 ± 0.4	PI	434	163
N ₂ ⁺ (B 2Σ _u ⁺)	N ₂		18.72	PE	432	248
N ₂ ⁺ (B 2Σ _u ⁺)	N ₂		18.94 ± 0.06	RPD	437	1012
N ₂ ⁺	N ₂		20.7 ± 0.4	PI		163
N ₂ ⁺ (C 2Σ _u ⁺)	N ₂		23.575	S	544*	2100
N ₂ ⁺ (A 2Π _u)	N ₂ H ₄	2H ₂	16.2 ± 0.1	SL	396	424
N ₂ ⁺	HN ₃	NH	16.0 ± 0.1	SL	(b)	340
N ₂ ⁺	CH ₃ N ₂ H ₃	CH ₄ + H ₂	13.2 ± 0.3	SL	345	424
N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂	2CH ₄	13.2 ± 0.1	SL	360	424
(1,1-Dimethylhydrazine)						
N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂	2CH ₄	12.5 ± 0.2	SL	346	424
(1,2-Dimethylhydrazine)						
N ₂ ⁺	(CH ₃) ₃ N ₂ H	CH ₄ + C ₂ H ₆	13.2 ± 0.2	SL	362	424
N ₂ ⁺	(CH ₃) ₄ N ₂	2C ₂ H ₆	13.1 ± 0.2	SL	359	424
N ₂ ⁺	N ₂ O	O	17.4 ± 0.2	PI	361	163
		N₂⁺²				
N ₂ ⁺²	N ₂		43.5 ± 0.3	FDP	1003	212
		N₃⁺				
N ₃ ⁺	HN ₃	H	16.0 ± 0.2	SL	387	340
N ₃ ⁺	CH ₃ N ₃	CH ₃	17.6 ± 0.5	SL	430	340
		NH⁺ Heat of formation 382 kcal mol⁻¹				
NH ⁺	NH		13.10 ± 0.05	NS	381*	132
NH ⁺	NH ₃	H ₂	17.1 ± 0.1	NS	383*	132
NH ⁺	NH ₃	2H	21.6 ± 0.1	NS	383*	132
NH ⁺	HN ₃	N ₂	14.4 ± 0.2	SL	402	340
		NH₂⁺ Heat of formation 304 kcal mol⁻¹				
NH ₂ ⁺	NH ₂		11.4 ± 0.1	SL	304*	34
NH ₂ ⁺	NH ₃	H	16.0 ± 0.1	SL	306*	34
NH ₂ ⁺	N ₂ H ₄	NH ₂	13.9 ± 0.4	SL	302*	34

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
NH₃⁺ Heat of formation 223 kcal mol⁻¹						
NH ₃ ⁺	NH ₃		10.19	S	224*	1070
NH ₃ ⁺	NH ₃		11.0 ± 0.2	S	243	138
NH ₃ ⁺	NH ₃		10.154 ± 0.01	PI	223*	159
NH ₃ ⁺	NH ₃		10.15 ± 0.01	PI	223*	416, 182
NH ₃ ⁺	NH ₃		10.07 ± 0.05	PI	221*	155
NH ₃ ⁺	NH ₃		10.16	PE	223*	1130
NH ₃ ⁺	NH ₃		10.40 ± 0.02	RPD	229	463
NH ₃ ⁺	NH ₃		10.34 ± 0.07	SL	227	14
NH ₃ ⁺	NH ₃		10.50 ± 0.09	SL	231	411
NH ₃ ⁺	NH ₃		10.3	EC	227	218
NH ₃ ⁺	NH ₃		9.94	TC	218	335
NH ₃ ⁺	NH ₃		17.0 ± 0.5	S		138
NH ₃ ⁺	NH ₃		15.02	PE		1130
NH ₃ ^{+(?E)}	NH ₃		15.31 ± 0.04	RPD	342	463
NH ₃ ⁺	NH ₃		16.20	TC		335
NH₃⁺²						
NH ₃ ⁺²	NH ₃		33.7 ± 0.2	FDP	766	212
NH ₃ ⁺²	NH ₃		36.8	FDP		212
N₂H⁺						
N ₂ H ⁺	N ₂ H ₄	H ₂ + H	14.8 ± 0.3	SL	312	424
N ₂ H ⁺	HN ₃	N	13.8 ± 0.2	SL	276	340
N ₂ H ⁺	CH ₃ N ₂ H ₃	CH ₃ + H ₂ ?	13.3 ± 0.3	SL	296	424
N₂H₂⁺						
N ₂ H ₂ ⁺	N ₂ H ₂		9.85 ± 0.1	SL		33, 34
N ₂ H ₂ ⁺	N ₂ H ₄	H ₂	10.98 ± 0.2	SL	276	33, 34
N ₂ H ₂ ⁺	N ₂ H ₄	H ₂	11.9 ± 0.2	SL	297	424
N ₂ H ₂ ⁺	N ₂ H ₄	2H	16.6 ± 0.1	SL	301	424
N ₂ H ₂ ⁺	CH ₃ N ₂ H ₃	CH ₄	11.2 ± 0.2	SL	299	424
N ₂ H ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	C ₂ H ₆	8.6 ± 0.1	PI	238	1141
N ₂ H ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	C ₂ H ₄ + H ₂ ?	12.9 ± 0.1	SL	305	424
N ₂ H ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,2-Dimethylhydrazine)	C ₂ H ₆	11.0 ± 0.2	SL	296	424
N ₂ H ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,2-Dimethylhydrazine)	C ₂ H ₄ + H ₂ ?	13.0 ± 0.2	SL	309	424
N ₂ H ₂ ⁺	(CH ₃) ₃ N ₂ H	C ₂ H ₄ + CH ₄	11.9 ± 1.0	SL	299	424
N ₂ H ₂ ⁺	(CH ₃) ₄ N ₂	C ₂ H ₆ + C ₂ H ₄	11.9 ± 0.2	SL	299	424
N ₂ H ₂ ⁺	C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	n-C ₅ H ₁₂	9.5 ± 0.2	PI	258	1141
N ₂ H ₂ ⁺	C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	n-C ₅ H ₁₂	11.1 ± 0.1	PI		1141

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
N₂H₃⁺						
N ₂ H ₃ ⁺	N ₂ H ₃		7.88 ± 0.2	SL		34
N ₂ H ₃ ⁺	N ₂ H ₄	H	10.6 ± 0.1	PI	215	1141
N ₂ H ₃ ⁺	N ₂ H ₄	H	11.18 ± 0.1	SL	229	34
N ₂ H ₃ ⁺	N ₂ H ₄	H	11.3 ± 0.1	SL	231	424
N ₂ H ₃ ⁺	N ₂ H ₄	H	11.3	NS	231	1455
N ₂ H ₃ ⁺	CH ₃ N ₂ H ₃	CH ₃	9.5 ± 0.1	PI	208	1141
N ₂ H ₃ ⁺	CH ₃ N ₂ H ₃	CH ₃	10.7 ± 0.3	SL	236	424
N ₂ H ₃ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,2-Dimethylhydrazine)	C ₂ H ₅	10.2 ± 0.2	SL	232	424
N ₂ H ₃ ⁺	(CH ₃) ₃ N ₂ H	C ₂ H ₄ + CH ₃ ?	11.7 ± 1.0	SL	243	424
N₂H₄⁺ Heat of formation 224 kcal mol⁻¹						
N ₂ H ₄ ⁺	N ₂ H ₄		9.56 ± 0.02	PI	243	1166
N ₂ H ₄ ⁺	N ₂ H ₄		8.74 ± 0.06	PI	224*	1141
N ₂ H ₄ ⁺	N ₂ H ₄		11.0 ± 0.1	PI		1141
N ₂ H ₄ ⁺	N ₂ H ₄		8.74 ± 0.06	PI	224*	2173
N ₂ H ₄ ⁺	N ₂ H ₄		9.00 ± 0.1	SL	230	424
N ₂ H ₄ ⁺	(CH ₃) ₃ N ₂ H	C ₂ H ₂ + CH ₄	11.9 ± 0.2	SL	257	424
N ₂ H ₄ ⁺	(CH ₃) ₄ N ₂		12.3 ± 0.1	SL		424
N₃H⁺						
N ₃ H ⁺	HN ₃		10.3 ± 0.2	SL	308*	340
N₃H₃⁺						
N ₃ H ₃ ⁺	N ₃ H ₃		9.6 ± 0.1	SL		34
CN⁺ Heat of formation 430 kcal mol⁻¹						
CN ⁺	CN		14.5 ± 0.5	SL	434*	154
CN ⁺	CN		14.2 ± 0.3	NS	427*	2145
CN ⁺	C ₂ N ₂	CN	21.5 ± 0.3	SL	470	154
CN ⁺	C ₂ N ₂	CN	20.4 ± 0.3	NS	444	2145
CN ⁺	CNC≡CCN	C ₃ N	19.2 ± 0.3	SL		154
CN ⁺	CNC≡CC≡CCN	C ₅ N	20.0 ± 1.0	SL		154
CN ⁺	CH≡CCN	C ₂ H	19.8 ± 0.2	SL	436	154
CN ⁺	C ₃ H ₅ CN (Cyclopropyl cyanide)	cyclo-C ₃ H ₅	19.5 ± 0.4	EVD		202
CN ⁺	CNCl	Cl ⁻	15.5 ± 0.2	SL	449	73
CN ⁺	CNCl	Cl	18.3 ± 0.2	SL	426	73
CN ⁺	CNBr	Br ⁻	14.6 ± 0.1	SL	437	73
CN ⁺	CNBr	Br	18.3 ± 0.1	SL	440	73
CN ⁺	CNI	I	18.1 ± 0.1	SL	446	73
C₂N⁺						
C ₂ N ⁺	C ₂ N		13	SL		154
C ₂ N ⁺	C ₂ N ₂	N	19.5 ± 0.1	SL	411	154
C ₂ N ⁺	CNC≡CCN	C ₂ N	18.1 ± 0.4	SL		154
C ₂ N ⁺	CNC≡CC=CCN	C ₄ N	17.0 ± 0.1	SL		154
C ₂ N ⁺	CNC≡CC≡CCN		19.7 ± 0.5	SL		154
C ₂ N ⁺	C ₂ H ₅ N (Ethylenimine)	H ₂ + 3H?	23.0 ± 0.4	EVD	400	51
C ₂ N ⁺	CH≡CCN	CH?	18.0 ± 0.5	SL	364	154
C ₂ N ⁺	CH≡CCN	C + H	24.0 ± 0.5	SL	421	154

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃N⁺						
C ₃ N ⁺	C ₃ N		14.4	SL		154
C ₃ N ⁺	CNC≡CCN	CN	18.4 ± 0.2	SL	452	154
C ₃ N ⁺	CNC≡CC≡CCN	C ₃ N	22.0 ± 0.5	SL		154
C ₃ N ⁺	CH≡CCN	H	18.2 ± 0.3	SL	459	154
C₄N⁺						
C ₄ N ⁺	C ₄ N		11.9 ± 0.5	SL		154
C ₄ N ⁺	CNC≡CCN	N	18.8 ± 0.5	SL	449	154
C ₄ N ⁺	CNC≡CC≡CCN	C ₂ N	19.0 ± 1.0	SL		154
C₅N⁺						
C ₅ N ⁺	CNC≡CC≡CCN	CN	17.3 ± 0.2	SL	482	154
C₆N⁺						
C ₆ N ⁺	C ₆ N		12.2 ± 0.1	SL		154
C ₆ N ⁺	CNC≡CC≡CCN	N	19.2 ± 0.3	SL	513	154
C₂N₂⁺ Heat of formation 387 kcal mol⁻¹						
C ₂ N ₂ ⁺	C ₂ N ₂		13.57 ± 0.02		387*	2114
C ₂ N ₂ ⁺	C ₂ N ₂		13.6 ± 0.2	SL	387*	154
C₄N₂⁺						
C ₄ N ₂ ⁺	CNC≡CCN		11.4 ± 0.2	SL	391	154
C₆N₂⁺						
C ₆ N ₂ ⁺	CNC≡CC≡CCN		11.4 ± 0.2	SL	446	154
CHN⁺ Heat of formation 351 kcal mol⁻¹						
CHN ⁺	HCN		13.73 ± 0.09	SL	349*	411
CHN ⁺	HCN		13.91 ± 0.04	CS	353*	282
CHN ⁺	CH ₃ N ₃	H ₂ + N ₂	13.6 ± 0.5	SL	371	340
CH₂N⁺						
CH ₂ N ⁺ (Azetidine)	(CH ₂) ₃ NH	C ₂ H ₄ + H	13.1 ± 0.2	EVD	253	52
CH ₂ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH	C ₃ H ₆ + H	13.9 ± 0.2	EVD	262	52
CH ₂ N ⁺	CH ₃ N ₃	H + N ₂	10.5 ± 0.1	SL	247	340
CH₄N⁺ Heat of formation 178 kcal mol⁻¹						
CH ₄ N ⁺	C ₂ H ₅ NH ₂	CH ₃	9.71	PI	179*	11
CH ₄ N ⁺ (Azetidine)	(CH ₂) ₃ NH	C ₂ H ₂ + H	12.3 ± 0.2	EVD	193	52
CH ₄ N ⁺	n-C ₃ H ₇ NH ₂	C ₂ H ₅	9.54	PI	178*	11
CH ₄ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH	C ₃ H ₄ + H	12.7 ± 0.2	EVD	193	52
CH ₄ N ⁺	CH ₂ NH ₂ COOH	COOH	10.1 ± 0.2	LE	175	88
CH₂D₂N⁺						
CH ₂ D ₂ N ⁺ (N,N-d ₂ -Benzylamine)	C ₆ H ₅ CH ₂ ND ₂	C ₆ H ₅	11.0 ± 0.1	PI		1160

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₅N⁺ Heat of formation 201 kcal mol⁻¹						
CH ₅ N ⁺	CH ₃ NH ₂		8.97 ± 0.02	PI	201*	159,
CH ₅ N ⁺	CH ₃ NH ₂		9.18	PE	206	416, 182
CH ₅ N ⁺	CH ₃ NH ₂		12.16	PE		1130
CH ₅ N ⁺	CH ₃ NH ₂		13.94?	PE		1130
CH ₅ N ⁺	CH ₃ NH ₂		15.07	PE		1130
CH ₅ N ⁺	CH ₃ NH ₂		16.57	PE		1130
CH ₅ N ⁺	CH ₃ NH ₂		19.89?	PE		1130
CH ₅ N ⁺	CH ₃ NH ₂		9.45 ± 0.08	RPD	212	1072
CH ₅ N ⁺	CH ₃ NH ₂		12.35 ± 0.10	RPD		1072
CH ₅ N ⁺	CH ₃ NH ₂		13.90 ± 0.30	RPD		1072
CH ₅ N ⁺	CH ₃ NH ₂		17.70 ± 0.70	RPD		1072
CH ₅ N ⁺	CH ₃ NH ₂		21.75 ± 0.20	RPD		1072
CH ₅ N ⁺	CH ₃ NH ₂		23.75 ± 0.70	RPD		1072
CH ₅ N ⁺	CH ₃ NH ₂		9.41 ± 0.08	SL	212	14
CH ₅ N ⁺	CH ₃ NH ₂		9.27 ± 0.1	SL	208	67
CH ₅ N ⁺	CH ₃ NH ₂		9.41 ± 0.02	CS	212	383, 384
CH ₅ N ⁺	CH ₃ NH ₂		9.56	TC	215	136
CH ₅ N ⁺	CH ₃ N ₂ H ₃	NH	11.3 ± 0.1	PI	204	1141
C₂HN⁺						
C ₂ HN ⁺ (Ethylenimine)	C ₂ H ₅ N		2H ₂	18.1 ± 0.6	EVD	443
C₂H₂N⁺ Heat of formation 298 kcal mol⁻¹						
C ₂ H ₂ N ⁺	CH ₂ CN		10.87 ± 0.1	SL	(a)	125
C ₂ H ₂ N ⁺	CH ₂ CN		10.86 ± 0.2	SL	(a)	125
C ₂ H ₂ N ⁺	CH ₂ CN		10.95 ± 0.2	SL	(a)	125
C ₂ H ₂ N ⁺	CH ₃ CN	H	14.28 ± 0.05	SL	298*	125
C ₂ H ₂ N ⁺ (Ethylenimine)	C ₂ H ₅ N		17.0 ± 0.2	EVD		51
CH₃CN⁺ Heat of formation 302 kcal mol⁻¹						
C ₂ H ₃ N ⁺	CH ₃ CN		12.205 ± 0.004	PI	302*	1253
C ₂ H ₃ N ⁺	CH ₃ CN		12.22 ± 0.01	PI	303*	182
C ₂ H ₃ N ⁺	CH ₃ CN		12.34 ± 0.04	RPD	305	286
C ₂ H ₃ N ⁺	CH ₃ CN		12.96 ± 0.03	RPD		286
C ₂ H ₃ N ⁺	CH ₃ CN		13.92 ± 0.04	RPD		286
C ₂ H ₃ N ⁺	CH ₃ CN		12.42 ± 0.09	SL	307	411
C ₂ H ₃ N ⁺	CH ₃ CN		12.3 ± 0.1	EC	305	2171
C ₂ H ₃ N ⁺	CH ₃ NC		11.8 ± 0.1	EC	308	2171
C ₂ H ₃ N ⁺ (Ethylenimine)	C ₂ H ₅ N	H ₂	15.2 ± 0.3	EVD	377	51
C₂H₄N⁺						
C ₂ H ₄ N ⁺ (Ethylenimine)	C ₂ H ₅ N	H	12.2 ± 0.1	EVD	255	51
C ₂ H ₄ N ⁺ (Azetidine)	(CH ₂) ₃ NH	CH ₃	11.9 ± 0.2	EVD	257	52
C ₂ H ₄ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH	C ₂ H ₅	13.0 ± 0.2	EVD	273	52
C ₂ H ₄ N ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	NH ₂ + H ₂ ?	12.8 ± 0.2	SL	274	424
C ₂ H ₄ N ⁺ (1,2-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	NH ₂ + H ₂ ?	12.1 ± 0.5	SL	260	424
C ₂ H ₄ N ⁺	(CH ₃) ₃ N ₂ H	NH ₂ + CH ₄	11.7 ± 0.2	SL	266	424
C ₂ H ₄ N ⁺	(CH ₃) ₄ N ₂	NH ₂ + C ₂ H ₆ ?	12.2 ± 0.2	SL	277	424

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
cyclo-C₂H₅N⁺ Heat of formation 255 kcal mol⁻¹						
C ₂ H ₅ N ⁺ (Ethylenimine)	C ₂ H ₅ N		9.94 ± 0.15	EVD	255*	51
C ₂ H ₅ N ⁺ (Ethylenimine)	C ₂ H ₅ N		9.8	EC	252	218
C ₂ H ₅ N ⁺ (Ethylenimine)	C ₂ H ₅ N		8.24	TC	216	2184
C ₂ H ₅ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH	C ₂ H ₄	12.3 ± 0.2	EVD	269	52
C ₂ H ₅ N ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂		8.8 ± 0.1	PI		1141
C ₂ H ₅ N ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂		10.9 ± 0.2	PI		1141
C ₂ H ₅ N ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂		12.5 ± 0.2	SL		424
C₂H₆N⁺						
C ₂ H ₆ N ⁺ (CH ₃) ₃ N		CH ₃	12.3 ± 0.1	NS	245	303
C ₂ H ₆ N ⁺ (CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)		NH ₂	9.0 ± 0.2	PI	186	1141
C ₂ H ₆ N ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	NH ₂	11.2 ± 0.2	PI		1141
C ₂ H ₆ N ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	NH ₂	10.9 ± 0.2	SL	230	424
C ₂ H ₆ N ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	NH ₂	10.7 ± 0.1	NS	225	303
C ₂ H ₆ N ⁺ (CH ₃) ₃ N ₂ H		CH ₃ NH	11.1 ± 0.2	SL		424
C ₂ H ₆ N ⁺ (CH ₃) ₄ N ₂		(CH ₃) ₂ N	11.2 ± 0.2	SL		424
C ₂ H ₆ N ⁺ (CH ₃) ₄ N ₂		(CH ₃) ₂ N	11.2 ± 0.1	NS	241	303
C ₂ H ₆ N ⁺ (CH ₃) ₂ NN=NN(CH ₃) ₂			9.85 ± 0.1	NS		303
C ₂ H ₆ N ⁺ (CH ₃) ₂ NCHO			11.6 ± 0.1	NS		303
C ₂ H ₆ N ⁺ (CH ₃) ₂ NCOCH ₃			12.4 ± 0.1	NS		303
C ₂ H ₆ N ⁺ (CH ₃) ₂ NNO		NO	10.9 ± 0.1	NS	244	303
C ₂ H ₆ N ⁺ (CH ₃) ₂ NNO ₂		NO ₂	11.1 ± 0.1	NS	282	303
C₂H₅NH₂⁺ Heat of formation 193 kcal mol⁻¹						
(CH₃)₂NH⁺ 186 kcal mol⁻¹						
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			8.86 ± 0.02	PI	193*	159, 182
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			8.8	PI	192	86
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			8.9	PI	194	11
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			9.19	PE	201	1130
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			11.86	PE		1130
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			12.66	PE		1130
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			14.65	PE		1130
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			15.55	PE		1130
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			16.81	PE		1130
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			19.71	PE		1130
C ₂ H ₇ N ⁺ C ₂ H ₅ NH ₂			9.19 ± 0.05	SL	201	14
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			8.24 ± 0.02	PI	186*	159, 182
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			8.36	PE	188	1130
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			12.88	PE		1130
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			14.63	PE		1130
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			16.35	PE		1130
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			19.62?	PE		1130
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			8.93 ± 0.03	SL	201	14
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			9.21 ± 0.05	CS	208	384
C ₂ H ₇ N ⁺ (CH ₃) ₂ NH			9.01	TC	203	136
C ₂ H ₇ N ⁺ (CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)		NH	11.2 ± 0.2	PI	199	1141

TABLE I. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃HN⁺						
C ₃ HN ⁺	CH≡CCN		11.6 ± 0.2	SL	358	154
C₃HN⁺²						
C ₃ HN ⁺²	CH≡CCN		32.3 ± 0.2	SL	836	154
C₃H₂N⁺						
C ₃ H ₂ N ⁺	CH ₂ =CHCN	H	13.82 ± 0.08	EVD	311	1406
C ₃ H ₂ N ⁺ (Metadiazine)	C ₄ H ₄ N ₂	HCN + H	15.01 ± 0.10	EVD	309	1406
C ₃ H ₂ N ⁺ (Paradiazine)	C ₄ H ₄ N ₂	HCN + H	15.25 ± 0.10	EVD	314	1406
CH₂=CHCN⁺ Heat of formation 296 kcal mol⁻¹						
C ₃ H ₃ N ⁺	CH ₂ =CHCN		10.91 ± 0.1	PI	296*	182
C ₃ H ₃ N ⁺	CH ₂ =CHCN		11.10 ± 0.05	EVD	301	1406
C ₃ H ₃ N ⁺ (Pyridine)	C ₅ H ₅ N	C ₂ H ₂	13.84 ± 0.10	EVD	299	1406
C ₃ H ₃ N ⁺ (Metadiazine)	C ₄ H ₄ N ₂	HCN	12.87 ± 0.10	EVD	311	1406
C ₃ H ₃ N ⁺ (Paradiazine)	C ₄ H ₄ N ₂	HCN	12.81 ± 0.10	EVD	310	1406
C₃H₄N⁺						
C ₃ H ₄ N ⁺	CH ₃ CHCN		9.76 ± 0.1	SL	125	
C ₃ H ₄ N ⁺	CH ₂ CH ₂ CN		9.85 ± 0.1	SL	125	
C₃H₅N⁺						
C ₃ H ₅ N ⁺	C ₂ H ₅ CN		11.84 ± 0.02	PI	289*	182
C ₃ H ₅ N ⁺	C ₂ H ₅ CN		11.9 ± 0.1	EC	290	2171
C ₃ H ₅ N ⁺	C ₂ H ₅ NC		11.2 ± 0.1	EC	289	2171
C₃H₆N⁺						
C ₃ H ₆ N ⁺ (Azetidine)	(CH ₂) ₃ NH	H	11.4 ± 0.2	EVD	226	52
C₃H₇N⁺						
C ₃ H ₇ N ⁺ (Azetidine)	(CH ₂) ₃ NH		9.1 ± 0.15	EVD	225*	52
C ₃ H ₇ N ⁺ (Azetidine)	(CH ₂) ₃ NH		8.9	EC	221	218
C ₃ H ₇ N ⁺ (Azetidine)	(CH ₂) ₃ NH		8.07	TC	202	2184
n-C₃H₇NH₂⁺ Heat of formation 185 kcal mol⁻¹						
iso-C₃H₇NH₂⁺ 183 kcal mol⁻¹						
(CH₃)₃N⁺ 175 kcal mol⁻¹						
C ₃ H ₉ N ⁺	n-C ₃ H ₇ NH ₂		8.78 ± 0.02	PI	185*	159, 182
C ₃ H ₉ N ⁺	n-C ₃ H ₇ NH ₂		8.7	PI	183	86
C ₃ H ₉ N ⁺	n-C ₃ H ₇ NH ₂		8.8	PI	186	11

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₃ H ₉ N ⁺	<i>iso</i> -C ₃ H ₇ NH ₂		8.72 ± 0.03	PI	183*	159, 182
C ₃ H ₉ N ⁺	<i>iso</i> -C ₃ H ₇ NH ₂		8.86	PE	186	1130
C ₃ H ₉ N ⁺	<i>iso</i> -C ₃ H ₇ NH ₂		11.23	PE		1130
C ₃ H ₉ N ⁺	<i>iso</i> -C ₃ H ₇ NH ₂		14.87	PE		1130
C ₃ H ₉ N ⁺	<i>iso</i> -C ₃ H ₇ NH ₂		16.41?	PE		1130
C ₃ H ₉ N ⁺	<i>iso</i> -C ₃ H ₇ NH ₂		19.09?	PE		1130
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		7.82 ± 0.02	PI	175*	159, 416, 182
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		8.12	PE	181	1130
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		11.63	PE		1130
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		13.52	PE		1130
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		15.31	PE		1130
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		19.34?	PE		1130
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		8.32 ± 0.02	SL	186	14
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		9.02 ± 0.05	CS	202	384
C ₃ H ₉ N ⁺	(CH ₃) ₃ N		8.66	TC	194	136
C₄H₄N⁺						
C ₄ H ₄ N ⁺ (Aniline)	C ₆ H ₅ NH ₂	C ₂ H ₃ ?	12.3 ± 0.1	PI	243	1160
CH₂=CHCH₂CN⁺ Heat of formation 281 kcal mol⁻¹						
C₄H₅N⁺ (Pyrrole)						
C ₄ H ₅ N ⁺	CH ₂ =CHCH ₂ CN		10.39 ± 0.01	PI	281*	182
C ₄ H ₅ N ⁺	C ₃ H ₅ CN (Cyclopropyl cyanide)		11.2 ± 0.2	EVD	301	202
C ₄ H ₅ N ⁺ (Pyrrole)	C ₄ H ₅ N		8.20 ± 0.01	PI	215*	182
C ₄ H ₅ N ⁺ (Pyrrole)	C ₄ H ₅ N		8.97 ± 0.05	CS	233	381
C ₄ H ₅ N ⁺ (Pyrrole)	C ₄ H ₅ N		8.61	TC	224	136
C₄H₆N⁺						
C ₄ H ₆ N ⁺	(CH ₃) ₂ CCN		9.15 ± 0.1	SL	239*	125
C₄H₇N⁺						
C ₄ H ₇ N ⁺	<i>n</i> -C ₃ H ₇ CN		11.67 ± 0.05	PI	280*	182
C ₄ H ₇ N ⁺	<i>n</i> -C ₃ H ₇ NC		11.1 ± 0.1	EC	282	2171
C₄H₈N⁺						
C ₄ H ₈ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH	H	11.0 ± 0.2	EVD	200	52
C₄H₉N⁺ (Pyrrolidine) Heat of formation 192 kcal mol⁻¹						
C ₄ H ₉ N ⁺	CH ₃ CH=NC ₂ H ₅		9.29	PE		1130
C ₄ H ₉ N ⁺	CH ₃ CH=NC ₂ H ₅		10.57	PE		1130
C ₄ H ₉ N ⁺	CH ₃ CH=NC ₂ H ₅		11.63	PE		1130
C ₄ H ₉ N ⁺	CH ₃ CH=NC ₂ H ₅		12.55	PE		1130
C ₄ H ₉ N ⁺	CH ₃ CH=NC ₂ H ₅		14.36	PE		1130
C ₄ H ₉ N ⁺	CH ₃ CH=NC ₂ H ₅		15.63	PE		1130
C ₄ H ₉ N ⁺	CH ₃ CH=NC ₂ H ₅		19.73?	PE		1130

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		8.41	PE	192*	1130
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		11.10	PE		1130
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		14.13	PE		1130
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		16.64	PE		1130
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		18.62	PE		1130
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		9.0 ± 0.15	EVD	206	52
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		8.9	EC	203	218
C ₄ H ₉ N ⁺ (Pyrrolidine)	(CH ₂) ₄ NH		7.98	TC	182	2184
n-C₄H₉NH₂⁺ Heat of formation				179 kcal mol⁻¹		
sec-C₄H₉NH₂⁺				177 kcal mol⁻¹		
iso-C₄H₉NH₂⁺				177 kcal mol⁻¹		
tert-C₄H₉NH₂⁺				173 kcal mol⁻¹		
(C₂H₅)₂NH⁺				163 kcal mol⁻¹		
C ₄ H ₁₁ N ⁺	n-C ₄ H ₉ NH ₂		8.71 ± 0.03	PI	179*	159, 182
C ₄ H ₁₁ N ⁺	n-C ₄ H ₉ NH ₂		8.79	PE	181	1130
C ₄ H ₁₁ N ⁺	n-C ₄ H ₉ NH ₂		10.75	PE		1130
C ₄ H ₁₁ N ⁺	n-C ₄ H ₉ NH ₂		14.11?	PE		1130
C ₄ H ₁₁ N ⁺	n-C ₄ H ₉ NH ₂		15.28	PE		1130
C ₄ H ₁₁ N ⁺	n-C ₄ H ₉ NH ₂		19.35?	PE		1130
C ₄ H ₁₁ N ⁺	sec-C ₄ H ₉ NH ₂		8.70	PI	177*	182
C ₄ H ₁₁ N ⁺	iso-C ₄ H ₉ NH ₂		8.70	PI	177*	182
C ₄ H ₁₁ N ⁺	tert-C ₄ H ₉ NH ₂		8.64	PI	173*	182
C ₄ H ₁₁ N ⁺	tert-C ₄ H ₉ NH ₂		8.83	PE	177	1130
C ₄ H ₁₁ N ⁺	tert-C ₄ H ₉ NH ₂		9.81	PE		1130
C ₄ H ₁₁ N ⁺	tert-C ₄ H ₉ NH ₂		12.46	PE		1130
C ₄ H ₁₁ N ⁺	tert-C ₄ H ₉ NH ₂		15.11	PE		1130
C ₄ H ₁₁ N ⁺	tert-C ₄ H ₉ NH ₂		19.46?	PE		1130
C ₄ H ₁₁ N ⁺	(C ₂ H ₅) ₂ NH		8.01 ± 0.01	PI	163*	159, 182
C ₄ H ₁₁ N ⁺	(C ₂ H ₅) ₂ NH		8.51	PE	175	1130
C ₄ H ₁₁ N ⁺	(C ₂ H ₅) ₂ NH		11.08	PE		1130
C ₄ H ₁₁ N ⁺	(C ₂ H ₅) ₂ NH		14.45	PE		1130
C ₄ H ₁₁ N ⁺	(C ₂ H ₅) ₂ NH		19.18?	PE		1130
C ₄ H ₁₁ N ⁺	(C ₂ H ₅) ₂ NH		8.44 ± 0.01	SL	173	14
C ₄ H ₁₁ N ⁺	(C ₂ H ₅) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	NH	11.2 ± 0.1	PI	188	1141
C₅H₃N⁺						
C ₅ H ₃ N ⁺ (Pyridine)	C ₅ H ₅ N	H ₂	12.42 ± 0.10	EVD	320	1406
C₅H₄N⁺						
C ₅ H ₄ N ⁺ (Pyridine)	C ₅ H ₅ N	H	14.00 ± 0.10	EVD	304	1406

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₅H₂D₂N⁺						
C ₅ H ₂ D ₂ N ⁺ (<i>N,N-d</i> ₂ -Benzylamine)	C ₆ H ₅ CH ₂ ND ₂	C ₂ H ₅ ?	11.0 ± 0.2	PI		1160
C₅H₅N⁺ (Pyridine) Heat of formation 247 kcal mol⁻¹						
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		9.266	S	247*	1115
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		9.23 ± 0.03	PI	246*	416, 182
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		9.20 ± 0.05	PI	246*	1160
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		9.28	PE	248	1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		9.45 ± 0.05	EVD	251	1406
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		10.06 ± 0.05	EVD	266	1406
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		9.85 ± 0.05	SL	261	217
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		9.76 ± 0.05	CS	259	383
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		10.3	S		1115
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		10.30 ± 0.05	PI		1160
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		10.54	PE		1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		11.56	S		1115
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		11.05 ± 0.1	PI		1160
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		12.22	PE		1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		13.43?	PE		1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		14.44	PE		1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		15.49	PE		1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		16.94	PE		1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		19.39?	PE		1130
C ₅ H ₅ N ⁺ (Pyridine)	C ₅ H ₅ N		20.14?	PE		1130
C₅H₆N⁺						
C ₅ H ₆ N ⁺ (Aminocyclopentadienyl radical)	C ₅ H ₄ NH ₂		7.55	SL		126

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₅H₁₁N⁺						
C ₅ H ₁₁ N ⁺	(CH ₃) ₂ C=NC ₂ H ₅		8.83	PE		1130
C ₅ H ₁₁ N ⁺	(CH ₃) ₂ C=NC ₂ H ₅		9.79	PE		1130
C ₅ H ₁₁ N ⁺	(CH ₃) ₂ C=NC ₂ H ₅		11.63	PE		1130
C ₅ H ₁₁ N ⁺	(CH ₃) ₂ C=NC ₂ H ₅		14.08	PE		1130
C ₅ H ₁₁ N ⁺	(CH ₃) ₂ C=NC ₂ H ₅		15.16	PE		1130
C ₅ H ₁₁ N ⁺	(CH ₃) ₂ C=NC ₂ H ₅		19.50?	PE		1130
C ₅ H ₁₁ N ⁺ (Piperidine)	(CH ₂) ₅ NH		8.7	EC	191	218
C ₅ H ₁₁ N ⁺ (Piperidine)	(CH ₂) ₅ NH		9.15	CTS	201	2031
C ₅ H ₁₁ N ⁺ (Piperidine)	(CH ₂) ₅ NH		7.85	TC	171	2184
C₅H₁₂N⁺						
C ₅ H ₁₂ N ⁺ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₄ H ₉ (CH ₃)N ₂ H ₂	NH ₂	9.0±0.1	PI	171	1141
C ₅ H ₁₂ N ⁺ (Isoleucine)	sec-C ₄ H ₉ CH(NH ₂)COOH	COOH	9.9±0.2	LE	150	88
C₅H₁₃N⁺						
C ₅ H ₁₃ N ⁺ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₄ H ₉ (CH ₃)N ₂ H ₂	NH	10.5±0.1	PI	167	1141
C₆H₄N⁺						
C ₆ H ₄ H ⁺ (Cyanocyclopentadienyl radical)	C ₅ H ₄ CN		9.44	SL	267*	126
C₆H₆N⁺						
C ₆ H ₆ N ⁺ (Anilino radical)	C ₆ H ₅ NH		8.26±0.1	SL		1011
C ₆ H ₆ N ⁺ (2-Pyridylmethyl radical)	C ₅ H ₄ NCH ₂		8.17±0.1	SL	(a)	1011
C ₆ H ₆ N ⁺ (3-Pyridylmethyl radical)	C ₅ H ₄ NCH ₂		7.92±0.1	SL	(a)	1011
C ₆ H ₆ N ⁺ (4-Pyridylmethyl radical)	C ₅ H ₄ NCH ₂		8.40±0.15	SL	(a)	1011
C ₆ H ₆ N ⁺ (2-picoline)	C ₅ H ₄ NCH ₃	H	12.38±0.1	SL	258	1011
C ₆ H ₆ N ⁺ (3-picoline)	C ₅ H ₄ NCH ₃	H	12.31±0.1	SL	259	1011
C ₆ H ₆ N ⁺ (4-picoline)	C ₅ H ₄ NCH ₃	H	12.22±0.1	SL	254	1011

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
					C₆H₇N⁺ (Aniline) Heat of formation 202 kcal mol⁻¹	
					C₆H₇N⁺ (2-Picoline) 232 kcal mol ⁻¹	
					C₆H₇N⁺ (3-Picoline) 236 kcal mol ⁻¹	
					C₆H₇N⁺ (4-Picoline) 233 kcal mol ⁻¹	
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		7.69 ± 0.02	PI	202*	1166
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		7.70 ± 0.02	PI	202*	182, 159, 416
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		7.67 ± 0.03	PI	202*	1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		8.8 ± 0.1	PI		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		10.2 ± 0.1	PI		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		11.8 ± 0.1	PI		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		12.6 ± 0.1	PI		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		7.69	PI	202*	1159
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		8.89 ± 0.1	PE		1159
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		9.2 ± 0.1	PE		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		10.3 ± 0.2	PE		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		8.32	SL	217	1066
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		7.76	CTS	204	1281
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		8.18	TC	213	1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		8.26	TC	215	1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		9.1	TC		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		9.2	TC		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		10.0	TC		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		10.2	TC		1160
C ₆ H ₇ N ⁺ (Aniline)	C ₆ H ₅ NH ₂		8.58	TC	223	136
C ₆ H ₇ N ⁺ (2-Picoline)	C ₅ H ₄ NCH ₃		9.02 ± 0.03	PI	232*	182
C ₆ H ₇ N ⁺ (2-Picoline)	C ₅ H ₄ NCH ₃		9.56 ± 0.05	SL	245	217
C ₆ H ₇ N ⁺ (3-Picoline)	C ₅ H ₄ NCH ₃		9.04 ± 0.03	PI	236*	182
C ₆ H ₇ N ⁺ (4-Picoline)	C ₅ H ₄ NCH ₃		9.04 ± 0.03	PI	233*	182
C ₆ H ₇ N ⁺ (4-Picoline)	C ₅ H ₄ NCH ₃		9.67 ± 0.05	SL	247	217
C ₆ H ₇ N ⁺ (Acetanilide)	C ₆ H ₅ NHCOCH ₃		8.88 ± 0.15	SL		1126

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆H₁₃N⁺ (Cyclohexylamine) Heat of formation 181 kcal mol⁻¹						
C ₆ H ₁₃ N ⁺	n-C ₃ H ₇ CH=NC ₂ H ₅		9.00	PE	1130	
C ₆ H ₁₃ N ⁺	n-C ₃ H ₇ CH=NC ₂ H ₅		10.15	PE	1130	
C ₆ H ₁₃ N ⁺	n-C ₃ H ₇ CH=NC ₂ H ₅		11.15	PE	1130	
C ₆ H ₁₃ N ⁺	n-C ₃ H ₇ CH=NC ₂ H ₅		12.59?	PE	1130	
C ₆ H ₁₃ N ⁺	n-C ₃ H ₇ CH=NC ₂ H ₅		13.37	PE	1130	
C ₆ H ₁₃ N ⁺	n-C ₃ H ₇ CH=NC ₂ H ₅		15.34	PE	1130	
C ₆ H ₁₃ N ⁺	n-C ₃ H ₇ CH=NC ₂ H ₅		19.17?	PE	1130	
C ₆ H ₁₃ N ⁺	iso-C ₃ H ₇ CH=NC ₂ H ₅		8.94	PE	1130	
C ₆ H ₁₃ N ⁺	iso-C ₃ H ₇ CH=NC ₂ H ₅		10.12	PE	1130	
C ₆ H ₁₃ N ⁺	iso-C ₃ H ₇ CH=NC ₂ H ₅		11.08	PE	1130	
C ₆ H ₁₃ N ⁺	iso-C ₃ H ₇ CH=NC ₂ H ₅		12.54	PE	1130	
C ₆ H ₁₃ N ⁺	iso-C ₃ H ₇ CH=NC ₂ H ₅		13.28	PE	1130	
C ₆ H ₁₃ N ⁺	iso-C ₃ H ₇ CH=NC ₂ H ₅		14.59	PE	1130	
C ₆ H ₁₃ N ⁺	iso-C ₃ H ₇ CH=NC ₂ H ₅		19.17?	PE	1130	
C ₆ H ₁₃ N ⁺	C ₆ H ₁₁ NH ₂ (Cyclohexylamine)		8.86	PE	181*	1130
C ₆ H ₁₃ N ⁺	C ₆ H ₁₁ NH ₂ (Cyclohexylamine)		10.25	PE	1130	
C ₆ H ₁₃ N ⁺	C ₆ H ₁₁ NH ₂ (Cyclohexylamine)		14.56	PE	1130	
C ₆ H ₁₃ N ⁺	C ₆ H ₁₁ NH ₂ (Cyclohexylamine)		18.17	PE	1130	
C ₆ H ₁₃ N ⁺	(CH ₂) ₆ NH (Hexamethylenimine)		8.5	EC	184	218
(n-C₃H₇)₂NH⁺ Heat of formation 153 kcal mol⁻¹						
(iso-C₃H₇)₂NH⁺ 148 kcal mol⁻¹						
(C₂H₅)₃N⁺ 147 kcal mol⁻¹						
C ₆ H ₁₅ N ⁺	(n-C ₃ H ₇) ₂ NH		7.84 ± 0.02	PI	153*	159, 182
C ₆ H ₁₅ N ⁺	(iso-C ₃ H ₇) ₂ NH		7.73 ± 0.03	PI	148*	159, 182
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		7.50 ± 0.02	PI	147*	159, 182
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		7.84	PE	155	1130
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		10.79	PE		1130
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		14.36	PE		1130
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		15.37	PE		1130
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		19.92?	PE		1130
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		7.68 ± 0.1	RPD	151	2158
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		8.18 ± 0.1	RPD		2158
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		8.55 ± 0.1	RPD		2158
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		8.95 ± 0.1	RPD		2158
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		9.40 ± 0.1	RPD		2158
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		7.85 ± 0.07	SL	155	14
C ₆ H ₁₅ N ⁺	(C ₂ H ₅) ₃ N		9.35	CTS	190	2031
cyclo-C₆H₅CN⁺ Heat of formation 277 kcal mol⁻¹						
C ₇ H ₅ N ⁺	C ₆ H ₅ CN (Benzonitrile)		9.705 ± 0.01	PI	277*	182
C ₇ H ₅ N ⁺	C ₆ H ₅ CN (Benzonitrile)		10.09	SL	286	1066
C ₇ H ₅ N ⁺	C ₆ H ₅ CONH ₂ (Benzamide)	H ₂ O	10.19 ± 0.10	SL	271	1126
C ₇ H ₅ N ⁺	(C ₆ H ₅) ₂ C ₂ N ₂ O (3,5-Diphenyl-1,2,4-oxidiazole)	C ₆ H ₅ NCO	10.2 ± 0.1	SL		1125

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇H₇N⁺						
C ₇ H ₇ N ⁺ (Benzylamine)	C ₆ H ₅ CH ₂ NH ₂	H ₂	9.35 ± 0.07	PI	236*	1147
C₇H₈N⁺						
C ₇ H ₈ N ⁺ (Benzylamine)	C ₆ H ₅ CH ₂ NH ₂	H	9.21 ± 0.07	PI	180*	1147
C ₇ H ₈ N ⁺ (Benzylamine)	C ₆ H ₅ CH ₂ NH ₂	H	9.3 ± 0.1	PI	182*	1160
C ₇ H ₈ N ⁺ (Benzylamine)	C ₆ H ₅ CH ₂ NH ₂	H	11.65 ± 0.1	PI		1160
C ₇ H ₈ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃	H	11.0 ± 0.1	PI	226*	1160
C₇H₉N⁺ (N-Methylaniline) Heat of formation 192 kcal mol⁻¹						
C₇H₉N⁺ (<i>m</i>-Toluidine) 189 kcal mol⁻¹						
C₇H₉N⁺ (Lutidine) 218 kcal mol⁻¹						
C ₇ H ₉ N ⁺ (Benzylamine)	C ₆ H ₅ CH ₂ NH ₂		7.56 ± 0.02	PI	194	159
C ₇ H ₉ N ⁺ (Benzylamine)	C ₆ H ₅ CH ₂ NH ₂		8.64 ± 0.02	PI	219	1166, 1160
C ₇ H ₉ H ⁺ (Benzylamine)	C ₆ H ₅ CH ₂ NH ₂		9.03 ± 0.05	CS	228	2025
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		7.34 ± 0.02	PI	193*	1166, 1159
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		7.30 ± 0.05	PI	192*	1160
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		8.55 ± 0.05	PI		1160
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		10.0 ± 0.1	PI		1160
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		8.44 ± 0.1	PE		1159
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		9.0 ± 0.1	PE		1160
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		10.0 ± 0.2	PE		1160
C ₇ H ₉ N ⁺ (N-Methylaniline)	C ₆ H ₅ NHCH ₃		7.58	CTS	199	1281
C ₇ H ₉ N ⁺ (<i>o</i> -Toluidine)	C ₆ H ₄ CH ₃ NH ₂		8.38	SL	210	1066
C ₇ H ₉ N ⁺ (<i>m</i> -Toluidine)	C ₆ H ₄ CH ₃ NH ₂		7.50 ± 0.02	PI	189*	1166
C ₇ H ₉ N ⁺ (<i>m</i> -Toluidine)	C ₆ H ₄ CH ₃ NH ₂		8.27	SL	207	1066
C ₇ H ₉ N ⁺ (<i>m</i> -Toluidine)	C ₆ H ₄ CH ₃ NH ₂		7.85 ± 0.05	CS	197	2025
C ₇ H ₉ N ⁺ (<i>p</i> -Toluidine)	C ₆ H ₄ CH ₃ NH ₂		8.14	SL	204	1066
C ₇ H ₉ N ⁺ (Toluidine)	C ₆ H ₄ CH ₃ NH ₂		8.16	TC	204	2194
C ₇ H ₉ N ⁺ (2,3-Lutidine)	C ₅ H ₃ N(CH ₃) ₂		8.85 ± 0.02	PI	218*	182
C ₇ H ₉ N ⁺ (2,4-Lutidine)	C ₅ H ₃ N(CH ₃) ₂		8.85 ± 0.03	PI	218*	182
C ₇ H ₉ N ⁺ (2,6-Lutidine)	C ₅ H ₃ N(CH ₃) ₂		8.85 ± 0.02	PI	218*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₈H₆N⁺						
C ₈ H ₆ N ⁺ (<i>m</i> -Cyanobenzyl radical)	C ₆ H ₄ CNCH ₂		8.58 ± 0.1	SL	267	69
C ₈ H ₆ N ⁺ (<i>p</i> -Cyanobenzyl radical)	C ₆ H ₄ CNCH ₂		8.36 ± 0.1	SL	262	69
C₈H₇N⁺						
C ₈ H ₇ N ⁺ (Benzyl cyanide)	C ₆ H ₅ CH ₂ CN		9.40 ± 0.05	CS	259*	2025
C ₈ H ₇ N ⁺ (<i>m</i> -Tolunitrile)	C ₆ H ₄ CH ₃ CN		9.66 ± 0.05	CS	271*	2025
C ₈ H ₇ N ⁺ (<i>p</i> -Tolunitrile)	C ₆ H ₄ CH ₃ CN		9.76	SL	273*	1066
C ₈ H ₇ N ⁺ (Tolunitrile)	C ₆ H ₄ CH ₃ CN		9.64	TC	270	2194
C ₈ H ₇ N ⁺ (Pyrrocoline)	C ₈ H ₇ N		7.27	TC		136
C₈H₁₀N⁺						
C ₈ H ₁₀ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂	H	10.75 ± 0.05	PI	217*	1160
cyclo-C₆H₅NHC₂H₅⁺ Heat of formation 193 kcal mol⁻¹						
cyclo-C₆H₅N(CH₃)₂⁺ 185 kcal mol⁻¹						
C ₈ H ₁₁ N ⁺ (<i>N</i> -Ethylaniline)	C ₆ H ₅ NHC ₂ H ₅		7.56	CTS	193*	1281
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		7.14 ± 0.03	PI	186*	1166, 1159
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		7.10 ± 0.05	PI	185*	1160
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		7.75 ± 0.05	PI		1160
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		8.6 ± 0.1	PI		1160
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		9.8 ± 0.1	PI		1160
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		8.14 ± 0.1	PE		1159
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		8.5 ± 0.1	PE		1160
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		9.7 ± 0.2	PE		1160
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		7.44	CTS	193	1281
C ₈ H ₁₁ N ⁺ (<i>N,N</i> -Dimethylaniline)	C ₆ H ₅ N(CH ₃) ₂		7.2	CTS	187	2037
C₈H₁₉N⁺						
C ₈ H ₁₉ N ⁺	(<i>n</i> -C ₄ H ₉) ₂ NH		7.69 ± 0.03	PI	140*	159, 182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₉H₁₃N⁺						
C ₉ H ₁₃ N ⁺ (N-n-Propylaniline)	C ₆ H ₅ NHC ₃ H ₇		7.54	CTS	188*	1281
C ₉ H ₁₃ N ⁺ (N-Ethyl-N-methylaniline)	C ₆ H ₅ N(CH ₃)C ₂ H ₅		7.37	CTS	185*	1281
C ₉ H ₁₃ N ⁺ (N,N-Dimethyl-o-toluidine)	C ₆ H ₄ N(CH ₃) ₂ CH ₃		7.37	CTS	184*	1281
C ₉ H ₁₃ N ⁺ (N,N-Dimethyl-m-toluidine)	C ₆ H ₄ N(CH ₃) ₂ CH ₃		7.35	CTS	181*	1281
C ₉ H ₁₃ N ⁺ (N,N-Dimethyl-p-toluidine)	C ₆ H ₄ N(CH ₃) ₂ CH ₃		7.33	CTS	181*	1281
C₉H₂₁N⁺						
C ₉ H ₂₁ N ⁺	(n-C ₃ H ₇) ₃ N		7.23	PI	207*	159, 182
C₁₀H₁₅N⁺						
C ₁₀ H ₁₅ N ⁺ (N-n-Butylaniline)	C ₆ H ₅ NHC ₄ H ₉		7.53	CTS	183*	1281
C ₁₀ H ₁₅ N ⁺ (N,N-Diethylaniline)	C ₆ H ₅ N(C ₂ H ₅) ₂		6.99	CTS	172*	1281
C ₁₀ H ₁₅ N ⁺ (N,N-Dimethyl-p-ethylaniline)	C ₆ H ₄ N(CH ₃) ₂ C ₂ H ₅		7.38	CTS	177*	1281
C ₁₀ H ₁₅ N ⁺ (N,N,2,4-Tetramethylaniline)	C ₆ H ₃ N(CH ₃) ₄		7.17	CTS	171*	1281
C ₁₀ H ₁₅ N ⁺ (N,N,2,6-Tetramethylaniline)	C ₆ H ₃ N(CH ₃) ₄		7.22	CTS	173*	1281
C ₁₀ H ₁₅ N ⁺ (N,N,3,5-Tetramethylaniline)	C ₆ H ₃ N(CH ₃) ₄		7.25	CTS	172*	1281
C₁₁H₁₇H⁺						
C ₁₁ H ₁₇ N ⁺ (N,N-Diethyl-p-toluidine)	C ₆ H ₄ N(C ₂ H ₅) ₂ CH ₃		6.93	CTS	164*	1281
C ₁₁ H ₁₇ N ⁺ (N,N-Dimethyl-p-isopropylaniline)	C ₆ H ₄ N(CH ₃) ₂ C ₃ H ₇		7.41	CTS	174*	1281
C₁₂H₁₁N⁺						
C ₁₂ H ₁₁ N ⁺	(C ₆ H ₅) ₂ NH (Diphenylamine)		7.25 ± 0.03	PI	223*	1140
C₁₂H₁₉N⁺						
C ₁₂ H ₁₉ N ⁺ (N,N-Di-n-propylaniline)	C ₆ H ₅ N(C ₃ H ₇) ₂		6.96	CTS	163*	1281
C ₁₂ H ₁₉ N ⁺ (N,N-Dimethyl-p-tert-butylaniline)	C ₆ H ₄ N(CH ₃) ₂ C ₄ H ₉		7.43	CTS	166*	1281
C₁₄H₂₃N⁺						
C ₁₄ H ₂₃ N ⁺ (N,N-Di-n-butylaniline)	C ₆ H ₅ N(C ₄ H ₉) ₂		6.95	CTS	153*	1281
C₁₈H₁₅N⁺						
C ₁₈ H ₁₅ N ⁺ (Triphenylamine)	(C ₆ H ₅) ₃ N		6.86 ± 0.03	PI	243*	1140

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CHN₂⁺						
CHN ₂ ⁺ (Diazomethane)	CH ₂ N ₂	H	14.8 ± 0.1	VC	338	314
CHN ₂ ⁺ (Diazirine)	CH ₂ N ₂	H	14.2 ± 0.1	VC	355	314
CH₂N₂⁺ (Diazomethane) Heat of formation 257 kcal mol⁻¹						
CH₂N₂⁺ (Diazirine) 314 kcal mol⁻¹						
CH ₂ N ₂ ⁺ (Diazomethane)	CH ₂ N ₂		8.999 ± 0.001	S	257*	1169
CH ₂ N ₂ ⁺ (Diazomethane)	CH ₂ N ₂		9.03 ± 0.05	VC	257	314
CH ₂ N ₂ ⁺ (Diazomethane)	CH ₂ N ₂		9.2 ± 0.3	NS	261	464
CH ₂ N ₂ ⁺ (Diazirine)	CH ₂ N ₂		10.18 ± 0.05	VC	314*	314
CH ₂ N ₂ ⁺	CH ₃ N ₂ H ₃	H ₂ + 2H	15.2 ± 0.2	SL	269	424
CH₃N₂⁺						
CH ₃ N ₂ ⁺	CH ₃ N ₂ H ₃	H ₂ + H	9.2 ± 0.2	PI	183	1141
CH ₃ N ₂ ⁺	CH ₃ N ₂ H ₃	H ₂ + H	11.9 ± 0.3	SL	245	424
CH ₃ N ₂ ⁺	CH ₃ N ₂ H ₃	3H?	14.8 ± 0.3	SL	208	424
CH ₃ N ₂ ⁺	CH ₃ N=NCH ₃	CH ₃	9.0 ± 0.1	SL	217	304
CH ₃ N ₂ ⁺ (1,2-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₃ + H ₂	9.7 ± 0.5	SL	212	424
CH₄N₂⁺						
CH ₄ N ₂ ⁺	CH ₃ N ₂ H ₃	H ₂	9.4 ± 0.1	PI	239	1141
CH ₄ N ₂ ⁺	CH ₃ N ₂ H ₃	H ₂	11.2 ± 0.1	PI	1141	1141
CH ₄ N ₂ ⁺	CH ₃ N ₂ H ₃	H ₂	10.4 ± 0.2	SL	262	424
CH ₄ N ₂ ⁺ (1,2-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₄	9.7 ± 0.3	SL	263	424
CH ₄ N ₂ ⁺ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₄ H ₉ (CH ₃)N ₂ H ₂		9.6 ± 0.1	PI		1141
CH ₄ N ₂ ⁺ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₄ H ₉ (CH ₃)N ₂ H ₂		11.0 ± 0.1	PI		1141
CH₅N₂⁺						
CH ₅ N ₂ ⁺	CH ₃ N ₂ H ₃	H	9.2 ± 0.1	PI	183	1141
CH ₅ N ₂ ⁺	CH ₃ N ₂ H ₃	H	10.9 ± 0.2	PI	1141	1141
CH ₅ N ₂ ⁺	CH ₃ N ₂ H ₃	H	10.2 ± 0.1	SL	206	424
CH ₅ N ₂ ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₃	8.4 ± 0.1	PI	180	1141
CH ₅ N ₂ ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₃	9.8 ± 0.1	PI		1141
CH ₅ N ₂ ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₃	9.7 ± 0.2	SL	210	424
CH ₅ N ₂ ⁺ (1,2-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₃	9.1 ± 0.2	SL	198	424
CH ₅ N ₂ ⁺ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₄ H ₉ (CH ₃)N ₂ H ₂		9.0 ± 0.1	PI		1141
CH ₅ N ₂ ⁺ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₄ H ₉ (CH ₃)N ₂ H ₂		10.6 ± 0.1	PI		1141

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₆N₂⁺						
CH ₆ N ₂ ⁺	CH ₃ N ₂ H ₃		8.00 ± 0.06	PI	207	2173, 1141
CH ₆ N ₂ ⁺	CH ₃ N ₂ H ₃		11.1 ± 0.1	PI		1141
CH ₆ N ₂ ⁺	CH ₃ N ₂ H ₃		8.63 ± 0.1	SL	222	424
C₂H₅N₂⁺						
C ₂ H ₅ N ₂ ⁺	(CH ₃) ₃ N ₂ H	CH ₃ + H ₂	11.1 ± 0.4	SL	242	424
C ₂ H ₅ N ₂ ⁺	(CH ₃) ₄ N ₂	CH ₃ + CH ₄ ?	12.4 ± 0.2	SL	287	424
CH₃N=NCH₃⁺ Heat of formation 243 kcal mol⁻¹						
C ₂ H ₆ N ₂ ⁺	CH ₃ N=NCH ₃		8.65 ± 0.1	SL	243*	304
C ₂ H ₆ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	H ₂	9.5 ± 0.1	PI	239	1141
C ₂ H ₆ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	H ₂	11.4 ± 0.2	PI		1141
C ₂ H ₆ N ₂ ⁺	(CH ₃) ₄ N ₂	C ₂ H ₆	10.5 ± 0.1	SL	279	424
C ₂ H ₆ N ₂ ⁺	(CH ₃) ₄ N ₂	2CH ₃ ?	13.3 ± 0.5	SL	257	424
C ₂ H ₆ N ₂ ⁺	C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₃ H ₈	9.5 ± 0.2	PI	248	1141
C ₂ H ₆ N ₂ ⁺	C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1- <i>n</i> -butylhydrazine)	C ₃ H ₈	10.6 ± 0.1	PI		1141
C₂H₇N₂⁺						
C ₂ H ₇ N ₂ ⁺	(CH ₃) ₂ N ₂ H (1,1-Dimethylhydrazyl radical)		6.6 ± 0.3	SL	(a)	67
C ₂ H ₇ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	H	8.7 ± 0.2	PI	168	1141
C ₂ H ₇ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	H	11.0 ± 0.2	PI		1141
C ₂ H ₇ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	H	10.2 ± 0.2	SL	203	424
C ₂ H ₇ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)	H	10.0 ± 0.3	SL	198	67
C ₂ H ₇ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,2-Dimethylhydrazine)	H	9.3 ± 0.2	SL	183	424
C ₂ H ₇ N ₂ ⁺	(CH ₃) ₃ N ₂ H	CH ₃	9.4 ± 0.1	SL	203	424
C ₂ H ₇ N ₂ ⁺	C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1- <i>n</i> -butylhydrazine)		9.1 ± 0.1	PI		1141
C ₂ H ₇ N ₂ ⁺	C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1- <i>n</i> -butylhydrazine)		10.7 ± 0.1	PI		1141
C₂H₈N₂⁺						
C ₂ H ₈ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)		7.67 ± 0.05	PI	197	1141, 2173
C ₂ H ₈ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)		10.6 ± 0.1	PI		1141
C ₂ H ₈ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)		11.2 ± 0.1	PI		1141
C ₂ H ₈ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,1-Dimethylhydrazine)		8.12 ± 0.1	SL	207	424
C ₂ H ₈ N ₂ ⁺	(CH ₃) ₂ N ₂ H ₂ (1,2-Dimethylhydrazine)		7.75 ± 0.1	SL	200	424

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₇N₂⁺						
C ₃ H ₇ N ₂ ⁺	(CH ₃) ₃ N ₂ H	H ₂ + H	10.7 ± 0.1	SL	214	424
C ₃ H ₇ N ₂ ⁺	(CH ₃) ₄ N ₂	CH ₃ + H ₂	10.7 ± 0.1	SL	230	424
C₃H₈N₂⁺						
C ₃ H ₈ N ₂ ⁺	(CH ₃) ₃ N ₂ H	H ₂	8.2 ± 0.1	SL	208	424
C ₃ H ₈ N ₂ ⁺	(CH ₃) ₄ N ₂	CH ₄	8.9 ± 0.1	SL	240	424
C₃H₉N₂⁺						
C ₃ H ₉ N ₂ ⁺	(CH ₃) ₃ N ₂ H	H	8.9 ± 0.1	SL	172	424
C ₃ H ₉ N ₂ ⁺	(C ₂ H ₅) ₂ N ₂ H ₂ (1,1-Diethylhydrazine)	CH ₃	8.0 ± 0.1	PI	160	1141
C ₃ H ₉ N ₂ ⁺	(C ₂ H ₅) ₂ N ₂ H ₂ (1,1-Diethylhydrazine)	CH ₃	8.5 ± 0.2	PI	172	1141
C ₃ H ₉ N ₂ ⁺	(CH ₃) ₄ N ₂	CH ₃	9.1 ± 0.1	SL	193	424
C₃H₁₀N₂⁺						
C ₃ H ₁₀ N ₂ ⁺	(CH ₃) ₃ N ₂ H		7.93 ± 0.1	SL	202*	424
C₄H₃N₂⁺						
C ₄ H ₃ N ₂ ⁺	C ₄ H ₄ N ₂ (Metadiazine)	H	13.01 ± 0.10	EVD	295	1406
C ₄ H ₃ N ₂ ⁺	C ₄ H ₄ N ₂ (Paradiazine)	H	13.68 ± 0.10	EVD	310	1406
C₄H₄N₂⁺						
C ₄ H ₄ N ₂ ⁺	C ₄ H ₄ N ₂ (Orthodiazine)		9.77 ± 0.05	EVD	292*	1406
C ₄ H ₄ N ₂ ⁺	C ₄ H ₄ N ₂ (Orthodiazine)		10.04 ± 0.05	EVD	298*	1406
C ₄ H ₄ N ₂ ⁺	C ₄ H ₄ N ₂ (Metadiazine)		9.83 ± 0.05	EVD	274*	1406
C ₄ H ₄ N ₂ ⁺	C ₄ H ₄ N ₂ (Metadiazine)		10.12 ± 0.05	EVD	280*	1406
C ₄ H ₄ N ₂ ⁺	C ₄ H ₄ N ₂ (Paradiazine)		9.59 ± 0.05	EVD	268*	1406
C ₄ H ₄ N ₂ ⁺	C ₄ H ₄ N ₂ (Paradiazine)		10.09 ± 0.05	EVD	280*	1406
C₄H₁₀N₂⁺						
C ₄ H ₁₀ N ₂ ⁺	(C ₂ H ₅) ₂ N ₂ H ₂ (1,1-Diethylhydrazine)	H ₂	8.3 ± 0.2	PI	200	1141
C₄H₁₁N₂⁺						
C ₄ H ₁₁ N ₂ ⁺	(C ₂ H ₅) ₂ N ₂ H ₂ (1,1-Diethylhydrazine)	H	8.9 ± 0.1	PI	162	1141
C ₄ H ₁₁ N ₂ ⁺	(C ₂ H ₅) ₂ N ₂ H ₂ (1,1-Diethylhydrazine)	H	11.1 ± 0.1	PI		1141
C ₄ H ₁₁ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	CH ₃	8.0 ± 0.1	PI	155	1141
C ₄ H ₁₁ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	CH ₃	9.6 ± 0.2	PI		1141

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₁₂N₂⁺						
C ₄ H ₁₂ N ₂ ⁺	(C ₂ H ₅) ₂ N ₂ H ₂ (1,1-Diethylhydrazine)		7.59 ± 0.05	PI	184	1141
C ₄ H ₁₂ N ₂ ⁺	(CH ₃) ₄ N ₂		7.76 ± 0.05	SL	196*	424
C₅H₆N₂⁺						
C ₅ H ₆ N ₂ ⁺	C ₅ H ₄ NNH ₂ (4-Aminopyridine)		8.97 ± 0.05	SL	244*	217
C₅H₁₂N₂⁺						
C ₅ H ₁₂ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	H ₂	8.0 ± 0.2	PI	188	1141
C ₅ H ₁₂ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	H ₂	10.6 ± 0.1	PI		1141
C₅H₁₃N₂⁺						
C ₅ H ₁₃ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	H	8.0 ± 0.3	PI	136	1141
C ₅ H ₁₃ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	H	10.4 ± 0.1	PI		1141
C ₅ H ₁₃ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)	H	11.3 ± 0.1	PI		1141
C₅H₁₄N₂⁺						
C ₅ H ₁₄ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)		7.62 ± 0.05	PI	180	1141, 2173
C ₅ H ₁₄ N ₂ ⁺	n-C ₄ H ₉ (CH ₃)N ₂ H ₂ (1-Methyl-1-n-butylhydrazine)		10.6 ± 0.1	PI		1141
C₆H₈N₂⁺						
C ₆ H ₈ N ₂ ⁺	C ₆ H ₄ (NH ₂) ₂ (o-Benzenediamine)		8.00	SL	214	1066
C ₆ H ₈ N ₂ ⁺	C ₆ H ₄ (NH ₂) ₂ (m-Benzenediamine)		7.96	SL	214	1066
C ₆ H ₈ N ₂ ⁺	C ₆ H ₄ (NH ₂) ₂ (p-Benzenediamine)		7.58	SL	205	1066
C ₆ H ₈ N ₂ ⁺	C ₆ H ₅ N ₂ H ₃ (Phenylhydrazine)		7.64 ± 0.02	PI	233	1166
C₁₀H₁₆N₂⁺						
C ₁₀ H ₁₆ N ₂ ⁺	(CH ₃) ₂ NC ₆ H ₄ N(CH ₃) ₂ (p-bis(Dimethylamino)benzene)		6.9	CTS	180*	2037
CHN₃⁺²						
CHN ₃ ⁺²	CH ₃ N ₃	2H?	34	SL	737	340
CH₃N₃⁺						
CH ₃ N ₃ ⁺	CH ₃ N ₃		9.5 ± 0.1	SL	276*	340

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₀H₁₅BH₂⁺2						
C ₁₀ H ₁₅ BN ₂ ⁺ 2	C ₁₀ H ₁₅ BN ₂ (1,3-Dimethyl-2-phenyl-1,3,2-diazaborolidine)		23.5 ± 1	NS		1418
C₆H₁₈BN₃⁺2						
C ₆ H ₁₈ BN ₃ ⁺ 2	C ₆ H ₁₈ BN ₃ (tris(Dimethylamino)borane)		21 ± 1	NS		1418
O^{+(4S_{3/2}) Heat of formation 374 kcal mol⁻¹} O^{+(2D)} O^{+(2P)}						
O ^{+(4S_{3/2})}	O		13.618	S	374*	2113
O ⁺	O		13.90 ± 0.2	LE	380	79
O ⁺	O		13.9 ± 0.2	LE	380	2021
O ⁺	O		13.6 ± 0.5	LE	373	2128
O ⁺	O		13.7 ± 0.5	LE	375	2130
O ^{+(2D)}	O		16.94	S	450*	2113
O ^{+(2P)}	O		18.64	S	489*	2113
O ⁺	O ₂	O ⁻	17.3 ± 0.10	RPD	375	288
O ⁺	O ₂	O ⁻	17.2	RPD	372	200
O ⁺	O ₂	O ⁻	17.25 ± 0.1	FPD	374	2014
O ⁺	O ₂	O ⁻	17.1 ± 0.2	LE	370	79
O ⁺	O ₂	O ⁻	17.264 ± 0.009	D	374	6
O ^{+(2D)}	O ₂	O ⁻	20.7 ± 0.4	PI	453	163
O ^{+(2D)}	O ₂	O ⁻	20.4 ± 0.1	FDP	446	2014
O ^{+(2D)}	O ₂	O ⁻	20.3 ± 0.2	LE	444	79
O ⁺	O ₂	O ⁻	21.30 ± 0.03	RPD		288
O ⁺	O ₂	O ⁻	19.7 ± 0.1	FDP		2014
O ⁺	O ₂	O	18.8 ± 0.4	PI	374	163
O ⁺	O ₂	O	18.99 ± 0.05	RPD	378	288
O ⁺	O ₂	O	18.8 ± 0.1	FDP	374	2014
O ⁺	O ₂	O	18.9 ± 0.2	LE	376	79
O ⁺	O ₂	O	20.42 ± 0.04	RPD		288
O ⁺	O ₂	O(¹ D)	20.55 ± 0.1	FDP	369	2014
O ⁺	O ₂	O	22.03 ± 0.03	RPD		288
O ^{+(2D)}	O ₂	O	22.0 ± 0.1	FDP	448	2014
O ⁺	O ₂	O(¹ S)	23.4 ± 0.5	PI	383	163
O ⁺	H ₂ O ₂		17.0 ± 1.0	LE		37
O ⁺	H ₂ O ₂		28.3 ± 1.0	LE		37
O ⁺	CO	C ⁻	23.41 ± 0.17	RPD		2180, 2191
O ⁺	CO	C ⁻	23.7	RPD		200
O ⁺	CO	C ⁻	23.6 ± 0.2	FDP		1378
O ⁺	CO	C ⁻	24.78 ± 0.23	RPD	374	2180, 2191

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
O ⁺	CO ₂	CO	19.2 ± 0.3	PI	375	163
O ⁺	CO ₂	CO	19.0 ± 0.3	LE	371	2021
O ⁺	CO ₂	CO?	20.3 ± 0.2	PI		163
O ⁺	CO ₂	CO?	20.3 ± 0.4	LE		2021
O ^{+(2D)}	CO ₂	CO	22.3 ± 0.4	PI	447	163
O ^{+(2D)}	CO ₂	CO	22.4 ± 0.6	LE	449	2021
O ^{+(2P)}	CO ₂	CO	24.6 ± 0.3	LE	500	2021
O ⁺	NO	N	19.5 ± 0.2	PI	358	163
O ⁺	NO	N	20.11 ± 0.03	RPD	372	328
O ⁺	NO	N	20.3 ± 0.5	LE	377	2021
O ⁺	NO	N(2D)	20.7 ± 0.5	PI	331	163
O ⁺	N ₂ O	N ₂	15.3 ± 0.4	PI	372	163
O ⁺	N ₂ O	N ₂	15.33 ± 0.02	SL	373	58
O ⁺	N ₂ O	N ₂	15.4 ± 0.1	MSD	375	1451
O ⁺	NO ₂	NO	17.6 ± 0.2	PI	392	163
O ⁺	NO ₂	NO	17.0	RPD	378	2018
O ⁺	NO ₂	NO	17.7	RPD		2018
O ⁺	NO ₂	NO	18.9	RPD		2018
O ⁺	NO ₂	NO	18.4 ± 0.5	LE	411	2021
O ^{+(2D)}	NO ₂	NO	20.5 ± 0.2	PI	459	163
O ^{+(2D)}	NO ₂	NO	20.3	RPD	454	2018
O ⁺	NO ₂	N + O	24.2 ± 1	LE	393	2021
O ⁺	CH ₂ NO ₂		14.50 ± 0.16	VC		90
O ⁺	SO ₂	SO	20.6	SL		418
O ⁺	ClO ₃ F		22 ± 1	SL		53
O ⁺	POCl ₃		13 ± 2	NS		1101

O₂⁺ (X ²Π_g) Heat of formation 278 kcal mol⁻¹

O₂⁺ (a ⁴Π_u) 371 kcal mol⁻¹

O₂⁺ (A ²Π_u) 388 kcal mol⁻¹

O₂⁺ (b ⁴Σ_g⁻) 419 kcal mol⁻¹

O ₂ ⁺ (X ² Π _g)	O ₂	12.063 ± 0.001	PI	278*	2048
O ₂ ⁺ (X ² Π _g)	O ₂	12.065 ± 0.003	PI	278*	1032
O ₂ ⁺ (X ² Π _g)	O ₂	12.078 ± 0.005	PI	279*	2013
O ₂ ⁺ (X ² Π _g)	O ₂	12.075 ± 0.01	PI	278*	182, 416
O ₂ ⁺ (X ² Π _g)	O ₂	12.1 ± 0.1	PI	279	230
O ₂ ⁺ (X ² Π _g)	O ₂	12.2 ± 0.3	PI	281	163
O ₂ ⁺ (X ² Π _g)	O ₂	12.10	PE	279	1108
O ₂ ⁺ (X ² Π _g)	O ₂	12.04 ± 0.02	EM	278	1094
O ₂ ⁺ (X ² Π _g)	O ₂	12.20 ± 0.05	EM	281	116
O ₂ ⁺ (X ² Π _g)	O ₂	12.21 ± 0.04	RPD	282	287, 288
O ₂ ⁺ (X ² Π _g)	O ₂	12.20	RPD	281	119
O ₂ ⁺ (X ² Π _g)	O ₂	12.15 ± 0.1	SL	280	31
O ₂ ⁺ (X ² Π _g)	O ₂	12.31 ± 0.1	SL	284	364
O ₂ ⁺ (X ² Π _g)	O ₂	12.2	VC	281	2136
O ₂ ⁺ (X ² Π _g)	O ₂	12.45 ± 0.10	CS	287	383
O ₂ ⁺ (X ² Π _g)	O ₂	12.23 ± 0.07	LE	282	79
O ₂ ⁺ (X ² Π _g)	O ₂	12.16 ± 0.08	LE	280	1029
O ₂ ⁺ (X ² Π _g)	O ₂	12.23 ± 0.08	LE	282	3
O ₂ ⁺ (X ² Π _g)	O ₂	12.5 ± 0.3	NS	288	2188
O ₂ ⁺ (X ² Π _g)	O ₂	12.5	EC	288	218

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
O ₂ ⁺	O ₂		13.1	RPD		119
(Autoionization)						
O ₂ ⁺	O ₂		13.6	RPD		119
(Autoionization)						
O ₂ ⁺	O ₂		14.3 ± 0.5	PI		163
(Autoionization)						
O ₂ ^{+(a⁴Π_u)}	O ₂		16.1060	S	371*	2099
O ₂ ^{+(a⁴Π_u)}	O ₂		15.9 ± 0.2	PI	367	163
O ₂ ^{+(a⁴Π_u)}	O ₂		16.26	PE	375	1108
O ₂ ^{+(a⁴Π_u)}	O ₂		16.42	PE	379	1130
O ₂ ^{+(a⁴Π_u)}	O ₂		16.24 ± 0.03	EM	375	116
O ₂ ^{+(a⁴Π_u)}	O ₂		16.30 ± 0.03	RPD	376	287, 288
O ₂ ^{+(a⁴Π_u)}	O ₂		16.2	RPD	374	119
O ₂ ^{+(a⁴Π_u)}	O ₂		15.7 ± 0.5	LE	362	79
O ₂ ^{+(A²Π_u)}	O ₂		16.8261	S	388*	2099
O ₂ ^{+(A²Π_u)}	O ₂		16.9 ± 0.3	PI	390	163
O ₂ ^{+(A²Π_u)}	O ₂		17.12 ± 0.04	EM	395	116
O ₂ ^{+(A²Π_u)}	O ₂		17.18 ± 0.02	RPD	396	287, 288
O ₂ ^{+(A²Π_u)}	O ₂		17.1	RPD	394	119
O ₂ ^{+(A²Π_u)}	O ₂		17.0	VC	392	2136
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		18.1724 ± 0.0006	S	419*	2099
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		18.8 ± 0.4	PI	434	163
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		17.99	PE	415	1130
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		18.18	PE	419	1108
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		18.40 ± 0.03	EM	424	116
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		18.42 ± 0.02	RPD	425	287, 288
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		18.1	RPD	417	119
O ₂ ^{+(b⁴Σ_g⁻)}	O ₂		18.0 ± 0.5	LE	415	79
O ₂ ⁺	O ₂		20.12	PE	464	1130
O ₂ ⁺	O ₂		20.31	PE	468	1108
O ₂ ⁺	O ₂		21.2 ± 0.4	PI	489	163
O ₂ ⁺	O ₂		21.29 ± 0.04	EM	491	116
O ₂ ⁺	O ₂		21.34 ± 0.02	RPD	492	287, 288
O ₂ ⁺	H ₂ O ₂	H ₂	15.8 ± 0.5	LE	332	37
O ₂ ⁺	H ₂ O ₂	2H	20.5 ± 0.5	LE	336	37
O ₂ ⁺	SO ₂	S	17.5 ± 0.3	SL	266	418
O ₂ ⁺	ClO ₃ F		15 ± 1	SL		54

O₃⁺ Heat of formation 318 kcal mol⁻¹

O ₃ ⁺	O ₃		11.7?	PI	304	416
O ₃ ⁺	O ₃		12.3 ± 0.1	PE	318*	1441
O ₃ ⁺	O ₃		12.52 ± 0.05	PE		1441
O ₃ ⁺	O ₃		13.52 ± 0.05	PE		1441
O ₃ ⁺	O ₃		16.9 ± 0.5	PE		1441
O ₃ ⁺	O ₃		19.24 ± 0.1	PE		1441
O ₃ ⁺	O ₃		12.89 ± 0.10	RPD	331	20
O ₃ ⁺	O ₃		12.80 ± 0.05	EVD	329	77

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
OH⁺ Heat of formation 312 kcal mol⁻¹						
HO ⁺	OH		13.17 ± 0.1	SL	313*	67
HO ⁺	H ₂ O	H	18.3 ± 0.2	PI	312*	427
HO ⁺	H ₂ O	H	18.59 ± 0.08	SL	319	2066
HO ⁺	H ₂ O	H	18.19	SL	310	67
HO ⁺	H ₂ O ₂	OH	15.60 ± 0.08	SL	318	2066
HO ⁺	H ₂ O ₂	OH	15.35 ± 0.10	SL	312	37
HO ⁺	CH ₃ COOH		15.1	SL		298
H₂O⁺ Heat of formation 233 kcal mol⁻¹						
H ₂ O ⁺	H ₂ O		12.614 ± 0.005	PI	233*	2013
H ₂ O ⁺	H ₂ O		12.597 ± 0.010	PI	233*	1253
H ₂ O ⁺	H ₂ O		12.59 ± 0.01	PI	233*	182, 416
H ₂ O ⁺	H ₂ O		12.62 ± 0.02	PI	233*	1103
H ₂ O ⁺	H ₂ O		12.5 ± 0.1	PI	230	230
H ₂ O ⁺	H ₂ O		12.6 ± 0.1	PI	233	427
H ₂ O ⁺	H ₂ O		12.61	PE	233	1130
H ₂ O ⁺	H ₂ O		12.60 ± 0.01	RPD	233	463
H ₂ O ⁺	H ₂ O		12.59 ± 0.05	RPD	233	1372
H ₂ O ⁺	H ₂ O		12.63	RPD	233	97
H ₂ O ⁺	H ₂ O		12.6	RPD	233	2060
H ₂ O ⁺	H ₂ O		12.69 ± 0.08	SL	235	2066
H ₂ O ⁺	H ₂ O		12.67	VC	234	2136
H ₂ O ⁺	H ₂ O		14.23	PE		1130
H ₂ O ^{+(2A₁)}	H ₂ O		14.35 ± 0.03	RPD	273	463
H ₂ O ⁺	H ₂ O		14.2	RPD		2060
H ₂ O ^{+(2B₂)}	H ₂ O		16.34 ± 0.06	RPD	319	463
H ₂ O ⁺	H ₂ O		16.2	RPD		2060
H ₂ O ⁺	H ₂ O		18.02	PE		1130
H ₂ O ⁺	H ₂ O		20.3 ± 0.4	PI		427
H ₂ O ⁺	H ₂ O ₂	O	14.09 ± 0.10	SL	233	37
D₂O⁺ Heat of formation 232 kcal mol⁻¹						
D ₂ O ⁺	D ₂ O		12.637 ± 0.005	PI	232*	2013
D ₂ O ⁺	D ₂ O		12.69	PE	233	1130
D ₂ O ⁺	D ₂ O		14.28	PE		1130
D ₂ O ⁺	D ₂ O		18.07	PE		1130
H₃O⁺						
H ₃ O ⁺	C ₂ H ₅ OH	C ₂ H ₃	12.01 ± 0.1	NS	156	339
H ₃ O ⁺	n-C ₃ H ₇ OH	C ₃ H ₃ + H ₂	12.66 ± 0.1	NS	155	339
H ₃ O ⁺	iso-C ₃ H ₇ OH	C ₂ H ₂ + CH ₃	13.44 ± 0.1	NS	157	339
H ₃ O ⁺	sec-C ₄ H ₉ OH	C ₂ H ₂ + C ₂ H ₅	13.36 ± 0.1	NS	158	339
H ₃ O ⁺	(C ₂ H ₅) ₂ O	C ₂ H ₂ + C ₂ H ₅	13.18 ± 0.1	NS	164	339
H ₃ O ⁺	n-C ₃ H ₇ CH(OH)CH ₃	n-C ₃ H ₇ + C ₂ H ₂	13.36 ± 0.1	NS	156	339
H ₃ O ⁺	iso-C ₃ H ₇ CH(OH)CH ₃	iso-C ₃ H ₇ + C ₂ H ₂	13.18 ± 0.1	NS	156	339
H ₃ O ⁺	HCOOC ₂ H ₅	C ₂ H ₂ + HCO	13.10 ± 0.1	NS	163	339
H ₃ O ⁺	HCOOCH(CH ₃) ₂	C ₂ H ₂ + CO + CH ₃	13.75 ± 0.1	NS	159	339
HO₂⁺ Heat of formation 271 kcal mol⁻¹						
HO ₂ ⁺	HO ₂		11.53 ± 0.02	SL	271*	36, 31
HO ₂ ⁺	H ₂ O ₂	H	15.36 ± 0.05	SL	270*	36, 37
HO ₂ ⁺	H ₂ O ₂	H	15.41 ± 0.1	SL	271*	31

TABLE I. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
H₂O₂⁺ Heat of formation 223 kcal mol⁻¹						
H ₂ O ₂ ⁺	H ₂ O ₂		11.26 ± 0.05	SL	227*	2066
H ₂ O ₂ ⁺	H ₂ O ₂		10.92 ± 0.05	VC	219*	37
Li₂O⁺ Heat of formation 118 kcal mol⁻¹						
Li ₂ O ⁺	Li ₂ O		6.8 ± 0.2	VC	117*	318
Li ₂ O ⁺	Li ₂ O		6.9 ± 0.3	LE	119*	1112
BeO⁺						
BeO ⁺	BeO		10.1 ± 0.4	VC	264	1106
Be₂O⁺						
Be ₂ O ⁺	Be ₂ O		10.5 ± 0.5	VC	224	1106
Be₂O₂⁺						
Be ₂ O ₂ ⁺	Be ₂ O ₂		11.1 ± 0.4	VC	154	1106
Be₃O₂⁺						
Be ₃ O ₂ ⁺	Be ₃ O ₂		12.5 ± 1.0	VC		1106
Be₃O₃⁺						
Be ₃ O ₃ ⁺	Be ₃ O ₃		10.7 ± 0.4	VC	— 13	1106
BO₂⁺						
BO ₂ ⁺	(CH ₃ O) ₃ B	CH ₃ O + 2CH ₃	17.5 ± 0.3	EVD	123	115
BO₃⁺						
BO ₃ ⁺	(CH ₃ O) ₃ B	3CH ₃	13.2 ± 0.3	EVD	— 10	115
BO ₃ ⁺	(CH ₃ O) ₃ B	3CH ₃	12.7 ± 1.0	SL	— 22	364
CO^{+(X 2Σ⁺) Heat of formation 297 kcal mol⁻¹}						
CO^{+(A 2Π_i) 355 kcal mol⁻¹}						
CO^{+(B 2Σ⁺) 427 kcal mol⁻¹}						
CO ^{+(X 2Σ⁺)}	CO		14.013 ± 0.004	S	297*	2098
CO ^{+(X 2Σ⁺)}	CO		13.985	PI	296	1382
CO ^{+(X 2Σ⁺)}	CO		14.01 ± 0.01	PI	297	416
CO ^{+(X 2Σ⁺)}	CO		13.9 ± 0.2	PI	294	163
CO ^{+(X 2Σ⁺)}	CO		13.98	PE	296	1108
CO ^{+(X 2Σ⁺)}	CO		14.01	PE	297	1130
CO ^{+(X 2Σ⁺)}	CO		14.11 ± 0.03	RPD	299	1012
CO ^{+(X 2Σ⁺)}	CO		14.15 ± 0.02	CS	300	2023
CO ^{+(X 2Σ⁺)}	CO		14.2 ± 0.1	FDP	301	1051, 1172
CO ^{+(X 2Σ⁺)}	CO		14.01 ± 0.08	LE	297	3
CO ^{+(X 2Σ⁺)}	CO		14.06 ± 0.08	LE	298	1029
CO ⁺ (Autoionization)	CO		15.5 ± 0.2	PI		163
CO ⁺ (Autoionization)	CO		15.6 ± 0.1	RPD		1012

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CO ⁺ (A $^2\Pi_i$)	CO		16.537 ± 0.004	S	355*	2098
CO ⁺ (A $^2\Pi_i$)	CO		16.6 ± 0.3	PI	356	163
CO ⁺ (A $^2\Pi_i$)	CO		16.51	PE	354	1130
CO ⁺ (A $^2\Pi_i$)	CO		16.58	PE	356	1108
CO ⁺ (A $^2\Pi_i$)	CO		16.5 ± 0.1	RPD	354	1012
CO ⁺ (Autoionization)	CO		18.4 ± 0.3	PI		163
CO ⁺ (Autoionization)	CO		18.4 ± 0.1	RPD		1012
CO ⁺ (B $^2\Sigma^+$)	CO		19.671 ± 0.004	S	427*	2098
CO ⁺ (B $^2\Sigma^+$)	CO		20.1 ± 0.2	PI	437	163
CO ⁺ (B $^2\Sigma^+$)	CO		19.67	PE	427	1108
CO ⁺ (B $^2\Sigma^+$)	CO		19.72	PE	428	1130
CO ⁺ (B $^2\Sigma^+$)	CO		19.6 ± 0.1	RPD	426	1012
CO ⁺	CO		25.7 ± 0.5	PI		163
CO ⁺	CO ₂	O ⁻	19.5 ± 0.2	PI	331	163
CO ⁺	CO ₂	O	20.5 ± 0.2	PI	319	163
CO ⁺	CO ₂	O(¹ D)	23.3 ± 1.0	PI	338	163
CO ⁺	CH ₂ O	2H?	18.7 ± 0.2	EVD	299	204
CO ⁺	CD ₂ O	2D?	18.8 ± 0.3	EVD		204
CO ⁺	CH ₃ OH		13.7	LE		46
CO ⁺	CH ₃ CHO	CH ₄	13.9 ± 0.1	MSD	299	1404
CO ⁺ (Ethylene oxide)	C ₂ H ₄ O	CH ₄	12.6 ± 0.4	EVD	296	50
CO⁺²						
CO ⁺²	CO ⁺ (C $^2\Sigma^+$)		15.9 ± 0.7	NS		2016
CO ⁺²	CO ⁺ (A $^2\Pi_i$)		25.0 ± 0.4	NS	932	2016
CO ⁺²	CO		41.8 ± 0.3	FDP	938	212
CO ⁺²	CO		45.9	FDP		212

CO₂⁺(X $^2\Pi_{3/2g}$) Heat of formation 223 kcal mol⁻¹
CO₂⁺(X $^2\Pi_{1/2g}$) 224 kcal mol⁻¹
CO₂⁺(A $^2\Pi_{3/2u}$) 305 kcal mol⁻¹
CO₂⁺(B $^2\Sigma_u^+$) 323 kcal mol⁻¹
CO₂⁺(C $^2\Sigma_g^+$) 353 kcal mol⁻¹

CO ₂ ⁺ (X $^2\Pi_{3/2g}$)	CO ₂	13.769 ± 0.03	S	223*	148
CO ₂ ⁺ (X $^2\Pi_{1/2g}$)	CO ₂	13.792 ± 0.03	S	224*	148
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.788	S	224	149
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.793	S	224	148
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.78 ± 0.01	S	224	410
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.79 ± 0.01	PI	224	182, 416
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.6 ± 0.2	PI	220	163
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	14.0 ± 0.3	PI	229	230
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.68	PE	221	92, 1130
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.85 ± 0.10	RPD	225	164, 169
CO ₂ ⁺ (X $^2\Pi_g$)	CO ₂	13.78 ± 0.08	LE	224	3, 1029
CO ₂ ⁺ (Autoionization)	CO ₂	14.9 ± 0.2	PI		163

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CO ₂ ⁺ (A ² Π _{3/2u})	CO ₂		17.312	S	305*	1179
CO ₂ ⁺ (A ² Π _{1/2u})	CO ₂		17.323	S	305*	1179
CO ₂ ⁺ (A ² Π _u)	CO ₂		17.0 ± 0.2	PI	298	163
CO ₂ ⁺ (A ² Π _u)	CO ₂		17.23	PE	303	1130
CO ₂ ⁺ (A ² Π _u)	CO ₂		17.27	PE	304	92
CO ₂ ⁺ (A ² Π _u)	CO ₂		17.23 ± 0.28	RPD	303	164, 169
CO ₂ ⁺ (B ² Σ _u ⁺)	CO ₂		18.068	S	323*	149
CO ₂ ⁺ (B ² Σ _u ⁺)	CO ₂		18.074	S	323*	148
CO ₂ ⁺ (B ² Σ _u ⁺)	CO ₂		18.076	S	323*	1179
CO ₂ ⁺ (B ² Σ _u ⁺)	CO ₂		18.084	S	323*	148
CO ₂ ⁺ (B ² Σ _u ⁺)	CO ₂		18.01 ± 0.01	S	321	409
CO ₂ ⁺ (B ² Σ _u ⁺)	CO ₂		18.08 ± 0.01	S	323*	409, 410
CO ₂ ⁺ (B ² Σ _u ⁺)	CO ₂		18.08	PE	323	92, 1130
CO ₂ ⁺	CO ₂		18.8 ± 0.3	PI		163
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.384	S	353*	148
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.391	S	353*	148
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.392	S	353*	148
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.38 ± 0.01	S	353*	409
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.39 ± 0.01	S	353*	409, 410
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.38	S	353*	149
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.29	PE	351	92, 1130
CO ₂ ⁺ (C ² Σ _g ⁺)	CO ₂		19.25 ± 0.40	RPD	350	164, 169
CO ₂ ⁺	CO ₂		20.5 ± 0.2	PI	379	163
CO ₂ ⁺	CO ₂		21.00 ± 0.39	RPD	390	164, 169

CO₂⁺2

CO ₂ ⁺²	CO ₂	36.4 ± 0.3	FDP	745	212
CO ₂ ⁺²	CO ₂	41.9	FDP		212

NO⁺(X ¹Σ⁺) Heat of formation 235 kcal mol⁻¹
NO^{+(a ³Σ⁺) 349 kcal mol⁻¹}
NO^{+(β series limit) 403 kcal mol⁻¹}
NO^{+(A ¹Π) 444 kcal mol⁻¹}

NO ^{+(X ¹Σ_{3/2}⁺)}	NO	9.250 ± 0.005	PI	235*	1032, 1253
NO ^{+(X ¹Σ_{3/2}⁺)}	NO	9.248 ± 0.008	D	235*	1148
NO ^{+(X ¹Σ_{1/2}⁺)}	NO	9.267 ± 0.005	S	235*	1217
NO ^{+(X ¹Σ_{1/2}⁺)}	NO	9.266 ± 0.008	S	235*	1148
NO ^{+(X ¹Σ⁺)}	NO	9.25 ± 0.02	PI	235	416
NO ^{+(X ¹Σ^{+) NO}}		9.20 ± 0.03	PI	234	157
NO ^{+(X ¹Σ^{+) NO}}		9.25 ± 0.03	PI	235	86
NO ^{+(X ¹Σ^{+) NO}}		9.2 ± 0.1	PI	234	163
NO ^{+(X ¹Σ^{+) NO}}		9.23	PE	234	1108
NO ^{+(X ¹Σ^{+) NO}}		9.34	PE	237	1130
NO ^{+(X ¹Σ^{+) NO}}		9.25	PE	235	1415
NO ^{+(X ¹Σ^{+) NO}}		9.25 ± 0.02	RPD	235	328
NO ⁺ (Autoionization)	NO	11.4 ± 0.1	PI		163
NO ⁺ (Autoionization)	NO	12.8 ± 0.2	PI		163
NO ^{+(a ³Σ^{+) NO}}		14.218 ± 0.006	S	349*	1217
NO ^{+(a ³Σ^{+) NO}}		14.2 ± 0.2	PI	349	163

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
NO ⁺	NO		15.23	PE	373	1130
NO ⁺	NO		15.4	PE	377	1108
NO ⁺	NO		15.5	PE	379	1415
NO ⁺	NO (β Rydberg series limit)		16.558 ± 0.001	S	403*	1217
NO ⁺	NO (β Rydberg series limit)		16.9 ± 0.4	PI	411	163
NO ⁺	NO (β Rydberg series limit)		16.53	PE	403	1108
NO ⁺	NO (β Rydberg series limit)		16.5	PE	402	1130, 1415
NO ^{+(A'II)}	NO		18.328 ± 0.005	S	444*	1217
NO ^{+(A'II)}	NO		18.8 ± 0.3	PI	455	163
NO ^{+(A'II)}	NO		18.27	PE	443	1130
NO ^{+(A'II)}	NO		18.34	PE	445	1108
NO ⁺	NO		20.7 ± 0.4	PI	499	163
NO ⁺	N ₂ O	N	15.3 ± 0.4	PI	259	163
NO ⁺	N ₂ O	N(² D)	16.4 ± 0.2	PI	230	163
NO ⁺	NO ₂	O ⁻	10.83 ± 0.02	PI	233	117
NO ⁺	NO ₂	O ⁻	11.3 ± 0.4	PI	244	163
NO ^{+(A'II)}	NO ₂	O ⁻	20.3 ± 0.3	PI	452	163
NO ⁺	NO ₂	O	12.5 ± 0.1	PI	237	163
NO ⁺	NO ₂	O	12.48 ± 0.43	EVD	236	139
NO ⁺	NO ₂	O(¹ D)	15.3 ± 0.4	PI	256	163
NO ⁺	NO ₂	O(¹ S)	16.5 ± 0.2	PI	232	163
NO ^{+(a'3Σ⁺)}	NO ₂	O	17.7 ± 0.3	PI	357	163
NO ⁺	CH ₃ ONO	CH ₃ O	11.07 ± 0.06	RPD	239	1139

NO⁺²

NO ⁺²	NO	39.8 ± 0.3	FDP	939	212
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N₂O^{+(X'2Π_{3/2}) Heat of formation 317 kcal mol⁻¹}
N₂O^{+(X'2Π_{1/2}) 318 kcal mol⁻¹}
N₂O^{+(2Σ⁺) 398 kcal mol⁻¹}
N₂O^{+(C) 483 kcal mol⁻¹}

N ₂ O ^{+(X'2Π_{3/2})}	N ₂ O	12.894	S	317*	149
N ₂ O ^{+(X'2Π_{1/2})}	N ₂ O	12.931	S	318*	149
N ₂ O ^{+(X'2Π)}	N ₂ O	12.94 ± 0.01	S	318	410
N ₂ O ⁺	N ₂ O	12.82 ± 0.008	PI	317	1253
N ₂ O ⁺	N ₂ O	12.90 ± 0.01	PI	317	416
N ₂ O ⁺	N ₂ O	12.83 ± 0.07	PI	315	157
N ₂ O ⁺	N ₂ O	12.8 ± 0.2	PI	315	163
N ₂ O ⁺	N ₂ O	12.82	PE	315	92, 1130
N ₂ O ⁺	N ₂ O	12.75	RPD	314	2018
N ₂ O ⁺	N ₂ O	13.09 ± 0.05	SL	321	58
N ₂ O ⁺	N ₂ O	12.9 ± 0.1	MSD	317	1451
N ₂ O ⁺	N ₂ O	13.15	RPD		2018
N ₂ O ⁺	N ₂ O	13.75	RPD		2018
N ₂ O ⁺	N ₂ O	15.37?	PE		1130
N ₂ O ⁺	N ₂ O	15.5	RPD		2018

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
N ₂ O+(² Σ ⁺)	N ₂ O		16.392	S	398*	149
N ₂ O+(² Σ ⁺)	N ₂ O		16.397	S	398*	149
N ₂ O+(² Σ ⁺)	N ₂ O		16.39 ± 0.01	S	398*	409, 410
N ₂ O ⁺	N ₂ O		16.9 ± 0.3	PI	409	163
N ₂ O ⁺	N ₂ O		16.37	PE	397	92, 1130
N ₂ O ⁺	N ₂ O		17.67	PE		92, 1130
N ₂ O ⁺	N ₂ O		18.8 ± 0.4	PI		163
N ₂ O+(C)	N ₂ O		20.101	S	483*	149
N ₂ O+(C)	N ₂ O		20.110	S	483*	149
N ₂ O+(C)	N ₂ O		20.10 ± 0.01	S	483*	409, 410
N ₂ O ⁺	N ₂ O		20.7 ± 0.3	PI	497	163
N ₂ O ⁺	N ₂ O		20.10	PE	483	92, 1130

NO₂⁺ Heat of formation 233 kcal mol⁻¹

NO ₂ ⁺	NO ₂		9.78 ± 0.05	PI	233*	117
NO ₂ ⁺	NO ₂		9.80 ± 0.05	PI	234*	61
NO ₂ ⁺	NO ₂		10.2	RPD	243	2018
NO ₂ ⁺	NO ₂		11.1	PI	264	61
NO ₂ ⁺	NO ₂		10.97	PE	261	1130
NO ₂ ⁺	NO ₂		11.0	RPD	262	2018
NO ₂ ⁺	NO ₂		11.3 ± 0.4	PI	269	163
NO ₂ ⁺	NO ₂		11.27 ± 0.19	NS	268	139
NO ₂ ⁺	NO ₂		11.3	EC	269	218
NO ₂ ⁺	NO ₂		11.62	S	276	117
NO ₂ ⁺	NO ₂		11.7?	PI	278	416
NO ₂ ⁺	NO ₂		11.7	RPD	278	2018
NO ₂ ⁺	NO ₂		12.5 ± 0.1	PI	296	163
NO ₂ ⁺	NO ₂		12.7	PI	301	61
NO ₂ ⁺	NO ₂		12.82	PE	304	1130
NO ₂ ⁺	NO ₂		12.5	RPD	296	2018
NO ₂ ⁺	NO ₂		13.4 ± 0.1	PI	317	163
NO ₂ ⁺	NO ₂		13.48	PE	319	1130
NO ₂ ⁺	NO ₂		14.01?	PE	331	1130
NO ₂ ⁺	NO ₂		13.98 ± 0.12	SL	330	58
NO ₂ ⁺	NO ₂		14.37?	PE	339	1130
NO ₂ ⁺	NO ₂		15.3 ± 0.4	PI	361	163
NO ₂ ⁺	NO ₂		16.2 ± 0.2	PI	382	163
NO ₂ ⁺	NO ₂		16.79	PE	395	1130
NO ₂ ⁺	NO ₂		17.8 ± 0.3	PI	418	163
NO ₂ ⁺	NO ₂		18.87 ± 0.05	S	443	1097
NO ₂ ⁺	NO ₂		18.86	PE	443	1130
NO ₂ ⁺	NO ₂		20.0 ± 0.3	PI	469	163

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
NO ₂ ⁺	CH ₃ NO ₂	CH ₃	12.60 ± 0.10	RPD	240	1241
NO ₂ ⁺	CH ₃ NO ₂	CH ₃	16.90	RPD		1241
NO ₂ ⁺	C ₂ H ₅ ONO ₂	C ₂ H ₅ O	11.40 ± 0.12	SL	235	1004, 1013
B₃H₂O₃⁺						
B ₃ H ₂ O ₃ ⁺	B ₃ H ₃ O ₃	H	14.5 ± 0.5	NS	— 7	2175
B₃H₃O₃⁺						
B ₃ H ₃ O ₃ ⁺	B ₃ H ₃ O ₃		13.5 ± 0.5	NS	22	2175
CHO⁺ Heat of formation 221 kcal mol⁻¹						
CHO ⁺	CHO		10.03 ± 0.17	EVD	227	128
CHO ⁺	CHO		9.83 ± 0.18	EVD	223*	128
CHO ⁺	CHO		9.9 ± 0.3	EVD	224	127
CHO ⁺	CH ₂ O	H	13.10 ± 0.08	EVD	222*	127, 204
CHO ⁺	CH ₂ O	H	12.89 ± 0.10	EVD	217*	127
CHO ⁺	CH ₂ O	H	18.4 ± 0.3	LE		204
CHO ⁺	CH ₃ OH	H ₂ + H	14.2	LE	227	46
CHO ⁺	CH ₃ CHO	CH ₃	12.88 ± 0.10	EVD	224*	130
CHO ⁺	CH ₃ CHO	CH ₃	12.70	SL	220*	298
CHO ⁺	C ₂ H ₄ O (Ethylene oxide)	CH ₃	12.2 ± 0.1	EVD	236	50
CHO ⁺	CH ₂ =CHCHO	C ₂ H ₃	13.99 ± 0.10	EVD	235	130
CHO ⁺	C ₃ H ₆ O (Propylene oxide)	C ₂ H ₅	11.8 ± 0.2	EVD	225	50
CHO ⁺	(CH ₂) ₃ O (Trimethylene oxide)	C ₂ H ₅	12.6 ± 0.2	EVD	242	52
CHO ⁺	C ₄ H ₆ O (3,4-Epoxy-1-butene)		12.9 ± 0.6	EVD		153
CHO ⁺	C ₆ H ₅ CHO (Benzaldehyde)	C ₆ H ₅	13.67 ± 0.13	EVD	233	130
CHO ⁺	C ₆ H ₅ CHO (Benzaldehyde)	C ₆ H ₅	13.71 ± 0.14	EVD	234	127
CHO ⁺	HCOOH	OH	13.75 ± 0.08	EVD	217*	127
CHO ⁺	CHOCHO	CHO	12.72 ± 0.12	EVD	223*	128
CHO ⁺	CHOCHO	CHO	13.75 ± 0.08	EVD		128
CHO ⁺	CH ₃ COCHO	CH ₃ CO	12.48 ± 0.05	EVD	226	128
CHO ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)		14.4 ± 0.2	EVD		153
CHO ⁺	(CH ₃ O) ₃ B		19.1 ± 0.3	EVD		115
CHO ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	C ₂ H ₄ Cl	12.0 ± 0.5	EVD	231	153
CHO ⁺	C ₃ H ₅ OB _r (Epibromohydrin)	C ₂ H ₄ Br	11.8 ± 0.2	EVD	226	153
CDO⁺						
CDO ⁺	CD ₂ O	D	13.10 ± 0.12	EVD		127, 204
CDO ⁺	CD ₂ O	D	18.8 ± 0.3	LE		204
CH₂O⁺ Heat of formation 223 kcal mol⁻¹						
CH ₂ O ⁺	CH ₂ O		10.90 ± 0.03	PI	223*	1166
CH ₂ O ⁺	CH ₂ O		10.87 ± 0.1	PI	223*	182, 416
CH ₂ O ⁺	CH ₂ O		10.99 ± 0.03	RPD	225	286
CH ₂ O ⁺	CH ₂ O		11.81 ± 0.03	RPD		286
CH ₂ O ⁺	CH ₂ O		13.77 ± 0.04	RPD		286

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH ₂ O ⁺	CH ₂ O		10.87 ± 0.07	EVD	223	127, 204
CH ₂ O ⁺	CH ₂ O		12.2 ± 0.2	LE		204
CH ₂ O ⁺	CH ₂ O		13.6 ± 0.2	LE		204
CH ₂ O ⁺	CH ₃ OH	H ₂	12.7	LE	245	46
CH ₂ O ⁺	C ₂ H ₅ OH	CH ₄	12.7	LE	255	46
CH ₂ O ⁺	C ₃ H ₆ O (Propylene oxide)	C ₂ H ₄	11.6 ± 0.3	EVD	233	50
CH ₂ O ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)	C ₂ H ₄ + CH ₂ O	10.9 ± 0.2	EVD	224	153
CH ₂ O ⁺	C ₂ H ₅ ONO ₂		11.76 ± 0.65	VC		1013
CD₂O⁺						
CD ₂ O ⁺	CD ₂ O		10.88 ± 0.08	EVD		127, 204
CD ₂ O ⁺	CD ₂ O		13.3 ± 0.2	LE		204
CH₃O⁺						
CH ₃ O ⁺	CH ₃ OH	H	12.32	RPD	184	97
CH ₃ O ⁺	CH ₃ OH	H	12.1 ± 0.1	VC	179	1100
CH ₃ O ⁺	CH ₃ OH	H	12.15	LE	180	46
CH ₃ O ⁺	C ₂ H ₅ OH	CH ₃	12.34	RPD	195	97
CH ₃ O ⁺	C ₂ H ₅ OH	CH ₃	11.3 ± 0.1	VC	171	1100
CH ₃ O ⁺	C ₂ H ₅ OH	CH ₃	11.6	LE	178	46
CH ₃ O ⁺	CH ₃ OCH ₃	CH ₃ ? ?	10.0	RPD		2018
CH ₃ O ⁺	CH ₃ OCH ₃	CH ₃	11.0	RPD	176	2018
CH ₃ O ⁺	CH ₃ OCH ₃	CH ₃ ? ?	11.6	RPD		2018
CH ₃ O ⁺	CH ₃ OCH ₃	CH ₃ ? ?	12.3	RPD		2018
CH ₃ O ⁺	CH ₃ OCH ₃	CH ₃	12.7	RPD		2018
CH ₃ O ⁺	CH ₃ OCH ₃	CH ₃	12.1 ± 0.1	VC	202	1100
CH ₃ O ⁺	C ₃ H ₆ O (Propylene oxide)	C ₂ H ₂ + H	13.4 ± 0.2	EVD	181	50
CH ₃ O ⁺	(CH ₂) ₃ O (Trimethylene oxide)	C ₂ H ₂ + H	13.3 ± 0.2	EVD	176	52
CH ₃ O ⁺	n-C ₃ H ₇ OH	C ₂ H ₅	11.47	PI	178	11
CH ₃ O ⁺	n-C ₃ H ₇ OH	C ₂ H ₅	12.13	RPD	193	97
CH ₃ O ⁺	n-C ₃ H ₇ OH	C ₂ H ₅	11.1 ± 0.1	VC	169	1100
CH ₃ O ⁺	n-C ₃ H ₇ OH	C ₂ H ₅	11.65	LE	182	46
CH ₃ O ⁺	iso-C ₃ H ₇ OH	C ₂ H ₅	12.5	LE	201	46
CH ₃ O ⁺	C ₄ H ₆ O (3,4-Epoxy-1-butene)		13.3 ± 0.5	EVD		153
CH ₃ O ⁺	n-C ₄ H ₉ OH	n-C ₃ H ₇	11.46	RPD	176	97
CH ₃ O ⁺	n-C ₄ H ₉ OH	n-C ₃ H ₇	11.4 ± 0.1	VC	174	1100
CH ₃ O ⁺	C ₂ H ₅ OC ₂ H ₅	C ₂ H ₄ + CH ₃	12.35 ± 0.1	EVD	179	2196
CH ₃ O ⁺	HCOOCH ₃	CHO	12.35 ± 0.1	SL	205	210
CH ₃ O ⁺	HCOOCH ₃	CHO	12.1 ± 0.1	VC	199	1100
CH ₃ O ⁺	HCOOC ₂ H ₅	CH ₃ CO	12.02 ± 0.1	SL	193	210
CH ₃ O ⁺	HCOOC ₂ H ₅	CH ₃ CO	12.44 ± 0.1	VC	202	1059
CH ₃ O ⁺	CH ₃ COOCH ₃	CH ₃ CO	12.7 ± 0.1	VC	198	1100
CH ₃ O ⁺	HCOOCH(CH ₃) ₂		13.45 ± 0.1	SL		210
CH ₃ O ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)		13.9 ± 0.4	EVD		153
CH ₃ O ⁺	(CH ₃ O) ₃ B	(CH ₃ O) ₂ B	12.7 ± 0.2	EVD		115
CH ₃ O ⁺	CH ₃ ONO	NO	11.0 ± 0.1	VC	216	1100
CH ₃ O ⁺	CH ₂ OHCH ₂ Cl	CH ₂ Cl	11.51 ± 0.1	SL		72
CH ₃ O ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	C ₂ H ₂ + Cl	13.4 ± 0.2	EVD	199	153
CH ₃ O ⁺	C ₃ H ₅ OBr (Epibromohydrin)	C ₂ H ₂ + Br	12.5 ± 0.2	EVD	192	153

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₂DO⁺						
CH ₂ DO ⁺	DCOOCH(CH ₃) ₂		13.53 ± 0.1	SL		210
CH₃OH⁺ Heat of formation 202 kcal mol⁻¹						
CH ₄ O ⁺	CH ₃ OH		10.85 ± 0.02	PI	202*	182, 416
CH ₄ O ⁺	CH ₃ OH		10.83	PE	202*	1130
CH ₄ O ⁺	CH ₃ OH		12.33	PE		1130
CH ₄ O ⁺	CH ₃ OH		14.64	PE		1130
CH ₄ O ⁺	CH ₃ OH		17.23	PE		1130
CH ₄ O ⁺	CH ₃ OH		10.95 ± 0.10	RPD	205	164, 1072
CH ₄ O ⁺	CH ₃ OH		12.82 ± 0.35	RPD		164, 1072
CH ₄ O ⁺	CH ₃ OH		14.50 ± 0.50	RPD		164, 1072
CH ₄ O ⁺	CH ₃ OH		16.06 ± 0.15	RPD		164, 1072
CH ₄ O ⁺	CH ₃ OH		18.85 ± 0.6	RPD		164, 1072
CH ₄ O ⁺	CH ₃ OH		11.15	RPD		2018
CH ₄ O ⁺	CH ₃ OH		12.1	RPD		2018
CH ₄ O ⁺	CH ₃ OH		13.2	RPD		2018
CH ₄ O ⁺	CH ₃ OH		13.7	RPD		2018
CH ₄ O ⁺	CH ₃ OH		10.8	RPD	201	28
CH ₄ O ⁺	CH ₃ OH		11.7	RPD		28
CH ₄ O ⁺	CH ₃ OH		12.6	RPD		28
CH ₄ O ⁺	CH ₃ OH		14.2	RPD		28
CH ₄ O ⁺	CH ₃ OH		10.8	RPD	201	2060
CH ₄ O ⁺	CH ₃ OH		11.8	RPD		2060
CH ₄ O ⁺	CH ₃ OH		12.5	RPD		2060
CH ₄ O ⁺	CH ₃ OH		14.5	RPD		2060
CH ₄ O ⁺	CH ₃ OH		10.97 ± 0.05	CS	205	383, 384
CH ₄ O ⁺	CH ₃ OH		10.9	LE	203	46
CH ₄ O ⁺	CH ₃ OH		10.79	TC	201	136
CH ₄ O ⁺	HCOOCH ₃	CO	11.53 ± 0.1	SL	209	210
C₂HO⁺						
C ₂ HO ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)		13.0 ± 0.3	EVD		153
C₂H₂O⁺						
C ₂ H ₂ O ⁺	C ₂ H ₄ O (Ethylene oxide)	2H	14.0 ± 0.3	EVD	206	50
C ₂ H ₂ O ⁺	CH ₃ COCH ₃	CH ₄	10.37	PI	205	1099
C ₂ H ₂ O ⁺	CH ₃ COCH ₃	CH ₄	10.2	MSD	201	1404
C ₂ H ₂ O ⁺	C ₃ H ₆ O (Propylene oxide)	CH ₃ + H	12.7 ± 0.2	EVD	186	50
C ₂ H ₂ O ⁺	C ₄ H ₆ O (3,4-Epoxy-1-butene)	C ₂ H ₄	9.8 ± 0.4	EVD	224	153
C ₂ H ₂ O ⁺	n-C ₄ H ₉ OH					97
C ₂ H ₂ O ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)	CH ₃ + CH ₃ O	11.23	RPD		153
C ₂ H ₂ O ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	CH ₂ Cl + H?	12.3 ± 0.3	EVD	208	
			12.1 ± 0.1	EVD		

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₃CO⁺ Heat of formation 152 kcal mol⁻¹						
C ₂ H ₃ O ⁺	CH ₃ CO		8.05 ± 0.17	EVD	181	128
C ₂ H ₃ O ⁺	CH ₃ CHO	H	11.67 ± 0.07	EVD	177	128, 130
C ₂ H ₃ O ⁺	CH ₃ CHO	H	11.45	SL	172	298
C ₂ H ₃ O ⁺	CH ₃ CHO	H	10.5 ± 0.2	MSD	150*	1404
C ₂ H ₃ O ⁺	C ₂ H ₄ O (Ethylene oxide)	H	12.1 ± 0.2	EVD	214	50
C ₂ H ₃ O ⁺	C ₂ H ₅ OH	H ₂ + H	14.5	LE	226	46
C ₂ H ₃ O ⁺	CH ₃ COCH ₃	CH ₃	10.33	PI	153*	95
C ₂ H ₃ O ⁺	CH ₃ COCH ₃	CH ₃	11.16 ± 0.09	EVD	172	128
C ₂ H ₃ O ⁺	CH ₃ COCH ₃	CH ₃	11.30	SL	176	298
C ₂ H ₃ O ⁺	CH ₃ COCH ₃	CH ₃	10.62 ± 0.04	VC	160	2174
C ₂ H ₃ O ⁺	CH ₃ COCH ₃	CH ₃	10.2 ± 0.1	MSD	150*	1404
C ₂ H ₃ O ⁺	C ₃ H ₆ O (Propylene oxide)	CH ₃	10.9 ± 0.2	EVD	196	50
C ₂ H ₃ O ⁺	CH ₃ COC≡CH	C ₂ H	11.85	SL	172	298
C ₂ H ₃ O ⁺	CH ₃ COCH=CH ₂	C ₂ H ₃	12.40	SL	194	298
C ₂ H ₃ O ⁺	C ₄ H ₆ O (3,4-Epoxy-1-butene)	C ₂ H ₃	10.5 ± 0.2	EVD	187	153
C ₂ H ₃ O ⁺	CH ₃ COC ₂ H ₅	C ₂ H ₅	10.3	PI	154*	95
C ₂ H ₃ O ⁺	CH ₃ COC ₂ H ₅	C ₂ H ₅	11.40	SL	180	298
C ₂ H ₃ O ⁺	(CH ₂) ₄ O (Tetrahydrofuran)	C ₂ H ₄ + H	12.8 ± 0.2	EVD	188	52
C ₂ H ₃ O ⁺	C ₃ H ₇ COCH ₃	n-C ₃ H ₇ ?	11.55	SL	183	298
C ₂ H ₃ O ⁺	iso-C ₃ H ₇ COCH ₃	iso-C ₃ H ₇	10.4	PI	160	95
C ₂ H ₃ O ⁺	n-C ₄ H ₉ COCH ₃	n-C ₄ H ₉	10.8	PI	164	95
C ₂ H ₃ O ⁺	C ₆ H ₅ COCH ₃ (Acetophenone)	C ₆ H ₅	13.7	SL	221	298
C ₂ H ₃ O ⁺	C ₆ H ₅ COCH (Acetophenone)	C ₆ H ₅	11.40 ± 0.28	LE	168	2174
C ₂ H ₃ O ⁺	CH ₃ COOH	OH	11.85	SL	160	298
C ₂ H ₃ O ⁺	CH ₃ COOH	OH	12.68	LE	179	171
C ₂ H ₃ O ⁺	CH ₃ COCHO	CHO	10.65 ± 0.12	EVD	184	128
C ₂ H ₃ O ⁺	CH ₃ COCOCH ₃	CH ₃ CO	9.88	PI	154*	1099
C ₂ H ₃ O ⁺	CH ₃ COCOCH ₃	CH ₃ CO	10.55 ± 0.13	EVD	170	128
C ₂ H ₃ O ⁺	CH ₃ COCOCH ₃	CH ₃ CO	10.50	SL	169	298
C ₂ H ₃ O ⁺	CH ₃ COCOCH ₃	CH ₃ + CO	11.51 ± 0.15	EVD	181	128
C ₂ H ₃ O ⁺	CH ₃ COOC ₂ H ₅	C ₂ H ₅ O	12.05	SL	180	298
C ₂ H ₃ O ⁺	CH ₃ COOC ₂ H ₅	C ₂ H ₅ O	12.23 ± 0.1	VC	184	1059
C ₂ H ₃ O ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)	CH ₂ + CH ₃ O	13.1 ± 0.2	EVD	166	153
C ₂ H ₃ O ⁺	CH ₃ COCHN ₂	CHN ₂	10.46 ± 0.05	VC		2174
C ₂ H ₃ O ⁺	CH ₃ COF	F	12.3	SL	160	298
C ₂ H ₃ O ⁺	CH ₃ COCF ₃	CF ₃	11.45	SL	160	298
C ₂ H ₃ O ⁺	CH ₃ COCl	Cl	11.20	SL	171	298
C ₂ H ₃ O ⁺	CH ₃ COCH ₂ Cl	CH ₂ Cl	10.29 ± 0.04	VC	152	2174
C ₂ H ₃ O ⁺	CH ₃ COBr	Br	10.60	SL	171	298
C₃D₃O⁺						
C ₂ D ₃ O ⁺	CD ₃ COOH	OH	12.97	LE		171

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
					CH₃CHO⁺ Heat of formation 196 kcal mol⁻¹	
					cyclo-C₂H₄O⁺ 231 kcal mol⁻¹	
C ₂ H ₄ O	CH ₃ CHO		10.21 ± 0.01	PI	195*	182, 416
C ₂ H ₄ O ⁺	CH ₃ CHG		10.20 ± 0.03	PI	195*	1166
C ₂ H ₄ O ⁺	CH ₃ CHO		10.25 ± 0.03	PI	197*	86
C ₂ H ₄ O ⁺	CH ₃ CHO		10.21	RPD	196	286
C ₂ H ₄ O ⁺	CH ₃ CHO		12.37	RPD	286	
C ₂ H ₄ O ⁺	CH ₃ CHO		14.48	RPD	286	
C ₂ H ₄ O ⁺	CH ₃ CHO		10.50 ± 0.05	EVD	202	127
C ₂ H ₄ O ⁺	CH ₃ CHO		10.25 ± 0.08	EVD	197	130
C ₂ H ₄ O ⁺	CH ₃ CHO		10.25 ± 0.01	CS	197	2026
C ₂ H ₄ O ⁺	CH ₃ CHO		10.2 ± 0.1	MSD	195	1404
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		10.565	S	231*	101
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		10.565 ± 0.01	PI	231*	101, 416
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		10.70 ± 0.02	PI		101
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		10.49	PE	229	1130
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		11.48	PE		1130
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		13.48	PE		1130
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		16.16	PE		1130
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		20.16?	PE		1130
C ₂ H ₄ O ⁺	C ₂ H ₄ O (Ethylene oxide)		10.65 ± 0.1	EVD	233	50
					C₂H₅O⁺	
C ₂ H ₅ O ⁺	C ₂ H ₅ OH	H	11.12	RPD	148	97
C ₂ H ₅ O ⁺	C ₂ H ₅ OH	H	10.9 ± 0.1	VC	143	1100
C ₂ H ₅ O ⁺	C ₂ H ₅ OH	H	10.95	LE	144	46
C ₂ H ₅ O ⁺	CH ₃ OCH ₃	H	11.42 ± 0.01	RPD	167	1139
C ₂ H ₅ O ⁺	CH ₃ OCH ₃	H	11.0 ± 0.1	VC	158	1100
C ₂ H ₅ O ⁺	n-C ₃ H ₇ OH	CH ₃	11.95	RPD	180	97
C ₂ H ₅ O ⁺	n-C ₃ H ₇ OH	CH ₃	11.1	LE	161	46
C ₂ H ₅ O ⁺	iso-C ₃ H ₇ OH	CH ₃	11.39	RPD	164	97
C ₂ H ₅ O ⁺	iso-C ₃ H ₇ OH	CH ₃	10.9	LE	153	46
C ₂ H ₅ O ⁺	CH ₃ OC ₂ H ₅	CH ₃	11.25 ± 0.07	RPD	174	1139
C ₂ H ₅ O ⁺	C ₂ H ₅ OC ₂ H ₅	C ₂ H ₅	13.23 ± 0.04	EVD	220	2196
C ₂ H ₅ O ⁺	C ₂ H ₅ OC ₂ H ₅	C ₂ H ₅	12.3 ± 0.1	VC	198	1100
C ₂ H ₅ O ⁺	HCOOC ₂ H ₅	HCO	11.55 ± 0.1	SL	182	210
C ₂ H ₅ O ⁺	HCOOC ₂ H ₅	HCO	11.4 ± 0.1	VC	178	1100
C ₂ H ₅ O ⁺	DCOOC ₂ H ₅	DCO	11.55 ± 0.1	SL		210
C ₂ H ₅ O ⁺	(CH ₃ O) ₂ CH ₂	CH ₃ O	11.41 ± 0.03	RPD	178	1139
C ₂ H ₅ O ⁺	HCOOCH(CH ₃) ₂	CH ₃ CO	11.53 ± 0.1	SL	173	210
C ₂ H ₅ O ⁺	CH ₃ COOC ₂ H ₅	CH ₃ CO	10.8 ± 0.1	VC	147	1100
C ₂ H ₅ O ⁺	(1,2-Epoxy-3-methoxypropane)		12.1 ± 0.15	EVD		153
					C₂H₄DO⁺	
C ₂ H ₄ DO ⁺	DCOOC ₂ H ₅	HCO?	12.33 ± 0.1	SL		210

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
	C₂H₅OH⁺ Heat of formation 185 kcal mol⁻¹					
	CH₃OCH₃⁺ 186 kcal mol⁻¹					
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.48 ± 0.05	PI	185*	182
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.50 ± 0.05	PI	186*	416
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.63	PE	189	1130
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		11.81	PE		1130
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		12.80	PE		1130
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		15.69	PE		1130
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		17.38	PE		1130
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		20.12	PE		1130
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.72	RPD	191	97
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.4	RPD	184	2060
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		11.9	RPD		2060
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		12.7	RPD		2060
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		13.8	RPD		2060
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.5	RPD	186	28
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		11.7	RPD		28
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		12.7	RPD		28
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		13.6	RPD		28
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		11.0	RPD		2018
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		11.3	RPD		2018
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		11.7	RPD		2018
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		12.4	RPD		2018
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		13.3	RPD		2018
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		13.6	RPD		2018
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.65 ± 0.05	CS	189	383, 384
C ₂ H ₆ O ⁺	C ₂ H ₅ OH		10.7	LE	191	46
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		9.96 ± 0.05	S	186*	2170
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		10.00 ± 0.02	PI	187*	182, 416
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		10.5	RPD		2018
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		11.0	RPD		2018
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		11.8	RPD		2018
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		13.0	RPD		2018
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		14.0	RPD		2018
C ₂ H ₆ O ⁺	CH ₃ OCH ₃		10.22	TC	192	136
C₃HO⁺						
C ₃ HO ⁺	CH ₃ COC≡CH	CH ₃	11.0	SL	231	298
C₃H₃O⁺						
C ₃ H ₃ O ⁺	CH ₃ COCH=CH ₂	CH ₃	10.85	SL	190	298
C₂H₃CHO⁺ Heat of formation 210 kcal mol⁻¹						
C ₃ H ₄ O ⁺	CH ₂ =CHCHO		10.10 ± 0.01	PI	210*	182, 416
C ₃ H ₄ O ⁺	CH ₂ =CHCHO		10.14 ± 0.06	EVD	211	130
C ₃ H ₄ O ⁺	CH ₂ =CHCHO		10.25 ± 0.05	CS	213	384
C ₃ H ₄ O ⁺	CH ₃ COCHN ₂	N ₂	9.86 ± 0.03	VC		2174

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₅CO⁺ Heat of formation 143 kcal mol⁻¹						
C ₃ H ₅ O ⁺ (Propylene oxide)	C ₃ H ₆ O	H	11.5 ± 0.3	EVD	191	50
C ₃ H ₅ O ⁺	CH ₃ COC ₂ H ₅	CH ₃	10.16	PI	143*	95
C ₃ H ₅ O ⁺	CH ₃ COC ₂ H ₅	CH ₃	10.18	PI	143*	1099
C ₃ H ₅ O ⁺	CH ₃ COC ₂ H ₅	CH ₃	10.45	SL	150	298
C ₃ H ₅ O ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)	CH ₃ O	11.2 ± 0.2	EVD	216	153
C ₃ H ₅ O ⁺	C ₂ H ₅ COCOH ₃	COCH ₃	9.67	PI	144*	1099
C ₃ H ₅ O ⁺ (Epichlorohydrin)	C ₃ H ₅ OCl	Cl	11.4 ± 0.3	EVD	207	153
C ₃ H ₅ O ⁺ (Epibromohydrin)	C ₃ H ₅ OBr	Br	10.8 ± 0.1	EVD	207	153
C₂H₅CHO⁺ Heat of formation 181 kcal mol⁻¹						
	CH ₃ COCH ₃ ⁺		171 kcal mol ⁻¹			
	CH ₂ =CHCH ₂ OH ⁺		191 kcal mol ⁻¹			
	CH ₂ =CHOCH ₃ ⁺		178 kcal mol ⁻¹			
	C ₃ H ₆ O ⁺ (Propylene oxide)		214 kcal mol ⁻¹			
	C ₃ H ₆ O ⁺ (Trimethylene oxide)		199 kcal mol ⁻¹			
C ₃ H ₆ O ⁺	C ₂ H ₅ CHO		9.98 ± 0.01	PI	181*	182
C ₃ H ₆ O ⁺	C ₂ H ₅ CHO		10.14 ± 0.10	EVD	185	130
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.69 ± 0.01	PI	172*	182, 416
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.68 ± 0.02	PI	171*	95
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		11.6	PI		95
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.71 ± 0.03	PI	172*	1166
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.65 ± 0.1	PI	171*	86
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.67	PE	171	1130
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		12.16	PE		1130
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		14.15?	PE		1130
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		15.55	PE		1130
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		17.92?	PE		1130
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		19.88	PE		1130
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.80 ± 0.05	VC	174	2174
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.84 ± 0.03	CS	175	2026
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.89 ± 0.05	CS	176	384
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.7 ± 0.1	MSD	172	1404
C ₃ H ₆ O ⁺	CH ₃ COCH ₃		9.73	LE	173	1254, 1256
C ₃ H ₆ O ⁺	CH ₂ =CHCH ₂ OH		9.67 ± 0.05	PI	191*	182
C ₃ H ₆ O ⁺	CH ₂ =CHOCH ₃		8.93 ± 0.02	PI	178*	182
C ₃ H ₆ O ⁺	CH ₂ =CHOCH ₃		9.97	TC	202	136
C ₃ H ₆ O ⁺ (Propylene oxide)	C ₃ H ₆ O		10.22 ± 0.02	PI	214*	182
C ₃ H ₆ O ⁺ (Propylene oxide)	C ₃ H ₆ O		9.80 ± 0.1	EVD	204	50
C ₃ H ₆ O ⁺ (Trimethylene oxide)	(CH ₂) ₃ O		9.667 ± 0.005	S	199*	2169
C ₃ H ₆ O ⁺ (Trimethylene oxide)	(CH ₂) ₃ O		9.85 ± 0.15	EVD	203	52
C ₃ H ₆ O ⁺ (Trimethylene oxide)	(CH ₂) ₃ O		9.7	EC	200	218

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₃ H ₆ O ⁺	<i>n</i> -C ₃ H ₇ COCH ₃	C ₂ H ₄	10.07	PI	158	95
C ₃ H ₆ O ⁺	<i>n</i> -C ₄ H ₉ COCH ₃	C ₃ H ₆	10.00	PI	159	95
C ₃ H ₆ O ⁺	<i>iso</i> -C ₄ H ₉ COCH ₃	C ₃ H ₆	10.1	PI	160	95
C ₃ H ₆ O ⁺	C ₄ H ₈ O ₂ (1,2-Epoxy-3-methoxypropane)	CH ₂ O	10.2 ± 0.2	EVD	220	153
C₃H₇O⁺						
C ₃ H ₇ O ⁺	<i>n</i> -C ₃ H ₇ OH	H	11.00	PI	140	11
C ₃ H ₇ O ⁺	<i>n</i> -C ₃ H ₇ OH	H	10.69	RPD	133	97
C ₃ H ₇ O ⁺	<i>n</i> -C ₃ H ₇ OH	H	11.2	LE	144	46
C ₃ H ₇ C ⁺	<i>iso</i> -C ₃ H ₇ OH	H	11.85	RPD	156	97
C ₃ H ₇ O ⁺	<i>iso</i> -C ₃ H ₇ OH	H	11.3	LE	143	46
C ₃ H ₇ O ⁺	C ₂ H ₅ OC ₂ H ₅	CH ₃	10.80 ± 0.08	EVD	156	2196
C ₃ H ₇ O ⁺	(CH ₃ O) ₂ CHCH ₃	CH ₃ O	10.63 ± 0.04	RPD	153	1139
<i>n</i>-C₃H₇OH⁺ Heat of formation 172 kcal mol⁻¹						
<i>iso</i>-C₃H₇OH⁺ 169 kcal mol⁻¹						
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		10.20	PI	173*	182
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		10.1	PI	171*	11
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		10.1	PI	171	86
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		10.37	RPD	177	97
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		10.5	RPD		2018
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		11.1	RPD		2018
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		11.6	RPD		2018
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		12.2	RPD		2018
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		13.0	RPD		2018
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		13.6	RPD		2018
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		10.42 ± 0.10	CS	178	384
C ₃ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ OH		10.9	LE	189	46
C ₃ H ₈ O ⁺	<i>iso</i> -C ₃ H ₇ OH		10.15 ± 0.05	PI	169*	416
C ₃ H ₈ O ⁺	<i>iso</i> -C ₃ H ₇ OH		10.16	PI	169*	182
C ₃ H ₈ O ⁺	<i>iso</i> -C ₃ H ₇ OH		10.41	RPD	175	97
C ₃ H ₈ O ⁺	<i>iso</i> -C ₃ H ₇ OH		10.27 ± 0.10	CS	171	384
C₄H₄O⁺ (Furan) Heat of formation 197 kcal mol⁻¹						
C ₄ H ₄ O ⁺ (Furan)	C ₄ H ₄ O		8.89	S	197*	161
C ₄ H ₄ O ⁺ (Furan)	C ₄ H ₄ O		9.95	S		161
C ₄ H ₄ O ⁺ (Furan)	C ₄ H ₄ O		8.89 ± 0.01	PI	197*	161
C ₄ H ₄ O ⁺ (Furan)	C ₄ H ₄ O		9.04 ± 0.09	SL	200	182, 416 411
C ₄ H ₄ O ⁺ (Furan)	C ₄ H ₄ O		9.00 ± 0.10	CS	199	383, 381
C ₄ H ₄ O ⁺ (Furan)	C ₄ H ₄ O		8.93	TC	198	136
CH₃CH=CHCHO⁺ Heat of formation 194 kcal mol⁻¹						
C ₄ H ₆ O ⁺	CH ₃ CH=CHCHO		9.73 ± 0.01	PI	194*	182, 416
C ₄ H ₆ O ⁺	CH ₃ CH=CHCHO		9.81 ± 0.05	CS	196	384
C ₄ H ₆ O ⁺ (3,4-Epoxy-1-butene)	C ₄ H ₆ O		9.7 ± 0.3	EVD	234	153

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₇O⁺						
C ₄ H ₇ O ⁺	<i>n</i> -C ₃ H ₇ COCH ₃	CH ₃	10.03	PI	136*	95
C ₄ H ₇ O ⁺	<i>iso</i> -C ₃ H ₇ COCH ₃	CH ₃	9.94	PI	133*	95
C ₄ H ₇ O ⁺	<i>n</i> -C ₄ H ₉ COCH ₃	C ₂ H ₅	10.03	PI	140*	95
C ₄ H ₇ O ⁺	(CH ₂) ₄ O (Tetrahydrofuran)	H	11.1 ± 0.2	EVD	161	52
n-C₃H₇CHO⁺ Heat of formation 174 kcal mol⁻¹						
<i>iso</i>-C₃H₇CHO⁺ 169 kcal mol⁻¹						
C₂H₅COCH₃⁺ 161 kcal mol⁻¹						
cyclo-C₄H₈O⁺ 174 kcal mol⁻¹						
C ₄ H ₈ O ⁺	<i>n</i> -C ₃ H ₇ CHO		9.86 ± 0.02	PI	174*	182
C ₄ H ₈ O ⁺	<i>iso</i> -C ₃ H ₇ CHO		9.74 ± 0.03	PI	169*	182
C ₄ H ₈ O ⁺	C ₂ H ₅ COCH ₃		9.53 ± 0.01	PI	162*	182
C ₄ H ₈ O ⁺	C ₂ H ₅ COCH ₃		9.48 ± 0.02	PI	160*	95
C ₄ H ₈ O ⁺	C ₂ H ₅ COCH ₃		11.3	PI		95
C ₄ H ₈ O ⁺	C ₂ H ₅ COCH ₃		9.54 ± 0.02	PI	162*	416
C ₄ H ₈ O ⁺	C ₂ H ₅ COCH ₃		9.55 ± 0.03	PI	162*	1166
C ₄ H ₈ O ⁺	C ₂ H ₅ COCH ₃		9.45 ± 0.1	PI	160*	86
C ₄ H ₈ O ⁺	C ₂ H ₅ COCH ₃		9.58 ± 0.09	SL	163	411
C ₄ H ₈ O ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		9.42 ± 0.01	S	174*	2169
C ₄ H ₈ O ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		9.54	PI	177	182
C ₄ H ₈ O ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		9.45 ± 0.15	EVD	175	52
C ₄ H ₈ O ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		9.3	EC	171	218
C ₄ H ₈ O ⁺	(CH ₂) ₄ O (Tetrahydrofuran)		9.53	TC	177	1077
C₄H₉O⁺						
C ₄ H ₉ O ⁺	(CH ₃ O) ₂ C(CH ₃) ₂	CH ₃ O	10.28 ± 0.05	RPD	144	1139
n-C₄H₉OH⁺ Heat of formation 165 kcal mol⁻¹						
C₂H₅OC₂H₅⁺ 161 kcal mol⁻¹						
C ₄ H ₁₀ O ⁺	<i>n</i> -C ₄ H ₉ OH		10.04	PI	165*	182
C ₄ H ₁₀ O ⁺	<i>n</i> -C ₄ H ₉ OH		10.56	RPD	177	97
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		9.53 ± 0.02	PI	160*	416, 182
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		9.65 ± 0.03	PI	162*	1166
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		9.61	PE	161	1130
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		11.08	PE		1130
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		11.92?	PE		1130
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		16.23	PE		1130
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		19.67?	PE		1130
C ₄ H ₁₀ O ⁺	C ₂ H ₅ OC ₂ H ₅		9.55 ± 0.02	EVD	160	2196
C₅H₆O⁺						
C ₅ H ₆ O ⁺	C ₅ H ₆ O (2-Methylfuran)		8.39 ± 0.01	PI	177*	182
C ₅ H ₆ O ⁺	C ₅ H ₆ O (2-Methylfuran)		8.31 ± 0.09	SL	176	411
C ₅ H ₆ O ⁺	C ₅ H ₆ O (2-Methylfuran)		8.58	TC	182	136

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₅H₈O⁺						
C ₅ H ₈ O ⁺ (Cyclopentanone)	C ₅ H ₈ O		9.26 ± 0.01	PI	167*	182
C ₅ H ₈ O ⁺ (Dihydropyran)	C ₅ H ₈ O		8.34 ± 0.01	PI	164*	182
C ₅ H ₈ O ⁺ (Dihydropyran)	C ₅ H ₈ O		9.45	CTS	189	2031
C₅H₉O⁺						
C ₅ H ₉ O ⁺	<i>n</i> -C ₄ H ₉ COCH ₃	CH ₃	9.66	PI	123*	95
C ₅ H ₉ O ⁺	<i>iso</i> -C ₄ H ₉ COCH ₃	CH ₃	9.80	PI	125*	95
<i>n</i>-C₄H₉CHO⁺ Heat of formation 168 kcal mol⁻¹						
<i>iso</i>-C₄H₉CHO⁺ 164 kcal mol⁻¹						
n-C₃H₇COCH₃⁺ 154 kcal mol⁻¹						
<i>iso</i>-C₃H₇COCH₃⁺ 151 kcal mol⁻¹						
(C₂H₅)₂CO⁺ 153 kcal mol⁻¹						
cyclo-C₅H₁₀O⁺ 161 kcal mol⁻¹						
C ₅ H ₁₀ O ⁺	<i>n</i> -C ₄ H ₉ CHO		9.82 ± 0.05	PI	168*	182
C ₅ H ₁₀ O ⁺	<i>iso</i> -C ₄ H ₉ CHO		9.71 ± 0.05	PI	164*	182
C ₅ H ₁₀ O ⁺	<i>n</i> -C ₃ H ₇ COCH ₃		9.37 ± 0.02	PI	154*	95
C ₅ H ₁₀ O ⁺	<i>n</i> -C ₃ H ₇ COCH ₃		10.7	PI		95
C ₅ H ₁₀ O ⁺	<i>n</i> -C ₃ H ₇ COCH ₃		9.39 ± 0.02	PI	155*	182
C ₅ H ₁₀ O ⁺	C ₃ H ₇ COCH ₃		9.47 ± 0.03	PI	157	1166
C ₅ H ₁₀ O ⁺	<i>iso</i> -C ₃ H ₇ COCH ₃		9.30 ± 0.02	PI	151*	95
C ₅ H ₁₀ O ⁺	<i>iso</i> -C ₃ H ₇ COCH ₃		10.7	PI		95
C ₅ H ₁₀ O ⁺	<i>iso</i> -C ₃ H ₇ COCH ₃		9.32 ± 0.02	PI	152*	182
C ₅ H ₁₀ O ⁺	C ₂ H ₅ COC ₂ H ₅		9.32 ± 0.01	PI	153*	182
C ₅ H ₁₀ O ⁺ (Tetrahydropyran)	(CH ₂) ₅ O		9.25 ± 0.01	S	161*	2169
C ₅ H ₁₀ O ⁺ (Tetrahydropyran)	(CH ₂) ₅ O		9.26 ± 0.03	PI	162	182
C ₅ H ₁₀ O ⁺ (Tetrahydropyran)	(CH ₂) ₅ O		9.7	EC	172	218
C ₅ H ₁₀ O ⁺ (Tetrahydropyran)	(CH ₂) ₅ O		9.25	TC	161	1077
C₆H₅O⁺						
C ₆ H ₅ O ⁺ (Phenoxy radical)	C ₆ H ₅ O		8.84	SL	(a)	1079
C ₆ H ₅ O ⁺ (Anisole)	C ₆ H ₅ OCH ₃	CH ₃	11.92 ± 0.1	SL	226*	1079
C ₆ H ₅ O ⁺ (Phenoxyacetylene)	C ₆ H ₅ OC≡CH	C ₂ H	9.5 ± 0.1	VC		13

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆H₆O⁺ (Phenol) Heat of formation 173 kcal mol⁻¹						
C ₆ H ₆ O ⁺	C ₆ H ₅ OH		8.50 ± 0.01	PI	173*	182, 416
C ₆ H ₆ O ⁺ (Phenol)	C ₆ H ₅ OH		8.52 ± 0.02	PI	173*	1166
C ₆ H ₆ O ⁺ (Phenol)	C ₆ H ₅ OH		9.16	SL	188	1066
C ₆ H ₆ O ⁺ (Phenol)	C ₆ H ₅ OH		9.03	TC	185	136
C ₆ H ₆ O ⁺ (Phenyl ether)	(C ₆ H ₅) ₂ O	C ₆ H ₄	13.88 ± 0.15	SL	(b)	1237
C₆H₈O⁺						
C ₆ H ₈ O ⁺	C ₆ H ₈ O (2,3-Dimethylfuran)		8.01 ± 0.09	SL	161*	411
(CH₃)₂C=CHCOCH₃⁺ Heat of formation 168 kcal mol⁻¹						
cyclo-C₆H₁₀O⁺ 157 kcal mol⁻¹						
C ₆ H ₁₀ O ⁺	(CH ₃) ₂ C=CHCOCH ₃		9.08 ± 0.03	PI	168*	182
C ₆ H ₁₀ O ⁺	(CH ₃) ₂ C=CHCOCH ₃		8.89 ± 0.05	CS	163	384
C ₆ H ₁₀ O ⁺ (Cyclohexanone)	C ₆ H ₁₀ O		9.14 ± 0.01	PI	157*	182
C ₆ H ₁₀ O ⁺ (Cyclohexanone)	C ₆ H ₁₀ O		9.91 ± 0.05	CS	174	431
C ₆ H ₁₀ O ⁺ (Cyclohexanone)	C ₆ H ₁₀ O		9.83 ± 0.05	LE	173	431
n-C₄H₉COCH₃⁺ Heat of formation 149 kcal mol⁻¹						
iso-C₄H₉COCH₃⁺ 147 kcal mol⁻¹						
tert-C₄H₉COCH₃⁺ 140 kcal mol⁻¹						
C ₆ H ₁₂ O ⁺	n-C ₄ H ₉ COCH ₃		9.37 ± 0.02	PI	150*	95
C ₆ H ₁₂ O ⁺	n-C ₄ H ₉ COCH ₃		10.6	PI	95	
C ₆ H ₁₂ O ⁺	n-C ₄ H ₉ COCH ₃		9.34 ± 0.03	PI	149*	182
C ₆ H ₁₂ O ⁺	n-C ₄ H ₉ COCH ₃		9.77	LE	159	1256
C ₆ H ₁₂ O ⁺	n-C ₄ H ₉ COCH ₃		9.70	TC	157	1256
C ₆ H ₁₂ O ⁺	sec-C ₄ H ₉ COCH ₃		9.69	LE	156	1254
C ₆ H ₁₂ O ⁺	sec-C ₄ H ₉ COCH ₃		9.657	TC	155	1254
C ₆ H ₁₂ O ⁺	iso-C ₄ H ₉ COCH ₃		9.30 ± 0.02	PI	147*	95
C ₆ H ₁₂ O ⁺	iso-C ₄ H ₉ COCH ₃		10.6	PI	95	
C ₆ H ₁₂ O ⁺	iso-C ₄ H ₉ COCH ₃		9.30 ± 0.03	PI	147*	182
C ₆ H ₁₂ O ⁺	iso-C ₄ H ₉ COCH ₃		9.33	LE	147	1256
C ₆ H ₁₂ O ⁺	iso-C ₄ H ₉ COCH ₃		9.69	TC	156	1256
C ₆ H ₁₂ O ⁺	tert-C ₄ H ₉ COCH ₃		9.17 ± 0.03	PI	140*	182
C ₆ H ₁₂ O ⁺	tert-C ₄ H ₉ COCH ₃		9.51	LE	148	1254
C ₆ H ₁₂ O ⁺	tert-C ₄ H ₉ COCH ₃		9.637	TC	151	1254
C₆H₇D₅O⁺						
C ₆ H ₇ D ₅ O ⁺	iso-C ₃ H ₇ CD ₂ COCD ₃		9.35	LE		1256
C ₆ H ₇ D ₅ O ⁺	iso-C ₃ H ₇ CD ₂ COCD ₃		9.69	TC		1256

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆H₁₄O⁺						
C ₆ H ₁₄ O ⁺	(<i>n</i> -C ₃ H ₇) ₂ O		9.27 ± 0.05	PI	147*	182
C ₆ H ₁₄ O ⁺	(<i>iso</i> -C ₃ H ₇) ₂ O		9.20 ± 0.05	PI	142*	182
C₇H₅O⁺						
C ₇ H ₅ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO	H	11.21 ± 0.08	EVD	196	130
C ₇ H ₅ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO	H	11.35 ± 0.05	SL	199	1237
C ₇ H ₅ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO	H	11.1	SL	193	308
C ₇ H ₅ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃	CH ₃	10.43 ± 0.05	SL	184	1237
C ₇ H ₅ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃	CH ₃	10.5	SL	186	308
C ₇ H ₅ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃	CH ₃	9.70 ± 0.09	VC	168	2174
C ₇ H ₅ O ⁺ (Trideuteroacetophenone)	C ₆ H ₅ COCD ₃	CD ₃	10.45	SL	308	
C ₇ H ₅ O ⁺ (Benzophenone)	(C ₆ H ₅) ₂ CO	C ₆ H ₅	12.00 ± 0.05	SL	217	1237
C ₇ H ₅ O ⁺ (Methyl benzoate)	C ₆ H ₅ COOCH ₃	CH ₃ O	11.4	SL	192	308
C ₇ H ₅ O ⁺ (Phenyl benzoate)	(C ₆ H ₅) ₂ CO ₂	C ₆ H ₅ O	10.01 ± 0.07	SL		1237
C ₇ H ₅ O ⁺ (Benzil)	(C ₆ H ₅) ₂ C ₂ O ₂	C ₆ H ₅ CO	9.70 ± 0.05	SL		1237
C ₇ H ₅ O ⁺ (Benzamide)	C ₆ H ₅ CONH ₂	NH ₂	9.9 ± 0.1	SL	165	1168
C ₇ H ₅ O ⁺ (Diazaoacetophenone)	C ₆ H ₅ COCHN ₂	CHN ₂	10.42 ± 0.18	VC		2174
C ₇ H ₅ O ⁺ (2,5-Diphenyl-1,3,4-oxadiazole)	(C ₆ H ₅) ₂ C ₂ N ₂ O		12.1 ± 0.2	SL		1125
C ₇ H ₅ O ⁺ (Benzoyl fluoride)	C ₆ H ₅ COF	F	11.5	SL		308
C ₇ H ₅ O ⁺ (Trifluoroacetophenone)	C ₆ H ₅ COCF ₃	CF ₃	10.05	SL		308
C ₇ H ₅ O ⁺ (Benzoyl chloride)	C ₆ H ₅ COCl	Cl	11.18 ± 0.10	EVD	200	130
C ₇ H ₅ O ⁺ (Benzoyl chloride)	C ₆ H ₅ COCl	Cl	10.5	SL	184	308
C ₇ H ₅ O ⁺ (Benzoyl bromide)	C ₆ H ₅ COBr	Br	10.0	SL	189	308
C₇H₆O⁺ (Benzaldehyde) Heat of formation 209 kcal mol⁻¹						
C₇H₆O⁺ (Tropone) 240 kcal mol⁻¹						
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		9.51 ± 0.02	PI	209*	416
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		9.60 ± 0.02	PI	211	1166
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		9.53 ± 0.03	PI	209*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		9.90 ± 0.02	EVD	218	127
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		9.63 ± 0.09	EVD	212	130
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		9.51 ± 0.05	SL	209	1237
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		10.1	SL	222	308
C ₇ H ₆ O ⁺ (Benzaldehyde)	C ₆ H ₅ CHO		9.73 ± 0.03	CS	214	2026
C ₇ H ₆ O ⁺ (Tropone)	C ₇ H ₆ O		9.68 ± 0.02	CS	240*	431
C ₇ H ₆ O ⁺ (Tropone)	C ₇ H ₆ O		9.69 ± 0.02	LE	240	431
C₇H₇O⁺						
C ₇ H ₇ O ⁺ (<i>p</i> -Hydroxybenzyl radical)	C ₆ H ₄ OHCH ₂		7.58	TC		136
cyclo-C₆H₅CH₂OH⁺ Heat of formation 186 kcal mol⁻¹						
cyclo-C₆H₅OCH₃⁺ 173 kcal mol⁻¹						
C₇H₈O⁺(<i>m</i>-Cresol) 165 kcal mol⁻¹						
C ₇ H ₈ O ⁺ (Benzyl alcohol)	C ₆ H ₅ CH ₂ OH		9.14 ± 0.05	CS	186*	2025
C ₇ H ₈ O ⁺ (Anisole)	C ₆ H ₅ OCH ₃		8.20 ± 0.02	PI	173*	416
C ₇ H ₈ O ⁺ (Anisole)	C ₆ H ₅ OCH ₃		8.22 ± 0.02	PI	173*	182
C ₇ H ₈ O ⁺ (Anisole)	C ₆ H ₅ OCH ₃		8.83	SL	188	1066
C ₇ H ₈ O ⁺ (Anisole)	C ₆ H ₅ OCH ₃		9.01	TC	192	136
C ₇ H ₈ O ⁺ (<i>o</i> -Cresol)	C ₆ H ₄ OHCH ₃		8.93	SL	175	1066
C ₇ H ₈ O ⁺ (<i>m</i> -Cresol)	C ₆ H ₄ OHCH ₃		8.98	SL	175	1066
C ₇ H ₈ O ⁺ (<i>m</i> -Cresol)	C ₆ H ₄ OHCH ₃		8.52 ± 0.05	CS	165*	2025
C ₇ H ₈ O ⁺ (<i>p</i> -Cresol)	C ₆ H ₄ OHCH ₃		8.97	SL	177	1066
C ₇ H ₈ O ⁺ (Cresol)	C ₆ H ₄ OHCH ₃		8.87	TC	175	2194
C₇H₁₄O⁺						
C ₇ H ₁₄ O ⁺	<i>n</i> -C ₅ H ₁₁ COCH ₃		9.33 ± 0.03	PI	143*	182
C₈H₆O⁺						
C ₈ H ₆ O ⁺ (Benzofuran)	C ₈ H ₆ O		8.67	TC		136
C ₈ H ₆ O ⁺ (Diazooacetophenone)	C ₆ H ₅ COCHN ₂	N ₂	10.08 ± 0.11	VC		2174

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₈H₇O⁺						
C ₈ H ₇ O ⁺ (Benzyl methyl ketone)	C ₆ H ₅ CH ₂ COCH ₃	CH ₃	9.90 ± 0.17	VC	170	2174
C₈H₈O⁺ (Acetophenone) Heat of formation 191 kcal mol⁻¹						
C₈H₈O⁺ (p-Methylbenzaldehyde) 194 kcal mol⁻¹						
C ₈ H ₈ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃		9.27 ± 0.03	PI	191*	182
C ₈ H ₈ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃		9.48 ± 0.05	SL	196	1237
C ₈ H ₈ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃		9.7	SL	201	308
C ₈ H ₈ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃		9.34 ± 0.04	VC	192	2174
C ₈ H ₈ O ⁺ (Acetophenone)	C ₆ H ₅ COCH ₃		9.32 ± 0.02	CS	192	2026, 2025
C ₈ H ₈ O ⁺ (p-Methylbenzaldehyde)	C ₆ H ₄ CH ₃ CHO		9.33 ± 0.05	CS	194*	2026
C ₈ H ₈ O ⁺ (Methylbenzaldehyde)	C ₆ H ₄ CH ₃ CHO		9.31	TC	194	2194
C₈H₉O⁺						
C ₈ H ₉ O ⁺ (m-Methoxybenzyl radical)	C ₆ H ₄ OCH ₃ CH ₂		7.66	TC	180	136
C ₈ H ₉ O ⁺ (p-Methoxybenzyl radical)	C ₆ H ₄ OCH ₃ CH ₂		6.82 ± 0.1	SL	160	69
C ₈ H ₉ O ⁺ (p-Methoxybenzyl radical)	C ₆ H ₄ OCH ₃ CH ₂		7.58	TC	178	136
C ₈ H ₉ O ⁺ (Benzyl methyl ether)	C ₆ H ₅ CH ₂ OCH ₃	H	10.65 ± 0.1	SL	174	122
C ₈ H ₉ O ⁺ (m-Methylanisole)	C ₆ H ₄ OCH ₃ CH ₃	H	12.13 ± 0.1	SL	205	122
C ₈ H ₉ O ⁺ (p-Methylanisole)	C ₆ H ₄ OCH ₃ CH ₃	H	11.98 ± 0.1	SL	201	122
C ₈ H ₉ O ⁺ (7-Methoxycycloheptatriene)	C ₇ H ₇ OCH ₃	H	9.70 ± 0.1	SL	177	122
C ₈ H ₉ O ⁺ (p-Ethylanisole)	C ₆ H ₄ OCH ₃ C ₂ H ₅	CH ₃	10.80 ± 0.1	SL	188	122
C₈H₇D₂O⁺						
C ₈ H ₇ D ₂ O ⁺ (m-Methyl-d ₃ -anisole)	C ₆ H ₄ OCH ₃ CD ₃	D	12.10 ± 0.1	SL		122
C ₈ H ₇ D ₂ O ⁺ (p-Methyl-d ₃ -anisole)	C ₆ H ₄ OCH ₃ CD ₃	D	12.10 ± 0.1	SL		122
C₈H₆D₃O⁺						
C ₈ H ₆ D ₃ O ⁺ (m-Methyl-d ₃ -anisole)	C ₆ H ₄ OCH ₃ CD ₃	H	12.10 ± 0.1	SL		122
C ₈ H ₆ D ₃ O ⁺ (p-Methyl-d ₃ -anisole)	C ₆ H ₄ OCH ₃ CD ₃	H	12.10 ± 0.1	SL		122
C ₈ H ₆ D ₃ O ⁺ (m-Methoxy-d ₃ -ethylbenzene)	C ₆ H ₄ OCD ₃ C ₂ H ₅	CH ₃	11.70 ± 0.1	SL		122
C ₈ H ₆ D ₃ O ⁺ (p-Methoxy-d ₃ -ethylbenzene)	C ₆ H ₄ OCD ₃ C ₂ H ₅	CH ₃	10.90 ± 0.1	SL		122

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
	C₈H₁₀O⁺ (Benzyl methyl ether) Heat of formation				184 kcal mol⁻¹	
	C₈H₁₀O⁺ (Phenyl ethyl ether)				167 kcal mol⁻¹	
	C₈H₁₀O⁺ (m-Methylanisole)				169 kcal mol⁻¹	
C ₈ H ₁₀ O ⁺ (Benzyl methyl ether)	C ₆ H ₅ CH ₂ OCH ₃		8.85 ± 0.03	PI	184*	416
C ₈ H ₁₀ O ⁺ (Benzyl methyl ether)	C ₆ H ₅ CH ₂ OCH ₃		9.34 ± 0.1	SL	195	122
C ₈ H ₁₀ O ⁺ (Benzyl methyl ether)	C ₆ H ₅ CH ₂ OCH ₃		8.83 ± 0.05	CS	184	2025
C ₈ H ₁₀ O ⁺ (Phenyl ethyl ether)	C ₆ H ₅ OC ₂ H ₅		8.13 ± 0.02	PI	167*	182
C ₈ H ₁₀ O ⁺ (m-Methylanisole)	C ₆ H ₄ OCH ₃ CH ₃		8.56 ± 0.1	SL	174	122
C ₈ H ₁₀ O ⁺ (m-Methylanisole)	C ₆ H ₄ OCH ₃ CH ₃		8.31 ± 0.05	CS	169*	2025
C ₈ H ₁₀ O ⁺ (p-Methylanisole)	C ₆ H ₄ OCH ₃ CH ₃		8.48 ± 0.1	SL	173	122
C ₈ H ₁₀ O ⁺ (Methylanisole)	C ₆ H ₄ OCH ₃ CH ₃		8.59	TC	175	2194
C ₈ H ₁₀ O ⁺ (7-Methoxycycloheptatriene)	C ₇ H ₇ OCH ₃		8.58 ± 0.1	SL	203	122
C₉H₁₀O⁺						
C ₉ H ₁₀ O ⁺ (Benzyl methyl ketone)	C ₆ H ₅ CH ₂ COCH ₃		9.14 ± 0.09	VC	186	2174
C ₉ H ₁₀ O ⁺ (Phenyl ethyl ketone)	C ₆ H ₅ COC ₂ H ₅		9.27 ± 0.05	CS	189*	2025
C ₉ H ₁₀ O ⁺ (m-Methylacetophenone)	C ₆ H ₄ COCH ₃ CH ₃		9.15 ± 0.05	CS	182*	2035
C ₉ H ₁₀ O ⁺ (Methylacetophenone)	C ₆ H ₄ COCH ₃ CH ₃		9.03	TC	179	2194
C₁₂H₈O⁺						
C ₁₂ H ₈ O ⁺ (Dibenzofuran)	C ₁₂ H ₈ O		8.59	TC		136
C₁₂H₉O⁺						
C ₁₂ H ₉ O ⁺ (Phenyl ether)	(C ₆ H ₅) ₂ O	H	12.90 ± 0.05	SL	262	1237
C ₁₂ H ₉ O ⁺ (Diphenyl carbonate)	(C ₆ H ₅) ₂ CO ₃	CO ₂ + H	12.51 ± 0.05	SL	244	1237
C₁₂H₁₀O⁺						
C ₁₂ H ₁₀ O ⁺ (Phenyl ether)	(C ₆ H ₅) ₂ O		8.82 ± 0.05	SL	220*	1237
C ₁₂ H ₁₀ O ⁺ (Diphenyl carbonate)	(C ₆ H ₅) ₂ CO ₃	CO ₂	10.78 ± 0.05	SL	257	1237
C₁₃H₁₀O⁺ (Benzophenone) Heat of formation 229 kcal mol⁻¹						
C ₁₃ H ₁₀ O ⁺ (Benzophenone)	(C ₆ H ₅) ₂ CO		9.46 ± 0.05	SL	231*	1237
C ₁₃ H ₁₀ O ⁺ (Benzophenone)	(C ₆ H ₅) ₂ CO		9.35 ± 0.04	CS	228*	2026

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₁₄H₁₂O⁺						
C ₁₄ H ₁₂ O ⁺ (<i>p</i> -Methylbenzophenone)	C ₆ H ₄ CH ₃ COC ₆ H ₅		9.13 ± 0.05	CS	214*	2026
C ₁₄ H ₁₂ O ⁺ (Methylbenzophenone)	C ₆ H ₄ CH ₃ COC ₆ H ₅		9.08	TC	213	2194
CHO₂⁺						
CHO ₂ ⁺	CH ₃ COOH	CH ₃	14.15	LE	189	171
CHO ₂ ⁺	CD ₃ COOH	CD ₃	14.08	LE		171
CH₂O₂⁺						
CH ₂ O ₂ ⁺	HCOOH		11.05 ± 0.01	PI	164*	182, 416
CH ₂ O ₂ ⁺	HCOOH		11.44 ± 0.08	EVD	173	127
CH₃O₂⁺						
CH ₃ O ₂ ⁺	HCOOC ₂ H ₅	C ₂ H ₃	11.60 ± 0.1	SL	114	210
CH ₃ O ₂ ⁺	HCOOC ₂ H ₅	C ₂ H ₃	11.73 ± 0.1	VC	116	1059
CH ₃ O ₂ ⁺	HCOOC ₂ H ₅	C ₂ H ₃	11.3 ± 0.1	VC	107	1100
CH ₃ O ₂ ⁺	HCOOC ₃ H ₇	CH ₃ C=CH ₂ ?	11.0 ± 0.1	VC	102	1100
C₂H₂O₂⁺						
C ₂ H ₂ O ₂ ⁺	CHOCHO		9.48 ± 0.08	EVD	145*	128
C ₂ H ₂ O ₂ ⁺	CHOCHO		10.25 ± 0.20	EVD		128
C₂H₃O₂⁺						
C ₂ H ₃ O ₂ ⁺	HCOOC ₂ H ₅	CH ₃	11.51 ± 0.1	VC	143	1059
CH₃COOH⁺ Heat of formation 135 kcal mol⁻¹						
HCOOCH₃⁺ 166 kcal mol⁻¹						
C ₂ H ₄ O ₂ ⁺	CH ₃ COOH		10.35 ± 0.03	PI	135*	416
C ₂ H ₄ O ₂ ⁺	CH ₃ COOH		10.37 ± 0.03	PI	135*	182
C ₂ H ₄ O ₂ ⁺	CH ₃ COOH		10.88 ± 0.01	CS	147	2026
C ₂ H ₄ O ₂ ⁺	CH ₃ COOH		10.66 ± 0.05	CS	142	384
C ₂ H ₄ O ₂ ⁺	CH ₃ COOH		10.72	LE	143	171
C ₂ H ₄ O ₂ ⁺	HCOOCH ₃		10.815 ± 0.005	PI	166*	182
C ₂ H ₄ O ₂ ⁺	HCOOCH ₃		10.92 ± 0.09	SL	168	411
C ₂ H ₄ O ₂ ⁺	HCOOCH ₃		11.12 ± 0.1	SL	173	210
C ₂ H ₄ O ₂ ⁺	HCOOCH ₃		11.14 ± 0.03	VC	173	305
C ₂ H ₄ O ₂ ⁺	HCOOCH ₃		10.4 ± 0.1	VC	156	1100
C ₂ H ₄ O ₂ ⁺	(H ₂ CO) ₂		10.51 ± 0.03	PI		1166
C ₂ H ₄ O ₂ ⁺	CH ₃ COOC ₂ H ₅	C ₂ H ₄	11.15 ± 0.1	VC	138	1059
C₂HD₃O₂⁺						
C ₂ HD ₃ O ₂ ⁺	CD ₃ COOH		10.71	LE		171

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₅O₂⁺						
C ₂ H ₅ O ₂ ⁺	CH ₃ COOC ₂ H ₅	C ₂ H ₃	10.80 ± 0.1	SL	77	1413
C ₂ H ₅ O ₂ ⁺	CH ₃ COOC ₂ H ₅	C ₂ H ₃	10.95 ± 0.1	VC	81	1059
C ₂ H ₅ O ₂ ⁺	CH ₃ COOC ₂ H ₅	C ₂ H ₃	10.8 ± 0.1	VC	77	1100
C ₂ H ₅ O ₂ ⁺	CH ₃ COOC ₃ H ₇	CH ₃ C=CH ₂ ?	10.5	VC	71	1100
C ₂ H ₅ O ₂ ⁺	CH ₃ COOCH(CH ₃) ₂	CH ₃ C=CH ₂ ?	10.42 ± 0.1	SL	66	1413
C₃H₄O₂[±]						
C ₃ H ₄ O ₂ ⁺	CH ₃ COCHO		9.60 ± 0.06	EVD	155	128
C ₃ H ₄ O ₂ ⁺	CH ₃ COCHO		10.18 ± 0.17	EVD		128
C ₃ H ₄ O ₂ ⁺	C ₃ H ₄ O ₂ (Propiolactone)		9.70 ± 0.01	PI		182
C₃H₅O⁺ Heat of formation 113 kcal mol⁻¹						
C ₃ H ₅ O ₂ ⁺	HCOOC ₂ H ₅	H	11.05 ± 0.1	VC	114*	1059
C ₃ H ₅ O ₂ ⁺	CH ₃ COOC ₂ H ₅	CH ₃	10.95 ± 0.1	VC	113*	1059
C₃H₄DO₂⁺						
C ₃ H ₄ DO ₂ ⁺	HCOOCD ₂ CH ₃	D	11.05 ± 0.1	VC		1059
C₃H₃D₂O₂⁺						
C ₃ H ₃ D ₂ O ₂ ⁺	HCOOCD ₂ CH ₃	H	10.97 ± 0.1	VC		1059
C₂H₅COOH⁺ Heat of formation 127 kcal mol⁻¹						
HCOOC₂H₅⁺ 156 kcal mol⁻¹						
CH₃COOCH₃⁺ 138 kcal mol⁻¹						
C ₃ H ₆ O ₂ ⁺	C ₂ H ₅ COOH		10.24 ± 0.03	PI	127*	182
C ₃ H ₆ O ₂ ⁺	HCOOC ₂ H ₅		10.61 ± 0.01	PI	156*	182
C ₃ H ₆ O ₂ ⁺	HCOOC ₂ H ₅		10.70 ± 0.1	SL	158	210
C ₃ H ₆ O ₂ ⁺	HCOOC ₂ H ₅		10.16 ± 0.04	VC	145	305
C ₃ H ₆ O ₂ ⁺	HCOOC ₂ H ₅		10.79 ± 0.1	VC	160	1059
C ₃ H ₆ O ₂ ⁺	HCOOC ₂ H ₅		10.3 ± 0.1	VC	149	1100
C ₃ H ₆ O ₂ ⁺	CH ₃ COOCH ₃		10.27 ± 0.02	PI	138*	182
C ₃ H ₆ O ₂ ⁺	CH ₃ COOCH ₃		10.58 ± 0.09	VC	145	305
C ₃ H ₆ O ₂ ⁺	CH ₃ COOCH ₃		10.8 ± 0.1	VC	150	1100
C ₃ H ₆ O ₂ ⁺	CH ₃ COOCH ₃		10.52 ± 0.02	CS	143	2026, 2025
C₃H₄D₂O₂[±]						
C ₃ H ₄ D ₂ O ₂ ⁺	HCOOCD ₂ CH ₃		10.75 ± 0.1	VC		1059
C₃H₇O₂⁺						
C ₃ H ₇ O ₂ ⁺	(CH ₃ O) ₂ CH ₂	H	10.38 ± 0.03	RPD	102	1139
C ₃ H ₇ O ₂ ⁺	(CH ₃ O) ₂ CHCH ₃	CH ₃	10.34 ± 0.07	RPD	112	1139
C ₃ H ₇ O ₂ ⁺	C ₂ H ₅ COOC ₂ H ₅	C ₂ H ₃	10.67 ± 0.1	SL	68	1413
C ₃ H ₇ O ₂ ⁺	C ₂ H ₅ COOC ₂ H ₅	C ₂ H ₃	10.77	VC	70	1059
C ₃ H ₇ O ₂ ⁺	C ₂ H ₅ COOC ₂ H ₅	C ₂ H ₃	10.4 ± 0.1	VC	61	1100
C ₃ H ₇ O ₂ ⁺	C ₂ H ₅ COOCH(CH ₃) ₂	CH ₃ C=CH ₂ ?	10.40 ± 0.1	SL	66	1413
C ₃ H ₇ O ₂ ⁺	(CH ₃ O) ₃ CH	CH ₃ O	10.36 ± 0.06	RPD	118	1139

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₈O₂⁺						
C ₃ H ₈ O ₂ ⁺	(CH ₃ O) ₂ CH ₂		10.00 ± 0.05	PI	145*	0182
CH₃COOCH=CH₂ Heat of formation 137 kcal mol⁻¹						
CH₃COCOCH₃⁺ 135 kcal mol⁻¹						
C ₄ H ₆ O ₂ ⁺	CH ₃ COOCH=CH ₂		9.19 ± 0.05	PI	137*	182
C ₄ H ₆ O ₂ ⁺	CH ₃ COCOCH ₃		9.23 ± 0.03	PI	135*	182
C ₄ H ₆ O ₂ ⁺	CH ₃ COCOCH ₃		9.25 ± 0.03	PI	135*	416
C ₄ H ₆ O ₂ ⁺	CH ₃ COCOCH ₃		9.60 ± 0.02	EVD	143	128
C ₄ H ₆ O ₂ ⁺	CH ₃ COCOCH ₃		10.22 ± 0.18	EVD		128
n-C₃H₇COOH⁺ Heat of formation 121 kcal mol⁻¹						
iso-C₃H₇COOH⁺ 113 kcal mol⁻¹						
HCOOC₃H₇⁺ 149 kcal mol⁻¹						
CH₃COOC₂H₅⁺ 126 kcal mol⁻¹						
C₂H₅COOCH₃⁺ 127 kcal mol⁻¹						
C₄H₈O₂⁺(p-Dioxane) 126 kcal mol⁻¹						
C ₄ H ₈ O ₂ ⁺	n-C ₃ H ₇ COOH		10.16 ± 0.05	PI	121*	182
C ₄ H ₈ O ₂ ⁺	iso-C ₃ H ₇ COOH		10.02 ± 0.05	PI	113*	182
C ₄ H ₈ O ₂ ⁺	HCOOCH ₂ CH ₂ CH ₃		10.54 ± 0.01	PI	149*	182
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		10.09 ± 0.02	PI	126*	416
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		10.11 ± 0.02	PI	127*	182
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		10.64	RPD		2018
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		11.1	RPD		2018
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		11.6	RPD		2018
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		10.13 ± 0.02	VC	127	305
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		10.32 ± 0.1	VC	131	1059
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		10.2 ± 0.1	VC	129	1100
C ₄ H ₈ O ₂ ⁺	CH ₃ COOC ₂ H ₅		10.40 ± 0.05	CS	133	2025
C ₄ H ₈ O ₂ ⁺	C ₂ H ₅ COOCH ₃		10.15 ± 0.03	PI	127*	182
C ₄ H ₈ O ₂ ⁺ (p-Dioxane)	C ₄ H ₈ O ₂		9.13 ± 0.03	PI	126*	182
C ₄ H ₈ O ₂ ⁺ (p-Dioxane)	C ₄ H ₈ O ₂		9.8	EC	141	218
C₄H₉O₂⁺						
C ₄ H ₉ O ₂ ⁺	(CH ₃ O) ₃ CCH ₃	CH ₃ O	10.37 ± 0.02	RPD	112	1139
C₄H₁₀O₂⁺						
C ₄ H ₁₀ O ₂ ⁺	(CH ₃ O) ₂ CHCH ₃		9.65 ± 0.03	PI	129*	182
C₅H₄O₂⁺						
C ₅ H ₄ O ₂ ⁺ (2-Furaldehyde)	C ₄ H ₃ OCHO		9.21 ± 0.01	PI	187*	182
C ₅ H ₄ O ₂ ⁺ (2-Furaldehyde)	C ₄ H ₃ OCHO		9.31 ± 0.09	SL	190	411

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₅H₈O₂⁺						
C ₅ H ₈ O ₂ ⁺	CH ₃ COCH ₂ COCH ₃		8.87 ± 0.03	PI	122*	182
C₅H₁₀O₂⁺						
C ₅ H ₁₀ O ₂ ⁺	HCOO(CH ₂) ₃ CH ₃		10.50 ± 0.02	PI	144*	182
C ₅ H ₁₀ O ₂ ⁺	HCOOCH ₂ CH(CH ₃) ₂		10.46 ± 0.02	PI	139*	182
C ₅ H ₁₀ O ₂ ⁺	CH ₃ COOCH ₂ CH ₂ CH ₃		10.04 ± 0.03	PI	119*	182
C ₅ H ₁₀ O ₂ ⁺	CH ₃ COOCH(CH ₃) ₂		9.99 ± 0.03	PI	115*	182
C ₅ H ₁₀ O ₂ ⁺	C ₂ H ₅ COOC ₂ H ₅		10.00 ± 0.02	PI	117*	182
C ₅ H ₁₀ O ₂ ⁺	C ₂ H ₅ COOC ₂ H ₅		10.2 ± 0.1	VC	122	1100
C ₅ H ₁₀ O ₂ ⁺	<i>n</i> -C ₃ H ₇ COOCH ₃		10.07 ± 0.03	PI	122*	182
C ₅ H ₁₀ O ₂ ⁺	<i>iso</i> -C ₃ H ₇ COOCH ₃		9.98 ± 0.02	PI	118*	182
C₅H₁₂O₂⁺						
C ₅ H ₁₂ O ₂ ⁺	(C ₂ H ₅ O) ₂ CH ₂		9.70 ± 0.05	PI	134*	182
C₆H₄O₂⁺						
C ₆ H ₄ O ₂ ⁺	C ₆ H ₄ O ₂ (<i>p</i> -Benzoquinone)		9.67 ± 0.02	PI	198*	1166
C₆H₆O₂⁺						
C ₆ H ₆ O ₂ ⁺	C ₆ H ₄ (OH) ₂ (Dihydroxybenzene)		8.85	TC	133	2194
C₆H₁₂O₂⁺						
C ₆ H ₁₂ O ₂ ⁺	CH ₃ COOC ₄ H ₉		9.56 ± 0.03	PI	102*	1166
C ₆ H ₁₂ O ₂ ⁺	CH ₃ COO(CH ₂) ₃ CH ₃		10.01?	PI	112*	182
C ₆ H ₁₂ O ₂ ⁺	CH ₃ COOCH ₂ CH(CH ₃) ₂		9.97?	PI	109*	182
C ₆ H ₁₂ O ₂ ⁺	CH ₃ COOCH(CH ₃)C ₂ H ₅		9.91 ± 0.03	PI	108*	182
C₇H₆O₂⁺(Benzoic acid) Heat of formation 152 kcal mol⁻¹						
C₇H₆O₂⁺(<i>p</i>-Hydroxybenzaldehyde) 157 kcal mol⁻¹						
C ₇ H ₆ O ₂ ⁺	C ₆ H ₅ COOH (Benzoic acid)		9.73 ± 0.09	CS	152*	2026
C ₇ H ₆ O ₂ ⁺	C ₆ H ₄ OHCHO (<i>p</i> -Hydroxybenzaldehyde)		9.32 ± 0.02	CS	157*	2026
C ₇ H ₆ O ₂ ⁺	C ₆ H ₄ OHCHO (Hydroxybenzaldehyde)		9.29	TC	156	2194
C ₇ H ₆ O ₂ ⁺	C ₇ H ₆ O ₂ (Tropolone)		9.86 ± 0.02	CS		431
C ₇ H ₆ O ₂ ⁺	C ₇ H ₆ O ₂ (Tropolone)		9.83 ± 0.02	LE		431
C₇H₈O₂⁺						
C ₇ H ₈ O ₂ ⁺	C ₆ H ₄ OHOCH ₃ (Methoxyphenol)		8.58	TC	137	2194

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₈H₈O₂⁺						
C ₈ H ₈ O ₂ ⁺	C ₆ H ₅ COCH ₂ OH (α -Hydroxyacetophenone)		9.33 ± 0.05	CS	159*	2025
C ₈ H ₈ O ₂ ⁺	C ₆ H ₅ COOCH ₃ (Methyl benzoate)		10.0	SL	159	308
C ₈ H ₈ O ₂ ⁺	C ₆ H ₅ COOCH ₃ (Methyl benzoate)		9.35 ± 0.06	CS	144*	2026
C ₈ H ₈ O ₂ ⁺	C ₆ H ₄ OCH ₃ CHO (<i>p</i> -Methoxybenzaldehyde)		8.60 ± 0.03	CS	150*	2026
C ₈ H ₈ O ₂ ⁺	C ₆ H ₄ OCH ₃ CHO (Methoxybenzaldehyde)		8.91	TC	157	2194
C ₈ H ₈ O ₂ ⁺	C ₆ H ₄ OHCOCH ₃ (<i>m</i> -Hydroxyacetophenone)		8.67 ± 0.05	CS	134*	2025
C ₈ H ₈ O ₂ ⁺	C ₆ H ₄ OHCOCH ₃ (<i>p</i> -Hydroxyacetophenone)		8.70 ± 0.03	CS	135*	2026
C ₈ H ₈ O ₂ ⁺	C ₆ H ₄ OHCOCH ₃ (Hydroxyacetophenone)		9.01	TC	142	2194
C₉H₁₀O₂⁺						
C ₉ H ₁₀ O ₂ ⁺	C ₆ H ₅ COCH ₂ OCH ₃ (α -Methoxyacetophenone)		8.60 ± 0.05	CS	142*	2025
C ₉ H ₁₀ O ₂ ⁺	C ₆ H ₄ OCH ₃ COCH ₃ (<i>m</i> -Methoxyacetophenone)		8.53 ± 0.05	CS	140*	2025
C ₉ H ₁₀ O ₂ ⁺	C ₆ H ₄ OCH ₃ COCH ₃ (<i>p</i> -Methoxyacetophenone)		8.62 ± 0.05	CS	142*	2026
C ₉ H ₁₀ O ₂ ⁺	C ₆ H ₄ OCH ₃ COCH ₃ (Methoxyacetophenone)		8.72	TC	144	2194
C ₉ H ₁₀ O ₂ ⁺	C ₆ H ₄ CH ₃ COOCH ₃ (Methyl <i>p</i> -toluate)		8.94 ± 0.04	CS	130*	2026
C ₉ H ₁₀ O ₂ ⁺	C ₆ H ₄ CH ₃ COOCH ₃ (Methyl toluate)		9.04	TC	132	2194
C₁₃H₁₀O₂⁺						
C ₁₃ H ₁₀ O ₂ ⁺	C ₆ H ₄ OHCO ₂ C ₆ H ₅ (<i>p</i> -Hydroxybenzophenone)		8.59 ± 0.05	CS	165*	2026
C ₁₃ H ₁₀ O ₂ ⁺	C ₆ H ₄ OHCO ₂ C ₆ H ₅ (Hydroxybenzophenone)		9.07	TC	176	2194
C ₁₃ H ₁₀ O ₂ ⁺	(C ₆ H ₅) ₂ CO ₂ (Phenyl benzoate)		8.98 ± 0.05	SL	177*	1237
C₁₄H₁₀O₂⁺						
C ₁₄ H ₁₀ O ₂ ⁺ (Benzil)	(C ₆ H ₅) ₂ C ₂ O ₂		8.78 ± 0.05	SL	181*	1237
C₁₄H₁₂O₂⁺						
C ₁₄ H ₁₂ O ₂ ⁺	C ₆ H ₄ OCH ₃ COC ₆ H ₅ (Methoxybenzophenone)		8.77	TC	178	2194
C₄H₈O₃⁺						
C ₄ H ₈ O ₃ ⁺	CH ₃ OCH ₂ COOCH ₃		9.56 ± 0.05	CS	88*	2025

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₉O₃⁺						
C ₄ H ₉ O ₃ ⁺	(CH ₃ O) ₃ CH	H	10.39 ± 0.05	RPD	66	1139
C ₄ H ₉ O ₃ ⁺	(CH ₃ O) ₃ CCH ₃	CH ₃	10.39 ± 0.10	RPD	78	1139
C ₄ H ₉ O ₃ ⁺	(CH ₃ O) ₄ C	CH ₃ O	10.32 ± 0.10	RPD	80	1139
C₈H₈O₃⁺						
C ₈ H ₈ O ₃ ⁺	C ₆ H ₄ OHCOOCH ₃ (Methyl hydroxybenzoate)		9.03	TC	94	2194
C₉H₁₀O₃⁺						
C ₉ H ₁₀ O ₃ ⁺	C ₆ H ₄ OCH ₃ COOCH ₃ (Methyl <i>p</i> -methoxybenzoate)		8.43 ± 0.04	CS	90*	2026
C ₉ H ₁₀ O ₃ ⁺	C ₆ H ₄ OCH ₃ COOCH ₃ (Methyl methoxybenzoate)		8.73	TC	97	2194
C₁₃H₁₀O₃⁺						
C ₁₃ H ₁₀ O ₃ ⁺	(C ₆ H ₅) ₂ CO ₃ (Diphenyl carbonate)		9.01 ± 0.05	SL	122*	1237
C₆H₁₁O₅⁺						
C ₆ H ₁₁ O ₅ ⁺	C ₇ H ₁₄ O ₆ (α -Methyl-(D)-glucoside)	CH ₃ O	12.9 ± 0.16	EVD	28	2036
C ₆ H ₁₁ O ₅ ⁺	C ₇ H ₁₄ O ₆ (β -Methyl-(D)-glucoside)	CH ₃ O	13.5 ± 0.16	EVD	42	2036
HNO₃⁺						
HNO ₃ ⁺	HNO ₃		11.03 ± 0.01	PI	222	1253
C₂H₆BO⁺						
C ₂ H ₆ BO ⁺	(CH ₃ O) ₃ B	CH ₂ O + OH	16.6 ± 0.3	EVD	187	115
C₂H₅BO₂⁺						
C ₂ H ₅ BO ₂ ⁺	(CH ₃ O) ₃ B	CH ₂ O + H ₂	13.2 ± 0.2	EVD	117	115
C₂H₆BO₂⁺						
C ₂ H ₆ BO ₂ ⁺	(CH ₃ O) ₂ BH	H	9.0 ± 0.2	SL	16	364
C ₂ H ₆ BO ₂ ⁺	(CH ₃ O) ₃ B	CH ₃ O	13.0 ± 0.2	EVD	85	115
C ₂ H ₆ BO ₂ ⁺	(CH ₃ O) ₃ B	CH ₃ O	9.6 ± 0.2	SL	7	364
C₂H₇BO₂⁺						
C ₂ H ₇ BO ₂ ⁺	(CH ₃ O) ₂ BH		9.7 ± 1.0	SL	84	364
C₂H₆BO₃⁺						
C ₂ H ₆ BO ₃ ⁺	(CH ₃ O) ₃ B	CH ₃	12.1 ± 0.2	EVD	31	115

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₉BO₃⁺						
C ₃ H ₉ BO ₃ ⁺	(CH ₃ O) ₃ B		10.8 ± 0.3	EVD	34	115
C ₃ H ₉ BO ₃ ⁺	(CH ₃ O) ₃ B		8.9 ± 0.2	SL	-10	364
CH₃NO⁺						
CH ₃ NO ⁺	HCONH ₂		10.25 ± 0.02	PI	190*	182
C₂H₅NO⁺						
C ₂ H ₅ NO ⁺	CH ₃ CONH ₂		9.77 ± 0.02	PI	171*	182
C ₂ H ₅ NO ⁺	CH ₃ CONH ₂		10.39 ± 0.05	CS	186	384
C₃H₇NO⁺						
C ₃ H ₇ NO ⁺	HCON(CH ₃) ₂		9.12 ± 0.02	PI	160*	182
C ₃ H ₇ NO ⁺	CH ₃ CONHCH ₃		8.90 ± 0.02	PI	150*	182
C₄H₉NO⁺						
C ₄ H ₉ NO ⁺	CH ₃ CON(CH ₃) ₂		8.81 ± 0.03	PI	145*	182
C₅H₅NO⁺						
C ₅ H ₅ NO ⁺	C ₅ H ₄ NOH (4-Hydroxypyridine)		9.70 ± 0.05	SL	209*	217
C₅H₁₁NO⁺						
C ₅ H ₁₁ NO ⁺	HCON(C ₂ H ₅) ₂		8.89 ± 0.02	PI	145*	182
C₆H₅NO⁺						
C ₆ H ₅ NO ⁺	C ₅ H ₄ NCHO (2-Pyridinecarboxaldehyde)		9.75 ± 0.05	SL	227*	217
C ₆ H ₅ NO ⁺	C ₅ H ₄ NCHO (4-Pyridinecarboxaldehyde)		10.12 ± 0.05	SL	235*	217
C₆H₇NO⁺						
C ₆ H ₇ NO ⁺	C ₆ H ₄ OHNH ₂ (Aminophenol)		8.13	TC	166	2194
C₆H₁₃NO⁺						
C ₆ H ₁₃ NO ⁺	CH ₃ CON(C ₂ H ₅) ₂		8.60 ± 0.02	PI	130*	182
cyclo-C₆H₅NCO⁺ Heat of formation 222 kcal mol⁻¹						
C ₇ H ₅ NO ⁺	C ₆ H ₅ NCO (Phenyl isocyanate)		8.77 ± 0.02	PI	222*	182
C ₇ H ₅ NO ⁺	C ₆ H ₄ OHNC (Cyanophenol)		9.60	TC	227	2194
C ₇ H ₅ NO ⁺	(C ₆ H ₅) ₂ C ₂ N ₂ O (3,5-Diphenyl-1,2,4-oxadiazole)		10.8 ± 0.1	SL		1125

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇H₇NO⁺(Benzamide) Heat of formation 197 kcal mol⁻¹						
C₇H₇NO⁺(<i>p</i>-Aminobenzaldehyde) 182 kcal mol⁻¹						
C ₇ H ₇ NO ⁺ (Benzamide)	C ₆ H ₅ CONH ₂		9.4 ± 0.2	SL	195*	1168
C ₇ H ₇ NO ⁺ (Benzamide)	C ₆ H ₅ CONH ₂		9.64	SL	200*	1126
C ₇ H ₇ NO ⁺ (<i>p</i> -Aminobenzaldehyde)	C ₆ H ₄ CHONH ₂		8.25 ± 0.02	CS	182*	2026
C ₇ H ₇ NO ⁺ (Aminobenzaldehyde)	C ₆ H ₄ CHONH ₂		8.38	TC	185	2194
C ₇ H ₇ NO ⁺ (2-Aminotropone)	C ₇ H ₇ NO		9.43 ± 0.02	CS		431
C ₇ H ₇ NO (2-Aminotropone)	C ₇ H ₇ NO		9.50 ± 0.02	LE		431
C₇H₉NO⁺						
C ₇ H ₉ NO ⁺ (<i>p</i> -Methoxyaniline)	C ₆ H ₄ NH ₂ OCH ₃		7.82	SL	169*	1066
C₈H₅NO⁺						
C ₈ H ₅ NO ⁺ (Cyanobenzaldehyde)	C ₆ H ₄ CHO CN		10.38	TC	221	2194
C₈H₉NO⁺						
C ₈ H ₉ NO ⁺ (Acetanilide)	C ₆ H ₅ NHCOCH ₃		8.39 ± 0.10	SL	171*	1126
C ₈ H ₉ NO ⁺ (<i>m</i> -Aminoacetophenone)	C ₆ H ₄ COCH ₃ NH ₂		8.09 ± 0.05	CS	171*	2025
C ₈ H ₉ NO ⁺ (<i>p</i> -Aminoacetophenone)	C ₆ H ₄ COCH ₃ NH ₂		8.17 ± 0.02	CS	172*	2026
C ₈ H ₉ NO ⁺ (Aminoacetophenone)	C ₆ H ₄ COCH ₃ NH ₂		8.25	TC	174	2194
C₉H₇NO⁺						
C ₉ H ₇ NO ⁺ (α -Cyanoacetophenone)	C ₆ H ₅ COCH ₂ CN		9.56 ± 0.05	CS	235*	2025
C ₉ H ₇ NO ⁺ (Cyanoacetophenone)	C ₆ H ₄ COCH ₃ CN		9.95	TC	240	2194
C₁₃H₁₁NO⁺						
C ₁₃ H ₁₁ NO ⁺ (Aminobenzophenone)	C ₆ H ₄ NH ₂ CO ₂ C ₆ H ₅		8.30	TC	208	2194
C₁₄H₉NO⁺						
C ₁₄ H ₉ NO ⁺ (Cyanobenzophenone)	C ₆ H ₄ CNCOC ₆ H ₅		9.81	TC	269	2194
C₂HN₂O⁺						
C ₂ HN ₂ O ⁺	CH ₃ COCHN ₂	CH ₃	11.42 ± 0.08	VC		2174
C ₂ HN ₂ O ⁺	CH ₂ ClCOCHN ₂	CH ₂ Cl	10.95 ± 0.15	VC		2174
C ₂ HN ₂ O ⁺	CCl ₃ COCHN ₂	CCl ₃	10.12 ± 0.08	VC		2174

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₄N₂O⁺						
C ₃ H ₄ N ₂ O ⁺	CH ₃ COCHN ₂		9.40 ± 0.03	VC	2174	
C₈H₅N₂O⁺						
C ₈ H ₅ N ₂ O ⁺	C ₆ H ₅ C ₂ N ₂ OC ₃ F ₇ (2-Phenyl-5-perfluoropropyl-1,3,4-oxadiazole)		11.8 ± 0.2	SL	2156	
C ₈ H ₅ N ₂ O ⁺	C ₆ H ₅ C ₂ N ₂ OC ₇ F ₁₅ (2-Phenyl-5-perfluoroheptyl-1,3,4-oxadiazole)		12.1 ± 0.1	SL	2156	
C₈H₆N₂O⁺						
C ₈ H ₆ N ₂ O ⁺	C ₆ H ₅ COCHN ₂ (Diazoacetophenone)		9.22 ± 0.04	VC	2174	
C₁₄H₁₀N₂O⁺						
C ₁₄ H ₁₀ N ₂ O ⁺	(C ₆ H ₅) ₂ C ₂ N ₂ O (3,5-Diphenyl-1,2,4-oxadiazole)		9.2 ± 0.1	SL	1125	
C ₁₄ H ₁₀ N ₂ O ⁺	(C ₆ H ₅) ₂ C ₂ N ₂ O (2,5-Diphenyl-1,3,4-oxadiazole)		8.9 ± 0.3	SL	1125	
CH₂NO₂⁺						
CH ₂ NO ₂ ⁺	CH ₃ NO ₂	H	11.97 ± 0.02	VC	206*	90
CH₃NO₂⁺ Heat of formation 238 kcal mol⁻¹						
CH ₃ NO ₂ ⁺	CH ₃ NO ₂		11.08 ± 0.03	PI	238*	182
CH ₃ NO ₂ ⁺	CH ₃ NO ₂		11.130 ± 0.006	PI	239*	1253
CH ₃ NO ₂ ⁺	CH ₃ NO ₂		11.4	RPD	2018	
CH ₃ NO ₂ ⁺	CH ₃ NO ₂		11.9	RPD	2018	
CH ₃ NO ₂ ⁺	CH ₃ NO ₂		12.8	RPD	2018	
CH ₃ NO ₂ ⁺	CH ₃ NO ₂		11.34 ± 0.09	VC	244	90
C₂H₅NO₂⁺ Heat of formation 227 kcal mol⁻¹						
C ₂ H ₅ NO ₂ ⁺	C ₂ H ₅ NO ₂		10.88 ± 0.05	PI	227*	182
C ₂ H ₅ NO ₂ ⁺	C ₂ H ₅ NO ₂		11.2	RPD	2018	
C ₂ H ₅ NO ₂ ⁺	C ₂ H ₅ NO ₂		11.6	RPD	2018	
C ₂ H ₅ NO ₂ ⁺	C ₂ H ₅ NO ₂		12.0	RPD	2018	
C ₂ H ₅ NO ₂ ⁺	C ₂ H ₅ NO ₂		12.6	RPD	2018	
C ₂ H ₅ NO ₂ ⁺	C ₂ H ₅ NO ₂		13.1	RPD	2018	
C ₂ H ₅ NO ₂ ⁺	NH ₂ CH ₂ COOH		9.5 ± 0.2	LE	122	88
n-C₃H₇NO₂⁺ Heat of formation 221 kcal mol⁻¹						
iso-C₃H₇NO₂⁺ 217 kcal mol⁻¹						
C ₃ H ₇ NO ₂ ⁺	n-C ₃ H ₇ NO ₂		10.81 ± 0.03	PI	221*	182
C ₃ H ₇ NO ₂ ⁺	n-C ₃ H ₇ NO ₂		11.1	RPD	2018	
C ₃ H ₇ NO ₂ ⁺	n-C ₃ H ₇ NO ₂		11.4	RPD	2018	
C ₃ H ₇ NO ₂ ⁺	n-C ₃ H ₇ NO ₂		11.8	RPD	2018	
C ₃ H ₇ NO ₂ ⁺	n-C ₃ H ₇ NO ₂		12.6	RPD	2018	
C ₃ H ₇ NO ₂ ⁺	iso-C ₃ H ₇ NO ₂		10.71 ± 0.05	PI	217*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₅NO₂⁺						
C ₄ H ₅ NO ₂ ⁺	CH ₂ CNCOOCH ₃		10.87 ± 0.05	CS	185	2025
C₆H₅NO₂⁺						
C ₆ H ₅ NO ₂ ⁺ (Nitrobenzene)	C ₆ H ₅ NO ₂		9.92	PI	244*	182
C ₆ H ₅ NO ₂ ⁺ (Nitrobenzene)	C ₆ H ₅ NO ₂		10.18	SL	250	1066
C₆H₁₃NO₂⁺						
C ₆ H ₁₃ NO ₂ ⁺ (Isoleucine)	C ₂ H ₅ CH(CH ₃)CH(NH ₂)COOH		9.5 ± 0.2	LE	99	88
C₇H₆NO₂⁺						
C ₇ H ₆ NO ₂ ⁺ (<i>m</i> -Nitrobenzyl radical)	C ₆ H ₄ NO ₂ CH ₂		8.56 ± 0.1	SL	227*	69
C₇H₇NO₂⁺						
C ₇ H ₇ NO ₂ ⁺ (<i>m</i> -Nitrotoluene)	C ₆ H ₄ CH ₃ NO ₂		9.65 ± 0.05	CS	233*	2025
C ₇ H ₇ NO ₂ ⁺ (<i>p</i> -Nitrotoluene)	C ₆ H ₄ CH ₃ NO ₂		9.82	SL	237*	1066
C ₇ H ₇ NO ₂ ⁺ (Nitrotoluene)	C ₆ H ₄ CH ₃ NO ₂		9.70	TC	234	2194
C₈H₉NO₂⁺						
C ₈ H ₉ NO ₂ ⁺ (Methyl <i>p</i> -aminobenzoate)	C ₆ H ₄ NH ₂ COOCH ₃		8.08 ± 0.01	CS	122*	2026
C ₈ H ₉ NO ₂ ⁺ (Methyl aminobenzoate)	C ₆ H ₄ NH ₂ COOCH ₃		8.25	TC	126	2194
C₉H₇NO₂⁺						
C ₉ H ₇ NO ₂ ⁺ (Methyl cyanobenzoate)	C ₆ H ₄ CNCOOCH ₃		10.06	TC	195	2194
C₆H₆N₂O₂⁺						
C ₆ H ₆ N ₂ O ₂ ⁺ (<i>o</i> -Nitroaniline)	C ₆ H ₄ NH ₂ NO ₂		8.66	SL	215*	1066
C ₆ H ₆ N ₂ O ₂ ⁺ (<i>m</i> -Nitroaniline)	C ₆ H ₄ NH ₂ NO ₂		8.80	SL	218*	1066
C ₆ H ₆ N ₂ O ₂ ⁺ (<i>p</i> -Nitroaniline)	C ₆ H ₄ NH ₂ NO ₂		8.85	SL	219*	1066
CH₂NO₃⁺						
CH ₂ NO ₃ ⁺	C ₂ H ₅ ONO ₂	CH ₃	10.13 ± 0.11	VC	164	1013
C₂H₅NO₃⁺						
C ₂ H ₅ NO ₃ ⁺	C ₂ H ₅ ONO ₂		11.22	PI	222*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₇NO₃⁺						
C ₃ H ₇ NO ₃ ⁺	n-C ₃ H ₇ ONO ₂		11.07 ± 0.02	PI	213*	182
C₆H₅NO₃⁺						
C ₆ H ₅ NO ₃ ⁺ (<i>p</i> -Nitrophenol)	C ₆ H ₄ OHNO ₂		9.52	SL	187*	1066
C ₆ H ₅ NO ₃ ⁺ (Nitrophenol)	C ₆ H ₄ OHNO ₂		9.67	TC	191	2194
C₇H₅NO₃⁺						
C ₇ H ₅ NO ₃ ⁺ (<i>p</i> -Nitrobenzaldehyde)	C ₆ H ₄ CHONO ₂		10.27 ± 0.01	CS	217*	2026
C ₇ H ₅ NO ₃ ⁺ (Nitrobenzaldehyde)	C ₆ H ₄ CHONO ₂		10.40	TC	220	2194
C₈H₇NO₃⁺						
C ₈ H ₇ NO ₃ ⁺ (<i>m</i> -Nitroacetophenone)	C ₆ H ₄ NO ₂ COCH ₃		9.89 ± 0.05	CS	201*	2025
C ₈ H ₇ NO ₃ ⁺ (<i>p</i> -Nitroacetophenone)	C ₆ H ₄ NO ₂ COCH ₃		10.07 ± 0.02	CS	205*	2026
C ₈ H ₇ NO ₃ ⁺ (Nitroacetophenone)	C ₆ H ₄ NO ₂ COCH ₃		10.10	TC	206	2194
C₁₃H₉NO₃⁺						
C ₁₃ H ₉ NO ₃ ⁺ (Nitrobenzophenone)	C ₆ H ₄ NO ₂ COC ₆ H ₅		10.57	TC	249	2194
C₈H₇NO₄⁺						
C ₈ H ₇ NO ₄ ⁺ (Methyl <i>p</i> -Nitrobenzoate)	C ₆ H ₄ NO ₂ COOCH ₃		10.20 ± 0.03	CS	160*	2026
C ₈ H ₇ NO ₄ ⁺ (Methyl nitrobenzoate)	C ₆ H ₄ NO ₂ COOCH ₃		10.20	TC	160	2194
F⁺ Heat of formation 421 kcal mol⁻¹						
F ⁺	F		17.426	S	421*	2113
F ⁺	BF ₃		31.5 ± 2	EVD	440	
F ⁺	CF ₄		36 ± 1	SL	24	
F ⁺	CF ₄	CF ₃	24.0 ± 1.0	NS	447	2157
F ⁺	C ₂ F ₆		22.6	LE	1062	
F ⁺	C ₆ F ₆ (Hexafluorobenzene)	C ₆ F ₅	29.2 ± 0.5	SL	1132	
F ⁺	C ₃ F ₈		23.5	LE	1062	
F ⁺	C ₄ F ₈ (Perfluoroclobutane)		24.0	LE	1062	
F ⁺	NF ₃	N + F + F ⁻ ?	25 ± 1	SL	480	401
F ⁺	CF ₃ Cl		31 ± 1	SL	24	
F ⁺	ClO ₃ F		27 ± 3	SL	53	
F ⁺	F		17.4 ± 0.3	VC	420	2165
F ⁺	CF ₃ Br		29 ± 1	SL	24	
F ⁺	CF ₃ I		33 ± 1	SL	24	

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
F₂⁺						
F ₂ ⁺	F ₂		15.7	S	362*	355
F ₂ ⁺	F ₂		15.83 ± 0.05	SL	365	75
HF⁺						
HF ^{+(2\Pi)}	HF		15.77 ± 0.02	RPD	299*	463
HF ^{+(2\Sigma)}	HF		16.91 ± 0.10	RPD	325	463
XeF⁺						
XeF ₂ ⁺	XeF ₂	F	13.3 ± 0.1	LE	262	2053
XeF ₄ ⁺	XeF ₄	F ₂ + F	13.3 ± 0.1	LE	236	2053
XeF₂⁺						
XeF ₂ ⁺	XeF ₂		11.5 ± 0.2	S	239	2181
XeF ₂ ⁺	XeF ₂		12.6 ± 0.1	LE	265	2053
XeF ₂ ⁺	XeF ₄	2F	14.9 ± 0.1	LE	254	2053
XeF₃⁺						
XeF ₃ ⁺	XeF ₄	F	13.1 ± 0.1	LE	232	2053
XeF₄⁺						
XeF ₄ ⁺	XeF ₄		12.9 ± 0.1	LE	246	2053
XeF ₄ ⁺	XeF ₄		13.2	TC	253	2168
XeF ₄ ⁺	XeF ₄		13.8	TC	267	1164
LiF⁺						
LiF ⁺	LiF		11.3	VC	181	2179
Li₂F⁺						
Li ₂ F ⁺	Li ₂ F ₂	F	11.5	VC	25	2179
BeF⁺						
BeF ⁺	BeF		9.1 ± 0.5	VC	168	2141
BeF ⁺	BeF ₂	F	15.4 ± 0.4	VC	147	2142
BeF ⁺	BeF ₂	F	15.5	VC	149	2141
BeF₂⁺						
BeF ₂ ⁺	BeF ₂		14.5 ± 0.4	VC	145	2142
BeF ₂ ⁺	BeF ₂		14.7 ± 0.4	VC	149	2141
BF⁺ Heat of formation 233 kcal mol⁻¹						
BF ⁺	BF		11.5 ± 0.4	VC	236*	1297
BF ⁺	BF		10.93	TC	223	1268
BF ⁺	BF		11.2 ± 0.4	LE	229*	440
BF ⁺	BF ₃	2F?	25.2 ± 0.2	EVD	272	440

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
BF₂⁺ Heat of formation 87 kcal mol⁻¹						
BF ₂ ⁺	BF ₃	F	16.2 ± 0.2	SL	83*	364
BF ₂ ⁺	BF ₃	F	16.17 ± 0.05	EVD	82*	440
BF ₂ ⁺	BF ₃	F	16.5 ± 0.8	VC	90*	1297
BF ₂ ⁺	BF ₃	F	16.25 ± 0.2	LE	84*	362
BF ₂ ⁺	BF ₃	F	16.7 ± 0.4	VC	95*	2040
BF ₂ ⁺	CH ₃ BF ₂	CH ₃	13.62 ± 0.02	SL	(a)	1076
BF ₂ ⁺	CH ₂ =CHBF ₂	C ₂ H ₃	14.8 ± 0.1	SL	86	1076
BF ₂ ⁺	C ₂ H ₅ BF ₂	C ₂ H ₅	14.3 ± 0.2	SL	91	1076
BF ₂ ⁺	iso-C ₃ H ₇ BF ₂	iso-C ₃ H ₇	14.6 ± 0.2	SL	101	1076
BF₃⁺ Heat of formation 87 kcal mol⁻¹						
BF ₃ ⁺	BF ₃		15.5 ± 0.5	SL	86*	364
BF ₃ ⁺	BF ₃		16.4 ± 0.4	VC	106	2040
BF ₃ ⁺	BF ₃		15.5 ± 0.3	LE	86*	362
BF ₃ ⁺	BF ₃		15.7 ± 0.1	LE	90*	440
CF⁺						
CF ⁺	CF		13.81 ± 0.12	LE	386	129
CF ⁺	CF ₄	F ₂ +F ⁻ ?	22.6 ± 0.5	SL	365	24
CF ⁺	CF ₄	F ₂ +F ⁻ ?	22.85 ± 0.2	NS	371	2157
CF ⁺	CF ₄	F+F ₂ ?	27.32 ± 0.07	LE	390	129
CF ⁺	C ₂ F ₄		14.06	VC	419	
CF ⁺	C ₃ F ₆	C ₂ F ₄ +F?	18.1	VC	295	1290
CF ⁺	C ₃ F ₆ (Hexafluorocyclopropane)		17.3	VC	1290	
CF ⁺	C ₆ F ₆ (Hexafluorobenzene)		17.3 ± 0.3	SL	1132	
CF ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		15.93	EVD	2192	
CF ⁺	C ₂ H ₃ F		15.43	VC	419	
CF ⁺	CH ₂ F ₂	HF+H?	18.8	VC	339	1288
CF ⁺	CH ₂ =CF ₂		15.23	VC	419	
CF ⁺	CHF ₃	HF+F?	20.2 ± 0.4	EVD	347	43
CF ⁺	CHF ₃	HF+F?	20.75	VC	360	1288
CF ⁺	C ₂ HF ₃		15.2	VC	419	
CF ⁺	CF ₃ Cl		22.6 ± 0.5	SL	24	
CF ⁺	CF ₂ ClCF=CF ₂		17.8	VC	1290	
CF ⁺	CHF ₂ Cl	HF+Cl?	17.30 ± 0.15	EVD	322	43
CF ⁺	CHFCI ₂	HCl+Cl?	16.9 ± 0.2	EVD	314	43
CF ⁺	CF ₃ Br		22.9 ± 0.5	SL	24	
CF ⁺	CF ₃ I		19.9 ± 0.3	EVD	439	
CF ⁺	CF ₃ I		20.7 ± 1	SL	24	
C₃F⁺						
C ₃ F ⁺	C ₆ F ₆ (Hexafluorobenzene)		22 ± 1	SL	1132	
C ₃ F ⁺	C ₆ F ₆ (Hexafluorobenzene)		25.9 ± 1	SL	1132	
C₅F⁺						
C ₅ F ⁺	C ₆ F ₆ (Hexafluorobenzene)		29.0 ± 0.5	SL	1132	

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CF₂⁺ Heat of formation 237 kcal mol⁻¹						
CF ₂ ⁺	CF ₂		11.7 ± 0.1	SL	235*	2164
CF ₂ ⁺	CF ₂		11.86 ± 0.1	SL	239*	1252
CF ₂ ⁺	CF ₂		13.30 ± 0.12	LE	272	129
CF ₂ ⁺	CF ₄	F ₂	20.3 ± 0.5	SL	247	24
CF ₂ ⁺	CF ₄	2F	22.2	VC	253	1288
CF ₂ ⁺	CF ₄	2F	22.33 ± 0.06	LE	256	129
CF ₂ ⁺	CF ₄	2F	22.45 ± 0.2	NS	259	2157
CF ₂ ⁺	C ₂ F ₄	CF ₂	15.2 ± 0.3	SL	230	214
CF ₂ ⁺	C ₂ F ₄	CF ₂	15.26 ± 0.05	SL	231	1252
CF ₂ ⁺	C ₂ F ₄	CF ₂	15.13	VC	228	419
CF ₂ ⁺	C ₃ F ₆	CF + CF ₃ ?	19.8	VC	244	1290
CF ₂ ⁺	C ₃ F ₆	C ₂ F ₄ ?	17.4	VC	1290	
(Hexafluorocyclopropane)						
CF ₂ ⁺	C ₆ F ₁₁ CF ₃		13.93	EVD		2192
(Perfluoromethylcyclohexane)						
CF ₂ ⁺	CH ₂ F ₂		14.8 ± 0.4	LE		2160
CF ₂ ⁺	CH ₂ F ₂		20.7	VC		1288
CF ₂ ⁺	CHF ₃		14.7 ± 0.4	LE		2160
CF ₂ ⁺	CHF ₃		20.2	VC		1288
CF ₂ ⁺	C ₂ HF ₃	CHF?	19.28	VC		419
CF ₂ ⁺	CHF ₂ Cl	H + Cl ⁻ ?	16.1 ± 0.3	EVD	265	43
CF ₂ ⁺	CHF ₃	H + F ⁻ ?	17.5 ± 0.3	EVD	252	43
CF ₂ ⁺	CF ₃ Cl	F + Cl	20 ± 1	SL	247	24
CF ₂ ⁺	CF ₃ Br	F + Br	18.3 ± 0.1	EVD	223	439
CF ₂ ⁺	CF ₃ Br	F + Br?	21.4 ± 0.2	EVD		439
CF ₂ ⁺	CF ₃ Br	F + Br	19.5 ± 0.5	SL	250	24
CF ₂ ⁺	CF ₃ I	F + I	17.95 ± 0.1	EVD	229	439
CF ₂ ⁺	CF ₃ I	F + I	18.5 ± 0.6	SL	241	24
CF₂⁺²						
CF ₂ ⁺²	CF ₄	2F	44.3 ± 0.3	NS	763	2157
C₂F₂⁺						
C ₂ F ₂ ⁺	C ₂ HF ₃	HF	14.83	VC	295	419
C₃F₂⁺						
C ₃ F ₂ ⁺	C ₆ F ₆		18.9 ± 0.5	SL		1132
(Hexafluorobenzene)						
C₄F₂⁺						
C ₄ F ₂ ⁺	C ₆ F ₆		18 ± 1	SL		1132
C ₄ F ₂ ⁺	C ₆ F ₆		20.2 ± 1	SL		1132
(Hexafluorobenzene)						
C₅F₂⁺						
C ₅ F ₂ ⁺	C ₆ F ₆		22 ± 1	SL		1132
C ₅ F ₂ ⁺	C ₆ F ₆		24.3 ± 1	SL		1132
(Hexafluorobenzene)						

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CF₃⁺						
CF ₃ ⁺	CF ₃		10.10 ± 0.05	EVD	119	441
CF ₃ ⁺	CF ₃		10.2	SL	121	141
CF ₃ ⁺	CF ₃		10.15 ± 0.06	LE	120	129
CF ₃ ⁺	CF ₄	F	15.56 ± 0.01	PI	119	1235
CF ₃ ⁺	CF ₄	F	16.0 ± 0.2	SL	129	24
CF ₃ ⁺	CF ₄	F	16.2	VC	134	1288
CF ₃ ⁺	CF ₄	F	15.40 ± 0.05	LE	115	129
CF ₃ ⁺	CF ₄	F	15.9 ± 0.1	NS	127	2157
CF ₃ ⁺	C ₂ F ₄	CF	13.54	VC	89	419
CF ₃ ⁺	C ₂ F ₄	C + F ⁻ ?	15.4	FDP	93	1378
CF ₃ ⁺	C ₂ F ₄	CF	14.4	FDP	109	1378
CF ₃ ⁺	C ₂ F ₆	CF ₃	14.2	VC	132	1288
CF ₃ ⁺	C ₂ F ₆	CF ₃	14.3 ± 0.1	VC	134	1419
CF ₃ ⁺	C ₂ F ₆		15.4	LE		1062
CF ₃ ⁺	C ₃ F ₆	C ₂ F ₃	15.96	VC	155	1290
CF ₃ ⁺	C ₃ F ₆	C ₂ F ₃	15.0 ± 0.1	LE	133	1067
CF ₃ ⁺	C ₃ F ₆	C ₂ F ₃	15.38	VC		1290
(Hexafluorocyclopropane)						
CF ₃ ⁺	C ₆ F ₆		17.1	SL		1132
(Hexafluorobenzene)						
CF ₃ ⁺	C ₆ F ₆		19.8 ± 1	SL		1132
(Hexafluorobenzene)						
CF ₃ ⁺	C ₃ F ₈	C ₂ F ₅	14.4 ± 0.1	VC	133	1419
CF ₃ ⁺	C ₃ F ₈	C ₂ F ₅	14.65	LE	139	1062
CF ₃ ⁺	C ₄ F ₈		15.7	LE		1062
(Perfluorocyclobutane)						
CF ₃ ⁺	n-C ₄ F ₁₀	n-C ₃ F ₇	14.3 ± 0.1	VC	131	1419
CF ₃ ⁺	C ₆ F ₁₁ CF ₃		14.4	EVD		2192
(Perfluoromethylcyclohexane)						
CF ₃ ⁺	CHF ₃	H	14.03 ± 0.06	RPD	107	1139
CF ₃ ⁺	CHF ₃	H	14.53 ± 0.05	EVD	119	441
CF ₃ ⁺	CHF ₃	H	14.67 ± 0.20	EVD	122	43
CF ₃ ⁺	CHF ₃	H	14.42	VC	116	1288
CF ₃ ⁺	CH ₃ CF ₃	CH ₃	13.90 ± 0.03	SL	109	1075
CF ₃ ⁺	CH ₂ =CHCF ₃	C ₂ H ₃	15.0 ± 0.2	SL	127	1075
CF ₃ ⁺	C ₂ H ₅ CF ₃	C ₂ H ₅	14.8 ± 0.1	SL	125	1075
CF ₃ ⁺	CF ₃ Cl	Cl	13.06 ± 0.05	EVD	106	441
CF ₃ ⁺	CF ₃ Cl	Cl	12.7 ± 0.2	SL	98	24
CF ₃ ⁺	CF ₂ ClCF=CF ₂	C ₂ F ₂ Cl	15.63	VC		1290
CF ₃ ⁺	CF ₃ Br	Br	12.1	EVD	99	441
CF ₃ ⁺	CF ₃ Br	Br	12.15 ± 0.02	EVD	100	439
CF ₃ ⁺	CF ₃ Br	Br	12.2 ± 0.2	SL	101	24
CF ₃ ⁺	CF ₃ Br	Br	12.51 ± 0.05	SL	108	1131
CF ₃ ⁺	CF ₃ I	I	11.28 ± 0.02	EVD	94	439
CF ₃ ⁺	CF ₃ I	I	11.4 ± 0.4	SL	96	24
CF ₃ ⁺	CF ₃ I	I	11.5 ± 0.1	MSD	99	1111
CF₃⁺²						
CF ₃ ⁺²	CF ₄	F	42.7 ± 0.3	NS	745	2157

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂F₃⁺						
C ₂ F ₃ ⁺	C ₂ F ₄	F	16.00	VC	195	419
C ₂ F ₃ ⁺	C ₃ F ₆	CF ₂ + F?	19.32	VC	203	1290
C ₂ F ₃ ⁺	C ₃ F ₆	CF ₃	16.1 ± 0.2	LE	227	1067
C ₂ F ₃ ⁺	C ₃ F ₆ (Hexafluorocyclopropane)		18.3	VC		1290
C ₂ F ₃ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		14.1	EVD		2192
C₃F₃⁺						
C ₃ F ₃ ⁺	C ₆ F ₆ (Hexafluorobenzene)		16.8 ± 0.3	SL		1132
C ₃ F ₃ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		16.6	EVD		2192
C₅F₃⁺						
C ₅ F ₃ ⁺	C ₆ F ₆ (Hexafluorobenzene)		15.8 ± 0.2	SL		1132
CF₄⁺						
CF ₄ ⁺	CF ₄		14.36	TC	110	1164
CF ₄ ⁺	CF ₄		14.9 ± 0.2	D	123	1110
C₂F₄⁺ Heat of formation 78 kcal mol⁻¹						
C ₂ F ₄ ⁺	C ₂ F ₄		10.12	PI	78*	168
C ₂ F ₄ ⁺	C ₂ F ₄		9.3 ± 0.2	SL	59	214
C ₂ F ₄ ⁺	C ₂ F ₄		10.12	VC	78	419
C ₂ F ₄ ⁺	C ₃ F ₆	CF ₂	13.15	VC	80	1288, 1290
C ₂ F ₄ ⁺	C ₃ F ₆	CF ₂	12.5 ± 0.1	LE	65	1067
C ₂ F ₄ ⁺	C ₃ F ₆ (Hexafluorocyclopropane)		11.85	VC		1290
C ₂ F ₄ ⁺	C ₄ F ₈ (Perfluorocyclobutane)	C ₂ F ₄	12.3 ± 0.1	VC	87	1290
C ₂ F ₄ ⁺	C ₄ F ₈ (Perfluorocyclobutane)	C ₂ F ₄	12.25	LE	86	1062
C ₂ F ₄ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		12.4	EVD		2192
C₃F₄⁺						
C ₃ F ₄ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		11.9	EVD		2192
C₅F₄⁺						
C ₅ F ₄ ⁺	C ₆ F ₆ (Hexafluorobenzene)	CF ₂ ?	16.1 ± 0.3	SL		1132

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂F₅⁺						
C ₂ F ₅ ⁺	C ₂ F ₅		9.98 ± 0.1	SL	18	2164
C ₂ F ₅ ⁺	C ₂ F ₆	F	16.3 ± 0.1	VC	47	1419
C ₂ F ₅ ⁺	C ₂ F ₆	F	16.05	LE	41	1062
C ₂ F ₅ ⁺	C ₃ F ₈	CF ₃	15.3 ± 0.1	VC	56	1419
C ₂ F ₅ ⁺	C ₃ F ₈	CF ₃	15.25	LE	55	1062
C ₂ F ₅ ⁺	n-C ₄ F ₁₀	C ₂ F ₅	14.6 ± 0.1	VC	43	1419
C ₂ F ₅ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		14.4	EVD		2192
C₃F₅⁺						
C ₃ F ₅ ⁺	C ₃ F ₆	F	15.18	VC	72	1290
C ₃ F ₅ ⁺	C ₃ F ₆	F	14.8 ± 0.3	LE	64	1067
C ₃ F ₅ ⁺	C ₃ F ₆ (Hexafluorocyclopropane)	F	14.14	VC		1290
C ₃ F ₅ ⁺	C ₄ F ₈ (Perfluorocyclobutane)	CF ₃	12.3 ± 0.1	VC	46	1290
C ₃ F ₅ ⁺	C ₄ F ₈ (Perfluorocyclobutane)	CF ₃	12.25	LE	46	1062
C ₃ F ₅ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		13.9	EVD		2192
C ₃ F ₅ ⁺	CF ₂ ClCF=CF ₂	Cl	11.22	VC		1290
C₄F₅⁺						
C ₄ F ₅ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)		14.9	EVD		2192
C₅F₅⁺						
C ₅ F ₅ ⁺	C ₆ F ₆ (Hexafluorobenzene)	CF	17.2 ± 0.2	SL		1132
C₆F₅⁺						
C ₆ F ₅ ⁺	C ₆ F ₆ (Hexafluorobenzene)	F	16.9 ± 0.3	SL		1132
C ₆ F ₅ ⁺	C ₆ F ₆ (Hexafluorobenzene)	F	16.9 ± 0.1	SL		301
C ₆ F ₅ ⁺	C ₆ F ₅ COCF ₃ (Perfluoroacetophenone)		16.0	SL		308
C ₆ F ₅ ⁺	C ₆ F ₅ COCH ₃ (Pentafluoroacetophenone)		16.7	SL		308
C ₆ F ₅ ⁺	C ₆ F ₅ CONH ₂ (Pentafluorobenzamide)		16.3 ± 0.3	SL		1168
C ₆ F ₅ ⁺	C ₆ F ₅ Cl (Chloropentafluorobenzene)	Cl	15.9 ± 0.1	SL		301
C ₆ F ₅ ⁺	C ₆ F ₅ Br (Bromopentafluorobenzene)	Br	15.2 ± 0.1	SL		301

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃F₆⁺						
C ₃ F ₆ ⁺	C ₃ F ₆		11.11	VC	-3	1290
C ₃ F ₆ ⁺	C ₃ F ₆		10.3 ± 0.2	LE	-21	1067
C ₃ F ₆ ⁺	C ₃ F ₆		11.1	VC	-3	1123
C ₃ F ₆ ⁺	C ₃ F ₆		11.3	VC		1290, 1123
(Hexafluorocyclopropane)						
C₄F₆⁺						
C ₄ F ₆ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	C ₃ F ₈ ?	13.4	EVD	45	2192
C₆F₆⁺						
C ₆ F ₆ ⁺	C ₆ F ₆ (Hexafluorobenzene)		9.97	PI		168
C ₆ F ₆ ⁺	C ₆ F ₆ (Hexafluorobenzene)		9.93 ± 0.2	SL		1132
C ₆ F ₆ ⁺	C ₆ F ₆ (Hexafluorobenzene)		10.0 ± 0.1	SL		301
C ₃ F ₆ ⁺	C ₆ F ₆ (Hexafluorobenzene)		10.1 ± 0.1	SL		1127
C₃F₇⁺						
C ₃ F ₇ ⁺	n-C ₃ F ₇		10.06 ± 0.1	SL	-75	2164
C ₃ F ₇ ⁺	iso-C ₃ F ₇		10.5 ± 0.1	SL	-78	2164
C ₃ F ₇ ⁺	C ₃ F ₈	F	17.1 ± 0.1	VC	-36	1419
C ₃ F ₇ ⁺	C ₃ F ₈	F	16.5	LE	-50	1062
C ₃ F ₇ ⁺	n-C ₄ F ₁₀	CF ₃	15.0 ± 0.1	VC	-46	1419
C₄F₇⁺						
C ₄ F ₇ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	n-C ₃ F ₇ ?	15.9	EVD	-2	2192
C₅F₇⁺						
C ₅ F ₇ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	C ₂ F ₅ + F ₂ ?	11.9	EVD	-189	2192
C₁₁F₇⁺						
C ₁₁ F ₇ ⁺	C ₁₂ F ₁₀ (Perfluorobiphenyl)		17.2 ± 0.1	SL		1127
+						
C₄F₈⁺						
C ₄ F ₈ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	C ₃ F ₆	11.9	EVD	-142	2192
C₇F₈⁺						
C ₇ F ₈ ⁺	C ₆ F ₅ CF ₃ (Perfluorotoluene)		10.4 ± 0.1	SL		301

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
		C₁₂F₈⁺				
C ₁₂ F ₈ ⁺	C ₁₂ F ₁₀ (Perfluorobiphenyl)	F ₂ ?	18.4 ± 0.3	SL	—	1127
		C₅F₉⁺				
C ₅ F ₉ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	C ₂ F ₅	13.9	EVD	—143	2192
		C₆F₉⁺				
C ₆ F ₉ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	CF ₃ + F ₂ ?	12.9	EVD	—264	2192
		C₁₂F₉⁺				
C ₁₂ F ₉ ⁺	C ₁₂ F ₁₀ (Perfluorobiphenyl)	F	16.7 ± 0.1	SL	—	1127
		C₅F₁₀⁺				
C ₅ F ₁₀ ⁺	C ₅ F ₁₀ (Perfluorocyclopentane)		11.7	SL	—	299
C ₅ F ₁₀ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	C ₂ F ₄	15.9	EVD	—153	2192
		C₆F₁₀⁺				
C ₆ F ₁₀ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	CF ₄	12.4	EVD	—168	2192
		C₁₂F₁₀⁺				
C ₁₂ F ₁₀ ⁺	C ₁₂ F ₁₀ (Perfluorobiphenyl)		10.0 ± 0.1	SL	—	1127
		C₆F₁₁⁺				
C ₆ F ₁₁ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	CF ₃	13.9	EVD	—241	2192
		C₁₇F₁₁⁺				
C ₁₇ F ₁₁ ⁺	C ₁₈ F ₁₄ (Perfluoro- <i>p</i> -terphenyl)		18.2 ± 0.1	SL	—	1127
		C₆F₁₂⁺				
C ₆ F ₁₂ ⁺	C ₆ F ₁₂ (Perfluorocyclohexane)		13.2	SL	—	299
		C₁₈F₁₂⁺				
C ₁₈ F ₁₂ ⁺	C ₁₈ F ₁₄ (Perfluoro- <i>p</i> -terphenyl)		19.9	SL	—	1127

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇F₁₃⁺						
C ₇ F ₁₃ ⁺	C ₆ F ₁₁ CF ₃ (Perfluoromethylcyclohexane)	F	15.4	EVD	-339	2192
C₁₈F₁₃⁺						
C ₁₈ F ₁₃ ⁺	C ₁₈ F ₁₄ (Perfluoro- <i>p</i> -terphenyl)	F	17.5 ± 0.3	SL		1127
C₇F₁₄⁺						
C ₇ F ₁₄ ⁺	<i>n</i> -C ₅ F ₁₁ CF=CF ₂		10.48 ± 0.02	PI		182
C₁₈F₁₄⁺						
C ₁₈ F ₁₄ ⁺	C ₁₈ F ₁₄ (Perfluoro- <i>p</i> -terphenyl)		9.85 ± 0.3	SL		1127
C₂₄F₁₈⁺						
C ₂₄ F ₁₈ ⁺	C ₂₄ F ₁₈ (Perfluoro- <i>p</i> -quaterphenyl)		9.9 ± 0.1	SL		1127
NF⁺ Heat of formation 349 kcal mol⁻¹						
NF ⁺	NF ₂	F ⁻	11.8 ± 0.2	SL	347*	76
NF ⁺	NF ₂	F	15.5 ± 0.2	SL	349*	76
NF ⁺	NF ₂	F	15.0 ± 0.2	VC	337	100
NF ⁺	cis-N ₂ F ₂	NF	16.9 ± 0.2	SL	349*	76
NF ⁺	trans-N ₂ F ₂	NF	17.0 ± 0.2	SL	355*	76
NF ⁺	NF ₃	2F	17.9 ± 0.3	SL	345*	401
N₂F⁺ Heat of formation 321 kcal mol⁻¹						
N ₂ F ⁺	cis-N ₂ F ₂	F	14.0 ± 0.2	SL	321*	76
N ₂ F ⁺	trans-N ₂ F ₂	F	13.9 ± 0.2	SL	321*	76
NF₂⁺ Heat of formation 284 kcal mol⁻¹						
NF ₂ ⁺	NF ₂		12.0 ± 0.1	SL	287*	76
NF ₂ ⁺	NF ₂		11.8 ± 0.2	VC	282*	100
NF ₂ ⁺	NF ₃	F	14.2 ± 0.3	SL	279*	401
NF ₂ ⁺	NF ₃	F	14.4 ± 0.2	SL	283*	76
NF ₂ ⁺	NF ₃	F	14.6	VC	288*	100
NF ₂ ⁺	SF ₅ NF ₂	SF ₄ + F?	16.3 ± 0.2	VC	(a)	1144
NF ₂ ⁺	FSO ₂ NF ₂	FSO ₂	14.6 ± 0.3	VC	(b)	1144
NF ₂ ⁺	FSO ₂ ONF ₂	FSO ₃	13.3 ± 0.1	VC	(b)	1144
N₂F₂⁺						
N ₂ F ₂ ⁺	trans-N ₂ F ₂		13.1 ± 0.1	SL	322*	76
NF₃⁺						
NF ₃ ⁺	NF ₃		13.2 ± 0.2	SL	275*	401, 76

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
N₂F₃⁺ Heat of formation 339 kcal mol⁻¹						
N ₂ F ₃ ⁺	N ₂ F ₄	F ⁻	12.0	SL	340*	76
N ₂ F ₃ ⁺	N ₂ F ₄	F	15.6	SL	339*	76
N₂F₄⁺						
N ₂ F ₄ ⁺	N ₂ F ₄		12.04 ± 0.10	SL	276*	74
OF⁺						
OF ⁺	OF ₂	F	15.8 ± 0.2	SL	340	2047
OF ⁺ (At 130 K)	O ₂ F ₂	OF	17.5 ± 0.2	RPD	367	42
OF ⁺ (At 90 K)	OF ₂	F	15.8 ± 0.2	RPD	340	42
O₂F⁺						
O ₂ F ⁺	O ₂ F		12.6 ± 0.2	SL	294	2143
O ₂ F ⁺ (At 130 K)	O ₂ F ₂	F	14.0 ± 0.1	RPD	308	42
O ₂ F ⁺	O ₂ F ₂	F	14.0 ± 0.1	SL	308	2143
OF₂⁺ Heat of formation 309 kcal mol⁻¹						
OF ₂ ⁺	OF ₂		13.54 ± 0.03	RPD	307*	286
OF ₂ ⁺	OF ₂		13.7 ± 0.2	SL	311*	2047
CHF⁺						
CHF ⁺	C ₂ HF ₃	CF ₂	15.38	VC	278	419
CHF ⁺	CH ₂ F ₂	HF?	17.7	VC	366	1288
CH₂F⁺ Heat of formation 209 kcal mol⁻¹						
CH ₂ F ⁺	CH ₂ F		9.35	SL	209*	141
CH ₂ F ⁺	CH ₂ F		9.4	SL	210*	141
CH ₂ F ⁺	CH ₃ F	H ^{-?}	13.25 ± 0.06	RPD	206	1139
CH ₂ F ⁺	CH ₃ F	H ^{-?}	13.35	RPD	208	160
CH ₂ F ⁺	CH ₃ F	H	14.0	RPD	204	160
CH ₂ F ⁺	CH ₃ F	H ^{-?}	15.15	RPD		160
CH ₂ F ⁺	CH ₃ F	H	15.85	RPD		160
CH ₂ F ⁺	CH ₂ F ₂	F	15.28	VC	227	1288
CH ₂ F ⁺	CH ₂ =CF ₂	CF	15.08	VC	201	419
CH ₂ F ⁺	CH ₃ CF ₃		15.6 ± 0.2	EVD		1075
CH ₂ F ⁺	C ₂ H ₅ CF ₃		15.7 ± 0.3	EVD		1075
CH₃F⁺						
CH ₃ F ^{+(2E)}}	CH ₃ F		12.85 ± 0.01	RPD	229*	289
CH ₃ F ⁺	CH ₃ F		12.95 ± 0.05	RPD	232	2154
CH ₃ F ⁺	CH ₃ F		14.0 ± 0.05	RPD		2154
CH ₃ F ⁺	CH ₃ F		14.10 ± 0.03	RPD		289
CH ₃ F ⁺	CH ₃ F		16.89 ± 0.03	RPD		289
CH ₃ F ⁺	CH ₃ F		16.9 ± 0.05	RPD		2154
CH ₃ F ⁺	CH ₃ F		13.4 ± 0.05	RPD		2154

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂HF⁺						
C ₂ HF ⁺	C ₂ H ₃ F	H ₂	14.04	VC	296	419
C ₂ HF ⁺	CH ₂ =CF ₂	HF	14.44	VC	319	419
C ₂ HF ⁺	C ₂ HF ₃	2F	20.0	VC	312	419
C₂H₂F⁺						
C ₂ H ₂ F ⁺	C ₂ H ₃ F	H	14.02	VC	243	419
C ₂ H ₂ F ⁺	CH ₂ =CF ₂	F	14.80	VC	244	419
C ₂ H ₂ F ⁺	CH ₃ CF ₃	HF + F?	15.8 ± 0.2	EVD	234	1075
C₂H₃F⁺ Heat of formation 211 kcal mol⁻¹						
C ₂ H ₃ F ⁺	C ₂ H ₃ F		10.37 ± 0.02	PI	211*	268
C ₂ H ₃ F ⁺	C ₂ H ₃ F		10.37	PI	211*	168
C ₂ H ₃ F ⁺	C ₂ H ₃ F		10.45 ± 0.05	EVD	213	268
C ₂ H ₃ F ⁺	C ₂ H ₃ F		10.45	VC	213	419
C ₂ H ₃ F ⁺	C ₂ H ₃ F		10.880	PI	268	
C ₂ H ₃ F ⁺	CH ₃ CHF ₂	HF?	14.8	VC	292	1288
C ₂ H ₃ F ⁺	CH ₂ =CHCF ₃		13.85 ± 0.02	EVD		1075
C₂H₄F⁺						
C ₂ H ₄ F ⁺	CH ₃ CHF ₂	F	14.9	VC	325	1288
C₃H₂F⁺						
C ₃ H ₂ F ⁺	C ₆ H ₅ F (Fluorobenzene)		15.77 ± 0.1	SL		2103
C₃H₄F⁺						
C ₃ H ₄ F ⁺	C ₂ H ₅ CF ₃		15.8 ± 0.1	EVD		1075
C₄H₃F⁺						
C ₄ H ₃ F ⁺	C ₆ H ₅ F (Fluorobenzene)	C ₂ H ₂	14.77 ± 0.1	SL	260	2103
C₅H₄F⁺						
C ₅ H ₄ F ⁺	C ₅ H ₄ F (Fluorocyclopentadienyl radical)		8.82	SL		126
C₆H₄F⁺						
C ₆ H ₄ F ⁺	C ₆ H ₅ F (Fluorobenzene)	H	15.22 ± 0.1	SL	272	2103
C ₆ H ₄ F ⁺	C ₆ H ₄ F ₂ (<i>p</i> -Difluorobenzene)	F	15.5 ± 0.1	SL	268	301
C ₆ H ₄ F ⁺	C ₆ H ₄ FCl (<i>o</i> -Fluorochlorobenzene)	Cl	13.94	EVD	261	1185
C ₆ H ₄ F ⁺	C ₆ H ₄ FCl (<i>m</i> -Fluorochlorobenzene)	Cl	14.10	EVD	264	1185
C ₆ H ₄ F ⁺	C ₆ H ₄ FCl (<i>p</i> -Fluorochlorobenzene)	Cl	14.13	EVD	265	1185

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
cyclo-C₆H₅F⁺ Heat of formation 186 kcal mol⁻¹						
C ₆ H ₅ F ⁺ (Fluorobenzene)	C ₆ H ₅ F		9.200	S	186*	344
C ₆ H ₅ F ⁺ (Fluorobenzene)	C ₆ H ₅ F		9.19 ± 0.01	PI	185*	416
C ₆ H ₅ F ⁺ (Fluorobenzene)	C ₆ H ₅ F		9.195 ± 0.01	PI	186*	182
C ₆ H ₅ F ⁺ (Fluorobenzene)	C ₆ H ₅ F		9.20	PI	186*	168
C ₆ H ₅ F ⁺ (Fluorobenzene)	C ₆ H ₅ F		9.3 ± 0.1	SL	188	301
C₇H₆F⁺						
C ₇ H ₆ F ⁺ (<i>m</i> -Fluorobenzyl radical)	C ₆ H ₄ FCH ₂		8.18 ± 0.06	SL		69
C ₇ H ₆ F ⁺ (<i>p</i> -Fluorobenzyl radical)	C ₆ H ₄ FCH ₂		7.78 ± 0.1	SL		69
C₇H₇F⁺						
C ₇ H ₇ F ⁺ (<i>o</i> -Fluorotoluene)	C ₆ H ₄ FCH ₃		8.915 ± 0.01	PI	173*	182
C ₇ H ₇ F ⁺ (<i>m</i> -Fluorotoluene)	C ₆ H ₄ FCH ₃		8.915 ± 0.01	PI	172*	182
C ₇ H ₇ F ⁺ (<i>m</i> -Fluorotoluene)	C ₆ H ₄ FCH ₃		9.15 ± 0.05	CS	177	2025
C ₇ H ₇ F ⁺ (<i>p</i> -Fluorotoluene)	C ₆ H ₄ FCH ₃		8.785 ± 0.01	PI	169*	182
CHF₂⁺ Heat of formation 143 kcal mol⁻¹						
CHF ₂ ⁺	CHF ₂		9.45	SL	(a)	141
CHF ₂ ⁺	CH ₂ F ₂	H	13.14 ± 0.02	RPD	144*	1139
CHF ₂ ⁺	CH ₂ F ₂	H	13.1	VC	143*	1288
CHF ₂ ⁺	CH ₃ CHF ₂	CH ₃	13.21	VC	157	1288
CHF ₂ ⁺	CHF ₃	F	16.4 ± 0.3	EVD	195	43
CHF ₂ ⁺	CHF ₃	F	15.75	VC	180	1288
CHF ₂ ⁺	C ₂ HF ₃	CF	14.22	VC	148	419
CHF ₂ ⁺	CH ₂ =CHCF ₃	C ₂ H ₂ F?	14.9 ± 0.1	EVD	202	1075
CHF ₂ ⁺	C ₂ H ₅ CF ₃	C ₂ H ₄ +F?	15.9 ± 0.1	EVD	144	1075
CHF ₂ ⁺	CHF ₂ Cl	Cl	12.59 ± 0.15	EVD	148	43
CH₂F₂⁺						
CH ₂ F ₂ ⁺	CH ₂ F ₂		12.6	VC	184	1288
CH ₂ F ₂ ⁺	CH ₂ F ₂		12.95	TC	192	1164
C₂HF₂⁺						
C ₂ HF ₂ ⁺	CH ₂ =CF ₂	H	16.67	VC	254	419
C ₂ HF ₂ ⁺	C ₂ HF ₃	F	16.13	VC	241	419

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₂F₂⁺ Heat of formation 159 kcal mol⁻¹						
C ₂ H ₂ F ₂ ⁺	CH ₂ =CF ₂		10.30	PI	159*	168
C ₂ H ₂ F ₂ ⁺	CH ₂ =CF ₂		10.31 ± 0.02	PI	159*	268
C ₂ H ₂ F ₂ ⁺	CH ₂ =CF ₂		10.32 ± 0.05	EVD	159	268
C ₂ H ₂ F ₂ ⁺	CH ₂ =CF ₂		10.45	VC	162	419
C ₂ H ₂ F ₂ ⁺	CH ₂ =CF ₂		10.890	PI		268
C ₂ H ₂ F ₂ ⁺	CH ₃ CHF ₂	2H?	16.5	VC	162	1288
C ₂ H ₂ F ₂ ⁺	CH ₃ CF ₃	HF	11.2 ± 0.1	EVD	147	1075
C₂H₃F₂⁺						
C ₂ H ₃ F ₂ ⁺	CH ₃ CHF ₂	H	12.33	VC	118	1288
C ₂ H ₃ F ₂ ⁺	CH ₃ CF ₃	F	14.9 ± 0.2	EVD	149	1075
C₂H₄F₂⁺						
C ₂ H ₄ F ₂ ⁺	CH ₃ CHF ₂		12.68	VC	178	1288
C₃HF₂⁺						
C ₃ HF ₂ ⁺	CH ₂ =CHCF ₃		14.8 ± 0.2	EVD		1075
C₃H₂F₂⁺						
C ₃ H ₂ F ₂ ⁺	CH ₂ =CHCF ₃	HF?	13.8 ± 0.1	EVD	229	1075
C₃H₃F₂⁺						
C ₃ H ₃ F ₂ ⁺	CH ₂ =CHCF ₃	F?	13.3 ± 0.15	EVD	134	1075
C ₃ H ₃ F ₂ ⁺	C ₂ H ₅ CF ₃	H + HF?	13.6 ± 0.1	EVD	135	1075
C₃H₄F₂⁺						
C ₃ H ₄ F ₂ ⁺	C ₂ H ₅ CF ₃	HF?	12.53 ± 0.04	EVD	163	1075
C₃H₅F₂⁺						
C ₃ H ₅ F ₂ ⁺	C ₂ H ₅ CF ₃	F	14.9 ± 0.2	EVD	134	1075
C₄H₂F₂⁺						
C ₄ H ₂ F ₂ ⁺ (<i>o</i> -Difluorobenzene)	C ₆ H ₄ F ₂	C ₂ H ₂	15.27	EVD	230	1185
C ₄ H ₂ F ₂ ⁺ (<i>m</i> -Difluorobenzene)	C ₆ H ₄ F ₂	C ₂ H ₂	15.30	EVD	227	1185
C ₄ H ₂ F ₂ ⁺ (<i>p</i> -Difluorobenzene)	C ₆ H ₄ F ₂	C ₂ H ₂	15.27	EVD	227	1185
C₆H₃F₂⁺						
C ₆ H ₃ F ₂ ⁺ (1,2,4-Trifluorobenzene)	C ₆ H ₃ F ₃	F	15.2 ± 0.1	SL		301

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆H₄F₂⁺(<i>o</i>-Difluorobenzene) Heat of formation 147 kcal mol⁻¹						
C₆H₄F₂⁺(<i>p</i>-Difluorobenzene) Heat of formation 140 kcal mol⁻¹						
C ₆ H ₄ F ₂ ⁺ (<i>o</i> -Difluorobenzene)	C ₆ H ₄ F ₂		9.31	PI	147*	168
C ₆ H ₄ F ₂ ⁺ (<i>o</i> -Difluorobenzene)	C ₆ H ₄ F ₂		9.74 ± 0.02	EVD	157	1185
C ₆ H ₄ F ₂ ⁺ (<i>m</i> -Difluorobenzene)	C ₆ H ₄ F ₂		9.78 ± 0.02	EVD	154	1185
C ₆ H ₄ F ₂ ⁺ (<i>p</i> -Difluorobenzene)	C ₆ H ₄ F ₂		9.15	PI	140*	168
C ₆ H ₄ F ₂ ⁺ (<i>p</i> -Difluorobenzene)	C ₆ H ₄ F ₂		9.66 ± 0.02	EVD	152	1185
C ₆ H ₄ F ₂ ⁺ (<i>p</i> -Difluorobenzene)	C ₆ H ₄ F ₂		9.3 ± 0.1	SL	144	301
C₂HF₃⁺ Heat of formation 122 kcal mol⁻¹						
C ₂ HF ₃ ⁺	C ₂ HF ₃		10.14	PI	122*	168
C ₂ HF ₃ ⁺	C ₂ HF ₃		10.33	VC	126	419
C₂H₂F₃⁺						
C ₂ H ₂ F ₃ ⁺	CF ₃ CH ₂		10.6 ± 0.1	SL		2164
C₃H₂F₃⁺						
C ₃ H ₂ F ₃ ⁺	CH ₂ =CHCF ₃	H	12.69 ± 0.05	EVD	87	1075
C₃H₃F₃⁺						
C ₃ H ₃ F ₃ ⁺	CH ₂ =CHCF ₃		10.9	PI	97*	168
C ₃ H ₃ F ₃ ⁺	CH ₂ =CHCF ₃		11.24 ± 0.04	EVD	105	1075
C₆H₂F₃⁺						
C ₆ H ₂ F ₃ ⁺ (1,2,4,5-Tetrafluorobenzene)	C ₆ H ₂ F ₄	F	15.9 ± 0.1	SL		301
C₆H₃F₃⁺						
C ₆ H ₃ F ₃ ⁺ (1,2,4-Trifluorobenzene)	C ₆ H ₃ F ₃		9.37	PI		168
C ₆ H ₃ F ₃ ⁺ (1,3,5-Trifluorobenzene)	C ₆ H ₃ F ₃		9.3	PI		168
C₇H₅F₃⁺ Heat of formation 84 kcal mol⁻¹						
C ₇ H ₅ F ₃ ⁺ (Benzotrifluoride)	C ₆ H ₅ CF ₃		9.685	S	84*	344
C ₇ H ₅ F ₃ ⁺ (Benzotrifluoride)	C ₆ H ₅ CF ₃		9.68 ± 0.02	PI	84*	182
C ₇ H ₅ F ₃ ⁺ (Benzotrifluoride)	C ₆ H ₅ CF ₃		10.0 ± 0.1	SL	92	301

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇H₁₁F₃⁺						
C ₇ H ₁₁ F ₃ ⁺ (Trifluoromethylcyclohexane)	C ₆ H ₁₁ CF ₃		10.46 ± 0.02	PI	37*	182
C₆HF₄⁺						
C ₆ HF ₄ ⁺ (Pentafluorobenzene)	C ₆ HF ₅	F	16.5 ± 0.1	SL		301
C₆H₂F₄⁺						
C ₆ H ₂ F ₄ ⁺ (1,2,3,4-Tetrafluorobenzene)	C ₆ H ₂ F ₄		9.61	PI		168
C ₆ H ₂ F ₄ ⁺ (1,2,3,5-Tetrafluorobenzene)	C ₆ H ₂ F ₄		9.55	PI		168
C ₆ H ₂ F ₄ ⁺ (1,2,4,5-Tetrafluorobenzene)	C ₆ H ₂ F ₄		9.39	PI		168
C₆HF₅⁺						
C ₆ HF ₅ ⁺ (Pentafluorobenzene)	C ₆ HF ₅		9.84	PI		168
C ₆ HF ₅ ⁺ (Pentafluorobenzene)	C ₆ HF ₅		10.0 ± 0.1	SL		301
C₇H₃F₅⁺						
C ₇ H ₃ F ₅ ⁺ (Pentafluorotoluene)	C ₆ F ₅ CH ₃		9.6 ± 0.1	SL		301
C₆F₁₅N⁺						
C ₆ F ₁₅ N ⁺	(C ₂ F ₅) ₃ N		11.7	PI		182
C₇F₅O⁺						
C ₇ F ₅ O ⁺ (Perfluoroacetophenone)	C ₆ F ₅ COCF ₃	CF ₃	11.15	SL		308
C ₇ F ₅ O ⁺ (Pentafluorobenzaldehyde)	C ₆ F ₅ CHO	H	11.6	SL		308
C ₇ F ₅ O ⁺ (Pentafluoroacetophenone)	C ₆ F ₅ COCH ₃	CH ₃	11.25	SL		308
C ₇ F ₅ O ⁺ (Pentafluorobenzamide)	C ₆ F ₅ CONH ₂	NH ₂ ?	11.3 ± 0.2	SL		1168
C₈F₈O⁺						
C ₈ F ₈ O ⁺ (Perfluoroacetophenone)	C ₆ F ₅ COCF ₃		11.05	SL		308
CH₂BF⁺						
CH ₂ BF ⁺	CH ₃ BF ₂	HF?	13.38 ± 0.02	SL	179	1076
CH₃BF⁺						
CH ₃ BF ⁺	CH ₃ BF ₂	F	15.05 ± 0.1	SL	134	1076

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₂BF⁺						
C ₂ H ₂ BF ⁺	CH ₂ =CHBF ₂	H+F?	12.69±0.05	SL	115	1076
C ₂ H ₂ BF ⁺	C ₂ H ₅ BF ₂	HF+H ₂	12.0±0.2	SL	128	1076
C ₂ H ₂ BF ⁺	C ₂ H ₅ BF ₂		15.0±0.2	SL		1076
C₂H₃BF⁺						
C ₂ H ₃ BF ⁺	CH ₂ =CHBF ₂	F?	11.9±0.2	SL	149	1076
C ₂ H ₃ BF ⁺	CH ₂ =CHBF ₂	F	15.5±0.2	SL	149	1076
C ₂ H ₃ BF ⁺	C ₂ H ₅ BF ₂	H ₂ +F?	12.0±0.2	SL	127	1076
C ₂ H ₃ BF ⁺	C ₂ H ₅ BF ₂	HF+H	14.9±0.2	SL	142	1076
C ₂ H ₃ BF ⁺	iso-C ₃ H ₇ BF ₂	CH ₄ +F?	11.8±0.1	SL	136	1076
C₂H₄BF⁺						
C ₂ H ₄ BF ⁺	C ₂ H ₅ BF ₂	HF	12.6±0.2	SL	141	1076
C₂H₅BF⁺						
C ₂ H ₅ BF ⁺	C ₂ H ₅ BF ₂	F?	12.1±0.2	SL	130	1076
C ₂ H ₅ BF ⁺	C ₂ H ₅ BF ₂	F	15.6±0.2	SL	127	1076
CH₃BF₂⁺						
CH ₃ BF ₂ ⁺	CH ₃ BF ₂		12.54±0.03	SL	95	1076
C₂H₃BF₂⁺						
C ₂ H ₃ BF ₂ ⁺	CH ₂ =CHBF ₂		11.06±0.03	SL	65	1076
C ₂ H ₃ BF ₂ ⁺	iso-C ₃ H ₇ BF ₂	CH ₄	12.80±0.05	SL	94	1076
C₂H₄BF₂⁺						
C ₂ H ₄ BF ₂ ⁺	iso-C ₃ H ₇ BF ₂	CH ₃	12.58±0.05	SL	38	1076
C₂H₅BF₂⁺						
C ₂ H ₅ BF ₂ ⁺	C ₂ H ₅ BF ₂		11.8±0.05	SL	58	1076
C₈H₁₀NF⁺						
C ₈ H ₁₀ NF ⁺	C ₆ H ₄ FN(CH ₃) ₂ (N,N-Dimethyl-p-Fluoroaniline)		7.50	CTS	150	1281
C₆H₅OF⁺						
C ₆ H ₅ OF ⁺	C ₆ H ₄ FOH (o-Fluorophenol)		8.66±0.01	PI	132*	182
C₇H₅OF⁺						
C ₇ H ₅ OF ⁺	C ₆ H ₅ COF (Benzoyl fluoride)		10.6	SL	190	308
C₈H₅OF₃⁺						
C ₈ H ₅ OF ₃ ⁺	C ₆ H ₅ COCF ₃ (Trifluoroacetophenone)		10.25	SL		308

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₈H₃OF₅⁺						
C ₈ H ₃ OF ₅ ⁺	C ₆ F ₅ COCH ₃ (Pentafluoroacetophenone)		11.25	SL		308
C₅H₃OF₇⁺						
C ₅ H ₃ OF ₇ ⁺	n-C ₃ F ₇ COCH ₃		10.58 ± 0.03	PI		182
C₇H₂NOF₅⁺						
C ₇ H ₂ NOF ₅ ⁺	C ₆ F ₅ CONH ₂ (Pentafluorobenzamide)		10.0 ± 0.1	SL		1168
C₁₉H₁₀N₄O₂F₆⁺						
C ₁₉ H ₁₀ N ₄ O ₂ F ₆ ⁺	(C ₆ H ₅ C ₂ N ₂ O) ₂ C ₃ F ₆ (1,3-Di-(2-Phenyl-1,3,4-oxadiazol-5-Yl)perfluoropropane)		9.5 ± 0.1	SL		2156
C₁₁H₅N₂OF₇⁺						
C ₁₁ H ₅ N ₂ OF ₇ ⁺	C ₆ H ₅ C ₂ N ₂ OC ₃ F ₇ (2-Phenyl-5-perfluoropropyl-1,3,4-oxadiazole)		9.8 ± 0.2	SL		2156
C₁₅H₅N₂OF₁₅⁺						
C ₁₅ H ₅ N ₂ OF ₁₅ ⁺	C ₆ H ₅ C ₂ N ₂ C ₇ F ₁₅ (2-Phenyl-5-perfluoroheptyl-1,3,4-oxadiazole)		9.9 ± 0.1	SL		2156
Na⁺ Heat of formation 144 kcal mol⁻¹						
Na ⁺	Na		5.139	S	144*	2113
Na ⁺	Na		5.14	LE	144	99
Na ⁺	NaI	I	8.7 ± 0.3	VC		2001
Na⁺² Heat of formation 1235 kcal mol⁻¹						
Na ⁺²	Na		52.44	S	1235*	2113
Na ⁺²	Na		52 ± 1	NRE	1225	99
Na⁺³ Heat of formation 2888 kcal mol⁻¹						
Na ⁺³	Na		124.11	S	2888*	2113
Na ⁺³	Na		125 ± 2	NRE	2908	99
Na₂⁺						
Na ₂ ⁺	Na ₂		4.90 ± 0.01	PI	146*	1189
Mg⁺ Heat of formation 212 kcal mol⁻¹						
Mg ⁺	Mg		7.646	S	212*	2113
Mg ⁺	Mg		7.6 ± 0.2	VC	211	1104
Mg ⁺	MgCl ₂	2Cl	17.5 ± 0.5	VC	250	178
Mg ⁺	MgBr ₂	2Br	15.5 ± 1	VC	229	178

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
MgF⁺						
MgF ⁺	MgF		7.8 ± 0.3	VC	127	1104
MgF ⁺	MgF		7.8 ± 0.3	VC	127	2148
MgF ⁺	MgF ₂	F	13.5 ± 0.4	VC	119	178
MgF ⁺	MgF ₂	F	13.7 ± 0.4	VC	124	1104
MgF₂⁺						
MgF ₂ ⁺	MgF ₂		13.5 ± 0.4	VC	138	178
Mg₂F₃⁺						
Mg ₂ F ₃ ⁺	Mg ₂ F ₄	F?	14.0 ± 0.5	VC	- 108	178
Al⁺ Heat of formation 216 kcal mol⁻¹						
Al ⁺	Al		5.986	S	216*	2113
Al ⁺	Al		5.986	S	216*	2199
Al ⁺	Al		6.0 ± 0.5	LE	216	2128
Al ⁺	Al		6.0 ± 0.3	VC	216	1104
Al ⁺	Al		6.1 ± 0.3	VC	219	2165
Al ⁺	AlF	F-?	9.2 ± 0.3	VC	215	2148
AlO⁺						
AlO ⁺	AlO		9.5 ± 0.5	LE	241	2128
Al₂O⁺						
Al ₂ O ⁺	Al ₂ O		7.7 ± 0.5	LE	147	2128
Al₂O₂⁺						
Al ₂ O ₂ ⁺	Al ₂ O ₂		9.9 ± 0.5	LE	134	2128
AlF⁺ Heat of formation 166 kcal mol⁻¹						
AlF ⁺	AlF		8.9 ± 0.6	VC	144	2142
AlF ⁺	AlF		9.7 ± 0.5	VC	162*	1104
AlF ⁺	AlF		9.7 ± 0.3	VC	162*	2148
AlF ⁺	AlF		9.9 ± 0.3	VC	167*	1104
AlF ⁺	AlF		10.1 ± 0.3	VC	171*	1104
AlF₂⁺						
AlF ₂ ⁺	AlF ₂		9 ± 1	VC	58	2148
AlF ₂ ⁺	AlF ₃	F?	15.2 ± 0.3	VC	44	1104
AlF ₂ ⁺	AlF ₃	F?	15.2 ± 0.3	VC	44	2148
Si⁺ Heat of formation 297 kcal mol⁻¹						
Si ⁺	Si		8.151	S	297*	2113
Si ⁺	Si		8.1	LE	296	1116
Si ⁺	SiH ₄	2H ₂	11.7 ± 0.2	LE	278	2116
Si ⁺	SiH ₄	H ₂ + 2H	16.4 ± 0.2	LE	282	2116
Si ⁺	SiH ₄	4H	20.8 ± 0.2	LE	280	2116
Si ⁺	(CH ₃) ₃ SiH	CH ₄ + C ₂ H ₆ ?	13.7 ± 0.3	EVD	312	83
Si ⁺	Si ₂ H ₆	Si + 3H ₂	15.2 ± 0.3	LE	261	2133

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Si₂⁺						
Si ₂ ⁺	Si ₂		7.3	LE	310	1116
Si ₂ ⁺	Si ₂		7.4 ± 0.3	LE	313	333
Si ₂ ⁺	Si ₂ H ₆	3H ₂	12.2 ± 0.3	LE	301	2133
Si₃⁺						
Si ₃ ⁺	Si ₃		8.0 ± 0.3	LE	332	333
SiH⁺						
SiH ⁺	SiH ₄	H ₂ + H	16.1 ± 0.2	LE	327	2116
SiH ⁺	SiH ₄	3H	20.4 ± 0.5	LE	322	2116
SiH ⁺	(CH ₃) ₃ SiH		14.2 ± 0.2	EVD		83
SiH₂⁺						
SiH ₂ ⁺	SiH ₄	H ₂	11.91 ± 0.02	SL	283	2182
SiH ₂ ⁺	SiH ₄	H ₂	12.1 ± 0.2	LE	287	2116
SiH ₂ ⁺	SiH ₄	2H	16.5 ± 0.3	LE	285	2116
SiH ₂ ⁺	CH ₃ SiH ₃	CH ₄	11.62 ± 0.1	SL		2182
SiH ₂ ⁺	C ₂ H ₅ SiH ₃	C ₂ H ₆	12.0 ± 0.1	SL	265	2182
SiH ₂ ⁺	Si ₂ H ₆	SiH ₄	11.94 ± 0.04	SL	286	2183
SiH₃⁺						
SiH ₃ ⁺	SiH ₄	H	12.40 ± 0.02	SL	242	2182
SiH ₃ ⁺	SiH ₄	H	11.8 ± 0.2	LE	228	173
SiH ₃ ⁺	SiH ₄	H	11.8 ± 0.2	LE	228	2116
SiH ₃ ⁺	SiH ₄	H	11.81 ± 0.09	LE	229	2002
SiH ₃ ⁺	CH ₃ SiH ₃	CH ₃	12.80 ± 0.1	SL		2182
SiH ₃ ⁺	C ₂ H ₅ SiH ₃	C ₂ H ₅	12.8 ± 0.2	SL	238	2182
SiH ₃ ⁺	<i>iso</i> -C ₃ H ₇ SiH ₃	<i>iso</i> -C ₃ H ₇	13.1 ± 0.2	SL	247	2182
SiH ₃ ⁺	(CH ₃) ₃ SiH		14.3 ± 0.5	EVD		83
SiH ₃ ⁺	<i>tert</i> -C ₄ H ₉ SiH ₃	<i>tert</i> -C ₄ H ₉	13.7 ± 0.2	SL		2182
SiH ₃ ⁺	Si ₂ H ₆	SiH ₃	11.85 ± 0.05	SL		2183
SiH ₃ ⁺	Si ₂ H ₆	SiH ₃	11.31 ± 0.12	LE		2002
SiH ₃ ⁺	Si ₂ H ₆	SiH ₃	11.3 ± 0.2	LE		173
SiH ₃ ⁺	SiPH ₅	PH ₂	11.5 ± 0.2	LE		173
SiH ₃ ⁺	GeSiH ₆	GeH ₃	12.01 ± 0.09	LE	266	2002
Si₂H₆⁺						
Si ₂ H ₆ ⁺	Si ₂ H ₆		10.6 ± 0.3	LE	264	2133
SiB⁺						
SiB ⁺	SiB		7.8	LE	355	1116
SiC⁺						
SiC ⁺	SiC		9.0	LE	385	1116
SiC ⁺	SiC		9.2 ± 0.4	LE	389	333

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
SiC₂⁺						
SiC ₂ ⁺	SiC ₂		10.2 ± 0.3	LE	382	333
SiC ₂ ⁺	SiC ₂		10.2	LE	382	1116
Si₂C⁺						
Si ₂ C ⁺	Si ₂ C		9.1	LE	342	1116
Si ₂ C ⁺	Si ₂ C		9.2 ± 0.3	LE	344	333
Si₂C₂⁺						
Si ₂ C ₂ ⁺	Si ₂ C ₂		8.2 ± 0.3	LE	357	333
Si₂C₃⁺						
Si ₂ C ₃ ⁺	Si ₂ C ₃		9.2 ± 0.3	LE	389	333
Si₃C⁺						
Si ₃ C ⁺	Si ₃ C		8.2 ± 0.3	LE	351	333
SiO⁺						
SiO ⁺	SiO		10.51	S	219	2150
SiF⁺						
SiF ⁺	SiF		7.26	S	168	2149
SiF₄⁺						
SiF ₄ ⁺	SiF ₄		15.4 ± 0.4	SL	-31	74
CHSi⁺						
CHSi ⁺	(CH ₃) ₃ SiH		11.7 ± 0.5	EVD		83
CH₂Si⁺						
CH ₂ Si ⁺	(CH ₃) ₃ SiH		10.6 ± 0.3	EVD		83
CH₃Si⁺						
CH ₃ Si ⁺	(CH ₃) ₃ SiH		12.4 ± 0.3	EVD		83
CH ₃ Si ⁺	(CH ₃) ₄ Si		17.1 ± 0.4	EVD		82
CH₄Si⁺						
CH ₄ Si ⁺	(CH ₃) ₃ SiH		11.0 ± 0.3	EVD		83
CH₅Si⁺						
CH ₅ Si ⁺	(CH ₃) ₃ SiH		12.8 ± 0.5	EVD		83
C₂H₆Si⁺						
C ₂ H ₆ Si ⁺	(CH ₃) ₃ SiH	CH ₄	10.3 ± 0.2	EVD	213	83
C ₂ H ₆ Si ⁺	(CH ₃) ₄ Si	2CH ₃	13.9 ± 0.3	EVD	197	82

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₇Si⁺						
C ₂ H ₇ Si ⁺	(CH ₃) ₂ SiH ₂	H	11.94 ± 0.04	RPD		1421
C ₂ H ₇ Si ⁺	(CH ₃) ₃ SiH	CH ₃	11.70 ± 0.06	RPD	195	1421
C ₂ H ₇ Si ⁺	(CH ₃) ₃ SiH	CH ₃	11.9 ± 0.3	EVD	199	83
C₂H₈Si⁺						
C ₂ H ₈ Si ⁺	C ₂ H ₅ SiH ₃		10.18 ± 0.05	SL	203	2182
C₃H₉Si⁺ Heat of formation 155 kcal mol⁻¹						
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiH	H	10.78 ± 0.07	RPD	(a)	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiH	H	10.9 ± 0.2	EVD		83
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiH	H	10.72 ± 0.1	NS		2055
C ₃ H ₉ Si ⁺	(CH ₃) ₄ Si	CH ₃	10.63 ± 0.13	RPD	155*	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₄ Si	CH ₃	11.3 ± 0.15	EVD	170	82
C ₃ H ₉ Si ⁺	(CH ₃) ₄ Si	CH ₃	10.53 ± 0.1	NS	152	2055
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiC ₂ H ₅	C ₂ H ₅	10.53 ± 0.09	RPD	(a)	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiC ₂ H ₅	C ₂ H ₅	10.34 ± 0.11	NS		2055
C ₃ H ₉ Si ⁺	<i>iso</i> -C ₃ H ₇ Si(CH ₃) ₃	<i>iso</i> -C ₃ H ₇	10.56 ± 0.16	RPD	(a)	1421
C ₃ H ₉ Si ⁺	<i>tert</i> -C ₄ H ₉ Si(CH ₃) ₃	<i>tert</i> -C ₄ H ₉	10.53 ± 0.09	RPD	(a)	1421
C ₃ H ₉ Si ⁺	C ₆ H ₅ CH ₂ Si(CH ₃) ₃ (Benzyltrimethylsilane)	C ₆ H ₅ CH ₂	10.05 ± 0.1	NS		2055
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiSi(CH ₃) ₃	Si(CH ₃) ₃	10.69 ± 0.04	RPD		1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiSi(CH ₃) ₃	Si(CH ₃) ₃	10.03 ± 0.1	NS		2055
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiN(C ₂ H ₅) ₂	N(C ₂ H ₅) ₂	12.61 ± 0.03	RPD	(a)	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiOCH ₃	OCH ₃	12.43 ± 0.18	RPD	(a)	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiOSi(CH ₃) ₃	OSi(CH ₃) ₃	15.36 ± 0.13	RPD	(b)	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiF	F ⁻ ?	11.7 ± 0.5	RPD		1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiCl	Cl	12.40 ± 0.06	RPD	173	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiCl	Cl	11.5 ± 0.2	NS	152	2055
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiBr	Br	10.69 ± 0.06	RPD	(a)	1421
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiHgSi(CH ₃) ₃		8.56 ± 0.1	NS		2055
C₃H₁₀Si⁺						
C ₃ H ₁₀ Si ⁺	<i>iso</i> -C ₃ H ₇ SiH ₃		9.85 ± 0.1	SL	189	2182
C ₃ H ₁₀ Si ⁺	(CH ₃) ₃ SiH		9.8 ± 0.3	EVD	184	83
C₄H₁₁Si⁺						
C ₄ H ₁₁ Si ⁺	(CH ₃) ₃ SiC ₂ H ₅	CH ₃	11.41 ± 0.06	RPD	167	1421
(CH₃)₄Si⁺ Heat of formation 171 kcal mol⁻¹						
C ₄ H ₁₂ Si ⁺	<i>tert</i> -C ₄ H ₉ SiH ₃		9.5 ± 0.2	SL		2182
C ₄ H ₁₂ Si ⁺	(CH ₃) ₄ Si		9.98 ± 0.03	RPD	173*	1421
C ₄ H ₁₂ Si ⁺	(CH ₃) ₄ Si		9.8	EC	169	218
C ₄ H ₁₂ Si ⁺	(CH ₃) ₄ Si		9.8 ± 0.15	EVD	169*	82
C₅H₁₄Si⁺						
C ₅ H ₁₄ Si ⁺	(CH ₃) ₃ SiC ₂ H ₅		9.70 ± 0.01	RPD	161	1421
C₆H₁₆Si⁺						
C ₆ H ₁₆ Si ⁺	<i>iso</i> -C ₃ H ₇ Si(CH ₃) ₃		9.50 ± 0.03	RPD	147	1421
C₇H₁₈Si⁺						
C ₇ H ₁₈ Si ⁺	<i>tert</i> -C ₄ H ₉ Si(CH ₃) ₃		9.34 ± 0.06	RPD	132	1421

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₅H₁₅Si₂⁺						
C ₅ H ₁₅ Si ₂ ⁺	(CH ₃) ₃ SiSi(CH ₃) ₃	CH ₃	10.74 ± 0.08	RPD	89	1421
C₆H₁₈Si₂⁺						
C ₆ H ₁₈ Si ₂ ⁺	(CH ₃) ₃ SiSi(CH ₃) ₃		8.79 ± 0.08	RPD	77	1421
BCSi⁺						
BCSi ⁺	BCSi		9.9	LE	394	1116
C₇H₁₉SiN⁺						
C ₇ H ₁₉ SiN ⁺	(CH ₃) ₃ SiN(C ₂ H ₅) ₂		8.06 ± 0.02	RPD	88	1421
C₃H₉SiO⁺						
C ₃ H ₉ SiO ⁺	(CH ₃) ₃ SiOCH ₃	CH ₃	10.25 ± 0.05	RPD	71	1421
C₄H₁₂SiO⁺						
C ₄ H ₁₂ SiO ⁺	(CH ₃) ₃ SiOCH ₃		9.79 ± 0.04	RPD	94	1421
C₅H₁₅Si₂O⁺						
C ₅ H ₁₅ Si ₂ O ⁺	(CH ₃) ₃ SiOSi(CH ₃) ₃	CH ₃	10.20 ± 0.07	RPD	16	1421
C₆H₁₈Si₂O⁺						
C ₆ H ₁₈ Si ₂ O ⁺	(CH ₃) ₃ SiOSi(CH ₃) ₃		9.59 ± 0.04	RPD	35	1421
C₂H₆SiF⁺						
C ₂ H ₆ SiF ⁺	(CH ₃) ₃ SiF	CH ₃	11.11 ± 0.05	RPD		1421
C₃H₉SiF⁺						
C ₃ H ₉ SiF ⁺	(CH ₃) ₃ SiF		10.55 ± 0.06	RPD		1421
P⁺ Heat of formation 328 kcal mol⁻¹						
P ⁺	P		10.980	S	328*	2113
P ⁺	P		11	VC	329	8
P ⁺	P ₂	P	16	VC	328	8
P ⁺	P ₂ H ₄	P ⁺ 2H ₂ ?	16.7 ± 0.3	LE	315	2133
P ⁺	P ₄	P ₃ ?	14	VC	8	
P ⁺	P ₄	P ⁺ P ₂ ?	18	VC	319	8
P ⁺	P ₄		20	VC	8	
P ⁺	P ₄	3P?	23.5	VC	330	8
P ⁺	P ₄		26.5	VC	8	
P ⁺	PH ₃	H ₂ +H	16.0 ± 1	VC	318	1036
P ⁺	PH ₃	H ₂ +H	17.2 ± 0.2	EVD	346	1033
P ⁺	PH ₃	H ₂ +H	16.5 ± 0.2	LE	330	2116
P ⁺	PH ₃		20 ± 1	LE		1036
P ⁺	PH ₃	3H	20.8 ± 0.3	LE	325	2116
P ⁺	(CH ₃) ₂ PH		11.9	LE		1036
P ⁺	PCl ₃	3Cl	21.2 ± 0.5	EVD	333	192
P ⁺	PCl ₃	3Cl	21.0 ± 0.5	NS	328	1101
P ⁺	POCl ₃		21.4	NS		1101

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
P⁺² Heat of formation 782 kcal mol⁻¹						
P ⁺²	P		30.637	S	782*	2113
P ⁺²	P ⁺		17.5	VC		8
P ⁺²	P ₄	P ₂ + P?	38	VC	781	8
P ⁺²	P ₄	2P + P ⁺ ?	55	VC		8
P ⁺²	PH ₃	3H	42 ± 2	LE	814	1036
P ⁺²	PH ₃	3H	42 ± 2	NRE	814	1036
P₂⁺						
P ₂ ⁺	P ₂		10	VC		8
Excited parent molecule)						
P ₂ ⁺	P ₂		12	VC	311	8
P ₂ ⁺	P ₂		13	VC		8
P ₂ ⁺	P ₄	P ₂	14.3	VC	309	8
P ₂ ⁺	P ₄		15.5	VC		8
P ₂ ⁺	P ₂ H ₄	2H ₂	12.2	EC	286	1033
P ₂ ⁺	P ₂ H ₄	2H ₂	13.7 ± 0.3	LE	321	2133
P ₂ ⁺	P ₂ Cl ₄	Cl ₂ + 2Cl?	19.7 ± 0.4	EVD	290	192
P₃⁺						
P ₃ ⁺	P ₃		11.5	VC		8
P ₃ ⁺	P ₃		13.2	VC		8
P ₃ ⁺	P ₄	P	14.5	VC	273	8
P ₃ ⁺	P ₄	P	17.5	VC		8
P₄⁺						
P ₄ ⁺	P ₄		9	VC	222	8
P ₄ ⁺	P ₄		10	VC		8
P ₄ ⁺	P ₄		11.5	VC		8
P ₄ ⁺	P ₄		12	VC		8
P ₄ ⁺	P ₄		12.5	VC		8
P ₄ ⁺	P ₄		13.7	VC		8
P ₄ ⁺	P ₄		14.2	VC		8
PH⁺						
PH ⁺	PH ₃	H ₂	13.3 ± 0.2	EVD	308	1033
PH ⁺	PH ₃	H ₂	13.1 ± 0.2	VC	303	1036
PH ⁺	PH ₃	H ₂	12.4 ± 0.2	LE	287	2116
PH ⁺	PH ₃	H ₂	13.6	LE	315	1036
PH ⁺	PH ₃	2H	16.4 ± 0.4	LE	275	2116
PH⁺²						
PH ⁺²	PH ₃	2H?	25.1	NRE	476	1036
PH ⁺²	PH ₃	2H?	21.2	LE	386	1036
PH₂⁺						
PH ₂ ⁺	PH ₃	H	13.2 ± 0.2	EVD	254	1033
PH ₂ ⁺	PH ₃	H	14.0 ± 0.2	VC	272	1036
PH ₂ ⁺	PH ₃	H	13.2 ± 0.2	LE	254	173
PH ₂ ⁺	PH ₃	H	13.4 ± 0.2	LE	258	2116
PH ₂ ⁺	PH ₃	H	14.4	LE	281	1036
PH ₂ ⁺	P ₂ H ₄	PH ₂	12.5 ± 0.2	LE	263	173
PH ₂ ⁺	SiPH ₅	SiH ₃	13.1 ± 0.2	LE		173

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
PH₂²⁺						
PH ₂ ⁺²	PH ₃	H	34.0	NRE	733	1036
PH ₂ ⁺²	PH ₃	H	32.7	LE	703	1036
PH₃⁺ Heat of formation 231 kcal mol⁻¹						
PH ₃ ⁺	PH ₃		9.98	PI	231*	1091
PH ₃ ⁺	PH ₃		10.2 ± 0.2	EVD	237	1033
PH ₃ ⁺	PH ₃		10.4 ± 0.3	SL	241	1407
PH ₃ ⁺	PH ₃		10.4 ± 0.3	VC	241	1036
PH ₃ ⁺	PH ₃		10.3 ± 0.5	LE	239	1036
PH ₃ ⁺	PH ₃		11.5 ± 0.3	LE	267	2116
PH ₃ ⁺	PH ₃		10.3	EC	239	218
PH ₃ ⁺	C ₂ H ₅ PH ₂	C ₂ H ₄	11.2 ± 0.2	EVD	234	2045
PH ₃ ⁺	(C ₂ H ₅) ₃ P	3C ₂ H ₄ ?	14.7 ± 0.2	EVD	264	2045
PH₂D⁺						
PH ₂ D ⁺	PH ₂ D		10.1 ± 0.2	EVD		1033
PHD₂⁺						
PHD ₂ ⁺	PHD ₂		10.2 ± 0.2	EVD		1033
PD₃⁺						
PD ₃ ⁺	PD ₃		10.1 ± 0.2	EVD		1033
PH₃⁺²						
PH ₃ ⁺²	PH ₃		15.6	NRE	361	1036
PH ₃ ⁺²	PH ₃		15.0	LE	347	1036
PH₄⁺ Heat of formation 174 kcal mol⁻¹						
PH ₄ ⁺				D	174*	1414
PH ₄ ⁺	(CH ₃) ₃ P		14.2 ± 0.2	EVD		2045
PH ₄ ⁺	(C ₂ H ₅) ₃ P		14.7 ± 0.3	EVD		2045
P₂H⁺						
P ₂ H ⁺	P ₂ H ₄	H ₂ + H	13.6 ± 0.3	LE	267	2133
P ₂ H ⁺	P ₂ H ₄	H ₂ + H	13.2	EC	257	1033
P₂H₂⁺						
P ₂ H ₂ ⁺	P ₂ H ₄	H ₂	12.7 ± 0.3	LE	298	2133
P ₂ H ₂ ⁺	P ₂ H ₄	H ₂	10.5	EC	247	1033
P₂H₃⁺						
P ₂ H ₃ ⁺	P ₂ H ₄	H	11.3 ± 0.3	LE	214	2133
P ₂ H ₃ ⁺	P ₂ H ₃		8.9	EC		1033
P ₂ H ₃ ⁺	P ₂ H ₃		9.1	EC		1033

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
P₂H₄⁺						
P ₂ H ₄ ⁺	P ₂ H ₄		10.6 ± 0.3	LE	249	2133
P ₂ H ₄ ⁺	P ₂ H ₄		8.7 ± 0.3	EC	206	1033
P₂H₃D⁺						
P ₂ H ₃ D ⁺	P ₂ H ₃ D		8.4 ± 0.3	EC		1033
P₂H₂D₂⁺						
P ₂ H ₂ D ₂ ⁺	P ₂ H ₂ D ₂		8.2 ± 0.5	EC		1033
PC⁺						
PC ⁺	CH ₃ PH ₂	2H ₂ + H	14.5 ± 0.3	EVD	275	2045
PC ⁺	C ₂ H ₅ PH ₂	CH ₃ + 2H ₂ ?	12.0 ± 0.3	EVD	232	2045
PC ⁺	(CH ₃) ₃ P		13.2 ± 0.3	EVD		2045
PC ⁺	(C ₂ H ₅) ₃ P		19.1 ± 0.5	EVD		2045
PO⁺						
PO ⁺	(CH ₃ O) ₂ PHO		16.3	LE		1036
PO ⁺	POCl ₃	Cl ₂ + Cl ⁻ ?	14.5 ± 0.5	NS	260	1101
PO₃⁺						
PO ₃ ⁺	(CH ₃ O) ₂ PHO		13.5	LE		1036
PF₃⁺						
PF ₃ ⁺	PF ₃		9.71	PI	4*	1091
AlP⁺						
AlP ⁺	AlP		8.4 ± 0.4	LE	297	2152
CHP⁺						
CHP ⁺	CH ₃ PH ₂	2H ₂	14.7 ± 0.3	EVD	332	2045
CHP ⁺	C ₂ H ₅ PH ₂	CH ₄ + H ₂ ?	13.1 ± 0.5	EVD	308	2045
CHP ⁺	(CH ₃) ₂ PH	CH ₄ + H ₂ ?	14.1	LE	328	1036
CHP ⁺	(CH ₃) ₃ P	2CH ₃ + H ₂ ?	18.4 ± 0.2	EVD	335	2045
CH₂P⁺						
CH ₂ P ⁺	CH ₃ PH ₂	H ₂ + H	14.7 ± 0.2	EVD	280	2045
CH ₂ P ⁺	C ₂ H ₅ PH ₂	CH ₃ + H ₂ ?	12.7 ± 0.4	EVD	248	2045
CH ₂ P ⁺	(CH ₃) ₃ P		16.1 ± 0.4	EVD		2045
CH ₂ P ⁺	(CH ₃) ₃ P		17 ± 1	VC		1036
CH₃P⁺						
CH ₃ P ⁺	C ₂ H ₅ PH ₂	CH ₄ ?	12.0 ± 0.2	EVD	283	2045
CH ₃ P ⁺	(CH ₃) ₂ PH	CH ₄ ?	11.9	LE	277	1036
CH ₃ P ⁺	(CH ₃) ₃ P	C ₂ H ₄ + H ₂ ?	14.0 ± 0.3	EVD	287	2045
CH ₃ P ⁺	(C ₂ H ₅) ₃ P		17.9 ± 0.5	EVD		2045
CH ₃ P ⁺	CH ₃ PH ₂	H ₂	12.2 ± 0.2	EVD	274	2045

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₄P⁺						
CH ₄ P ⁺	CH ₃ PH ₂	H	11.6 ± 0.12	EVD	208	2045
CH ₄ P ⁺	C ₂ H ₅ PH ₂	CH ₃	12.2 ± 0.2	EVD	236	2045
CH ₄ P ⁺	(CH ₃) ₃ P		14.7 ± 0.2	EVD		2045
CH ₄ P ⁺	(C ₂ H ₅) ₃ P		15.8 ± 0.2	EVD		2045
CH₅P⁺						
CH ₅ P ⁺	CH ₃ PH ₂		9.72 ± 0.15	EVD	217*	2045
C₂H₂P⁺						
C ₂ H ₂ P ⁺	C ₂ H ₅ PH ₂	2H ₂ + H	15.8 ± 0.3	EVD	300	2045
C ₂ H ₂ P ⁺	(CH ₃) ₃ P	CH ₃ + 2H ₂ ?	16.7 ± 0.2	EVD	329	2045
C ₂ H ₂ P ⁺	(C ₂ H ₅) ₃ P		16.5 ± 0.3	EVD		2045
C₂H₃P⁺						
C ₂ H ₃ P ⁺	C ₂ H ₅ PH ₂	2H ₂	12.9 ± 0.4	EVD	286	2045
C ₂ H ₃ P ⁺	(C ₂ H ₅) ₃ P		16.7 ± 0.2	EVD		2045
C₂H₄P⁺						
C ₂ H ₄ P ⁺	C ₂ H ₅ PH ₂	H ₂ + H	12.9 ± 0.3	EVD	233	2045
C ₂ H ₄ P ⁺	(CH ₃) ₃ P	CH ₃ + H ₂ ?	14.0 ± 0.2	EVD	266	2045
C ₂ H ₄ P ⁺	(CH ₃) ₃ P	CH ₃ + H ₂ ?	15 ± 1	VC	290	1036
C ₂ H ₄ P ⁺	(C ₂ H ₅) ₃ P	2C ₂ H ₅ + H?	16.0 ± 0.2	EVD	229	2045
C₂H₅P⁺						
C ₂ H ₅ P ⁺	C ₂ H ₅ PH ₂	H ₂	12.0 ± 0.2	EVD	265	2045
C ₂ H ₅ P ⁺	(C ₂ H ₅) ₃ P		13.4 ± 0.5	EVD		2045
C₂H₆P⁺ Heat of formation 214 kcal mol⁻¹						
C ₂ H ₆ P ⁺	C ₂ H ₅ PH ₂	H	12.0 ± 0.3	EVD	213*	2045
C ₂ H ₆ P ⁺	(CH ₃) ₂ PH	H	12.2	LE	214	1036
C ₂ H ₆ P ⁺	(CH ₃) ₃ P	CH ₃	11.7 ± 0.2	EVD	213*	2045
C ₂ H ₆ P ⁺	(CH ₃) ₃ P	CH ₃	11.8 ± 0.2	VC	216*	1036
C ₂ H ₆ P ⁺	(C ₂ H ₅) ₃ P		14.0 ± 0.2	EVD		2045
C₂H₇P⁺						
C ₂ H ₇ P ⁺	C ₂ H ₅ PH ₂		9.47 ± 0.5	EVD	206	2045
C ₂ H ₇ P ⁺	(CH ₃) ₂ PH		9.7	LE	209	1036
C ₂ H ₇ P ⁺	(C ₂ H ₅) ₃ P	2C ₂ H ₄ ?	12.7 ± 0.2	EVD	230	2045
C₃H₈P⁺						
C ₃ H ₈ P ⁺	(CH ₃) ₃ P	H	10.2 ± 0.5	EVD	160	2045
C ₃ H ₈ P ⁺	(CH ₃) ₃ P	H	11.8 ± 0.2	VC	197	1036
C ₃ H ₈ P ⁺	(C ₂ H ₅) ₃ P		13.8 ± 0.5	EVD		2045
C₃H₉P⁺						
C ₃ H ₉ P ⁺	(CH ₃) ₃ P		8.60 ± 0.2	EVD	175	2045
C ₃ H ₉ P ⁺	(CH ₃) ₃ P		9.2 ± 0.5	VC	189	1036

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₁₀P⁺						
C ₄ H ₁₀ P ⁺	(C ₂ H ₅) ₃ P	C ₂ H ₅	11.4 ± 0.3	EVD	200	2045
C₄H₁₁P⁺						
C ₄ H ₁₁ P ⁺	(C ₂ H ₅) ₃ P	C ₂ H ₄	10.7 ± 0.3	EVD	196	2045
C₅H₁₂P⁺						
C ₅ P ₁₂ P ⁺	(C ₂ H ₅) ₃ P	CH ₃	12.0 ± 0.2	EVD	206	2045
C₆H₁₅P⁺						
C ₆ H ₁₅ P ⁺	(C ₂ H ₅) ₃ P		8.27 ± 0.24	EVD	153	2045
C₁₈H₁₅P⁺						
C ₁₈ H ₁₅ P ⁺ (Triphenylphosphine)	(C ₆ H ₅) ₃ P		7.36 ± 0.05	PI	242*	1140
HPO₃⁺						
HPO ₃ ⁺	(CH ₃ O) ₂ PHO	2CH ₃ ?	11.2	LE		1036
C₃F₉P⁺						
C ₃ F ₉ P ⁺	(CF ₃) ₃ P		11.3 ± 0.1	EVD		1007
SiPH₅⁺						
SiPH ₅ ⁺	SiPH ₅		10.0 ± 0.2	LE		173
CH₄PO₃⁺						
CH ₄ PO ₃ ⁺	(CH ₃ O) ₂ PHO	CH ₃ ?	11.9	LE		1036
C₂H₆PO₃⁺						
C ₂ H ₆ PO ₃ ⁺	(CH ₃ O) ₂ PHO	H	12.7	LE		1036
C₂H₇PO₃⁺						
C ₂ H ₇ PO ₃ ⁺	(CH ₃ O) ₂ PHO		10.5	LE		1036
S⁺ Heat of formation 306 kcal mol⁻¹						
S ⁺	S		10.360	S	306*	2113
S ^{+(2D)}	SO ₂	O ₂	17.5 ± 0.3	SL	333	418
S ^{+(2D)}	SO ₂	2O	22.6 ± 0.2	SL	331	418
S ⁺	C ₂ H ₄ S (Ethylene sulfide)	C ₂ H ₄	13.1 ± 0.2	EVD	301	51
S ⁺	SnS	Sn	16.5 ± 2.0	LE	337	2139
S ⁺	PbS	Pb	16.0 ± 2.0	LE	354	2139

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
S₂⁺						
S ₂ ⁺	S ₂		9.6 ± 0.5	LE	252	2139
S ₂ ⁺	S ₂		9.7 ± 0.1	LE	254	2022
S ₂ ⁺	S ₂		9.7 ± 0.1	NS	254	2172
S ₂ ⁺	S ₂		10.0 ± 0.3	NS	261	319
S ₂ ⁺	S ₂		10.3 ± 0.2	NS	268	319
S ₂ ⁺	S ₆	2S ₂ ?	12.8 ± 1.0	EVD	258	1035
S ₂ ⁺	CH ₃ SSCH ₃	2CH ₃	15.4 ± 0.3	EVD	283	176
S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅	2C ₂ H ₅	14.9 ± 0.4	EVD	276	186
S ₂ ⁺	CH ₃ SSSCH ₃	CH ₃ S + CH ₃ ?	14.4 ± 0.3	EVD	267	84
S₃⁺						
S ₃ ⁺	S ₆		13.3 ± 0.5	EVD		1035
S ₃ ⁺	S ₈		12.6 ± 0.5	EVD		1035
S₄⁺						
S ₄ ⁺	S ₄		10.4 ± 0.5	NS	273	2172
S ₄ ⁺	S ₆	S ₂	10.9 ± 0.3	EVD	245	1035
S ₄ ⁺	S ₆	S ₂	11.05 ± 0.3	EVD	249	1035
S ₄ ⁺	S ₈		12.5 ± 0.3	EVD		1035
S₅⁺						
S ₅ ⁺	S ₈		10.2 ± 0.3	EVD		1035
S₆⁺						
S ₆ ⁺	S ₆		9.7 ± 0.3	EVD	248	1035
S ₆ ⁺	S ₆		9.81 ± 0.3	EVD	251	1035
S ₆ ⁺	S ₆		8.5 ± 0.3	NS	221	2172
S ₆ ⁺	S ₈	S ₂	10.1 ± 0.3	EVD	227	1035
S₇⁺						
S ₇ ⁺	S ₇		9.1 ± 0.3	EVD		1035
S ₇ ⁺	S ₇		9.3 ± 0.3	EVD		1035
S₈⁺						
S ₈ ⁺	S ₈		9.6 ± 0.2	EVD	246	1035
S ₈ ⁺	S ₈		7.3 ± 0.3	NS	193	2172
HS⁺ Heat of formation 276 kcal mol⁻¹						
HS ⁺	HS		10.50 ± 0.1	SL	276*	120
HS ⁺	H ₂ S	H	14.43 ± 0.1	SL	276*	120
HS ⁺	CH ₃ SCD ₃	C ₂ H ₂ D ₃	11.9	SL		307

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
H₂S⁺ Heat of formation 235 kcal mol⁻¹						
H ₂ S ⁺	H ₂ S		10.414 ± 0.002	S	235*	387
H ₂ S ⁺	H ₂ S		10.425 ± 0.003	S	235*	387
H ₂ S ⁺	H ₂ S		10.46 ± 0.01	PI	236	182, 416, 1103
H ₂ S ⁺	H ₂ S		10.45 ± 0.03	RPD	236	463
H ₂ S ⁺	H ₂ S		12.46 ± 0.03	RPD		463
H ₂ S ⁺	H ₂ S		14.18 ± 0.04	RPD		463
H ₂ S ⁺	H ₂ S		16.07 ± 0.05	RPD		463
H ₂ S ⁺	C ₂ H ₄ S (Ethylene sulfide)	C ₂ H ₂	13.4 ± 0.1	EVD	275	51
H ₂ S ⁺	H ₂ S		10.42	PE	235	1130
H ₂ S ⁺	H ₂ S		12.62	PE		1130
H ₂ S ⁺	H ₂ S		14.82	PE		1130
H ₂ S ⁺	H ₂ S		18.00?	PE		1130
H ₂ S ⁺	H ₂ S		20.12	PE		1130
H₃S⁺						
H ₃ S ⁺	CH ₃ SCH ₃	C ₂ H ₂ + H?	14.8 ± 0.2	EVD	226	84
H ₃ S ⁺	CH ₃ SCH ₃	C ₂ H ₂ + H?	13.85	SL	204	307
H ₃ S ⁺	CH ₃ SC ₂ H ₅	C ₂ H ₂ + CH ₃ ?	15.1 ± 0.2	EVD	247	176
H ₃ S ⁺	CH ₃ SCH ₂ CH=CH ₂		14.8 ± 0.2	EVD		186
H ₃ S ⁺	n-C ₃ H ₇ SCH ₃		15.6 ± 0.3	EVD		176
H ₃ S ⁺	C ₂ H ₅ SC ₂ H ₅		15.6 ± 0.4	EVD		84
H ₃ S ⁺	C ₂ H ₅ SSC ₂ H ₅		15.3 ± 0.2	EVD		186
H₂DS⁺						
H ₂ DS ⁺	CH ₃ SCD ₃	C ₂ D ₂ + H?	12.8	SL		307
HD₂S⁺						
HD ₂ S ⁺	CH ₃ SCD ₃	C ₂ H ₂ + D?	13.9	SL		307
D₃S⁺						
D ₃ S ⁺	CH ₃ SCD ₃	C ₂ H ₂ + H?	14.8	SL		307
H₂S₂⁺						
H ₂ S ₂ ⁺	H ₂ S ₂		10.54	CS	246	383
H ₂ S ₂ ⁺	H ₂ S ₂		9.90	TC	231	191
H ₂ S ₂ ⁺	H ₂ S ₂		10.09	TC	235	191
H ₂ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅	2C ₂ H ₄	12.2 ± 0.2	EVD	239	186, 191
H ₂ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅	2C ₂ H ₄	11.9	SL	232	307
CS⁺						
CS ⁺	CS		11.8 ± 0.2	NS	328	319
CS ⁺	CS		11.9 ± 0.3	NS	330	319
CS ⁺	CH ₃ NCS	CH ₃ N?	15.6 ± 0.4	SL		315
CS ⁺	C ₂ H ₅ NCS	C ₂ H ₅ N?	16.1 ± 0.5	SL		315

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CS₂⁺(²Π_{3/2g}) Heat of formation 261 kcal mol⁻¹						
			262 kcal mol⁻¹			
			318 kcal mol⁻¹			
			362 kcal mol⁻¹			
			401 kcal mol⁻¹			
CS ₂ ⁺ (² Π _{3/2g})	CS ₂		10.080	S	261*	149
CS ₂ ⁺ (² Π _{3/2g})	CS ₂		10.07 ± 0.01	S	260*	410
CS ₂ ⁺ (² Π _{1/2g})	CS ₂		10.134	S	262*	149
CS ₂ ⁺ (² Π _{1/2g})	CS ₂		10.13 ± 0.01	S	262*	410
CS ₂ ⁺ (² Π _g)	CS ₂		10.08 ± 0.01	PI	261	416
CS ₂ ⁺ (² Π _g)	CS ₂		10.06	PE	260	92
CS ₂ ⁺ (² Π _g)	CS ₂		10.07	PE	260	1130
CS ₂ ⁺	CS ₂		10.15 ± 0.05	RPD	262	164, 169
CS ₂ ⁺	CS ₂		12.01 ± 0.09	RPD		164, 169
CS ₂ ^{+(2Π_u)}	CS ₂		12.57	PE	318*	92
CS ₂ ^{+(2Π_u)}	CS ₂		12.62	PE	319*	1130
CS ₂ ⁺	CS ₂		13.60 ± 0.19	RPD		164, 169
CS ₂ ^{+(2Σ_u⁺)}	CS ₂		14.476	S	362*	149
CS ₂ ^{+(2Σ_u⁺)}	CS ₂		14.47 ± 0.01	S	362*	410
CS ₂ ^{+(2Σ_u⁺)}	CS ₂		14.46	PE	362	92
CS ₂ ^{+(2Σ_u⁺)}	CS ₂		14.52	PE	363	1130
CS ₂ ⁺	CS ₂		14.76 ± 0.25	RPD		164, 169
CS ₂ ^{+(2Σ_g⁺)}	CS ₂		16.19	S	401*	149
CS ₂ ^{+(2Σ_g⁺)}	CS ₂		16.19 ± 0.01	S	401*	410
CS ₂ ^{+(2Σ_g⁺)}	CS ₂		16.02	PE	397	92
CS ₂ ^{+(2Σ_g⁺)}	CS ₂		16.17	PE	401	1130
CS ₂ ⁺	CS ₂		15.90 ± 0.12	RPD	395	164, 169
CS ₂ ⁺	CS ₂		16.64	PE		92
CS ₂ ⁺	CS ₂		16.82	PE		1130
CS ₂ ⁺	CS ₂		18.10 ± 0.36	RPD		164, 169
CS ₂ ⁺	CS ₂		18.42	PE		1130
CS ₂ ⁺	CS ₂		19.05	PE		92
CS ₂ ⁺	CS ₂		19.31?	PE		1130
CS ₂ ⁺	CS ₂		19.513	S		149
CS ₂ ⁺	CS ₂		19.51 ± 0.05	S		410
CS₂⁺²						
CS ₂ ⁺²	CS ₂		27.45 ± 0.2	NRE	661	1040
CS₂⁺³						
CS ₂ ⁺³	CS ₂		53.6 ± 0.5	NRE	1264	1040
NS⁺						
NS ⁺	CH ₃ NCS	C ₂ H ₃ ?	12.5 ± 0.2	SL	255	315

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
SO⁺						
SO ⁺	SO ₂	O	16.2 ± 0.2	SL	243	418
SO ⁺	SO ₂	O	16.5 ± 0.2	LE	250	2022, 2172
SO ⁺	S ₂ O	S	14.5 ± 0.2	LE		2022, 2172
SO ⁺	SO ₂ F ₂	O + 2F	24.3 ± 0.3	SL	258	418
SO₂⁺ Heat of formation 214 kcal mol⁻¹						
SO ₂ ⁺	SO ₂		12.34 ± 0.02	PI	214*	416
SO ₂ ⁺	SO ₂		12.44 ± 0.1	SL	216	418
SO ₂ ⁺	SO ₂		12.5 ± 0.2	LE	217	2022, 2172
SO ₂ ⁺	SO ₂		12.7 ± 0.2	LE	222	2022, 2172
SO ₂ ⁺	SO ₂ F ₂	2F	19.9 ± 0.3	SL	(a)	418
SO ₂ ⁺	SO ₂		12.32	PE	213	1130
SO ₂ ⁺	SO ₂		13.17	PE		1130
SO ₂ ⁺	SO ₂		16.42	PE		1130
SO ₂ ⁺	SO ₂		20.07?	PE		1130
S₂O⁺						
S ₂ O ⁺	S ₂ O		10.3 ± 0.1	LE		2022, 2172
SF₃⁺						
SF ₃ ⁺	SF ₅ NF ₂	NF ₂ + F ₂ ?	16.0 ± 0.2	VC	114	1144
SF₄⁺						
SF ₄ ⁺	SF ₅ NF ₂	NF ₃ ?	15.9 ± 0.2	VC	151	1144
SF₅⁺						
SF ₅ ⁺	SF ₆	F	15.29	PI	45	2027
SF ₅ ⁺	SF ₆	F	16.53	PI		2027
SF ₅ ⁺	SF ₆	F	15.85 ± 0.15	RPD	58	196
SF ₅ ⁺	SF ₆	F	17.0 ± 0.2	RPD		196
SF ₅ ⁺	SF ₆	F	18.0 ± 0.2	RPD		196
SF ₅ ⁺	SF ₅ NF ₂	NF ₂ ?	12.0 ± 0.2	VC		1144
SF ₅ ⁺	SF ₅ NF ₂	NF ₂	14.3 ± 0.5	LE	74	1144
CHS⁺						
CHS ⁺ (Ethylene sulfide)	C ₂ H ₄ S	CH ₃	12.3 ± 0.2	EVD	270	51
CHS ⁺	CH ₃ SCH ₃	CH ₄ + H?	15.6 ± 0.2	EVD	317	84
CHS ⁺ (Propylene sulfide)	C ₃ H ₆ S	C ₂ H ₄ + H?	14.1 ± 0.2	EVD	280	188
CHS ⁺ (Trimethylene sulfide)	(CH ₂) ₃ S	C ₂ H ₄ + H?	13.9 ± 0.2	EVD	271	52
CHS ⁺	C ₂ H ₅ SCH ₃		15.9 ± 0.4	EVD		176
CHS ⁺ (Thiophene)	C ₄ H ₄ S	C ₃ H ₃ ?	13.0 ± 0.2	EVD	249	2166
CHS ⁺	CH ₃ SCH ₂ CH=CH ₂	CH ₂ CH=CH ₂ + H ₂ ?	13.8 ± 0.3	EVD	298	186
CHS ⁺ (Tetrahydrothiophene)	(CH ₂) ₄ S	C ₂ H ₅ + H ₂	13.8 ± 0.2	EVD	285	52

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CHS ⁺	<i>n</i> -C ₃ H ₇ SCH ₃		15.2 ± 0.4	EVD	176	
CHS ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃		16.4 ± 0.4	EVD	186	
CHS ⁺	C ₂ H ₅ SC ₂ H ₅		15.3 ± 0.5	EVD	84	
CHS ⁺	C ₆ H ₅ SD (Deuterated benzenethiol)	C ₅ H ₄ D?	12.7 ± 0.2	SL	1039	
CHS ⁺	C ₆ H ₅ SCH ₃ (Phenyl methyl sulfide)	C ₆ H ₅ + H ₂	14.5	SL	286	307
CHS ⁺	C ₆ H ₅ SC ₂ H ₅ (Phenyl ethyl sulfide)		12.5	SL	307	
CHS ⁺	CH ₃ SSCH ₃	CH ₄ S + H	15.5 ± 0.3	EVD	305	176
CHS ⁺	CH ₃ SSCH ₃	CH ₄ + SH	13.6	SL	292	307
CHS ⁺	C ₂ H ₅ SSC ₂ H ₅		17.8 ± 0.5	EVD	186	
CHS ⁺	CH ₃ NCS		12.9 ± 0.2	SL	315	
CHS ⁺	C ₂ H ₅ NCS		15.2 ± 0.5	SL	315	
CHS ⁺	CH ₃ SSSCH ₃		14.5 ± 0.3	EVD	84	
CDS⁺						
CDS ⁺	C ₆ H ₅ SD (Deuterated benzenethiol)	C ₅ H ₅ ?	12.7 ± 0.2	SL	1039	
CH₂S⁺						
CH ₂ S ⁺	C ₂ H ₄ S (Ethylene sulfide)	CH ₂	12.7 ± 0.2	EVD	219	51
CH ₂ S ⁺	CH ₃ SCH ₃	CH ₄	11.2 ± 0.2	EVD	267	84
CH ₂ S ⁺	C ₃ H ₆ S (Propylene sulfide)	C ₂ H ₂ + H ₂	12.4 ± 0.3	EVD	252	188
CH ₂ S ⁺	(CH ₂) ₃ S (Trimethylene sulfide)	C ₂ H ₂ + H ₂	11.8 ± 0.2	EVD	233	52
CH ₂ S ⁺	C ₂ H ₅ SCH ₃	C ₂ H ₅ + H	13.6 ± 0.3	EVD	222	176
CH ₂ S ⁺	CH ₃ SCH ₂ CH=CH ₂		11.4 ± 0.3	EVD	186	
CH ₂ S ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)		13.0 ± 0.2	EVD	52	
CH ₂ S ⁺	<i>n</i> -C ₃ H ₇ SCH ₃		14.1 ± 0.3	EVD	176	
CH ₂ S ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃		15.5 ± 0.4	EVD	186	
CH ₂ S ⁺	C ₂ H ₅ SC ₂ H ₅		12.5 ± 0.3	EVD	84	
CH ₂ S ⁺	CH ₃ SSCH ₃		12.2 ± 0.2	EVD	176	
CH ₂ S ⁺	CH ₃ SSSCH ₃		13.4 ± 0.3	EVD	84	
CH₃S⁺ Heat of formation 218 kcal mol⁻¹						
CH ₃ S ⁺	CH ₃ S		8.06 ± 0.1	SL	218*	120
CH ₃ S ⁺	CH ₃ SCH ₃	CH ₃	11.7 ± 0.2	EVD	228	84
CH ₃ S ⁺	CH ₃ SCH ₃	CH ₃	11.24 ± 0.1	SL	217*	120
CH ₃ S ⁺	CH ₃ SCH ₃	CH ₃	11.3	SL	219*	307
CH ₃ S ⁺	CH ₃ SCD ₃	CD ₃	11.0	SL	307	
CH ₃ S ⁺	C ₃ H ₆ S (Propylene sulfide)	C ₂ H ₂ + H	13.5 ± 0.2	EVD	225	188
CH ₃ S ⁺	(CH ₂) ₃ S (Trimethylene sulfide)	C ₂ H ₃	12.3 ± 0.15	EVD	233	52
CH ₃ S ⁺	C ₂ H ₅ SCH ₃	CH ₃ + CH ₂	14.7 ± 0.2	EVD	198	176
CH ₃ S ⁺	CH ₃ SCH ₂ CH=CH ₂	CH ₂ CH=CH ₂ ?	11.9 ± 0.2	EVD	254	186
CH ₃ S ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)	CH ₂ =C=CH ₂ + H?	14.0 ± 0.2	EVD	217	52

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH ₃ S ⁺	<i>n</i> -C ₃ H ₇ SCH ₃	C ₂ H ₅ + CH ₂	14.0 ± 0.2	EVD	185	176
CH ₃ S ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃	C ₂ H ₅ + CH ₂	15.3 ± 0.2	EVD	213	186
CH ₃ S ⁺	C ₂ H ₅ SC ₂ H ₅	CH ₃ + C ₂ H ₄	13.5 ± 0.2	EVD	246	84
CH ₃ S ⁺	C ₂ H ₅ SC ₂ H ₅	CH ₃ + C ₂ H ₄	12.75	SL	228	307
CH ₃ S ⁺	(<i>n</i> -C ₃ H ₇) ₂ S		12.65	SL		307
CH ₃ S ⁺	CH ₃ SSCH ₃	CH ₃ S	13.0 ± 0.4	EVD	262	176
CH ₃ S ⁺	CH ₃ SSCH ₃	CH ₃ S	11.1	SL	218*	307
CH ₃ S ⁺	CH ₃ SSCH ₃	CH ₃ S	11.12 ± 0.1	SL	218*	120
CH ₃ S ⁺	CH ₃ SSSCH ₃	CH ₃ + S ₂	12.9 ± 0.2	EVD	234	84
CH₂DS⁺						
CH ₂ DS ⁺	CH ₃ SCD ₃	CHD ₂	11.05	SL		307
CHD₂S⁺						
CHD ₂ S ⁺	CH ₃ SCD ₃	CH ₂ D	11.55	SL		307
CD₃S⁺						
CD ₃ S ⁺	CH ₃ SCD ₃	CH ₃	11.15	SL		307
CH₃SH⁺ Heat of formation 212 kcal mol⁻¹						
CH ₄ S ⁺	CH ₃ SH		9.440 ± 0.005	PI	212*	182
CH ₄ S ⁺	C ₂ H ₅ SCH ₃	C ₂ H ₂ + H ₂ ?	11.8 ± 0.2	EVD	204	176
CH ₄ S ⁺	CH ₃ SCH ₂ CH=CH ₂	CH ₂ =C=CH ₂ ?	11.5 ± 0.2	EVD	229	186
CH ₄ S ⁺	<i>n</i> -C ₃ H ₇ SCH ₃	C ₂ H ₂ + CH ₄ ?	11.3 ± 0.2	EVD	205	176
CH ₄ S ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃	C ₂ H ₂ + CH ₄ ?	12.0 ± 0.2	EVD	219	186
CH ₄ S ⁺	CH ₃ SSCH ₃	CS + H ₂ ?	11.5 ± 0.2	EVD	204	176
CH ₄ S ⁺	CH ₃ SSCH ₃	CS + H ₂ ?	11.2	SL	197	307
CH₅S⁺						
CH ₅ S ⁺	C ₂ H ₅ SCH ₃	C ₂ H ₂ + H?	12.0 ± 0.3	EVD	156	176
CH ₅ S ⁺	<i>n</i> -C ₃ H ₇ SCH ₃	C ₂ H ₂ + CH ₃ ?	11.0 ± 0.2	EVD	147	176
CH ₅ S ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃	C ₂ H ₂ + CH ₃ ?	12.1 ± 0.2	EVD	170	186
CH ₅ S ⁺	CH ₃ SSCH ₃	CS + H?	11.9 ± 0.2	EVD	161	176
C₂H₂S⁺						
C ₂ H ₂ S ⁺	C ₂ H ₄ S (Ethylene sulfide)	2H?	15.0 ± 0.2	EVD	261	51
C ₂ H ₂ S ⁺	C ₃ H ₆ S (Propylene sulfide)	CH ₃ + H?	15.6 ± 0.4	EVD	294	188
C ₂ H ₂ S ⁺	C ₄ H ₄ S (Thiophene)	C ₂ H ₂	10.8 ± 0.2	EVD	219	2166
C ₂ H ₂ S ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)		17.0 ± 0.3	EVD		52
C ₂ H ₂ S ⁺	C ₂ H ₅ SSC ₂ H ₅		18.6 ± 0.5	EVD		186
C₂H₃S⁺						
C ₂ H ₃ S ⁺	C ₂ H ₄ S (Ethylene sulfide)	H	11.4 ± 0.2	EVD	230	51
C ₂ H ₃ S ⁺	C ₃ H ₆ S (Propylene sulfide)	CH ₃	12.3 ± 0.3	EVD	270	188
C ₂ H ₃ S ⁺	C ₂ H ₅ SCH ₃	CH ₃ + H ₂	13.4 ± 0.4	EVD	262	176
C ₂ H ₃ S ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)		15.7 ± 0.4	EVD		52
C ₂ H ₃ S ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃		16.1 ± 0.3	EVD		186
C ₂ H ₃ S ⁺	C ₂ H ₅ SC ₂ H ₅		14.6 ± 0.4	EVD		84
C ₂ H ₃ S ⁺	C ₂ H ₅ SSC ₂ H ₅		16.2 ± 0.3	EVD		186

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₄S⁺ (Ethylene sulfide) 224 kcal mol⁻¹						
C ₂ H ₄ S ⁺ (Ethylene sulfide)	C ₂ H ₄ S		8.87 ± 0.15	EVD	224*	51
C ₂ H ₄ S ⁺ (Ethylene sulfide)	C ₂ H ₄ S		8.9	EC	225	218
C ₂ H ₄ S ⁺ (Tetrahydrothiophene)	(CH ₂) ₄ S	C ₂ H ₂ + H ₂	11.7 ± 0.3	EVD	208	52
C ₂ H ₄ S ⁺	C ₂ H ₅ SC ₂ H ₅	C ₂ H ₄ + H ₂ ?	11.2 ± 0.2	EVD	226	84
C ₂ H ₄ S ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₅ + SH?	12.3 ± 0.3	EVD	207	186
C ₂ H ₄ S ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₄ + H ₂ S?	11.6	SL	243	307
C₂H₅S⁺						
C ₂ H ₅ S ⁺	CH ₃ SCH ₃	H	11.8 ± 0.2	EVD	211	84
C ₂ H ₅ S ⁺	C ₂ H ₅ SCH ₃	CH ₃	11.8 ± 0.2	EVD	225	176
C ₂ H ₅ S ⁺	CH ₃ SCH ₂ CH=CH ₂	C ₂ H ₃	12.0 ± 0.2	EVD	222	186
C ₂ H ₅ S ⁺	n-C ₃ H ₇ SCH ₃	C ₂ H ₅	11.9 ± 0.2	EVD	230	176
C ₂ H ₅ S ⁺	iso-C ₃ H ₇ SCH ₃	C ₂ H ₃ + H ₂	13.5 ± 0.3	EVD	225	186
C ₂ H ₅ S ⁺	C ₂ H ₅ SC ₂ H ₅	C ₂ H ₅	12.0 ± 0.2	EVD	232	84
C ₂ H ₅ S ⁺	C ₂ H ₅ SC ₂ H ₅	C ₂ H ₅	11.05	SL	210	307
C ₂ H ₅ S ⁺	(n-C ₃ H ₇) ₂ S	C ₂ H ₅ + C ₂ H ₄	12.2	SL	216	307
C ₂ H ₅ S ⁺	CH ₃ SSCH ₃	SH	10.9 ± 0.2	EVD	212	176
C ₂ H ₅ S ⁺	CH ₃ SSCH ₃	SH	11.0	SL	214	307
C ₂ H ₅ S ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₅ S	12.5 ± 0.3	EVD	245	186
C ₂ H ₅ S ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₅ S	11.15	SL	214	307
C₂H₅SH⁺ Heat of formation 203 kcal mol⁻¹						
CH₃SCH₃⁺ 191 kcal mol⁻¹						
C ₂ H ₆ S ⁺	C ₂ H ₅ SH		9.285 ± 0.005	PI	203*	182
C ₂ H ₆ S ⁺	C ₂ H ₅ SH		9.21 ± 0.05	CS	201	384
C ₂ H ₆ S ⁺	CH ₃ SCH ₃		8.685 ± 0.005	PI	191*	182
C ₂ H ₆ S ⁺	CH ₃ SCH ₃		8.70 ± 0.20	EVD	192	84
C ₂ H ₆ S ⁺	CH ₃ SCH ₃		9.0	SL	199	307
C ₂ H ₆ S ⁺	C ₂ H ₅ SC ₂ H ₅	C ₂ H ₄	10.4 ± 0.2	EVD	207	84
C ₂ H ₆ S ⁺	C ₂ H ₅ SC ₂ H ₅	C ₂ H ₄	10.4	SL	207	307
C₂H₃D₃S⁺						
C ₂ H ₃ D ₃ S ⁺	CH ₃ SCD ₃		8.7	SL		307
C₃H₅S⁺						
C ₃ H ₅ S ⁺ (Propylene sulfide)	C ₃ H ₆ S	H	11.2 ± 0.3	EVD	226	188
C ₃ H ₅ S ⁺	CH ₃ SCH ₂ CH=CH ₂	CH ₃	11.0 ± 0.2	EVD	231	186
C₃H₆S⁺						
C ₃ H ₆ S ⁺ (Propylene sulfide)	C ₃ H ₆ S		8.6 ± 0.2	EVD	218*	188
C ₃ H ₆ S ⁺ (Trimethylene sulfide)	(CH ₂) ₃ S		8.9 ± 0.15	EVD	220*	52
C ₃ H ₆ S ⁺ (Trimethylene sulfide)	(CH ₂) ₃ S		8.9	EC	220	218

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₇S⁺						
C ₃ H ₇ S ⁺	<i>n</i> -C ₃ H ₇ SCH ₃	CH ₃	11.7 ± 0.2	EVD	217	176
C ₃ H ₇ S ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃	CH ₃	11.7 ± 0.2	EVD	215	186
C ₃ H ₇ S ⁺	C ₂ H ₅ SC ₂ H ₅	CH ₃	11.6 ± 0.2	EVD	214	84
C ₃ H ₇ S ⁺	C ₂ H ₅ SC ₂ H ₅	CH ₃	10.65	SL	193	307
C ₃ H ₇ S ⁺	(<i>n</i> -C ₃ H ₇) ₂ S	CH ₃ + C ₂ H ₄	11.55	SL	192	307
<i>n</i>-C₃H₇SH⁺ Heat of formation 198 kcal mol⁻¹						
C₂H₅SCH₃⁺ 183 kcal mol⁻¹						
C ₃ H ₈ S ⁺	<i>n</i> -C ₃ H ₇ SH		9.195 ± 0.005	PI	198*	182
C ₃ H ₈ S ⁺	C ₂ H ₅ SCH ₃		8.70 ± 0.10	EVD	186	176
C ₃ H ₈ S ⁺	C ₂ H ₅ SCH ₃		8.55 ± 0.01	PI	183*	182
C ₃ H ₈ S ⁺	(<i>n</i> -C ₃ H ₇) ₂ S		10.4	SL		307
C₄H₄S⁺ (Thiophene) Heat of formation 229 kcal mol⁻¹						
C ₄ H ₄ S ⁺ (Thiophene)	C ₄ H ₄ S		8.860 ± 0.005	PI	229*	182
C ₄ H ₄ S ⁺ (Thiophene)	C ₄ H ₄ S		9.2 ± 0.2	EVD	237	2166
C ₄ H ₄ S ⁺ (Thiophene)	C ₄ H ₄ S		9.30	CTS	239	2031
C ₄ H ₄ S ⁺	C ₆ H ₅ SD (Deuterated benzenethiol)	C ₂ HD	11.8 ± 0.2	SL		1039
C ₄ H ₄ S ⁺	C ₄ H ₃ SC ₂ H ₅ (2-Ethylthiophene)	C ₂ H ₄	11.5 ± 0.2	EVD	265	2166
C ₄ H ₄ S ⁺	C ₄ H ₃ SC ₃ H ₇ (2-Propylthiophene)	C ₃ H ₆	11.1 ± 0.2	EVD	258	2166
C ₄ H ₄ S ⁺	C ₄ H ₃ SC ₄ H ₉ (2-Butylthiophene)	1-C ₄ H ₈ ?	11.0 ± 0.2	EVD	256	2166
C₄H₃DS⁺						
C ₄ H ₃ DS ⁺	C ₆ H ₅ SD (Deuterated benzenethiol)	C ₂ H ₂	11.8	SL		1039
C₄H₇S⁺						
C ₄ H ₇ S ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)	H	12.4 ± 0.3	EVD	226	52
C₄H₈S⁺						
C ₄ H ₈ S ⁺	CH ₃ SCH ₂ CH=CH ₂		8.70 ± 0.2	EVD	211*	186
C ₄ H ₈ S ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)		8.57 ± 0.15	EVD	190*	52
C ₄ H ₈ S ⁺	(CH ₂) ₄ S (Tetrahydrothiophene)		8.4	EC	186	218
<i>n</i>-C₄H₉SH⁺ Heat of formation 192 kcal mol⁻¹						
<i>n</i>-C₃H₇SCH₃⁺ 183 kcal mol⁻¹						
<i>iso</i>-C₃H₇SCH₃⁺ 179 kcal mol⁻¹						
C₂H₅SC₂H₅⁺ 175 kcal mol⁻¹						
C ₄ H ₁₀ S ⁺	<i>n</i> -C ₄ H ₉ SH		9.14 ± 0.02	PI	192*	182
C ₄ H ₁₀ S ⁺	<i>n</i> -C ₃ H ₇ SCH ₃		8.8 ± 0.15	EVD	183*	176
C ₄ H ₁₀ S ⁺	<i>iso</i> -C ₃ H ₇ SCH ₃		8.7 ± 0.2	EVD	179*	186
C ₄ H ₁₀ S ⁺	C ₂ H ₅ SC ₂ H ₅		8.430 ± 0.005	PI	175*	182
C ₄ H ₁₀ S ⁺	C ₂ H ₅ SC ₂ H ₅		8.49 ± 0.19	EVD	176	84
C ₄ H ₁₀ S ⁺	C ₂ H ₅ SC ₂ H ₅		8.6	SL	178	307

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₅H₅S⁺						
C ₅ H ₅ S ⁺ (2-Ethylthiophene)	C ₄ H ₃ SC ₂ H ₅	CH ₃	11.4 ± 0.2	EVD	242*	2166
C ₅ H ₅ S ⁺ (2-Propylthiophene)	C ₄ H ₃ SC ₃ H ₇	C ₂ H ₅	11.4 ± 0.2	EVD	245*	2166
C ₅ H ₅ S ⁺ (2-Butylthiophene)	C ₄ H ₃ SC ₄ H ₉	n-C ₃ H ₇	11.3 ± 0.2	EVD	241*	2166
C₅H₉S⁺						
C ₅ H ₉ S ⁺	(n-C ₃ H ₇) ₂ S	CH ₃ + H ₂ ?	10.9	SL	190	307
C₅H₁₁S⁺						
C ₅ H ₁₁ S ⁺	(n-C ₃ H ₇) ₂ S	CH ₃	11.55	SL	205	307
cyclo-C₆H₅S⁺ Heat of formation 250 kcal mol⁻¹						
C ₆ H ₅ S ⁺ (Phenyl sulfide radical)	C ₆ H ₅ S		8.63 ± 0.1	SL	250*	120
C ₆ H ₅ S ⁺ (Deuterated benzenethiol)	C ₆ H ₅ SD	D	12.2	SL		1039
C ₆ H ₅ S ⁺ (Phenyl methyl sulfide)	C ₆ H ₅ SCH ₃	CH ₃	12.1 ± 0.1	SL	269	120
C ₆ H ₅ S ⁺ (Phenyl methyl sulfide)	C ₆ H ₅ SCH ₃	CH ₃	12.15	SL	271	307
C ₆ H ₅ S ⁺ (Phenyl ethyl sulfide)	C ₆ H ₅ SC ₂ H ₅	C ₂ H ₅	12.2	SL	274	307
cyclo-C₆H₅SH⁺ Heat of formation 217 kcal mol⁻¹						
C ₆ H ₆ S ⁺ (Benzenethiol)	C ₆ H ₅ SH		8.32 ± 0.01	PI	217*	190
C ₆ H ₆ S ⁺ (Benzenethiol)	C ₆ H ₅ SH		9.46 ± 0.04	PI		190
C ₆ H ₆ S ⁺ (Phenyl ethyl sulfide)	C ₆ H ₅ SC ₂ H ₅	C ₂ H ₄	11.4	SL	269	307
C₆H₅DS⁺						
C ₆ H ₅ DS ⁺ (Deuterated benzenethiol)	C ₆ H ₅ SD		8.5 ± 0.1	SL		1039
C₆H₈S⁺						
C ₆ H ₈ S ⁺ (2-Ethylthiophene)	C ₄ H ₃ SC ₂ H ₅		8.8 ± 0.2	EVD	215*	2166
C₆H₁₄S⁺						
C ₆ H ₁₄ S ⁺	(n-C ₃ H ₇) ₂ S		8.30 ± 0.02	PI	163*	182
C ₆ H ₁₄ S ⁺	(n-C ₃ H ₇) ₂ S		8.95	SL	178	307
C₇H₇S⁺						
C ₇ H ₇ S ⁺ (Phenyl ethyl sulfide)	C ₆ H ₅ SC ₂ H ₅	CH ₃	11.7	SL	255	307

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇H₈S⁺						
C ₇ H ₈ S ⁺ (Phenyl methyl sulfide)	C ₆ H ₅ SCH ₃		8.9	SL	229*	307
C₇H₁₀S⁺						
C ₇ H ₁₀ S ⁺ (2-Propylthiophene)	C ₄ H ₃ SC ₃ H ₇		8.6 ± 0.2	EVD	205*	2166
C₈H₁₀S⁺						
C ₈ H ₁₀ S ⁺ (Phenyl ethyl sulfide)	C ₆ H ₅ SC ₂ H ₅		8.8	SL	221*	307
C₈H₁₂S⁺						
C ₈ H ₁₂ S ⁺ (2-Butylthiophene)	C ₄ H ₃ SC ₄ H ₉		8.5 ± 0.2	EVD	198*	2166
CH₃S₂⁺						
CH ₃ S ₂ ⁺	CH ₃ SSCH ₃	CH ₃	12.1 ± 0.2	EVD	240	176
CH ₃ S ₂ ⁺	CH ₃ SSCH ₃	CH ₃	11.45	SL	225	307
CH ₃ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅		14.6 ± 0.2	EVD		186
CH ₃ S ₂ ⁺	CH ₃ SSSCH ₃	CH ₃ S	12.3 ± 0.2	EVD	251	84
CH₄S₂⁺						
CH ₄ S ₂ ⁺	CH ₃ SSSCH ₃	CH ₂ S	10.8 ± 0.2	EVD		84
C₂H₅S₂⁺						
C ₂ H ₅ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₅	11.5	SL	223	307
CH₃SSCH₃⁺ Heat of formation 189 kcal mol⁻¹						
C ₂ H ₆ S ₂ ⁺	CH ₃ SSCH ₃		8.46 ± 0.03	PI	189*	182
C ₂ H ₆ S ₂ ⁺	CH ₃ SSCH ₃		9.1 ± 0.2	EVD	204	176
C ₂ H ₆ S ₂ ⁺	CH ₃ SSCH ₃		8.53	SL	191	411
C ₂ H ₆ S ₂ ⁺	CH ₃ SSCH ₃		9.05	SL	203	307
C ₂ H ₆ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₄	10.8 ± 0.3	EVD	219	186
C ₂ H ₆ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅	C ₂ H ₄	10.9	SL	221	307
C₄H₈S₂⁺						
C ₄ H ₈ S ₂ ⁺ (Thiadioxane)	(CH ₂) ₄ S ₂		8.5	EC	200	218
C₂H₅SSC₂H₅⁺ Heat of formation 173 kcal mol⁻¹						
C ₄ H ₁₀ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅		8.27 ± 0.03	PI	173*	182
C ₄ H ₁₀ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅		8.30 ± 0.15	EVD	174	186
C ₄ H ₁₀ S ₂ ⁺	C ₂ H ₅ SSC ₂ H ₅		8.85	SL	187	307

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₃S₃⁺						
CH ₃ S ₃ ⁺	CH ₃ SSSCH ₃	CH ₃	11.4 ± 0.2	EVD	230	84
C₂H₆S₃⁺						
C ₂ H ₆ S ₃ ⁺	CH ₃ SSSCH ₃		8.80 ± 0.15	EVD	203*	84
CNS⁺						
CNS ⁺	CH ₃ NCS	CH ₃	14.9 ± 0.5	SL	342	315
CNS ⁺	C ₂ H ₅ NCS	C ₂ H ₅	14.6 ± 0.4	SL	338	315
C₂NS⁺						
C ₂ NS ⁺	CH ₃ NCS	H ₂ + H?	14.1 ± 0.3	SL	304	315
C ₂ NS ⁺	C ₂ H ₅ NCS	CH ₃ + 2H?	16.3 ± 0.2	SL	265	315
COS^{+(2Π_{3/2g}) Heat of formation 224 kcal mol⁻¹}						
		COS^{+(2Π_{1/2g})}	225 kcal mol⁻¹			
		COS^{+(2Π_u)}	313 kcal mol⁻¹			
		COS^{+(2Σ_u⁺)}	336 kcal mol⁻¹			
		COS^{+(2Σ_g⁺)}	380 kcal mol⁻¹			
COS ^{+(2Π_{3/2g}?)}	COS		11.234	S	225	149
COS ^{+(2Π_{3/2g})}	COS		11.17 ± 0.01	PI	224*	190
COS ^{+(2Π_{1/2g}?)}	COS		11.250	S	225	149
COS ^{+(2Π_{1/2g})}	COS		11.21 ± 0.01	PI	225*	190
COS ^{+(2Π_g)}	COS		11.06	PE	221	92
COS ^{+(2Π_u)}	COS		15.04	PE	313*	92
COS ^{+(2Σ_u⁺)}	COS		16.043	S	336*	149
COS ^{+(2Σ_u⁺)}	COS		16.04 ± 0.01	S	336*	410
COS ^{+(2Σ_u⁺)}	COS		16.04	PE	336	92
COS ^{+(2Σ_g⁺)}	COS		17.938	S	380*	149
COS ^{+(2Σ_g⁺)}	COS		17.94 ± 0.05	S	380*	410
COS ^{+(2Σ_g⁺)}	COS		17.87	PE	378	92
COS ⁺	COS		19.9	PE		92
SO₂F⁺						
SO ₂ F ⁺	SO ₂ F ₂	F + O	18.6 ± 0.1	SL	145	418
SO₂F₂⁺						
SO ₂ F ₂ ⁺	SO ₂ F ₂	F	15.1 ± 0.2	SL	124	418
SO ₂ F ₂ ⁺	FSO ₂ NF ₂	NF ₂	13.1 ± 0.1	VC		1144
SO ₂ F ₂ ⁺	FSO ₂ ONF ₂	NO + F ₂	13.3 ± 0.2	VC		1144
SO ₂ F ₂ ⁺	(FSO ₂) ₂ NF	FSO ₂ NF	13.5 ± 0.1	VC		1144
SO₂F₂⁺						
SO ₂ F ₂ ⁺	SO ₂ F ₂		13.3 ± 0.1	SL	102*	418

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CHNS⁺						
CHNS ⁺	C ₂ H ₅ NCS	C ₂ H ₄	11.38 ± 0.15	EVD	276	193, 315
CH₂NS⁺						
CH ₂ NS ⁺	C ₂ H ₅ NCS	C ₂ H ₂ + H?	12.0 ± 0.3	SL	196	315
C₂HNS⁺						
C ₂ HNS ⁺	C ₂ H ₅ NCS	CH ₃ + H?	14.0 ± 0.2	SL	264	315
C₂HNS⁺²						
C ₂ HNS ⁺²	CH ₃ NCS	2H?	28.0 ± 0.5	SL	573	315
C₂H₂NS⁺						
C ₂ H ₂ NS ⁺	CH ₃ NCS	H	11.9 ± 0.2	SL	254	315
C ₂ H ₂ NS ⁺	C ₂ H ₅ NCS	CH ₃	12.5 ± 0.2	SL	281	315
CH₃NCS⁺ Heat of formation 245 kcal mol⁻¹						
CH₃SCN⁺ 270 kcal mol⁻¹						
C ₂ H ₃ NS ⁺	CH ₃ NCS		9.25 ± 0.03	PI	245*	182
C ₂ H ₃ NS ⁺	CH ₃ NCS		9.13 ± 0.15	SL	242	315
C ₂ H ₃ NS ⁺	CH ₃ SCN		10.065 ± 0.01	PI	270*	182
C₂H₅NCS⁺ Heat of formation 237 kcal mol⁻¹						
C₂H₅SCN⁺ 261 kcal mol⁻¹						
C ₃ H ₅ NS ⁺	C ₂ H ₅ NCS		9.14 ± 0.03	PI	237*	182
C ₃ H ₅ NS ⁺	C ₂ H ₅ NCS		9.10 ± 0.15	EVD	236	193, 315
C ₃ H ₅ NS ⁺	C ₂ H ₅ SCN		9.89 ± 0.01	PI	261*	182
C₄H₁₀NS⁺						
C ₄ H ₁₀ NS ⁺	CH ₃ SCH ₂ CH ₂ CH(NH ₂)COOH (Methionine)		10.2 ± 0.2	LE		88
C₇H₅NS⁺						
C ₇ H ₅ NS ⁺	C ₆ H ₅ NCS (Phenyl isothiocyanate)		8.520 ± 0.005	PI	259*	182
C ₇ H ₅ NS ⁺	C ₇ H ₅ NS (Benzothiazole)		8.65	CTS		1211
C₈H₇NS⁺						
C ₈ H ₇ NS ⁺	C ₆ H ₅ CH ₂ SCN (Benzyl thiocyanate)		9.06 ± 0.05	CS	274*	2025
CH₄N₂S⁺						
CH ₄ N ₂ S ⁺	NH ₂ CSNH ₂		8.50 ± 0.05	SL	194*	1390
C₂H₆N₂S⁺						
C ₂ H ₆ N ₂ S ⁺	NH ₂ CSNHCH ₃		8.29 ± 0.05	SL	188*	1390

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₆N₂S⁺						
C ₃ H ₆ N ₂ S ⁺	NH ₂ CSNHCH=CH ₂		8.29 ± 0.05	SL	213*	1390
C₃H₈N₂S⁺						
C ₃ H ₈ N ₂ S ⁺	NH ₂ CSN(CH ₃) ₂		8.34 ± 0.05	SL	186*	1390
C ₃ H ₈ N ₂ S ⁺	CH ₃ NHCSNHCH ₃		8.17 ± 0.05	SL	184*	1390
C₄H₁₀N₂S⁺						
C ₄ H ₁₀ N ₂ S ⁺	CH ₃ NHCSN(CH ₃) ₂		7.93 ± 0.05	SL	176*	1390
C₅H₁₂N₂S⁺						
C ₅ H ₁₂ N ₂ S ⁺	C ₅ H ₁₂ N ₂ S (Diethyl thiourea)		7.98 ± 0.05	SL	170*	1390
C ₅ H ₁₂ N ₂ S ⁺	(CH ₃) ₂ NCSN(CH ₃) ₂		7.95 ± 0.05	SL	173*	1390
C₂H₄SO⁺						
C ₂ H ₄ SO ⁺	CH ₃ COSH		10.00 ± 0.02	PI		182
C₄H₁₀SO₃⁺						
C ₄ H ₁₀ SO ₃ ⁺	(C ₂ H ₅) ₂ SO ₃		9.68?	PI		182
Cl⁺ Heat of formation 329 kcal mol⁻¹						
Cl ⁺	Cl		13.02	S	329*	2113
Cl ⁺	Cl		12.83 ± 0.1	RPD	325	196
Cl ⁺	Cl		12.9 ± 0.15	LE	327	440
Cl ⁺	Cl ₂	Cl ⁻	11.86 ± 0.04	RPD	332	288, 292
Cl ⁺	Cl ₂	Cl	15.51 ± 0.03	RPD	329	288, 292
Cl ⁺	HCl	H	17.1 ± 0.15	LE	320	440
Cl ⁺	CCl ₄	CCl ₃	16.10 ± 0.2	RPD	333	196
Cl ⁺	MgCl ₂	MgCl	19 ± 1.0	NS	353	178
Cl ⁺	PCl ₃	PCl ₂ ?	14 ± 1	NS		1101
Cl ⁺	PCl ₃	PCl + Cl?	20.2 ± 0.4	EVD	(b)	192
Cl ⁺	PCl ₃	PCl + Cl?	19.8 ± 0.4	NS	331	1101
Cl ⁺	CH ₃ Cl	CH ₃ ?	15.6 ± 0.05	RPD		2154
Cl ⁺	CH ₃ Cl	CH ₃	16.6 ± 0.05	RPD		2154
Cl ⁺	CH ₃ Cl	CH ₃	18.6 ± 0.05	RPD		2154
Cl ⁺	CH ₃ Cl	CH ₃	19.6 ± 0.05	RPD		2154
Cl ⁺	CH ₃ Cl	CH ₃	20.1 ± 0.05	RPD		2154
Cl ⁺	C ₂ H ₅ Cl	CH ₃ + CH ₂ ?	23.4 ± 0.3	VC	386	356
Cl ⁺	CH ₃ C≡CCl	C ₃ H ₃	18.4 ± 0.5	VC	(b)	13
Cl ⁺	CHCl ₃	CH + Cl ₂	22.0 ± 0.3	EVD	340	43
Cl ⁺	CNCl	CN ⁻	13.6 ± 0.1	SL		73
Cl ⁺	CNCl	CN	17.9 ± 0.1	SL		73
Cl ⁺	CF ₃ Cl	CF ₂ + F ⁻ ?	21 ± 1	SL		24
Cl ⁺	ClO ₃ F	3O + F?	23.0 ± 0.2	SL		53
Cl ⁺	POCl ₃		19 ± 1	NS		1101
Cl ⁺	CHF ₂ Cl	CF ₂ + H?	20.5 ± 0.3	EVD	343	43
Cl ⁺	CHFCl ₂	CFCl + H?	23.0 ± 0.3	EVD	361	43
Cl ⁺	TlCl	Tl	16.9 ± 0.1	RPD	330	2159

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Cl₂⁺(²Π_{3/2g}) Heat of formation 265 kcal mol⁻¹						
Cl ₂ ⁺ (² Π _{3/2g})	Cl ₂		11.48 ± 0.01	PI	265*	182, 416
Cl ₂ ⁺	Cl ₂		11.63 ± 0.04	RPD	268	292
Cl ₂ ⁺ (² Σ _g ⁺)	Cl ₂		14.09 ± 0.03	RPD	325	292
Cl ₂ ⁺ (² Σ _u ⁺)	Cl ₂		20.61 ± 0.06	RPD	475	292
Cl ₂ ⁺	Cl ₂		12.03 ± 0.05	EVD	277	440
Cl ₂ ⁺	Cl ₂		11.64 ± 0.05	SL	268	75
Cl₂⁺²						
Cl ₂ ⁺²	Cl ₂		32.6	NS	752	75
HCl⁺(²Π_{3/2}) Heat of formation 272 kcal mol⁻¹						
HCl⁺(²Π_{1/2}) 274 kcal mol⁻¹						
HCl ^{+(2Π_{3/2})}	HCl		12.74 ± 0.01	PI	272*	182, 416
HCl ^{+(2Π_{3/2})}	HCl		12.742 ± 0.010	PI	272*	1253
HCl ^{+(2Π_{1/2})}	HCl		12.818 ± 0.008	PI	274*	1253
HCl ⁺	HCl		12.56 ± 0.1	RPD	268	39
HCl ⁺	HCl		14.16 ± 0.2	RPD		39
HCl⁺²						
HCl ⁺²	HCl		35.5 ± 0.5	NRE	797	212
XeCl₄⁺						
XeCl ₄ ⁺	XeCl ₄		11.5	TC		1164
LiCl⁺						
LiCl ⁺	LiCl		10.1	VC	186	2179
Li₂Cl⁺						
Li ₂ Cl ⁺	Li ₂ Cl ₂	Cl	10.6	VC	72	2179
BCl⁺						
B ⁺ Cl ₃	B ⁺ Cl ₃	2Cl	18.54 ± 0.07	EVD	273	440
B ⁺ Cl ₃	B ⁺ Cl ₃	Cl ₂	17.2 ± 0.2	VC	300	206
B ⁺ Cl ₃	B ⁺ Cl ₃	2Cl	20.0 ± 0.2	VC	307	206
B⁺Cl₂						
B ⁺ Cl ₂	B ⁺ Cl ₃	Cl	13.01 ± 0.02	EVD	174	440
B ⁺ Cl ₂	B ⁺ Cl ₃	Cl	11.8 ± 0.2	VC	147	206
B ⁺ Cl ₂	B ⁺ Cl ₃	Cl	12.0 ± 0.2	VC	151	206
B⁺Cl₂²						
B ⁺ Cl ₂ ²	B ⁺ Cl ₃	Cl	33.77 ± 0.07	EVD	653	440

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
B_{Cl}⁺₃						
B _{Cl} ⁺ ₃	B _{Cl} ₃		12.03 ± 0.02	EVD	181	440
B _{Cl} ⁺ ₃	B _{Cl} ₃		10.6 ± 0.2	VC	148	206
B _{Cl} ⁺ ₃	B _{Cl} ₃		10.9 ± 0.2	VC	155	206
B _{Cl} ⁺ ₃	B _{Cl} ₃		11.0 ± 0.2	VC	157	206
CCl⁺						
CCl ⁺	CCl		12.9 ± 0.10	NS	420	129
CCl ⁺	CCl ₂	Cl	16.3 ± 0.2	NS	413	319
CCl ⁺	CCl ₄	Cl ₂ + Cl	19.35 ± 0.05	NS	393	129
CCl ⁺	CCl ₄	Cl ₂ + Cl	19.4 ± 0.1	NS	394	319
CCl ⁺	CHCl ₃	HCl + Cl	16.3 ± 0.2	EVD	344	43
CCl ⁺	CNCl	N	17.2 ± 0.2	SL	316	73
CCl ⁺	CHFCl ₂	HCl + F	18.3 ± 0.2	EVD	356	43
CCl₂⁺						
CCl ₂ ⁺	CCl ₂		13.10 ± 0.08	NS	368	129
CCl ₂ ⁺	CCl ₂		13.2 ± 0.2	NS	370	319
CCl ₂ ⁺	CCl ₄	Cl ₂	16.10 ± 0.02	NS	347	129
CCl ₂ ⁺	CCl ₄	Cl ₂	16.5 ± 0.2	NS	356	319
CCl₃⁺ Heat of formation 214 kcal mol⁻¹						
CCl ₃ ⁺	CCl ₃		8.78 ± 0.05	EVD	(a)	441
CCl ₃ ⁺	CCl ₃		8.64	TC	213	136
CCl ₃ ⁺	CCl ₄	Cl	11.65 ± 0.10	RPD	215*	196
CCl ₃ ⁺	CCl ₄	Cl	11.67 ± 0.1	EVD	215*	441
CCl ₃ ⁺	CCl ₄	Cl	11.90 ± 0.07	NS	221	129
CCl ₃ ⁺	CHCl ₃	H	11.70 ± 0.09	RPD	193	1139
CCl ₃ ⁺	C ₂ HCl ₅	CHCl ₂	11.54 ± 0.1	SL	72	
CCl ₃ ⁺	CFCl ₃	F	12.77 ± 0.15	RPD	210*	185
CCl ₃ ⁺	CFCl ₃	F	14.3 ± 0.2	RPD	185	
CCl ₃ ⁺	CFCl ₃	F	15.5 ± 0.2	RPD	185	
CCl ₃ ⁺	CCl ₃ Br	Br	10.90 ± 0.1	EVD	214*	441
CCl ₃ ⁺	CCl ₃ COCHN ₂		11.0	VC		2174
CCl₄⁺						
CCl ₄ ⁺	CCl ₄		11.47 ± 0.01	PI	240*	182, 416
CCl ₄ ⁺	CCl ₄		11.48	TC	240	1164
C₂Cl₄⁺						
C ₂ Cl ₄ ⁺	C ₂ Cl ₄		9.32 ± 0.01	PI	212*	182, 168
C ₂ Cl ₄ ⁺	C ₂ Cl ₄		9.71	TC	221	136
ClO⁺						
ClO ⁺	ClO ₃ F	2O + F	18.0 ± 0.5	SL	271	53
ClO₂⁺						
ClO ₂ ⁺	ClO ₃ F	O + F	15.7 ± 0.5	SL	278	53

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
ClO₃⁺						
ClO ₃ ⁺	ClO ₃ F	F	14.3 ± 0.2	SL	305	53
FCl⁺						
FCl ⁺	F ₃ Cl		12.7 ± 0.3	VC		357
F₂Cl⁺						
F ₂ Cl ⁺	F ₃ Cl	F	12.8 ± 0.3	VC	237	357
F₃Cl⁺						
F ₃ Cl ⁺	F ₃ Cl		13.0 ± 0.2	VC	261	357
MgCl⁺						
MgCl ⁺	MgCl ₂	Cl	11.5 ± 0.5	VC	140	178
MgCl₂⁺						
MgCl ₂ ⁺	MgCl ₂		11.1 ± 0.2	VC	160	178
Mg₂Cl₃⁺						
Mg ₂ Cl ₃ ⁺	Mg ₂ Cl ₄	Cl	11.2 ± 0.3	VC	-4	178
SiCl₃⁺ Heat of formation 101 kcal mol⁻¹						
SiCl ₃ ⁺	SiCl ₄	Cl	12.48 ± 0.02	SL	102*	2182
SiCl ₃ ⁺	Si ₂ Cl ₆	SiCl ₃	11.55 ± 0.1	SL		2183
SiCl ₃ ⁺	HSiCl ₃	H	11.91 ± 0.03	SL	100*	2182
SiCl ₃ ⁺	CH ₃ SiCl ₃	CH ₃	11.90 ± 0.08	SL	115	2182
SiCl ₃ ⁺	C ₂ H ₅ SiCl ₃	C ₂ H ₅	12.10 ± 0.03	SL	123	2182
SiCl ₃ ⁺	<i>iso</i> -C ₃ H ₇ SiCl ₃	<i>iso</i> -C ₃ H ₇	13.1 ± 0.2	SL	147	2182
SiCl ₃ ⁺	<i>tert</i> -C ₄ H ₉ SiCl ₃	<i>tert</i> -C ₄ H ₉	13.0 ± 0.1	SL		2182
PCl⁺						
PCl ⁺	PCl ₃	2Cl	16.83 ± 0.3	EVD	261	192
PCl ⁺	PCl ₃	2Cl	16.5 ± 0.5	NS	254	1101
PCl ⁺	P ₂ Cl ₄	PCl ₂ + Cl	15.7 ± 0.3	EVD		192
PCl ⁺	POCl ₃	O + Cl ₂ ?	17 ± 1	NS	199	1101
P₂Cl⁺						
P ₂ Cl ⁺	P ₂ Cl ₄	Cl ₂ + Cl	16.1 ± 0.4	EVD		192
PCl₂⁺						
PCl ₂ ⁺	PCl ₃	Cl	12.32 ± 0.2	EVD	186	192
PCl ₂ ⁺	PCl ₃	Cl ⁻	11.8 ± 0.5	NS	262	1101
PCl ₂ ⁺	P ₂ Cl ₄	PCl ₂	11.68 ± 0.2	EVD		192
PCl ₂ ⁺	POCl ₃	O + Cl ⁻ ?	13.3 ± 0.5	NS	172	1101

TABLE I. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
P₂Cl₂⁺						
P ₂ Cl ₂ ⁺	P ₂ Cl ₄	Cl ₂	13.9 ± 0.3	EVD		192
PCl₃⁺ Heat of formation 160 kcal mol⁻¹						
PCl ₃ ⁺	PCl ₃		9.91	PI	160*	1091
PCl ₃ ⁺	PCl ₃		10.75 ± 0.2	EVD	179	192
PCl ₃ ⁺	PCl ₃		10.6 ± 0.2	NS	176	1101
PCl ₃ ⁺	POCl ₃		12.3 ± 0.5	NS		1101
P₂Cl₃⁺						
P ₂ Cl ₃ ⁺	P ₂ Cl ₄	Cl	11.7 ± 0.3	EVD		192
P₂Cl₄⁺						
P ₂ Cl ₄ ⁺	P ₂ Cl ₄		9.36 ± 0.2	EVD		192
CHCl⁺						
CHCl ⁺	CHCl ₃	2Cl	17.5 ± 0.2	EVD	321	43
CHCl ⁺	CHFCl ₂	Cl + F	19.0 ± 0.2	EVD	321	43
CH₂Cl⁺						
CH ₂ Cl ⁺	CH ₂ Cl		9.32	SL	244	141
CH ₂ Cl ⁺	CH ₂ Cl		9.70 ± 0.09	NS	253	131
CH ₂ Cl ⁺	CH ₂ Cl		9.42	TC	246	136
CH ₂ Cl ⁺	CH ₃ Cl	H-?	13.06	RPD	248	160
CH ₂ Cl ⁺	CH ₃ Cl	H-?	14.35	RPD		160
CH ₂ Cl ⁺	CH ₃ Cl	H	12.98 ± 0.07	RPD	228	1139
CH ₂ Cl ⁺	CH ₃ Cl	H	13.64	RPD	243	160
CH ₂ Cl ⁺	CH ₃ Cl	H	14.95	RPD		160
CH ₂ Cl ⁺	CH ₃ Cl	H	12.88 ± 0.1	SL	226	72
CH ₂ Cl ⁺	CH ₃ Cl	H	13.0 ± 0.2	VC	228	356
CH ₂ Cl ⁺	C ₂ H ₅ Cl	CH ₃	13.20 ± 0.2	SL	244	72
CH ₂ Cl ⁺	C ₂ H ₅ Cl	CH ₃	13.6 ± 0.2	VC	254	356
CH ₂ Cl ⁺	CH ₂ Cl ₂	Cl	12.12 ± 0.1	SL	228	72
CH ₂ Cl ⁺	CH ₂ Cl ₂	Cl	12.89 ± 0.03	NS	246	131
CH ₂ Cl ⁺	CH ₂ ClCH ₂ Cl	CH ₂ Cl	12.52 ± 0.1	SL	229	72
CH ₂ Cl ⁺	CH ₃ COCH ₂ Cl	COCH ₃	13.8 ± 0.07	VC	266	2174
CH ₂ Cl ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	C ₂ H ₃ O	12.5 ± 0.1	EVD	266	153
CH ₂ Cl ⁺	CH ₂ ClBr	Br	11.56 ± 0.1	SL	228	72
CH ₂ Cl ⁺	CH ₂ ClCOCHN ₂	COCHN ₂	12.2 ± 0.1	VC		2174
CH₃Cl⁺ (²E_{1/2}) Heat of formation 239 kcal mol⁻¹						
CH₃Cl⁺ (²E_{3/2}) 241 kcal mol⁻¹						
CH ₃ Cl ⁺ (² E _{1/2})	CH ₃ Cl		11.220	S	239*	2064
CH ₃ Cl ⁺ (² E _{1/2})	CH ₃ Cl		11.265 ± 0.003	PI	240*	1253
CH ₃ Cl ⁺ (² E _{3/2})	CH ₃ Cl		11.305	S	241*	2064
CH ₃ Cl ⁺ (² E _{3/2})	CH ₃ Cl		11.340 ± 0.003	PI	242*	1253
CH ₃ Cl ⁺	CH ₃ Cl		11.28 ± 0.01	PI	241	182, 416
CH ₃ Cl ⁺	CH ₃ Cl		11.28	PI	241	1399

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH ₃ Cl ^{+(2E_{3/2})}	CH ₃ Cl		11.4 ± 0.05	RPD	244	2154
CH ₃ Cl ⁺	CH ₃ Cl		11.42 ± 0.02	RPD	244	289
CH ₃ Cl ⁺	CH ₃ Cl		11.9 ± 0.05	RPD		2154
CH ₃ Cl ⁺	CH ₃ Cl		12.07 ± 0.04	RPD		289
CH ₃ Cl ⁺	CH ₃ Cl		13.02 ± 0.04	RPD		289
CH ₃ Cl ⁺	CH ₃ Cl		13.2 ± 0.05	RPD		2154
CH ₃ Cl ⁺	CH ₃ Cl		18.71 ± 0.06	RPD		289
CH ₃ Cl ⁺	CH ₃ Cl		10.9 ± 0.3	SL	232	364
CH ₃ Cl ⁺	CH ₃ Cl		11.3 ± 0.1	SL	241	364
CH ₃ Cl ⁺	CH ₃ Cl		11.44 ± 0.02	SL	244	2146
CH ₃ Cl ⁺	CH ₃ Cl		11.45 ± 0.05	SL	245	72
CH ₃ Cl ⁺	CH ₃ Cl		11.33	TC	242	136
C₂HCl⁺						
C ₂ HCl ⁺	cis-C ₂ H ₂ Cl ₂	HCl	13.27 ± 0.05	SL	329	114
C ₂ HCl ⁺	trans-C ₂ H ₂ Cl ₂	HCl	13.39 ± 0.05	SL	332	114
C₂H₂Cl⁺						
C ₂ H ₂ Cl ⁺	cis-C ₂ H ₂ Cl ₂	Cl	12.29 ± 0.05	SL	255	114
C ₂ H ₂ Cl ⁺	trans-C ₂ H ₂ Cl ₂	Cl	12.61 ± 0.05	SL	263	114
C₂H₃Cl⁺ Heat of formation 239 kcal mol⁻¹						
C ₂ H ₃ Cl ⁺	C ₂ H ₃ Cl		9.998	S	239*	261
C ₂ H ₃ Cl ⁺	C ₂ H ₃ Cl		9.995 ± 0.01	PI	239*	182
C ₂ H ₃ Cl ⁺	C ₂ H ₃ Cl		9.995	PI	239*	168
C ₂ H ₃ Cl ⁺	C ₂ H ₃ Cl		10.00 ± 0.02	PI	239*	268
C ₂ H ₃ Cl ⁺	C ₂ H ₃ Cl		10.515	PI		268
C ₂ H ₃ Cl ⁺	C ₂ H ₃ Cl		10.10 ± 0.03	EVD	242	268
C ₂ H ₃ Cl ⁺	C ₂ H ₃ Cl		10.39	TC	248	136
C₂D₃Cl⁺						
C ₂ D ₃ Cl ⁺	C ₂ D ₃ Cl		10.02 ± 0.02	PI		268
C ₂ D ₃ Cl ⁺	C ₂ D ₃ Cl		10.10 ± 0.03	EVD		268
C₂H₅Cl^{+(2E_{1/2}) Heat of formation 226 kcal mol⁻¹}						
C ₂ H ₅ Cl ^{+(2E_{1/2})}	C ₂ H ₅ Cl		10.97 ± 0.02	PI	226*	416
C ₂ H ₅ Cl ^{+(2E_{1/2})}	C ₂ H ₅ Cl		10.98 ± 0.02	PI	226*	182
C ₂ H ₅ Cl ^{+(2E_{1/2})}	C ₂ H ₅ Cl		11.1	RPD	229	160
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		11.5	RPD		160
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		12.5	RPD		160
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		13.2	RPD		160
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		11.10 ± 0.06	SL	229	2146
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		11.16 ± 0.05	SL	231	72
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		11.2 ± 0.2	VC	231	356
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		11.5	TC		2038
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		12.3	TC		2038
C ₂ H ₅ Cl ⁺	C ₂ H ₅ Cl		13.2	TC		2038
C₃H₃Cl⁺						
C ₃ H ₃ Cl ⁺	CH ₃ C≡CCl		9.9 ± 0.1	VC	265*	13
C₃H₄Cl⁺						
C ₃ H ₄ Cl ⁺	CHCl=CHCH ₂		8.06	TC	209	136
C ₃ H ₄ Cl ⁺	CH ₂ =CClCH ₂		8.16	TC	210	136

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
<i>n</i>-C₃H₇Cl⁺ Heat of formation 218 kcal mol⁻¹						
<i>iso</i>-C₃H₇Cl⁺ 212 kcal mol⁻¹						
C ₃ H ₇ Cl ⁺	<i>n</i> -C ₃ H ₇ Cl		10.82 ± 0.03	PI	218*	182
C ₃ H ₇ Cl ⁺	<i>n</i> -C ₃ H ₇ Cl		10.78 ± 0.04	SL	218	2146
C ₃ H ₇ Cl ⁺	<i>n</i> -C ₃ H ₇ Cl		11.05 ± 0.05	SL	224	72
C ₃ H ₇ Cl ⁺	<i>n</i> -C ₃ H ₇ Cl		11.0	TC		2038
C ₃ H ₇ Cl ⁺	<i>n</i> -C ₃ H ₇ Cl		12.0	TC		2038
C ₃ H ₇ Cl ⁺	<i>n</i> -C ₃ H ₇ Cl		12.4	TC		2038
C ₃ H ₇ Cl ⁺	<i>n</i> -C ₃ H ₇ Cl		13.2	TC		2038
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		10.78 ± 0.02	PI	212*	182
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		11.2	RPD		160
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		11.6	RPD		160
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		12.5	RPD		160
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		13.1	RPD		160
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		10.77 ± 0.03	SL	212	2146
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		11.0	TC		2038
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		11.7	TC		2038
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		12.7	TC		2038
C ₃ H ₇ Cl ⁺	<i>iso</i> -C ₃ H ₇ Cl		13.2	TC		2038
<i>n</i>-C₄H₉Cl⁺ Heat of formation 211 kcal mol⁻¹						
<i>sec</i>-C₄H₉Cl⁺ 207 kcal mol⁻¹						
<i>iso</i>-C₄H₉Cl⁺ 208 kcal mol⁻¹						
<i>tert</i>-C₄H₉Cl⁺ 202 kcal mol⁻¹						
C ₄ H ₉ Cl ⁺	<i>n</i> -C ₄ H ₉ Cl		10.67 ± 0.03	PI	211*	182
C ₄ H ₉ Cl ⁺	<i>n</i> -C ₄ H ₉ Cl		10.50 ± 0.07	SL	207	2146
C ₄ H ₉ Cl ⁺	<i>sec</i> -C ₄ H ₉ Cl		10.65 ± 0.03	PI	207*	182
C ₄ H ₉ Cl ⁺	<i>sec</i> -C ₄ H ₉ Cl		10.52 ± 0.1	SL	204	2146
C ₄ H ₉ Cl ⁺	<i>iso</i> -C ₄ H ₉ Cl		10.66 ± 0.03	PI	208*	182
C ₄ H ₉ Cl ⁺	<i>iso</i> -C ₄ H ₉ Cl		10.48 ± 0.1	SL	203	2146
C ₄ H ₉ Cl ⁺	<i>tert</i> -C ₄ H ₉ Cl		10.61 ± 0.03	PI	202*	182
C ₄ H ₉ Cl ⁺	<i>tert</i> -C ₄ H ₉ Cl		10.3 ± 0.1	SL	194	2146
C₅H₄Cl⁺						
C ₅ H ₄ Cl ⁺	C ₅ H ₄ Cl (Chlorocyclopentadienyl radical)		8.78	SL		126
cyclo-C₆H₅Cl⁺ Heat of formation 222 kcal mol⁻¹						
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		9.07 ± 0.02	PI	222*	182, 416
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		9.07	PI	222*	168
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		9.35	PE		2015
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		9.68	PE		2015
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		11.44	PE		2015
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		11.79	PE		2015
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		12.38	PE		2015
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		17.02	PE		2015

TABLE I. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		9.60	SL	234	1066
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		9.6 ± 0.1	SL	234	301
C ₆ H ₅ Cl ⁺	C ₆ H ₅ Cl (Chlorobenzene)		9.14	TC	224	136
C₇H₆Cl⁺						
C ₇ H ₆ Cl ⁺	C ₆ H ₅ ClCH ₂ (<i>p</i> -Chlorobenzyl radical)		7.95 ± 0.1	SL	213*	69
C₇H₇Cl⁺						
C ₇ H ₇ Cl ⁺	C ₆ H ₅ CH ₂ Cl (Benzyl chloride)		9.19 ± 0.05	CS	219*	2025
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>o</i> -Chlorotoluene)		8.83 ± 0.02	PI	208*	182
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>o</i> -Chlorotoluene)		8.92	TC	210	136
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>m</i> -Chlorotoluene)		8.83 ± 0.02	PI	207*	182
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>m</i> -Chlorotoluene)		9.10 ± 0.05	CS	213	2025
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>m</i> -Chlorotoluene)		8.93	TC	209	136
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>p</i> -Chlorotoluene)		8.69 ± 0.02	PI	204*	416, 182
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>p</i> -Chlorotoluene)		9.21	SL	216	1066
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (<i>p</i> -Chlorotoluene)		8.95	TC	210	136
C ₇ H ₇ Cl ⁺	C ₆ H ₄ ClCH ₃ (Chlorotoluene)		9.24	TC	217	2194
C₇H₉Cl⁺						
C ₇ H ₉ Cl ⁺	C ₇ H ₉ Cl (<i>endo</i> -5-Chloro-2-norbornene)		9.1 ± 0.15	SL	233*	2155
C ₇ H ₉ Cl ⁺	C ₇ H ₉ Cl (<i>exo</i> -5-Chloro-2-norbornene)		9.15 ± 0.15	SL	234*	2155
C ₇ H ₉ Cl ⁺	C ₇ H ₉ Cl (3-Chloronortricyclene)		9.51 ± 0.15	SL	234*	2155
CHCl₂⁺						
CHCl ₂ ⁺	CHCl ₂		9.30	SL	245	141
CHCl ₂ ⁺	CHCl ₂		9.54 ± 0.10	NS	251	131
CHCl ₂ ⁺	CHCl ₂		9.02	TC	239	136
CHCl ₂ ⁺	CH ₂ Cl ₂	H	12.12 ± 0.05	RPD	205	1139
CHCl ₂ ⁺	CH ₂ Cl ₂	H	13.00 ± 0.10	NS	226	131
CHCl ₂ ⁺	CHCl ₃	Cl	11.64 ± 0.20	EVD	215	43
CHCl ₂ ⁺	CHCl ₃	Cl	11.70 ± 0.1	SL	216	72
CHCl ₂ ⁺	CHCl ₃	Cl	12.43 ± 0.02	NS	233	131
CHCl ₂ ⁺	CHCl ₂ CHCl ₂	CHCl ₂	11.55 ± 0.1	SL	200	72
CHCl ₂ ⁺	CHCl ₂ Br	Br	11.02 ± 0.1	SL	213	72

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₂Cl₂⁺						
CH ₂ Cl ₂ ⁺	CH ₂ Cl ₂		11.35 ± 0.02	PI	240*	182, 416
CH ₂ Cl ₂ ⁺	CH ₂ Cl ₂		11.49 ± 0.05	SL	243	72
CH ₂ Cl ₂ ⁺	CH ₂ Cl ₂		11.60	TC	245	1164
cis-C₂H₂Cl₂⁺ Heat of formation 223 kcal mol⁻¹						
trans-C₂H₂Cl₂⁺ 224 kcal mol⁻¹						
C ₂ H ₂ Cl ₂ ⁺	CH ₂ =CCl ₂		9.459	S	218	269
C ₂ H ₂ Cl ₂ ⁺	CH ₂ =CCl ₂		9.79	PI	225*	168
C ₂ H ₂ Cl ₂ ⁺	CH ₂ =CCl ₂		10.16	TC	234	136
C ₂ H ₂ Cl ₂ ⁺	cis-C ₂ H ₂ Cl ₂		9.652	S	223	261
C ₂ H ₂ Cl ₂ ⁺	cis-C ₂ H ₂ Cl ₂		9.65 ± 0.01	PI	223*	182
C ₂ H ₂ Cl ₂ ⁺	cis-C ₂ H ₂ Cl ₂		9.65	PI	223*	168
C ₂ H ₂ Cl ₂ ⁺	cis-C ₂ H ₂ Cl ₂		9.66 ± 0.02	PI	224*	114, 268,
					1058, 1190	
C ₂ H ₂ Cl ₂ ⁺	cis-C ₂ H ₂ Cl ₂		9.66 ± 0.05	EVD	224	268
C ₂ H ₂ Cl ₂ ⁺	cis-C ₂ H ₂ Cl ₂		9.67 ± 0.05	SL	224	114,
					1190, 1058	
C ₂ H ₂ Cl ₂ ⁺	trans-C ₂ H ₂ Cl ₂		9.954	S	231	261
C ₂ H ₂ Cl ₂ ⁺	trans-C ₂ H ₂ Cl ₂		9.63	PI	224*	168
C ₂ H ₂ Cl ₂ ⁺	trans-C ₂ H ₂ Cl ₂		9.64 ± 0.02	PI	224*	114, 268,
					1058, 1190	
C ₂ H ₂ Cl ₂ ⁺	trans-C ₂ H ₂ Cl ₂		9.66 ± 0.03	PI	224*	182
C ₂ H ₂ Cl ₂ ⁺	trans-C ₂ H ₂ Cl ₂		9.96 ± 0.05	EVD	231	268
C ₂ H ₂ Cl ₂ ⁺	trans-C ₂ H ₂ Cl ₂		10.00 ± 0.05	SL	232	114, 1190
C ₂ H ₂ Cl ₂ ⁺	trans-C ₂ H ₂ Cl ₂		10.00 ± 0.05	NS	232	1058
C ₂ H ₂ Cl ₂ ⁺	CHCl=CHCl		10.275	PI	268	
C ₂ H ₂ Cl ₂ ⁺	CHCl=CHCl		10.50	PI	268	
C ₂ H ₂ Cl ₂ ⁺	CHCl=CHCl		10.74	PI	268	
C ₂ H ₂ Cl ₂ ⁺	CHCl=CHCl		10.14	TC		136
C₂H₄Cl₂⁺						
C ₂ H ₄ Cl ₂ ⁺	CH ₂ ClCH ₂ Cl		11.12 ± 0.05	PI	225*	182
C ₂ H ₄ Cl ₂ ⁺	CH ₂ ClCH ₂ Cl		11.25 ± 0.05	SL	228	72
C₃H₄Cl₂⁺						
C ₃ H ₄ Cl ₂ ⁺	CH ₂ =CClCH ₂ Cl		9.82 ± 0.03	PI	218*	182
C₃H₆Cl₂⁺						
C ₃ H ₆ Cl ₂ ⁺	1,2-C ₃ H ₆ Cl ₂		10.87 ± 0.05	PI	215*	182
C ₃ H ₆ Cl ₂ ⁺	1,3-C ₃ H ₆ Cl ₂		10.85 ± 0.05	PI	215*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
<i>o</i>-C₆H₄Cl₂⁺ Heat of formation 217 kcal mol⁻¹						
	<i>m</i>-C₆H₄Cl₂⁺		217 kcal mol⁻¹			
	<i>p</i>-C₆H₄Cl₂⁺		212 kcal mol⁻¹			
C ₆ H ₄ Cl ₂ ⁺ (<i>o</i> -Dichlorobenzene)	C ₆ H ₄ Cl ₂		9.06	PI	217*	168
C ₆ H ₄ Cl ₂ ⁺ (<i>o</i> -Dichlorobenzene)	C ₆ H ₄ Cl ₂		9.07 ± 0.01	PI	217*	182
C ₆ H ₄ Cl ₂ ⁺ (<i>o</i> -Dichlorobenzene)	C ₆ H ₄ Cl ₂		9.64	SL	230	1066
C ₆ H ₄ Cl ₂ ⁺ (<i>o</i> -Dichlorobenzene)	C ₆ D ₄ Cl ₂		9.06	TC	217	136
C ₆ H ₄ Cl ₂ ⁺ (<i>m</i> -Dichlorobenzene)	C ₆ H ₄ Cl ₂		9.12 ± 0.01	PI	217*	182
C ₆ H ₄ Cl ₂ ⁺ (<i>p</i> -Dichlorobenzene)	C ₆ H ₄ Cl ₂		8.94 ± 0.01	PI	212*	182
C ₆ H ₄ Cl ₂ ⁺ (<i>p</i> -Dichlorobenzene)	C ₆ H ₄ Cl ₂		8.95	PI	212*	168
C ₆ H ₄ Cl ₂ ⁺ (<i>p</i> -Dichlorobenzene)	C ₆ H ₄ Cl ₂		9.07	TC	215	136
CHCl₃⁺						
CHCl ₃ ⁺	CHCl ₃		11.42 ± 0.03	PI	239*	182, 416
CHCl ₃ ⁺	CHCl ₃		11.39 ± 0.12	EVD	238	43
C₂HCl₃⁺ Heat of formation 216 kcal mol⁻¹						
C ₂ HCl ₃ ⁺	C ₂ HCl ₃		8.79	S	201	261
C ₂ HCl ₃ ⁺	C ₂ HCl ₃		9.45 ± 0.01	PI	216*	182
C ₂ HCl ₃ ⁺	C ₂ HCl ₃		9.45	PI	216*	168
C ₂ HCl ₃ ⁺	C ₂ HCl ₃		9.47 ± 0.01	PI	217*	416
C ₂ HCl ₃ ⁺	C ₂ HCl ₃		9.94	TC	227	136
C₂H₂Cl₄⁺						
C ₂ H ₂ Cl ₄ ⁺	CHCl ₂ CHCl ₂		11.10 ± 0.05	SL	220*	72
CNCl⁺						
CNCl ⁺	CNCl		12.49 ± 0.04	SL	321*	73
CFCl⁺						
CFCl ⁺	CFCl ₃	Cl ₂	17.41 ± 0.15	RPD	336	185
CFCl ⁺	CFCl ₃	2Cl?	18.8 ± 0.2	RPD	309	185
CFCl ⁺	CHF ₂ Cl	H + F ⁻ ?	15.9 ± 0.3	EVD		43
CF₂Cl⁺						
CF ₂ Cl ⁺	CF ₃ Cl	F	15.0 ± 0.4	SL	161	24
CF₃Cl⁺						
CF ₃ Cl ⁺	CF ₃ Cl		12.91 ± 0.03	PI	132*	182
CF ₃ Cl ⁺	CF ₃ Cl		12.8 ± 0.2	EVD	129	439
CF ₃ Cl ⁺	CF ₃ Cl		13 ± 1	SL	134	24

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂F₃Cl⁺						
C ₂ F ₃ Cl ⁺	C ₂ F ₃ Cl		10.4±0.2	SL	107*	214
C₃F₅Cl⁺						
C ₃ F ₅ Cl ⁺	CF ₂ ClCF=CF ₂		10.79	VC		1290
C₆F₅Cl⁺						
C ₆ F ₅ Cl ⁺	C ₆ F ₅ Cl (Chloropentafluorobenzene)		10.4±0.1	SL		301
CFCl₂⁺						
CFCl ₂ ⁺	CFCl ₃	Cl	11.97±0.07	RPD	181	185
CF₂Cl₂⁺						
CF ₂ Cl ₂ ⁺	CF ₂ Cl ₂		12.31±0.05	PI	170*	182
CF ₂ Cl ₂ ⁺	CF ₂ Cl ₂		11.95	TC	162	1164
C₂F₂Cl₂⁺						
C ₂ F ₂ Cl ₂ ⁺	C ₂ F ₂ Cl ₂		10.0±0.2	SL		214
C₄F₆Cl₂⁺						
C ₄ F ₆ Cl ₂ ⁺	CF ₃ CCl=CClCF ₃		10.36±0.01	PI		182
CFCl₃⁺						
CFCl ₃ ⁺	CFCl ₃		11.77±0.02	PI	205*	182
C₂F₃Cl₃⁺						
C ₂ F ₃ Cl ₃ ⁺	CF ₃ CCl ₃		11.78±0.03	PI		182
C ₂ F ₃ Cl ₃ ⁺	CFCl ₂ CF ₂ Cl		11.99±0.02	PI	95*	182
ClO₃F⁺						
ClO ₃ F ⁺	ClO ₃ F		13.6±0.2	SL	308*	53
POCl₂⁺						
POCl ₂ ⁺	POCl ₃	Cl ⁻	13.3±0.2	NS	232	1101
POCl₃⁺						
POCl ₃ ⁺	POCl ₃		13.1±0.2	NS	169	1101
C₅H₄NCl⁺						
C ₅ H ₄ NCl ⁺	C ₅ H ₄ NCl (2-Chloropyridine)		9.91±0.05	SL	255*	217
C ₅ H ₄ NCl ⁺	C ₅ H ₄ NCl (4-Chloropyridine)		10.15±0.05	SL	260*	217

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₈H₁₀NCl⁺						
C ₈ H ₁₀ NCl ⁺ (<i>N,N</i> -Dimethyl- <i>p</i> -chloroaniline)	C ₆ H ₄ ClN(CH ₃) ₂		7.38	CTS	182	1281
C₂H₂OCl⁺						
C ₂ H ₂ OCl ⁺	CH ₃ COCH ₂ Cl	CH ₃	11.97 ± 0.11	VC	186	2174
C ₂ H ₂ OCl ⁺	CH ₂ ClCOCHN ₂	CHN ₂	11.66 ± 0.04	VC		2174
C₂H₃OCl⁺						
C ₂ H ₃ OCl ⁺	CH ₃ COCl		11.02 ± 0.05	PI	196*	182
C ₂ H ₃ OCl ⁺	CH ₃ COCl		11.08 ± 0.06	CS	197	2026
C₃H₅OCl⁺ Heat of formation 173 kcal mol⁻¹						
C ₃ H ₅ OCl ⁺	CH ₃ COCH ₂ Cl		9.98 ± 0.13	VC	173*	2174
C ₃ H ₅ OCl ⁺	CH ₃ COCH ₂ Cl		10.00 ± 0.01	CS	174*	2026
C₆H₅OCl⁺						
C ₆ H ₅ OCl ⁺ (<i>o</i> -Chlorophenol)	C ₆ H ₄ ClOH		9.28	SL	181*	1066
C ₆ H ₅ OCl ⁺ (<i>p</i> -Chlorophenol)	C ₆ H ₄ ClOH		9.07	SL	175*	1066
C ₆ H ₅ OCl ⁺ (Chlorophenol)	C ₆ H ₄ ClOH		9.19	TC	178	2194
C₇H₅OCl⁺						
C ₇ H ₅ OCl ⁺ (Benzoyl chloride)	C ₆ H ₅ COCl		10.6	SL	216	308
C ₇ H ₅ OCl ⁺ (Benzoyl chloride)	C ₆ H ₅ COCl		9.70 ± 0.01	CS	195*	2026
C ₇ H ₅ OCl ⁺ (<i>p</i> -Chlorobenzaldehyde)	C ₆ H ₄ ClCHO		9.61 ± 0.01	CS	201*	2026
C ₇ H ₅ OCl ⁺ (Chlorobenzaldehyde)	C ₆ H ₄ ClCHO		9.83	TC	206	2194
C₈H₇OCl⁺ (<i>α</i>-Chloroacetophenone) Heat of formation 195 kcal mol⁻¹						
C₈H₇OCl⁺ (<i>p</i>-Chloroacetophenone) 190 kcal mol⁻¹						
C₈H₇OCl⁺ (<i>p</i>-Methylbenzoyl chloride) 187 kcal mol⁻¹						
C ₈ H ₇ OCl ⁺ (<i>α</i> -Chloroacetophenone)	C ₆ H ₅ COCH ₂ Cl		9.44 ± 0.05	CS	193*	2025
C ₈ H ₇ OCl ⁺ (<i>α</i> -Chloroacetophenone)	C ₆ H ₅ COCH ₂ Cl		9.65 ± 0.01	CS	198*	2026
C ₈ H ₇ OCl ⁺ (<i>p</i> -Chloroacetophenone)	C ₆ H ₄ ClCOCH ₃		9.47 ± 0.05	CS	190*	2026
C ₈ H ₇ OCl ⁺ (Chloroacetophenone)	C ₆ H ₄ ClCOCH ₃		9.51	TC	191	2194
C ₈ H ₇ OCl ⁺ (<i>p</i> -Methylbenzoyl chloride)	C ₆ H ₄ CH ₃ COCl		9.37 ± 0.01	CS	187*	2026
C₁₃H₉OCl⁺						
C ₁₃ H ₉ OCl ⁺ (<i>p</i> -Chlorobenzophenone)	C ₆ H ₄ ClCOC ₆ H ₅		9.68 ± 0.01	CS	227*	2026
C ₁₃ H ₉ OCl ⁺ (Chlorobenzophenone)	C ₆ H ₄ ClCOC ₆ H ₅		9.56	TC	224	2194

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₄O₂Cl⁺						
C ₂ H ₄ O ₂ Cl ⁺	CH ₂ ClCOOC ₂ H ₅	C ₂ H ₃	10.97	VC	78	1059
C₃H₅O₂Cl⁺						
C ₃ H ₅ O ₂ Cl ⁺	CH ₂ ClCOOCH ₃		10.53 ± 0.05	CS	138*	2025
C₈H₇O₂Cl⁺						
C ₈ H ₇ O ₂ Cl ⁺ <i>(p</i> -Methoxybenzoyl chloride)	C ₆ H ₄ CH ₃ OCOCl		8.87 ± 0.05	CS	149*	2026
C ₈ H ₇ O ₂ Cl ⁺ <i>(Methyl chlorobenzoate)</i>	C ₆ H ₄ CICOOC ₂ H ₅		9.70	TC	147	2194
C₇H₄OCl₂⁺						
C ₇ H ₄ OCl ₂ ⁺ <i>(p</i> -Chlorobenzoyl chloride)	C ₆ H ₄ ClCOCl		9.58 ± 0.03	CS	192*	2026
CHFCl⁺						
CHFCl ⁺	CHF ₂ Cl	F	15.11 ± 0.15	EVD	217	43
CHFCl ⁺	CHFCl ₂	Cl	12.69 ± 0.15	EVD	195	43
cis-C₂H₂FCl⁺ Heat of formation 191 kcal mol⁻¹						
trans-C₂H₂FCl⁺ Heat of formation 191 kcal mol⁻¹						
C ₂ H ₂ FCl ⁺	<i>cis</i> -C ₂ H ₂ FCl		9.86 ± 0.02	PI	191*	268
C ₂ H ₂ FCl ⁺	<i>cis</i> -C ₂ H ₂ FCl		9.87 ± 0.01	PI	192*	182
C ₂ H ₂ FCl ⁺	<i>cis</i> -C ₂ H ₂ FCl		10.14 ± 0.03	EVD	198	268
C ₂ H ₂ FCl ⁺	<i>trans</i> -C ₂ H ₂ FCl		9.87 ± 0.01	PI	191*	182
C ₂ H ₂ FCl ⁺	<i>trans</i> -C ₂ H ₂ FCl		9.87 ± 0.02	PI	191*	268
C ₂ H ₂ FCl ⁺	<i>trans</i> -C ₂ H ₂ FCl		10.30 ± 0.03	EVD	201	268
C ₂ H ₂ FCl ⁺	CHF=CHCl		10.30	PI	268	
C₆H₄FCl⁺						
C ₆ H ₄ FCl ⁺ <i>(o</i> -Chlorofluorobenzene)	C ₆ H ₄ FCI		9.155 ± 0.01	PI	180*	182
C ₆ H ₄ FCl ⁺ <i>(o</i> -Chlorofluorobenzene)	C ₆ H ₄ FCI		9.46 ± 0.02	EVD	187	1185
C ₆ H ₄ FCl ⁺ <i>(m</i> -Chlorofluorobenzene)	C ₆ H ₄ FCI		9.21 ± 0.01	PI	180*	182
C ₆ H ₄ FCl ⁺ <i>(m</i> -Chlorofluorobenzene)	C ₆ H ₄ FCI		9.55 ± 0.02	EVD	188	1185
C ₆ H ₄ FCl ⁺ <i>(p</i> -Chlorofluorobenzene)	C ₆ H ₄ FCI		9.43 ± 0.02	EVD	185	1185
CHF₂Cl⁺						
CHF ₂ Cl ⁺	CHF ₂ Cl		12.45 ± 0.05	PI	174*	182
CHF ₂ Cl ⁺	CHF ₂ Cl		12.69 ± 0.15	EVD	180	43
C₂HF₂Cl⁺ Heat of formation 147 kcal mol⁻¹						
C ₂ HF ₂ Cl ⁺	<i>cis</i> -C ₂ HF ₂ Cl		9.86 ± 0.02	PI	147*	268
C ₂ HF ₂ Cl ⁺	<i>cis</i> -C ₂ HF ₂ Cl		10.17 ± 0.03	EVD	155	268
C ₂ HF ₂ Cl ⁺	<i>trans</i> -C ₂ HF ₂ Cl		9.83 ± 0.02	PI	147*	268
C ₂ HF ₂ Cl ⁺	<i>trans</i> -C ₂ HF ₂ Cl		9.96 ± 0.03	EVD	150	268
C ₂ HF ₂ Cl ⁺	CHF=CFCl		10.43	PI	268	
C ₂ HF ₂ Cl ⁺	CHF=CFCl		10.82	PI	268	

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₃F₂Cl⁺						
C ₂ H ₃ F ₂ Cl ⁺	CH ₃ CF ₂ Cl		11.98 ± 0.01	PI		182
C₄H₂F₇Cl⁺						
C ₄ H ₂ F ₇ Cl ⁺	<i>n</i> -C ₃ F ₇ CH ₂ Cl		11.84 ± 0.02	PI		182
CHFCl₂⁺						
CHFCl ₂ [†]	CHFCl ₂		12.39 ± 0.20	EVD	217*	43
C₂H₆SiCl⁺						
C ₂ H ₆ SiCl ⁺	(CH ₃) ₃ SiCl	CH ₃	11.00 ± 0.16	RPD	136	1421
C₃H₉SiCl⁺						
C ₃ H ₉ SiCl ⁺	(CH ₃) ₃ SiCl		10.58 ± 0.04	RPD	160*	1421
CH₃SiCl₃⁺						
CH ₃ SiCl ₃ [‡]	CH ₃ SiCl ₃		11.36 ± 0.03	SL	136*	2182
C₂H₃SiCl₃⁺						
C ₂ H ₃ SiCl ₃ [‡]	CH ₂ =CHSiCl ₃		10.79 ± 0.02	PI	148*	182
C₂H₅SiCl₃⁺						
C ₂ H ₅ SiCl ₃ [‡]	C ₂ H ₅ SiCl ₃		10.74 ± 0.04	SL	117*	2182
C₃H₇SiCl₃⁺						
C ₃ H ₇ SiCl ₃ [‡]	<i>iso</i> -C ₃ H ₇ SiCl ₃		10.28 ± 0.1	SL	99*	2182
C₄H₃ClS⁺						
C ₄ H ₃ ClS ⁺	C ₄ H ₃ ClS (2-Chlorothiophene)		8.68 ± 0.01	PI	217*	182, 416
C₃H₃N₂OCl⁺						
C ₃ H ₃ N ₂ OCl ⁺	CH ₂ ClCOCHN ₂		9.92 ± 0.1	VC		2174
C₇H₄NO₃Cl⁺						
C ₇ H ₄ NO ₃ Cl ⁺	C ₆ H ₄ NO ₂ COCl (<i>p</i> -Nitrobenzoyl chloride)		10.66 ± 0.01	CS	219*	2026
C₃HN₂OCl₃⁺						
C ₃ HN ₂ OCl ₃ [‡]	CCl ₃ COCHN ₂		9.95 ± 0.06	VC		2174
K⁺ Heat of formation 121 kcal mol⁻¹						
K ⁺	K	I	4.341	S	121*	2113
K ⁺	KI		8.6 ± 0.3	VC		2001

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Ca⁺ Heat of formation 187 kcal mol⁻¹						
Ca ⁺	Ca		6.113	S	187*	2113
Ca ⁺	Ca		6.0 ± 0.5	VC	184	1297
Ca ⁺	Ca		5.9 ± 0.2	VC	182	2141
Ca ⁺	Ca		6.1 ± 0.2	NS	187	2178
Ca⁺² Heat of formation 461 kcal mol⁻¹						
Ca ⁺²	Ca		17.98	S	461*	2113
Ca ⁺²	Ca		28.5 ± 2	NS	703	2178
CaO⁺						
CaO ⁺	CaO		6.5	LE	163	1244
CaO ⁺	CaO		6.5	LE	163	2123
CaF⁺ Heat of formation 75 kcal mol⁻¹						
CaF ⁺	CaF		6.0 ± 0.5	VC	74*	2141, 1297
CaF ⁺	CaF		5.5 ± 0.3	VC	63*	2165
CaF ⁺	CaF		5.8 ± 0.3	VC	70*	2165
CaF ⁺	CaF ₂	F	12.5 ± 0.8	VC	81*	2141, 1297
CaF ⁺	CaF ₂	F	12.5	VC	81*	2165
Sc⁺ Heat of formation 242 kcal mol⁻¹						
Sc ⁺	Sc		6.561	S	242*	2113
Sc ⁺	ScF ₃	3F?	28.0	VC	310	2009
ScF⁺						
ScF ⁺	ScF ₃	2F?	16.0	VC	52	2009
ScF₂⁺						
ScF ₂ ⁺	ScF ₃	F?	13.5	VC	13	2009
V⁺ Heat of formation 275 kcal mol⁻¹						
V ⁺	V		6.740	S	275*	2113
V ⁺	C ₅ H ₅ V(CO) ₄ (Cyclopentadienylvanadium tetracarbonyl)		19.4 ± 0.4	EVD		1381
C₃H₃V⁺						
C ₃ H ₃ V ⁺	C ₅ H ₅ V(CO) ₄ (Cyclopentadienylvanadium tetracarbonyl)	C ₂ H ₂ + 4CO?	18.9 ± 0.3	EVD	307	1381
C₅H₅V⁺						
C ₅ H ₅ V ⁺	C ₅ H ₅ V(CO) ₄ (Cyclopentadienylvanadium tetracarbonyl)	4CO	14.2 ± 0.2	EVD	253	1381
C₆H₅OV⁺						
C ₆ H ₅ OV ⁺	C ₅ H ₅ V(CO) ₄ (Cyclopentadienylvanadium tetracarbonyl)	3CO	10.7 ± 0.3	EVD	146	1381

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₇H₅O₂V⁺						
C ₇ H ₅ O ₂ V ⁺ (Cyclopentadienylvanadium tetracarbonyl)	C ₅ H ₅ V(CO) ₄	2CO	9.7 ± 0.3	EVD	97	1381
C₉H₅O₄V⁺						
C ₉ H ₅ O ₄ V ⁺ (Cyclopentadienylvanadium tetracarbonyl)	C ₅ H ₅ V(CO) ₄		8.2 ± 0.3	EVD	9*	1381
Cr⁺ Heat of formation 251 kcal mol⁻¹						
Cr ⁺ Cr ⁺ Cr ⁺ Cr ⁺ Cr ⁺ Cr ⁺	Cr Cr Cr(CO) ₆ Cr(CO) ₆ CrO ₂ F ₂ CrO ₂ Cl ₂	6CO 6CO	6.765 6.7 ± 0.3 17.7 ± 0.3 14.7 ± 0.1 30.8 ± 0.2 26.7 ± 0.2	S VC EVD CS LE LE	251* 249 326 257 30 30	2113 1249 1107 2023 30 30
CrO⁺						
CrO ⁺ CrO ⁺ CrO ⁺ CrO ⁺	CrO CrO ₂ CrO ₂ F ₂ CrO ₂ Cl ₂	O O + 2F? O + 2Cl?	8.4 ± 0.5 13.5 24.4 ± 0.2 21.4 ± 0.2	LE LE LE LE	247 239 30 247	2130 2130 30 30
CrO₂⁺						
CrO ₂ ⁺ CrO ₂ [‡] CrO ₂ [‡]	CrO ₂ CrO ₂ F ₂ CrO ₂ Cl ₂	F ₂ Cl ₂	10.3 ± 0.5 19.8 ± 0.2 15.2 ± 0.5	LE LE LE	225 30 222	2130 30 30
CrO₃⁺						
CrO ₃ [‡]	CrO ₃		11.6 ± 0.5	LE	200	2130
CrF⁺						
CrF ⁺ CrF ⁺	CrF CrO ₂ F ₂	2O + F?	8.4 ± 0.3 21.7 ± 0.4	VC LE	201 30	1249 30
CrF₂⁺						
CrF ₂ [‡] CrF ₂ [‡]	CrF ₂ CrO ₂ F ₂	2O?	10.1 ± 0.3 14.8 ± 0.2	VC LE	134 30	1249 30
CrCl⁺						
CrCl ⁺	CrO ₂ Cl ₂	2O + Cl?	22.2 ± 0.2	LE	235	30
CrCl₂⁺						
CrCl ₂ [‡]	CrO ₂ Cl ₂	2O?	18.2 ± 0.2	LE	172	30
CrCO⁺						
CrCO ⁺ CrCO ⁺	Cr(CO) ₆ Cr(CO) ₆	5CO 5CO	14.9 ± 0.2 13.3 ± 0.2	EVD CS	235 198	1107 2023

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CrC₂O₂⁺						
CrC ₂ O ₂ [‡]	Cr(CO) ₆	4CO	13.1 ± 0.2	EVD	167	1107
CrC ₂ O ₂ [‡]	Cr(CO) ₆	4CO	11.56 ± 0.2	CS	132	2023
CrC₃O₃⁺						
CrC ₃ O ₃ [‡]	Cr(CO) ₆	3CO	10.62 ± 0.15	CS	84	2023
CrC₄O₄⁺						
CrC ₄ O ₄ [‡]	Cr(CO) ₆	2CO	9.97 ± 0.04	CS	42	2023
CrC₅O₅⁺						
CrC ₅ O ₅ [‡]	Cr(CO) ₆	CO	9.17 ± 0.04	CS	-3	2023
CrC₆O₆⁺ Heat of formation — 55 kcal mol⁻¹						
CrC ₆ O ₆ [‡]	Cr(CO) ₆		8.03 ± 0.03	PI	-55*	1167
CrC ₆ O ₆ [‡]	Cr(CO) ₆		8.15 ± 0.17	EVD	-52	1107
CrC ₆ O ₆ [‡]	Cr(CO) ₆		8.18 ± 0.07	CS	-52	2023
CrOF⁺						
CrOF ⁺	CrO ₂ F ₂	O + F?	19.8 ± 0.2	LE		30
CrO₂F⁺						
CrO ₂ F ⁺	CrO ₂ F ₂	F	16.3 ± 0.3	LE		30
CrOF₂⁺						
CrOF ₂ [‡]	CrO ₂ F ₂	O	16.8 ± 0.4	LE		30
CrO₂F₂⁺						
CrO ₂ F ₂ [‡]	CrO ₂ F ₂		14.0 ± 0.2	LE		30
CrOCl⁺						
CrOCl ⁺	CrO ₂ Cl ₂	O + Cl?	17.0 ± 0.3	LE	175	30
CrO₂Cl⁺						
CrO ₂ Cl ⁺	CrO ₂ Cl ₂	Cl	13.9 ± 0.3	LE	163	30
CrOCl₂⁺						
CrOCl ₂ [‡]	CrO ₂ Cl ₂	O	15.8 ± 0.2	LE	176	30
CrO₂Cl₂⁺						
CrO ₂ Cl ₂ [‡]	CrO ₂ Cl ₂		12.6 ± 0.3	LE	162	30

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Mn⁺ Heat of formation 240 kcal mol⁻¹						
Mn ⁺	Mn		7.434	S	240*	2113
Mn ⁺	Mn		7.7 ± 0.3	VC	246	2161
Mn ⁺	C ₅ H ₅ Mn(CO) ₃ (Cyclopentadienylmanganese tricarbonyl)		15.9 ± 0.3	EVD		1381
MnF⁺						
MnF ⁺	MnF	F	8.7 ± 0.3	VC	187	2161
MnF ⁺	MnF ₂		14.5	VC	202	2161
MnF₂[±]						
MnF ₂ [±]	MnF ₂		11.5 ± 0.3	VC	152	2161
C₅H₅Mn⁺						
C ₅ H ₅ Mn ⁺	C ₅ H ₅ Mn(CO) ₃ (Cyclopentadienylmanganese tricarbonyl)	3CO	12.0 ± 0.3	EVD	248	1381
C₆H₅OMn⁺						
C ₆ H ₅ OMn ⁺	C ₅ H ₅ Mn(CO) ₃ (Cyclopentadienylmanganese tricarbonyl)	2CO	9.8 ± 0.3	EVD	171	1381
C₈H₅O₃Mn⁺						
C ₈ H ₅ O ₃ Mn ⁺	C ₅ H ₅ Mn(CO) ₃ (Cyclopentadienylmanganese tricarbonyl)		8.3 ± 0.4	EVD	83*	1381
Fe⁺ Heat of formation 282 kcal mol⁻¹						
Fe ⁺	Fe		7.90 ± 0.01	S	282*	2113
Fe ⁺	FeF ₂	F ₂	16.5 ± 0.3	VC	287	1280
Fe ⁺	FeCl ₂	2Cl	16.5 ± 0.5	LE	287	397
Fe ⁺	FeBr ₂	2Br	16.6 ± 0.5	LE	318	174
Fe ⁺	Fe(CO) ₅	5CO	16.1 ± 0.2	EVD	328	112
Fe ⁺	Fe(CO) ₅	5CO	14.7 ± 0.1	CS	296	2023
FeF⁺						
FeF ⁺	FeF ₂	F	12.6 ± 0.3	VC	179	1280
FeF₂[±]						
FeF ₂ [±]	FeF ₂		11.3 ± 0.3	VC	167	1280
FeCl⁺						
FeCl ⁺	FeCl ₂	Cl	12.8 ± 0.5	LE	231	397
FeCl₂[±]						
FeCl ₂ [±]	FeCl ₂		11.5 ± 0.5	LE	230	397
Fe₂Cl₃⁺						
Fe ₂ Cl ₃ ⁺	Fe ₂ Cl ₄	Cl	12.0 ± 1.0	LE	143	397

TABLE I. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Fe₂Cl₄⁺						
Fe ₂ Cl ₄ ⁺	Fe ₂ Cl ₄		10.5 ± 1.0	LE	137	397
FeCO⁺						
FeCO ⁺	Fe(CO) ₅	4CO	14.0 ± 0.2	EVD	253	112
FeCO ⁺	Fe(CO) ₅	4CO	12.9 ± 0.1	CS	228	2023
FeCO⁺²						
FeCO ⁺²	Fe(CO) ₅	4CO	30.2 ± 2	EVD	627	112
FeC₂O₂⁺						
FeC ₂ O ₂ ⁺	Fe(CO) ₅	3CO	11.8 ± 0.2	EVD	176	112
FeC ₂ O ₂ ⁺	Fe(CO) ₅	3CO	10.92 ± 0.04	CS	156	2023
FeC₃O₃⁺						
FeC ₃ O ₃ ⁺	Fe(CO) ₅	2CO	10.3 ± 0.3	EVD	115	112
FeC ₃ O ₃ ⁺	Fe(CO) ₅	2CO	9.89 ± 0.05	CS	106	2023
FeC₄O₄⁺						
FeC ₄ O ₄ ⁺	Fe(CO) ₅	CO	10.0 ± 0.2	EVD	82	112
FeC ₄ O ₄ ⁺	Fe(CO) ₅	CO	8.34 ± 0.12	CS	43	2023
FeC₅O₅⁺ Heat of formation 8 kcal mol⁻¹						
FeC ₅ O ₅ ⁺	Fe(CO) ₅		7.95 ± 0.03	PI	8*	1167
FeC ₅ O ₅ ⁺	Fe(CO) ₅		8.53 ± 0.2	EVD	21	112
FeC ₅ O ₅ ⁺	Fe(CO) ₅		8.14 ± 0.06	CS	12	2023
Co⁺ Heat of formation 283 kcal mol⁻¹						
Co ⁺	Co		7.87 ± 0.02	S	283*	2113
Co ⁺	C ₅ H ₅ Co(CO) ₂ (Cyclopentadienylcobalt dicarbonyl)		16.8 ± 0.3	EVD		1381
C₈H₃Co⁺						
C ₃ H ₃ Co ⁺	C ₅ H ₅ Co(CO) ₂ (Cyclopentadienylcobalt dicarbonyl)		16.8 ± 0.3	EVD		1381
C₅H₅Co⁺						
C ₅ H ₅ Co ⁺	C ₅ H ₅ Co(CO) ₂ (Cyclopentadienylcobalt dicarbonyl)	2CO	11.7 ± 0.2	EVD	267	1381
CoCO⁺						
CoCO ⁺	C ₅ H ₅ Co(CO) ₂ (Cyclopentadienylcobalt dicarbonyl)		16.5 ± 0.4	EVD		1381

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆H₅OCo⁺						
C ₆ H ₅ OCo ⁺ (Cyclopentadienylcobalt dicarbonyl)	C ₅ H ₅ Co(CO) ₂	CO	10.1 ± 0.2	EVD	203	1381
C₇H₅O₂Co⁺						
C ₇ H ₅ O ₂ Co ⁺ (Cyclopentadienylcobalt dicarbonyl)	C ₅ H ₅ Co(CO) ₂		8.3 ± 0.2	EVD	135*	1381
Ni⁺ Heat of formation 279 kcal mol⁻¹						
Ni ⁺	Ni		7.635	S	279*	2113
Ni ⁺	Ni		7.5 ± 0.5	LE	276	2125
Ni ⁺	Ni		7.6 ± 0.3	NS	278	2188
Ni ⁺	NiF ₂	2F	16.7 ± 0.3	VC	271	2162
Ni ⁺	NiCl ₂	2Cl	15.7 ± 0.5	LE	277	2125
Ni ⁺	Ni(CO) ₄	4CO	16.0 ± 0.3	EVD	331	112
NiO⁺						
NiO ⁺	NiO		9.5 ± 0.3	NS	295	2188
NiF⁺						
NiF ⁺	NiF ₂	F	13.0 ± 0.3	VC	205	2162
NiF₂⁺						
NiF ₂ ⁺	NiF ₂		11.5 ± 0.3	VC	189	2162
NiCl⁺						
NiCl ⁺	NiCl		11.4 ± 0.5	LE	278	2125
NiCl ⁺	NiCl ₂	Cl	12.7 ± 0.5	LE	237	2125
NiCl₂⁺						
NiCl ₂ ⁺	NiCl ₂		11.2 ± 0.5	LE	231	2125
NiCO⁺						
NiCO ⁺	Ni(CO) ₄	3CO	13.5 ± 0.2	EVD	246	112
NiC₂O₂⁺						
NiC ₂ O ₂ ⁺	Ni(CO) ₄	2CO	10.7 ± 0.2	EVD	155	112
NiC₂O₂⁺²						
NiC ₂ O ₂ ⁺²	Ni(CO) ₄	2CO	28.3 ± 1	EVD	561	112
NiC₃O₃⁺						
NiC ₃ O ₃ ⁺	Ni(CO) ₄	CO	9.36 ± 0.15	EVD	98	112
NiC₄O₄⁺ Heat of formation 47 kcal mol⁻¹						
NiC ₄ O ₄ ⁺	Ni(CO) ₄		8.28 ± 0.03	PI	47*	1167
NiC ₄ O ₄ ⁺	Ni(CO) ₄		8.64 ± 0.15	EVD	55	112

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Cu⁺ Heat of formation 259 kcal mol⁻¹						
Cu ⁺	Cu		7.726	S	259*	2113
Cu ⁺	CuF ₂	2F	16.5 ± 0.3	VC	274	1458
CuF⁺						
CuF ⁺	CuF		8.6 ± 0.3	VC	210	1458
CuF ⁺	CuF ₂	F	12.4 ± 0.3	VC	198	1458
CuF₂⁺						
CuF ₂ ⁺	CuF ₂		11.3 ± 0.3	VC	192	1458
Ge⁺ Heat of formation 272 kcal mol⁻¹						
Ge ⁺	Ge		7.89	S	272*	2113
Ge ⁺	GeH ₄	2H ₂	10.7 ± 0.2	LE	269	2116
Ge ⁺	GeH ₄	H ₂ + 2H	14.1 ± 0.5	LE	243	2116
Ge ⁺	GeH ₄	4H	18.3 ± 0.3	LE	235	2116
Ge ⁺	Ge ₂ H ₆	Ge + 3H ₂ ?	13.3 ± 0.3	LE	256	2133
Ge ⁺	Ge ₃ H ₈	2Ge + 4H ₂ ?	16.3 ± 0.3	LE	250	2133
Ge ⁺	GeO	O	14.0 ± 1	LE	252	1255
Ge ⁺	GeTe	Te	12.6 ± 0.5	NS	286	1023
Ge ⁺	(CH ₃) ₄ Ge	4CH ₃	19.2 ± 0.5	EVD	275	83
Ge₂⁺						
Ge ₂ ⁺	Ge ₂ H ₆	3H ₂ ?	13.1 ± 0.3	LE	341	2133
Ge ₂ ⁺	Ge ₃ H ₈	Ge + 4H ₂ ?	15.8 ± 0.3	LE	329	2133
Ge₃⁺						
Ge ₃ ⁺	Ge ₃ H ₈	4H ₂	14.6 ± 0.3	LE	391	2133
GeH⁺						
GeH ⁺	GeH ₄	H ₂ + H	11.3 ± 0.3	LE	230	2116
GeH ⁺	GeH ₄	3H	16.8 ± 0.3	LE	253	2116
GeH₂⁺						
GeH ₂ ⁺	GeH ₄	H ₂	11.8 ± 0.2	LE	294	2116
GeH ₂ ⁺	GeH ₄	2H	15.4 ± 0.3	LE	273	2116
GeH₃⁺						
GeH ₃ ⁺	GeH ₄	H	10.80 ± 0.07	LE	219	2002, 2116
GeH ₃ ⁺	Ge ₂ H ₆	GeH ₃	10.26 ± 0.10	LE	237	2002
GeH ₃ ⁺	GeSiH ₆	SiH ₃	11.32 ± 0.14	LE		2002
Ge₂H⁺						
Ge ₂ H ⁺	Ge ₂ H ₆	2H ₂ + H	13.0 ± 0.3	LE	286	2133
Ge₂H₂⁺						
Ge ₂ H ₂ ⁺	Ge ₂ H ₆	2H ₂	12.9 ± 0.3	LE	336	2133

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Ge₂H₃⁺						
Ge ₂ H ₃ ⁺	Ge ₂ H ₆	H ₂ + H	12.8 ± 0.3	LE	282	2133
Ge₂H₄⁺						
Ge ₂ H ₄ ⁺	Ge ₂ H ₆	H ₂	12.7 ± 0.3	LE	332	2133
Ge₂H₅⁺						
Ge ₂ H ₅ ⁺	Ge ₂ H ₆	H	12.6 ± 0.3	LE	277	2133
Ge₂H₆⁺						
Ge ₂ H ₆ ⁺	Ge ₂ H ₆		12.5 ± 0.3	LE	327	2133
Ge₃H⁺						
Ge ₃ H ⁺	Ge ₃ H ₈	3H ₂ + H	11.8 ± 0.3	LE	274	2133
Ge₃H₂⁺						
Ge ₃ H ₂ ⁺	Ge ₃ H ₈	3H ₂	10.7 ± 0.3	LE	301	2133
Ge₃H₃⁺						
Ge ₃ H ₃ ⁺	Ge ₃ H ₈	2H ₂ + H	10.6 ± 0.3	LE	247	2133
Ge₃H₄⁺						
Ge ₃ H ₄ ⁺	Ge ₃ H ₈	2H ₂	10.4 ± 0.3	LE	294	2133
Ge₃H₅⁺						
Ge ₃ H ₅ ⁺	Ge ₃ H ₈	H ₂ + H	10.1 ± 0.3	LE	235	2133
Ge₃H₆⁺						
Ge ₃ H ₆ ⁺	Ge ₃ H ₈	H ₂	10.0 ± 0.3	LE	285	2133
Ge₃H₇⁺						
Ge ₃ H ₇ ⁺	Ge ₃ H ₈	H	9.9 ± 0.3	LE	230	2133
Ge₃H₈⁺						
Ge ₃ H ₈ ⁺	Ge ₃ H ₈		9.6 ± 0.3	LE	276	2133
GeO⁺						
GeO ⁺	GeO		10.1 ± 0.8	LE	222	1255
Ge₂O⁺						
Ge ₂ O ⁺	Ge ₂ O ₂	O	14.3 ± 1.0	LE	158	1255

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Ge₂O₂⁺						
Ge ₂ O ₂ ⁺	Ge ₂ O ₂		8.7 ± 1.0	LE	89	1255
Ge₃O₃⁺						
Ge ₃ O ₃ ⁺	Ge ₃ O ₃		8.6 ± 1.0	LE	-14	1255
CH₃Ge⁺						
CH ₃ Ge ⁺	(CH ₃) ₄ Ge	3CH ₃	16.8 ± 0.4	EVD	253	83
C₂H₆Ge⁺						
C ₂ H ₆ Ge ⁺	(CH ₃) ₄ Ge	2CH ₃	14.1 ± 0.2	EVD	224	83
C₃H₉Ge⁺						
C ₃ H ₉ Ge ⁺	(CH ₃) ₄ Ge	CH ₃	10.2 ± 0.1	EVD	167	83
C₄H₁₂Ge⁺						
C ₄ H ₁₂ Ge ⁺	(CH ₃) ₄ Ge		9.2 ± 0.2	EVD	177*	83
GeSiH₆⁺						
GeSiH ₆ ⁺	GeSiH ₆		10.20 ± 0.03	LE	263	2002
As⁺ Heat of formation 299 kcal mol⁻¹						
As ⁺	As		9.815	S	299*	2113
As ⁺	AsH ₃	H ₂ + H	14.8 ± 0.2	LE	305	2116
As ⁺	AsH ₃	3H	19.4 ± 0.2	LE	307	2116
As ⁺	As ₂ H ₄	As + 2H ₂	14.3 ± 0.3	LE	(a)	2133
As₂⁺						
As ₂ ⁺	As ₂ H ₄	2H ₂	13.0 ± 0.3	LE	341	2133
As₄⁺						
As ₄ ⁺	As ₄		9.07 ± 0.07	SL	244*	1047
AsH⁺						
AsH ⁺	AsH ₃	H ₂	12.4 ± 0.2	LE	302	2116
AsH ⁺	AsH ₃	2H	16.8 ± 0.4	LE	299	2116
AsH₂⁺						
AsH ₂ ⁺	AsH ₃	H	14.5 ± 0.2	LE	298	2116
AsH₃⁺ Heat of formation 247 kcal mol⁻¹						
AsH ₃ ⁺	AsH ₃		10.03	PI	247*	1091
AsH ₃ ⁺	AsH ₃		10.6 ± 0.1	EVD	260	1007
AsH ₃ ⁺	AsH ₃		12.1 ± 0.2	LE	295	2116

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
As₂H⁺						
As ₂ H ⁺	As ₂ H ₄	H ₂ + H	12.7 ± 0.3	LE	282	2133
As₂H₂⁺						
As ₂ H ₂ ⁺	As ₂ H ₄	H ₂	12.6 ± 0.3	LE	332	2133
As₂H₃⁺						
As ₂ H ₃ ⁺	As ₂ H ₄	H	12.5 ± 0.3	LE	277	2133
As₂H₄⁺						
As ₂ H ₄ ⁺	As ₂ H ₄		12.2 ± 0.3	LE	323	2133
AsCl₃⁺						
AsCl ₃ ⁺	AsCl ₃		11.7 ± 0.1	EVD	208*	1007
CH₅As⁺						
CH ₅ As ⁺	CH ₃ AsH ₂		9.7 ± 0.1	EVD		1007
C₂H₇As⁺						
C ₂ H ₇ As ⁺	(CH ₃) ₂ AsH		9.0 ± 0.1	EVD		1007
C₃H₉As⁺						
C ₃ H ₉ As ⁺	(CH ₃) ₃ As		8.3 ± 0.1	EVD	195*	1007
C₁₈H₁₅As⁺						
C ₁₈ H ₁₅ As ⁺ (Triphenylarsine)	(C ₆ H ₅) ₃ As		7.34 ± 0.07	PI	269*	1140
C₃F₉As⁺						
C ₃ F ₉ As ⁺	(CF ₃) ₃ As		11.0 ± 0.1	EVD		1007
C₃H₆F₃As⁺						
C ₃ H ₆ F ₃ As ⁺	(CH ₃) ₂ AsCF ₃		9.2 ± 0.1	EVD		1007
C₂HF₆As⁺						
C ₂ HF ₆ As ⁺	(CF ₃) ₂ AsH		10.9 ± 0.1	EVD		1007
C₃H₃F₆As⁺						
C ₃ H ₃ F ₆ As ⁺	(CF ₃) ₂ AsCH ₃		10.5 ± 0.1	EVD		1007
C₂H₆ClAs⁺						
C ₂ H ₆ ClAs ⁺	(CH ₃) ₂ AsCl		9.9 ± 0.1	EVD		1007
CH₃Cl₂As⁺						
CH ₃ Cl ₂ As ⁺	CH ₃ AsCl ₂		10.4 ± 0.1	EVD		1007

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂F₆ClAs⁺						
C ₂ F ₆ ClAs ⁺	(CF ₃) ₂ AsCl		11.0 ± 0.1	EVD		1007
Se⁺ Heat of formation 279 kcal mol⁻¹						
Se ⁺	Se		9.752	S	279*	2113
Se ⁺	SnSe	Sn	12.7 ± 0.5	LE	251	2063
Br⁺ Heat of formation 300 kcal mol⁻¹						
Br ⁺	Br		11.85	S	300*	2113
Br ⁺	Br ₂	Br ⁻	10.38 ± 0.05	RPD	302	292
Br ⁺	Br ₂	Br ⁻	12.30 ± 0.06	RPD		292
Br ⁺	Br ₂	Br	14.31 ± 0.03	RPD	311	292
Br ⁺	Br ₂	Br	15.88 ± 0.04	RPD		292
Br ⁺	Br ₂	Br	17.06 ± 0.04	RPD		292
Br ⁺	Br ₂	Br	17.97 ± 0.06	RPD		292
Br ⁺	Br ₂	Br	19.98 ± 0.06	RPD		292
Br ⁺	CBr ₄		18.1 ± 0.2	EVD		1246
Br ⁺	CBr ₄		21.4 ± 0.6	EVD		1246
Br ⁺	MgBr ₂	MgBr	16 ± 1	NS	307	178
Br ⁺	CH ₃ Br	CH ₃ ? ⁺	13.8 ± 0.05	RPD		2154
Br ⁺	CH ₃ Br	CH ₃	14.7 ± 0.05	RPD	297	2154
Br ⁺	CH ₃ Br	CH ₃	16.6 ± 0.05	RPD		2154
Br ⁺	CH ₃ Br	CH ₃	17.6 ± 0.05	RPD		2154
Br ⁺	CH ₃ Br	CH ₃	18.5 ± 0.05	RPD		2154
Br ⁺	C ₂ H ₅ Br	CH ₃ + CH ₂	18.6 ± 0.3	VC	287	356
Br ⁺	CH ₃ C≡CBr	C ₃ H ₃	16.0 ± 0.5	VC	(b)	13
Br ⁺	CNBr	CN ⁻	11.9 ± 0.2	SL		73
Br ⁺	CNBr	CN	16.2 ± 0.1	SL	318	73
Br ⁺	CF ₃ Br	CF ₃	16.7 ± 0.1	EVD	346	439
Br ⁺	CF ₃ Br	CF ₃	17.6 ± 1	SL	366	24
Br ⁺	CF ₃ Br	CF ₂ + F	21.0 ± 0.2	LE	347	439
Br₂⁺ (²Π_{3/2g}) Heat of formation 250 kcal mol⁻¹						
Br₂⁺ (²Π_{1/2g})						
261 kcal mol⁻¹						
Br ₂ ⁺ (² Π _{3/2g})	Br ₂		10.53 ± 0.03	PI	250*	213
Br ₂ ⁺ (² Π _{3/2g})	Br ₂		10.55 ± 0.02	PI	251*	182, 416
Br ₂ ⁺ (² Π _{1/2g})	Br ₂		11.0 ± 0.1	PI	261*	213
Br ₂ ⁺ (² Π _{3/2g})	Br ₂		10.69 ± 0.03	RPD	254	292
Br ₂ ⁺ (² Π _{1/2g})	Br ₂		11.05 ± 0.05	RPD	262	292
Br ₂ ⁺ (² Π _{3/2g})	Br ₂		11.97 ± 0.03	RPD	283	292
Br ₂ ⁺ (² Π _{1/2u})	Br ₂		12.36 ± 0.04	RPD	292	292
Br ₂ ⁺ (² Σ _u ⁺)	Br ₂		13.72 ± 0.04	RPD	324	292
Br ₂ ⁺	Br ₂		10.58 ± 0.08	SL	251	75
Br ₂ ⁺	Br ₂		10.7 ± 0.3	VC	254	357
Br ₂ ⁺	MgBr ₂	Mg	17 ± 1	NS	282	178
Br₂⁺ (²Π_{3/2g})						
Br ₂ ⁺ (² Π _{3/2g})	Br ₂		30.0	NS	692	75
HBr⁺						
HBr ⁺	HBr		11.62 ± 0.01	PI	259*	182, 416

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
DBr⁺²						
DBr ⁺²	DBr		33.2 ± 0.3	FDP		212
LiBr⁺						
LiBr ⁺	LiBr		9.4	VC	182	2179
Li₂Br⁺						
Li ₂ Br ⁺	Li ₂ Br ₂	Br	9.9	VC	84	2179
BBr⁺						
BBr ⁺	BBr		10.7 ± 0.2	VC		206
BBr ⁺	BBr		11.8 ± 0.2	VC		206
BBr ⁺	BBr ₃	Br ₂ ?	15.0 ± 0.2	VC	289	206
BBr₂⁺						
BBr ₂ ⁺	BBr ₃	Br	10.7 ± 0.2	VC	171	206
BBr ₂ ⁺	BBr ₃	Br	10.8 ± 0.2	VC	173	206
BBr ₂ ⁺	BBr ₃	Br	11.0 ± 0.2	VC	178	206
BBr₃⁺						
BBr ₃ ⁺	BBr ₃		9.7 ± 0.2	VC	175	206
CBr⁺						
CBr ⁺	CBr		10.43 ± 0.02	NS	374	129
CBr ⁺	CBr ₄	Br ₂ +Br?	17.5 ± 0.2	EVD	388	1246
CBr ⁺	CBr ₄	3Br	19.5 ± 0.4	EVD	388	1246
CBr ⁺	CBr ₄	Br ₂ +Br?	16.35 ± 0.13	NS	362	129
CBr ⁺	CNBr	N	17.4 ± 0.2	SL	333	73
CBr₂⁺						
CBr ₂ ⁺	CBr ₂		10.11 ± 0.09	NS	328	129
CBr ₂ ⁺	CBr ₄	Br ₂	14.6 ± 0.3	EVD	348	1246
CBr ₂ ⁺	CBr ₄	2Br	16.2 ± 0.4	EVD	339	1246
CBr ₂ ⁺	CBr ₄	Br ₂	12.30 ± 0.08	NS	295	129
CBr₃⁺						
CBr ₃ ⁺	CBr ₄	Br	11.3 ± 0.2	EVD	253	1246
CBr ₃ ⁺	CBr ₄	Br	9.95 ± 0.05	NS	222	129
CBr₄⁺						
CBr ₄ ⁺	CBr ₄		11.0 ± 0.5	EVD	273	1246
BrF⁺						
BrF ⁺	BrF ₅		20	VC		357
BrF₂⁺						
BrF ₂ ⁺	BrF ₃	F	13.5 ± 0.3	VC	231	357
BrF ₂ ⁺	BrF ₅	F ₂ +F?	16.1 ± 0.2	VC	250	357

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
BrF₃⁺						
BrF ₃ ⁺	BrF ₃		12.9 ± 0.3	VC	236	357
BrF ₃ ⁺	BrF ₅	F ₂	15.5 ± 0.2	VC	255	357
BrF₄⁺						
BrF ₄ ⁺	BrF ₅	F	14.0 ± 0.3	VC	202	357
MgBr⁺						
MgBr ⁺	MgBr ₂	Br	12.0 ± 0.4	VC	175	178
MgBr ⁺	MgBr ₂	Br	13.6 ± 0.4	VC	212	178
MgBr₂⁺						
MgBr ₂ ⁺	MgBr ₂		10.65 ± 0.15	VC	171*	178
Mg₂Br₃⁺						
Mg ₂ Br ₃ ⁺	Mg ₂ Br ₄	Br	10.8 ± 0.3	VC	35	178
BrCl⁺						
BrCl ⁺	BrCl		11.1 ± 0.2	VC	259*	357
FeBr⁺						
FeBr ⁺	FeBr ₂	Br	12.9 ± 0.5	LE	260	174
FeBr₂⁺						
FeBr ₂ ⁺	FeBr ₂		10.7 ± 0.5	LE	236	174
Fe₂Br₃⁺						
Fe ₂ Br ₃ ⁺	Fe ₂ Br ₄	Br	13.6 ± 0.5	LE	224	174
Fe₂Br₄⁺						
Fe ₂ Br ₄ ⁺	Fe ₂ Br ₄		12.6 ± 0.5	LE	228	174
B₅H₈Br⁺						
B ₅ H ₈ Br ⁺	B ₅ H ₈ Br		9.5 ± 0.1	EVD		1102
CH₂Br⁺						
CH ₂ Br ⁺	CH ₂ Br		9.30	SL	261	141
CH ₂ Br ⁺	CH ₂ Br		8.34 ± 0.11	NS	239	131
CH ₂ Br ⁺	CH ₃ Br	H-?	13.0	RPD	258	160
CH ₂ Br ⁺	CH ₃ Br	H-?	14.3	RPD	160	
CH ₂ Br ⁺	CH ₃ Br	H	12.12 ± 0.09	RPD	219	1139
CH ₂ Br ⁺	CH ₃ Br	H	13.6	RPD	253	160
CH ₂ Br ⁺	CH ₃ Br	H	15.0	RPD	160	
CH ₂ Br ⁺	CH ₃ Br	H	13.4 ± 0.2	VC	249	356
CH ₂ Br ⁺	C ₂ H ₅ Br	CH ₃	14.1 ± 0.1	VC	277	356
CH ₂ Br ⁺	CH ₂ Br ₂	Br	10.93 ± 0.04	NS	224	131

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₃Br⁺ (²E_{1/2}) Heat of formation 234 kcal mol⁻¹						
CH₃Br⁺ (²E_{3/2}) 242 kcal mol⁻¹						
CH ₃ Br ^{+(2E_{1/2})}	CH ₃ Br		10.541 ± 0.003	S	235*	2064
CH ₃ Br ^{+(2E_{1/2})}	CH ₃ Br		10.528 ± 0.005	PI	234*	1253
CH ₃ Br ^{+(2E_{1/2})}	CH ₃ Br		10.53 ± 0.01	PI	234*	182, 416
CH ₃ Br ^{+(2E_{1/2})}	CH ₃ Br		10.53 ± 0.02	RPD	234	289
CH ₃ Br ^{+(2E_{3/2})}	CH ₃ Br		10.856 ± 0.003	S	242*	2064
CH ₃ Br ^{+(2E_{3/2})}	CH ₃ Br		10.857 ± 0.010	PI	242*	1253
CH ₃ Br ^{+(2E_{3/2})}	CH ₃ Br		10.8 ± 0.05	RPD	241	2154
CH ₃ Br ^{+(2E_{3/2})}	CH ₃ Br		10.85 ± 0.03	RPD	242	289
CH ₃ Br ⁺	CH ₃ Br		11.5 ± 0.05	RPD		2154
CH ₃ Br ⁺	CH ₃ Br		11.62 ± 0.04	RPD		289
CH ₃ Br ⁺	CH ₃ Br		12.9 ± 0.05	RPD		2154
CH ₃ Br ⁺	CH ₃ Br		12.94 ± 0.05	RPD		289
CH ₃ Br ⁺	CH ₃ Br		19.13 ± 0.15	RPD		289
C₂H₂Br⁺						
C ₂ H ₂ Br ⁺	cis-C ₂ H ₂ Br ₂	Br	11.44 ± 0.05	SL	260	114
C ₂ H ₂ Br ⁺	trans-C ₂ H ₂ Br ₂	Br	11.65 ± 0.05	SL	264	114
C₂H₃Br⁺ Heat of formation 243 kcal mol⁻¹						
C ₂ H ₃ Br ⁺	C ₂ H ₃ Br		9.80 ± 0.01	PI	243*	182
C ₂ H ₃ Br ⁺	C ₂ H ₃ Br		9.80	PI	243*	168
C ₂ H ₃ Br ⁺	C ₂ H ₃ Br		9.82 ± 0.02	PI	243*	268
C ₂ H ₃ Br ⁺	C ₂ H ₃ Br		10.300	PI		268
C ₂ H ₃ Br ⁺	C ₂ H ₃ Br		9.97 ± 0.05	EVD	247	268
C₂H₅Br⁺ (²E_{1/2}) Heat of formation 222 kcal mol⁻¹						
C₂H₅Br⁺ (²E_{3/2}) 229 kcal mol⁻¹						
C ₂ H ₅ Br ^{+(2E_{1/2})}	C ₂ H ₅ Br		10.29 ± 0.02	S	222*	2065
C ₂ H ₅ Br ^{+(2E_{1/2})}	C ₂ H ₅ Br		10.29 ± 0.01	PI	222*	182, 416
C ₂ H ₅ Br ^{+(2E_{3/2})}	C ₂ H ₅ Br		10.61 ± 0.02	S	229*	2065
C ₂ H ₅ Br ^{+(2E_{3/2})}	C ₂ H ₅ Br		10.7	RPD	231	160
C ₂ H ₅ Br ⁺	C ₂ H ₅ Br		11.1	RPD		160
C ₂ H ₅ Br ⁺	C ₂ H ₅ Br		12.3	RPD		160
C ₂ H ₅ Br ⁺	C ₂ H ₅ Br		13.1	RPD		160
C ₂ H ₅ Br ⁺	C ₂ H ₅ Br		10.7 ± 0.1	VC	231	356
C ₂ H ₅ Br ⁺	C ₂ H ₅ Br		11.1	TC		2038
C ₂ H ₅ Br ⁺	C ₂ H ₅ Br		12.2	TC		2038
C ₂ H ₅ Br ⁺	C ₂ H ₅ Br		13.2	TC		2038
C₃H₃Br⁺						
C ₃ H ₃ Br ⁺	CH ₃ C≡CBr		10.1 ± 0.1	VC	282*	13
C₃H₅Br⁺						
C ₃ H ₅ Br ⁺	CH ₃ CH=CHBr		9.30 ± 0.05	PI	224*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
<i>n</i>-C₃H₇Br⁺ (²E_{1/2}) Heat of formation 216 kcal mol⁻¹						
<i>iso</i>-C₃H₇Br⁺ 208 kcal mol⁻¹						
C ₃ H ₇ Br ^{+(2E_{1/2})}	<i>n</i> -C ₃ H ₇ Br		10.18 ± 0.01	PI	216*	182
C ₃ H ₇ Br ^{+(2E_{3/2})}	<i>n</i> -C ₃ H ₇ Br		10.55	RPD	225	160
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		10.8	RPD		160
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		11.4	RPD		160
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		12.1	RPD		160
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		12.9	RPD		160
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		10.8	TC		2038
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		11.7	TC		2038
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		12.4	TC		2038
C ₃ H ₇ Br ⁺	<i>n</i> -C ₃ H ₇ Br		13.2	TC		2038
C ₃ H ₇ Br ⁺	<i>iso</i> -C ₃ H ₇ Br		10.075 ± 0.01	PI	208*	182
C ₃ H ₇ Br ⁺	<i>iso</i> -C ₃ H ₇ Br		11.0	TC		2038
C ₃ H ₇ Br ⁺	<i>iso</i> -C ₃ H ₇ Br		11.2	TC		2038
C ₃ H ₇ Br ⁺	<i>iso</i> -C ₃ H ₇ Br		12.7	TC		2038
C ₃ H ₇ Br ⁺	<i>iso</i> -C ₃ H ₇ Br		13.2	TC		2038
C₄H₉Br⁺						
C ₄ H ₉ Br ⁺	<i>n</i> -C ₄ H ₉ Br		10.125 ± 0.01	PI	208*	416, 182
C ₄ H ₉ Br ⁺	<i>sec</i> -C ₄ H ₉ Br		9.98 ± 0.01	PI	206*	182
C ₄ H ₉ Br ⁺	<i>iso</i> -C ₄ H ₉ Br		10.09 ± 0.02	PI	208*	182
C ₄ H ₉ Br ⁺	<i>tert</i> -C ₄ H ₉ Br		9.89 ± 0.03	PI	201*	182
C₅H₄Br⁺						
C ₅ H ₄ Br ⁺	C ₅ H ₄ Br (Bromocyclopentadienyl radical)		8.85	SL		126
C₅H₁₁Br⁺						
C ₅ H ₁₁ Br ⁺	<i>n</i> -C ₅ H ₁₁ Br		10.10 ± 0.02	PI	205*	182
C₆H₅Br⁺						
C ₆ H ₅ Br ⁺	C ₆ H ₅ Br (Bromobenzene)		8.98 ± 0.02	PI	231*	182, 416
C ₆ H ₅ Br ⁺	C ₆ H ₅ Br (Bromobenzene)		9.52	SL	244	1066
C ₆ H ₅ Br ⁺	C ₆ H ₅ Br (Bromobenzene)		10.05 ± 0.1	SL	256	301
C₇H₇Br⁺						
C ₇ H ₇ Br ⁺	C ₆ H ₅ CH ₂ Br (Benzyl bromide)		9.10 ± 0.05	CS	229*	2025
C ₇ H ₇ Br ⁺	C ₆ H ₄ BrCH ₃ (<i>o</i> -Bromotoluene)		8.78 ± 0.01	PI	218*	416, 182
C ₇ H ₇ Br ⁺	C ₆ H ₄ BrCH ₃ (<i>m</i> -Bromotoluene)		8.81 ± 0.02	PI	218*	182
C ₇ H ₇ Br ⁺	C ₆ H ₄ BrCH ₃ (<i>p</i> -Bromotoluene)		8.67 ± 0.02	PI	215*	182, 416
C ₇ H ₇ Br ⁺	C ₆ H ₄ BrCH ₃ (<i>p</i> -Bromotoluene)		9.22	SL	228	1066
C ₇ H ₇ Br ⁺	C ₆ H ₄ BrCH ₃ (Bromotoluene)		9.17	TC	226	2194

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CHBr₂⁺						
CHBr ₂ ⁺	CHBr ₂		8.13 ± 0.16	NS	238	131
CHBr ₂ ⁺	CHBr ₃	Br	10.80 ± 0.01	NS	226	131
CH₂Br₂⁺						
CH ₂ Br ₂ ⁺	CH ₂ Br ₂		10.49 ± 0.02	PI	241*	182
cis-C₂H₂Br₂⁺ Heat of formation 241 kcal mol⁻¹						
trans-C₂H₂Br₂⁺ 240 kcal mol⁻¹						
C ₂ H ₂ Br ₂ ⁺	cis-C ₂ H ₂ Br ₂		9.45 ± 0.01	PI	241*	114, 1058, 1190, 268
C ₂ H ₂ Br ₂ ⁺	cis-C ₂ H ₂ Br ₂		9.45	PI	241*	168
C ₂ H ₂ Br ₂ ⁺	cis-C ₂ H ₂ Br ₂		9.69 ± 0.05	EVD	246	114, 268, 1058, 1190
C ₂ H ₂ Br ₂ ⁺	trans-C ₂ H ₂ Br ₂		9.46 ± 0.01	PI	240*	114, 1058, 1190, 268
C ₂ H ₂ Br ₂ ⁺	trans-C ₂ H ₂ Br ₂		9.47	PI	240*	168
C ₂ H ₂ Br ₂ ⁺	trans-C ₂ H ₂ Br ₂		9.54 ± 0.05	EVD	242	114, 268, 1058, 1190
C ₂ H ₂ Br ₂ ⁺	CHBr=CHBr		9.45 ± 0.01	PI		182
C ₂ H ₂ Br ₂ ⁺	CHBr=CHBr		9.84	PI		268
C₂H₄Br₂⁺						
C ₂ H ₄ Br ₂ ⁺	CH ₃ CHBr ₂		10.19 ± 0.03	PI	228*	182
C₃H₆Br₂⁺						
C ₃ H ₆ Br ₂ ⁺	1,3-C ₃ H ₆ Br ₂		10.07 ± 0.02	PI	221*	182
CHBr₃⁺						
CHBr ₃ ⁺	CHBr ₃		10.51 ± 0.02	PI	246*	182
C₂HBr₃⁺						
C ₂ HBr ₃ ⁺	C ₂ HBr ₃		9.27 ± 0.01	PI	240*	182
C ₂ HBr ₃ ⁺	C ₂ HBr ₃		9.27	PI	240*	168
CNBr⁺						
CNBr ⁺	CNBr		11.95 ± 0.08	SL	320*	73
CF₂Br⁺						
CF ₂ Br ⁺	CF ₃ Br	F	15.0 ± 0.1	EVD	173	439
CF ₂ Br ⁺	CF ₃ Br	F	15.0 ± 0.7	SL	173	24
CF₃Br⁺ Heat of formation 121 kcal mol⁻¹						
CF ₃ Br ⁺	CF ₃ Br		11.82 ± 0.02	EVD	119*	439
CF ₃ Br ⁺	CF ₃ Br		11.89 ± 0.10	SL	121*	1131
CF ₃ Br ⁺	CF ₃ Br		11.97 ± 0.08	SL	122*	1131
CF ₃ Br ⁺	CF ₃ Br		12.3 ± 0.3	SL	130	24

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₆F₅Br⁺						
C ₆ F ₅ Br ⁺ (Bromopentafluorobenzene)	C ₆ F ₅ Br		9.6 ± 0.1	SL		301
CF₂Br₂⁺						
CF ₂ Br ₂ ⁺	CF ₂ Br ₂		11.07 ± 0.03	PI		182
CFBr₃⁺						
CFBr ₃ ⁺	CFBr ₃		10.67 ± 0.01	PI		182
C₅H₄NBr⁺						
C ₅ H ₄ NBr ⁺ (2-Bromopyridine)	C ₅ H ₄ NBr		9.65 ± 0.05	SL	261*	217
C ₅ H ₄ NBr ⁺ (4-Bromopyridine)	C ₅ H ₄ NBr		9.94 ± 0.05	SL	267*	217
C₈H₁₀NBr⁺						
C ₈ H ₁₀ NBr ⁺ (N,N-Dimethyl-p-bromoaniline)	C ₆ H ₄ BrN(CH ₃) ₂		7.33	CTS	193	1281
C₁₀H₁₄NBr⁺						
C ₁₀ H ₁₄ NBr ⁺ (N,N-Diethyl-p-bromoaniline)	C ₆ H ₄ BrN(C ₂ H ₅) ₂		6.96	CTS	175	1281
C₂H₃OBr⁺						
C ₂ H ₃ OBr ⁺	CH ₃ COBr		10.55 ± 0.05	PI	197*	182
C₆H₅OBr⁺						
C ₆ H ₅ OBr ⁺ (p-Bromophenol)	C ₆ H ₄ BrOH		9.04	SL	187*	1066
C ₆ H ₅ OBr ⁺ (Bromophenol)	C ₆ H ₄ BrOH		9.15	TC	189	2194
C₇H₅OBr⁺						
C ₇ H ₅ OBr ⁺ (Bromobenzaldehyde)	C ₆ H ₄ BrCHO		9.60	TC	212	2194
C₈H₇OBr⁺						
C ₈ H ₇ OBr ⁺ (Bromoacetophenone)	C ₆ H ₄ BrCOCH ₃		9.31	TC	198	2194
C₁₃H₉OBr⁺						
C ₁₃ H ₉ OBr ⁺ (Bromobenzophenone)	C ₆ H ₄ BrCOC ₆ H ₅		9.34	TC	231	2194
C₃H₅O₂Br⁺						
C ₃ H ₅ O ₂ Br ⁺	CH ₂ BrCOOCH ₃		10.37 ± 0.05	CS	146*	2025

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₈H₇O₂Br⁺						
C ₈ H ₇ O ₂ Br ⁺ (Methyl bromobenzoate)	C ₆ H ₄ BrCOOCH ₃		9.34	TC	150	2194
C₆H₄FBr⁺						
C ₆ H ₄ FBr ⁺ (<i>p</i> -Bromofluorobenzene)	C ₆ H ₄ FBr		8.99 ± 0.03	PI	187*	182
C₂H₃FBr₂⁺						
C ₂ H ₃ FBr ₂ [†]	CHBrFCH ₂ Br		10.75 ± 0.02	PI		182
C₂H₂F₂Br₂⁺						
C ₂ H ₂ F ₂ Br ₂ [†]	CF ₂ BrCH ₂ Br		10.83 ± 0.01	PI	160*	162
C₂H₆SiBr⁺						
C ₂ H ₆ SiBr ⁺	(CH ₃) ₃ SiBr	CH ₃	10.97 ± 0.02	RPD	155	1421
C₃H₉SiBr⁺						
C ₃ H ₉ SiBr ⁺	(CH ₃) ₃ SiBr		10.24 ± 0.02	RPD	171*	1421
C₄H₃BrS⁺						
C ₄ H ₃ BrS ⁺ (2-Bromothiophene)	C ₄ H ₃ BrS		8.63 ± 0.01	PI	228*	182
CH₂ClBr⁺						
CH ₂ ClBr ⁺	CH ₂ ClBr		10.77 ± 0.01	PI	236*	182
CH ₂ ClBr ⁺	CH ₂ ClBr		10.75 ± 0.05	SL	236	72
C₂H₄ClBr⁺						
C ₂ H ₄ ClBr ⁺	CH ₂ BrCH ₂ Cl		10.63 ± 0.03	PI	227*	182
CHCl₂Br⁺						
CHCl ₂ Br ⁺	CHCl ₂ Br		10.88 ± 0.05	SL	237*	72
CHClBr₂⁺						
CHClBr ₂ [†]	CHClBr ₂		10.59 ± 0.01	PI		182
Rb⁺						
Rb ⁺	Rb		4.176	S		2113
Rb ⁺	RbI	I	8.1 ± 0.3	VC		2001
Sr⁺ Heat of formation 171 kcal mol⁻¹						
Sr ⁺	Sr		5.694	S	171*	2113
Sr ⁺	Sr		5.8 ± 0.2	NS	173	2178

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Sr⁺² Heat of formation 425 kcal mol⁻¹						
Sr ⁺²	Sr		16.724	S	425*	2113
Sr ⁺²	Sr		11.5 ± 0.2	NS		2178
Sr ⁺²	Sr		13.3 ± 0.2	NS		2178
SrO⁺						
SrO ⁺	SrO		6.1	LE	137	1244, 2123
Sr₂O⁺						
Sr ₂ O ⁺	Sr ₂ O		4.8	LE	55	1244, 2123
SrF⁺						
SrF ⁺	SrF		4.9 ± 0.3	VC	108	1105
SrF ⁺	SrF		5.2 ± 0.3	VC	115	1104
SrF ⁺	SrF ₂	F ⁻ ?	11	VC	132	1105
Y⁺ Heat of formation 252 kcal mol⁻¹						
Y ⁺	Y		6.528	S	252*	2113
Y ⁺	Y		6	LE	240	2167
Y ⁺	Y		6.4 ± 0.3	LE	249	2151
Y ⁺	YO	O	12	LE	210	2167
Y ⁺	YF ₃	3F?	28	VC	293	2009
Y ⁺	YCl ₃	3Cl	22.1 ± 0.5	LE	244	2132
YC⁺						
YC ⁺	YC ₂	C	13.4 ± 0.5	LE	281	2151
YC₂⁺						
YC ₂ ⁺	YC ₂		6.8 ± 0.3	LE	300	2151
YO⁺						
YO ⁺	YO		5.5	LE	119	2167
YF⁺						
YF ⁺	YF ₃	2F?	21.5	VC	162	2009
YF₂⁺						
YF ₂ ⁺	YF ₃	F?	13.5	VC	-3	2009
YCl⁺						
YCl ⁺	YCl ₃	2Cl	17.3 ± 0.5	LE	163	2132
YCl₂⁺						
YCl ₂ ⁺	YCl ₃	Cl	14.5 ± 0.5	LE	127	2132

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
YCl₃⁺						
YCl ₃ ⁺	YCl ₃		12.8 ± 0.5	LE	117	2132
Y₂Cl₅⁺						
Y ₂ Cl ₅ ⁺	Y ₂ Cl ₆	Cl	13.7 ± 0.5	LE		2132
Mo⁺ Heat of formation 321 kcal mol⁻¹						
Mo ⁺	Mo		7.099	S	321*	2113
Mo ⁺	Mo(CO) ₆	6CO	20.7 ± 0.5	EVD	418	1107
Mo ⁺	Mo(CO) ₆	6CO	18.3 ± 0.3	CS	363	2023
MoC⁺						
MoC ⁺	Mo(CO) ₆	CO ₂ + 4CO?	27.2 ± 0.4	EVD	609	1107
MoO⁺						
MoO ⁺	MoO		8.0 ± 0.6	LE	285	2126
MoO₂⁺						
MoO ₂ ⁺	MoO ₂		9.2	LE	215	1244, 2123
MoO ₂ ⁺	MoO ₂		9.4 ± 0.6	LE	220	2126, 2129
MoO₃⁺						
MoO ₃ ⁺	MoO ₃		11.8	LE	194	1244, 2123
MoO ₃ ⁺	MoO ₃		12.0 ± 0.6	LE	199	2126, 2129
Mo₂O₅⁺						
Mo ₂ O ₅ ⁺	Mo ₂ O ₅		10	LE		2129
Mo ₂ O ₅ ⁺	Mo ₂ O ₆	O	14.5	LE	4	2129
Mo₂O₆⁺						
Mo ₂ O ₆ ⁺	Mo ₂ O ₆		12.1 ± 0.6	LE	8	2129
Mo₃O₈⁺						
Mo ₃ O ₈ ⁺	Mo ₃ O ₈		12.2	LE		2129
Mo ₃ O ₈ ⁺	Mo ₃ O ₉	O	14.5	LE	−176	2129
Mo₃O₉⁺						
Mo ₃ O ₉ ⁺	Mo ₃ O ₉		12.0 ± 1.0	LE	−174	2129
MoCO⁺						
MoCO ⁺	Mo(CO) ₆	5CO	18.1 ± 0.3	EVD	331	1107
MoCO ⁺	Mo(CO) ₆	5CO	15.8 ± 0.06	CS	278	2023
MoCO⁺²						
MoCO ⁺²	Mo(CO) ₆	5CO	34.5 ± 0.5	EVD	710	1107

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
MoC₂O₂⁺						
MoC ₂ O ₂ ⁺	Mo(CO) ₆	4CO	15.6 ± 0.3	EVD	247	1107
MoC ₂ O ₂ ⁺	Mo(CO) ₆	4CO	13.90 ± 0.3	CS	208	2023
MoC₂O₂⁺²						
MoC ₂ O ₂ ⁺²	Mo(CO) ₆	4CO	30.8 ± 0.5	EVD	598	1107
MoC₃O₃⁺						
MoC ₃ O ₃ ⁺	Mo(CO) ₆	3CO	13.7 ± 0.3	EVD	177	1107
MoC ₃ O ₃ ⁺	Mo(CO) ₆	3CO	12.36 ± 0.12	CS	146	2023
MoC₃O₃⁺²						
MoC ₃ O ₃ ⁺²	Mo(CO) ₆	3CO	29.1 ± 1.2	EVD	532	1107
MoC₄O₄⁺						
MoC ₄ O ₄ ⁺	Mo(CO) ₆	2CO	11.9 ± 0.2	EVD	109	1107
MoC ₄ O ₄ ⁺	Mo(CO) ₆	2CO	11.28 ± 0.14	CS	95	2023
MoC₅O₅⁺						
MoC ₅ O ₅ ⁺	Mo(CO) ₆	CO	9.80 ± 0.15	EVD	34	1107
MoC ₅ O ₅ ⁺	Mo(CO) ₆	CO	9.64 ± 0.05	CS	31	2023
MoC₆O₆⁺ Heat of formation – 31 kcal mol⁻¹						
MoC ₆ O ₆ ⁺	Mo(CO) ₆		8.12 ± 0.03	PI	-31*	1167
MoC ₆ O ₆ ⁺	Mo(CO) ₆		8.23 ± 0.12	EVD	-28	1107
MoC ₆ O ₆ ⁺	Mo(CO) ₆		8.30 ± 0.03	CS	-27	2023
SrMoO₂⁺						
SrMoO ₂ ⁺	SrMoO ₄	O ₂ ?	11.0	LE	-3	1244
SrMoO₃⁺						
SrMoO ₃ ⁺	SrMoO ₃		6.2	LE	4	1244
SrMoO₄⁺						
SrMoO ₄ ⁺	SrMoO ₄		9.2	LE	-45	1244
Ru⁺ Heat of formation 323 kcal mol⁻¹						
Ru ⁺	Ru		7.366	S	323*	2113
Ru ⁺	RuO ₄	O ₂ + 2O?	22.3 ± 0.3	EVD	351	1284
RuO⁺						
RuO ⁺	RuO ₄	O ₂ + O?	18.1 ± 0.3	EVD	314	1284

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
RuO₂⁺						
RuO ₂ ⁺	RuO ₄	O ₂	14.2 ± 0.2	EVD	283	1284
RuO₃⁺						
RuO ₃ ⁺	RuO ₄	O	15.7 ± 0.3	EVD	259	1284
RuO₄⁺						
RuO ₄ ⁺	RuO ₄		12.33 ± 0.23	EVD	240*	1284
Rh⁺ Heat of formation 305 kcal mol⁻¹						
Rh ⁺	Rh		7.463	S	305*	2113
Rh ⁺	Rh		7.4	NS	304	1020
RhO⁺						
RhO ⁺	RhO		9.3	NS	303	1020
RhO₂⁺						
RhO ₂ ⁺	RhO ₂		10.0	NS	271	1020
Pd⁺ Heat of formation 283 kcal mol⁻¹						
Pd ⁺	Pd		8.336	S	283*	2113
Pd ⁺	Pd		8.1	NS	277	1020
PdO⁺						
PdO ⁺	PdO		9.1	NS		1020
Cd⁺ Heat of formation 234 kcal mol⁻¹						
Cd ⁺	Cd		8.993	S	234*	2113
Cd ⁺	Cd		8.93 ± 0.05	SL	233	1047
Cd ⁺	Cd		9.0 ± 0.2	LE	234	2056
CdCl⁺						
CdCl ⁺	CdCl ₂	Cl	11.8 ± 0.2	LE	191	2056
CdCl₂⁺						
CdCl ₂ ⁺	CdCl ₂		11.2 ± 0.2	LE	206	2056
In⁺ Heat of formation 192 kcal mol⁻¹						
In ⁺	In		5.786	S	192*	2113
In ⁺	In		5.8 ± 0.3	LE	192	2138
In ⁺	In		5.8 ± 0.5	VC	192	1065
In₂⁺						
In ₂ ⁺	In ₂		5.8 ± 0.3	LE	225	2138
In₂O⁺						
In ₂ O ⁺	In ₂ O		7.8 ± 0.5	VC	177	1065

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Sn⁺ Heat of formation 242 kcal mol⁻¹						
Sn ⁺	Sn		7.344	S	242*	2113
Sn ⁺	SnH ₄	2H ₂	9.0 ± 0.3	LE	246	2116
Sn ⁺	SnH ₄	2H ₂	11.4 ± 0.2	LE	302	2137
Sn ⁺	SnH ₄	H ₂ + 2H	13.4 ± 0.4	LE	244	2116
Sn ⁺	SnH ₄	H ₂ + 2H	15.5 ± 0.2	LE	292	2137
Sn ⁺	SnH ₄	4H	18.3 ± 0.4	LE	253	2116
Sn ⁺	SnH ₄	4H	19.5 ± 0.2	LE	280	2137
Sn ⁺	Sn ₂ H ₆	3H ₂ + Sn	10.8 ± 0.3	LE	(a)	2133
Sn ⁺	SnO	O	13.0 ± 1	NS	244	1243
Sn ⁺	SnS	S	12.5 ± 0.5	LE	250	2139
Sn ⁺	SnSe	Se	12.8 ± 0.5	LE	272	2063
Sn ⁺	(CH ₃) ₄ Sn	4CH ₃	18.1 ± 0.3	EVD	280	82
Sn₂⁺						
Sn ₂ ⁺	Sn ₂ H ₆	3H ₂	10.7 ± 0.3	LE	311	2133
Sn ₂ ⁺	Sn ₂ S ₂	S ₂ ?	16.5 ± 1.0	LE	358	2139
SnH⁺						
SnH ⁺	SnH ₄	H ₂ + H	10.7 ± 0.3	LE	234	2116
SnH ⁺	SnH ₄	H ₂ + H	13.3 ± 0.2	LE	294	2137
SnH ⁺	SnH ₄	3H	14.8 ± 0.5	LE	224	2116
SnH ⁺	SnH ₄	3H	17.3 ± 0.2	LE	282	2137
SnH₂⁺						
SnH ₂ ⁺	SnH ₄	H ₂	9.5 ± 0.3	LE	258	2116
SnH ₂ ⁺	SnH ₄	H ₂	12.1 ± 0.2	LE	318	2137
SnH ₂ ⁺	SnH ₄	2H	13.9 ± 0.4	LE	255	2116
SnH ₂ ⁺	SnH ₄	2H	16.4 ± 0.3	LE	313	2137
SnH₃⁺						
SnH ₃ ⁺	SnH ₄	H	9.4 ± 0.3	LE	204	2116
SnH ₃ ⁺	SnH ₄	H	11.9 ± 0.2	LE	261	2137
Sn₂H⁺						
Sn ₂ H ⁺	Sn ₂ H ₆	2H ₂ + H	10.6 ± 0.3	LE	257	2133
Sn₂H₂⁺						
Sn ₂ H ₂ ⁺	Sn ₂ H ₆	2H ₂	10.5 ± 0.3	LE	307	2133
Sn₂H₃⁺						
Sn ₂ H ₃ ⁺	Sn ₂ H ₆	H ₂ + H	10.4 ± 0.3	LE	252	2133
Sn₂H₄⁺						
Sn ₂ H ₄ ⁺	Sn ₂ H ₆	H ₂	10.3 ± 0.3	LE	302	2133
Sn₂H₅⁺						
Sn ₂ H ₅ ⁺	Sn ₂ H ₆	H	10.0 ± 0.3	LE	243	2133

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Sn₂H₆⁺						
Sn ₂ H ₆ ⁺	Sn ₂ H ₆		9.0 ± 0.3	LE	272	2133
SnO⁺						
SnO ⁺	SnO		10.5 ± 0.5	NS	246	1243, 1244
Sn₂O⁺						
Sn ₂ O ⁺	Sn ₂ O ₂	O?	13.8 ± 0.5	NS	199	1243
Sn ₂ O ⁺	Sn ₂ O ₂	O?	14.0	NS	203	1244
Sn₂O₂⁺						
Sn ₂ O ₂ ⁺	Sn ₂ O ₂		9.8 ± 0.5	NS	166	1243, 1244
Sn₃O₃⁺						
Sn ₃ O ₃ ⁺	Sn ₃ O ₃		9.3 ± 0.5	NS	100	1243, 1244
Sn₄O₄⁺						
Sn ₄ O ₄ ⁺	Sn ₄ O ₄		9.2 ± 0.5	NS	19	1243, 1244
SnS⁺						
SnS ⁺	SnS		9.7 ± 0.5	LE	252	2139
Sn₂S⁺						
Sn ₂ S ⁺	Sn ₂ S ₂	S	12.4 ± 1.0	LE	228	2139
Sn₂S₂⁺						
Sn ₂ S ₂ ⁺	Sn ₂ S ₂		9.4 ± 0.5	LE	225	2139
SnSe⁺						
SnSe ⁺	SnSe		9.7 ± 0.5	LE	254	2063
Sn₂Se₂⁺						
Sn ₂ Se ₂ ⁺	Sn ₂ Se ₂		9.8 ± 0.5	LE	241	2063
CH₃Sn⁺						
CH ₃ Sn ⁺	(CH ₃) ₄ Sn	3CH ₃	15.7 ± 0.4	EVD	258	82
C₂H₆Sn⁺						
C ₂ H ₆ Sn ⁺	(CH ₃) ₄ Sn	2CH ₃	13.1 ± 0.2	EVD	231	82
C₃H₉Sn⁺ Heat of formation 186 kcal mol⁻¹						
C ₃ H ₉ Sn ⁺	(CH ₃) ₄ Sn	CH ₃	9.72 ± 0.06	RPD	186*	1424
C ₃ H ₉ Sn ⁺	(CH ₃) ₄ Sn	CH ₃	9.9 ± 0.15	EVD	191	82
C ₃ H ₉ Sn ⁺	(CH ₃) ₃ SnC ₂ H ₅	C ₂ H ₅	9.47 ± 0.15	RPD	186*	1424
C ₃ H ₉ Sn ⁺	n-C ₃ H ₇ Sn(CH ₃) ₃	n-C ₃ H ₇	9.50 ± 0.12	RPD	185*	1424
C ₃ H ₉ Sn ⁺	(CH ₃) ₃ SnSn(CH ₃) ₃	(CH ₃) ₃ Sn	9.84 ± 0.09	RPD	(b)	1424

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₁₂Sn⁺						
C ₄ H ₁₂ Sn ⁺	(CH ₃) ₄ Sn		8.25 ± 0.15	EVD	186*	82
C ₄ H ₁₂ Sn ⁺	(CH ₃) ₄ Sn		8.4	EC	189	218
Sb⁺ Heat of formation 262 kcal mol⁻¹						
Sb ⁺	Sb		8.641	S	262*	2113
Sb ⁺	Sb		8.6 ± 0.3	LE	261	2138
Sb ⁺	Sb ₂	Sb	11.5 ± 0.3	LE	259	2138
Sb ⁺	Sb ₄	Sb ₂ + Sb?	15 ± 0.5	LE	276	2138
Sb ⁺	SbH ₃	H ₂ + H	12.1 ± 0.2	LE	262	2116
Sb ⁺	SbH ₃	3H	16.7 ± 0.3	LE	264	2116
Sb ⁺	Sb ₂ H ₄	Sb + 2H ₂	11.5 ± 0.3	LE	(a)	2133
Sb₂⁺						
Sb ₂ ⁺	Sb ₂		8.4 ± 0.3	LE	250	2138
Sb ₂ ⁺	Sb ₄	Sb ₂	11.4 ± 0.3	LE	256	2138
Sb ₂ ⁺	Sb ₂ H ₄	2H ₂	11.2 ± 0.3	LE	318	2133
Sb₃⁺						
Sb ₃ ⁺	Sb ₄	Sb	10.8 ± 0.3	LE	235	2138
Sb₄⁺						
Sb ₄ ⁺	Sb ₄		7.7 ± 0.3	LE	227	2138
SbH⁺						
SbH ⁺	SbH ₃	H ₂	9.9 ± 0.2	LE	263	2116
SbH ⁺	SbH ₃	2H	14.2 ± 0.2	LE	258	2116
SbH₂⁺						
SbH ₂ ⁺	SbH ₃	H	11.8 ± 0.3	LE	255	2116
SbH₃⁺						
SbH ₃ ⁺	SbH ₃		9.58	PI	256*	1091
SbH ₃ ⁺	SbH ₃		9.9 ± 0.3	LE	263	2116
Sb₂H⁺						
Sb ₂ H ⁺	Sb ₂ H ₄	H ₂ + H	10.9 ± 0.3	LE	259	2133
Sb₂H₂⁺						
Sb ₂ H ₂ ⁺	Sb ₂ H ₄	H ₂	10.7 ± 0.3	LE	306	2133
Sb₂H₃⁺						
Sb ₂ H ₃ ⁺	Sb ₂ H ₄	H	10.5 ± 0.3	LE	250	2133
Sb₂H₄⁺						
Sb ₂ H ₄ ⁺	Sb ₂ H ₄		10.2 ± 0.3	LE	295	2133

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
InSb⁺						
InSb ⁺	InSb ₂	Sb	8.4 ± 0.3	LE	206	2138
InSb₂[±]						
InSb ₂ [±]	InSb ₂		6.6 ± 0.4	LE	227	2138
C₁₈H₁₅Sb⁺						
C ₁₈ H ₁₅ Sb ⁺ (Triphenylstilbene)	(C ₆ H ₅) ₃ Sb		7.3 ± 0.1	PI	255*	1140
Te⁺ Heat of formation 255 kcal mol⁻¹						
Te ⁺	Te		9.009	S	255*	2113
Te ⁺	Te		9.5 ± 1.0	LE	266	2063
Te ⁺	GeTe	Ge	13.3 ± 0.5	NS	259	1023
Te ⁺	SnTe	Sn	12.1 ± 1.0	LE	245	2063
Te₂[±]						
Te ₂ [±]	Te ₂		8.4 ± 0.6	NS	234	1023
GeTe⁺						
GeTe ⁺	GeTe		10.1 ± 0.5	NS	275	1023
GeTe₂[±]						
GeTe ₂ [±]	GeTe ₂		10.8 ± 0.5	NS	293	1023
SnTe⁺						
SnTe ⁺	SnTe		9.1 ± 0.5	LE	248	2063
I⁺ Heat of formation 267 kcal mol⁻¹						
I ⁺	I		10.457	S	267*	2113
I ⁺	I ₂	I ⁻	8.62 ± 0.06	RPD	261	292, 288
I ⁺	I ₂	I	12.02 ± 0.04	RPD	267	292
I ⁺	I ₂	I	12.72 ± 0.04	RPD		292
I ⁺	I ₂	I	13.71 ± 0.06	RPD		292
I ⁺	LlI	Li	14.4 ± 0.3	VC	275	2001
I ⁺	NaI	Na	14.4 ± 0.3	VC		2001
I ⁺	KI	K	14.6 ± 0.3	VC		2001
I ⁺	RbI	Rb	14.4 ± 0.3	VC		2001
I ⁺	CH ₃ I	CH ₃ ? CH ₃	11.8 ± 0.05 12.9 ± 0.05	RPD RPD	267	2154
I ⁺	CH ₃ I	CH ₃	13.6 ± 0.05	RPD		2154
I ⁺	CH ₃ I	CH ₃	14.4 ± 0.05	RPD		2154
I ⁺	C ₂ H ₅ I	C ₂ H ₃ + H ₂	14.8 ± 0.2	VC	274	356
I ⁺	CNI	CN ⁻	9.8 ± 0.1	SL		73
I ⁺	CNI	CN	14.3 ± 0.1	SL	284	73
I ⁺	CF ₃ I	CF ₃ ? CF ₃	10.6 ± 0.2 13.25 ± 0.07	LE EVD	279	439
I ⁺	CF ₃ I	CF ₃	13.4 ± 0.1	MSD	282	1111
I ⁺	CF ₃ I	CF ₃	13.6 ± 0.5	SL	287	24
I ⁺	CF ₃ I	CF ₂ + F?	16.4 ± 0.2	LE	253	439
I ⁺	CsI	Cs	14.1 ± 0.3	VC	264	2001
I ⁺	TlI	Tl	13.4 ± 0.1	RPD	267	2159

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
I₂⁺(²Π_{3/2g}) Heat of formation 229 kcal mol⁻¹						
I₂⁺(²Π_{1/2g}) 246 kcal mol⁻¹						
I₂⁺(²Π_{3/2u}) 266 kcal mol⁻¹						
I ₂ ^{+(2Π_{3/2g})}	I ₂		9.28 ± 0.02	PI	229*	182, 416
I ₂ ^{+(2Π_{3/2g})}	I ₂		9.3 ± 0.1	PI	229*	213
I ₂ ^{+(2Π_{3/2g})}	I ₂		9.35 ± 0.03	RPD	231	288, 292
I ₂ ^{+(2Π_{1/2g})}	I ₂		10.0 ± 0.1	PI	246*	213
I ₂ ^{+(2Π_{1/2g})}	I ₂		9.97 ± 0.02	RPD	245	288, 292
I ₂ ^{+(2Π_{3/2u})}	I ₂		10.9 ± 0.1	PI	266*	213
I ₂ ^{+(2Π_{3/2u})}	I ₂		10.91 ± 0.04	RPD	267	288, 292
I ₂ ^{+(2Π_{1/2u})}	I ₂		11.72 ± 0.04	RPD	285	288, 292
I ₂ ^{+(2Σ_g⁺)}	I ₂		13.64 ± 0.06	RPD	329	288, 292
HI^{+(2Π_{3/2}) Heat of formation 246 kcal mol⁻¹}						
HI ^{+(2Π_{3/2})}	HI		10.38 ± 0.02	PI	246*	182, 416
HI ^{+(2Π_{3/2})}	HI		10.4 ± 0.1	PI	246*	213
HI ^{+(2Π_{3/2})}	HI		10.44 ± 0.04	RPD	247	463
HI ^{+(2Π_{1/2})}	HI		11.14 ± 0.04	RPD	263	463
HI ^{+(2Σ)}	HI		13.27 ± 0.10	RPD	312	463
HI ⁺	HI		10.4 ± 0.1	VC	246	2001
HI ⁺	HI		10.5 ± 0.1	VC	248	2001
HI ⁺	C ₂ H ₅ I	C ₂ H ₄	11.7 ± 0.1	VC	255	356
HI⁺²						
HI ⁺²	HI		30.0 ± 0.5	FDP	698	212
LiI⁺						
LiI ⁺	LiI		8.6 ± 0.3	VC	179	2001
Li₂I⁺						
Li ₂ I ⁺	Li ₂ I ₂	I	9.2 ± 0.3	VC	105	2001
Li₃I₂⁺						
Li ₃ I ₂ ⁺	Li ₃ I ₃	I	9.2 ± 0.3	VC		2001
BI⁺						
BI ⁺	BI ₃	2I	14.4 ± 0.2	VC	298	206
BI ⁺	BI ₃	2I	14.6 ± 0.2	VC	303	206
BI₂⁺						
BI ₂ ⁺	BI ₃	I	9.7 ± 0.2	VC	215	206
BI ₂ ⁺	BI ₃	I	10.1 ± 0.2	VC	224	206
BI₃⁺						
BI ₃ ⁺	BI ₃		9.0 ± 0.2	VC	225	206
CI⁺						
CI ⁺	CNI	N	17.6 ± 0.3	SL	347	73

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
IF⁺						
IF ⁺	IF		10.5 ± 0.3	VC	219	357
IF ⁺	IF ₅		24	VC		357
IF₂⁺						
IF ₂ ⁺	IF ₅	2F + F ⁻ ?	15.1 ± 0.3	VC	179	357
IF₃⁺						
IF ₃ ⁺	IF ₅	F + F ⁻ ?	11.5 ± 0.3	VC	114	357
IF₄⁺						
IF ₄ ⁺	IF ₅	F ⁻ ?	13.6 ± 0.3	VC	182	357
IF₅⁺						
IF ₅ ⁺	IF ₅		13.5 ± 0.2	VC	115	357
IF ₅ ⁺	IF ₅		21.8	VC		357
NaI⁺						
NaI ⁺	NaI		8.7 ± 0.3	VC		2001
Na₂I⁺						
Na ₂ I ⁺	Na ₂ I ₂	I	9.1 ± 0.3	VC		2001
Na₃I₂⁺						
Na ₃ I ₂ ⁺	Na ₃ I ₃	I	8.6 ± 0.3	VC		2001
MgI⁺						
MgI ⁺	MgI ₂	I	11.5 ± 0.5	VC	199	178
Mg₂I₂⁺						
Mg ₂ I ₂ ⁺	MgI ₂		10.0 ± 0.5	VC	190	178
Mg₂I₃⁺						
Mg ₂ I ₃ ⁺	Mg ₂ I ₄	I	10.0 ± 0.4	VC	92	178
ICl^{+(2Π_{3/2g}) Heat of formation 242 kcal mol⁻¹}						
ICl ^{+(2Π_{3/2g})}	ICl		10.31 ± 0.02	RPD	242*	292
ICl ⁺	ICl		10.4 ± 0.2	VC	244	357
ICl ^{+(2Π_{1/2g})}	ICl		10.79 ± 0.03	RPD	253	292
ICl ^{+(2Π_{3/2u})}	ICl		12.13 ± 0.04	RPD	284	292
KI⁺						
KI ⁺	KI		8.2 ± 0.3	VC		2001
K₂I⁺						
K ₂ I ⁺	K ₂ I ₂	I	8.2 ± 0.3	VC		2001

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
IBr⁺(²Π_{3/2g}) Heat of formation 240 kcal mol⁻¹						
IBr ^{+(2Π_{3/2g})}	IBr		9.98 ± 0.03	RPD	240*	292
IBr ⁺	IBr		10.3 ± 0.2	VC	247	357
IBr ^{+(2Π_{1/2g})}	IBr		10.49 ± 0.03	RPD	252	292
IBr ^{+(2Π_{3/2u})}	IBr		11.59 ± 0.05	RPD	277	292
RbI⁺						
RbI ⁺	RbI		8.0 ± 0.3	VC		2001
Rb₂I⁺						
Rb ₂ I ⁺	Rb ₂ I ₂	I	8.2 ± 0.3	VC		2001
B₅H₈I⁺						
B ₅ H ₈ I ⁺	B ₅ H ₈ I		11.1 ± 0.5	SL		103
B ₅ H ₈ I ⁺	B ₅ H ₈ I		9.2 ± 0.1	EVD		1102
CH₂I⁺						
CH ₂ I ⁺	CH ₃ I	H	12.08 ± 0.09	RPD	230	1139
CH ₂ I ⁺	CH ₃ I	H	13.7	RPD	267	160
CH ₂ I ⁺	CH ₃ I	H	15.0	RPD		160
CH ₂ I ⁺	CH ₃ I	H	13.1 ± 0.2	VC	253	356
CH ₂ I ⁺	C ₂ H ₅ I	CH ₃	13.7 ± 0.3	VC	281	356
CH ₂ I ⁺	CH ₃ I	H ⁻ ?	13.0	RPD	270	160
CH ₂ I ⁺	CH ₃ I	H ⁻ ?	14.3	RPD		160
CH₃I^{+(2E_{1/2}) Heat of formation 223 kcal mol⁻¹}						
CH₃I^{+(2E_{3/2})}						
CH ₃ I ^{+(2E_{1/2})}	CH ₃ I		9.538 ± 0.003	S	223*	2064
CH ₃ I ^{+(2E_{1/2})}	CH ₃ I		9.54 ± 0.01	PI	223*	182, 416
CH ₃ I ^{+(2E_{1/2})}	CH ₃ I		9.550 ± 0.006	PI	223*	1253
CH ₃ I ^{+(2E_{1/2})}	CH ₃ I		9.55 ± 0.1	PI	223*	213
CH ₃ I ^{+(2E_{1/2})}	CH ₃ I		9.51 ± 0.02	RPD	222	289
CH ₃ I ^{+(2E_{3/2})}	CH ₃ I		10.165 ± 0.003	S	238*	2064
CH ₃ I ^{+(2E_{3/2})}	CH ₃ I		10.12 ± 0.03	PI	236*	1253
CH ₃ I ^{+(2E_{3/2})}	CH ₃ I		10.15 ± 0.1	PI	237*	213
CH ₃ I ^{+(2E_{3/2})}	CH ₃ I		10.0 ± 0.05	RPD	234	2154
CH ₃ I ^{+(2E_{3/2})}	CH ₃ I		10.09 ± 0.04	RPD	236	289
CH ₃ I ⁺	CH ₃ I		11.2 ± 0.05	RPD		2154
CH ₃ I ⁺	CH ₃ I		11.22 ± 0.06	RPD		289
CH ₃ I ⁺	CH ₃ I		13.1 ± 0.05	RPD		2154
CH ₃ I ⁺	CH ₃ I		13.14 ± 0.05	RPD		289
CH ₃ I ⁺	CH ₃ I		19.76 ± 0.2	RPD		289

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₅I⁺ (²E_{1/2}) Heat of formation 213 kcal mol⁻¹						
C₂H₅I⁺ (²E_{3/2})						
C ₂ H ₅ I ⁺ (² E _{1/2})	C ₂ H ₅ I		9.346 ± 0.005	S	214*	2065
C ₂ H ₅ I ⁺ (² E _{1/2})	C ₂ H ₅ I		9.33 ± 0.01	PI	213*	182, 416
C ₂ H ₅ I ⁺ (² E _{1/2})	C ₂ H ₅ I		9.35 ± 0.02	RPD	214	224
C ₂ H ₅ I ⁺	C ₂ H ₅ I		9.6 ± 0.2	VC	220	356
C ₂ H ₅ I ⁺ (² E _{3/2})	C ₂ H ₅ I		9.928 ± 0.005	S	227*	2065
C ₂ H ₅ I ⁺ (² E _{3/2})	C ₂ H ₅ I		9.85 ± 0.1	RPD	225	224
C ₂ H ₅ I ⁺ (² E _{3/2})	C ₂ H ₅ I		9.85	RPD	225	160
C ₂ H ₅ I ⁺	C ₂ H ₅ I		10.60 ± 0.1	RPD		224
C ₂ H ₅ I ⁺	C ₂ H ₅ I		10.6	RPD		160
C ₂ H ₅ I ⁺	C ₂ H ₅ I		10.6	TC		2038
C ₂ H ₅ I ⁺	C ₂ H ₅ I		12.1	RPD		160
C ₂ H ₅ I ⁺	C ₂ H ₅ I		12.2	TC		2038
C ₂ H ₅ I ⁺	C ₂ H ₅ I		13.0	RPD		160
C ₂ H ₅ I ⁺	C ₂ H ₅ I		13.2	TC		2038
n-C₃H₇I⁺ (²E_{1/2}) Heat of formation 208 kcal mol⁻¹						
iso-C₃H₇I⁺ (²E_{1/2})						
C ₃ H ₇ I ⁺ (² E _{1/2})	<i>n</i> -C ₃ H ₇ I		9.26 ± 0.01	PI	208*	182
C ₃ H ₇ I ⁺ (² E _{3/2})	<i>n</i> -C ₃ H ₇ I		9.85	RPD	221	160
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		10.4	RPD		160
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		10.4	TC		2038
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		11.4	RPD		160
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		11.6	TC		2038
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		12.2	RPD		160
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		12.4	TC		2038
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		13.0	RPD		160
C ₃ H ₇ I ⁺	<i>n</i> -C ₃ H ₇ I		13.2	TC		2038
C ₃ H ₇ I ⁺ (² E _{1/2})	<i>iso</i> -C ₃ H ₇ I		9.17 ± 0.02	PI	201*	182
C ₃ H ₇ I ⁺	<i>iso</i> -C ₃ H ₇ I		10.5	TC		2038
C ₃ H ₇ I ⁺	<i>iso</i> -C ₃ H ₇ I		11.0	TC		2038
C ₃ H ₇ I ⁺	<i>iso</i> -C ₃ H ₇ I		12.8	TC		2038
C ₃ H ₇ I ⁺	<i>iso</i> -C ₃ H ₇ I		13.2	TC		2038
C₄H₉I⁺						
C ₄ H ₉ I ⁺	<i>n</i> -C ₄ H ₉ I		9.21 ± 0.01	PI	202*	182
C ₄ H ₉ I ⁺	<i>sec</i> -C ₄ H ₉ I		9.09 ± 0.02	PI	198*	182
C ₄ H ₉ I ⁺	<i>iso</i> -C ₄ H ₉ I		9.18 ± 0.02	PI	200*	182
C ₄ H ₉ I ⁺	<i>tert</i> -C ₄ H ₉ I		9.02 ± 0.03	PI	193*	182
C₅H₁₁I⁺						
C ₅ H ₁₁ I ⁺	<i>n</i> -C ₅ H ₁₁ I		9.19 ± 0.01	PI	197*	182, 416
C₆H₅I⁺						
C ₆ H ₅ I ⁺ (Iodobenzene)	C ₆ H ₅ I		8.73 ± 0.03	PI	238*	182, 416
C₇H₇I⁺						
C ₇ H ₇ I ⁺ (<i>o</i> -Iodotoluene)	C ₆ H ₄ ICH ₃		8.62 ± 0.01	PI	228*	182
C ₇ H ₇ I ⁺ (<i>m</i> -Iodotoluene)	C ₆ H ₄ ICH ₃		8.61 ± 0.03	PI	226*	182
C ₇ H ₇ I ⁺ (<i>p</i> -Iodotoluene)	C ₆ H ₄ ICH ₃		8.50 ± 0.01	PI	224*	182

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CNI⁺						
CNI ⁺	CNI		10.98 ± 0.05	SL	307*	73
CF₂I⁺						
CF ₂ I ⁺	CF ₃ I	F	14.58 ± 0.06	EVD	176	439
CF ₂ I ⁺	CF ₃ I	F	15.3 ± 0.3	SL	193	24
CF₃I⁺						
CF ₃ I ⁺	CF ₃ I		10.64 ± 0.02	EVD	104	439
CF ₃ I ⁺	CF ₃ I		10.0 ± 0.3	SL	90	24
CF ₃ I ⁺	CF ₃ I		10.5 ± 0.1	MSD	101	1111
C₆F₅I⁺						
C ₆ F ₅ I ⁺	C ₆ F ₅ I (Iodopentafluorobenzene)		9.5 ± 0.1	SL		301
C₃F₇I⁺						
C ₃ F ₇ I ⁺	n-C ₃ F ₇ I		10.36 ± 0.01	PI		182
LiNaI ⁺	LiNaI ₂	LiNaI ⁺ I	9.0 ± 0.3	VC		2001
LiKI⁺						
LiKI ⁺	LiKI ₂	I	9.0 ± 0.3	VC		2001
LiRbI⁺						
LiRbI ⁺	LiRbI ₂	I	8.4 ± 0.3	VC		2001
C₈H₁₀NI⁺						
C ₈ H ₁₀ NI ⁺	C ₆ H ₄ IN(CH ₃) ₂ (N,N-Dimethyl-p-iodoaniline)		7.29	CTS	205	1281
C₂H₂F₃I⁺						
C ₂ H ₂ F ₃ I ⁺	CF ₃ CH ₂ I		10.00 ± 0.01	PI		182
C₄H₂F₇I⁺						
C ₄ H ₂ F ₇ I ⁺	n-C ₃ F ₇ CH ₂ I		9.96 ± 0.02	PI		182
C₆H₄ClII⁺						
C ₆ H ₄ ClII ⁺	C ₆ H ₄ ClII (o-Chloroiodobenzene)		8.35 ± 0.1	PI	222*	416
Cs⁺ Heat of formation 109 kcal mol⁻¹						
Cs ⁺	Cs		3.894	S	109*	2113
Cs ⁺	CsCl	Cl	11.9 ± 0.2	LE	183	2056
Cs ⁺	CsI	I	8.3 ± 0.3	VC	124	2001
Cs ⁺	CsI	I	7.3 ± 1	NS	101	1239

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CsI⁺						
CsI ⁺	CsI		7.9 ± 0.3	VC	140	2001
CsI ⁺	CsI		7.3 ± 1	NS	126	1239
Cs₂I⁺						
Cs ₂ I ⁺	Cs ₂ I ₂	I	8.1 ± 0.3	VC	40	2001
Cs ₂ I ⁺	Cs ₂ I ₂	I	10.7 ± 1	NS	100	1239
CsCdCl⁺						
CsCdCl ⁺	CsCdCl ₃	2Cl	10.5 ± 0.2	LE		2056
LiCsI⁺						
LiCsI ⁺	LiCsI ₂	I	8.6 ± 0.3	VC		2001
Ba⁺ Heat of formation 162 kcal mol⁻¹						
Ba ⁺	Ba		5.211	S	162*	2113
Ba ⁺	Ba		5.2 ± 0.1	NS	162	2178
Ba ⁺	BaO	O	13.2 ± 0.2	NS	200	2178
Ba ⁺	BaI ₂	2I?	12.8 ± 1	NS	160	1239
Ba⁺² Heat of formation 393 kcal mol⁻¹						
Ba ⁺²	Ba		15.215	S	393*	2113
Ba ⁺²	Ba		11.5 ± 0.3	NS	307	2178
Ba ⁺²	BaO	O	20.6 ± 0.5	NS	371	2178
Ba⁺³						
Ba ⁺³	Ba		57.5	NS	1368	2178
BaO⁺						
BaO ⁺	BaO		6.5 ± 0.3	NS	105	2178
BaO ⁺	BaO		7 ± 1	NS	117	2052
BaF⁺						
BaF ⁺	BaF		4.9 ± 0.3	NS	104	1104
BaI⁺						
BaI ⁺	BaI ₂	I	9.6 ± 1	NS	112	1239
BaI₂⁺						
BaI ₂ ⁺	BaI ₂		8.1 ± 1	NS	103	1239
BaOH⁺						
BaOH ⁺	BaOH		4.5 ± 1	NS	35	2052
La⁺ Heat of formation 232 kcal mol⁻¹						
La ⁺	La		5.615 ± 0.03	S	232*	2113
La ⁺	LaF ₃	3F?	26.5	VC	228	2009

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
LaF⁺						
LaF ⁺	LaF ₃	2F	18.5	VC	63	2009
LaF₂⁺						
LaF ₂ ⁺	LaF ₃	F	12.0	VC	-68	2009
Nd⁺ Heat of formation 206 kcal mol⁻¹						
Nd ⁺	Nd		5.46	S	204*	2177
Nd ⁺	Nd		5.62	S	208*	2177
Sm⁺						
Sm ⁺	Sm		5.70 ± 0.02	SI	180*	1165
Eu⁺						
Eu ⁺	Eu		5.68 ± 0.03	SI	173*	1165
Dy⁺						
Dy ⁺	Dy		5.80 ± 0.02	SI	205*	1165
Ho⁺						
Ho ⁺	Ho		6.19 ± 0.02	SI	213*	1165
Er⁺						
Er ⁺	Er		6.3 ± 0.1	S	227*	1286
Tm⁺ Heat of formation 203 kcal mol⁻¹						
Tm ⁺	Tm		5.81 ± 0.02	S	193	2186
Tm ⁺	Tm		6.22 ± 0.02	S	203*	1448
Tm ⁺	Tm		6.51 ± 0.08	S	209	1286
Tm ⁺	Tm		6.15 ± 0.02	SI	201	1165
Lu⁺						
Lu ⁺	Lu		5.41 ± 0.02	SI	227*	1165
TaO⁺						
TaO ⁺	TaO		6 ± 0.5	VC	200	2050
TaO₂⁺						
TaO ₂ ⁺	TaO ₂		9 ± 0.5	VC	164	2050
W⁺ Heat of formation 387 kcal mol⁻¹						
W ⁺	W		7.98	S	387*	2113
W ⁺	W(CO) ₆	6CO	22.9 ± 0.6	EVD	478	1107
W ⁺	W(CO) ₆	6CO	20.6 ± 0.2	CS	425	2023
WC⁺						
WC ⁺	W(CO) ₆	CO ₂ + 4CO?	28.8 ± 0.5	EVD	656	1107

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
WO⁺						
WO ⁺	WO		9.1 ± 1	LE	318	2126
WO₂⁺						
WO ₂ ⁺	WO ₂		9.8	LE	237	1244, 2123
WO ₂ ⁺	WO ₂		9.9 ± 0.6	LE	239	2126
WO ₂ ⁺	WO ₃	O	14.2	VC	197	2131
WO₃⁺						
WO ₃ ⁺	WO ₃		11.7 ± 0.6	LE	199	2126
WO ₃ ⁺	WO ₃		11.9	LE	203	1244, 2123
WO ₃ ⁺	WO ₃		12.1	VC	208	2131
W₂O₅⁺						
W ₂ O ₅ ⁺	W ₂ O ₆	O	15.8	VC	28	2131
W₂O₆⁺						
W ₂ O ₆ ⁺	W ₂ O ₆		13.4	VC	32	2131
W₃O₈⁺						
W ₃ O ₈ ⁺	W ₃ O ₉	O	15.5	VC	-170	2131
W₃O₉⁺						
W ₃ O ₉ ⁺	W ₃ O ₉		13.3	VC	-161	2131
WCO⁺						
WCO ⁺	W(CO) ₆	5CO	20.2 ± 0.3	EVD	390	1107
WCO ⁺	W(CO) ₆	5CO	18.5 ± 0.16	CS	350	2023
WC₂O⁺						
WC ₂ O ⁺	W(CO) ₆	CO ₂ + 3CO?	25.9 ± 0.6	EVD	562	1107
WC₂O₂⁺						
WC ₂ O ₂ ⁺	W(CO) ₆	4CO	17.6 ± 0.2	EVD	303	1017
WC ₂ O ₂ ⁺	W(CO) ₆	4CO	16.07 ± 0.04	CS	268	2023
WC₃O₃⁺						
WC ₃ O ₃ ⁺	W(CO) ₆	3CO	14.9 ± 0.2	EVD	215	1107
WC ₃ O ₃ ⁺	W(CO) ₆	3CO	13.60 ± 0.02	CS	185	2023
WC₄O₄⁺						
WC ₄ O ₄ ⁺	W(CO) ₆	2CO	12.7 ± 0.2	EVD	137	1107
WC ₄ O ₄ ⁺	W(CO) ₆	2CO	11.82 ± 0.02	CS	117	2023
WC₅O₅⁺						
WC ₅ O ₅ ⁺	W(CO) ₆	CO	9.80 ± 0.17	EVD	44	1107
WC ₅ O ₅ ⁺	W(CO) ₆	CO	9.97 ± 0.04	CS	48	2023

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
WC₆O₆⁺						
WC ₆ O ₆ ⁺	W(CO) ₆		8.18 ± 0.03	PI	-20*	1167
WC ₆ O ₆ ⁺	W(CO) ₆		8.56 ± 0.13	EVD	-11	1107
WC ₆ O ₆ ⁺	W(CO) ₆		8.46 ± 0.02	CS	-13	2023
CaWO₃⁺						
CaWO ₃ ⁺	CaWO ₃		6.7	LE	38	1244
CaWO₄⁺						
CaWO ₄ ⁺	CaWO ₄		9.8	LE	3	1244
SrWO₃⁺						
SrWO ₃ ⁺	SrWO ₃		6.4	LE	4	1244
SrWO₄⁺						
SrWO ₄ ⁺	SrWO ₄		9.4	LE	-34	1244
SnWO₄⁺						
SnWO ₄ ⁺	SnWO ₄		10.8	LE	57	1244
Sn₂WO₅⁺						
Sn ₂ WO ₅ ⁺	Sn ₂ WO ₅		8.4	LE	-58	1244
ReCl₃⁺						
ReCl ₃ ⁺	Re ₃ Cl ₉	Re ₂ Cl ₆ ?	16 ± 0.5	VC		2140
ReCl₄⁺						
ReCl ₄ ⁺	Re ₃ Cl ₉	Re ₂ Cl ₅ ?	16 ± 0.5	VC		2140
Re₂Cl₅⁺						
Re ₂ Cl ₅ ⁺	Re ₃ Cl ₉	ReCl ₃ + Cl	13.5 + 0.5	VC		2140
Re₂Cl₆⁺						
Re ₂ Cl ₆ ⁺	Re ₃ Cl ₉	ReCl ₃ ?	13.5 ± 0.5	VC		2140
Re₃Cl₈⁺						
Re ₃ Cl ₈ ⁺	Re ₃ Cl ₉	Cl	13 ± 0.5	VC	131	2140
Re₃Cl₉⁺						
Re ₃ Cl ₉ ⁺	Re ₃ Cl ₉		10.5 ± 0.5	VC	102	2140
Os⁺ Heat of formation 390 kcal mol⁻¹						
Os ⁺	Os	O ₂ + 2O?	8.7	S	390*	2113
Os ⁺	OsO ₄		26.8 ± 0.5	EVD	418	1284

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
OsO⁺						
OsO ⁺	OsO ₄	O ₂ + O?	21.2 ± 0.2	EVD	349	1284
OsO₂⁺						
OsO ₂ ⁺	OsO ₄	O ₂	17.1 ± 0.2	EVD	314	1284
OsO₃⁺						
OsO ₃ ⁺	OsO ₃	O	12.3 ± 1	LE	216	2127
OsO ₃ ⁺	OsO ₄	O	17.00 ± 0.10	EVD	252	1284
OsO₄⁺						
OsO ₄ ⁺	OsO ₄		12.97 ± 0.12	EVD	219*	1284
OsO ₄ ⁺	OsO ₄		12.6 ± 1	LE	210	2127
Ir⁺						
Ir ⁺	Ir		9	S	367	2113
Ir ⁺	Ir		9.6	NS	380	1124
Ir ⁺	IrO ₂	O ₂	13.1	NS	351	1124
IrO⁺						
IrO ⁺	IrO	O	10.1	NS	337	1124
IrO ⁺	IrO ₂	O	15.1	NS	337	1124
IrO₂⁺						
IrO ₂ ⁺	IrO ₂		10.9	NS	300	1124
IrO₃⁺						
IrO ₃ ⁺	IrO ₃		11.9	NS	276	1124
Hg⁺ Heat of formation 255 kcal mol⁻¹						
Hg ⁺	Hg		10.44	S	255*	2113
Hg⁺² Heat of formation 688 kcal mol⁻¹						
Hg ⁺²	Hg		29.19	S	688*	2113
Hg ⁺²	Hg		29.8	VC	702	211
Hg ⁺²	Hg		29.0 ± 0.2	NRE	683	211
Hg⁺³ Heat of formation 1477 kcal mol⁻¹						
Hg ⁺³	Hg		63.4	S	1477*	2113
Hg ⁺³	Hg		68.5	VC	1594	211
Hg ⁺³	Hg		63.5 ± 0.5	NRE	1479	211
Hg⁺⁴						
Hg ⁺⁴	Hg		122.5	VC	2840	211
Hg ⁺⁴	Hg		113 ± 1	NRE	2621	211

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
Hg⁺⁵						
Hg ⁺⁵	Hg		175	VC	4050	211
Hg ⁺⁵	Hg		158±2	NRE	3658	211
Hg⁺⁶						
Hg ⁺⁶	Hg		300	VC	6933	211
Hg ⁺⁶	Hg		225±10	NRE	5203	211
CH₃Hg⁺						
CH ₃ Hg ⁺	(CH ₃) ₂ Hg	CH ₃	10.4±0.2	EVD	233	83
CH ₃ Hg ⁺	(CH ₃) ₂ Hg	CH ₃	10.5±0.1	SL	235	306
CH ₃ Hg ⁺	CH ₃ HgCl	Cl	12.35±0.2	SL	244	306
C₂H₅Hg⁺						
C ₂ H ₅ Hg ⁺	(C ₂ H ₅) ₂ Hg	C ₂ H ₅	9.65±0.1	SL	223	306
C₂H₆Hg⁺ Heat of formation 233 kcal mol⁻¹						
C ₂ H ₆ Hg ⁺	(CH ₃) ₂ Hg		8.90±0.2	EVD	231*	83
C ₂ H ₆ Hg ⁺	(CH ₃) ₂ Hg		9.1±0.1	SL	236*	306
C₃H₇Hg⁺						
C ₃ H ₇ Hg ⁺	(iso-C ₃ H ₇) ₂ Hg	iso-C ₃ H ₇	9.1±0.1	SL	206	306
C₄H₁₀Hg⁺						
C ₄ H ₁₀ Hg ⁺	(C ₂ H ₅) ₂ Hg		8.5±0.1	SL	221*	306
C₆H₁₄Hg⁺						
C ₆ H ₁₄ Hg ⁺	(iso-C ₃ H ₇) ₂ Hg		7.6±0.1	SL	188*	306
CH₃HgCl⁺						
CH ₃ HgCl ⁺	CH ₃ HgCl		11.5±0.2	SL	253*	306
Tl⁺ Heat of formation 184 kcal mol⁻¹						
Tl ⁺	Tl		6.108	S	184*	2113
Tl ⁺	TlCl	Cl	10.0±0.1	RPD	185	2159
Tl ⁺	TlBr	Br ⁻	5.95±0.1	RPD	184	2159
Tl ⁺	TlI	I ⁻	6.0±0.1	RPD	187	2159
Pb⁺ Heat of formation 218 kcal mol⁻¹						
Pb ⁺	Pb		7.417	S	218*	2113
Pb ⁺	Pb		7.3±0.5	LE	215	1245
Pb ⁺	Pb		7.5±0.5	LE	220	2139
Pb ⁺	PbH ₄	H ₂ +2H	11.2	LE	(a)	2116
Pb ⁺	PbS	S	11.6±0.5	LE	233	2139
Pb ⁺	PbCl ₂	Cl ₂	12.0±0.2	LE	226	2056
Pb ⁺	(CH ₃) ₄ Pb	4CH ₃	15.0±0.5	EVD	246	82

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
PbH⁺						
PbH ⁺	PbH ₄	3H	11.1	LE	163	2116
PbH₂⁺						
PbH ₂ ⁺	PbH ₄	2H	10.1	LE	192	2116
PbH₃⁺						
PbH ₃ ⁺	PbH ₄	H	9.6	LE	233	2116
PbO⁺						
PbO ⁺	PbO		9.0 ± 0.5	LE	225	1245
Pb₂O⁺						
Pb ₂ O ⁺	Pb ₂ O ₂ ?	O?	11.9 ± 1.0	LE	186	1245
Pb₂O₂⁺						
Pb ₂ O ₂ ⁺	Pb ₂ O ₂		8.8 ± 0.5	LE	174	1245
Pb₃O₂⁺						
Pb ₃ O ₂ ⁺	Pb ₃ O ₃ ?	O?	14.6 ± 1.0	LE	202	1245
Pb₃O₃⁺						
Pb ₃ O ₃ ⁺	Pb ₃ O ₃		9.7 ± 1.0	LE	149	1245
Pb₄O₄⁺						
Pb ₄ O ₄ ⁺	Pb ₄ O ₄		8.5 ± 1.0	LE	62	1245
PbS⁺						
PbS ⁺	PbS		8.6 ± 0.5	LE	230	2139
Pb₂S₂⁺						
Pb ₂ S ₂ ⁺	Pb ₂ S ₂		9.2 ± 0.5	LE	231	2139
PbCl⁺						
PbCl ⁺	PbCl ₂	Cl	11.7 ± 0.2	LE	190	2056
PbCl₂⁺						
PbCl ₂ ⁺	PbCl ₂		11.2 ± 0.2	LE	208	2056
CH₃Pb⁺						
CH ₃ Pb ⁺	(CH ₃) ₄ Pb	3CH ₃	12.4 ± 0.2	EVD	219	82
C₂H₆Pb⁺						
C ₂ H ₆ Pb ⁺	(CH ₃) ₄ Pb	2CH ₃	11.6 ± 0.2	EVD	234	82

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₉Pb⁺						
C ₃ H ₉ Pb ⁺	(CH ₃) ₄ Pb	CH ₃	8.9 ± 0.1	EVD	205	82
C₄H₁₂Pb⁺						
C ₄ H ₁₂ Pb ⁺	(CH ₃) ₄ Pb		8.0 ± 0.4	EVD	217*	82
RbPbCl₂⁺						
RbPbCl ₂ ⁺	RbPbCl ₃	Cl	11.6 ± 0.2	LE		2056
CsPbCl⁺						
CsPbCl ⁺	CsPbCl ₃	2Cl	11.5 ± 0.2	LE		2056
Bi⁺ Heat of formation 218 kcal mol⁻¹						
Bi ⁺	Bi		7.289	S	218*	2113
Bi ⁺	Bi		8	NS	234	2049
Bi ⁺	BiH ₃	3H	13.4	LE	(a)	2116
Bi₂⁺						
Bi ₂ ⁺	Bi ₂		8	NS	237	2049
BiH⁺						
BiH ⁺	BiH ₃	2H	12.2	LE	242	2116
BiH₂⁺						
BiH ₂ ⁺	BiH ₃	H	12.4	LE	299	2116
BiH₃⁺						
BiH ₃ ⁺	BiH ₃		10.1	LE	298	2116
BiS⁺						
BiS ⁺	BiS		8	NS	227	2049
Bi₂S⁺						
Bi ₂ S ⁺	Bi ₂ S ₂	S	14	NS		2049
C₁₈H₁₅Bi⁺						
C ₁₈ H ₁₅ Bi ⁺ (Triphenylbismuth)	(C ₆ H ₅) ₃ Bi		7.3 ± 0.1	PI	288*	1140
At₂⁺						
At ₂ ⁺	At ₂		8.3	D		104

TABLE 1. Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
U⁺ Heat of formation 266 kcal mol⁻¹						
U ⁺	U		6.11 ± 0.05	RPD	266*	16
U ⁺	U		6.08 ± 0.08	SI	265*	317
U ⁺	U		5.4 ± 0.3	LE	250	2126
U ⁺	U		4.9	VC	238	2054
U ⁺	UO	O	13.4	VC	255	2054
UO⁺						
UO ⁺	UO		5.72 ± 0.06	RPD	138	16
UO ⁺	UO		4.7 ± 0.6	LE	114	2126
UO ⁺	UO		4.2	VC	103	2054
UO₂⁺						
UO ₂ ⁺	UO ₂		5.5 ± 0.1	RPD	31	16
UO ₂ ⁺	UO ₂		4.3 ± 0.6	LE	3	2126
UO ₂ ⁺	UO ₂		4.9	VC	17	2054
UO₃⁺						
UO ₃ ⁺	UO ₃		10.4 ± 0.6	LE	51	2126
Pu⁺						
Pu ⁺	Pu		5.1 ± 0.5	SI		1149
Am⁺						
Am ⁺	Am		6.0	S		341

4. TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1

This table lists heats of formation of neutral species derived from appearance potential measurements. Here (a) refers to a neutral reactant, and (b) to a neutral product. These quantities are listed for illustrative purposes and have not been evaluated.

TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CH₂						
CH ₂ ⁺	CH ₂		10.396 ± 0.003	S	93(a)	1078
CH ₂ ⁺	CH ₂		11.82 ± 0.05	VC	60(a)	327
CH ₂ ⁺	CH ₂		10.7 ± 0.5	NS	86(a)	87
	(EI on neutral fragment from C ₃ H ₈)					
CH ₂ ⁺	CH ₂		11.0 ± 0.5	NS	79(a)	87
	(EI on neutral fragment from n-C ₄ H ₁₀)					
C₂H						
CH ₃ ⁺	CH ₃ C≡CH	C ₂ H	15.4 ± 0.5	VC	140(b)	13
C ₂ H ₅ ⁺	C ₂ H ₅ C≡CH	C ₂ H	12.9 ± 0.1	VC	118(b)	13
C₃H₃						
CH ₃ ⁺	CH ₃ CH=C=CH ₂	C ₃ H ₃	14.4 ± 0.2	SL	112(b)	462
CH ₃ ⁺	CH ₃ C≡CCH ₃	C ₃ H ₃	17.6 ± 0.5	VC	182(b)	13
Cl ⁺	CH ₃ C≡CCl	C ₃ H ₃	18.4 ± 0.5	VC	132(b)	13
Br ⁺	CH ₃ C≡CBr	C ₃ H ₃	16.0 ± 0.5	VC	118(b)	13
C ₃ H ₃ ⁺	C ₂ H ₅ C≡CC≡CH	C ₃ H ₃	12.20	EVD	120(b)	1197
C ₃ H ₃ ⁺	CH ₃ C≡CCH ₂ C≡CH	C ₃ H ₃	12.05	EVD	117(b)	1197
C ₃ H ₃ ⁺	CH ₃ C≡CC≡CCH ₃	C ₃ H ₃	11.99	EVD	111(b)	1197
C ₃ H ₃ ⁺	CH≡CCH ₂ CH ₂ C≡CH	C ₃ H ₃	12.17	EVD	125(b)	1197
C ₃ H ₃ ⁺	C ₆ H ₆	C ₃ H ₃	15.17 ± 0.1	EVD	115(b)	1238
(Benzene)						
C ₃ H ₃ ⁺	C ₆ H ₆	C ₃ H ₃	16	EVD	135(b)	1197
(Benzene)						
C ₃ H ₃ ⁺	C ₈ H ₈	C ₃ H ₃ + C ₂ H ₂	11.14 ± 0.18	EVD	96(b)	2105
(Cubane)						
C₃H₅						
C ₃ H ₅ ⁺	CH ₂ =CHCH ₂		8.15 ± 0.03	SL	28(a)	2114
C ₃ H ₅ ⁺	C ₃ H ₅		8.05 ± 0.1	SL	53(a)	123
(Cyclopropyl radical)						
C₄H₂						
C ₆ H ₆ ⁺	C ₁₀ H ₈	C ₄ H ₂	15.20 ± 0.05	SL	150(b)	2112
(Naphthalene)						
C ₆ H ₆ ⁺	C ₁₀ H ₈	C ₄ H ₂	13.86 ± 0.05	SL	159(b)	2112
(Azulene)						

TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₄H₇						
C ₄ H ⁺	CH ₃ CH=CHCH ₂		7.71 ± 0.05	EVD	23(a)	108
C ₄ H	CH ₂ =C(CH ₃)CH ₂		8.03 ± 0.05	EVD	20(a)	108
C ₄ H ₇ (Cyclobutyl radical)	C ₄ H ₇		7.88 ± 0.05	SL	31(a)	123
C₄H₉						
C ₄ H ₉ ⁺	<i>tert</i> -C ₄ H ₉		7.42 ± 0.07	SL	0(a)	141, 145
C₅H₅						
C ₆ H ₅ ⁺ (Diphenyl carbonate)	(C ₆ H ₅) ₂ CO ₃	C ₅ H ₅ + CO + CO ₂	12.1 ± 0.1	SL	28(b)	1237
C₅H₉						
C ₅ H ₉ ⁺ (Cyclopentyl radical)	C ₅ H ₉		7.79 ± 0.03	SL	14(a)	123
C₅H₁₁						
C ₅ H ₁₁ ⁺	<i>n</i> -C ₃ H ₇ CHCH ₃		7.73 ± 0.1	EVD	5(a)	151
C ₅ H ₁₁ ⁺	(C ₂ H ₅) ₂ CH		7.86 ± 0.05	EVD	7(a)	151
C ₅ H ₁₁ ⁺	<i>tert</i> -C ₅ H ₁₁		7.12 ± 0.1	EVD	0(a)	151
C₆H₄						
C ₆ H ₆ O ⁺ (Phenyl ether)	(C ₆ H ₅) ₂ O	C ₆ H ₄	13.88 ± 0.15	SL	164(b)	1237
C₆H₅						
C ₂ H ₅ ⁺ (Phenyl ethyl sulfide)	C ₆ H ₅ SC ₂ H ₅	C ₆ H ₅ + S	13.7	SL	49(b)	307
C₆H₁₁						
C ₆ H ₁₁ ⁺ (Cyclohexyl radical)	C ₆ H ₁₁		7.66 ± 0.05	SL	8(a)	123
C₇H₁₀						
C ₅ H ₆ ⁺ (Norbornene)	C ₇ H ₁₀	C ₂ H ₄	9.58 ± 0.15	SL	30(a)	2155
C₂H₆B						
CH ₃ ⁺	(CH ₃) ₃ B	(CH ₃) ₂ B	15.1 ± 0.3	SL	60(b)	364
NH						
N ₂ ⁺	HN ₃	NH	16.0 ± 0.1	SL	80(b)	340
N₂H₃						
CH ₃ ⁺	CH ₃ N ₂ H ₃	N ₂ H ₃	14.1 ± 0.3	SL	89(b)	424

TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1 – Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₂H₂N						
C ₂ H ₂ N ⁺	CH ₂ CN		10.87 ± 0.1	SL	47(a)	125
C ₂ H ₂ N ⁺	CH ₂ CN		10.86 ± 0.2	SL	48(a)	125
C ₂ H ₂ N ⁺	CH ₂ CN		10.95 ± 0.2	SL	46(a)	125
C ₃ H ₃ ⁺ (Pyridine)	C ₅ H ₅ N	C ₂ H ₂ N?	14.00 ± 0.10	EVD	101(b)	1406
C₆H₆N						
C ₆ H ₆ N ⁺ (2-Pyridylmethyl radical)	C ₅ H ₄ NCH ₂		8.17 ± 0.1	SL	69(a)	1011
C ₆ H ₆ N ⁺ (3-Pyridylmethyl radical)	C ₅ H ₄ NCH ₂		7.92 ± 0.1	SL	76(a)	1011
C ₆ H ₆ N ⁺ (4-Pyridylmethyl radical)	C ₅ H ₄ NCH ₂		8.40 ± 0.15	SL	60(a)	1011
CH₂N₂						
CH ₂ ⁺ (Diazomethane)	CH ₂ N ₂	N ₂	12.3 ± 0.1	VC	49(a)	314
CH ₂ ⁺ (Diazirine)	CH ₂ N ₂	N ₂	11.0 ± 0.1	VC	79(a)	314
CH₅N₂						
CH ₃ ⁺ (1,1-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₃ NNH ₂	14.5 ± 0.3	SL	95(b)	424
CH ₃ ⁺ (1,2-Dimethylhydrazine)	(CH ₃) ₂ N ₂ H ₂	CH ₃ NHNH	13.9 ± 0.3	SL	83(b)	424
C₂H₇N₂						
C ₂ H ₇ N ₂ ⁺ (1,1-Dimethylhydrazyl radical)	(CH ₃) ₂ N ₂ H		6.6 ± 0.3	SL	16(a)	67
CH ₃ ⁺	(CH ₃) ₃ N ₂ H	(CH ₃) ₂ N ₂ H	14.0 ± 0.5	SL	83(b)	424
C₃H₉N₂						
CH ₃ ⁺	(CH ₃) ₄ N ₂	(CH ₃) ₃ N ₂	14 ± 1	SL	83(b)	424
NO₃						
C ₂ H ₅ ⁺	C ₂ H ₅ ONO ₂	NO ₃ ?	11.86 ± 0.25	VC	18(b)	1013
CH₃O						
CH ₃ ⁺	(CH ₃) ₂ O	CH ₃ O	13.1	RPD	1(b)	2018
C₆H₅O						
C ₆ H ₅ O ⁺ (Phenoxy radical)	C ₆ H ₅ O		8.84	SL	22(a)	1079
CH₂NO₃						
CH ₃ ⁺	C ₂ H ₅ ONO ₂	CH ₂ ONO ₂	13.75 ± 0.50	VC	21(b)	1013

TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
BHF₂						
CH ₂ ⁺	CH ₃ BF ₂	HBF ₂	16.9 ± 0.1	VC	−137(b)	1076
C ₂ H ₂ ⁺	C ₂ H ₃ BF ₂	HBF ₂	13.75 ± 0.1	VC	−190(b)	1076
C ₂ H ₄ ⁺	C ₂ H ₅ BF ₂	HBF ₂	12.08 ± 0.01	VC	−188(b)	1076
C ₃ H ₆ ⁺	<i>iso</i> -C ₃ H ₇ BF ₂	HBF ₂	11.48 ± 0.02	LE	−183(b)	1076
C₂HF						
C ₄ H ₄ ⁺	C ₆ H ₅ F (Fluorobenzene)	C ₂ HF	17.00 ± 0.1	SL	72(b)	2103
C₂H₄F						
C ₃ H ₇ ⁺	<i>n</i> -C ₅ H ₁₁ F	C ₂ H ₄ F?	12.02	SL	−7(b)	2029
CHF₂						
CHF ₂ ⁺	CHF ₂		9.45	SL	−74(a)	141
CH ₃ ⁺	CH ₃ CHF ₂	CHF ₂	18.6	VC	56(b)	1288
C₃H₃F₃						
C ₂ H ₂ ⁺	C ₂ H ₃ CF ₃	HCF ₃	13.3 ± 0.15	SL	−154(a)	1075
C₃H₅F₃						
C ₂ H ₅ ⁺	C ₂ H ₅ CF ₃	CF ₃	12.82 ± 0.02	SL	−191(a)	1075
CH₃BF₂						
BF ₂ ⁺	CH ₃ BF ₂	CH ₃	13.62 ± 0.02	SL	−194(a)	1076
C₂H₃BF₂						
C ₂ H ₃ ⁺	C ₂ H ₃ BF ₂	BF ₂	14.25 ± 0.05	VC	−190(a)	1076
C₂H₅BF₂						
C ₂ H ₅ ⁺	C ₂ H ₅ BF ₂	BF ₂	13.1 ± 0.2	VC	−214(a)	1076
C₃H₇BF₂						
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ BF ₂	BF ₂	12.05 ± 0.05	VC	−219(a)	1076
C₃H₃OF₃						
CH ₃ ⁺	CH ₃ COCF ₃	CO + CF ₃	14.60	SL	−218(a)	298
SiH₃						
C ₂ H ₅ ⁺	C ₂ H ₅ SiH ₃	SiH ₃	12.6 ± 0.2	SL	40(b)	2182
C ₃ H ₇ ⁺	<i>iso</i> -C ₃ H ₇ SiH ₃	SiH ₃	11.33 ± 0.03	SL	33(b)	2182
C₂H₇Si						
CH ₃ ⁺	(CH ₃) ₃ SiH	(CH ₃) ₂ SiH	14.8 ± 0.5	EVD	40(b)	83

TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
C₃H₁₀Si						
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiH	H	10.78 ± 0.07	RPD	-42(a)	1421
C₅H₁₄Si						
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiC ₂ H ₅	C ₂ H ₅	10.53 ± 0.09	RPD	-63(a)	1421
C₆H₁₆Si						
C ₃ H ₉ Si ⁺	<i>iso</i> -C ₃ H ₇ Si(CH ₃) ₃	<i>iso</i> -C ₃ H ₇	10.56 ± 0.16	RPD	-72(a)	1421
C₇H₁₈Si						
C ₃ H ₉ Si ⁺	<i>tert</i> -C ₄ H ₉ Si(CH ₃) ₃	<i>tert</i> -C ₄ H ₉	10.53 ± 0.09	RPD	-83(a)	1421
C₇H₁₉SiN						
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiN(C ₂ H ₅) ₂	N(C ₂ H ₅) ₂	12.61 ± 0.03	RPD	-98(a)	1421
C₃H₉SiO						
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiOSi(CH ₃) ₃	OSi(CH ₃) ₃	15.36 ± 0.13	RPD	13(b)	1421
C₄H₁₂SiO						
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiOCH ₃	OCH ₃	12.43 ± 0.18	RPD	-132(a)	1421
C₃H₉SiBr						
C ₃ H ₉ Si ⁺	(CH ₃) ₃ SiBr	Br	10.69 ± 0.06	RPD	-65(a)	1421
CS						
CH ₂ ⁺ (Ethylene sulfide)	C ₂ H ₄ S	CS + 2H	20.4 ± 0.5	EVD	53(b)	51
CHS						
C ₃ H ₃ ⁺ (Thiophene)	C ₄ H ₄ S	CHS	12.8 ± 0.2	EVD	65(b)	2166
C ₂ H ₃ ⁺ (Trimethylene sulfide)	(CH ₂) ₃ S	CHS + H ₂	16.7 ± 0.2	EVD	117(b)	52
C ₃ H ₃ ⁺ (Tetrahydrothiophene)	(CH ₂) ₄ S	CHS + 2H ₂	17.2 ± 0.2	EVD	134(b)	52
CH₂S						
C ₂ H ₄ ⁺	(CH ₂) ₃ S	CH ₂ S	13.6 ± 0.2	EVD	75(b)	52
CH₃S						
CH ₃ ⁺	(CH ₃) ₂ S	CH ₃ S	13.0	SL	32(b)	307
C₃H₇S						
C ₃ H ₇ ⁺	(<i>n</i> -C ₃ H ₇) ₂ S	<i>n</i> -C ₃ H ₇ S?	12.0	SL	39(b)	307

TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1—Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
CNS						
CH ₃ ⁺	CH ₃ NCS	NCS	15.3 ± 0.3	EVD	125(b)	315
C ₂ H ₅ ⁺	C ₂ H ₅ NCS	NCS	12.9 ± 0.2	EVD	100(b)	315
C ₂ H ₃ ⁺	C ₂ H ₅ NCS	NCS + H ₂	15.6 ± 0.3	LE	99(b)	315
SNF₇						
NF ₂ ⁺	SF ₅ NF ₂	SF ₄ + F?	16.3 ± 0.2	VC	-245(a)	1144
SO₂F						
NF ₂ ⁺	FSO ₂ NF ₂	FSO ₂	14.6 ± 0.3	VC	-117(b)	1144
SO₃F						
NF ₂ ⁺	FSO ₂ ONF ₂	FSO ₃	13.3 ± 0.1	VC	-140(b)	1144
SO₂F₂						
SO ₂ ⁺	SO ₂ F ₂	2F	19.9 ± 0.3	SL	-208(a)	418
CCl₃						
CCl ₃ ⁺	CCl ₃		8.78 ± 0.05	EVD	11(a)	441
SiCl₃						
CH ₃ ⁺	CH ₃ SiCl ₃	SiCl ₃	15.0 ± 0.2	SL	-40(b)	2182
C ₂ H ₅ ⁺	C ₂ H ₅ SiCl ₃	SiCl ₃	12.77 ± 0.05	SL	-56(b)	2182
C ₃ H ₇ ⁺	iso-C ₃ H ₇ SiCl ₃	SiCl ₃	11.36 ± 0.1	SL	-66(b)	2182
PCl₃						
Cl ⁺	PCl ₃	PCl + Cl	20.2 ± 0.4	EVD	39(a)	192
CH₂Cl						
C ₂ H ₅ ⁺	n-C ₃ H ₇ Cl	CH ₂ Cl	12.48 ± 0.1	SL	38(b)	72
C ₃ H ₇ ⁺	iso-C ₄ H ₉ Cl	CH ₂ Cl	11.26 ± 0.1	SL	31(b)	72
CH ₃ ⁺	C ₂ H ₅ Cl	CH ₂ Cl?	15.9 ± 0.3	VC	81(b)	356
CH ₃ ⁺	CH ₃ COCH ₂ Cl	CO + CH ₂ Cl	13.9 ± 0.2	VC	31(b)	2174
CH ₃ ⁺	C ₃ H ₅ OCl (Epichlorohydrin)	CO + CH ₂ Cl?	14.6 ± 0.5	EVD	77(b)	153
C₂HCl						
C ₄ H ₄ ⁺	C ₆ H ₅ Cl (Chlorobenzene)	C ₂ HCl	17.57 ± 0.1	SL	124(b)	2103
C₇H₉Cl						
C ₅ H ₆ ⁺	C ₇ H ₉ Cl (endo-5-Chloro-2-norbornene)	C ₂ H ₃ Cl	9.75 ± 0.15	SL	22(a)	2155
C ₅ H ₆ ⁺	C ₇ H ₉ Cl (exo-5-Chloro-2-norbornene)	C ₂ H ₃ Cl	9.77 ± 0.15	SL	22(a)	2155
C ₅ H ₆ ⁺	C ₇ H ₉ Cl (3-Chloronortricyclene)	C ₂ H ₃ Cl	10.15 ± 0.15	SL	13(a)	2155

TABLE 2. Heats of Formation of Gaseous Neutral Species Derived from the Data of Table 1 – Continued

Ion	Reactant	Other products	AP or IP (eV)	Method	Heat of formation (kcal mol ⁻¹)	Ref.
As₂H₄						
As ⁺	As ₂ H ₄	As + 2H ₂	14.3 ± 0.3	LE	41(a)	2133
CH₂Br						
CH ₃ ⁺	C ₂ H ₅ Br	CH ₂ Br	16.9 ± 0.3	VC	115(b)	356
CH ₃ ⁺	C ₃ H ₅ OBr (Epibromohydrin)	CO + CH ₂ Br?	15.6 ± 0.5	EVD	112(b)	153
C₂HBr						
C ₄ H ₄ ⁺	C ₆ H ₅ Br (Bromobenzene)	C ₂ HBr	16.77 ± 0.1	SL	118(b)	2103
Sn₂H₆						
Sn ⁺	Sn ₂ H ₆	3H ₂ + Sn	10.8 ± 0.3	LE	65(a)	2133
C₃H₉Sn						
C ₃ H ₉ Sn ⁺	(CH ₃) ₃ SnSn(CH ₃) ₃	(CH ₃) ₃ Sn	9.84 ± 0.09	RPD	29(b)	1424
Sb₂H₄						
Sb ⁺	Sb ₂ H ₄	Sb + 2H ₂	11.5 ± 0.3	LE	59(a)	2133
CH₂I						
CH ₃ ⁺	C ₂ H ₅ I	CH ₂ I	16.3 ± 0.3	VC	115(b)	356
HgCl						
CH ₃ ⁺	CH ₃ HgCl	HgCl	14.8 ± 0.2	SL	70(b)	306
CH₃Hg						
CH ₃ ⁺	(CH ₃) ₂ Hg	CH ₃ Hg	13.4 ± 0.1	SL	76(b)	306
C₃H₇Hg						
C ₃ H ₇ ⁺	(<i>iso</i> -C ₃ H ₇) ₂ Hg	<i>iso</i> -C ₃ H ₇ Hg	9.65 ± 0.1	SL	45(b)	306
C₄H₉Hg						
C ₄ H ₉ ⁺	(<i>n</i> -C ₄ H ₉) ₂ Hg	<i>n</i> -C ₄ H ₉ Hg	10.55 ± 0.1	SL	31(b)	306
PbH₄						
Pb ⁺	PbH ₄	H ₂ + 2H	11.2	LE	64(a)	2116
BiH₃						
Bi ⁺	BiH ₃	3H	13.4	LE	65(a)	2116

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7. Appendix 1. Heats of Formation Used in Tables 1 and 2

This appendix contains the auxiliary heats of formation used in calculating the heats of formation presented in tables 1 and 2. It is not intended to be a critical compilation. Many values are only estimates and no attempt has been made to insure internal consistency.

Appendix 1. Heats of Formation Used in Tables 1 and 2

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
H	H	52.095	7007
H ⁻	H ⁻	33.39	7007
D	D	52.981	7007
HD	HD	.076	7007
Li	Li	38.41	7004
Li ₂	Li ₂	50.4	7004
LiH	LiH	32.1	7004
Be	Be	78.0	7140
B	B	134.5	7007
B ₂	B ₂	198.5	7007
BH	BH	107.46	7007
BH ₂	BH ₂	48	7004
BH ₃	BH ₃	24	7007
B ₂ H ₆	B ₂ H ₆	8.5	7007
B ₄ H ₁₀	B ₄ H ₁₀	15.8	7007
B ₅ H ₉	B ₅ H ₉	17.5	7007
B ₅ H ₁₁	B ₅ H ₁₁	24.7	7007
B ₆ H ₁₀	B ₆ H ₁₀	22.6	7007
B ₁₀ H ₁₄	B ₁₀ H ₁₄	7.54	7007
C	C	171.291	7007
C ⁻	C ⁻	140.5	7004
C ₂	C ₂	199	7004
C ₃	C ₃	189.7	7004
C ₄	C ₄	242.3	7004
C ₅	C ₅	242.4	7004
CH	CH	142.4	7007
CH ₂	CH ₂	93.7	7007
CH ₃	CH ₃	33.2	7007
CH ₄	CH ₄	-17.88	7007
C ₂ H	C ₂ H	112	^a 7036
C ₂ H ₂	C ₂ H ₂	54.19	7007
C ₂ H ₃	C ₂ H ₃	65	7039
C ₂ H ₄	C ₂ H ₄	12.49	7007
C ₂ H ₅	C ₂ H ₅	25	7007
C ₂ H ₆	C ₂ H ₆	-20.24	7007
C ₃ H ₃	CH ₂ C≡CH	75	^a 7136
C ₃ H ₄	CH ₂ =C=CH ₂	45.9	7045
C ₃ H ₄	cyclopropene	66.6	7055
C ₃ H ₄	CH ₃ C≡CH	44.319	7045
C ₃ H ₅	CH ₃ C=CH ₂	58	^b 7057
C ₃ H ₅	CH ₂ CH=CH ₂	30	7048
C ₃ H ₅	cyclopropyl radical	68	^a 7031
C ₃ H ₆	CH ₃ CH=CH ₂	4.88	7045
C ₃ H ₆	cyclopropane	12.74	7058
C ₃ H ₇	<i>n</i> -C ₃ H ₇	22.1	7084
C ₃ H ₇	<i>iso</i> -C ₃ H ₇	16.8	7130
C ₃ H ₈	C ₃ H ₈	-24.82	7045

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_{f298}^{\circ}(g)$ (kcal mol ⁻¹)	Reference
C ₄ H ₂	CH≡CC≡CH	102	^a 7036
C ₄ H ₄	CH ₂ =CHC≡CH	69	(^b)
C ₄ H ₅	CH ₃ CHC≡CH	67	(^b)
C ₄ H ₆	CH ₂ =CHCH=CH ₂	26.33	7045
C ₄ H ₆	C ₂ H ₅ C≡CH	39.48	7045
C ₄ H ₆	CH ₃ C≡CCH ₃	34.97	7045
C ₄ H ₆	CH ₃ CH=C=CH ₂	38.77	7045
C ₄ H ₇	CH ₃ CH=CHCH ₂	26	^a 7075
C ₄ H ₇	CH ₂ =CHCHCH ₃	20	(^b)
C ₄ H ₇	CH ₂ =C(CH ₃)CH ₂	21	^a 7075
C ₄ H ₈	cis-2-C ₄ H ₈	-1.67	7045
C ₄ H ₈	trans-2-C ₄ H ₈	-2.67	7045
C ₄ H ₈	methylcyclopropane	6.4	(^c)
C ₄ H ₈	1-C ₄ H ₈	-0.03	7045
C ₄ H ₈	cyclobutane	6.3	7077
C ₄ H ₈	iso-C ₄ H ₈	-4.04	7045
C ₄ H ₉	n-C ₄ H ₉	18.5	7084
C ₄ H ₉	sec-C ₄ H ₉	8.83	(^b)
C ₄ H ₉	iso-C ₄ H ₉	12.67	(^b)
C ₄ H ₉	tert-C ₄ H ₉	4.5	7084
C ₄ H ₁₀	n-C ₄ H ₁₀	-30.15	7045
C ₄ H ₁₀	iso-C ₄ H ₁₀	-32.15	7045
C ₅ H ₆	cyclopentadiene	31.84	7112
C ₅ H ₈	cyclopentene	7.87	7045
C ₅ H ₈	CH ₂ =C=C(CH ₃) ₂	31.0	7045
C ₅ H ₈	CH ₂ =CHC(CH ₃)=CH ₂	18.1	7045
C ₅ H ₈	C ₂ H ₅ CH=C=CH ₂	34.80	7045
C ₅ H ₈	CH ₂ =CHCH ₂ CH=CH ₂	25.1	(^b)
C ₅ H ₈	cis-CH ₃ CH=CHCH=CH ₂	18.7	7045
C ₅ H ₈	trans-CH ₃ CH=CHCH=CH ₂	18.6	7045
C ₅ H ₈	CH ₃ CH=C=CHCH ₃	33.10	7045
C ₅ H ₉	(CH ₃) ₂ C=CHCH ₂	15	(^b)
C ₅ H ₉	CH ₃ CH=CHCHCH ₃	13	(^b)
C ₅ H ₁₀	cyclopentane	-18.46	7045
C ₅ H ₁₀	(CH ₃) ₂ C=CHCH ₃	-10.7	7045
C ₅ H ₁₀	1-C ₅ H ₁₀	-5.00	7045
C ₅ H ₁₀	cis-2-C ₅ H ₁₀	-6.71	7045
C ₅ H ₁₀	trans-2-C ₅ H ₁₀	-7.59	7045
C ₅ H ₁₀	C ₂ H ₅ C(CH ₃)=CH ₂	-8.68	7045
C ₅ H ₁₀	(CH ₃) ₂ CHCH=CH ₂	-6.92	7045
C ₅ H ₁₀	1,2-dimethylcyclopropane	0	(^c)
C ₅ H ₁₁	(C ₂ H ₅) ₂ CH	3.9	(^b)
C ₅ H ₁₁	n-C ₃ H ₇ CHCH ₃	5.9	(^b)
C ₅ H ₁₁	iso-C ₃ H ₇ CHCH ₃	2.6	(^b)
C ₅ H ₁₁	n-C ₅ H ₁₁	9.1	(^b)
C ₅ H ₁₁	C ₂ H ₅ CH(CH ₃)CH ₂	7.7	(^b)
C ₅ H ₁₁	neo-C ₅ H ₁₁	4	7096
C ₅ H ₁₁	tert-C ₅ H ₁₁	1.0	7096
C ₅ H ₁₁	iso-C ₅ H ₁₁	7.7	(^b)
C ₅ H ₁₂	n-C ₅ H ₁₂	-35.00	7045
C ₅ H ₁₂	iso-C ₅ H ₁₂	-36.92	7045
C ₅ H ₁₂	neo-C ₅ H ₁₂	-39.67	7045
C ₆ H ₄	benzyne	164	^a 7186
C ₆ H ₅	phenyl radical	72	7263
C ₆ H ₆	CH≡CCH=CHCH=CH ₂	88.4	(^b)
C ₆ H ₆	CH ₃ C≡CC≡CCH ₃	89.2	(^b)
C ₆ H ₆	benzene	19.8	7045

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₆ H ₆	CH≡CCH ₂ CH ₂ C≡CH	98.9	(^h)
C ₆ H ₆	C ₂ H ₅ C≡CC≡CH	94.12	(^h)
C ₆ H ₆	CH ₃ C≡CCH ₂ C≡CH	94	(^h)
C ₆ H ₈	CH ₂ =CHCH=CHCH=CH ₂	49	(^h)
C ₆ H ₈	1-methylcyclopentadiene	24	(^h)
C ₆ H ₈	2-methylcyclopentadiene	24	(^h)
C ₆ H ₁₀	cyclohexene	-2	(^h)
C ₆ H ₁₂	1-C ₆ H ₁₂	-9.96	7045
C ₆ H ₁₂	cyclohexane	-29.43	7045
C ₆ H ₁₂	methylcyclopentane	-25.5	7045
C ₆ H ₁₂	CH ₂ =CHC(CH ₃) ₃	-14.25	7045
C ₆ H ₁₂	(CH ₃) ₂ C=C(CH ₃) ₂	-15.91	7045
C ₆ H ₁₃	n-C ₆ H ₁₃	4.2	(^h)
C ₆ H ₁₄	(CH ₃) ₂ CHCH(CH ₃) ₂	-42.49	7045
C ₆ H ₁₄	(C ₂ H ₅) ₂ CHCH ₃	-41.02	7045
C ₆ H ₁₄	C ₂ H ₅ C(CH ₃) ₃	-44.35	7045
C ₆ H ₁₄	n-C ₆ H ₁₄	-39.96	7045
C ₆ H ₁₄	iso-C ₆ H ₁₄	-41.66	7045
C ₇ H ₇	benzyl radical	37.5	7107
C ₇ H ₇	cycloheptatrienyl radical	65	7112
C ₇ H ₈	spiroheptadiene	52.0	^g 7108
C ₇ H ₈	cycloheptatriene	43.47	7109
C ₇ H ₈	toluene	11.95	7045
C ₇ H ₈	bicyclo(3.2.0)heptadiene-2,6	62.3	^a 7110
C ₇ H ₈	bicyclo(2.2.1)heptadiene-2,5	66.8	7226
C ₇ H ₁₀	1,3-cycloheptadiene	22.1	7110
C ₇ H ₁₀	bicyclo(3.2.0)heptene-6	30	^a 7110
C ₇ H ₁₀	1,2-dimethylcyclopentadiene	17.2	(^h)
C ₇ H ₁₀	2,3-dimethylcyclopentadiene	17.2	(^h)
C ₇ H ₁₀	5,5-dimethylcyclopentadiene	16.6	(^h)
C ₇ H ₁₀	norbornene	31	^a 7227
C ₇ H ₁₂	4-methylcyclohexene	-7.5	(^h)
C ₇ H ₁₄	methylcyclohexane	-36.99	7045
C ₇ H ₁₄	cycloheptane	-28.52	7109
C ₇ H ₁₅	(C ₃ H ₇) ₂ CH	-44.1	(ⁱ)
C ₇ H ₁₆	n-C ₇ H ₁₆	-44.89	7045
C ₈ H ₆	phenylacetylene	76	(^h)
C ₈ H ₈	cubane	148.7	7111
C ₈ H ₈	cyclooctatetraene	71	(^h)
C ₈ H ₈	styrene	37	(^h)
C ₈ H ₉	m-methylbenzyl radical	29.6	(ⁱ)
C ₈ H ₉	p-methylbenzyl radical	29.6	(ⁱ)
C ₈ H ₁₀	2-methylspiroheptadiene	44.1	^g 7108
C ₈ H ₁₀	6-methylspiroheptadiene	45.4	^g 7108
C ₈ H ₁₀	<i>o</i> -xylene	4.54	7045
C ₈ H ₁₀	<i>m</i> -xylene	4.12	7045
C ₈ H ₁₀	<i>p</i> -xylene	4.29	7045
C ₈ H ₁₀	CH ₂ =C(CH ₃)C≡CC(CH ₃)=CH ₂	68.2	^g 7108
C ₈ H ₁₀	1-methylspiroheptadiene	44.1	^g 7108
C ₈ H ₁₀	7-methylcycloheptatriene	37.19	^g 7112
C ₈ H ₁₀	ethylbenzene	7.120	7045
C ₈ H ₁₂	4-vinylcyclohexene	17.6	(^h)
C ₈ H ₁₂	1,2,3-trimethylcyclopentadiene	10.3	(^h)
C ₈ H ₁₂	1,5,5-trimethylcyclopentadiene	8.9	(^h)
C ₈ H ₁₆	trans-1,2-dimethylcyclohexane	-43.02	7045

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₈ H ₁₆	cis-1,2-dimethylcyclohexane	−41.15	7045
C ₈ H ₁₆	cyclooctane	−30.06	7109
C ₈ H ₁₇	n-C ₈ H ₁₇	−5.7	(^h)
C ₈ H ₁₈	iso-C ₄ H ₉ C(CH ₃) ₃	−53.57	7045
C ₈ H ₁₈	n-C ₈ H ₁₈	−49.82	7045
C ₉ H ₇	γ-phenylpropargyl radical	92	(^h)
C ₉ H ₈	methylphenylacetylene	65.9	(^h)
C ₉ H ₈	indene	42.8	(^h)
C ₉ H ₁₀	α-methylstyrene	27.00	7045
C ₉ H ₁₂	1,2,4-trimethylbenzene	−3.33	7045
C ₉ H ₁₂	p-ethyltoluene	−.8	(^h)
C ₉ H ₁₂	isopropylbenzene	.940	7045
C ₉ H ₁₂	1,2,3-trimethylbenzene	−2.29	7045
C ₉ H ₁₂	n-propylbenzene	1.870	7045
C ₉ H ₁₂	1,3,5-trimethylbenzene	−3.84	7045
C ₉ H ₁₄	1,2,3,4-tetramethylcyclopentadiene	1.3	(^h)
C ₉ H ₁₄	1,4,5,5-tetramethylcyclopentadiene	1.3	(^h)
C ₉ H ₁₆	hexahydroindane	−34	(^h)
C ₉ H ₁₉	n-C ₉ H ₁₉	−10.6	(^h)
C ₉ H ₂₀	n-C ₉ H ₂₀	−54.74	7045
C ₁₀ H ₈	naphthalene	33.0	^c 7113, 7114
C ₁₀ H ₈	azulene	72.5	7187, 7188
C ₁₀ H ₁₃	p-isopropylbenzyl radical	17	(ⁱ)
C ₁₀ H ₁₄	1,2,4,5-tetramethylbenzene	−10.95	(ⁱ)
C ₁₀ H ₁₄	3,5-dimethylethylbenzene	−8.77	(ⁱ)
C ₁₀ H ₁₄	1,2,3,5-tetramethylbenzene	−10.33	(ⁱ)
C ₁₀ H ₁₄	2,5-dimethylethylbenzene	−7.33	(ⁱ)
C ₁₀ H ₁₄	tert-butylbenzene	−7	(^h)
C ₁₀ H ₁₄	sec-butylbenzene	−4.2	(^h)
C ₁₀ H ₁₄	n-butylbenzene	−3.3	7045
C ₁₀ H ₁₄	3,4-dimethylethylbenzene	−8.01	(ⁱ)
C ₁₀ H ₁₆	1,2,4,5,5-pentamethylcyclopentadiene	−6.3	(^h)
C ₁₀ H ₁₆	1,2,3,5,5-pentamethylcyclopentadiene	−6.3	(^h)
C ₁₀ H ₁₈	trans-decaline	−43.54	7154
C ₁₀ H ₁₈	cis-decaline	−40.45	7154
C ₁₀ H ₂₂	n-C ₁₀ H ₂₂	−59.67	7045
C ₁₁ H ₁₀	2-methylnaphthaiene	25.4	(ⁱ)
C ₁₁ H ₁₀	1-methylnaphthalene	25.4	(ⁱ)
C ₁₁ H ₁₆	pentamethylbenzene	−27.2	(^h)
C ₁₁ H ₁₈	hexamethylcyclopentadiene	−13.9	(^h)
C ₁₁ H ₂₃	n-C ₁₁ H ₂₃	−20.5	(^h)
C ₁₁ H ₂₄	n-C ₁₁ H ₂₄	−64.6	7045
C ₁₂ H ₁₀	biphenyl	39.5	^c 7059, 7106
C ₁₂ H ₁₂	1,2-dimethylnaphthalene	17.8	(ⁱ)
C ₁₂ H ₁₈	hexamethylbenzene	−29	(^h)
C ₁₂ H ₂₆	n-C ₁₂ H ₂₆	−69.52	7045
C ₁₃ H ₁₀	fluorene	43.8	(^h)
C ₁₃ H ₁₁	diphenylmethyl radical	48	(^h)
C ₁₃ H ₂₇	n-C ₁₃ H ₂₇	−30.4	(^h)
C ₁₃ H ₂₈	n-C ₁₃ H ₂₈	−74.45	7045
C ₁₄ H ₁₀	diphenylacetylene	99	(^h)
C ₁₄ H ₁₀	anthracene	53.8	^c 7114, 7115
C ₁₄ H ₁₀	phenanthrene	47.7	^c 7114, 7115
C ₁₄ H ₁₄	dibenzyl	27.8	7116

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_f^{\circ}(\text{g})$ (kcal mol ⁻¹)	Reference
C ₁₄ H ₃₀	<i>n</i> -C ₁₄ H ₃₀	-79.38	7045
C ₁₅ H ₃₁	<i>n</i> -C ₁₅ H ₃₁	-40.2	(^h)
C ₁₅ H ₃₂	<i>n</i> -C ₁₅ H ₃₂	-84.31	7045
C ₁₆ H ₃₃	<i>n</i> -C ₁₆ H ₃₃	-45	(^h)
C ₁₆ H ₃₄	<i>n</i> -C ₁₆ H ₃₄	-89.23	7045
C ₁₇ H ₃₆	<i>n</i> -C ₁₇ H ₃₆	-94.15	7045
C ₁₈ H ₁₂	1,2-benzophenanthrene	66.3	c, d 7059
C ₁₈ H ₃₀	3-phenyldodecane	-43.7	(^h)
C ₁₈ H ₃₀	1-phenyldodecane	-43.7	(^h)
C ₁₈ H ₃₈	<i>n</i> -C ₁₈ H ₃₈	-99.04	(^h)
C ₁₉ H ₃₂	7-phenyltridecane	-48.6	(^h)
C ₁₉ H ₃₈	1-C ₁₉ H ₃₈	-74.01	(^h)
C ₂₆ H ₄₆	1-phenyleicosane	-81.79	(^h)
C ₂₆ H ₄₆	2-phenyleicosane	-83.14	(^h)
C ₂₆ H ₄₆	3-phenyleicosane	-83.14	(^h)
C ₂₆ H ₄₆	4-phenyleicosane	-83.14	(^h)
C ₂₆ H ₄₆	5-phenyleicosane	-83.14	(^h)
C ₂₆ H ₄₆	7-phenyleicosane	-83.14	(^h)
C ₂₆ H ₄₆	9-phenyleicosane	-83.14	(^h)
CB	CB	199	d 7007
CB'	CB ₂	183	d 7007
C ₂ B	C ₂ B	183	d 7007
C ₂ H ₅ B	C ₂ H ₅ B	-41.4	(ⁱ)
C ₃ H ₉ B	(CH ₃) ₃ B	-29.7	7007
C ₆ H ₁₅ B	(C ₂ H ₅) ₃ B	-37.69	7007
N	N	112.97 ^a	7007
N	N(² D)	167.9	7007, 7241
N	N(² P)	195.4	7007, 7241
NH	NH	79	7007
NH ₂	NH ₂	41	7007
NH ₃	NH ₃	-11.02	7007
N ₂ H ₂	N ₂ H ₂	48.7	^a 7167
N ₂ H ₃	N ₂ H ₃	87	^a 7071
N ₂ H ₄	N ₂ H ₄	22.80	7007
N ₃ H	HN ₃	70.3	7007
CN	CN	100	7138
C ₂ N	C ₂ N	123	^a 7030
C ₃ N	C ₃ N	131	^a 7030
C ₄ N	C ₄ N	166	^a 7030
C ₅ N	C ₅ N	216	^a 7030
C ₆ N	C ₆ N	233	^a 7030
C ₂ N ₂	C ₂ N ₂	73.84	7007
C ₄ N ₂	CNC≡CCN	128	7030
C ₆ N ₂	CNC≡CC≡CCN	183	^g 7030
CHN	HCN	32.3	7007
CH ₄ N	CH ₂ NH ₂	36.8	(^h)
CH ₄ N	CH ₃ NH	37	7132
CH ₅ N	CH ₃ NH ₂	-5.49	7007
C ₂ H ₃ N	CH ₃ NC	35.6	7007
C ₂ H ₃ N	CH ₃ CN	20.9	7007
C ₂ H ₅ N	ethylenimine	26	7129
C ₂ H ₅ N	CH ₂ =CHNH ₂	5.5	(^h)
C ₂ H ₆ N	(CH ₃) ₂ N	34	7132
C ₂ H ₆ N	C ₂ H ₅ NH	33	7132
C ₂ H ₇ N	(CH ₃) ₂ NH	-4.41	7007
C ₂ H ₇ N	C ₂ H ₅ NH ₂	-11.27	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₃ HN	CH≡CCN	91	^g 7030
C ₃ H ₃ N	CH ₂ =CHCN	44.5	^(h)
C ₃ H ₅ N	C ₂ H ₅ NC	31	⁽ⁱ⁾
C ₃ H ₅ N	C ₂ H ₅ CN	15.9	⁽ⁱ⁾
C ₃ H ₇ N	azetidine	15.5	^g 7060
C ₃ H ₉ N	(CH ₃) ₃ N	-5.81	7007
C ₃ H ₉ N	<i>iso</i> -C ₃ H ₇ NH ₂	-18.5	^(h)
C ₃ H ₉ N	<i>n</i> -C ₃ H ₇ NH ₂	-17.3	^c 7059
C ₄ H ₅ N	cyclopropyl cyanide	43	^g 7031
C ₄ H ₅ N	CH ₂ =CHCH ₂ CN	41.4	^(h)
C ₄ H ₅ N	pyrrole	25.88	7240
C ₄ H ₆ N	(CH ₃) ₂ CCN	28	^(h)
C ₄ H ₇ N	<i>n</i> -C ₃ H ₇ NC	26	⁽ⁱ⁾
C ₄ H ₇ N	<i>n</i> -C ₃ H ₇ CN	10.9	^(h)
C ₄ H ₉ N	pyrrolidine	-2	7085
C ₄ H ₁₀ N	(C ₂ H ₅) ₂ N	38	^b 7139
C ₄ H ₁₁ N	(C ₂ H ₅) ₂ NH	-21.4	^c 7059
C ₄ H ₁₁ N	<i>tert</i> -C ₄ H ₉ NH ₂	-26.2	^(h)
C ₄ H ₁₁ N	<i>iso</i> -C ₄ H ₉ NH ₂	-23.3	^(h)
C ₄ H ₁₁ N	<i>sec</i> -C ₄ H ₉ NH ₂	-24.1	^(h)
C ₄ H ₁₁ N	<i>n</i> -C ₄ H ₉ NH ₂	-21.9	^(h)
C ₅ H ₅ N ₅	pyridine	33.63	7143
C ₅ H ₁₁ N	piperidine	-10	^{c, d} 7059
C ₆ H ₄ N	cyanocyclopentadienyl radical	49.3	^(h)
C ₆ H ₇ N	aniline	24.8	^(h)
C ₆ H ₇ N	2-picoline	24.38	7143
C ₆ H ₇ N	3-picoline	27.16	7143
C ₆ H ₇ N	4-picoline	24.43	7143
C ₆ H ₁₃ N	cyclohexylamine	-23.4	^(h)
C ₆ H ₁₃ N	hexamethylenimine	-12	^(h)
C ₆ H ₁₅ N	(<i>n</i> -C ₃ H ₇) ₂ NH	-27.9	^(h)
C ₆ H ₁₅ N	(<i>iso</i> -C ₃ H ₇) ₂ NH	-30.7	^(h)
C ₆ H ₁₅ N	(C ₂ H ₅) ₃ N	-26	^(h)
C ₇ H ₅ N	benzonitrile	53.3	^(h)
C ₇ H ₈ N	aminobenzyl radical	41	^(h)
C ₇ H ₉ N	<i>N</i> -methylaniline	23.9	^(h)
C ₇ H ₉ N	<i>m</i> -toluidine	15.9	^(h)
C ₇ H ₉ N	<i>p</i> -toluidine	15.9	^(h)
C ₇ H ₉ N	<i>o</i> -toluidine	16.9	^(h)
C ₇ H ₉ N	benzylamine	19.9	^(h)
C ₇ H ₉ N	2,3-lutidine	14.2	^{c, d} 7059
C ₇ H ₉ N	2,4-lutidine	14.2	^{c, d} 7059
C ₇ H ₉ N	2,6-lutidine	13.43	7143
C ₈ H ₆ N	cyanobenzyl radical	69	^(h)
C ₈ H ₇ N	benzyl cyanide	42	^{c, d} 7059
C ₈ H ₇ N	<i>m</i> -tolunitrile	48	^{c, d} 7059
C ₈ H ₇ N	<i>p</i> -tolunitrile	48	^{c, d} 7059
C ₈ H ₁₁ N	<i>N,N</i> -dimethylaniline	20.96	^(h)
C ₈ H ₁₁ N	<i>N</i> -ethylaniline	18.9	^(h)
C ₈ H ₁₉ N	(<i>n</i> -C ₄ H ₉) ₂ NH	-37.8	^(h)
C ₉ H ₁₃ N	<i>N,N</i> -dimethyl- <i>p</i> -toluidine	13.84	^(h)
C ₉ H ₁₃ N	<i>N,N</i> -dimethyl- <i>m</i> -toluidine	13.84	^(h)
C ₉ H ₁₃ N	<i>N</i> -ethyl- <i>N</i> -methylaniline	16.03	^(h)
C ₉ H ₁₃ N	<i>N</i> - <i>n</i> -propylaniline	14.0	^(h)
C ₉ H ₁₃ N	<i>N,N</i> -dimethyl- <i>o</i> -toluidine	15.84	^(h)
C ₉ H ₂₁ N	(<i>n</i> -C ₃ H ₇) ₃ N	40.7	^(h)

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₁₀ H ₁₅ N	<i>N,N</i> -dimethyl- <i>p</i> -ethylaniline	6.91	(^h)
C ₁₀ H ₁₅ N	<i>N,N</i> ,3,5-tetramethylaniline	5.2	(ⁱ)
C ₁₀ H ₁₅ N	<i>N,N</i> ,2,6-tetramethylaniline	6.8	(ⁱ)
C ₁₀ H ₁₅ N	<i>N,N</i> ,2,4-tetramethylaniline	5.8	(ⁱ)
C ₁₀ H ₁₅ N	<i>N,N</i> -diethylaniline	10.9	(^h)
C ₁₀ H ₁₅ N	<i>N-n</i> -butylaniline	9.1	(^h)
C ₁₁ H ₁₇ N	<i>N,N</i> -dimethyl- <i>p</i> -isopropylaniline	2.63	(^h)
C ₁₁ H ₁₇ N	<i>N,N</i> -diethyl- <i>p</i> -toluidine	3.98	(^h)
C ₁₂ H ₁₁ N	diphenylamine	56	(^h)
C ₁₂ H ₁₉ N	<i>N,N</i> -di- <i>n</i> -propylaniline	2.86	(^h)
C ₁₂ H ₁₉ N	<i>N,N</i> -dimethyl- <i>p</i> - <i>tert</i> -butylaniline	-5.6	(^h)
C ₁₄ H ₂₃ N	<i>N,N</i> -di- <i>n</i> -butylaniline	-7.0	(^h)
C ₁₈ H ₁₅ N	triphenylamine	84.8	(^h)
CH ₂ N ₂	diazomethane	49.3	^a 7183
CH ₂ N ₂	diazirine	79.3	^a 7183
CH ₆ N ₂	CH ₃ N ₂ H ₃	22.55	7007
C ₂ H ₆ N ₂	CH ₃ N=NCH ₃	43	7215
C ₂ H ₈ N ₂	1,1-dimethylhydrazine	19.7	7029
C ₂ H ₈ N ₂	1,2-dimethylhydrazine	21.6	7029
C ₃ H ₁₀ N ₂	(CH ₃) ₃ N ₂ H	19.2	^g 7071
C ₄ H ₄ N ₂	metadiazine	46.99	7141
C ₄ H ₄ N ₂	paradiazine	46.86	7141
C ₄ H ₄ N ₂	orthodiazine	66.53	7141
C ₄ H ₁₀ N ₂	C ₂ H ₅ N=NC ₂ H ₅	33	7223
C ₄ H ₁₂ N ₂	(CH ₃) ₄ N ₂	16.6	^g 7071
C ₄ H ₁₂ N ₂	1,1-diethylhydrazine	9	^b 7142
C ₅ H ₆ N ₂	4-aminopyridine	37.4	(ⁱ)
C ₅ H ₁₄ N ₂	1-methyl-1- <i>n</i> -butylhydrazine	4	^b 7142
C ₆ H ₈ N ₂	benzenediamine	30.0	(^h)
C ₆ H ₈ N ₂	phenylhydrazine	57.0	(ⁱ)
C ₆ H ₁₄ N ₂	(iso-C ₃ H ₇) ₂ N ₂	19.4	7102
C ₁₀ H ₁₆ N ₂	<i>p</i> -bis(dimethylamino)benzene	20.9	(^h)
CH ₃ N ₃	CH ₃ N ₃	57	^{c, g} 7024
O	O	59.553	7007
O	O(¹ D)	104.9	7007, 7241
O	O(¹ S)	156.17	7007, 7241
O ⁻	O ⁻	24.29	7007
O ₃	O ₃	34.1	7007
HO	OH	9.31	7007
HO ⁻	OH ⁻	-33.67	7007
H ₂ O	H ₂ O	-57.796	7007
D ₂ O	D ₂ O	-59.560	7007
HO ₂	HO ₂	5	7166
H ₂ O ₂	H ₂ O ₂	-32.58	7007
LiO	LiO	20.1	7004
Li ₂ O	Li ₂ O	-39.9	7004
BeO	BeO	31	7004
Be ₂ O	Be ₂ O	-18	7140
Be ₂ O ₂	Be ₂ O ₂	-102	7140
Be ₃ O ₃	Be ₃ O ₃	-260	7140
CO	CO	-26.416	7007
CO ₂	CO ₂	-94.051	7007
C ₃ O ₂	C ₃ O ₂	-8.3	7004
NO	NO	21.57	7007
N ₂ O	N ₂ O	19.61	7007
NO ₂	NO ₂	7.93	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_f^\circ(298)(g)$ (kcal mol ⁻¹)	Reference
B ₃ H ₃ O ₃	B ₃ H ₃ O ₃	−289	7007
CHO	CHO	−4.12	7007
CH ₂ O	CH ₂ O	−28	7007
CH ₃ O	CH ₃ O	−.5	7184
CH ₄ O	CH ₃ OH	−47.96	7007
C ₂ H ₂ O	CH ₂ CO	−14.6	7007
C ₂ H ₃ O	CH ₃ CO	−4.5	7007
C ₂ H ₄ O	CH ₃ CHO	−39.72	7007
C ₂ H ₄ O	ethylene oxide	−12.58	7007
C ₂ H ₅ O	C ₂ H ₅ O	−8.5	7048
C ₂ H ₆ O	CH ₃ OCH ₃	−43.99	7007
C ₂ H ₆ O	C ₂ H ₅ OH	−56.19	7007
C ₃ H ₄ O	CH ₂ =CHCHO	−23	^d 7018 ^(h)
C ₃ H ₅ O	CH ₃ COCH ₂	−7.7	^(h)
C ₃ H ₆ O	propylene oxide	−22	7061
C ₃ H ₆ O	CH ₂ =CHCH ₂ OH	−32.3	^d 7018
C ₃ H ₆ O	C ₂ H ₅ CHO	−48.7	7018
C ₃ H ₆ O	CH ₂ =CHOCH ₃	−27.7	7018
C ₃ H ₆ O	CH ₃ COCH ₃	−51.8	^(h)
C ₃ H ₆ O	trimethylene oxide	−24	^g 7060
C ₃ H ₈ O	n-C ₃ H ₇ OH	−62.3	7018
C ₃ H ₈ O	iso-C ₃ H ₇ OH	−65.6	7018
C ₃ H ₈ O	CH ₃ OC ₂ H ₅	−52.1	^c 7059
C ₄ H ₄ O	furan	−8.29	7073
C ₄ H ₄ O	CH ₃ COC≡CH	11	^(h)
C ₄ H ₆ O	3,4-epoxy-1-butene	10	^g 7014
C ₄ H ₆ O	CH ₃ CH=CHCHO	−30.0	^d 7018
C ₄ H ₆ O	CH ₃ COCH=CH ₂	−26.72	^(h)
C ₄ H ₈ O	tetrahydrofuran	−43.08	7079
C ₄ H ₈ O	iso-C ₃ H ₇ CHO	−55.33	^(h)
C ₄ H ₈ O	C ₂ H ₅ COCH ₃	−58.37	7258
C ₄ H ₈ O	n-C ₃ H ₇ CHO	−53.7	^(h)
C ₄ H ₁₀ O	n-C ₄ H ₉ OH	−66.5	^e 7046, 7086
C ₄ H ₁₀ O	n-C ₃ H ₇ OCH ₃	−60	⁽ⁱ⁾
C ₄ H ₁₀ O	sec-C ₄ H ₉ OH	−71.2	^(h)
C ₄ H ₁₀ O	C ₂ H ₅ OC ₂ H ₅	−60.26	7007
C ₅ H ₆ O	1-methylfuran	−16	⁽ⁱ⁾
C ₅ H ₆ O	2-methylfuran	−16	⁽ⁱ⁾
C ₅ H ₈ O	cyclopentanone	−46.31	7259
C ₅ H ₈ O	dihydropyran	−28.5	7079
C ₅ H ₁₀ O	n-C ₃ H ₇ COCH ₃	−61.7	^(h)
C ₅ H ₁₀ O	C ₂ H ₅ COC ₂ H ₅	−61.7	^(h)
C ₅ H ₁₀ O	tetrahydropyran	−52	^(h)
C ₅ H ₁₀ O	iso-C ₄ H ₉ CHO	−60.2	^(h)
C ₅ H ₁₀ O	n-C ₄ H ₉ CHO	−58.8	^(h)
C ₅ H ₁₀ O	iso-C ₃ H ₇ COCH ₃	−63.0	^(h)
C ₅ H ₁₂ O	n-C ₃ H ₇ CH(OH)CH ₃	−76.1	^(h)
C ₅ H ₁₂ O	iso-C ₃ H ₇ CH(OH)CH ₃	−77.4	^(h)
C ₆ H ₅ O	phenoxy radical	9	^a 7186
C ₆ H ₆ O	phenol	−23.05	7100
C ₆ H ₈ O	dimethylfuran	−23.5	^(h)
C ₆ H ₉ O	(CH ₃) ₂ C=CHCOCH ₂	2.35	^(h)
C ₆ H ₁₀ O	cyclohexanone	−54.09	7259
C ₆ H ₁₀ O	(CH ₃) ₂ C=CHCOCH ₃	−41.8	^(h)
C ₆ H ₁₂ O	tert-C ₄ H ₉ COCH ₃	−71.3	^(h)
C ₆ H ₁₂ O	sec-C ₄ H ₉ COCH ₃	−67.98	^(h)

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_f^\circ_{298}$ (g) (kcal mol ⁻¹)	Reference
C ₆ H ₁₂ O	<i>n</i> -C ₄ H ₉ COCH ₃	-66.6	(^h)
C ₆ H ₁₂ O	<i>iso</i> -C ₄ H ₉ COCH ₃	-67.98	(^h)
C ₆ H ₁₄ O	(<i>iso</i> -C ₃ H ₇) ₂ O	-69.9	(^h)
C ₆ H ₁₄ O	(<i>n</i> -C ₃ H ₇) ₂ O	-67.2	(^h)
C ₇ H ₆ O	benzaldehyde	-10.5	^c 7059, 7106
C ₇ H ₆ O	tropone	17	(^h)
C ₇ H ₈ O	benzyl alcohol	-25	^{c, d} 7059
C ₇ H ₈ O	anisole	-16	(^h)
C ₇ H ₈ O	<i>m</i> -cresol	-31.63	7100
C ₇ H ₈ O	<i>p</i> -cresol	-29.97	7100
C ₇ H ₈ O	<i>o</i> -cresol	-30.74	7100
C ₇ H ₁₄ O	<i>n</i> -C ₅ H ₁₁ COCH ₃	-72	(^h)
C ₈ H ₈ O	acetophenone	-23	^d 7186
C ₈ H ₈ O	<i>p</i> -methylbenzaldehyde	-21	(^h)
C ₈ H ₉ O	methoxybenzyl radical	3	(ⁱ)
C ₈ H ₁₀ O	phenyl ethyl ether	-20.3	(^h)
C ₈ H ₁₀ O	<i>m</i> -methylanisole	-23	(^h)
C ₈ H ₁₀ O	7-methoxycycloheptatriene	5	7229
C ₈ H ₁₀ O	benzyl methyl ether	-20	(^h)
C ₈ H ₁₀ O	<i>p</i> -methylanisole	-23	(^h)
C ₉ H ₁₀ O	phenyl ethyl ketone	-24.7	(^h)
C ₉ H ₁₀ O	benzyl methyl ketone	-24.7	(^h)
C ₉ H ₁₀ O	methylacetophenone	-28.8	(^h)
C ₉ H ₁₂ O	<i>p</i> -ethylanisole	-28	(^h)
C ₉ H ₁₂ O	ethoxytoluene	-28	(^h)
C ₁₂ H ₁₀ O	phenyl ether	17	^g 7186
C ₁₃ H ₁₀ O	benzophenone	12.5	7189
C ₁₄ H ₁₂ O	<i>p</i> -methylbenzophenone	3.3	(^h)
CHO ₂	COOH	-39.2	7018
CH ₂ O ₂	HCOOH	-90.48	7007
C ₂ H ₂ O ₂	CHOCHO	-74	^d 7001
C ₂ H ₄ O ₂	CH ₃ COOH	-103.31	7007
C ₂ H ₄ O ₂	HCOOCH ₃	-83.7	7007
C ₃ H ₄ O ₂	CH ₃ COCHO	-66	7056
C ₃ H ₆ O ₂	HCOOC ₂ H ₅	-89	(ⁱ)
C ₃ H ₆ O ₂	CH ₃ COOCH ₃	-99.2	7048
C ₃ H ₆ O ₂	C ₂ H ₅ COOH	-108.7	(ⁱ)
C ₃ H ₈ O ₂	(CH ₃ O) ₂ CH ₂	-85.3	^d 7018
C ₄ H ₆ O ₂	CH ₂ =CHCH ₂ COOH	-84.5	(^h)
C ₄ H ₆ O ₂	CH ₃ COOCH=CH ₂	-74.9	(^h)
C ₄ H ₆ O ₂	CH ₃ COCOCH ₃	-78.1	7074
C ₄ H ₈ O ₂	<i>n</i> -C ₃ H ₇ COOH	-113.5	^d 7018
C ₄ H ₈ O ₂	CH ₃ COOC ₂ H ₅	-106.58	7048
C ₄ H ₈ O ₂	<i>iso</i> -C ₃ H ₇ COOH	-118.5	^d 7018
C ₄ H ₈ O ₂	<i>p</i> -dioxane	-85	^d 7046
C ₄ H ₈ O ₂	C ₂ H ₅ COOCH ₃	-106.6	(ⁱ)
C ₄ H ₈ O ₂	HCOOCH(CH ₃) ₂	-97	7080
C ₄ H ₈ O ₂	1,2-epoxy-3-methoxypropane	-43	^g 7014
C ₄ H ₈ O ₂	HCOOCH ₂ CH ₂ CH ₃	-94	7057
C ₄ H ₁₀ O ₂	(CH ₃ O) ₂ CHCH ₃	-93.1	7091
C ₅ H ₄ O ₂	2-furaldehyde	-25	(ⁱ)
C ₅ H ₈ O ₂	CH ₃ COCH ₂ COCH ₃	-83	(ⁱ)
C ₅ H ₈ O ₂	C ₂ H ₅ COCOCH ₃	-83	(ⁱ)
C ₅ H ₁₀ O ₂	C ₂ H ₅ COOC ₂ H ₅	-113.5	^c 7081
C ₅ H ₁₀ O ₂	CH ₃ COOCH ₂ CH ₂ CH ₃	-112.8	7048
C ₅ H ₁₀ O ₂	<i>n</i> -C ₃ H ₇ COOCH ₃	-110.7	^c 7081

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₅ H ₁₀ O ₂	<i>iso</i> -C ₃ H ₇ COOCH ₃	-112	(ⁱ)
C ₅ H ₁₀ O ₂	HCOOCH ₂ CH(CH ₃) ₂	-102	(ⁱ)
C ₅ H ₁₀ O ₂	HCOO(CH ₂) ₃ CH ₃	-98.39	(ⁱ)
C ₅ H ₁₀ O ₂	CH ₃ COOCH(CH ₃) ₂	-115.85	7048
C ₅ H ₁₂ O ₂	(CH ₃ O) ₂ C(CH ₃) ₂	-94.1	(^h)
C ₅ H ₁₂ O ₂	(C ₂ H ₅ O) ₂ CH ₂	-89.4	(^h)
C ₆ H ₄ O ₂	<i>p</i> -benzoquinone	-24.6	c, d 7059
C ₆ H ₆ O ₂	<i>p</i> -dihydroxybenzene	-70.8	(^h)
C ₆ H ₁₂ O ₂	C ₂ H ₅ COOCH(CH ₃) ₂	-116	(^h)
C ₆ H ₁₂ O ₂	CH ₃ COO(CH ₂) ₃ CH ₃	-118.9	7048
C ₆ H ₁₂ O ₂	CH ₃ COOCH ₂ CH(CH ₃) ₂	-121.1	7048
C ₆ H ₁₂ O ₂	CH ₃ COOCH(CH ₃)C ₂ H ₅	-121	(ⁱ)
C ₇ H ₆ O ₂	<i>p</i> -hydroxybenzaldehyde	-57.8	(^h)
C ₇ H ₆ O ₂	benzoic acid	-72.6	(^h)
C ₇ H ₈ O ₂	methoxyphenol	-61.2	(^h)
C ₈ H ₈ O ₂	α -hydroxyacetophenone	-56.4	(^h)
C ₈ H ₈ O ₂	<i>m</i> -hydroxyacetophenone	-65.6	(^h)
C ₈ H ₈ O ₂	<i>p</i> -hydroxyacetophenone	-65.6	(^h)
C ₈ H ₈ O ₂	<i>p</i> -methoxybenzaldehyde	-48.1	(^h)
C ₈ H ₈ O ₂	methyl benzoate	-71.7	7048
C ₉ H ₁₀ O ₂	methyl <i>p</i> -toluate	-76	(^h)
C ₉ H ₁₀ O ₂	α -methoxyacetophenone	-56	(^h)
C ₉ H ₁₀ O ₂	<i>m</i> -methoxyacetophenone	-57	(^h)
C ₉ H ₁₀ O ₂	<i>p</i> -methoxyacetophenone	-57	(^h)
C ₁₃ H ₁₀ O ₂	phenyl benzoate	-30	d 7186
C ₁₃ H ₁₀ O ₂	<i>p</i> -hydroxybenzophenone	-33.5	(^h)
C ₁₄ H ₁₀ O ₂	benzil	-21.8	7189
C ₁₄ H ₁₂ O ₂	methoxybenzophenone	-23.9	(^h)
C ₄ H ₈ O ₃	CH ₃ OCH ₂ COOCH ₃	-132	(^h)
C ₄ H ₁₀ O ₃	(CH ₃ O) ₃ CH	-121.3	c 7059
C ₅ H ₁₂ O ₃	(CH ₃ O) ₃ CCH ₃	-128	(ⁱ)
C ₈ H ₈ O ₃	methyl <i>p</i> -hydroxybenzoate	-113.8	(^h)
C ₉ H ₁₀ O ₃	methyl <i>p</i> -methoxybenzoate	-104	(^h)
C ₁₃ H ₁₀ O ₃	diphenyl carbonate	-86	d 7186
C ₅ H ₁₂ O ₄	(CH ₃ O) ₄ C	-158	(ⁱ)
C ₇ H ₁₄ O ₆	methylglucoside	-270	c, d 7059
HNO ₃	HNO ₃	-32.28	7007
C ₂ H ₇ BO ₂	(CH ₃ O) ₂ BH	-139.2	7217
C ₃ H ₉ BO ₃	(CH ₃ O) ₃ B	-215.0	7007
CH ₃ NO	HCONH ₂	-46	d 7007
C ₂ H ₅ NO	CH ₃ CONH ₂	-54	c, d 7059
C ₃ H ₇ NO	CH ₃ CONHCH ₃	-55	(ⁱ)
C ₃ H ₇ NO	HCON(CH ₃) ₂	-50	(ⁱ)
C ₄ H ₉ NO	CH ₃ CON(CH ₃) ₂	-58	(ⁱ)
C ₅ H ₅ NO	4-hydroxypyridine	-15	(^h)
C ₅ H ₁₁ NO	HCON(C ₂ H ₅) ₂	-60	(ⁱ)
C ₆ H ₅ NO	2-pyridinecarboxaldehyde	2	(^h)
C ₆ H ₅ NO	4-pyridinecarboxaldehyde	2	(^h)
C ₆ H ₇ NO	aminophenol	-21.1	(^h)
C ₆ H ₁₃ NO	CH ₃ CON(C ₂ H ₅) ₂	-68	(ⁱ)
C ₇ H ₅ NO	phenyl isocyanate	20.2	(^h)
C ₇ H ₅ NO	cyanophenol	5.6	(^h)
C ₇ H ₇ NO	benzamide	-22	(ⁱ)
C ₇ H ₇ NO	<i>p</i> -aminobenzaldehyde	-8.1	(^h)
C ₇ H ₉ NO	<i>p</i> -methoxyaniline	-11.5	(^h)
C ₈ H ₅ NO	<i>p</i> -cyanobenzaldehyde	18.6	(^h)

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₈ H ₉ NO	aminoacetophenone	-15.9	(^h)
C ₈ H ₉ NO	acetanilide	-23	(ⁱ)
C ₉ H ₇ NO	p-cyanoacetophenone	10.8	(^h)
C ₉ H ₇ NO	α -cyanoacetophenone	14.9	(^h)
C ₁₃ H ₁₁ NO	aminobenzophenone	16.2	(^h)
C ₁₄ H ₉ NO	cyanobenzophenone	42.9	(^h)
C ₂ H ₆ N ₂ O	(CH ₃) ₂ NNO	14.5	c, d 7059
CH ₃ NO ₂	CH ₃ NO ₂	-17.86	7007
CH ₃ NO ₂	CH ₃ ONO	-16.5	7007
C ₂ H ₅ NO ₂	C ₂ H ₅ NO ₂	-23.56	7007
C ₂ H ₅ NO ₂	NH ₂ CH ₂ COOH	-96.7	(^h)
C ₃ H ₇ NO ₂	iso-C ₃ H ₇ NO ₂	-30	(^h)
C ₃ H ₇ NO ₂	n-C ₃ H ₇ ONO	-30.9	(^h)
C ₃ H ₇ NO ₂	n-C ₃ H ₇ NO ₂	-28.5	(^h)
C ₄ H ₅ NO ₂	CH ₂ CNCOOCH ₃	-65.4	(^h)
C ₄ H ₉ NO ₂	n-C ₄ H ₉ ONO	-35.8	(^h)
C ₆ H ₅ NO ₂	nitrobenzene	15	(^h)
C ₆ H ₁₃ NO ₂	isoleucine	-120.3	(^h)
C ₇ H ₆ NO ₂	m-nitrobenzyl radical	30	(^h)
C ₇ H ₇ NO ₂	m-nitrotoluene	10	c, d 7059
C ₇ H ₇ NO ₂	p-nitrotoluene	10	(ⁱ)
C ₈ H ₉ NO ₂	methyl p-aminobenzoate	-64	(^h)
C ₉ H ₇ NO ₂	methyl p-cyanobenzoate	-37.4	(^h)
C ₂ H ₆ N ₂ O ₂	(CH ₃) ₂ NNO ₂	33.7	7134
C ₄ H ₁₀ N ₂ O ₂	(C ₂ H ₅) ₂ NNO ₂	36.8	7134
C ₆ H ₆ N ₂ O ₂	<i>o</i> -nitroaniline	15	(^h)
C ₆ H ₆ N ₂ O ₂	<i>m</i> -nitroaniline	15	(^h)
C ₆ H ₆ N ₂ O ₂	<i>p</i> -nitroaniline	15	(^h)
C ₂ H ₅ NO ₃	C ₂ H ₅ ONO ₂	-36.82	7007
C ₃ H ₇ NO ₃	n-C ₃ H ₇ ONO ₂	-42	(ⁱ)
C ₆ H ₅ NO ₃	<i>p</i> -nitrophenol	-32.4	(^h)
C ₇ H ₅ NO ₃	<i>p</i> -nitrobenzaldehyde	-19.4	(^h)
C ₈ H ₇ NO ₃	<i>m</i> -nitroacetophenone	-27.2	(^h)
C ₈ H ₇ NO ₃	<i>p</i> -nitroacetophenone	-27.2	(^h)
C ₁₃ H ₉ NO ₃	<i>p</i> -nitrobenzophenone	4.9	(^h)
C ₈ H ₇ NO ₄	methyl <i>p</i> -nitrobenzoate	-75.4	(^h)
F	F	18.88	7007
F ⁻	F ⁻	-64.7	7007
HF	HF	-64.8	7007
XeF ₂	XeF ₂	-25.9	7195
XeF ₄	XeF ₄	-51.5	7195
XeF ₆	XeF ₆	-70.4	7195
LiF	LiF	-79.5	7004
Li ₂ F ₂	Li ₂ F ₂	-221.6	7004
BeF	BeF	-41.5	7140
BeF ₂	BeF ₂	-189.6	7140
BF	BF	-29.2	7007
BF ₂	BF ₂	-130.6	7004
BF ₃	BF ₃	-271.75	7007
CF	CF	68	(^b)
CF ₂	CF ₂	-35	7009
CF ₃	CF ₃	-114	7007
C ₂ F ₃	C ₂ F ₃	-45.8	7034
CF ₄	CF ₄	-221	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_{f298}^o(g)$ (kcal mol ⁻¹)	Reference
C ₂ F ₄	C ₂ F ₄	−155.5	7007
C ₂ F ₅	C ₂ F ₅	−212	7034
C ₂ F ₆	C ₂ F ₆	−310	7007
C ₃ F ₆	C ₃ F ₆	−258.75	7034
C ₃ F ₇	<i>n</i> -C ₃ F ₇	−306.5	7034
C ₃ F ₇	<i>iso</i> -C ₃ F ₇	−319.9	7034
C ₃ F ₈	C ₃ F ₈	−411	7034
C ₄ F ₈	perfluoromethylcyclohexane	−352.0	7053
C ₄ F ₁₀	<i>n</i> -C ₄ F ₁₀	−505.5	7034
C ₇ F ₁₄	perfluoromethylclohexane	−675.3	7228
NF	NF	57	^(b)
NF ₂	NF ₂	10.3	7007
N ₂ F ₂	<i>trans</i> -N ₂ F ₂	19.6	7007
N ₂ F ₂	<i>cis</i> -N ₂ F ₂	16.6	7007
NF ₃	NF ₃	−29.8	7007
N ₂ F ₄	N ₂ F ₄	−1.7	7007
OF	OF	41	7007
O ₂ F	O ₂ F	3.0	7004
OF ₂	OF ₂	−5.2	7007
O ₂ F ₂	O ₂ F ₂	4.3	7007
CH ₂ F	CH ₂ F	−6.6	^(b)
CH ₃ F	CH ₃ F	−67	7012
C ₂ H ₂ F	C ₂ H ₂ F	−12.2	^(b)
C ₂ H ₃ F	C ₂ H ₃ F	−28	7012
C ₂ H ₄ F	C ₂ H ₄ F	−16	^(b)
C ₂ H ₅ F	C ₂ H ₅ F	−60.05	^(b)
C ₃ H ₆ F	CH ₂ FCH ₂ CH ₂	−20.9	^(b)
C ₅ H ₉ F	fluorocyclopentane	−61	⁽ⁱ⁾
C ₅ H ₁₁ F	<i>n</i> -C ₅ H ₁₁ F	−74.8	^(b)
C ₆ H ₅ F	fluorobenzene	−26.48	7097
C ₇ H ₇ F	<i>o</i> -fluorotoluene	−33	⁽ⁱ⁾
C ₇ H ₇ F	<i>m</i> -fluorotoluene	−34	⁽ⁱ⁾
C ₇ H ₇ F	<i>p</i> -fluorotoluene	−34.01	7148
CHF ₂	CHF ₂	−70.2	^(b)
CH ₂ F ₂	CH ₂ F ₂	−106.8	7007
C ₂ H ₂ F ₂	CH ₂ =CF ₂	−78.6	7007
C ₂ H ₄ F ₂	CH ₃ CHF ₂	−114.3	7007
C ₆ H ₄ F ₂	<i>p</i> -difluorobenzene	−70.69	7148
C ₆ H ₄ F ₂	<i>m</i> -difluorobenzene	−71.35	7148
C ₆ H ₄ F ₂	<i>o</i> -difluorobenzene	−67.65	7148
CHF ₃	CHF ₃	−164.5	7007
C ₂ HF ₃	C ₂ HF ₃	−111.9	^e 7012, 7037
C ₂ H ₃ F ₃	CH ₃ CF ₃	−176.0	7007
C ₃ H ₃ F ₃	CH ₂ =CHCF ₃	−154	^a 7042
C ₃ H ₅ F ₃	C ₂ H ₅ CF ₃	−191	^a 7042
C ₇ H ₅ F ₃	benzotrifluoride	−138.87	7105
BOF	BOF	−145	7007
B ₃ O ₃ F ₃	B ₃ O ₃ F ₃	−568	7007
CH ₃ BF ₂	CH ₃ BF ₂	−194	^a 7020
C ₂ H ₃ BF ₂	CH ₂ =CHBF ₂	−190	^a 7020
C ₂ H ₅ BF ₂	C ₂ H ₅ BF ₂	−214	^a 7020
C ₃ H ₇ BF ₂	<i>iso</i> -C ₃ H ₇ BF ₂	−219	^a 7020
C ₈ H ₁₀ NF	<i>N,N</i> -dimethyl- <i>p</i> -fluoroaniline	−23	^(h)
C ₂ H ₃ OF	CH ₃ COF	−104.9	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_f^{\circ}298(g)$ (kcal mol ⁻¹)	Reference
C ₆ H ₅ OF	<i>o</i> -fluorophenol	-67.9	(^h)
C ₇ H ₅ OF	benzoyl fluoride	-54.6	(^h)
C ₃ H ₃ COCF ₃	CH ₃ COCF ₃	-218	^a 7044
Na	Na	25.755	7004
Na ₂	Na ₂	32.87	7004
Mg	Mg	35.28	7004
MgO	MgO	1.0	7004
MgF	MgF	-53.1	7004
MgF ₂	MgF ₂	-173.2	7004
Mg ₂ F ₄	Mg ₂ F ₄	-411.9	7004
Al	Al	78.0	7007
AlO	AlO	21.8	7007
Al ₂ O	Al ₂ O	-31	7007
Al ₂ O ₂	Al ₂ O ₂	-94	7007
AlF	AlF	-61.7	7007
AlF ₂	AlF ₂	-149.2	7207
AlF ₃	AlF ₃	-287.9	7007
Si	Si	108.9	7007
Si ₂	Si ₂	142	7007
Si ₃	Si ₃	147	7007
SiH ₃	SiH ₃	33.4	(^b)
SiH ₄	SiH ₄	8.2	7007
Si ₂ H ₆	Si ₂ H ₆	19.2	7007
SiB	SiB	175	^d 7007
SiC	SiC	177	7007
SiC ₂	SiC ₂	147	7007
Si ₂ C	Si ₂ C	132	7007
Si ₂ C ₂	Si ₂ C ₂	168	^d 7007
Si ₂ C ₃	Si ₂ C ₃	177	^d 7007
Si ₃ C	Si ₃ C	162	^d 7007
SiO	SiO	-23.8	7007
SiF	SiF	1.7	7007
SiF ₄	SiF ₄	-385.98	7007
C ₂ H ₆ Si	C ₂ H ₃ SiH ₃	-2	7007
C ₂ H ₈ Si	C ₂ H ₅ SiH ₃	-32	(ⁱ)
C ₃ H ₁₀ Si	(CH ₃) ₃ SiH	-42	^a 7139
C ₃ H ₁₀ Si	<i>iso</i> -C ₃ H ₇ SiH ₃	-38	(ⁱ)
C ₄ H ₁₂ Si	(CH ₃) ₄ Si	-57.149	7007
C ₅ H ₁₄ Si	(CH ₃) ₃ SiC ₂ H ₅	-63	^a 7139
C ₆ H ₁₆ Si	<i>iso</i> -C ₃ H ₇ Si(CH ₃) ₃	-72	^a 7139
C ₆ H ₁₆ Si	(C ₂ H ₅) ₃ SiH	-47	^d 7007
C ₇ H ₁₈ Si	<i>tert</i> -C ₄ H ₉ Si(CH ₃) ₃	-83	^a 7139
C ₈ H ₂₀ Si	(n-C ₃ H ₇) ₂ Si(CH ₃) ₂	-41	^d 7135
C ₈ H ₂₀ Si	(C ₂ H ₅) ₄ Si	-61	^d 7007
C ₁₀ H ₁₆ Si	benzyltrimethylsilane	-30	(ⁱ)
C ₆ H ₁₈ Si ₂	(CH ₃) ₃ SiSi(CH ₃) ₃	-126	^g 7139
BCSi	BCSi	166	^d 7007
C ₇ H ₁₉ SiN	(CH ₃) ₃ SiN(C ₂ H ₅) ₂	-98	^a 7139
C ₄ H ₁₂ SiO	(CH ₃) ₃ SiOCH ₃	-132	^a 7139
C ₆ H ₁₈ Si ₂ O	(CH ₃) ₃ SiOSi(CH ₃) ₃	-185.88	7007
P	P	75.20	7007
P ₂	P ₂	34.5	7007
P ₄	P ₄	14.08	7007
PH	PH	59.2	7004
PH ₂	PH ₂	30.1	7004

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_{f298}^{\circ}(g)$ (kcal mol ⁻¹)	Reference
PH ₃	PH ₃	1.3	7007
P ₂ H ₃	P ₂ H ₃	23	^b 7123
P ₂ H ₄	P ₂ H ₄	5.0	7007
PC	PC	111.7	7004
PO	PO	-1.46	7004
PF ₃	PF ₃	-219.6	7007
AlP	AlP	103	^c 7208
CH ₅ P	CH ₃ PH ₂	-7	^g 7224
C ₂ H ₇ P	C ₂ H ₅ PH ₂	-12	^g 7224
C ₂ H ₇ P	(CH ₃) ₂ PH	-15	7028
C ₃ H ₉ P	(CH ₃) ₃ P	-23.2	7069
C ₄ H ₁₁ P	(C ₂ H ₅) ₂ PH	-25	^g 7224
C ₆ H ₁₅ P	(C ₂ H ₅) ₃ P	-38	^g 7224
C ₁₈ H ₁₅ P	triphenylphosphine	72.4	7118
S	S	66.636	7007
S ₂	S ₂	30.68	7007
S ₄	S ₄	32.7	7007
S ₆	S ₆	24.5	7007
S ₈	S ₈	24.45	7007
HS	HS	34.10	7007
H ₂ S	H ₂ S	-4.93	7007
H ₂ S ₂	H ₂ S ₂	2.53	7007
CS	CS	56	7007
CS ₂	CS ₂	28.05	7007
SO	SO	1.496	7007
SO ₂	SO ₂	-70.944	7007
SF ₄	SF ₄	-171.7	7197
SF ₆	SF ₆	-289	7007
CH ₃ S	CH ₃ S	32.3	^(h)
CH ₄ S	CH ₃ SH	-5.34	7007
C ₂ H ₄ S	CH ₂ =CHSH	20.7	^(h)
C ₂ H ₄ S	ethylene sulfide	19.69	7007
C ₂ H ₅ S	C ₂ H ₅ S	25.5	7019
C ₂ H ₆ S	CH ₃ SCH ₃	-8.90	7007
C ₂ H ₆ S	C ₂ H ₅ SH	-10.95	7007
C ₃ H ₆ S	propylene sulfide	19.7	^g 7063
C ₃ H ₆ S	trimethylene sulfide	14.78	7062
C ₃ H ₇ S	n-C ₃ H ₇ S	39	^a 7257
C ₃ H ₈ S	C ₂ H ₅ SCH ₃	-14.22	7067
C ₃ H ₈ S	n-C ₃ H ₇ SH	-14.3	^(h)
C ₄ H ₄ S	thiophene	24.5	^c 7059
C ₄ H ₈ S	tetrahydrothiophene	-8.1	7043
C ₄ H ₈ S	CH ₃ SCH ₂ CH=CH ₂	10	^g 7083
C ₄ H ₁₀ S	iso-C ₃ H ₇ SCH ₃	-21.43	7087
C ₄ H ₁₀ S	C ₂ H ₅ SC ₂ H ₅	-19.86	7007
C ₄ H ₁₀ S	sec-C ₄ H ₉ SH	-20.56	^(h)
C ₄ H ₁₀ S	iso-C ₄ H ₉ SH	-20.56	^(h)
C ₄ H ₁₀ S	tert-C ₄ H ₉ SH	-23.86	^(h)
C ₄ H ₁₀ S	n-C ₄ H ₉ SH	-19.2	^(h)
C ₄ H ₁₀ S	n-C ₃ H ₇ SCH ₃	-19.51	7087
C ₅ H ₆ S	2-methylthiophene	19.94	7225
C ₅ H ₁₀ S	3-methyltetrahydrothiophene	-8.72	^(h)
C ₅ H ₁₀ S	pentamethylene sulfide	-13.5	^(h)
C ₅ H ₁₀ S	cyclopentanethiol	-9.43	^(h)
C ₅ H ₁₂ S	n-C ₅ H ₁₁ SH	-24.14	^(h)

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₅ H ₁₂ S	(C ₂ H ₅) ₂ CHSH	-25.5	(^h)
C ₅ H ₁₂ S	n-C ₄ H ₉ SCH ₃	-23.43	(^h)
C ₅ H ₁₂ S	n-C ₃ H ₇ SC ₂ H ₅	-23.43	(^h)
C ₅ H ₁₂ S	tert-C ₄ H ₉ SCH ₃	-28.08	(^h)
C ₅ H ₁₂ S	iso-C ₅ H ₁₁ SH	-25.49	(^h)
C ₆ H ₅ S	phenyl sulfide radical	51	7019
C ₆ H ₆ S	benzenethiol	25.37	7101
C ₆ H ₈ S	2-ethylthiophene	12	(ⁱ)
C ₆ H ₁₀ S	cyclopentenyl methyl sulfide	11.85	(ⁱ)
C ₆ H ₁₂ S	cyclohexanethiol	-21.23	(ⁱ)
C ₆ H ₁₄ S	(n-C ₃ H ₇) ₂ S	-28.3	(^h)
C ₇ H ₈ S	phenyl methyl sulfide	23.5	7019
C ₇ H ₁₀ S	2-propylthiophene	7.0	(ⁱ)
C ₈ H ₁₀ S	phenyl ethyl sulfide	18.4	7019
C ₈ H ₁₂ S	2-butylthiophene	2.1	(ⁱ)
C ₈ H ₁₈ S	(n-C ₄ H ₉) ₂ S	-38.2	(^h)
C ₂ H ₆ S ₂	CH ₃ SSCH ₃	-5.64	7007
C ₄ H ₈ S ₂	thiadioxane	3.5	(^h)
C ₄ H ₁₀ S ₂	C ₂ H ₅ SSC ₂ H ₅	-17.42	7051
C ₂ H ₆ S ₃	CH ₃ SSSCH ₃	0	7026
COS	COS	-33.96	7007
SNF ₇	SF ₅ NF ₂	-245	^a 7196
SO ₂ F ₂	SO ₂ F ₂	-205	^a 7121
CHNS	HNCS	30.5	7007
C ₂ H ₃ NS	CH ₃ NCS	31.3	7007
C ₂ H ₃ NS	CH ₃ SCN	38.3	7007
C ₃ H ₅ NS	C ₂ H ₅ NCS	26	(^h)
C ₃ H ₅ NS	C ₂ H ₅ SCN	33	(^h)
C ₄ H ₇ NS	n-C ₃ H ₇ NCS	21	(^h)
C ₇ H ₅ NS	phenyl thiocyanate	70	(^h)
C ₇ H ₅ NS	phenyl isothiocyanate	63	(^h)
C ₈ H ₇ NS	benzyl thiocyanate	65	(^h)
CH ₄ N ₂ S	NH ₂ CSNH ₂	-2	^d 7001
C ₂ H ₆ N ₂ S	NH ₂ CSNHCH ₃	-3	(ⁱ)
C ₃ H ₆ N ₂ S	NH ₂ CSNHCH=CH ₂	22	(ⁱ)
C ₃ H ₈ N ₂ S	CH ₃ NHCSNHCH ₃	-4	(ⁱ)
C ₃ H ₈ N ₂ S	NH ₂ CSN(CH ₃) ₂	-6	(ⁱ)
C ₄ H ₁₀ N ₂ S	CH ₃ NHCSN(CH ₃) ₂	-7	(ⁱ)
C ₅ H ₁₂ N ₂ S	(CH ₃) ₂ NCSN(CH ₃) ₂	-10	(ⁱ)
C ₅ H ₁₂ N ₂ S	C ₂ H ₅ NHCSNHC ₂ H ₅	-14	(ⁱ)
C ₅ H ₁₁ NSO ₂	methionine	-101	(^h)
SO ₂ NF ₃	FSO ₂ NF ₂	-170	^a 7196
SO ₃ NF ₃	FSO ₂ ONF ₂	-163	^a 7196
Cl	Cl	29.082	7007
Cl ⁻	Cl ⁻	-58.8	7007
HCl	HCl	-22.062	7007
LiCl	LiCl	-46.778	7004
Li ₂ Cl ₂	Li ₂ Cl ₂	-143.06	7004
BeCl ₂	BeCl ₂	-85.7	7140
BCl	BCl	35.73	7007
BCl ₂	BCl ₂	-19.5	(^b)
BCl ₃	BCl ₃	-96.50	7007
B ₂ Cl ₄	B ₂ Cl ₄	-117.2	7007
CCl	CCl	122	(^b)
CCl ₂	CCl ₂	66	(^b)
CCl ₃	CCl ₃	14	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_f^{\circ} \text{298(g)}$ (kcal mol ⁻¹)	Reference
CCl ₄	CCl ₄	-24.6	7007
C ₂ Cl ₄	C ₂ Cl ₄	-2.9	7007
C ₂ Cl ₅	C ₂ Cl ₅	9.1	(b)
F ₃ Cl	F ₃ Cl	-39.0	7007
MgCl	MgCl	-10.4	7004
MgCl ₂	MgCl ₂	-95.85	7004
Mg ₂ Cl ₄	Mg ₂ Cl ₄	-233	c 7006
SiCl ₃	SiCl ₃	-102.4	(b)
SiCl ₄	SiCl ₄	-157.03	7007
PCl	PCl	28.4	(b)
PCl ₂	PCl ₂	-21	(b)
PCl ₃	PCl ₃	-68.6	7007
P ₂ Cl ₄	P ₂ Cl ₄	-106	a, b 7120
CH ₂ Cl	CH ₂ Cl	29	a 7016
CH ₃ Cl	CH ₃ Cl	-19.32	7007
C ₂ H ₃ Cl	C ₂ H ₃ Cl	8.5	7007
C ₂ H ₄ Cl	CH ₂ CH ₂ Cl	19.07	(h)
C ₂ H ₅ Cl	C ₂ H ₅ Cl	-26.81	7007
C ₃ H ₃ Cl	CH ₃ C≡Cl	37	(i)
C ₃ H ₄ Cl	CHCl=CHCH ₂	23	(h)
C ₃ H ₄ Cl	CH ₂ =CClCH ₂	22	(h)
C ₃ H ₇ Cl	n-C ₃ H ₇ Cl	-31.05	7065
C ₃ H ₇ Cl	iso-C ₃ H ₇ Cl	-36.15	7065
C ₄ H ₉ Cl	sec-C ₄ H ₉ Cl	-38.7	7066
C ₄ H ₉ Cl	n-C ₄ H ₉ Cl	-35.4	7066
C ₄ H ₉ Cl	iso-C ₄ H ₉ Cl	-38.2	7066
C ₄ H ₉ Cl	tert-C ₄ H ₉ Cl	-43.1	7066
C ₅ H ₉ Cl	chlorocyclopentane	-26	(i)
C ₅ H ₁₁ Cl	n-C ₅ H ₁₁ Cl	-40	(h)
C ₆ H ₅ Cl	chlorobenzene	12.7	7064
C ₇ H ₆ Cl	p-chlorobenzyl radical	30	(i)
C ₇ H ₇ Cl	m-chlorotoluene	3.5	(i)
C ₇ H ₇ Cl	p-chlorotoluene	3.5	(i)
C ₇ H ₇ Cl	o-chlorotoluene	4.6	7064
C ₇ H ₇ Cl	benzyl chloride	7.1	(h)
C ₇ H ₉ Cl	exo-5-chloro-2-norbornene	23	a 7227
C ₇ H ₉ Cl	endo-5-chloro-2-norbornene	23	a 7227
C ₇ H ₉ Cl	3-chloronortricyclene	15	a 7227
CHCl ₂	CHCl ₂	31	(b)
CH ₂ Cl ₂	CH ₂ Cl ₂	-22.10	7007
C ₂ H ₂ Cl ₂	CH ₂ =CCl ₂	.58	7007
C ₂ H ₂ Cl ₂	trans-C ₂ H ₂ Cl ₂	1.47	7007
C ₂ H ₂ Cl ₂	cis-C ₂ H ₂ Cl ₂	.90	7007
C ₂ H ₄ Cl ₂	CH ₂ ClCH ₂ Cl	-31.02	7007
C ₃ H ₄ Cl ₂	CH ₂ =CClCH ₂ Cl	-8.04	(h)
C ₃ H ₆ Cl ₂	1,3-C ₃ H ₆ Cl ₂	-34.79	(h)
C ₃ H ₆ Cl ₂	1,2-C ₃ H ₆ Cl ₂	-36	(h)
C ₆ H ₄ Cl ₂	m-dichlorobenzene	6.7	7064
C ₆ H ₄ Cl ₂	p-dichlorobenzene	6.0	7064
C ₆ H ₄ Cl ₂	o-dichlorobenzene	7.8	7064
CHCl ₃	CHCl ₃	-24.65	7007
C ₂ HCl ₃	C ₂ HCl ₃	-1.86	7007
C ₂ H ₂ Cl ₄	CHCl ₂ CHCl ₂	-35.7	7007
CNCl	CNCl	32.97	7007
CFCl	CFCl	48	a 7008
CF ₃ Cl	CF ₃ Cl	-166	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
C ₂ F ₃ Cl	C ₂ F ₃ Cl	-132.7	7007
CF ₂ Cl ₂	CF ₂ Cl ₂	-114	7007
CFCl ₃	CFCl ₃	-66	7007
C ₂ F ₃ Cl ₃	CFCl ₂ CF ₂ Cl	-181.5	7007
ClO ₃ F	ClO ₃ F	-5.7	7007
SiHCl ₃	HSiCl ₃	-122.6	7007
POCl	POCl	51.5	^(b)
POCl ₂	POCl ₂	-92.3	^(b)
POCl ₃	POCl ₃	-133.48	7007
C ₅ H ₄ NCl	4-chloropyridine	26	⁽ⁱ⁾
C ₅ H ₄ NCl	2-chloropyridine	26	⁽ⁱ⁾
C ₈ H ₁₀ NCl	<i>N,N</i> -dimethyl- <i>p</i> -chloroaniline	12	^(h)
C ₂ H ₂ OCl	CH ₂ ClCO	-12	⁽ⁱ⁾
C ₂ H ₃ OCl	CH ₃ COCl	-58.20	7007
C ₂ H ₅ OCl	CH ₂ ClCH ₂ OH	-59	^d 7001
C ₃ H ₅ OCl	CH ₃ COCH ₂ Cl	-56.7	^(h)
C ₃ H ₅ OCl	epichlorohydrin	-27	7014
C ₆ H ₅ OCl	<i>p</i> -chlorophenol	-33.9	^(h)
C ₆ H ₅ OCl	<i>o</i> -chlorophenol	-32.9	^(h)
C ₇ H ₅ OCl	<i>p</i> -chlorobenzaldehyde	-20.9	^(h)
C ₇ H ₅ OCl	benzoyl chloride	-28.9	^d 7104
C ₈ H ₇ OCl	α -chloroacetophenone	-24.5	^(h)
C ₈ H ₇ OCl	<i>p</i> -chloroacetophenone	-28.7	^(h)
C ₈ H ₇ OCl	<i>p</i> -methylbenzoyl chloride	-28.7	^(h)
C ₁₃ H ₉ OCl	<i>p</i> -chlorobenzophenone	3.4	^(h)
C ₃ H ₅ O ₂ Cl	CH ₂ ClCOOCH ₃	-104.8	^(h)
C ₄ H ₇ O ₂ Cl	CH ₂ ClCOOC ₂ H ₅	-109.8	^(h)
C ₈ H ₇ O ₂ Cl	<i>p</i> -methoxybenzoyl chloride	-55.9	^(h)
C ₈ H ₇ O ₂ Cl	methyl <i>p</i> -chlorobenzoate	-76.9	^(h)
C ₇ H ₄ OCl ₂	<i>p</i> -chlorobenzoyl chloride	-28.6	^(h)
C ₂ H ₂ FCl	<i>cis</i> -C ₂ H ₂ FCl	-36	^(h)
C ₂ H ₂ FCl	<i>trans</i> -C ₂ H ₂ FCl	-37	^(h)
C ₆ H ₄ FCl	<i>m</i> -chlorofluorobenzene	-32	^(h)
C ₆ H ₄ FCl	<i>p</i> -chlorofluorobenzene	-32	^(h)
C ₆ H ₄ FCl	<i>o</i> -chlorofluorobenzene	-31	^(h)
CHF ₂ Cl	CHF ₂ Cl	-113	7004
C ₂ HF ₂ Cl	<i>cis</i> -C ₂ HF ₂ Cl	-80	^(h)
C ₂ HF ₂ Cl	<i>trans</i> -C ₂ HF ₂ Cl	-80	^(h)
CHFCl ₂	CHFCl ₂	-69	7004
C ₃ H ₉ SiCl	(CH ₃) ₃ SiCl	-84.32	7007
CH ₃ SiCl ₃	CH ₃ SiCl ₃	-126.4	7004
C ₂ H ₃ SiCl ₃	CH ₂ =CHSiCl ₃	-101	⁽ⁱ⁾
C ₂ H ₅ SiCl ₃	C ₂ H ₅ SiCl ₃	-131	⁽ⁱ⁾
C ₃ H ₇ SiCl ₃	<i>iso</i> -C ₃ H ₇ SiCl ₃	-138	⁽ⁱ⁾
C ₃ H ₇ SiCl ₃	<i>n</i> -C ₃ H ₇ SiCl ₃	-136.3	⁽ⁱ⁾
C ₄ H ₃ ClS	2-chlorothiophene	17	⁽ⁱ⁾
C ₇ H ₄ NO ₃ Cl	<i>p</i> -nitrobenzoyl chloride	-27.1	^(h)
K	K	21.31	7004
Ca	Ca	46.04	7001
CaO	CaO	13	^f 7191
CaF	CaF	-63.9	7156
CaF ₂	CaF ₂	-188.0	7157
CaCl	CaCl	6.7	7001
Sc	Sc	90.98	7158
ScF ₃	ScF ₃	-279	7230

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
Ti	Ti	112.7	7140
V	V	120	7001
C ₉ H ₅ O ₄ V	cyclopentadienylvanadium tetracarbonyl	-180	a, d 7149, 7185
Cr	Cr	94.8	7140
CrO	CrO	53	f 7194
CrO ₂	CrO ₂	-13	f 7194
CrO ₃	CrO ₃	-68	f 7194
CrF	CrF	7.3	f 7160
CrF ₂	CrF ₂	-99	7140
CrC ₆ O ₆	Cr(CO) ₆	-240.4	7103
CrO ₂ Cl ₂	CrO ₂ Cl ₂	-128.6	7001
Mn	Mn	68.34	7001
MnF	MnF	-13.4	7231
MnF ₂	MnF ₂	-113.4	7231
C ₈ H ₅ O ₃ Mn	cyclopentadienylmanganese tricarbonyl	-108	d 7185
Fe	Fe	99.5	7004
FeF	FeF	11.4	7004
FeF ₂	FeF ₂	-93.1	7004
FeCl ₂	FeCl ₂	-35.50	7004
Fe ₂ Cl ₄	Fe ₂ Cl ₄	-105	7140
FeC ₅ O ₅	Fe(CO) ₅	-175.4	7140
Co	Co	101.5	7140
C ₇ H ₅ O ₂ Co	cyclopentadienylcobalt dicarbonyl	-56	a, d 7149, 7185
Ni	Ni	102.7	7140
Ni ₂	Ni ₂	150	7140
NiO	NiO	76	f 7234
NiF ₂	NiF ₂	-76.3	c 7140, 7233
NiCl	NiCl	15	7001
NiCl ₂	NiCl ₂	-27.1	b 7001
NiC ₄ O ₄	Ni(CO) ₄	-144.10	7140
Cu	Cu	81.0	7004
CuF	CuF	12	7004
CuF ₂	CuF ₂	-68.7	7004
Ge	Ge	90.0	7007
GeH ₃	GeH ₃	38.8	(p)
GeH ₄	GeH ₄	21.7	7007
Ge ₂ H ₆	Ge ₂ H ₆	38.8	7007
Ge ₃ H ₈	Ge ₃ H ₈	54.2	7007
GeO	GeO	-11.04	7007
Ge ₂ O ₂	Ge ₂ O ₂	-112	7007
Ge ₃ O ₃	Ge ₃ O ₃	-212	7007
C ₄ H ₁₂ Ge	(CH ₃) ₄ Ge	-35	g 7088
GeSiH ₆	GeSiH ₆	27.8	7198
As	As	72.3	7007
As ₄	As ₄	34.4	7007
AsH ₃	AsH ₃	15.88	7007
As ₂ H ₄	As ₂ H ₄	41	a 7179
AsCl ₃	AsCl ₃	-61.80	7007
C ₃ H ₉ As	(CH ₃) ₃ As	3.7	7260
C ₁₈ H ₁₅ As	triphenylarsine	99.5	d 7117
Se	Se	54.27	7007
Br	Br	26.741	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_f^{\circ} \text{298(g)}$ (kcal mol ⁻¹)	Reference
Br ⁻	Br ⁻	-55.9	7007
Br ₂	Br ₂	7.387	7007
HBr	HBr	-8.70	7007
LiBr	LiBr	-34.439	7004
Li ₂ Br ₂	Li ₂ Br ₂	-117.892	7004
BBr ₃	BBr ₃	-49.15	7007
CBr	CBr	133	(b)
CBr ₂	CBr ₂	95	(b)
CBr ₃	CBr ₃	42	7007
CBr ₄	CBr ₄	19	7007
BrF	BrF	-22.43	7007
BrF ₃	BrF ₃	-61.09	7007
BrF ₅	BrF ₅	-102.5	7007
MgBr	MgBr	-13	7004
MgBr ₂	MgBr ₂	-74.6	7004
Mg ₂ Br ₄	Mg ₂ Br ₄	-187	c 7006
BrCl	BrCl	3.50	7007
FeBr ₂	FeBr ₂	-11	7140
Fe ₂ Br ₄	Fe ₂ Br ₄	-63	7140
CH ₂ Br	CH ₂ Br	46.3	(b)
CH ₃ Br	CH ₃ Br	-8.4	7007
C ₂ H ₃ Br	C ₂ H ₃ Br	17	(b)
C ₂ H ₄ Br	CH ₂ CH ₂ Br	31	(b)
C ₂ H ₅ Br	C ₂ H ₅ Br	-15.42	7007
C ₃ H ₃ Br	CH ₃ C≡CBr	49	(i)
C ₃ H ₃ Br	CH≡CCH ₂ Br	51	(b)
C ₃ H ₅ Br	CH ₃ CH=CHBr	9.7	(b)
C ₃ H ₇ Br	iso-C ₃ H ₇ Br	-23.99	c 7219
C ₃ H ₇ Br	n-C ₃ H ₇ Br	-18.65	c 7219
C ₄ H ₉ Br	n-C ₄ H ₉ Br	-25.67	7255
C ₄ H ₉ Br	iso-C ₄ H ₉ Br	-24.26	(b)
C ₄ H ₉ Br	sec-C ₄ H ₉ Br	-24.26	(b)
C ₄ H ₉ Br	tert-C ₄ H ₉ Br	-27.56	(b)
C ₅ H ₁₁ Br	n-C ₅ H ₁₁ Br	-27.84	(b)
C ₆ H ₅ Br	bromobenzene	24	(b)
C ₇ H ₇ Br	m-bromotoluene	14.9	(b)
C ₇ H ₇ Br	o-bromotoluene	15.9	(b)
C ₇ H ₇ Br	benzyl bromide	19.1	(b)
C ₇ H ₇ Br	p-bromotoluene	14.9	(b)
CHBr ₂	CHBr ₂	50.1	(b)
CH ₂ Br ₂	CH ₂ Br ₂	-1	7001
C ₂ H ₂ Br ₂	trans-C ₂ H ₂ Br ₂	22	(b)
C ₂ H ₂ Br ₂	cis-C ₂ H ₂ Br ₂	23	(b)
C ₂ H ₄ Br ₂	CH ₃ CHBr ₂	-7	(b)
C ₃ H ₆ Br ₂	1,3-C ₃ H ₆ Br ₂	-10.8	(b)
CHBr ₃	CHBr ₃	4	7007
C ₂ HBr ₃	C ₂ HBr ₃	26.19	(b)
CNBr	CNBr	44.5	7007
CF ₃ Br	CF ₃ Br	-153.6	7007
CCl ₃ Br	CCl ₃ Br	-11.0	7007
C ₅ H ₄ NBr	4-bromopyridine	38	(i)
C ₅ H ₄ NBr	2-bromopyridine	38	(i)
C ₈ H ₁₀ NBr	N,N-dimethyl-p-bromoaniline	24	(b)
C ₁₀ H ₁₄ NBr	N,N-diethyl-p-bromoaniline	14.1	(b)
C ₂ H ₃ COBr	CH ₃ COBr	-46.6	7040

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_{f298}^{\circ}(g)$ (kcal mol ⁻¹)	Reference
C ₃ H ₅ OBBr	epibromohydrin	-15	(i)
C ₆ H ₅ OBBr	p-bromophenol	-21.9	(h)
C ₇ H ₅ OBBr	p-bromobenzaldehyde	-8.9	(h)
C ₇ H ₅ OBBr	benzoyl bromide	-14.7	d 7104
C ₈ H ₇ OBBr	p-bromoacetophenone	-16.7	(h)
C ₁₃ H ₉ OBBr	p-bromobenzophenone	15.4	(h)
C ₃ H ₅ O ₂ Br	CH ₂ BrCOOCH ₃	-92.8	(h)
C ₈ H ₇ O ₂ Br	methyl p-bromobenzoate	-64.9	(h)
C ₆ H ₄ FBr	p-bromofluorobenzene	-20	(h)
C ₂ H ₂ F ₂ Br ₂	CF ₂ BrCH ₂ Br	-90	(h)
C ₃ H ₉ SiBr	(CH ₃) ₃ SiBr	-65	a 7139
C ₄ H ₃ BrS	2-bromothiophene	29	(i)
CH ₂ ClBr	CH ₂ ClBr	-12	7012
C ₂ H ₄ ClBr	CH ₂ BrCH ₂ Cl	-18	(h)
CHCl ₂ Br	CHCl ₂ Br	-14	7012
Sr	Sr	39.2	7001
SrO	SrO	-3.4	f 7191
Sr ₂ O	Sr ₂ O	-56	f 7191
SrF	SrF	-5	7001
SrF ₂	SrF ₂	-186.6	c 7001, 7261
SrCl	SrCl	9	7001
Y	Y	101.52	7158
YC ₂	YC ₂	143	c 7218
YO	YO	-7.5	f 7237
YF ₃	YF ₃	-295.7	7230
YCl ₃	YCl ₃	-178	c 7193
Zr	Zr	145.42	7004
Nb	Nb	184.5	7001
Mo	Mo	157.3	7004
MoO	MoO	101	7140
MoO ₂	MoO ₂	3	7140
MoO ₃	MoO ₃	-78	7140
Mo ₂ O ₆	Mo ₂ O ₆	-271	7140
Mo ₃ O ₉	Mo ₃ O ₉	-451	7140
MoC ₆ O ₆	Mo(CO) ₆	-218.0	7140
SrMoO ₃	SrMoO ₃	-139	f 7192
SrMoO ₄	SrMoO ₄	-257	f 7192
Ru	Ru	153.6	7140
RuO ₄	RuO ₄	-44.0	7140
Rh	Rh	133.1	7140
RhO	RhO	89	7202
RhO ₂	RhO ₂	40	7202
Pd	Pd	90.4	7140
Ag	Ag	68.01	7140
Cd	Cd	26.77	7007
CdCl ₂	CdCl ₂	-51.8	7001
In	In	58.15	7007
In ₂	In ₂	91.04	7007
InO	InO	92.5	7007
In ₂ O	In ₂ O	-3	c 7170
Sn	Sn	72.2	7007
SnH ₄	SnH ₄	38.9	7007
Sn ₂ H ₆	Sn ₂ H ₆	65	a 7179
SnO	SnO	3.6	7140
Sn ₂ O ₂	Sn ₂ O ₂	-60	7140

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	ΔH_{f298}° (g) (kcal mol ⁻¹)	Reference
Sn ₃ O ₃	Sn ₃ O ₃	−126	7140
Sn ₄ O ₄	Sn ₄ O ₄	−193	7140
SnS	SnS	28.5	7007
Sn ₂ S ₂	Sn ₂ S ₂	8.3	^c 7238
SnSe	SnSe	30.8	7007
Sn ₂ Se ₂	Sn ₂ Se ₂	15	^f 7206
C ₃ H ₉ Sn	(CH ₃) ₃ Sn	14.7	^(b)
C ₄ H ₁₂ Sn	(CH ₃) ₄ Sn	−4.5	7007
C ₅ H ₁₄ Sn	(CH ₃) ₃ SnC ₂ H ₅	−7	7007
C ₆ H ₁₆ Sn	<i>n</i> -C ₃ H ₇ Sn(CH ₃) ₃	−12	⁽ⁱ⁾
C ₆ H ₁₆ Sn	(C ₂ H ₅) ₃ SnH	−16.3	7256
C ₆ H ₁₈ Sn ₂	(CH ₃) ₃ SnSn(CH ₃) ₃	−11.6	^d 7007
Sb	Sb	62.7	7007
Sb ₂	Sb ₂	56.3	7007
Sb ₄	Sb ₄	49.0	7007
SbH ₃	SbH ₃	34.681	7007
Sb ₂ H ₄	Sb ₂ H ₄	59	^a 7179
InSb	InSb	82.3	7007
InSb ₂	InSb ₂	75	7007
C ₁₈ H ₁₅ Sb	triphenylstilbene	87.0	^d 7117
Te	Te	47.02	7007
Te ₂	Te ₂	40.2	7007
GeTe	GeTe	42	7007
GeTe ₂	GeTe ₂	44	7007
SnTe	SnTe	38.4	7007
I	I(² P _{3/2})	25.535	7007
I	I(² P _{1/2})	47.27	7007, 7241
I [−]	I [−]	−47.0	7007
I ₂	I ₂	14.923	7007
HI	HI	6.33	7007
LiI	LiI	−19.10	7004
Li ₂ I ₂	Li ₂ I ₂	−81.78	7004
BI ₃	BI ₃	17.00	7007
IF	IF	−22.86	7007
IF ₅	IF ₅	−196.58	7007
MgI	MgI	−2.5	^(b)
MgI ₂	MgI ₂	−41	^c 7001, 7006
Mg ₂ I ₄	Mg ₂ I ₄	−113.4	^c 7006
ICl	ICl	4.25	7007
IBr	IBr	9.76	7007
CH ₃ I	CH ₃ I	3.1	7007
C ₂ H ₅ I	C ₂ H ₅ I	−1.84	7007
C ₃ H ₃ I	CH≡CCH ₂ I	64	^(h)
C ₃ H ₇ I	<i>n</i> -C ₃ H ₇ I	−5.77	7065
C ₃ H ₇ I	<i>iso</i> -C ₃ H ₇ I	−10.45	7065
C ₄ H ₇ I	CH ₂ =C(CH ₃)CH ₂ I	14	ⁱ 7076
C ₄ H ₇ I	CH ₃ CH=CHCH ₂ I	15	ⁱ 7076
C ₄ H ₉ I	<i>sec</i> -C ₄ H ₉ I	−11.26	^(h)
C ₄ H ₉ I	<i>n</i> -C ₄ H ₉ I	−9.91	^(h)
C ₄ H ₉ I	<i>iso</i> -C ₄ H ₉ I	−11.26	^(h)
C ₄ H ₉ I	<i>tert</i> -C ₄ H ₉ I	−14.56	^(h)
C ₅ H ₁₁ I	<i>n</i> -C ₅ H ₁₁ I	−14.84	^(h)
C ₆ H ₅ I	iodobenzene	37	^(h)
C ₇ H ₇ I	<i>o</i> -iodotoluene	28.9	^(h)
C ₇ H ₇ I	<i>p</i> -iodotoluene	27.9	^(h)
C ₇ H ₇ I	<i>m</i> -iodotoluene	27.9	^(h)
CH ₂ I ₂	CH ₂ I ₂	27.0	7007

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_{f298}^\circ(\text{g})$ (kcal mol ⁻¹)	Reference
CHI ₃	CHI ₃	50	7012
CNI	CNI	53.9	7007
CF ₃ I	CF ₃ I	-141	7012
C ₈ H ₁₀ NI	<i>N,N</i> -dimethyl- <i>p</i> -iodoaniline	37	^(h)
C ₆ H ₄ ClII	<i>o</i> -chloriodobenzene	29	^(h)
Cs	Cs	18.83	7001
CsCl	CsCl	-62.4	7001
CsI	CsI	-42	^c 7001, 7161
Cs ₂ I ₂	Cs ₂ I ₂	-121	^c 7001, 7161
Ba	Ba	41.96	7001
BaO	BaO	-44.4	7001
BaF	BaF	-9	7001
BaCl	BaCl	24	7001
BaI ₂	BaI ₂	-84	^{c,d} 7001, 7161
BaOH	BaOH	-68.5	^c 7180
La	La	102.96	7158
LaF ₃	LaF ₃	-326	7230
Ce	Ce	111.60	7158
CeF ₃	CeF ₃	-330	7230
Pr	Pr	89.09	7158
Nd	Nd	78.33	7158
Sm	Sm	48.59	7158
Eu	Eu	41.92	7158
Gd	Gd	95.75	7158
Tb	Tb	93.96	7158
Dy	Dy	70.91	7158
Ho	Ho	70.6	7169
Er	Er	81.79	7158
Tm	Tm	59.1	7176
Yb	Yb	36.33	7158
Lu	Lu	102.16	7158
Ta	Ta	186.8	7159
TaO	TaO	62	7262
TaO ₂	TaO ₂	-44	7262
W	W	203.0	7140
WO	WO	108	7140
WO ₂	WO ₂	11	7140
WO ₃	WO ₃	-71	7140
W ₂ O ₆	W ₂ O ₆	-277	7140
W ₃ O ₉	W ₃ O ₉	-468	7140
WC ₆ O ₆	W(CO) ₆	-208.3	7140
CaWO ₃	CaWO ₃	-117	^f 7192
CaWO ₄	CaWO ₄	-223	^f 7192
SrWO ₃	SrWO ₃	-144	^f 7192
SrWO ₄	SrWO ₄	-251	^f 7192
SnWO ₄	SnWO ₄	-192	^f 7192
Sn ₂ WO ₅	Sn ₂ WO ₅	-252	^f 7192
Re	Re	189	7001
Re ₃ Cl ₉	Re ₃ Cl ₉	-140	7212
Re ₃ Br ₉	Re ₃ Br ₉	-70	7212
Os	Os	189	7140
OsO ₃	OsO ₃	-67.8	7140
OsO ₄	OsO ₄	-80.6	7140
Ir	Ir	159.0	7140
IrO	IrO	104	^(b)
IrO ₂	IrO ₂	48.5	^c 7199
IrO ₃	IrO ₃	1.9	7140

Appendix 1. Heats of Formation Used in Tables 1 and 2—Continued

Formula	Description	$\Delta H_{f298}^\circ(g)$ (kcal mol ⁻¹)	Reference
Hg	Hg	14.652	7004
C ₂ H ₆ Hg	(CH ₃) ₂ Hg	26.1	7001
C ₄ H ₁₀ Hg	(C ₂ H ₅) ₂ Hg	25.1	7001
C ₆ H ₁₄ Hg	(iso-C ₃ H ₇) ₂ Hg	12.54	(i)
C ₈ H ₁₈ Hg	(n-C ₄ H ₉) ₂ Hg	5.38	(i)
CH ₃ HgCl	CH ₃ HgCl	−12.08	7213
Tl	Tl	43.55	7007
TlCl	TlCl	−16.2	7007
TlBr	TlBr	−9.0	7007
TlI	TlI	1.7	7007
Pb	Pb	46.6	7007
PbH ₄	PbH ₄	64	^a 7181
PbO	PbO	17.1	^c 7171
Pb ₂ O ₂	Pb ₂ O ₂	−29.2	^c 7171
Pb ₃ O ₃	Pb ₃ O ₃	−75.1	^c 7171
Pb ₄ O ₄	Pb ₄ O ₄	−134	^c 7171
PbS	PbS	31.7	^c 7007, 7238
Pb ₂ S ₂	Pb ₂ S ₂	18.6	^c 7238
PbCl ₂	PbCl ₂	−50.6	7001, 7007
C ₄ H ₁₂ Pb	(CH ₃) ₄ Pb	32.48	7007
Bi	Bi	49.5	7007
Bi ₂	Bi ₂	52.5	7007
BiH ₃	BiH ₃	65	^a 7181
BiS	BiS	43	7007
C ₁₈ H ₁₅ Bi	triphenylbismuth	119.6	7117
U	U	125	7001
UO	UO	6	^f 7200
UO ₂	UO ₂	−96	^f 7200
UO ₃	UO ₃	−189	^f 7200

^a Calculated from appearance potential data.

^b Calculated from average or estimated bond energies.

^c Calculated from measured heats of combustion, reaction, etc.

^d Calculated using estimated heats of vaporization, sublimation, etc.

^e Average value.

^f Calculated from atomization energies.

^g Calculated using group equivalents.

^h Calculated using group equivalents from appendix 2.

ⁱ Calculated using measured heats of formation and group equivalents from appendix 2.

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*Note that the numbering is not continuous and should cause no concern.

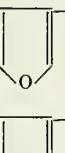
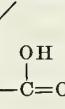
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9. Appendix 2. Table of Group Equivalent Values

Certain of the heats of formation in appendix 1 were estimated by the method of Franklin.^a The group equivalent values used are listed here.

Group equivalent values for ΔH_f of ideal gas at 298 K, kcal mol⁻¹

Group	ΔH_f	Group	ΔH_f	Group	ΔH_f
$-\text{CH}_3$	-10.12		23		-79.8
$\diagup \text{CH}_2$	-4.93			$-\text{C}=\text{O}$	5.7
$\diagup \text{CH}$	-1.09		35	$-\text{SH}$	11.6
$\diagup \text{C}-$	0.80			$-\text{S}-$	10
$-\text{HC}=\text{CH}_2$	15.00			$-\text{S}-\text{S}-$	
$\diagup \text{HC}=\text{CH}$ (trans)	17.83		-6	$-\text{NH}_2$	2.8
$\diagup \text{HC}=\text{CH}$ (cis)	18.88		-4	$\diagup \text{NH}$	12.0
$\diagup \text{C}=\text{CH}_2$	16.89			$\diagup \text{N}-$	19.2
$\diagup \text{HC}=\text{C}\diagdown$	20.19		-45	$-\text{ONO}$	-10.9
$\diagup \text{C}=\text{C}\diagdown$	24.57		-10	$-\text{NO}_2$	-8.5
$=\text{CH}_2$	6.25		2	$-\text{ONO}_2$	-18.4
$=\text{C}=$	33.42		15	$-\text{CN}$	29.5
$-\text{C}\equiv\text{CH}$	54	$-\text{OH}$ (primary)	-41.9	$-\text{NC}$	44.4
$-\text{C}\equiv\text{C}-$	54	$-\text{OH}$ (sec.)	-44.9	$\overset{\cdot}{\text{C}}=\text{NH}_2$	-44
		$-\text{OH}$ (tert.)	-49.2	$-\text{NCS}$	41
		$-\text{OH}$ (phenol)	-46.9	$-\text{SCN}$	48
	22	$-\text{OOH}$	-21	$-\dot{\text{C}}_2$	34
	24	$-\text{O}-$	-27.2	$-\text{O}\cdot$	8
		$-\text{O}-\text{O}-$	-24	$-\text{O}-\text{O}\cdot$	8
		$-\text{HC=O}$	-33.9	$-\text{S}\cdot$	43
			-31.6	$-\overset{\cdot}{\text{C}}=\text{O}$	0
	23	$-\overset{\text{O}}{\text{C}}=\text{O}$	-94.6	$-\overset{\cdot}{\text{O}}\text{C=O}$	-35
		$-\overset{\text{O}}{\text{C}}=\text{O}$	-74	$-\overset{\cdot}{\text{N}}\text{H}$	47
				$-\overset{\cdot}{\text{N}}$	54

Correction factors for—

C_5 cycloparaffin ring.....	5.68
C_4 cycloparaffin ring.....	18.4
C_3 cycloparaffin ring.....	24.22
Adjacent $\begin{array}{c} \diagup \\ \text{C} \end{array}$ and $\begin{array}{c} \diagup \\ \text{CH} \end{array}$ groups.....	2.5

3 adjacent $\begin{array}{c} \diagup \\ \text{C} \end{array}$ groups	2.3
2 adjacent $\begin{array}{c} \\ \text{C} \end{math}—$ groups.....	5.4
Resonance of radical with one $\text{C}=\text{C}$ bond or aromatic ring.....	-19
Resonance of radical with 2 $\text{C}=\text{C}$ bonds or aromatic rings.....	-30
Resonance of radical with 3 $\text{C}=\text{C}$ bonds or aromatic rings.....	-39

^a J. L. Franklin, Ind Eng. Chem. **41**, 1070 (1949); J. Chem. Phys. **21**, 2029 (1953).

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