NATIONAL BUREAU OF STANDARDS REPORT

6928 (#4)

Preliminary Report on the Thermodynamic Properties of Selected Light-Element Compounds

(Supplement to NBS Reports 6297, 6484, and 6645)

1 July 1960

NBS

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

THE NATIONAL BUREAU OF STANDARDS

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Fourth Technical Summary Report
to the Advanced Research Projects Agency
on the Thermodynamic Properties
of Light-Element Compounds

Reference: ARPA Order No. 20-60

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ABSTRACT

A fourth report is presented on the current extensive investigation, at the National Bureau of Standards, of the thermodynamic properties of light-element compounds (principally those of Li, Be, Mg, and Al with H, O, F, Cl, N, and C). This supplements the first three reports (NBS Reports 6297, 6484, and 6645), which were dated 1 January 1959, 1 July 1959, and 1 January 1960 respectively. The present report discusses the status of the program, additional literature survey and analysis, and some new data recently determined at the Bureau. The text of the first three reports is not repeated. However, standard heats of formation and thermodynamic functions are tabulated for all substances so tabulated in the earlier three reports. Many of these new values are revised ones based on additional results reported in the literature or on more accurate methods of computation. All such tables in the earlier reports are thus superseded.

The status of the work of each NBS group in the program is summarized in considerable detail, in terms of accomplishments during the past year and plans for the coming year. Discussions of selected subjects follow. Methods of preparing the carbides and nitrides of Li, Be, Mg, and Al are comprehensively covered. New NBS-determined experimental values are given for the heats of formation of $LiClO_4$, $NaClO_4$, NH_4ClO_4, and $BeCl_2$. Some recently published data on the vaporization of light-metal oxides are discussed.

Three appendices include a complete set of revised tables giving values for those properties necessary to determine completely the thermodynamic behavior, up to high temperatures, of the substances covered. All earlier tables of ideal-gas thermodynamic functions of the monatomic and diatomic gases were recomputed using revised molecular data, with in addition new tables for Al_2, AlH, and AlS. In all these cases the changes are minor below 2000°K, but somewhat larger at higher temperatures for those monatomic gases having low ionization energies and for the diatomic gases. The tables for the polyatomic gases were recomputed only in two cases (AlF_2 and $AlCl_2$), where obvious errors in multiplicity had occurred. The table of thermodynamic functions of the condensed phases of AlN, as well as the standard heats of formation of several substances, were revised in the light of new data.

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

Page

APPENDIX B. THERMODYNAMIC FUNCTIONS OF SOLIDS AND LIQUIDS (Continued)

APPENDIX C. HEAT OF FORMATION AND DISSOCIATION ENERGY
(G. T. Armstrong, H. W. Woolley, W. H. Evans, and L. A. Krieger)

PART A

SUMMARY OF RESEARCH ACCOMPLISHMENTS AND PLANS FOR FUTURE WORK

INTRODUCTION

The rapid development of chemically propelled rocket systems during the past few years has sharply called to attention the wide gaps in our knowledge of the thermodynamic properties of a great many light-element compounds. The background of basic data has been particularly deficient in the case of such substances containing the more metallic light elements. A large number of industrial, university, and government laboratories has cooperated in the various phases of research to supply the missing information, and no one of them has contributed a predominant share of the aggregate results.

Because of its background in making accurate physical measurements and in issuing selected values of chemical thermodynamic properties, the National Bureau of Standards undertook an experimental and theoretical investigation of boron compounds in 1953. In 1958 a new program was begun in which this work was extended to aluminum, beryllium, lithium, and magnesium, free and in combination with one or more of the elements fluorine, chlorine, oxygen, nitrogen, carbon, and hydrogen. Though this description includes an enormous number of possible organometallic and other relatively high-molecular-weight compounds, the current program at the Bureau is focused mainly on the simpler compounds of these elements. The objective is to secure the basic information which is necessary to determine, with an accuracy of one percent or better where possible, the energies and equilibrium proportions of these substances in the solid, liquid, and gaseous states in the temperature range from 0° to 6000°K and the pressure range from 0 to 100 atmospheres.

The phases of the program and activities of the various research groups concurrently involved may be summarized as follows.

I. Tables of Standard Heats of Formation and Thermodynamic Functions

- (a) Literature survey and critical data analysis
- (b) Estimation of missing molecular constants
- (c) Computation of tables of thermodynamic functions
- (d) Revision of tables when necessary

II. Hydride Studies and Other Chemical Preparation

- (a) Provision of samples suitable for measurement of properties
- (b) Studies of hydrides

III. Heat Measurements on Solids and Liquids

1. Thermochemistry
2. Fluorine calorimetry
3. Low-temperature calorimetry
4. High-temperature calorimetry

IV. High-Temperature Measurements Involving Gases

1. Vaporization of refractory substances
2. Vaporization of halides
3. High-temperature microwave spectroscopy
4. Light-element equation of state

The program began with a concentrated effort by all groups to accomplish what is described above as phase I, with the issuance of critical values and tables which in some cases must be regarded as provisional because more accurate underlying data are needed. The results of the program have been given at six-month intervals in the form of so-called Technical Summary Reports. The first two reports (NBS Reports 6297 and 6484 respectively) were devoted almost entirely to the free metals Al, Be, Li, and Mg and their fluorides, chlorides, oxides, hydroxides, and hydrides. Though both reports included non-overlapping critical discussions of the underlying data, the end product was tabulated completely in the second report, in the form of heats of formation and dissociation energies of 96 substances (other than a few nitrides and carbides also included) and thermodynamic functions for 65 gases and 27 solid (and liquid) phases. The third report (NBS Report 6645) covered similarly the nitrides and carbides of the above four metals and Ti, and gave standard heats of formation for 15 substances as well as 14 tables of thermodynamic functions. Because of the present very limited knowledge of the molecular constants of the corresponding nitride and carbide gas species, no attempt has yet been made to compute their thermodynamic functions.

As the program got underway two years ago, the various types of measurement to be undertaken were planned. With some exceptions, apparatus was already available for the different types of heat measurements (phase III), and it remained only to acquire suitable samples and find the special conditions of measurement invariably dictated by the unique character of each new substance investigated. On the other hand, for the gas measurements (phase IV) new apparatus had to be designed, procured or built, and tested; this work is now in various advanced stages of completion which should lead to the production of considerable data within the next year. The thermodynamic tables for compounds of light metals, as originally planned, are now essentially complete except for future revisions based on whatever better data and better computer codes become available.

Details of program status and plans were summarized in the second report issued a year ago. The literature survey had helped to reveal where new data were most needed. The developments of the past year have justified a careful reappraisal of program plans in the light of what are presently regarded as the greatest practical priorities, greatest lack of adequate existing data, and probable ability for definitive accomplishment with the expected available facilities. Details for each of the research groups are given below in terms of

(a) The relation of its task to the overall program
(b) Accomplishments during the past year
(c) Plans to the end of the third year of the program (fifteen months hence)

A future report on the current NBS program, probably within the next year and a half, is planned which will combine and bring up to date all material of the reports issued up to that time.

I. TABLES OF STANDARD HEATS OF FORMATION AND THERMODYNAMIC FUNCTIONS

Spectroscopic data need to be examined and properly used to provide dependable constants for calculation of the ideal-gas thermodynamic functions and relevant dissociation energies for the various gaseous species formed at high temperature. Calculations of thrust yields require a knowledge of the chemical compositions of the reacting systems as functions of temperature and pressure, and the energies involved in the reactions. These calculations make possible the determination of the types of materials that will be most satisfactory and establish the limits of performance.

During the period July 1, 1959 to June 30, 1960, two separate studies have been made relevant to spectroscopic constants. (1) In one, a brief study of an empirical prediction rule (Lippincott's) was made, giving estimated dissociation energies, bond lengths and vibrational frequencies for diatomic molecules theoretically possible among the eighteen bonding elements following hydrogen and extending to titanium. Various discrepancies from known values were noted. (2) In a second study, references on diatomic molecules relevant to the present light-element program have been systematically examined to permit use of the latest spectroscopic data available so as to arrive at present best values of molecular spectroscopic constants. Relatively few and minor changes in the accepted constants for molecules of principal interest have resulted.

The thermochemical data on the oxides, hydroxides, fluorides, chlorides, nitrides, and carbides of Li, Be, Mg, and Al were reviewed and a table of "best" values assembled. Codes were developed for machine calculation of ideal-gas thermodynamic functions for atoms, diatomic molecules, and linear and non-linear polyatomic molecules, including second-order corrections. These were used to calculate thermodynamic functions for a large number of molecules of interest.

Abstracting thermochemical and thermodynamic data from the scientific literature was continued.

The survey of relevant diatomic molecular constants will be concluded in the immediate future. The thermochemical data for compounds of the elements of interest will be kept up to date, and reviewed in about a year. The data on the boron compounds will be similarly treated. Thermodynamic functions will be calculated as molecular data become available. Abstracting of data from the literature will be continued, with the eventual aim of a revised edition of NBS Circular 500, "Selected Values of Chemical Thermodynamic Properties."

II. HYDRIDE STUDIES AND OTHER CHEMICAL PREPARATION

Background: In order to supply samples that are either not available or unobtainable in the desired purity, a group in "Chemical Preparation and Purification" was set up in the Molecular Kinetics Section. In addition, owing to the experience of this group in handling organometallic compounds, the group was assigned the further task of studying the various important light metal hydrides, principally those of aluminum and beryllium. The work on beryllium hydride has centered about the study of means of synthesis and of analysis of the product. Since several other laboratories are engaged in the attempted synthesis of aluminum hydride, it was deemed more practical that this group should study the equilibrium properties of certain complexes of aluminum hydride. The study of hydrides has received the greater effort, while the preparation and purification aspects have been pursued at the request of the heat measurement groups.

Statement of work done from July 1, 1959 to June 30, 1960: The work of this group has proceeded along two broad lines: (a) the synthesis and characterization of beryllium hydride, and (b) the study of equilibria involving the complexes of aluminum hydride. In addition, studies have been made on methods of purification of compounds needed by other groups, and literature studies in anticipation of future syntheses.

The synthesis of beryllium hydride has been based entirely on the pyrolysis of di-t-butylberyllium dietherate. The direct synthesis from the elements was rejected since theoretical and experimental work done elsewhere made this approach seem unfruitful. An apparatus has been built such that once the Grignard reagent is prepared and the beryllium chloride added the di-t-butylberyllium and the beryllium hydride are handled in a closed system. It was found impossible to pyrolyze the t-butylberyllium dietherate under a high vacuum since the liquid bumped and refluxed violently, which prevented the material from reaching pyrolysis temperature. The technique was developed whereby the organometallic was heated gradually under about 60 mm Hg pressure of nitrogen until the liquid began to gel; at this point the temperature was raised slowly to 200°C under vacuum to produce the porous beryllium hydride. This product was then pumped at 125°C for about a week. By this means, samples of beryllium hydride of 80 to 85 wt. percent purity were obtained consistently. In anticipation of the needs of the heat measurements groups a larger apparatus of this type has been built and tested. A small experiment is in progress to prepare ether-free t-butylberyllium and to compare the beryllium hydride obtained therefrom with material from the etherate.

In addition to the synthesis, the problem of assay and analysis of beryllium hydride has been studied by both hydrolysis and pyrolysis methods. Both methods were carried out in the same apparatus, which makes use of a Toeppler pump. These studies were conducted on beryllium hydride prepared six months ago. The beryllium hydride content is now down to 72% (wt.) as compared to over 80% (wt.) immediately after preparation. This difference may or may not be attributed to the more accurate method of analysis. Some gas chromatography studies have been made on the gaseous products from decomposition. The products that have been identified other than hydrogen are isobutane (the majority of the condensable gases), ethane, propane, ethylene and carbon dioxide. The analytical data are being studied to make some interpretation of the mechanism by which these products are formed.

The vapor pressure and dissociation studies of aluminum hydride - trimethylamine complexes were continued. The data reported in the last semiannual report were rechecked using a more sensitive cathetometer for pressure measurements. Good agreement was found with the data for the vapor pressure of $AlH_3 \cdot 2NMe_3$. The previously reported equation

$$\log p_{mm} = - \frac{3.230}{T} + 11.15 \quad (20°\text{-}60°C)$$

fitted the new data very well. The value for the heat of sublimation can now be expressed with a deviation of only about 1% ($\Delta H_{subl} = 14{,}800 \pm 150$ cal/mole).

The vapor phase dissociation measurements were also repeated with the more sensitive pressure-reading device. These data, however, showed considerable deviations from those reported previously. Furthermore several measurements on fresh samples showed definite inconsistencies. The conclusions drawn from these results as well as the previous results are that the equilibrium processes in the vapor phase are not correctly expressed by the equation

$$AlH_3 \cdot 2NMe_3\ (g) \rightleftharpoons AlH_3 \cdot NMe_3\ (g) + NMe_3\ (g).$$

The basis for this conclusion is the fact that the values of the equilibrium constants appear to be dependent on the initial pressure of the sample. The measurements, however, indicated that the processes occurring are reversible and it is therefore likely that additional equilibria are occurring in the vapor phase over the temperature range (60-90°C) measured. Such equilibria might be the following:

$$2\ AlH_3 \cdot NMe_3\ (g) \rightleftharpoons (AlH_3 \cdot NMe_3)_2\ (g)$$

$$2\ AlH_3 \cdot NMe_3\ (g) \rightleftharpoons (AlH_3)_2 \cdot NMe_3\ (g) + NMe_3\ (g)$$

To elucidate these possibilities vapor phase measurements of the monoamino complex $AlH_3 \cdot NMe_3$ were undertaken. However, probably due to impure samples no reliable data could be obtained so far. Work is presently in progress to prepare freshly purified samples of this compound and to repeat the measurements.

Future plans from July 1, 1960 to September 30, 1961: The synthesis of beryllium hydride by the above method has been perfected to the point that it may be supplied to the heat measurement groups on demand. Therefore, during the coming 15 months the research will be directed toward better techniques of analysis and new, more-unique methods of preparation of the light metal hydrides. These methods will include beam and flow techniques, and particularly, the reduction of metal alkyls with atomic hydrogen. The equilibrium, vapor-phase decomposition studies of the aluminum hydride complexes will be continued. The decomposition rates of other prepared hydrides and their complexes will be studied.

It is expected that more time will be spent in close support of the heat measurement groups. This will involve synthesis and/or analysis of various light-element compounds which are not available on the market in sufficient purity to allow definitive determinations of their thermal properties.

III. HEAT MEASUREMENTS ON SOLIDS AND LIQUIDS

1. Thermochemistry

The objective of this experimental phase of the program is to determine experimentally the heats of formation of the hydrides, halides and related compounds of the light elements of interest to the sponsor. The thermochemical properties of compounds of lithium, beryllium and other light metals are necessary for any evaluation of these materials as energy sources.

Calorimetric Measurements During the Past Year: The following heats of formation were determined by solution calorimetry:

$LiClO_4(c)$, $\Delta Hf°$ (25°C) = -90.89 kcal/mole

$NaClO_4(c)$, " = -91.48 "

$NH_4ClO_4(c)$, " = -70.74 "

These values are based on -103.22 kcal/mole for the heat of formation of $KClO_4(c)$ and on the values given in NBS Circular 500 for the heats of formation of KCl, LiCl, NaCl, and NH_4Cl.

A single experiment was performed on a crude sample to determine the feasibility of measurement of the heat of hydrolysis of aluminum hydride in dil. HCl by solution calorimetry. The reaction, although extremely rapid, was not satisfactory; the metallic aluminum which was formed initially required an excessive amount of time for complete solution. No further samples have been available.

A sample of high-purity beryllium metal was obtained from the Brush Beryllium Corp. Attempts to measure the heat of reaction with chlorine in an existing reaction vessel were not successful since this vessel was designed for operation below 300°C. A new vessel was constructed which was capable of higher temperatures. It was found that the reaction proceeds quite rapidly at temperatures above 350°C. The main difficulty was determination of the amount of reaction, which was not complete in any case. Since the group was unable to determine accurately the quantity of unreacted metal, they measured instead the amount of chloride in the solution of the reaction products. They obtained -118.03 kcal/mole for the standard heat of formation of $BeCl_2(c)$ corrected to 25°C.

Preliminary experiments on BeH_2 indicate that the reaction with aqueous acid is too slow for calorimetric measurement. Other experiments indicate that the thermal decomposition method is feasible, providing that a sufficiently pure sample can be obtained. The decomposition appears to be complete at about 350°C.

Future Plans: Calorimetric measurement of the heat of decomposition of BeH_2 into metallic beryllium and gaseous hydrogen will be undertaken. The accuracy of the heat of formation, however, will depend upon the purity of the sample obtained.

The determination of the heat of formation of Be_3N_2 by combustion of the metal in a nitrogen atmosphere will be attempted. This will be followed by measurements of the heats of combustion of Be_3N_2 and of Be metal in oxygen. Similar methods will be used for the heats of formation and combustion of AlN and for the heat of combustion of Al_4C_3.

Various methods are being considered for measurement of the heat of formation of LiH and some preliminary work will be done in an effort to devise a suitable procedure for calorimetric measurement.

2. Fluorine Calorimetry

Background: The preliminary studies of the status of heats of formation of compounds of the light metals, carried out in the early stages of this project, revealed a particular deficiency among the fluorine compounds. In view of the past experience of this group in fluorine flame calorimetry it was considered feasible and desirable to undertake bomb calorimetry with fluorine in order to establish with greater definiteness the heats of formation of the metal fluorides of this group.

The heat of formation of $AlF_3(c)$ was reported in NBS Circular 500 to be -311 kcal/mole, a value derived many years ago from several measurements of heats of reaction in solution and the heat of solution. The accuracy of this value was cast in doubt by a study of the dry reaction between Al and PbF_2 which led to a value of -356.3 kcal/mole for the heat of formation of AlF_3, a value later further confirmed by other studies by the same workers. The error in the earlier measurements could be attributed to the very slow establishment of equilibrium between crystalline phases of AlF_3, its hydrates, and their solutions, and perhaps to heat effects of the formation of complex ions in solution, of which account was not properly taken.

Besides indicating a need for an independent study of AlF_3, the errors found in the early solution calorimetry suggested also the possibility of similar errors existing in the data on other salts which had only been studied in their aqueous solutions. Of immediate concern in this context is beryllium fluoride.

Statement of Work Done from July 1, 1959 to June 30, 1960:

1. Aluminum Combustion in Fluorine: A large effort has been made to develop satisfactory practices for fluorine bomb calorimetry and to cause aluminum to burn completely and reproducibly in fluorine. The difficulties which have been found fall in three groups as follows: (a) the participation of interior parts of the bomb in the combustion process, (b) breaking or reaction of crucible materials and (c) failure of the sample of aluminum to burn completely.

Using either a monel or an "A" nickel bomb, little trouble has been found in the handling of fluorine itself, the only accident being the premature firing of the bomb contents on one occasion, apparently caused by an impurity in one of the valves. In early experiments the bomb process was found to cause severe corrosion of monel electrodes and to cause superficial corrosion of the bomb wall in spots touched by burning materials. It has been found possible to prevent attack on the electrodes by using massive aluminum electrodes supported by nickel rods, and a nickel baffle a short distance above the reaction zone. A bomb liner of "A" nickel is used to protect the bomb walls from damage by falling pieces of ignited aluminum.

A variety of crucible materials have been tested. In general, fluorides are low melting and have poor thermal shock resistance and have therefore been found to be unsatisfactory. Oxides either react or melt. Platinum melts and reacts. A fairly massive aluminum crucible with a firmly attached lid has been found to be more satisfactory than any other crucible material tried.

Complete combustion has not been achieved with aluminum metal in any form. Foil, shredded foil, powder and lathe turnings of aluminum and pellets of aluminum mixed with teflon have been tried. It has not been found possible to burn any large pieces of aluminum. High thermal conductivity of the metal combined with melting which causes the metal to agglomerate tend to cause the flame to go out. Large pieces are also very difficult to ignite. Shredded metal burns readily, but is difficult to support in such a way that no pieces fall from the reaction zone and are extinguished and no melting and agglomeration occur. Very fine aluminum turnings (~0.001 in. thickness) volatilize so rapidly that a substantial part, incompletely oxidized, condenses and disproportionates to Al and AlF_3. A mixture of teflon and aluminum gives a larger fraction of combustion than other methods tried, but a small amount of unburned carbon also remains.

Aluminum fluoride was found to form to the exclusion of aluminum oxide when aluminum is burned in an equimolar mixture of oxygen and fluorine, in excess. The compound AlOF was not found among the products.

From observations of the combustion, the reaction appears to occur at least partly in the gas phase. Because of the formation of the product as a powder on all the bomb walls, and the occurrence of dark flakes of product on the massive surfaces nearest to the reaction zone, it appears that AlF must form first in the gas phase. By further reaction this leads to AlF_3 which condenses on the walls. Some AlF, however, strikes cold surfaces and disproportionates without undergoing further oxidation.

2. Construction of Rotating Bomb Calorimeter: A rotating bomb calorimeter was constructed using the plans of the Bartlesville-Argonne calorimetry groups. Some assembly of the calorimeter and parts of the associated test station remains to be done.

3. Literature Studies: Studies of the literature on heats of formation of many light-element compounds were kept current and revisions made in several of the values selected previously.

Program Plan for Future Work: The program plan for the 15 months (July 1, 1960 to September 30, 1961) is to continue combustion calorimetry work already in progress and extend the work to several additional reactions. The combustion studies on aluminum in fluorine will be completed. While it is difficult to establish termination dates for studies for which unresolved problems remain, it is estimated that the study of the heat of formation of aluminum fluoride will be completed by December 31, 1960. The group estimates that studies of the method and degree of completeness of reaction will be completed by October 1, 1960, and that measurements of the heat of reaction will be completed by the end of the calendar year. The fluorine bomb calorimetry will be continued with a study of the heat of combustion of beryllium metal in fluorine. It is estimated that for this work, exploratory studies will have been completed by July 1, 1961, and that the study will be completed by October 1, 1961.

Completion date of the rotating-bomb-calorimeter measuring station should be about July 31, 1960. This calorimeter will be used for reactions involving an aqueous solution phase for which homogeneity is required. Studies of heats of formation in the AlF_3 hydrate and hydrofluoride system are being considered.

3. Low-Temperature Calorimetry

The low-temperature heat-capacity phase of the program has been concerned in the period July 1, 1959 to June 30, 1960, with further literature search and analyses involving carbides and nitrides of metallic elements of the first two rows of the periodic chart, with possible methods of preparation and sources of procurement of substances of interest that lack thermodynamic data, with the installation and testing of equipment for handling these substances, and with thermodynamic measurements. The survey of the literature on carbides and nitrides has revealed that low-temperature heat-capacity measurements have been made on very few of these compounds. There are, however, available estimates of the entropy. The substances considered were: Li_2C_2, Be_2C, B_4C, Na_2C_2, Mg_2C_3, MgC_2, Al_4C_3, SiC, TiC, Li_3N, Be_3N_2, BN, Na_3N, Mg_3N_2, AlN, Si_3N_4, TiN, and Ti. Low-temperature heat-capacity measurements were found on B_4C, SiC, TiC, BN, TiN and Ti. The data on TiC, TiN, and Ti were analyzed in preparation for the calculation of tables of thermodynamic functions referred to elsewhere in this report. Since the issuance of the NBS Report 6484 new low-temperature heat-capacity data have become available on Li, LiCl, and $AlCl_3$. Analyses of these data are in progress.

Sources and possible methods of preparation of some of the substances of interest have been investigated. Only the more recent references have been examined. This study is discussed in another chapter of this report.

Although sufficient sample of BeO was used to have about 60 percent of the gross heat capacity at room temperature, the heat capacity of BeO decreases to about 4 percent of the gross at 15°K. Considering the decreased sensitivity of the thermometer, the accuracy of the heat-capacity measurements at 15°K is expected to be at best 0.3 to 0.4 percent. Therefore the heat capacity of BeO will be uncertain by about 10 percent at 15°K. Very careful repeat measurements have been made below 50°K to obtain the maximum accuracy. Thermodynamic functions obtained from the results of the measurements will be given in a later report.

Measurements on $LiAlH_4$ have been started recently and it is expected that measurements on LiH will be started soon. Chemical analyses are being made on samples of BeF_2 and $BeCl_2$ in order to determine whether these samples are suitable for heat measurements. A sample of $Be(OH)_2$ is undergoing study to determine the conditions suitable for drying. The present sample contains stoichiometrically slightly more water than corresponds to the formula $Be(OH)_2$. Samples of AlN and Al_4C_3 are expected to become available soon for heat measurements. The preparation of Li_3AlF_6 is being investigated.

4. High-Temperature Calorimetry

The function of this experimental task is to measure accurately the heat contents of solids and liquids from room temperature up to 1800°K. The data yield heat capacities and heats of fusion and transition, properties which, when combined with entropies derived from low-temperature heat capacities, form the basis of subsequent computation of tables of thermodynamic functions of the condensed states. In turn, such tables increase the reliability with which high-temperature heats of reaction and equilibria involving these substances can be computed.

The "drop method" is used, and two apparatuses are currently available: (a) The first has been in operation for many years, but is limited to the temperature range 273° to 1200°K; (b) the second, in the later stages of testing, is applicable over the temperature range 273° to 1800°K, but was designed specifically for temperatures above 1200°K. In the program covered by this report, attention is directed to measuring light-element compounds for which good data are lacking. Attempts are made to procure the purest samples available and to have them analyzed chemically and spectroscopically as a basis for correcting the data for any appreciable amounts of impurities.

During the past year the first apparatus has been idle because of the priority of other phases of the work. The second apparatus (that designed to measure up to 1800°K) has undergone extensive tests principally in an effort to determine reproducibly and accurately the temperature of the sample, which is commonly the major source of error in this type of calorimetry. Since the thermocouples to achieve this must read the temperatures of the surrounding wall rather than be attached directly to the falling sample, provision was made to reduce considerably the space between the two and thus to reduce the temperature discrepancy caused by heat transfer inside the furnace, which cannot entirely be avoided. To aid in surrounding the sample with a constant and uniform temperature environment, the furnace heaters were attached to automatic temperature controls, but the latter are capable of greater sensitivity than tests thus far have shown.

During the next fifteen months it is planned to measure the high-temperature heat capacities of aluminum nitride (AlN) and lithium aluminum fluoride (probably the composition Li_3AlF_6), first from 300° to 1200°K and later, using the new apparatus, above 1200°, and as high as 1800°K if practical. A sample of Al_4C_3 is now available, and it too may be measured. New data on (unsintered) AlN, discussed elsewhere in this report, have recently become available. However, some measurements on a sintered sample would afford a useful comparison. In the case of Li_3AlF_6 no data are known to exist; although the true values may not be far from those calculated additively from the published values for LiF and AlF_3, the assumption of additivity would at best be only a rough approximation, particularly since the ternary salt probably begins to dissociate appreciably into other components at higher temperatures. Subsequent heat-content measurements on lithium hydride (LiH) to well above the melting point (960°K) are planned.

However, studies elsewhere have shown that the phase composition and decomposition pressure of this substance are highly sensitive to small amounts of impurities such as lithium metal. Consequently, the advisability of undertaking measurements on this substance appears to rest on the ability to obtain a highly pure sample, or at least one which is well defined chemically and thermodynamically.

IV. HIGH-TEMPERATURE MEASUREMENTS INVOLVING GASES

1. Vaporization of Refractory Substances

The experimental program of this group is concerned with vaporization reactions involving the more refractory light-metal compounds. The oxides, nitrides, and carbides of Aℓ, Be, and Mg are being given particular attention, with initial emphasis being placed on the oxides. Those reactions between condensed phases and foreign gases which yield volatile products are being considered in addition to those which involve simple sublimation or evaporation *in vacuo* or neutral conditions.

The classical experimental techniques for studying the reactions are adaptations of the Knudsen effusion, the Langmuir, and the transpiration methods. The difficulties of using these techniques at temperatures above about 1800°K have resulted in much of the uncertainty in the existing data. Furthermore, the problem of selecting non-reactive containers and furnace components and the inability to write down the precise equations for the reactions observed has made it difficult to obtain unambiguous results even under neutral or vacuum conditions. Under oxidizing or aqueous conditions the experimental problems become much greater.

The experimental program based on the classical techniques has, therefore, been restricted to a number of limited objectives. First, using the Knudsen method, the aim is to repeat the measurements of the vapor pressure of aluminum oxide and to avoid or otherwise evaluate possible sources of experimental error which previous investigators have thought to be significant. Secondly, a microbalance technique based on the Langmuir method is being adapted for use with non-metals, and in particular with Al_2O_3.

A third approach is based on the use of image furnace techniques in an attempt to obtain data on the vaporization of Al_2O_3 in chemically pure conditions and in aqueous or other atmospheres. A major difficulty with this approach is the accurate measurement of temperature.

The Langmuir method and some of the techniques based on image furnaces determine rates of vaporization only, and a knowledge of the coefficient of vaporization is necessary to convert the rates to equivalent equilibrium pressures. Additional experiments can be undertaken to determine the coefficient, or the coefficient may be computed by comparing the nonequilibrium data with that obtained by the Knudsen method. It is, however,

frequently important to know just the rates of vaporization, for with chemical systems which involve vapor species which differ in structural configuration from the molecules of the condensed phase, it is quite possible that kinetic barriers to vaporization exist.

Perhaps the most useful tool for studying the vaporization processes is the mass spectrometer. By these techniques the molecular weight of vapor species can be determined with reasonable assurance, and the only major new uncertainty introduced in the estimation of vapor pressures arises from the uncertainty in ionization cross-section of the gas molecules. A mass spectrometer suitable for high temperature vaporization studies is expected to be available only towards the end of 1960. Because of the excellent potentialities of this approach, it has, however, been decided to proceed with the adaptation of the instrument for the pertinent investigations in the hope that useful information will be acquired in the time that is available.

The following paragraphs summarize in somewhat greater detail the progress that has been made in the experimental program.

Knudsen Effusion Technique. The overall aim of this part of the program is to compare rates of effusion of the equilibrium vapor above Al_2O_3 from tungsten cells with that obtained from rhenium cells. In addition, the aim is to maintain the cells at a uniform high temperature without the use of radiation shields. One of the problems has been to obtain fabricated rhenium cells of suitable geometry. Early delivery of the first of these is now expected from the Linde Company, who have been adapting their plasma-spraying technique to the solution of the problem.

The basic Knudsen cell apparatus has been constructed and tested using tungsten cells. Blank runs with empty cells are now being made, prior to commencing the first measurements with Al_2O_3.

Langmuir, Microbalance Technique. The major difficulties with this technique have been to develop apparatus that would permit the microbalance to operate satisfactorily in an intense R.F. induction field and to develop a furnace design that would not interfere with the free vaporization of non-metals. All major problems with the operation of the balance in vacuum have now been solved, and its reliability has been confirmed by measuring the vapor pressure of platinum, which is fairly well-established. The major outstanding problem with the furnace design is the deposition of vapor (mainly tungsten) from furnace components onto the balance suspension; deposits have not been detected on the sample. At worst, the problem means that an additional weight measurement is necessary to determine how much of the observed changes in weight is due to vaporization of the sample itself. However, modifications in the furnace are being undertaken to help reduce the problem. It is anticipated that in the near future, measurements of the rate of vaporization of alumina in vacuum will be made routinely with this apparatus.

Image Furnace Techniques. Initial, survey-type experiments were carried out with a solar furnace to determine the feasibility of measuring rates of vaporization with image furnaces. An equilibrium constant for the reaction of molten aluminum oxide with water vapor under a pressure of nitrogen gas was derived on the assumption that the rate of weight loss of the sample by diffusion through the gas phase was proportional to the equilibrium vapor pressure. The crude data obtained was not inconsistent with the formation of AlOH gas molecules, but was not conclusive. It was decided to continue the work with an arc-image furnace, and a furnace was purchased. This equipment does not yet meet required specifications, but preliminary measurements on the rate of vaporization of liquid alumina are now proceeding. Two factors, about which there is still some uncertainty, have thus far arisen: The coefficient of evaporization of liquid Al_2O_3 appears to be much higher than expected, and may be close to one; and a possible change of composition of the molten oxide under high vacuum has been observed.

Mass Spectrometer Techniques. Specifications have been prepared and orders have been placed for various items required to adapt the mass spectrometer to high temperature studies. Vacuum pumps of higher than usual pumping speed have been specified in an attempt to operate the instrument with a relatively high pressure inlet system. Initially, electron bombardment heating will be employed. Experiments are currently being undertaken in the group's laboratories to develop a convenient re-imaged incandescent source for heating purposes. A successful furnace of this type would have the same advantages as the image furnace techniques discussed above.

2. Vaporization of Halides

Vapor-pressure measurements of low-to-moderate accuracy have been reported for most of the light-metal fluorides and chlorides such as AlF_3 and $AlCl_3$, and in addition some quantitative data on the gas-phase association of $AlCl_3$ exist. However, it is now known that in systems involving a metallic element and two or more non-metallic ones the convenient assumption that only binary (two-element) species exist in the gas phase is often far from true. Yet in the case of aluminum systems little if any data exist on such multi-element gas molecules, and their abundance under given conditions cannot be predicted with any real reliability.

During the past year detailed plans were developed to study gaseous equilibria which may possibly reflect the existence of ternary molecules (particularly Al-O-F, Al-F-H, and Al-F-Cl species). The plan is to measure the volatility of the less volatile binary aluminum compound in a gaseous atmosphere composed of an inert gas and the more volatile binary compound.

It is anticipated that such volatility data itself would have practical utility, but in addition the data may be interpretable in terms of heats and equilibrium constants of specific chemical reactions. A furnace was designed and constructed in which the platinum-rhodium evaporation cell (designed to block unwanted effusion and radiation) is surrounded by a thick housing of copper metal which, owing to its high thermal conductivity, should facilitate the achievement of temperature uniformity and constancy, with the help of automatic temperature controls. Since copper melts near 1350°K, an alternative housing of nickel metal (which can be used up to above 1700°K) is being constructed. The thermal conductivity of nickel, however, is not nearly as favorable as that of copper.

It is planned that during the next fifteen months a gas-flow system will first be constructed and the apparatus will then be tested, possibly by measuring the vapor pressure of some pure substance for which values are believed to be known already with considerable confidence. Subsequent measurements are to use sublimed $A\ell F_3$; a sample of this material is now on hand but has not yet been analyzed for chemical purity. Some qualitative exploratory measurements are planned on the volatility of $A\ell_2O_3$ in a stream of $A\ell F_3$ vapor, since the volatility should be greater than that in an inert atmosphere if appreciable amounts of aluminum oxyfluoride molecules are formed. Effects due to traces of oxygen-containing contaminants must be allowed for, however, and this fact may seriously limit the sensitivity of these particular experiments. Unless this approach promises worthwhile results by more careful study in the temperature range of the apparatus, it is planned to shift the investigation to the volatility of $A\ell F_3$ in $HF(g)$ and, if time permits, also in $A\ell C\ell_3(g)$. It is difficult to predict to what extent aluminum hydrofluoride species would form under these conditions. But energy and molecular-symmetry considerations make it seem likely that aluminum fluoride-chloride molecules should form in extensive amounts. If both $A\ell F_2C\ell$ and $A\ell FC\ell_2$ are important species, it can be shown possible in principle to calculate from such measurements the thermodynamic properties of both species. However, if gas association is appreciable at these temperatures and pressures, other types of measurement would be needed before the association could be allowed for. Another possible barrier to simple interpretation will arise if equilibrium is reached only after the composition of the condensed phase has changed.

3. High-Temperature Microwave Spectroscopy

The objective of this phase of the program is to design and construct a microwave spectrograph for the study of relatively involatile and refractory substances in the vapor state at elevated temperatures. The molecular structures of many substances which are present in reactions at high temperatures or which are comparatively involatile are either unknown or known only approximately. Microwave spectroscopy is almost the only technique available for the precise determination of bond distances and angles and of dipole moments of molecules which can be studied only at high temperatures.

Considerable effort has been spent on developing and refining the electronic equipment to be used with the high-temperature absorption cell in order to take fullest advantage of the available sensitivity. Various designs for the high-temperature absorption cell were considered. A nickel-cell furnace and vacuum enclosure have been acquired and are undergoing test in preparation for preliminary trial.

During the next year the high temperature microwave spectrograph will be put into operation and tested initially on some alkali and other halides up to its maximum temperature range.

4. Light-Element Equation of State

The overall objective is to determine by experimental measurements the equation of state of the various light elements (Li, Be, Mg, and Al) and their compounds at temperatures between 2000 and 6000°K, and pressures up to 100 atmospheres. The immediate objective is to explore the feasibility of making such measurements on an aluminum-oxygen system brought to the desired range of temperature and pressure by the exploding-wire method. This method involves the explosion of an aluminum wire into an oxygen atmosphere by means of a sudden discharge of electrical energy through the wire.

Under conditions of high temperature, it is difficult to determine the equation of state of a system by steady-state experimental measurements, because of the loss of mechanical strength of the container. Some dynamic or transient method is needed. The present project proposes to explore the exploding-wire method as a possible method for producing a high-temperature and high-pressure environment in local equilibrium so that meaningful thermodynamic data may be obtained. The development of techniques for precision high-speed measurements under extreme experimental conditions forms an important part of this work.

Activity Summary - July 1, 1959 to June 30, 1960. The design and construction of the exploding-wire apparatus were essentially completed by January, 1960. The apparatus consists of a bank of condensers (10 KV, 400 μf, maximum energy storage 20,000 joules), a triggering spark gap, a test vessel, a current shunt and return passage which also serves as a shield for the entire apparatus. Suitable electrical and electronic equipment is used for charging the condenser bank, for firing the triggering spark gap, and for triggering oscilloscopes and other measuring instruments. These various units were tested and were found to function reliably. Since January, therefore, the work has been devoted to the various problems of instrumentation, including pressure, current, voltage measurements, optical and spectroscopic observations for determining the molecular composition, and x-ray absorption measurement for determining the density distribution in the system. These problems are in various stages of completion. Of these, the techniques for pressure and current measurements may be considered as well-developed.

Besides the problems of instrumentation, one of the basic difficulties with the exploding wire method is the achievement of a uniform distribution of the metallic vapor in the vessel. Earlier, it was planned to study this problem in some detail: a) by investigating experimentally the process of vaporization and explosion of the wire as affected by such factors as the energy input, and b) by studying the theoretical and hydrodynamical problem of the flow field produced by the exploding wire and the subsequent diffusion of the metallic vapor into the surrounding gas. However, around the middle of May, a new idea involving the explosion of a finely divided metallic wool instead of a solid wire was developed. Preliminary tests indicated that a wad of wool of an aluminum alloy could be distributed fairly uniformly in the test vessel and exploded in much the same manner as a solid wire. The wool fibers measured approximately 0.001 in. x 0.0005 in., and the bulk density of the wool was approximately 1/400 of the density of the solid wire. These results strongly indicate that as far as the problem of uniform distribution of vapor is concerned, the metallic wool offers a much more favorable configuration than the solid wire. The use of metallic wool, therefore, will be investigated in greater detail.

Plans for Period July 1, 1960 to September 30, 1961. The work in this next period will be a continuation of all phases of the instrumentation work now in progress. In addition, the explosion of the metallic wool will be investigated in detail. This will include the procurement or manufacture of fine fibers in pure aluminum, observation of the explosion by means of a high-speed framing camera, and spectroscopic and other observations for determining the state of homogeneity and the existence of local thermodynamic equilibrium in the test vessel. This is primarily an experimental procedure. If the results should be favorable, then a systematic attempt would be made to measure such thermodynamic properties as are required for the determination of the equation of state of the aluminum-oxygen system.

PART B

PREPARATION AND THERMODYNAMIC PROPERTIES OF LIGHT-ELEMENT COMPOUNDS (SELECTED TOPICS)

CHAPTER 1

PREPARATION OF CARBIDES AND NITRIDES OF LITHIUM, BERYLLIUM, MAGNESIUM, AND ALUMINUM

George T. Furukawa and Larry R. Doyle

Suitable laboratory methods of preparation of the carbides and nitrides of lithium, beryllium, magnesium, and aluminum have been investigated as a part of the program on the literature survey of experimental thermodynamic data of these substances. In this study, the Gmelins Handbuch der Anorganischen Chemie (Verlag Chemie, Berlin) and Nouveau Traité de Chimie Minérale (Masson et Cie., Paris) were freely consulted. Only those references that seemed immediately useful in the laboratory preparation of pure samples were examined. No exhaustive study was necessarily made or intended of all possible methods of preparation, nor any attempt made to determine the first investigator to report a particular method of preparation. In the cases of lithium carbide and lithium nitride, which are not covered in the above compilations, the Chemical Abstracts was searched. The discussion deals first with the carbides, then with the nitrides. References follow the discussion of each compound.

Lithium Carbide (Acetylide), Li_2C_2, 37.902

Lithium carbide, Li_2C_2, reacts violently with water to form acetylene and lithium hydroxide. The carbide may be prepared by the action of acetylene on heated lithium [1]. Guernsey and Sherman [2] reported a procedure for preparing Na_2C_2 by bubbling acetylene through molten sodium at temperatures of 120° to 200°C. A product containing 96.2 percent Na_2C_2, 0.4 percent $NaHC_2$, and 3.4 percent tar was obtained. It is expected therefore that Li_2C_2 without excessive amount of tar may be obtained by bubbling acetylene slowly through liquid lithium maintained a few degrees above the melting point (M.P. = 181°C). In the reaction:

$$2\ Li\ (\ell) + C_2H_2(g) \longrightarrow Li_2C_2(c) + H_2(g), \qquad (1)$$

$$\Delta F°/RT = -64 \text{ [3,4,5] at } 475°K.$$

Lithium carbide has also been prepared by the action of acetylene on lithium dissolved in liquid ammonia [1]. The material obtained by Masdupuy and Gallais [6], by evaporating the ammonia and heating in a vacuum to 120°C, was analyzed to be 82 percent Li_2C_2 and 17.6 percent $LiHC_2$. $LiHC_2$ may be converted to Li_2C_2 and C_2H_2 by heating to about 200°C [1]. Campbell and Campbell [7] found that approximately equimolar mixture of Li_2C_2 and $LiHC_2$ was formed when ammonia was evaporated. Some ammonia of occlusion was found.

Hérold [8] found that lithium vapor reacted with graphite in a tube furnace at about 500°C to form Li_2C_2. An intermediate yellow-gold compound was observed, having the composition LiC_4, that decomposed at 700°C in a vacuum giving off lithium metal.

It seems that the liquid ammonia method used by Masdupuy and Gallais [6] and by Campbell and Campbell [7] would be suitable for preparing Li_2C_2 of fair purity. Occluded ammonia impurity would be expected. The method as used by Herold [8] would be suitable only for very small amounts. A larger sample may be prepared, however, by premixing graphite with lithium and heating to 500°C.

Lithium Carbide References

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Beryllium Carbide, Be_2C, 30.037

Beryllium carbide, Be_2C, the only carbide of beryllium found, has been prepared by the action of lamp black on BeO [1,2,3,4] at temperatures of about 2000°C according to the reaction:

$$2\ BeO + 3\ C \longrightarrow Be_2C + 2\ CO,$$

and by the direct combination of lamp black with Be metal powder at temperatures of about 1000° to 1700°C [4,5]. Above 2100°C the dissociation pressure of Be vapor becomes significant [6]. Since Be as well as Be_2C react readily with nitrogen at the above temperatures, the latter should be removed from the reaction zone. Impurities in the preparation are invariably Be metal, BeO, Be_2N_3, and free carbon. Theodore et al [5] reported a commercial method of preparing Be_2C in quantities up to 140 pounds. The process consisted of reacting, at temperatures of about 1000°C, -200 mesh Be powder with -325 mesh graphite powder (99.8 percent C) compacted in a graphite crucible. The best product contained 0.72 percent BeO, 0.37 percent free C, 0.04 percent N as Be_2N_3, 0.04 percent water, and 60.10 percent Be assay as compared to 60.01 percent theoretical. The method of reacting metallic Be with graphite powder is expected to be the better from the standpoint of lower temperatures involved and the higher-purity product reported.

Beryllium Carbide References

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Magnesium Carbide (Acetylide), MgC_2, 48.342
Magnesium Carbide (Methylacetylide), Mg_2C_3, 84.673

Two carbides of magnesium are known, MgC_2 and Mg_2C_3. On hydrolysis, MgC_2 yields acetylene, while Mg_2C_3 yields methylacetylene. These carbides can not be prepared by heating magnesium or its oxide with carbon at high temperatures [1]. They are both thermodynamically unstable much above 800° to 900°C [1,2,3]. At 1000°K, $\Delta F°/RT = +9$ for the reaction:

$$Mg(\ell) + 2C\ (c) \longrightarrow MgC_2\ (c)$$

and $\Delta F°/RT = +7$ for the reaction:

$$2\ Mg(\ell) + 3C\ (c) \longrightarrow Mg_2C_3\ (c) \quad [4,5]$$

MgC_2 has been prepared by passing acetylene over magnesium powder or turnings heated in tube furnaces [6,7]. Yields of about 30 percent and slightly higher have been obtained around 450° to 500°C [6,7]. Mg_2C_3 up to 8 percent has been found when the reaction was conducted at temperatures of about 700°C [6]. Better yields of about 50 percent of Mg_2C_3 have been reported using n-pentane, n-octane, and other hydrocarbons [6,7]. In these processes, free magnesium and carbon are the major impurities.

Rueggeberg [8] prepared MgC_2 by heating acetylene di-magnesium bromide (Br-Mg-C≡C-Mg-Br) at temperatures from 100° to 450°C according to the reaction:

$$Br\text{-}Mg\text{-}C{\equiv}C\text{-}Mg\text{-}Br \longrightarrow MgBr_2 + MgC_2.$$

When the acetylene di-magnesium bromide was heated at 600°C, the product on hydrolysis yielded methylacetylene. Magnesium bromide would be the added impurity in this preparation. Rueggeberg [8] also prepared MgC_2 by reacting 1,4-dioxane — ethyl ether solution of diethyl magnesium with ethyl ether solution of acetylene. A white precipitate of MgC_2 formed according to the reaction:

$$Mg\ (C_2H_5)_2 + C_2H_2 \longrightarrow MgC_2 + 2C_2H_6.$$

When heated to 400°C, Rueggeberg [8] found the white precipitate to become dark with the elimination of carbon according to the reaction:

$$2\ MgC_2 \longrightarrow Mg_2C_3 + C.$$

On the bases of observations reported by various investigators, it seems pure Mg_2C_3 would be difficult to obtain. Impurities will be MgO, Mg, and C. On the other hand, MgC_2 may be obtained fairly pure by the method of Rueggeberg [8] in which diethyl magnesium was reacted with acetylene to obtain MgC_2.

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Aluminum Carbide, Al_4C_3, 143.953

Aluminum carbide, Al_4C_3, reacts with water to form methane and aluminum oxide, according to the reaction:

$$Al_4C_3 + 6\ H_2O \longrightarrow 4\ Al_2O_3 + 3\ CH_4 . \qquad (1)$$

The carbide has been prepared by the direct combination of the elements at temperatures of 1700° to 1800°C [1,2]. At 1500°K, for the reaction:

$$4\ Al(\ell) + 3\ C(c) \longrightarrow Al_4C_3(c) \qquad (2)$$

$$\Delta F°/RT = -14\ [3,4].$$

The reaction proceeds rapidly above 1500°C, but above about 2200°C the dissociation of Al_4C_3 becomes significantly large [5]. Heim [6] obtained a patent in which the preparation of Al_4C_3 may be carried out at considerably lower temperatures, 900° to 1300°C. The method involves passing a

volatile aluminum trihalide over aluminum powder and lampblack maintained at the above temperature range. A product of 95.8 percent purity was reported. The reaction mechanism postulated by Heim [6] is that the aluminum trihalide reacts with aluminum to form aluminum monohalide which in turn reacts with carbon to form Al_4C_3 and AlX_3, according to the reactions:

$$AlCl_3(g) + 2\ Al(l) \longrightarrow 3\ AlCl(g) \quad \text{and} \tag{3}$$

$$6\ AlCl\ (g) + 3\ C(c) \longrightarrow Al_4C_3(c) + 2\ AlCl_3(g)\ . \tag{4}$$

At 1500°K, for reaction (3), $\Delta F°/RT = +0.5$ and for reaction (4), $\Delta F°/RT = -15$ [3,4]. Earlier, Guntz and Masson [6] reported that both $AlCl_3$ and AlI_3 helped the reaction:

$$6\ Al + 3\ CO \longrightarrow Al_2O_3 + Al_4C_3 \tag{5}$$

to proceed more smoothly, supporting Heim's [5] observations.

Matignon [7,8] found that hexachlorobenzene reacted exothermally with aluminum starting around 225°C, according to the reaction:

$$10\ Al + C_6Cl_6 \longrightarrow 2\ Al_4C_3 + 2\ AlCl_3\ , \tag{6}$$

the relatively more volatile $AlCl_3$ being easily removed.

On the basis of the above information, either Heim's [5] or Matignon's [7,8] method should yield a sample of fair purity. Aluminum oxide impurity should, however, be eliminated from the reaction since aluminum oxycarbide impurity would be formed [9].

Aluminum Carbide References

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Lithium Nitride, Li_3N, 34.828

Nitrogen reacts readily with lithium to form Li_3N. The preparation of a small quantity (about 10 g) of Li_3N is described by Masdupuy and Gallais in Inorganic Synthesis, Volume IV [1]. Lithium metal contained in an iron boat is reacted with purified nitrogen in a tube furnace held at 370° to 450°C. The product is expected to be from 95 to 99 percent pure, depending upon the purity of lithium metal used. The reaction temperature in an iron container should not go above 500°C, since Li_3N reacts with iron above this temperature. Lam and Schafer [2] reported that friable, sintered lithium nitride can be prepared by mixing finely divided lithium metal with lithium nitride and reacting the mixture with nitrogen at 400°C in a tube furnace. A product containing 95 percent Li_3N was obtained.

Lithium Nitride References

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Beryllium Nitride, Be_3N_2, 30.037

Beryllium nitride, Be_3N_2, has been prepared by the action of nitrogen at about 900° to 1100°C [1], or of ammonia at about 1000°C [1,2], on metallic beryllium in tube furnaces. Fichter and Brunner [1] found the product from the Be and N_2 reaction to contain 64.7 percent Be_3N_2, and the product from Be and NH_3 reaction to contain 93.7 percent Be_3N_2. Satoh [2] obtained a product that analyzed 98.13 percent Be_3N_2 when Be powder was reacted with NH_3 stream at 1050°C for 5 hours. Langsdorf [3] reported a method of preparation in which Be metal was reacted with a mixture of N_2 and H_2 between 700° and 1400°C, the optimum reaction mixture being 2 to 6 volume percent H_2. Beryllium alloy containing 3 percent aluminum was found to react with nitrogen more readily and the nitrogen content of the product closely approached the theoretical value. On the bases of the results reported, it seems that the reaction of NH_3 or of a mixture of N_2 and H_2 on Be would produce a fairly pure sample of Be_3N_2

Beryllium Nitride References

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Magnesium Nitride, Mg_3N_2, 100.976

Magnesium nitride, Mg_3N_2, has been prepared by the direct combination of metallic magnesium with nitrogen [1,2,3,4,5,6] or with ammonia [1,4,6]. The reaction with nitrogen begins at about 300°C and with ammonia at 200°C [1]. The preferred procedure is to react granular pieces of magnesium with nitrogen or ammonia below the melting point of magnesium [4]. The vapor pressure of magnesium is sufficiently high to diffuse through the Mg_3N_2 layer. The final reaction should be carried out at about 1000°C. Mitchell [3] prepared Mg_3N_2 by heating fine magnesium filings (Mg, 99.9 percent; copper, traces; aluminum, 0.003 percent; and lead, traces), contained in an iron boat, in nitrogen atmosphere at 650° to 700°C for 3 to 4 hours and raising the temperature to 950°C for 12 hours. The product analyzed 27.49 percent nitrogen and 72.14 percent magnesium, the theoretical being 27.75 and 72.25 percent, respectively. The nitrogen percentage corresponded to 99.10 percent Mg_3N_2. The remaining 0.90 percent was taken as MgO.

It is expected that the reaction of either nitrogen or ammonia with magnesium metal would produce a Mg_3N_2 sample of high purity. In the case of ammonia, however, a flow method would be required to remove the hydrogen that will be formed.

Magnesium Nitride References

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Aluminum Nitride, AlN, 40.988

Aluminum nitride, AlN, has been prepared by the action of nitrogen [1,2,3] or of ammonia [1,4,5] on metallic aluminum powder. Fichter [2] heated aluminum in a nitrogen stream at about 720° to 740°C and obtained AlN of 97 percent purity based on nitrogen analysis. Sofianopoulos [4] and Meyer and Hobrock [5] prepared AlN by passing ammonia over aluminum powder heated to about 500° to 550°C. The material prepared by Sofianopoulos [4] was analyzed to be 98 percent based on nitrogen analysis. Laffitte, Elchardus, and Grandadam [6] found ammonia to react with aluminum starting about 100°C. Above 265°C the reaction

$$2\ NH_3 + 2\ Al = 2\ AlN + 3\ H_2 \qquad (1)$$

becomes reversible [6]. A continuous stream of NH_3 would be needed to sweep out the H_2 formed as well as to react with aluminum. Charlton and Evans [7] reported that NH_3 did not react with high purity aluminum (99.9 percent) even in the range 700° to 1000°C. They found alkali metal halide and nitrite, in particular KHF_2, to promote the reaction between aluminum and nitrogen. The product obtained, however, contained the alkali metal halide impurity. The theoretical AlN yield ranged from 95 to 100 percent.

The method Long and Foster [3] used to prepare AlN involved striking a d-c arc between high-purity aluminum (99.99 percent) electrodes in a nitrogen atmosphere. A 220-volt d.c. service line with about 40-volt drop was used. A lump was formed at the electrodes, and fine reactive powder on the walls of the vessel. The lump was analyzed to be 92 to 94 percent AlN. The fine powder was analyzed to be about 25 percent AlN and the greater part of the remainder was found to be metallic aluminum. The impurity in the lump material was presumed to be Al_2O_3 since there was no evidence of metallic aluminum. The purity of this material was improved by crushing and sintering above 2000°C in pure nitrogen atmosphere. White crystals that analyzed 100 percent AlN have been obtained.

The method used by Long and Foster [3] seems preferable because, at least in the first phase, there is no need for a high temperature container. Ammonia seems, however, to react at lower temperatures. A flow method with ammonia at reasonably elevated pressures may be the more practical method to obtain pure AlN.

Aluminum Nitride References

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NEW CALORIMETRIC VALUES FOR THE HEATS OF FORMATION OF LITHIUM PERCHLORATE, SODIUM PERCHLORATE, AMMONIUM PERCHLORATE, AND BERYLLIUM CHLORIDE

W. H. Johnson and A. A. Gilliland

The preceding report (NBS Report 6645) stated briefly the results of new precise NBS calorimetric measurements of the standard heats of formation of $KClO_4$, $LiClO_4$, and NH_4ClO_4. Measurements on $NaClO_4$ and $BeCl_2$ have been completed since. The values for these five compounds are given below, and the thermochemistry of the solution calorimetry involved is outlined in detail.

The heats of formation of $LiClO_4$, $NaClO_4$, and NH_4ClO_4 were obtained by solution calorimetry. The following solutions were used:

$[2.38\ KClO_4 + 2.23\ KCl + 815\ H_2O]$, Solution **I**,

$[2.38\ KClO_4 + 1.23\ KCl + LiCl + 815\ H_2O]$, Solution **II**,

$[2.38\ KClO_4 + 1.23\ KCl + NaCl + 815\ H_2O]$, Solution **III**,

$[2.38\ KClO_4 + 1.23\ KCl + NH_4Cl + 815\ H_2O]$, Solution **IV**,

$[2.38\ KcO_4 + 1.23\ KCl + 815\ H_2O]$, Solution V.

An excess of 0.01 mole of $KClO_4$ was added to solution I in each case to insure complete saturation. Purified samples of $LiClO_4$, $NaClO_4$, NH_4ClO_4, $KClO_4$, $LiCl$, KCl, $NaCl$, and NH_4Cl were sealed into glass bulbs and crushed in the solution. The calorimetric processes and the measured changes in enthalpy correspond to the following reactions:

$$LiClO_4(c) + [I] \longrightarrow [II] + KClO_4\ (pptd), \qquad (1)$$
$$\Delta H = -15.019 \pm 0.052\ kcal/mole,$$

$$NaClO_4(c) + [I] \longrightarrow [III] + KClO_4\ (pptd), \qquad (2)$$
$$\Delta H = -0.060 \pm 0.034\ kcal/mole,$$

$$NH_4ClO_4 + [I] \longrightarrow [IV] + KClO_4\ (pptd), \qquad (3)$$
$$\Delta H = -5.059 \pm 0.048\ kcal/mole,$$

$$KCl(c) + [V] \longrightarrow [I], \qquad (4)$$
$$\Delta H = 0.920 \pm 0.027\ kcal/mole,$$

$LiCl(c) + [V] \longrightarrow [II]$, (5)

$\Delta H = -8.226 \pm 0.021$ kcal/mole,

$NaCl(c) + [V] \longrightarrow [III]$, (6)

$\Delta H = 1.674 \pm 0.031$ kcal/mole,

$NH_4Cl(c) + [V] \longrightarrow [IV]$, (7)

$\Delta H = 4.560 \pm 0.015$ kcal/mole,

$KClO_4(c) + [I] = [I] + KClO_4$ (pptd), (8)

$\Delta H = -0.018 \pm 0.007$ kcal/mole.

The appropriate combinations of reactions 1-7 yield the following processes:

$LiClO_4(c) + KCl(c) \longrightarrow LiCl(c) + KClO_4(c)$

ΔH° (25°C) = -5.855 ± 0.062 kcal/mole

$NaClO_4(c) + KCl(c) \longrightarrow NaCl(c) + KClO_4(c)$

ΔH° (25°C) = -5.794 ± 0.064 kcal/mole

$NH_4ClO_4 + KCl(c) \longrightarrow NaCl(c) + KClO_4(c)$

ΔH° (25°C) = -3.682 ± 0.047 kcal/mole.

By taking the NBS-determined value -103.22 ± 0.15 kcal/mole for the heat of formation of $KClO_4$, and other data from NBS Circular 500, the following heats of formation were obtained:

$LiClO_4(c)$, $\Delta Hf^\circ(25°C) = -90.89 \pm 0.29$ kcal/mole

$NaClO_4(c)$, $\Delta Hf^\circ(25°C) = -91.48 \pm 0.22$ kcal/mole

$NH_4ClO_4(c)$, $\Delta Hf^\circ(25°C) = -70.74 \pm 0.32$ kcal/mole

A complete description of the method together with tabulated results of the individual experiments has been prepared and submitted for publication.

The heat of formation of beryllium chloride was obtained by passing chlorine over beryllium metal at 350°C in a calorimeter. Two series of experiments were performed. In one series the quantity of electrical energy necessary to produce a given rise in the calorimeter temperature was determined; in a second series the temperature rise was duplicated but a substantial part of the required energy was derived from a measured quantity of electrical energy. Although the actual reaction took place at about 350°C the calorimetric data, referred to the initial and final states of the system, was approximately 26°C and was corrected to 25°C from heat capacity data.

It was not possible to determine accurately the quantity of unreacted beryllium. The quantity of reaction was determined gravimetrically from the mass of silver chloride produced by the addition of silver nitrate to the water solution of the reaction products.

The formation of beryllium chloride is represented by the reaction:

$$Be(c) + Cl_2(g) \quad --- \quad BeCl_2(c)$$

$$\Delta H°(25°C) = -118.03 \pm 0.54 \text{ kcal/mole.}$$

A complete description of the experimental method and a tabulation of the results of the individual experiments have been prepared and submitted for publication.

Chapter 3

RECENT DATA ON THE VAPORIZATION OF LIGHT-METAL OXIDES

R. F. Walker, R. F. Hampson, and J. Efimenko

Several publications and reports have recently become available which amplify the data on the vaporization of the BeO and Al_2O_3 discussed in NBS Reports No. 6297 and 6484. As far as can be evaluated at present, much of the more recent data is broadly consistent with the earlier conclusions, but contributes towards a better understanding of the experimental uncertainties. A brief summary of the more pertinent points arising from the later contributions follows.

Systems containing BeO. Experiments to determine the rates of effusion(m) of BeO vapor from tungsten Knudsen cells have been undertaken by Pollock, Saul, and Milne [1]. A mass spectrometric determination of the vapor species was not made, but Log m. $T^{\frac{1}{2}}$ vs. 1/T alone was plotted, thus avoiding the immediate need to make a decision on the vapor species. The data was represented by the equation:

$$\text{Log m. } T^{\frac{1}{2}} = -\frac{32,629}{T} + 11.612 .$$

This equation corresponds to a heat of sublimation of BeO in the presence of tungsten of 149.3 kcal/mole at about 2300°K.

Belix and Nesmeyanov [2] measured the rate of effusion of BeO from a tungsten cell surrounded by tantalum radiation shields. The condensed phase was assumed to vaporize as BeO, yielding "an upper limiting" equilibrium vapor pressure represented by

$$\text{Log P (atm)} = 8.156 - \frac{33,240}{T}$$

for the temperature range 2103-2573°K. A heat of sublimation, $\Delta H^\circ = 157.6$ kcals/mole, was calculated, from which we calculate $\Delta H^\circ_{2370} = 152.3$ kcals/mole. This value is in fair agreement with that obtained by Erway and Seifert [3], whose vapor pressure equation based on BeO vapor species gives $\Delta H^\circ_{2300} = 147.5$ kcals/mole. Belix and Nesmeyanov apparently also measured the rate of vaporization of BeO by the Langmuir method, although they do not present their data. They state, however, that because the results of the effusion experiments agreed with the results of the measurements by the Langmuir method, the condensation coefficient of BeO is close to one. This conclusion was implicit in the use of a BeO collector plate by Erway and Seifert.

Within the limits of experimental error and the analysis of their data in terms of a BeO vapor species, the results of the above authors are in good agreement with the mass spectrometric investigation of Chupka, Berkowitz and Giese [4] discussed in NBS Report No. 6297. These investigators found that BeO in a tungsten cell sublimes predominantly by dissociation to the elements, but that polymeric gas species up to the hexamer, $(BeO)_6$, also exist in the gas state. Amonenko et al [5] have recently investigated with a mass spectrometer the vapor species effusing from a BeO cell containing Be metal. Over the temperature range 1120° to 1600°C the following gas species were identified: Be_2, Be, BeO, Be_2O. At the lower temperatures Be_2 was the dominant species, but Be ions were detected as the major species at intermediate temperatures. The relative abundance of Be_2O increased with temperature, however, and was the major species at 1600°C. Quantitative data on ion intensities and the relative abundance of the species was not obtained; therefore, it is not possible to derive thermodynamic data from the results. The evidence suggests, nevertheless, that Be_2O may be an important vapor species during the vaporization of BeO under reducing conditions. A yellow deposit was found on the edges of the collimator used in effusion experiments of Amonenko et al. The deposit was subject to x-ray analysis, from which the authors concluded that the deposit was a cubic, CaF_2-type compound of composition Be_2O. Lattice parameters and relative intensities of diffraction peaks are given by the authors.

W. A. Young [6] has repeated the investigation of Grossweiner and Seifert [7] on the reaction of BeO(c) with $H_2O(g)$. As a result of Young's transpiration experiments over the range 1300-1515°C, he gives for the reaction

$$BeO(c) + H_2O(g) = Be(OH)_2(g)$$

$\Delta H° = 42.5$ kcals/mole; $\Delta F°_{1673°K} = 27.7$ kcals/mole. These values compare with $\Delta H° = 41.5$ and $\Delta F°_{1673} = 29$ kcals/mole determined by Grossweiner and Seifert. Using a $\Delta H°_f$ (298) of 143.1 kcals for BeO(c) and -57.8 for $H_2O(g)$, we calculate $\Delta H°_f$ (298) of $Be(OH)_2(g)$ as -158.4 kcals/mole, assuming $\Delta H°$ of the above reaction is invariant with temperature. This value differs from that given in Chapter 7 of NBS Report No. 6484, viz. -162.4 kcals, principally because a $\Delta H°_f$ (298) BeO of -146 kcals/mole was apparently used in the earlier calculation.

Young also studied the reaction of water vapor with $BeO.Al_2O_3$ and with $BeO.3Al_2O_3$, as represented by the following equations:

$$3/2\ BeO.Al_2O_3(c) + H_2O(g) = 1/2\ BeO.3Al_2O_3(c) + Be(OH)_2(g)$$

$$BeO.3Al_2O_3(c) + H_2O(g) = 3Al_2O_3(c) + Be(OH)_2(g).$$

For the first reaction $\Delta H^\circ = 49.4$ kcals and $\Delta F^\circ_{1673} = 30.7$ kcals/mole; for the second reaction $\Delta H^\circ = 43.2$ kcals and $\Delta F^\circ_{1673} = 31.4$ kcals/mole.

Vaporization of Al_2O_3. Drowart et al [8] have recently published more complete data on the results of their mass spectrometric investigation of the vaporization of Al_2O_3. An earlier paper [9], discussed in NBS Report No. 6484, gave data which was subject to corrections due to the reducing conditions of the tungsten cell. These corrections have now been made; additional data is also given for the vaporization of alumina in molybdenum cells. The average heats of reaction which they computed from their equilibrium data (cf. p. 58 of NBS Report No. 6484) are as follows:

$$AlO(g) = Al(g) + O(g); \quad \Delta H^\circ_0 = 115.0 \pm 5 \text{ kcals/mole}$$

$$Al_2O(g) = 2Al(g) + O(g); \quad \Delta H^\circ_0 = 244.8 \pm 7 \quad "$$

$$Al_2O_2(g) = 2AlO(g); \quad \Delta H^\circ_0 = 135.0 \pm 5 \quad "$$

$$Al_2O(g) = AlO(g) + Al(g); \quad \Delta H^\circ_0 = 131.0 \pm 5 \quad "$$

from which we calculate:

$$2AlO(g) = Al_2O(g) + O(g); \quad \Delta H^\circ_0 = -14.8 \pm 9 .$$

Of additional interest to the experimental part of this program is the conclusion of Drowart et al concerning the evaporation coefficient of alumina. They conclude from their observations that the coefficient for liquid alumina is greater than 0.1, whereas Sears and Mavias [10] have reported a value for solid alumina one or two orders of magnitude lower than this. Recent preliminary measurements of the rate of vaporization of Al_2O_3 in vacuum obtained at NBS are also in accord with an evaporation coefficient for liquid alumina which is close to one.

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Chapter 4

REVISED HEATS OF FORMATION

George T. Armstrong and L. A. Krieger

A complete set of tables of heats of formation of the substances forming the subject of these reports is found in Appendix C, revised to take into account some, though not all, of the new data received since issuance of earlier reports. In addition a reconsideration of some older data has been made in a few cases. The new data received and the revisions made in selected values of certain compounds are discussed below. Several substances which are unknown and for which no experimental data exist for the heat of formation have been omitted from the table.

(a) New Information

The following studies have been received since the issuance of the last report (NBS Report No. 6645); these provide information on the heats of formation of substances reported in Chapter 7, Tables 1 and 2, of NBS Report No. 6484 and in Appendix 3 of this report.

Aluminum Compounds:

The vaporization of Al_2O_3 dissociation products has been reported in more detail by Drowart, de Maria, Burns and Inghram [1]. An article by Ivanova [2] may provide measurements of the heats of formation of Al_2O_3 and AlF_3. The vapor pressure and heat of vaporization of AlF_3 is reported by Evseev, Pozharskaya, Nesmayanov and Gerasimov [3]. Kelley [4] has determined the heat of combustion of AlN, from which the heat of formation is found to be -75.6 ±0.4 kcal/mole, in good agreement with the value (-76.5) listed previously, which we based on the work of Neugebauer and Margrave [5]. A vaporization study of AlN has been performed by Dreger, Dadape, and Margrave [40].

Beryllium Compounds:

Vaporization studies of BeO have been made by Belykh and Nesmeyanov [6], Pollock, Saul, and Milne [7], and Amonenko, Ryabchukov, Tichinskii and Finkel [8]. The volatility of BeO in the presence of water vapor has been studied by Young [9], who also studied the effect of water vapor on the volatilization of 3/2 $BeO \cdot Al_2O_3$ and $BeO \cdot 3Al_2O_3$. Khandaminova, Evseev, Pozharskaya, Borisov, Nesmeyanov and Gerasimov [10] and Noveselova, Muratov, Reshetnikova, and Gordeev [11] determined the vapor pressure and heat of vaporization of BeF_2. The heat of formation of $BeCl_2(c)$ has been determined by Johnson and Gilliland [12] as described elsewhere in this report.

Lithium Compounds:

Evseev, Pozharskaya, Nesmayanov, and Gerasimov [13] determined the vapor pressure and heat of vaporization of LiF.

Magnesium Compounds:

The dissociation of MgO(g) and MgOH(g) by the method of flame photometry was studied by Bulewicz and Sugden [14], who report $D_0 = 98 \pm 2$ kcal/mole for MgO and 56 ±5 kcal/mole for MgOH. Viets and Gurvich [15] have determined the dissociation energy of MgO(g) from measurements of the equilibrium constants for dissociation reactions in the flames of H_2 with O_2, and air and C_2H_2 with O_2 and air.

(b) Revised Heats of Formation

The selected values for heats of formation of a few compounds have been revised.

$AlCl_3(g)$ $\Delta Hf^\circ_{298} = -139.0$ kcal/mole

The heat of dissociation of $Al_2Cl_6(g)$ to $AlCl_3(g)$ was calculated by Douglas, Victor and Beaudoin [16] to be 34.5 kcal/mole of Al_2Cl_6 from equilibrium measurements by Smits and Meijering [17] and by Fischer and Rahlfs [18]. Combined with the revised heat of formation of $Al_2Cl_6(g)$, this leads to $\Delta Hf^\circ_{298} = -139.0$ kcal/mole for $AlCl_3(g)$.

$Al_2Cl_6(g)$ $\Delta Hf^\circ_{298} = 312.3 \pm 2$ kcal/mole

The heat of vaporization of $Al_2Cl_6(g)$ from the crystal was calculated to be 24.80 kcal/mole by Douglas for this report, from the vapor pressure data of Fischer, Rahlfs and Benze [19], Smits, Meijering and Kamermans [20,21], Treadwell and Terebesi [22], Friedel and Crafts [23], Maier [24], and by Dunne and Gregory [25]. For the third law method of treatment Douglas used low temperature specific heat measurements by Hatton, Sinke and Stull [26], leading to a slightly revised value.

AlN $\Delta Hf^\circ_{298} = -76.0 \pm 1$ kcal/mole

The heat of formation was thought to be in considerable doubt at the time of writing NBS Report No. 6645 (1 January 1960), despite the precision of the work of Neugebauer and Margrave [5], because of the wide spread in values found by other workers and methods. Recently Kelley [4] has determined the heat of combustion and found -75.6 ±0.4 kcal/mole for the heat of formation, differing by less than 1 kcal/mole from that reported by Neugebauer and Margrave, on the basis of the direct reaction of aluminum with nitrogen in a bomb. The average of these two values is taken as the best value. A new vaporization study of AlN by Dreger, Dadape, and Margrave [40] appears to substantiate further the selected value.

$BeCl_2(c)$ $\Delta Hf^\circ_{298} = -118.0 \pm 1.0$ kcal/mole

Johnson and Gilliland [12] burned a 99.4% pure sample of beryllium in chlorine and determined the value -118.03 ±0.54 kcal/mole for the heat of reaction. Mielenz and von Wartenberg [27] burned Be containing 30% BeO in chlorine and reported $\Delta Hf^\circ_{298} = -112.6 \pm 0.4$ kcal/mole. They also measured the heat of combustion of the same beryllium in oxygen and found ΔHf°_{298} [BeO] = -135.9 kcal/mole, as compared with a recent more accurate determination by Cosgrove and Snyder [28] of -143.1 kcal/mole. If the low value obtained by Mielenz and von Wartenberg is assumed to be due to impurity in their beryllium, the value they obtained for $BeCl_2$ would be low by the same factor. Applying a correction on this basis, ΔHf°_{298} $BeCl_2$ from the work of Mielenz and von Wartenberg is -118.6 kcal/mole, in reasonably good agreement with the work of Johnson and Gilliland. Siemonsen [29] measured the heat of reaction of beryllium with chlorine in a bomb and found -109.2 kcal/mole, a value which appears to be low in the light of the above determinations. The value listed in NBS Circular 500 [30] is -122.3, which is based upon a series of reactions involving BeO and its solution in acids. For that calculation the heat of formation of BeO was taken to be -146.0 kcal/mole. Using the more recent value of -143.1 kcal/mole the heat of formation of $BeCl_2$ is found to be -119.4 kcal/mole, which is in reasonably good agreement with the above value.

$BeCl_2(g)$ $\Delta Hf^\circ_{298} = -86.5 \pm 6$ kcal/mole

No specific heat data are given for crystalline $BeCl_2$. Therefore insufficient data exist to determine the heat of sublimation to form $BeCl_2(g)$ at 298°K. The heat of sublimation at 678°K is given in NBS Circular 500 [30] as 29.2 kcal/mole. This figure must be considered to be very doubtful because of the limited amount of data upon which it is based and because of the presence of appreciable amounts of dimer in the vapor during the vapor pressure studies. Using this as the only available data, taking enthalpy data for $BeCl_2(g)$ from the tables of NBS Report 6484 and estimating the enthalpy of $BeCl_2(c)$ to be the same as that of $MgCl_2(c)$, we estimate the heat of sublimation of $BeCl_2$ at 298°K to be 31.5 kcal/mole. This number is added to the selected heat of formation of crystalline $BeCl_2$.

$Be_2Cl_4(g)$ $\Delta Hf^\circ_{298} = -201.5 \pm 10$ kcal/mole

Insufficient data exist for calculating accurately the heat of sublimation of $BeCl_2(c)$ to form $Be_2Cl_4(g)$. The above value is derived from the selected heat of formation of $BeCl_2(c)$; the probably not very reliable value for the heat of sublimation of $BeCl_2$ to form $Be_2Cl_4(g)$ at 678°K, 15.4 kcal/mole $BeCl_2$, listed in NBS Circular 500 [30]; and estimates of the enthalpy changes of $BeCl_2(c)$, 7.05 kcal/mole, and $Be_2Cl_4(g)$, 10.3 kcal/mole, between 298° and 678°K, which are based upon analogies to chlorides of neighboring elements in the periodic table and the tables in NBS Report 6484.

$MgF_2(c)$ $\Delta Hf^\circ_{298} = -264 \pm 4$ kcal mole

Domange [31] studied the equilibrium constant of the reaction $MgF_2(c) + H_2O(g) \rightleftarrows MgO(c) + 2HF(g)$ and calculated ΔH° for the reaction to be 45.00 kcal/mole in the range 900° to 1000°C and 43.56 kcal at 1000° to 1100°C. These values yield an average value of 45.94 kcal/mole at 25°, and, combined with thermal tables of NBS Report 6484, lead to a heat of formation, of -260.2 kcal/mole from this gas-solid equilibrium.

Von Wartenberg [32] determined the heat of solution of magnesium in aqueous hydrofluoric acid ($HF\text{-}80H_2O$) and found $\Delta H = -109.5 \pm 0.7$ kcal/mole of magnesium. Using the heat of formation of aqueous HF of this concentration from NBS Circular 500 [30], we calculate -260.85 kcal/mole for the heat of formation of MgF_2 from this reaction.

Torgeson and Sahama [33] determined the heat of reaction of $Mg(OH)_2$ at 25°C with aqueous hydrofluoric acid (20.1% HF by weight) at 73.7° to be -29.090 kcal/mole, and the enthalpy difference of the resulting aqueous solution at 25°C and 73.7°C to be -1.620 kcal per mole of $Mg(OH)_2$. Using these data, the specific heat of aqueous HF from Thorvaldson and Bailey [34], the enthalpy of MgF_2 from NBS Report No. 6484, the heat of formation of aqueous HF from NBS Circular 500 [30], and the heat of formation of $Mg(OH)_2$ from NBS Report No. 6484, we calculate ΔHf°_{298} $[MgF_2] = -266.2$ kcal/mole.

Gross, Hayman and Levi [35] measured the heat of reaction of magnesium with lead fluoride. $Mg(c) + PbF_2(c) = MgF_2(c) + Pb(c)$ $\Delta H^\circ_{298} = -109.5 \pm 1.5$ kcal. Using the heat of formation of $PbF_2(c)$ from NBS Circular 500 [30], they calculated ΔHf°_{298} $MgF_2(c) = -268.0 \pm 1.8$ kcal/mole.

Taking the mean of the four values for the heat of formation calculated above, we select -264 ± 4 kcal/mole as the best value for the heat of formation of $MgF_2(c)$.

$MgF_2(g)$ $\Delta Hf^\circ_{298} = -178.8 \pm 6$ kcal/mole

By application of the third law of thermodynamics to the vapor pressure data of Ruff and Le Boucher [36], Douglas, Victor and Beaudoin [16] determined the heat of sublimation, ΔH°_{298}, to be 85.2 kcal/mole. The heat of sublimation is added to the selected heat of formation of the crystal.

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Chapter 5

SPECTROSCOPIC CONSTANTS FOR DIATOMIC MOLECULES

Harold W. Woolley

The examination of a large collection of spectroscopic abstracts recently obtained, extending over a period of almost two decades previous to 1959, has provided very little that is new to the project pertaining to light-element diatomic molecules involving Aℓ, Be, Li and Mg.* We had not included thermodynamic functions for AℓC in earlier reports although Zeeman's paper on AℓC is referred to in regard to heats of formation in NBS Report No. 6645, dated January 1, 1960. In the present consideration, we retain appreciable doubt that the molecule was actually AℓC, so we still do not recommend that functions be calculated using these constants for AℓC. Spectroscopic constants had not been included in our earlier reports for AℓH, since tables of thermodynamic functions for this molecule are included among the hydrides treated in a forthcoming NBS Monograph by Haar, Friedman, and Beckett.

More recent references, subsequent to the collection of abstracts referred to, pertain to studies on AℓO by Loginov, by Goodlett and Innes, and by Goodlett; on AℓS by McKinney; and on BeF by Tatevskii, Tunitskii and Novikov.

We note particularly that no spectroscopic data are at hand for AℓN, BeC, BeN, LiC, LiN, MgC or MgN.

* It is desired to acknowledge the assistance of Mr. Howard F. Kimel in facilitating the examination of the collection of abstracts.

Al_2

The only spectroscopic data found in the regular literature and purporting to be for Al_2 are due to Sharma, who observed AlCl bands in a discharge in helium with $AlCl_3$ vapor and also observed some unidentified bands which he suggested might be due to Al_2. For the lower of the two states observed, the vibrational constants are $\omega_e = 592.0$ cm^{-1} and $\omega_e x_e = 3.0$ cm^{-1}. We are reluctant to accept that the spectra are certainly identified as belonging to Al_2, however, and we note that for Al_2 the empirical rules of Lippincott suggest a vibrational frequency near 335 cm^{-1}. The Cl_2 and Cl_2^+ molecules are known to have frequencies in the range 565 cm^{-1} to 645 cm^{-1}, which brackets Sharma's observed frequency. The empirical rules of Lippincott also give a dissociation energy for Al_2 of about 38 kcal/mole, which compares favorably with the value 1.7 e.v. or 39 kcal/mole, estimated by Drowart and Honig. A simple Birge-Sponer extrapolation of Sharma's unidentified band gives 83 kcal/mole as an estimated dissociation energy, D_e. A proposed reinterpretation of the so-called AlC bands of Zeeman, taking them as applying to Al_2, would give for Al_2:

$$\omega_e = 350.01 \text{ cm}^{-1}, \quad \omega_e x_e = 2.022 \text{ cm}^{-1} \quad \text{and} \quad \omega_e y_e = -0.0105 \text{ cm}^{-1}.$$

No rotational constants are known for Al_2 but estimates using empirical rules of Lippincott would suggest $B_e \approx 0.20$ cm^{-1} and $\alpha_e \approx 0.0013$ cm^{-1} as approximate magnitudes.

Sharma, D., Two new band systems of the AlCl molecule, Astrophys. J. 113, 210-18 (1951).

Lippincott, E.R., and Dayhoff, M. O., Delta function model of chemical binding, Office of Ordnance Research Contract DA-36-034-ORD-2175, March 1959, AD-214751.

Drowart, J., and Honig, R. E., A mass-spectrometric method for the determination of dissociation energies of diatomic molecules, J. Phys. Chem. 61, 980-5 (1957).

Zeeman, P. B., Spectrum of the AlC molecule, Can. J. Phys. 32, 9-15 (1954).

Lippincott, E. R., and Schroeder, R., General relation between Potential Energy and Internuclear Distance for Diatomic and Polyatomic Molecules. I. J. Chem. Phys., 23, 1131-41 (1955).

AlC

The only available spectroscopic data presumed to be due to the AlC molecule were reported by Zeeman as obtained in connection with a study of AlH spectra while using a carbide liner in a furnace. The new bands appeared only when both Al and C were known to be in the system. Zeeman reported that the bands had appeared single-headed at low dispersion but "in the third order some band heads split into very close doublets." Since the AlC molecule involves an odd number of electrons, its states would not be singlets and we suppose its ground state would be a doublet. For the lower of the two states observed, Zeeman found the vibrational constants $\omega_e = 350.01$ cm^{-1}, $\omega_e x_e = 2.022$ cm^{-1}, and $\omega_e y_e = -0.0105$.

If we estimate the vibrational frequency for the AlC molecule using Lippincott's empirical rules, we get $\omega_e \approx 733$ cm^{-1}, which may support a question as to the identification of AlC as the emitter involved. In fact, Zeeman admitted that "it is difficult to account for such a small value of the vibrational frequency in the ground state of AlC when that of AlO or AlF in their respective ground states is about twice as large. For an unambiguous assignment to AlC, an investigation of the isotope effect would be desirable."

We note that for Al_2, the Lippincott-type estimate gives an ω_e of 335 cm^{-1}, which agrees with the observed 350 cm^{-1} much better than the 733 cm^{-1} does. The fact that Zeeman observed none of the new bands when a zirconium oxide liner was used, but did observe AlO bands, could apparently be accounted for on the basis that there was then enough oxygen to eliminate Al_2 quite effectively and not necessarily that some otherwise observed AlC was eliminated by the absence of the carbon. It is of course clear that Al_2 would not give doublet bands; thus the reported splitting into very close doublets under higher dispersion could seem to rule out the Al_2 proposal. We may wonder, however, if the well known phenomenon of line reversal might not give such an appearance of doublet splitting. We note also that by a graphical Birge-Sponer extrapolation for his lower state, Zeeman estimated a D_0 of 1.6 ±0.2 e.v., which would be 37 kcal/mole, and interestingly close to 38 kcal/mole and 39 kcal/mole quoted elsewhere for dissociation energy estimates for Al_2.

Zeeman, P. B., Spectrum of the AlC molecule, Can. J. Phys. 32, 9-15 (1954).

Lippincott, E. R., and Dayhoff, M. O., Delta function model of chemical binding. Office of Ordnance Research Contract DA-36-034-ORD-2175, March 1959. AD-214751.

AlCl

The ground state for AlCl is believed to be $x^1\Sigma^+$, with constants $\omega_e = 481.30$, $\omega_e x_e = 1.95$, $B_e = 0.242$ and $\alpha_e = 0.002$, as listed by both Herzberg and Rosen. The next higher electronic state listed by Rosen is a $^3\pi$ state observed by Sharma in the breaking up of $AlCl_3$ in a gaseous discharge. It is about 24600 cm^{-1} above the ground state. We note that the other fragment formed in the breaking up of $AlCl_3$ might conceivably be a Cl_2 molecule or ion, likewise possibly in an excited electronic state. This comment is considered relevant concerning the suggestion of Sharma that an unidentified band may have been due to Al_2.

Herzberg, G., Molecular spectra and molecular structure. Vol. 1. Spectra of Diatomic Molecules, D. Van Nostrand Company, New York, 1950.

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Sharma, D., Two new band systems of the AlCl molecule, Astrophys. J. 113, 210-18 (1951).

AlF

The spectroscopic constants for the $^1\Sigma^+$ ground state for AlF as given by Naudé and Hugo as the product of a number of steps of inference finally pertaining to zero line estimates are as follows: $\omega_e = 801.95$ cm^{-1}, $\omega_e x_e = 4.70$ cm^{-1}, $B_e = 0.55228$ cm^{-1}, and $\alpha_e = 0.00483$ cm^{-1}. The lowest known excited state is $^1\pi$ at $T_e = 43947.99$ cm^{-1}.

Naudé, S. M. and Hugo, T. J., The emission spectrum of AlF in the vacuum ultraviolet, Can. J. Phys. 35, 64-70 (1957).

AlH

The spectroscopic constants for the AlH ground state, $^1\Sigma^+$, from Zeeman and Ritter are: $\omega_e = 1682.563$ cm^{-1}, $\omega_e x_e = 29.090$ cm^{-1}, $\omega_e y_e = 0.2389$ cm^{-1}, $B_e = 6.39066$ cm^{-1}, $\alpha_{e_1} = 0.1858_1$ cm^{-1}, $\alpha_{e_2} = 0.0016_1$ cm^{-1}. A set of rotational constants agreeing for B_v as far as $v = 0$ and $v = 1$ are concerned is $B_e = 6.38945$ cm^{-1} and $\alpha_e = 0.18258$ cm^{-1}. An excited $^3\pi$ electronic state is presumed to occur a little short of 20000 cm^{-1} above the ground state as shown in the tabulation of Rosen.

Zeeman, P. B., and Ritter, G. J., New measurements on the A $^1\pi$ - $X^1\Sigma$ band system of AlH, Can. J. Phys. 32, 555-61 (1954).

Rosen, B., loc. cit.

AlO

For the $^{2}\Sigma^{+}$ ground state for AlO, we take the constants of Lagerqvist, Nilsson and Barrow: $\omega_e = 979.23$ cm^{-1}. $\omega_e x_e = 6.97$ cm^{-1}. $B_e = 0.64136$ cm^{-1}. $\alpha_e = 0.00580$ cm^{-1}. The more recent data of Goodlett and Innes and of Goodlett pertain to small doublet splittings for the $A^{2}\Sigma - X^{2}\Sigma$ system ($\gamma' = 0.019 \pm 0.005$ cm^{-1} and $\gamma'' = 0.008 \pm 0.006$ cm^{-1}) and to revision of constants for the $B^{2}\pi$ state at $T_e = 33175.4$ cm^{-1}.. The lowest known excited state for AlO is the $A^{2}\Sigma^{+}$ indicated by Lagerqvist, Nilsson and Barrow as at $T_e = 20688.95$ cm^{-1}.

Lagerqvist, A., Nilsson, N.E.L., and Barrow, R. F., On a supposed predissociation in the spectrum of AlO, Proc. Phys. Soc. (London) 69A, 356-7 (1956).

Goodlett, V. W., and Innes, K. K., Hollow-cathode emission of the AlO spectrum, Nature 183, 243-4 (1959).

Goodlett, V. W., Visible and near ultraviolet spectra of the aluminum monoxide molecule, Thesis, Vanderbilt U., 1959, Diss. Abs. 20, 2585-2586 (1960).

AlS

Spectroscopic data relevant to the AlS molecule have been reported by McKinney, giving for the $X^{2}\Sigma$ ground state $\omega_e = 617.12$ cm^{-1}, $\omega_e x_e = 3.33$ cm^{-1}, $B_e = 0.2799$ cm^{-1}, $\alpha_e = 0.0018$ cm^{-1}. He reports the lowest known excited state as $^{2}\pi$ at $T_e = 23433.79$ cm^{-1}.

McKinney, C. N., Spectrum and structure of the aluminum monosulfide molecule, Thesis, Vanderbilt U., 1959, Diss. Abs. 20, 117 (1959).

BeF

The ground state of BeF is $X^{2}\Sigma^{+}$. The spectroscopic constants given for this state by Tatevskii, Tunitskii and Novikov are consistent with $\omega_e = 1265.61$ cm^{-1}, $\omega_e x_e = 9.234$ cm^{-1}, $\omega_e y_e = .02259$ cm^{-1}, $B_e = 1.4877$ cm^{-1}, $\alpha_e = 0.01685$ cm^{-1}, $D_0 = 8.209 \times 10^{-6}$ cm^{-1}. These are only slightly different from the indications in the compilations of Herzberg and of Rosen. The lowest excited electronic state known is a $^{2}\pi$ at $T_e = 33226.3$ according to the listing of Rosen.

Tatevskiĭ, V. M., Tunitskii, L. N., and Novikov, M. M., Vibrational constants and dissociation energy of the BeF molecule, Optika i Spektroskopiya 5, 520-9 (1958).

Herzberg, G., loc. cit.

Rosen, B., loc. cit.

HF

The data used for the ground state of HF are based on results given by Mann, Thrush, Lide, Ball and Acquista. While the present constants are not identical with those which they quote, since they give five-term formulas for $G(v)$ and B_v, we note that the present constants are essentially equivalent for the first few lowest levels. We thus have: $\omega_e = 4138.33$ cm^{-1}, $\omega_e x_e = 89.652$ cm^{-1}, $\omega_e y_e = 0.792$ cm^{-1}, $B_e = 20.9555$ cm^{-1} and $\alpha_e = 0.7958$ cm^{-1}. The lowest known excited electronic state is a $^1\Sigma^+$ state with $T_e = 84747.5$ cm^{-1}, according to Johns and Barrow.

Mann, D. E., Thrush, B. A., Lide, D. R., Jr., Ball, J. J., and Acquista, N., Spectroscopy of Fluorine Flames I. Hydrogen-Fluorine Flame and the Vibration-Rotation Emission Spectrum of HF. [To be published, J. Chem. Phys.]

NBS Report No. 6858, May 1960.

Johns, J. W. C., and Barrow, R. F., The ultraviolet spectra of HF and DF, Proc. Roy. Soc. (London) A251, 504-518 (1959).

Molecule	Ground State	ω_e cm^{-1}	$\omega_e x_e$ cm^{-1}	$\omega_e y_e$ cm^{-1}	B_e cm^{-1}	α_e cm^{-1}	$10^4 D_e$ cm^{-1}	r_e Å	g_o*	g_i	T_e lowest excited state cm^{-1}
Al_2	$^1\Sigma$	350.01	2.022	-0.0105	(0.20)	(0.0013)	(0.0026)	2.53	1	1	17269
AlF	$^1\Sigma^+$	801.95	4.70		0.55228	0.00483	0.0105	1.6547	1	2	43948
AlH	$^1\Sigma^+$	1682.56_3	$29.09_{0.}$	0.238_9	6.38945	0.18258	3.69	1.648_2	1	6	< 20000
AlS	$^2\Sigma$	617.12	3.33		0.2799	0.0018	0.00230	2.029	2	2	23434
BeF	$^2\Sigma^+$	1265.61	9.234	0.02259	1.4877	0.01685	0.08209	1.3614	2	4	33226
HF	$^1\Sigma^+$	4138.33	89.652	0.792	20.9555	0.7958	21.49	0.9168	1	1	84748

* g_o and g_i are a priori weights for the ground and lowest excited electronic states.

Appendix A

IDEAL GAS THERMODYNAMIC FUNCTIONS

by

William H. Evans, Joseph Hilsenrath, Harold W. Woolley

The thermodynamic functions for 69 gaseous species are given from 50°K to 6000°K in units of calories (4.1840 abs. joules), gram moles, and °K. These tables are newly computed using the molecular data given in NBS Reports 6297 and 6484, as modified in the body of this report. The computations were performed on the IBM 704 using the fundamental constants of Cohen, Crowe, and Dumond [1] and the molecular data indicated at the bottom of the first or second page of each table. Each table also carries conversion factors to other units.

With certain few exceptions, the tables in this appendix are newly computed from revised data or from improved and corrected codes, therefore this collection supersedes the tables of ideal gas thermal functions contained in Reports 6297 and 6484, which should be discarded.

In view of the provisional character of the earlier tables, no detailed comparison will be attempted here. The following general remarks appear to be in order. For the monatomic species, only in the case of Lithium, Magnesium, and Sodium do the differences between the old and new tables get as large as 0.076, 0.013, and 0.005 entropy units respectively at 6000°K, with correspondingly larger effects on the heat capacity. In the remainder of the tables, the differences are roughly one in the third decimal. The differences in the diatomic molecules result from three sources: modified molecular and spectroscopic constants, higher order corrections to the RR-HO contributions, and the correction of a coding error. The polyatomic molecules are unchanged except for the tables for AlF_2 and $AlCl_2$, which have been corrected for the neglect of an Rln2 in the entropy and free energy functions, and for Al_2Cl_6, for which the moment of inertia has been corrected.

The functions for the atoms were computed by a summation over the energy levels given in Volume I (and as corrected in Volume III) of Atomic Energy Levels [2]. The functions for the polyatomic molecules were computed on the harmonic oscillator-rigid rotator approximation using the molecular data listed with the tables. The molecular constants are for the ground state.

The thermodynamic functions for diatomic molecules given in the accompanying tables have been calculated using experimentally determined spectroscopic constants where these are available. A few of the less important constants have been estimated, as indicated by their appearing in parentheses in Chapter 5 of this report and in corresponding chapters in the earlier reports.

For molecules involving elements with more than one isotope, the constants listed with the tables are averaged or effective spectroscopic constants corresponding to the natural isotope mixture, in all cases except the hydrides. For the hydrides, the constants used apply to the hydride as distinct from the deuteride, but with the constants adjusted to the natural isotope mixture as far as the elements other than hydrogen are concerned.

The present tables omit entropy due to spin and entropy of natural isotope mixing.

The calculation has been made according to an extension of the logarithmic development treatment of the partition function as introduced by Mayer and Mayer [3]. We include here second order anharmonicities and second order rotational-vibrational interaction effects. Both of these are carried only in their first power contribution to the thermodynamic functions. However, the first order anharmonicities and interaction constants have been included in first and second power contributions. The formulas for these effects are obtained by specialization of the formulas for the linear polyatomic molecule given in RP 2916 [4] to the case with only one vibrational degree of freedom, and into the notation used for diatomic constants.

For several of the diatomic molecules, newly considered data are involved. These cases are discussed in Chapter 5. The table for nitrogen (A-48) is from NBS Circular 564 [5] converted to the units employed in this work.

The arrangement of the tables for the gaseous species is as follows:

a. Tables for the atomic elements are in order of atomic number.
b. Tables for diatomic molecules of Lithium, Beryllium, Magnesium, Aluminum, Fluorine, Chlorine and Boron are in that order. The within-group arrangement is in accord with the scheme of NBS Circular 500, page 4. [6]
c. Tables for polyatomic molecules of Li, Be, Mg, Al, F, and Cl are in that order. The within-group arrangement is in accord with the scheme of NBS Circular 500, page 4. [6]

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Table A-1 Thermodynamic Functions for H (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	13.553	4.968	18.521	248.4	4.968
75.	15.568	4.968	20.536	372.6	4.968
100.	16.997	4.968	21.965	496.8	4.968
125.	18.105	4.968	23.074	621.0	4.968
150.	19.011	4.968	23.979	745.2	4.968
175.	19.777	4.968	24.745	869.4	4.968
200.	20.441	4.968	25.409	993.6	4.968
225.	21.026	4.968	25.994	1117.8	4.968
250.	21.549	4.968	26.517	1242.0	4.968
275.	22.023	4.968	26.991	1366.2	4.968
300.	22.455	4.968	27.423	1490.4	4.968
325.	22.853	4.968	27.821	1614.6	4.968
350.	23.221	4.968	28.189	1738.9	4.968
375.	23.564	4.968	28.532	1863.1	4.968
400.	23.884	4.968	28.852	1987.3	4.968
425.	24.185	4.968	29.154	2111.5	4.968
450.	24.469	4.968	29.438	2235.7	4.968
475.	24.738	4.968	29.706	2359.9	4.968
500.	24.993	4.968	29.961	2484.1	4.968
550.	25.466	4.968	30.434	2732.5	4.968
600.	25.899	4.968	30.867	2980.9	4.968
650.	26.296	4.968	31.264	3229.3	4.968
700.	26.664	4.968	31.633	3477.7	4.968
750.	27.007	4.968	31.975	3726.1	4.968
800.	27.328	4.968	32.296	3974.5	4.968
850.	27.629	4.968	32.597	4222.9	4.968
900.	27.913	4.968	32.881	4471.3	4.968
950.	28.182	4.968	33.150	4719.7	4.968
1000.	28.436	4.968	33.405	4968.1	4.968
1050.	28.679	4.968	33.647	5216.6	4.968
1100.	28.910	4.968	33.878	5465.0	4.968
1150.	29.131	4.968	34.099	5713.4	4.968
1200.	29.342	4.968	34.310	5961.8	4.968
1250.	29.545	4.968	34.513	6210.2	4.968
1300.	29.740	4.968	34.708	6458.6	4.968
1350.	29.927	4.968	34.896	6707.0	4.968
1400.	30.108	4.968	35.076	6955.4	4.968
1450.	30.282	4.968	35.251	7203.8	4.968
1500.	30.451	4.968	35.419	7452.2	4.968
1550.	30.614	4.968	35.582	7700.6	4.968
1600.	30.772	4.968	35.740	7949.0	4.968
1650.	30.924	4.968	35.893	8197.4	4.968
1700.	31.073	4.968	36.041	8445.9	4.968
1750.	31.217	4.968	36.185	8694.3	4.968
1800.	31.357	4.968	36.325	8942.7	4.968
1850.	31.493	4.968	36.461	9191.1	4.968
1900.	31.625	4.968	36.593	9439.5	4.968
1950.	31.754	4.968	36.722	9687.9	4.968
2000.	31.880	4.968	36.848	9936.3	4.968
2050.	32.003	4.968	36.971	10184.7	4.968

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.99206
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	4.1508
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.99141

Table A-1 Thermodynamic Functions for H (gas) - continued

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	32.123	4.968	37.091	10433.1	4.968
2150.	32.239	4.968	37.208	10681.5	4.968
2200.	32.354	4.968	37.322	10929.9	4.968
2250.	32.465	4.968	37.433	11178.3	4.968
2300.	32.574	4.968	37.543	11426.7	4.968
2350.	32.681	4.968	37.649	11675.2	4.968
2400.	32.786	4.968	37.754	11923.6	4.968
2450.	32.888	4.968	37.857	12172.0	4.968
2500.	32.989	4.968	37.957	12420.4	4.968
2600.	33.184	4.968	38.152	12917.2	4.968
2700.	33.371	4.968	38.339	13414.0	4.968
2800.	33.552	4.968	38.520	13910.8	4.968
2900.	33.726	4.968	38.694	14407.6	4.968
3000.	33.895	4.968	38.863	14904.4	4.968
3100.	34.057	4.968	39.026	15401.3	4.968
3200.	34.215	4.968	39.183	15898.1	4.968
3300.	34.368	4.968	39.336	16394.9	4.968
3400.	34.516	4.968	39.485	16891.7	4.968
3500.	34.660	4.968	39.629	17388.5	4.968
3600.	34.800	4.968	39,768	17885.3	4.968
3700.	34.936	4.968	39.905	18382.2	4.968
3800.	35.069	4.968	40.037	18879.0	4.968
3900.	35.198	4.968	40.166	19375.8	4.968
4000.	35.324	4.968	40.292	19872.6	4.968
4100.	35.446	4.968	40.415	20369.4	4.968
4200.	35.566	4.968	40.534	20866.2	4.968
4300.	35.683	4.968	40.651	21363.0	4.968
4400.	35.797	4.968	40.765	21859.9	4.968
4500.	35.909	4.968	40.877	22356.7	4.968
4600.	36.018	4.968	40.986	22853.5	4.968
4700.	36.125	4.968	41.093	23350.3	4.968
4800.	36.230	4.968	41.198	23847.1	4.968
4900.	36.332	4.968	41.300	24343.9	4.968
5000.	36.432	4.968	41.401	24840.7	4.968
5100.	36.531	4.968	41.499	25337.6	4.968
5200.	36.627	4.968	41.595	25834.4	4.968
5300.	36.722	4.968	41.690	26331.2	4.968
5400.	36.815	4.968	41.783	26828.0	4.968
5500.	36.906	4.968	41.874	27324.8	4.968
5600.	36.995	4.968	41.964	27821.6	4.968
5700.	37.083	4.968	42.052	28318.5	4.968
5800.	37.170	4.968	42.138	28815.3	4.968
5900.	37.255	4.968	42.223	29312.1	4.968
6000.	37.338	4.968	42.306	29808.9	4.968
6100.	37.420	4.968	42.388	30305.7	4.968
6200.	37.501	4.968	42.469	30802.5	4.968
6300.	37.581	4.968	42.549	31299.4	4.968
6400.	37.659	4.968	42.627	31796.2	4.968
6500.	37.736	4.968	42.704	32293.0	4.968
6600.	37.812	4.968	42.780	32789.8	4.968
6700.	37.886	4.968	42.855	33286.6	4.968
6800.	37.960	4.968	42.928	33783.5	4.968
6900.	38.033	4.968	43.001	34280.3	4.968
7000.	38.104	4.968	43.072	34777.1	4.968
273.15	21.989	4.968	26.957	1357.1	4.968
298.15	22.424	4.968	27.392	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 1.0080

Table A-2 Thermodynamic Functions for He

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	16.287	4.968	21.255	248.4	4.968
75.	18.301	4.968	23.269	372.6	4.968
100.	19.730	4.968	24.698	496.8	4.968
125.	20.839	4.968	25.807	621.0	4.968
150.	21.745	4.968	26.713	745.2	4.968
175.	22.511	4.968	27.479	869.4	4.968
200.	23.174	4.968	28.142	993.6	4.968
225.	23.759	4.968	28.727	1117.8	4.968
250.	24.283	4.968	29.251	1242.0	4.968
275.	24.756	4.968	29.724	1366.2	4.968
300.	25.188	4.968	30.156	1490.4	4.968
325.	25.586	4.968	30.554	1614.6	4.968
350.	25.954	4.968	30.922	1738.9	4.968
375.	26.297	4.968	31.265	1863.1	4.968
400.	26.618	4.968	31.586	1987.3	4.968
425.	26.919	4.968	31.887	2111.5	4.968
450.	27.203	4.968	32.171	2235.7	4.968
475.	27.471	4.968	32.440	2359.9	4.968
500.	27.726	4.968	32.694	2484.1	4.968
550.	28.200	4.968	33.168	2732.5	4.968
600.	28.632	4.968	33.600	2980.9	4.968
650.	29.030	4.968	33.998	3229.3	4.968
700.	29.398	4.968	34.366	3477.7	4.968
750.	29.741	4.968	34.709	3726.1	4.968
800.	30.061	4.968	35.029	3974.5	4.968
850.	30.362	4.968	35.331	4222.9	4.968
900.	30.646	4.968	35.615	4471.3	4.968
950.	30.915	4.968	35.883	4719.7	4.968
1000.	31.170	4.968	36.138	4968.1	4.968
1050.	31.412	4.968	36.380	5216.6	4.968
1100.	31.643	4.968	36.612	5465.0	4.968
1150.	31.864	4.968	36.832	5713.4	4.968
1200.	32.076	4.968	37.044	5961.8	4.968
1250.	32.278	4.968	37.247	6210.2	4.968
1300.	32.473	4.968	37.441	6458.6	4.968
1350.	32.661	4.968	37.629	6707.0	4.968
1400.	32.842	4.968	37.810	6955.4	4.968
1450.	33.016	4.968	37.984	7203.8	4.968
1500.	33.184	4.968	38.152	7452.2	4.968
1550.	33.347	4.968	38.315	7700.6	4.968
1600.	33.505	4.968	38.473	7949.0	4.968
1650.	33.658	4.968	38.626	8197.4	4.968
1700.	33.806	4.968	38.774	8445.9	4.968
1750.	33.950	4.968	38.918	8694.3	4.968
1800.	34.090	4.968	39.058	8942.7	4.968
1850.	34.226	4.968	39.194	9191.1	4.968
1900.	34.359	4.968	39.327	9439.5	4.968
1950.	34.488	4.968	39.456	9687.9	4.968
2000.	34.614	4.968	39.582	9936.3	4.968
2050.	34.736	4.968	39.704	10184.7	4.968

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.24981
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	1.0452
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.24965

Table A-2 Thermodynamic Functions for He - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	34.856	4.968	39.824	10433.1	4.968
2150.	34.973	4.968	39.941	10681.5	4.968
2200.	35.087	4.968	40.055	10929.9	4.968
2250.	35.199	4.968	40.167	11178.3	4.968
2300.	35.308	4.968	40.276	11426.7	4.968
2350.	35.415	4.968	40.383	11675.2	4.968
2400.	35.519	4.968	40.487	11923.6	4.968
2450.	35.622	4.968	40.590	12172.0	4.968
2500.	35.722	4.968	40.690	12420.4	4.968
2600.	35.917	4.968	40.885	12917.2	4.968
2700.	36.104	4.968	41.073	13414.0	4.968
2800.	36.285	4.968	41.253	13910.8	4.968
2900.	36.460	4.968	41.428	14407.6	4.968
3000.	36.628	4.968	41.596	14904.4	4.968
3100.	36.791	4.968	41.759	15401.3	4.968
3200.	36.949	4.968	41.917	15898.1	4.968
3300.	37.101	4.968	42.070	16394.9	4.968
3400.	37.250	4.968	42.218	16891.7	4.968
3500.	37.394	4.968	42.362	17388.5	4.968
3600.	37.534	4.968	42.502	17885.3	4.968
3700.	37.670	4.968	42.638	18382.2	4.968
3800.	37.802	4.968	42.771	18879.0	4.968
3900.	37.931	4.968	42.900	19375.8	4.968
4000.	38.057	4.968	43.025	19872.6	4.968
4100.	38.180	4.968	43.148	20369.4	4.968
4200.	38.300	4.968	43.268	20866.2	4.968
4300.	38.416	4.968	43.385	21363.0	4.968
4400.	38.531	4.968	43.499	21859.9	4.968
4500.	38.642	4.968	43.610	22356.7	4.968
4600.	38.752	4.968	43.720	22853.5	4.968
4700.	38.858	4.968	43.827	23350.3	4.968
4800.	38.963	4.968	43.931	23847.1	4.968
4900.	39.065	4.968	44.034	24343.9	4.968
5000.	39.166	4.968	44.134	24840.7	4.968
5100.	39.264	4.968	44.232	25337.6	4.968
5200.	39.361	4.968	44.329	25834.4	4.968
5300.	39.455	4.968	44.423	26331.2	4.968
5400.	39.548	4.968	44.516	26828.0	4.968
5500.	39.639	4.968	44.607	27324.8	4.968
5600.	39.729	4.968	44.697	27821.6	4.968
5700.	39.817	4.968	44.785	28318.5	4.968
5800.	39.903	4.968	44.871	28815.3	4.968
5900.	39.988	4.968	44.956	29312.1	4.968
6000.	40.072	4.968	45.040	29808.9	4.968
6100.	40.154	4.968	45.122	30305.7	4.968
6200.	40.235	4.968	45.203	30802.5	4.968
6300.	40.314	4.968	45.282	31299.3	4.968
6400.	40.392	4.968	45.360	31796.2	4.968
6500.	40.469	4.968	45.437	32293.0	4.968
6600.	40.545	4.968	45.513	32789.8	4.968
6700.	40.620	4.968	45.588	33286.6	4.968
6800.	40.693	4.968	45.662	33783.4	4.968
6900.	40.766	4.968	45.734	34280.2	4.968
7000.	40.837	4.968	45.806	34777.0	4.968
273.15	24.723	4.968	29.691	1357.1	4.968
298.15	25.158	4.968	30.126	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 4.003

Table A-3 Thermodynamic Functions for Li

T °K	$\frac{-(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	19.304	4.968	24.272	248.4	4.968
75.	21.319	4.968	26.287	372.6	4.968
100.	22.748	4.968	27.716	496.8	4.968
125.	23.857	4.968	28.825	621.0	4.968
150.	24.762	4.968	29.731	745.2	4.968
175.	25.528	4.968	30.496	869.4	4.968
200.	26.192	4.968	31.160	993.6	4.968
225.	26.777	4.968	31.745	1117.8	4.968
250.	27.300	4.968	32.268	1242.0	4.968
275.	27.774	4.968	32.742	1366.2	4.968
300.	28.206	4.968	33.174	1490.4	4.968
325.	28.604	4.968	33.572	1614.6	4.968
350.	28.972	4.968	33.940	1738.9	4.968
375.	29.315	4.968	34.283	1863.1	4.968
400.	29.635	4.968	34.603	1987.3	4.968
425.	29.937	4.968	34.905	2111.5	4.968
450.	30.220	4.968	35.189	2235.7	4.968
475.	30.489	4.968	35.457	2359.9	4.968
500.	30.744	4.968	35.712	2484.1	4.968
550.	31.217	4.968	36.186	2732.5	4.968
600.	31.650	4.968	36.618	2980.9	4.968
650.	32.047	4.968	37.016	3229.3	4.968
700.	32.416	4.968	37.384	3477.7	4.968
750.	32.758	4.968	37.726	3726.1	4.968
800.	33.079	4.968	38.047	3974.5	4.968
850.	33.380	4.968	38.348	4222.9	4.968
900.	33.664	4.968	38.632	4471.3	4.968
950.	33.933	4.968	38.901	4719.7	4.968
1000.	34.188	4.968	39.156	4968.1	4.968
1050.	34.430	4.968	39.398	5216.6	4.968
1100.	34.661	4.968	39.629	5465.0	4.968
1150.	34.882	4.968	39.850	5713.4	4.968
1200.	35.093	4.968	40.062	5961.8	4.968
1250.	35.296	4.968	40.264	6210.2	4.968
1300.	35.491	4.968	40.459	6458.6	4.968
1350.	35.679	4.968	40.647	6707.0	4.968
1400.	35.859	4.968	40.827	6955.4	4.968
1450.	36.034	4.968	41.002	7203.9	4.969
1500.	36.202	4.968	41.170	7452.3	4.969
1550.	36.365	4.968	41.333	7700.8	4.969
1600.	36.523	4.968	41.491	7949.2	4.970
1650.	36.676	4.968	41.644	8197.7	4.970
1700.	36.824	4.968	41.792	8446.3	4.971
1750.	36.968	4.968	41.936	8694.9	4.972
1800.	37.108	4.969	42.076	8943.5	4.974
1850.	37.244	4.969	42.213	9192.3	4.976
1900.	37.376	4.969	42.345	9441.1	4.978
1950.	37.506	4.969	42.475	9690.0	4.980
2000.	37.631	4.970	42.601	9939.1	4.983
2050.	37.754	4.970	42.724	10188.4	4.987

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.14409
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.60287
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.14400

Table A-3 Thermodynamic Functions for Li - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	37.874	4.970	42.844	10437.8	4.991
2150.	37.991	4.971	42.962	10687.5	4.996
2200.	38.105	4.972	43.077	10937.4	5.001
2250.	38.217	4.972	43.189	11187.6	5.007
2300.	38.326	4.973	43.299	11438.2	5.014
2350.	38.433	4.974	43.407	11689.1	5.022
2400.	38.538	4.975	43.513	11940.4	5.031
2450.	38.640	4.976	43.617	12192.2	5.040
2500.	38.741	4.978	43.719	12444.5	5.051
2600.	38.936	4.981	43.917	12950.7	5.075
2700.	39.124	4.985	44.109	13459.5	5.102
2800.	39.306	4.990	44.295	13971.2	5.134
2900.	39.481	4.995	44.476	14486.4	5.169
3000.	39.650	5.002	44.652	15005.2	5.209
3100.	39.814	5.009	44.824	15528.3	5.253
3200.	39.974	5.017	44.991	16055.9	5.300
3300.	40.128	5.027	45.155	16588.5	5.352
3400.	40.278	5.037	45.316	17126.4	5.407
3500.	40.425	5.049	45.473	17670.1	5.466
3600.	40.567	5.061	45.628	18219.8	5.529
3700.	40.706	5.075	45.780	18776.0	5.596
3800.	40.841	5.089	45.931	19339.1	5.666
3900.	40.974	5.105	46.079	19909.4	5.740
4000.	41.103	5.122	46.225	20487.3	5.819
4100.	41.230	5.140	46.370	21073.2	5.901
4200.	41.354	5.159	46.513	21667.6	5.988
4300.	41.476	5.179	46.655	22270.9	6.079
4400.	41.595	5.201	46.796	22883.6	6.176
4500.	41.712	5.224	46.936	23506.3	6.278
4600.	41.827	5.248	47.075	24139.5	6.386
4700.	41.940	5.273	47.213	24783.7	6.501
4800.	42.052	5.300	47.351	25439.8	6.622
4900.	42.161	5.328	47.489	26108.4	6.751
5000.	42.269	5.358	47.627	26790.2	6.888
5100.	42.375	5.389	47.765	27486.2	7.033
5200.	42.480	5.423	47.903	28197.1	7.187
5300.	42.584	5.457	48.041	28924.0	7.351
5400.	42.686	5.494	48.180	29667.7	7.525
5500.	42.788	5.533	48.320	30429.3	7.709
5600.	42.888	5.573	48.461	31209.8	7.903
5700.	42.987	5.616	48.602	32010.3	8.109
5800.	43.085	5.661	48.745	32831.9	8.325
5900.	43.182	5.708	48.890	33675.6	8.552
6000.	43.278	5.757	49.035	34542.6	8.790
6100.	43.374	5.809	49.183	35434.0	9.039
6200.	43.469	5.863	49.332	36350.8	9.299
6300.	43.563	5.920	49.483	37294.1	9.568
6400.	43.657	5.979	49.635	38264.8	9.847
6500.	43.750	6.041	49.790	39263.9	10.135
6600.	43.842	6.105	49.947	40292.1	10.431
6700.	43.935	6.172	50.106	41350.3	10.734
6800.	44.027	6.241	50.268	42439.2	11.044
6900.	44.118	6.313	50.431	43559.3	11.359
7000.	44.210	6.387	50.597	44711.1	11.677
273.15	27.740	4.968	32.708	1357.1	4.968
298.15	28.175	4.968	33.143	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 6.940

Table A-4 Thermodynamic Functions for Be

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	18.706	4.968	23.674	248.4	4.968
75.	20.720	4.968	25.689	372.6	4.968
100.	22.150	4.968	27.118	496.8	4.968
125.	23.258	4.968	28.226	621.0	4.968
150.	24.164	4.968	29.132	745.2	4.968
175.	24.930	4.968	29.898	869.4	4.968
200.	25.593	4.968	30.561	993.6	4.968
225.	26.178	4.968	31.147	1117.8	4.968
250.	26.702	4.968	31.670	1242.0	4.968
275.	27.175	4.968	32.144	1366.2	4.968
300.	27.608	4.968	32.576	1490.4	4.968
325.	28.005	4.968	32.974	1614.6	4.968
350.	28.374	4.968	33.342	1738.9	4.968
375.	28.716	4.968	33.684	1863.1	4.968
400.	29.037	4.968	34.005	1987.3	4.968
425.	29.338	4.968	34.306	2111.5	4.968
450.	29.622	4.968	34.590	2235.7	4.968
475.	29.891	4.968	34.859	2359.9	4.968
500.	30.146	4.968	35.114	2484.1	4.968
550.	30.619	4.968	35.587	2732.5	4.968
600.	31.051	4.968	36.020	2980.9	4.968
650.	31.449	4.968	36.417	3229.3	4.968
700.	31.817	4.968	36.785	3477.7	4.968
750.	32.160	4.968	37.128	3726.1	4.968
800.	32.481	4.968	37.449	3974.5	4.968
850.	32.782	4.968	37.750	4222.9	4.968
900.	33.066	4.968	38.034	4471.3	4.968
950.	33.334	4.968	38.303	4719.7	4.968
1000.	33.589	4.968	38.557	4968.1	4.968
1050.	33.832	4.968	38.800	5216.6	4.968
1100.	34.063	4.968	39.031	5465.0	4.968
1150.	34.284	4.968	39.252	5713.4	4.968
1200.	34.495	4.968	39.463	5961.8	4.968
1250.	34.698	4.968	39.666	6210.2	4.968
1300.	34.893	4.968	39.861	6458.6	4.968
1350.	35.080	4.968	40.048	6707.0	4.968
1400.	35.261	4.968	40.229	6955.4	4.968
1450.	35.435	4.968	40.403	7203.8	4.968
1500.	35.604	4.968	40.572	7452.2	4.968
1550.	35.767	4.968	40.735	7700.6	4.968
1600.	35.924	4.968	40.892	7949.0	4.968
1650.	36.077	4.968	41.045	8197.5	4.968
1700.	36.225	4.968	41.194	8445.9	4.968
1750.	36.369	4.968	41.338	8694.3	4.968
1800.	36.509	4.968	41.478	8942.7	4.968
1850.	36.646	4.968	41.614	9191.1	4.968
1900.	36.778	4.968	41.746	9439.5	4.968
1950.	36.907	4.968	41.875	9687.9	4.969
2000.	37.033	4.968	42.001	9936.4	4.969
2050.	37.156	4.968	42.124	10184.8	4.969

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.11095
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.46421
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.11088

Table A-4 Thermodynamic Functions for Be - continued

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	37.275	4.968	42.244	10433.3	4.969
2150.	37.392	4.968	42.360	10681.8	4.970
2200.	37.506	4.968	42.475	10930.3	4.970
2250.	37.618	4.968	42.586	11178.8	4.971
2300.	37.727	4.968	42.696	11427.3	4.972
2350.	37.834	4.968	42.803	11676.0	4.973
2400.	37.939	4.969	42.907	11924.6	4.974
2450.	38.041	4.969	43.010	12173.4	4.976
2500.	38.142	4.969	43.110	12422.2	4.977
2600.	38.336	4.969	43.306	12920.1	4.982
2700.	38.524	4.970	43.494	13418.6	4.988
2800.	38.705	4.971	43.675	13917.9	4.997
2900.	38.879	4.972	43.851	14418.0	5.007
3000.	39.048	4.973	44,021	14919.4	5.021
3100.	39.211	4.975	44.186	15422.2	5.037
3200.	39.369	4.977	44.346	15926.9	5.057
3300.	39.522	4.980	44.502	16433.8	5.081
3400.	39.671	4.983	44.654	16943.3	5.109
3500.	39.815	4.987	44.803	17455.8	5.142
3600.	39.956	4.992	44.948	17971.8	5.179
3700.	40.093	4.998	45.090	18491.7	5.221
3800.	40.226	5.004	45.230	19016.1	5.268
3900.	40.356	5.012	45.368	19545.5	5.320
4000.	40.483	5.020	45.503	20080.3	5.378
4100.	40.607	5.030	45.637	20621.2	5.440
4200.	40.729	5.040	45.769	21168.5	5.508
4300.	40.847	5.052	45.899	21722.9	5.581
4400.	40.964	5.065	46.028	22284.8	5.658
4500.	41.078	5.079	46.156	22854.7	5.741
4600.	41.189	5.094	46.283	23433.1	5.828
4700.	41.299	5.111	46.410	24020.4	5.919
4800.	41.407	5.129	46.535	24617.0	6.014
4900.	41.513	5.148	46.660	25223.3	6.113
5000.	41.617	5.168	46.785	25839.6	6.215
5100.	41.720	5.189	46.909	26466.3	6.320
5200.	41.820	5.212	47.033	27103.6	6.428
5300.	41.920	5.236	47.156	27751.9	6.538
5400.	42.018	5.261	47.279	28411.2	6.649
5500.	42.115	5.288	47.402	29081.8	6.763
5600.	42.210	5.315	47.525	29763.8	6.877
5700.	42.305	5.343	47.648	30457.3	6.993
5800.	42.398	5.373	47.771	31162.3	7.108
5900.	42.490	5.403	47.893	31879.0	7.224
6000.	42.581	5.435	48.016	32607.2	7.340
6100.	42.671	5.467	48.138	33346.9	7.455
6200.	42.760	5.500	48.260	34098.1	7.569
6300.	42.849	5.533	48.382	34860.7	7.683
6400.	42.936	5.568	48.504	35634.6	7.795
6500.	43.023	5.603	48.626	36419.7	7.906
6600.	43.108	5.639	48.747	37215.7	8.015
6700.	43.193	5.675	48.869	38022.5	8.122
6800.	43.278	5.712	48.990	38840.0	8.227
6900.	43.362	5.749	49.110	39667.9	8.331
7000.	43.444	5.787	49.231	40506.1	8.432
273.15	27.142	4.968	32.110	1357.1	4.968
298.15	27.577	4.968	32.545	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 9.013

Table A-5 Thermodynamic Functions for B

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	22.250	5.479	27.729	273.9	5.072
75.	24.441	5.331	29.772	399.8	5.013
100.	25.962	5.249	31.211	524.9	4.993
125.	27.127	5.197	32.324	649.6	4.984
150.	28.071	5.161	33.232	774.1	4.979
175.	28.865	5.135	34.000	898.6	4.976
200.	29.549	5.115	34.664	1022.9	4.974
225.	30.151	5.099	35.250	1147.3	4.973
250.	30.687	5.086	35.774	1271.6	4.972
275.	31.171	5.076	36.247	1395.9	4.971
300.	31.613	5.067	36.680	1520.2	4.971
325.	32.018	5.060	37.078	1644.4	4.970
350.	32.393	5.053	37.446	1768.7	4.970
375.	32.741	5.048	37.789	1892.9	4.970
400.	33.067	5.043	38.110	2017.2	4.970
425.	33.372	5.039	38.411	2141.4	4.969
450.	33.660	5.035	38.695	2265.6	4.969
475.	33.932	5.031	38.964	2389.9	4.969
500.	34.190	5.028	39.219	2514.1	4.969
550.	34.669	5.023	39.692	2762.6	4.969
600.	35.106	5.018	40.125	3011.0	4.969
650.	35.508	5.015	40.522	3259.4	4.969
700.	35.879	5.011	40.891	3507.9	4.969
750.	36.225	5.008	41.233	3756.3	4.969
800.	36.548	5.006	41.554	4004.7	4.969
850.	36.851	5.004	41.855	4253.1	4.968
900.	37.137	5.002	42.139	4501.6	4.968
950.	37.408	5.000	42.408	4750.0	4.968
1000.	37.664	4.998	42.663	4998.4	4.968
1050.	37.908	4.997	42.905	5246.8	4.968
1100.	38.140	4.996	43.136	5495.3	4.968
1150.	38.363	4.994	43.357	5743.7	4.968
1200.	38.575	4.993	43.568	5992.1	4.968
1250.	38.779	4.992	43.771	6240.5	4.968
1300.	38.975	4.991	43.966	6488.9	4.968
1350.	39.163	4.991	44.154	6737.3	4.968
1400.	39.345	4.990	44.334	6985.7	4.968
1450.	39.520	4.989	44.509	7234.2	4.968
1500.	39.689	4.988	44.677	7482.6	4.968
1550.	39.852	4.988	44.840	7731.0	4.968
1600.	40.011	4.987	44.998	7979.4	4.968
1650.	40.164	4.987	45.151	8227.8	4.968
1700.	40.313	4.986	45.299	8476.2	4.968
1750.	40.457	4.986	45.443	8724.6	4.968
1800.	40.598	4.985	45.583	8973.0	4.968
1850.	40.734	4.985	45.719	9221.4	4.968
1900.	40.867	4.984	45.852	9469.9	4.968
1950.	40.997	4.984	45.981	9718.3	4.968
2000.	41.123	4.983	46.106	9966.7	4.968
2050.	41.246	4.983	46.229	10215.1	4.968

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.092421
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.38669
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.092361

Table A-5 Thermodynamic Functions for B - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	41.366	4.983	46.349	10463.5	4.968
2150.	41.483	4.982	46.466	10711.9	4.968
2200.	41.598	4.982	46.580	10960.3	4.968
2250.	41.710	4.982	46.692	11208.7	4.968
2300.	41.819	4.981	46.801	11457.1	4.968
2350.	41.927	4.981	46.908	11705.6	4.968
2400.	42.031	4.981	47.012	11954.0	4.968
2450.	42.134	4.981	47.115	12202.4	4.968
2500.	42.235	4.980	47.215	12450.8	4.968
2600.	42.430	4.980	47.410	12947.6	4.968
2700.	42.618	4.979	47.597	13444.5	4.968
2800.	42.799	4.979	47.778	13941.3	4.969
2900.	42.974	4.979	47.952	14438.2	4.969
3000.	43.143	4.978	48.121	14935.0	4.969
3100.	43.306	4.978	48.284	15431.9	4.969
3200.	43.464	4.978	48.442	15928.9	4.970
3300.	43.617	4.978	48.595	16425.9	4.970
3400.	43.766	4.977	48.743	16923.0	4.971
3500.	43.910	4.977	48.887	17420.1	4.972
3600.	44.050	4.977	49.027	17917.4	4.973
3700.	44.186	4.977	49.163	18414.9	4.975
3800.	44.319	4.977	49.296	18912.4	4.977
3900.	44.448	4.977	49.425	19410.2	4.979
4000.	44.574	4.977	49.552	19908.3	4.982
4100.	44.697	4.977	49.675	20406.6	4.985
4200.	44.817	4.977	49.795	20905.3	4.988
4300.	44.934	4.978	49.912	21404.3	4.993
4400.	45.049	4.978	50.027	21903.8	4.997
4500.	45.161	4.979	50.139	22403.8	5.002
4600.	45.270	4.979	50.249	22904.3	5.008
4700.	45.377	4.980	50.357	23405.5	5.015
4800.	45.482	4.981	50.463	23907.3	5.022
4900.	45.585	4.982	50.566	24409.9	5.030
5000.	45.685	4.983	50.668	24913.3	5.039
5100.	45.784	4.984	50.768	25417.6	5.048
5200.	45.881	4.985	50.866	25922.9	5.058
5300.	45.976	4.987	50.963	26429.3	5.069
5400.	46.069	4.988	51.057	26936.7	5.081
5500.	46.161	4.990	51.151	27445.4	5.093
5600.	46.251	4.992	51.243	27955.4	5.107
5700.	46.339	4.994	51.333	28466.8	5.121
5800.	46.426	4.996	51.422	28979.6	5.136
5900.	46.511	4.999	51.510	29494.0	5.152
6000.	46.595	5.002	51.597	30010.0	5.168
6100.	46.678	5.005	51.683	30527.7	5.186
6200.	46.759	5.008	51.767	31047.2	5.204
6300.	46.840	5.011	51.850	31568.6	5.224
6400.	46.919	5.014	51.933	32092.0	5.244
6500.	46.996	5.018	52.014	32617.4	5.265
6600.	47.073	5.022	52.095	33144.9	5.286
6700.	47.148	5.026	52.175	33674.7	5.309
6800.	47.223	5.030	52.253	34206.7	5.332
6900.	47.296	5.035	52.331	34741.1	5.356
7000.	47.369	5.040	52.409	35278.0	5.381
273.15	31.137	5.077	36.214	1386.7	4.971
298.15	31.581	5.068	36.649	1511.0	4.971

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 10.82

Table A-6 Thermodynamic Functions for C

T °K	$\frac{-(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	22.461	6.203	28.664	310.2	5.428
75.	24.913	5.895	30.808	442.1	5.177
100.	26.581	5.702	32.283	570.2	5.085
125.	27.838	5.574	33.412	696.8	5.042
150.	28.846	5.483	34.330	822.5	5.019
175.	29.686	5.416	35.102	947.8	5.005
200.	30.406	5.364	35.770	1072.8	4.997
225.	31.035	5.323	36.358	1197.6	4.990
250.	31.594	5.289	36.884	1322.3	4.986
275.	32.097	5.262	37.359	1447.0	4.983
300.	32.554	5.238	37.792	1571.5	4.981
325.	32.972	5.218	38.191	1696.0	4.979
350.	33.358	5.201	38.560	1820.4	4.977
375.	33.717	5.186	38.903	1944.9	4.976
400.	34.051	5.173	39.224	2069.2	4.975
425.	34.364	5.161	39.526	2193.6	4.974
450.	34.659	5.151	39.810	2318.0	4.974
475.	34.937	5.142	40.079	2442.3	4.973
500.	35.201	5.133	40.334	2566.6	4.973
550.	35.689	5.119	40.808	2815.2	4.972
600.	36.134	5.106	41.240	3063.8	4.971
650.	36.542	5.096	41.638	3312.3	4.971
700.	36.920	5.087	42.007	3560.9	4.970
750.	37.270	5.079	42.350	3809.4	4.970
800.	37.598	5.072	42.670	4057.9	4.970
850.	37.905	5.066	42.972	4306.4	4.970
900.	38.195	5.061	43.256	4554.9	4.970
950.	38.468	5.056	43.524	4803.3	4.969
1000.	38.727	5.052	43.779	5051.8	4.969
1050.	38.974	5.048	44.022	5300.3	4.969
1100.	39.209	5.044	44.253	5548.7	4.969
1150.	39.433	5.041	44.474	5797.2	4.970
1200.	39.647	5.038	44.685	6045.7	4.970
1250.	39.853	5.035	44.888	6294.2	4.970
1300.	40.050	5.033	45.083	6542.7	4.971
1350.	40.240	5.031	45.271	6791.2	4.971
1400.	40.423	5.028	45.452	7039.8	4.972
1450.	40.600	5.027	45.626	7288.5	4.973
1500.	40.770	5.025	45.795	7537.2	4.975
1550.	40.935	5.023	45.958	7786.0	4.976
1600.	41.094	5.022	46.116	8034.8	4.978
1650.	41.249	5.020	46.269	8283.8	4.981
1700.	41.398	5.019	46.418	8532.9	4.984
1750.	41.544	5.018	46.562	8782.2	4.987
1800.	41.685	5.018	46.703	9031.6	4.990
1850.	41.823	5.017	46.840	9281.2	4.994
1900.	41.957	5.016	46.973	9531.0	4.998
1950.	42.087	5.016	47.103	9781.0	5.003
2000.	42.214	5.016	47.229	10031.3	5.008
2050.	42.338	5.016	47.353	10281.8	5.013

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.083257
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.34835
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.083203

Table A-6 Thermodynamic Functions for C - continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	42.459	5.016	47.474	10532.6	5.019
2150.	42.577	5.016	47.592	10783.7	5.025
2200.	42.692	5.016	47.708	11035.1	5.032
2250.	42.805	5.016	47.821	11286.9	5.038
2300.	42.915	5.017	47.932	11539.0	5.046
2350.	43.023	5.018	48.040	11791.4	5.053
2400.	43.128	5.018	48.147	12044.3	5.061
2450.	43.232	5.019	48.251	12297.5	5.069
2500.	43.333	5.020	48.354	12551.1	5.077
2600.	43.530	5.023	48.553	13059.7	5.094
2700.	43.720	5.026	48.746	13570.0	5.112
2800.	43.903	5.029	48.932	14082.1	5.130
2900.	44.079	5.033	49.112	14596.0	5.149
3000.	44.250	5.037	49.287	15111.8	5.168
3100.	44.415	5.042	49.457	15629.5	5.187
3200.	44.575	5.047	49.622	16149.2	5.206
3300.	44.731	5.052	49.782	16670.7	5.224
3400.	44.882	5.057	49.939	17194.0	5.243
3500.	45.028	5.063	50.091	17719.3	5.261
3600.	45.171	5.068	50.239	18246.3	5.279
3700.	45.310	5.074	50.384	18775.0	5.296
3800.	45.445	5.080	50.526	19305.5	5.313
3900.	45.577	5.087	50.664	19837.7	5.329
4000.	45.706	5.093	50.799	20371.4	5.345
4100.	45.832	5.099	50.931	20906.6	5.360
4200.	45.955	5.106	51.061	21443.4	5.375
4300.	46.075	5.112	51.187	21981.5	5.388
4400.	46.193	5.118	51.311	22521.0	5.402
4500.	46.308	5.125	51.433	23061.8	5.414
4600.	46.421	5.131	51.552	23603.8	5.426
4700.	46.531	5.138	51.669	24147.0	5.437
4800.	46.639	5.144	51.783	24691.3	5.448
4900.	46.745	5.150	51.896	25236.7	5.459
5000.	46.850	5.157	52.006	25783.0	5.468
5100.	46.952	5.163	52.115	26330.3	5.477
5200.	47.052	5.169	52.221	26878.5	5.486
5300.	47.151	5.175	52.326	27427.5	5.494
5400.	47.247	5.181	52.428	27977.3	5.502
5500.	47.342	5.187	52.529	28527.9	5.509
5600.	47.436	5.193	52.629	29079.2	5.516
5700.	47.528	5.198	52.726	29631.2	5.523
5800.	47.618	5.204	52.822	30183.8	5.529
5900.	47.707	5.210	52.917	30737.0	5.535
6000.	47.795	5.215	53.010	31290.8	5.541
6100.	47.881	5.221	53.102	31845.1	5.546
6200.	47.966	5.226	53.192	32399.9	5.551
6300.	48.050	5.231	53.281	32955.3	5.556
6400.	48.132	5.236	53.368	33511.1	5.560
6500.	48.213	5.241	53.455	34067.4	5.565
6600.	48.294	5.246	53.540	34624.1	5.569
6700.	48.372	5.251	53.623	35181.2	5.573
6800.	48.450	5.256	53.706	35738.7	5.577
6900.	48.527	5.260	53.787	36296.7	5.581
7000.	48.603	5.265	53.868	36855.0	5.585
273.15	32.061	5.264	37.325	1437.7	4.983
298.15	32.521	5.240	37.761	1562.3	4.981

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 12.011

Table A-7 Thermodynamic Functions for N

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	22.775	4.968	27.744	248.4	4.968
75.	24.790	4.968	29.758	372.6	4.968
100.	26.219	4.968	31.187	496.8	4.968
125.	27.328	4.968	32.296	621.0	4.968
150.	28.233	4.968	33.202	745.2	4.968
175.	28.999	4.968	33.967	869.4	4.968
200.	29.663	4.968	34.631	993.6	4.968
225.	30.248	4.968	35.216	1117.8	4.968
250.	30.771	4.968	35.739	1242.0	4.968
275.	31.245	4.968	36.213	1366.2	4.968
300.	31.677	4.968	36.645	1490.4	4.968
325.	32.075	4.968	37.043	1614.6	4.968
350.	32.443	4.968	37.411	1738.9	4.968
375.	32.786	4.968	37.754	1863.1	4.968
400.	33.106	4.968	38.074	1987.3	4.968
425.	33.408	4.968	38.376	2111.5	4.968
450.	33.692	4.968	38.660	2235.7	4.968
475.	33.960	4.968	38.928	2359.9	4.968
500.	34.215	4.968	39.183	2484.1	4.968
550.	34.688	4.968	39.657	2732.5	4.968
600.	35.121	4.968	40.089	2980.9	4.968
650.	35.518	4.968	40.487	3229.3	4.968
700.	35.887	4.968	40.855	3477.7	4.968
750.	36.229	4.968	41.198	3726.1	4.968
800.	36.550	4.968	41.518	3974.5	4.968
850.	36.851	4.968	41.819	4222.9	4.968
900.	37.135	4.968	42.103	4471.3	4.968
950.	37.404	4.968	42.372	4719.7	4.968
1000.	37.659	4.968	42.627	4968.1	4.968
1050.	37.901	4.968	42.869	5216.6	4.968
1100.	38.132	4.968	43.100	5465.0	4.968
1150.	38.353	4.968	43.321	5713.4	4.968
1200.	38.564	4.968	43.533	5961.8	4.968
1250.	38.767	4.968	43.735	6210.2	4.968
1300.	38.962	4.968	43.930	6458.6	4.968
1350.	39.150	4.968	44.118	6707.0	4.968
1400.	39.330	4.968	44.298	6955.4	4.968
1450.	39.505	4.968	44.473	7203.8	4.968
1500.	39.673	4.968	44.641	7452.2	4.968
1550.	39.836	4.968	44.804	7700.6	4.968
1600.	39.994	4.968	44.962	7949.0	4.968
1650.	40.147	4.968	45.115	8197.5	4.968
1700.	40.295	4.968	45.263	8445.9	4.968
1750.	40.439	4.968	45.407	8694.3	4.968
1800.	40.579	4.968	45.547	8942.7	4.968
1850.	40.715	4.968	45.683	9191.1	4.969
1900.	40.847	4.968	45.816	9439.6	4.969
1950.	40.976	4.968	45.945	9688.0	4.969
2000.	41.102	4.968	46.070	9936.4	4.969
2050.	41.225	4.968	46.193	10184.9	4.969

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.071388
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.29869
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.071341

Table A-7 Thermodynamic Functions for N - continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	41.345	4.968	46.313	10433.4	4.970
2150.	41.462	4.968	46.430	10681.9	4.970
2200.	41.576	4.968	46.544	10930.4	4.971
2250.	41.687	4.968	46.656	11179.0	4.972
2300.	41.797	4.969	46.765	11427.6	4.972
2350.	41.904	4.969	46.872	11676.2	4.973
2400.	42.008	4.969	46.977	11924.9	4.975
2450.	42.111	4.969	47.079	12173.7	4.976
2500.	42.211	4.969	47.180	12422.5	4.978
2600.	42.406	4.969	47.375	12920.5	4.982
2700.	42.593	4.970	47.563	13418.9	4.987
2800.	42.774	4.971	47.745	13917.9	4.993
2900.	42.949	4.972	47.920	14417.6	5.001
3000.	43.117	4.973	48.090	14918.2	5.010
3100.	43.280	4.974	48.254	15419.8	5.022
3200.	43.438	4.976	48.414	15922.6	5.035
3300.	43.591	4.978	48.569	16426.8	5.050
3400.	43.740	4.980	48.720	16932.5	5.067
3500.	43.884	4.983	48.867	17440.1	5.086
3600.	44.025	4.986	49.011	17949.7	5.107
3700.	44.161	4.990	49.151	18461.5	5.130
3800.	44.295	4.994	49.288	18975.8	5.155
3900.	44.424	4.998	49.422	19492.7	5.183
4000.	44.551	5.003	49.554	20012.5	5.213
4100.	44.675	5.009	49.683	20535.3	5.244
4200.	44.795	5.015	49.810	21061.4	5.278
4300.	44.913	5.021	49.935	21591.0	5.314
4400.	45.029	5.028	50.057	22124.2	5.351
4500.	45.142	5.036	50.178	22661.3	5.390
4600.	45.253	5.044	50.297	23202.3	5.431
4700.	45.361	5.053	50.414	23747.5	5.473
4800.	45.468	5.062	50.530	24297.0	5.517
4900.	45.572	5.072	50.644	24850.9	5.562
5000.	45.675	5.082	50.757	25409.4	5.608
5100.	45.776	5.093	50.868	25972.5	5.655
5200.	45.875	5.104	50.978	26540.3	5.702
5300.	45.972	5.116	51.088	27113.0	5.751
5400.	46.068	5.128	51.196	27690.5	5.800
5500.	46.162	5.141	51.302	28273.0	5.850
5600.	46.255	5.154	51.408	28860.5	5.900
5700.	46.346	5.167	51.513	29453.0	5.950
5800.	46.436	5.181	51.617	30050.4	6.000
5900.	46.525	5.195	51.720	30652.9	6.050
6000.	46.612	5.210	51.822	31260.4	6.100
6100.	46.698	5.225	51.923	31872.9	6.150
6200.	46.783	5.240	52.024	32490.4	6.199
6300.	46.867	5.256	52.123	33112.7	6.248
6400.	46.950	5.272	52.222	33739.9	6.296
6500.	47.032	5.288	52.320	34371.9	6.344
6600.	47.113	5.304	52.417	35008.6	6.391
6700.	47.193	5.321	52.514	35650.0	6.437
6800.	47.272	5.338	52.609	36295.9	6.482
6900.	47.350	5.355	52.704	36946.3	6.526
7000.	47.427	5.372	52.799	37601.1	6.569
273.15	31.211	4.968	36.179	1357.1	4.968
298.15	31.646	4.968	36.615	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 14.008

Table A-8 Thermodynamic Functions for O

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	23.628	5.028	28.657	251.4	5.249
75.	25.691	5.158	30.849	386.8	5.555
100.	27.191	5.275	32.466	527.5	5.666
125.	28.378	5.353	33.730	669.1	5.649
150.	29.358	5.397	34.755	809.5	5.583
175.	30.192	5.418	35.609	948.1	5.506
200.	30.916	5.424	36.340	1084.9	5.434
225.	31.554	5.422	36.976	1219.9	5.371
250.	32.125	5.414	37.539	1353.5	5.317
275.	32.641	5.403	38.044	1485.9	5.272
300.	33.110	5.391	38.501	1617.2	5.235
325.	33.541	5.377	38.919	1747.6	5.203
350.	33.939	5.364	39.303	1877.4	5.177
375.	34.309	5.351	39.660	2006.5	5.154
400.	34.654	5.338	39.992	2135.1	5.135
425.	34.977	5.325	40.302	2263.3	5.118
450.	35.281	5.313	40.595	2391.0	5.104
475.	35.568	5.302	40.870	2518.5	5.092
500.	35.840	5.291	41.131	2645.6	5.081
550.	36.343	5.271	41.614	2899.2	5.063
600.	36.801	5.253	42.054	3152.0	5.049
650.	37.221	5.237	42.458	3404.2	5.038
700.	37.608	5.223	42.831	3655.8	5.029
750.	37.968	5.209	43.178	3907.1	5.021
800.	38.304	5.197	43.502	4158.0	5.015
850.	38.619	5.187	43.806	4408.6	5.010
900.	38.915	5.177	44.092	4659.0	5.006
950.	39.195	5.168	44.362	4909.2	5.002
1000.	39.460	5.159	44.619	5159.3	4.999
1050.	39.711	5.152	44.863	5409.1	4.996
1100.	39.951	5.144	45.095	5658.9	4.994
1150.	40.179	5.138	45.317	5908.5	4.992
1200.	40.398	5.132	45.529	6158.1	4.990
1250.	40.607	5.126	45.733	6407.5	4.988
1300.	40.808	5.121	45.929	6656.9	4.987
1350.	41.001	5.116	46.117	6906.2	4.985
1400.	41.187	5.111	46.298	7155.4	4.984
1450.	41.366	5.107	46.473	7404.6	4.983
1500.	41.539	5.102	46.642	7653.7	4.982
1550.	41.707	5.099	46.805	7902.8	4.981
1600.	41.868	5.095	46.963	8151.9	4.981
1650.	42.025	5.091	47.117	8400.9	4.980
1700.	42.177	5.088	47.265	8649.9	4.979
1750.	42.325	5.085	47.410	8898.9	4.979
1800.	42.468	5.082	47.550	9147.8	4.979
1850.	42.607	5.079	47.686	9396.7	4.978
1900.	42.742	5.077	47.819	9645.6	4.978
1950.	42.874	5.074	47.948	9894.5	4.978
2000.	43.003	5.072	48.074	10143.4	4.978
2050.	43.128	5.069	48.197	10392.3	4.978

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.062500
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.26150
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.062459

Table A-8 Thermodynamic Functions for O - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	43.250	5.067	48.317	10641.2	4.978
2150.	43.369	5.065	48.434	10890.1	4.978
2200.	43.486	5.063	48.549	11139.0	4.979
2250.	43.599	5.061	48.661	11388.0	4.979
2300.	43.711	5.060	48.770	11636.9	4.980
2350.	43.819	5.058	48.877	11885.9	4.980
2400.	43.926	5.056	48.982	12135.0	4.981
2450.	44.030	5.055	49.085	12384.1	4.982
2500.	44.132	5.053	49.186	12633.2	4.984
2600.	44.330	5.051	49.381	13131.7	4.986
2700.	44.521	5.048	49.569	13630.5	4.990
2800.	44.705	5.046	49.751	14129.7	4.994
2900.	44.882	5.045	49.926	14629.4	4.999
3000.	45.053	5.043	50.096	15129.5	5.004
3100.	45.218	5.042	50.260	15630.2	5.010
3200.	45.378	5.041	50.419	16131.6	5.017
3300.	45.533	5.041	50.574	16633.7	5.025
3400.	45.684	5.040	50.724	17136.5	5.033
3500.	45.830	5.040	50.870	17640.2	5.041
3600.	45.972	5.040	51.012	18144.8	5.050
3700.	46.110	5.041	51.150	18650.3	5.060
3800.	46.244	5.041	51.285	19156.8	5.070
3900.	46.375	5.042	51.417	19664.4	5.081
4000.	46.503	5.043	51.546	20173.0	5.091
4100.	46.627	5.045	51.672	20682.7	5.103
4200.	46.749	5.046	51.795	21193.5	5.114
4300.	46.868	5.048	51.916	21705.5	5.126
4400.	46.984	5.050	52.033	22218.7	5.138
4500.	47.097	5.052	52.149	22733.0	5.150
4600.	47.208	5.054	52.262	23248.6	5.162
4700.	47.317	5.056	52.374	23765.4	5.174
4800.	47.424	5.059	52.483	24283.4	5.186
4900.	47.528	5.062	52.590	24802.6	5.198
5000.	47.630	5.065	52.695	25323.0	5.210
5100.	47.730	5.068	52.798	25844.6	5.222
5200.	47.829	5.071	52.900	26367.5	5.234
5300.	47.926	5.074	52.999	26891.5	5.246
5400.	48.020	5.077	53.098	27416.6	5.258
5500.	48.114	5.081	53.194	27943.0	5.269
5600.	48.205	5.084	53.289	28470.5	5.280
5700.	48.295	5.088	53.383	28999.1	5.292
5800.	48.384	5.091	53.475	29528.8	5.302
5900.	48.471	5.095	53.566	30059.5	5.313
6000.	48.556	5.099	53.655	30591.4	5.323
6100.	48.641	5.102	53.743	31124.2	5.334
6200.	48.724	5.106	53.830	31658.1	5.344
6300.	48.805	5.110	53.915	32192.9	5.353
6400.	48.886	5.114	54.000	32728.7	5.362
6500.	48.965	5.118	54.083	33265.4	5.372
6600.	49.043	5.122	54.165	33803.0	5.380
6700.	49.121	5.126	54.246	34341.5	5.389
6800.	49.196	5.130	54.326	34880.8	5.397
6900.	49.271	5.133	54.405	35420.9	5.405
7000.	49.345	5.137	54.483	35961.8	5.413
273.15	32.604	5.404	38.008	1476.1	5.275
298.15	33.077	5.392	38.469	1607.5	5.237

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 16.0000

Table A-9 Thermodynamic Functions for F

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	23.684	4.968	28.652	248.4	4.969
75.	25.699	4.971	30.670	372.9	4.994
100.	27.131	4.985	32.116	498.5	5.068
125.	28.246	5.012	33.258	626.5	5.172
150.	29.163	5.047	34.210	757.1	5.271
175.	29.943	5.085	35.029	889.9	5.350
200.	30.625	5.122	35.747	1024.4	5.403
225.	31.230	5.155	36.385	1159.9	5.433
250.	31.775	5.184	36.958	1295.9	5.446
275.	32.270	5.207	37.477	1432.0	5.445
300.	32.724	5.227	37.951	1568.1	5.436
325.	33.143	5.242	38.385	1703.8	5.421
350.	33.532	5.254	38.786	1839.1	5.402
375.	33.895	5.264	39.158	1973.9	5.382
400.	34.235	5.270	39.505	2108.2	5.361
425.	34.554	5.275	39.830	2241.9	5.341
450.	34.856	5.278	40.134	2375.2	5.320
475.	35.141	5.280	40.421	2508.0	5.301
500.	35.412	5.281	40.693	2640.3	5.282
550.	35.915	5.279	41.195	2903.5	5.248
600.	36.375	5.275	41.650	3165.1	5.218
650.	36.797	5.270	42.067	3425.4	5.192
700.	37.187	5.263	42.450	3684.4	5.169
750.	37.550	5.257	42.806	3942.4	5.150
800.	37.889	5.249	43.138	4199.4	5.133
850.	38.207	5.242	43.449	4455.7	5.118
900.	38.506	5.235	43.741	4711.2	5.105
950.	38.789	5.228	44.017	4966.2	5.093
1000.	39.057	5.221	44.278	5220.6	5.083
1050.	39.312	5.214	44.525	5474.5	5.074
1100.	39.554	5.207	44.761	5727.9	5.066
1150.	39.785	5.201	44.986	5981.0	5.059
1200.	40.007	5.195	45.201	6233.8	5.052
1250.	40.219	5.189	45.408	6486.3	5.046
1300.	40.422	5.183	45.605	6738.5	5.041
1350.	40.618	5.178	45.796	6990.4	5.036
1400.	40.806	5.173	45.979	7242.1	5.032
1450.	40.987	5.168	46.155	7493.6	5.028
1500.	41.162	5.163	46.326	7744.9	5.025
1550.	41.332	5.159	46.490	7996.1	5.021
1600.	41.495	5.154	46.650	8247.1	5.018
1650.	41.654	5.150	46.804	8497.9	5.016
1700.	41.807	5.146	46.954	8748.6	5.013
1750.	41.957	5.142	47.099	8999.2	5.011
1800.	42.101	5.139	47.240	9249.7	5.009
1850.	42.242	5.135	47.377	9500.1	5.007
1900.	42.379	5.132	47.511	9750.4	5.005
1950.	42.512	5.128	47.641	10000.6	5.003
2000.	42.642	5.125	47.767	10250.7	5.001
2050.	42.769	5.122	47.891	10500.7	5.000

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.052632
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.22021
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.052598

Table A-9 Thermodynamic Functions for F - continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	42.892	5.119	48.011	10750.7	4.998
2150.	43.012	5.117	48.129	11000.5	4.997
2200.	43.130	5.114	48.244	11250.4	4.996
2250.	43.245	5.111	48.356	11500.1	4.995
2300.	43.357	5.109	48.466	11749.9	4.994
2350.	43.467	5.106	48.573	11999.5	4.993
2400.	43.575	5.104	48.678	12249.1	4.992
2450.	43.680	5.102	48.781	12498.7	4.991
2500.	43.783	5.099	48.882	12748.2	4.990
2600.	43.983	5.095	49.078	13247.1	4.988
2700.	44.175	5.091	49.266	13745.9	4.987
2800.	44.360	5.087	49.447	14244.5	4.986
2900.	44.539	5.084	49.622	14743.1	4.985
3000.	44.711	5.080	49.791	15241.5	4.984
3100.	44.877	5.077	49.955	15739.8	4.983
3200.	45.038	5.074	50.113	16238.0	4.982
3300.	45.195	5.072	50.266	16736.1	4.981
3400.	45.346	5.069	50.415	17234.2	4.980
3500.	45.493	5.066	50.559	17732.2	4.980
3600.	45.636	5.064	50.699	18230.1	4.979
3700.	45.774	5.062	50.836	18728.0	4.978
3800.	45.909	5.059	50.969	19225.8	4.978
3900.	46.041	5.057	51.098	19723.6	4.977
4000.	46.169	5.055	51.224	20221.3	4.977
4100.	46.293	5.053	51.347	20719.0	4.977
4200.	46.415	5.052	51.467	21216.6	4.976
4300.	46.534	5.050	51.584	21714.2	4.976
4400.	46.650	5.048	51.698	22211.8	4.975
4500.	46.764	5.047	51.810	22709.3	4.975
4600.	46.874	5.045	51.919	23206.8	4.975
4700.	46.983	5.043	52.026	23704.3	4.975
4800.	47.089	5.042	52.131	24201.7	4.974
4900.	47.193	5.041	52.234	24699.2	4.974
5000.	47.295	5.039	52.334	25196.6	4.974
5100.	47.395	5.038	52.433	25693.9	4.974
5200.	47.492	5.037	52.529	26191.3	4.973
5300.	47.588	5.036	52.624	26688.6	4.973
5400.	47.682	5.034	52.717	27185.9	4.973
5500.	47.775	5.033	52.808	27683.2	4.973
5600.	47.866	5.032	52.898	28180.5	4.973
5700.	47.955	5.031	52.986	28677.8	4.973
5800.	48.042	5.030	53.072	29175.0	4.972
5900.	48.128	5.029	53.157	29672.3	4.972
6000.	48.213	5.028	53.241	30169.5	4.972
6100.	48.296	5.027	53.323	30666.7	4.972
6200.	48.377	5.026	53.404	31163.9	4.972
6300.	48.458	5.026	53.483	31661.1	4.972
6400.	48.537	5.025	53.562	32158.3	4.972
6500.	48.615	5.024	53.639	32655.4	4.972
6600.	48.692	5.023	53.715	33152.6	4.971
6700.	48.767	5.022	53.789	33649.7	4.971
6800.	48.842	5.022	53.863	34146.8	4.971
6900.	48.915	5.021	53.936	34644.0	4.971
7000.	48.987	5.020	54.007	35141.1	4.971
273.15	32.235	5.206	37.441	1422.0	5.445
298.15	32.692	5.226	37.917	1558.0	5.437

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 19.00

Table A-10 Thermodynamic Functions for Ne

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	21.109	4.968	26.077	248.4	4.968
75.	23.124	4.968	28.092	372.6	4.968
100.	24.553	4.968	29.521	496.8	4.968
125.	25.661	4.968	30.630	621.0	4.968
150.	26.567	4.968	31.535	745.2	4.968
175.	27.333	4.968	32.301	869.4	4.968
200.	27.996	4.968	32.965	993.6	4.968
225.	28.582	4.968	33.550	1117.8	4.968
250.	29.105	4.968	34.073	1242.0	4.968
275.	29.579	4.968	34.547	1366.2	4.968
300.	30.011	4.968	34.979	1490.4	4.968
325.	30.408	4.968	35.377	1614.6	4.968
350.	30.777	4.968	35.745	1738.9	4.968
375.	31.119	4.968	36.088	1863.1	4.968
400.	31.440	4.968	36.408	1987.3	4.968
425.	31.741	4.968	36.709	2111.5	4.968
450.	32.025	4.968	36.993	2235.7	4.968
475.	32.294	4.968	37.262	2359.9	4.968
500.	32.549	4.968	37.517	2484.1	4.968
550.	33.022	4.968	37.990	2732.5	4.968
600.	33.454	4.968	38.423	2980.9	4.968
650.	33.852	4.968	38.820	3229.3	4.968
700.	34.220	4.968	39.188	3477.7	4.968
750.	34.563	4.968	39.531	3726.1	4.968
800.	34.884	4.968	39.852	3974.5	4.968
850.	35.185	4.968	40.153	4222.9	4.968
900.	35.469	4.968	40.437	4471.3	4.968
950.	35.738	4.968	40.706	4719.7	4.968
1000.	35.992	4.968	40.960	4968.1	4.968
1050.	36.235	4.968	41.203	5216.6	4.968
1100.	36.466	4.968	41.434	5465.0	4.968
1150.	36.687	4.968	41.655	5713.4	4.968
1200.	36.898	4.968	41.866	5961.8	4.968
1250.	37.101	4.968	42.069	6210.2	4.968
1300.	37.296	4.968	42.264	6458.6	4.968
1350.	37.483	4.968	42.451	6707.0	4.968
1400.	37.664	4.968	42.632	6955.4	4.968
1450.	37.838	4.968	42.806	7203.8	4.968
1500.	38.007	4.968	42.975	7452.2	4.968
1550.	38.170	4.968	43.138	7700.6	4.968
1600.	38.327	4.968	43.296	7949.0	4.968
1650.	38.480	4.968	43.448	8197.4	4.968
1700.	38.629	4.968	43.597	8445.9	4.968
1750.	38.773	4.968	43.741	8694.3	4.968
1800.	38.913	4.968	43.881	8942.7	4.968
1850.	39.049	4.968	44.017	9191.1	4.968
1900.	39.181	4.968	44.149	9439.5	4.968
1950.	39.310	4.968	44.278	9687.9	4.968
2000.	39.436	4.968	44.404	9936.3	4.968
2050.	39.559	4.968	44.527	10184.7	4.968

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.049547
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.20732
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.049514

Table A-10 Thermodynamic Functions for Ne - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	39.678	4.968	44.647	10433.1	4.968
2150.	39.795	4.968	44.763	10681.5	4.968
2200.	39.910	4.968	44.878	10929.9	4.968
2250.	40.021	4.968	44.989	11178.3	4.968
2300.	40.130	4.968	45.099	11426.7	4.968
2350.	40.237	4.968	45.205	11675.2	4.968
2400.	40.342	4.968	45.310	11923.6	4.968
2450.	40.444	4.968	45.412	12172.0	4.968
2500.	40.545	4.968	45.513	12420.4	4.968
2600.	40.739	4.968	45.708	12917.2	4.968
2700.	40.927	4.968	45.895	13414.0	4.968
2800.	41.108	4.968	46.076	13910.8	4.968
2900.	41.282	4.968	46.250	14407.6	4.968
3000.	41.450	4.968	46.419	14904.4	4.968
3100.	41.613	4.968	46.581	15401.3	4.968
3200.	41.771	4.968	46.739	15898.1	4.968
3300.	41.924	4.968	46.892	16394.9	4.968
3400.	42.072	4.968	47.040	16891.7	4.968
3500.	42.216	4.968	47.184	17388.5	4.968
3600.	42.356	4.968	47.324	17885.3	4.968
3700.	42.492	4.968	47.460	18382.2	4.968
3800.	42.625	4.968	47.593	18879.0	4.968
3900.	42.754	4.968	47.722	19375.8	4.968
4000.	42.880	4.968	47.848	19872.6	4.968
4100.	43.002	4.968	47.970	20369.4	4.968
4200.	43.122	4.968	48.090	20866.2	4.968
4300.	43.239	4.968	48.207	21363.0	4.968
4400.	43.353	4.968	48.321	21859.9	4.968
4500.	43.465	4.968	48.433	22356.7	4.968
4600.	43.574	4.968	48.542	22853.5	4.968
4700.	43.681	4.968	48.649	23350.3	4.968
4800.	43.785	4.968	48.754	23847.1	4.968
4900.	43.888	4.968	48.856	24343.9	4.968
5000.	43.988	4.968	48.956	24840.7	4.968
5100.	44.087	4.968	49.055	25337.6	4.968
5200.	44.183	4.968	49.151	25834.4	4.968
5300.	44.278	4.968	49.246	26331.2	4.968
5400.	44.371	4.968	49.339	26828.0	4.968
5500.	44.462	4.968	49.430	27324.8	4.968
5600.	44.551	4.968	49.519	27821.6	4.968
5700.	44.639	4.968	49.607	28318.5	4.968
5800.	44.726	4.968	49.694	28815.3	4.968
5900.	44.811	4.968	49.779	29312.1	4.968
6000.	44.894	4.968	49.862	29808.9	4.968
6100.	44.976	4.968	49.944	30305.7	4.968
6200.	45.057	4.968	50.025	30802.5	4.968
6300.	45.136	4.968	50.105	31299.3	4.968
6400.	45.215	4.968	50.183	31796.2	4.968
6500.	45.292	4.968	50.260	32293.0	4.968
6600.	45.368	4.968	50.336	32789.8	4.968
6700.	45.442	4.968	50.410	33286.6	4.968
6800.	45.516	4.968	50.484	33783.4	4.968
6900.	45.588	4.968	50.557	34280.2	4.968
7000.	45.660	4.968	50.628	34777.0	4.968
273.15	29.545	4.968	34.513	1357.1	4.968
298.15	29.980	4.968	34.948	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 20.183

Table A-11 Thermodynamic Functions for Na

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	22.875	4.968	27.843	248.4	4.968
75.	24.889	4.968	29.857	372.6	4.968
100.	26.319	4.968	31.287	496.8	4.968
125.	27.427	4.968	32.395	621.0	4.968
150.	28.333	4.968	33.301	745.2	4.968
175.	29.099	4.968	34.067	869.4	4.968
200.	29.762	4.968	34.730	993.6	4.968
225.	30.347	4.968	35.315	1117.8	4.968
250.	30.871	4.968	35.839	1242.0	4.968
275.	31.344	4.968	36.312	1366.2	4.968
300.	31.777	4.968	36.745	1490.4	4.968
325.	32.174	4.968	37.142	1614.6	4.968
350.	32.542	4.968	37.511	1738.9	4.968
375.	32.885	4.968	37.853	1863.1	4.968
400.	33.206	4.968	38.174	1987.3	4.968
425.	33.507	4.968	38.475	2111.5	4.968
450.	33.791	4.968	38.759	2235.7	4.968
475.	34.060	4.968	39.028	2359.9	4.968
500.	34.314	4.968	39.283	2484.1	4.968
550.	34.788	4.968	39.756	2732.5	4.968
600.	35.220	4.968	40.188	2980.9	4.968
650.	35.618	4.968	40.586	3229.3	4.968
700.	35.986	4.968	40.954	3477.7	4.968
750.	36.329	4.968	41.297	3726.1	4.968
800.	36.649	4.968	41.618	3974.5	4.968
850.	36.951	4.968	41.919	4222.9	4.968
900.	37.235	4.968	42.203	4471.3	4.968
950.	37.503	4.968	42.471	4719.7	4.968
1000.	37.758	4.968	42.726	4968.1	4.968
1050.	38.000	4.968	42.969	5216.6	4.968
1100.	38.232	4.968	43.200	5465.0	4.968
1150.	38.452	4.968	43.421	5713.4	4.968
1200.	38.664	4.968	43.632	5961.8	4.968
1250.	38.867	4.968	43.835	6210.2	4.968
1300.	39.062	4.968	44.030	6458.6	4.968
1350.	39.249	4.968	44.217	6707.0	4.968
1400.	39.430	4.968	44.398	6955.4	4.968
1450.	39.604	4.968	44.572	7203.8	4.968
1500.	39.773	4.968	44.741	7452.2	4.968
1550.	39.935	4.968	44.904	7700.7	4.968
1600.	40.093	4.968	45.061	7949.1	4.968
1650.	40.246	4.968	45.214	8197.5	4.969
1700.	40.394	4.968	45.363	8445.9	4.969
1750.	40.538	4.968	45.507	8694.4	4.969
1800.	40.678	4.968	45.647	8942.9	4.970
1850.	40.814	4.968	45.783	9191.3	4.970
1900.	40.947	4.968	45.915	9439.9	4.971
1950.	41.076	4.968	46.044	9688.4	4.972
2000.	41.202	4.969	46.170	9937.0	4.973
2050.	41.324	4.969	46.293	10185.7	4.974

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.043495
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.18198
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.043467

Table A-11 Thermodynamic Functions for Na - continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ-H^\circ_0)/T$	S°	$H^\circ-H^\circ_0$	C°_p
2100.	41.444	4.969	46.413	10434.4	4.975
2150.	41.561	4.969	46.530	10683.2	4.977
2200.	41.675	4.969	46.645	10932.1	4.979
2250.	41.787	4.969	46.756	11181.2	4.982
2300.	41.896	4.970	46.866	11430.3	4.985
2350.	42.003	4.970	46.973	11679.7	4.988
2400.	42.108	4.970	47.078	11929.2	4.992
2450.	42.210	4.971	47.181	12178.9	4.996
2500.	42.311	4.972	47.282	12428.8	5.001
2600.	42.506	4.973	47.479	12929.5	5.013
2700.	42.693	4.975	47.668	13431.4	5.027
2800.	42.874	4.977	47.851	13935.0	5.044
2900.	43.049	4.979	48.029	14440.4	5.065
3000.	43.218	4.983	48.201	14948.0	5.089
3100.	43.381	4.987	48.368	15458.2	5.116
3200.	43.540	4.991	48.531	15971.4	5.148
3300.	43.693	4.996	48.690	16488.0	5.184
3400.	43.843	5.002	48.845	17008.5	5.226
3500.	43.988	5.010	48.997	17533.3	5.272
3600.	44.129	5.018	49.147	18063.0	5.324
3700.	44.267	5.027	49.293	18598.3	5.383
3800.	44.401	5.037	49.438	19139.9	5.449
3900.	44.532	5.048	49.580	19688.3	5.522
4000.	44.660	5.061	49.721	20244.6	5.604
4100.	44.785	5.075	49.860	20809.5	5.696
4200.	44.907	5.091	49.999	21384.2	5.799
4300.	45.027	5.109	50.137	21969.7	5.913
4400.	45.145	5.129	50.274	22567.3	6.041
4500.	45.261	5.151	50.411	23178.4	6.182
4600.	45.374	5.175	50.549	23804.3	6.339
4700.	45.486	5.201	50.687	24446.8	6.513
4800.	45.595	5.231	50.826	25107.6	6.705
4900.	45.704	5.263	50.967	25788.5	6.916
5000.	45.810	5.298	51.109	26491.4	7.147
5100.	45.916	5.337	51.253	27218.6	7.400
5200.	46.020	5.379	51.399	27972.2	7.675
5300.	46.123	5.425	51.548	28754.4	7.973
5400.	46.224	5.475	51.700	29567.6	8.295
5500.	46.325	5.530	51.855	30414.2	8.640
5600.	46.426	5.589	52.014	31296.5	9.010
5700.	46.525	5.652	52.177	32217.0	9.403
5800.	46.624	5.720	52.344	33177.9	9.819
5900.	46.722	5.793	52.516	34181.6	10.258
6000.	46.820	5.872	52.692	35230.2	10.717
6100.	46.918	5.955	52.873	36325.7	11.196
6200.	47.016	6.044	53.059	37470.0	11.692
6300.	47.113	6.137	53.250	38664.6	12.203
6400.	47.210	6.236	53.447	39911.1	12.727
6500.	47.308	6.340	53.648	41210.4	13.261
6600.	47.406	6.449	53.855	42563.5	13.801
6700.	47.503	6.563	54.066	43970.7	14.344
6800.	47.601	6.681	54.283	45432.2	14.886
6900.	47.700	6.804	54.504	46947.8	15.424
7000.	47.799	6.931	54.730	48516.8	15.955
273.15	31.311	4.968	36.279	1357.1	4.968
298.15	31.746	4.968	36.714	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 22.991

Table A-12 Thermodynamic Functions for Mg

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	21.665	4.968	26.633	248.4	4.968
75.	23.679	4.968	28.647	372.6	4.968
100.	25.109	4.968	30.077	496.8	4.968
125.	26.217	4.968	31.185	621.0	4.968
150.	27.123	4.968	32.091	745.2	4.968
175.	27.889	4.968	32.857	869.4	4.968
200.	28.552	4.968	33.520	993.6	4.968
225.	29.137	4.968	34.106	1117.8	4.968
250.	29.661	4.968	34.629	1242.0	4.968
275.	30.134	4.968	35.102	1366.2	4.968
300.	30.567	4.968	35.535	1490.4	4.968
325.	30.964	4.968	35.932	1614.6	4.968
350.	31.332	4.968	36.301	1738.9	4.968
375.	31.675	4.968	36.643	1863.1	4.968
400.	31.996	4.968	36.964	1987.3	4.968
425.	32.297	4.968	37.265	2111.5	4.968
450.	32.581	4.968	37.549	2235.7	4.968
475.	32.850	4.968	37.818	2359.9	4.968
500.	33.104	4.968	38.073	2484.1	4.968
550.	33.578	4.968	38.546	2732.5	4.968
600.	34.010	4.968	38.978	2980.9	4.968
650.	34.408	4.968	39.376	3229.3	4.968
700.	34.776	4.968	39.744	3477.7	4.968
750.	35.119	4.968	40.087	3726.1	4.968
800.	35.440	4.968	40.408	3974.5	4.968
850.	35.741	4.968	40.709	4222.9	4.968
900.	36.025	4.968	40.993	4471.3	4.968
950.	36.293	4.968	41.261	4719.7	4.968
1000.	36.548	4.968	41.516	4968.1	4.968
1050.	36.791	4.968	41.759	5216.6	4.968
1100.	37.022	4.968	41.990	5465.0	4.968
1150.	37.243	4.968	42.211	5713.4	4.968
1200.	37.454	4.968	42.422	5961.8	4.968
1250.	37.657	4.968	42.625	6210.2	4.968
1300.	37.852	4.968	42.820	6458.6	4.968
1350.	38.039	4.968	43.007	6707.0	4.968
1400.	38.220	4.968	43.188	6955.4	4.968
1450.	38.394	4.968	43.362	7203.8	4.968
1500.	38.563	4.968	43.531	7452.2	4.968
1550.	38.725	4.968	43.694	7700.6	4.968
1600.	38.883	4.968	43.851	7949.0	4.968
1650.	39.036	4.968	44.004	8197.5	4.968
1700.	39.184	4.968	44.153	8445.9	4.968
1750.	39.328	4.968	44.297	8694.3	4.968
1800.	39.468	4.968	44.437	8942.7	4.968
1850.	39.604	4.968	44.573	9191.1	4.968
1900.	39.737	4.968	44.705	9439.5	4.968
1950.	39.866	4.968	44.834	9687.9	4.969
2000.	39.992	4.968	44.960	9936.4	4.969
2050.	40.114	4.968	45.083	10184.8	4.969

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.041118
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.17204
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.041092

Table A-12 Thermodynamic Functions for Mg - continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	40.234	4.968	45.202	10433.3	4.969
2150.	40.351	4.968	45.319	10681.8	4.970
2200.	40.465	4.968	45.434	10930.3	4.970
2250.	40.577	4.968	45.545	11178.8	4.971
2300.	40.686	4.968	45.655	11427.4	4.972
2350.	40.793	4.969	45.762	11676.0	4.973
2400.	40.898	4.969	45.866	11924.7	4.974
2450.	41.000	4.969	45.969	12173.4	4.976
2500.	41.100	4.969	46.069	12422.3	4.978
2600.	41.295	4.969	46.265	12920.3	4.983
2700.	41.483	4.970	46.453	13418.8	4.989
2800.	41.664	4.971	46.634	13918.2	4.998
2900.	41.838	4.972	46.810	14418.5	5.009
3000.	42.007	4.973	46.980	14920.0	5.023
3100.	42.170	4.975	47.145	15423.1	5.040
3200.	42.328	4.978	47.305	15928.0	5.060
3300.	42.481	4.980	47.461	16435.3	5.085
3400.	42.630	4.984	47.614	16945.2	5.114
3500.	42.774	4.988	47.762	17458.2	5.148
3600.	42.915	4.993	47.908	17974.9	5.186
3700.	43.052	4.999	48.051	18495.6	5.229
3800.	43.185	5.006	48.191	19020.9	5.278
3900.	43.315	5.013	48.328	19551.4	5.332
4000.	43.442	5.022	48.464	20087.6	5.392
4100.	43.566	5.032	48.598	20630.0	5.457
4200.	43.688	5.043	48.730	21179.2	5.528
4300.	43.807	5.055	48.861	21735.8	5.604
4400.	43.923	5.068	48.991	22300.2	5.686
4500.	44.037	5.083	49.120	22873.2	5.774
4600.	44.149	5.099	49.248	23455.1	5.866
4700.	44.259	5.116	49.375	24046.6	5.964
4800.	44.367	5.135	49.502	24648.2	6.068
4900.	44.473	5.155	49.628	25260.3	6.176
5000.	44.577	5.177	49.754	25883.5	6.289
5100.	44.680	5.200	49.879	26518.3	6.407
5200.	44.781	5.224	50.005	27165.1	6.530
5300.	44.881	5.250	50.131	27824.5	6.658
5400.	44.979	5.277	50.256	28496.9	6.791
5500.	45.076	5.306	50.382	29182.8	6.928
5600.	45.172	5.336	50.508	29882.6	7.070
5700.	45.267	5.368	50.635	30596.9	7.216
5800.	45.361	5.401	50.762	31326.0	7.367
5900.	45.453	5.436	50.889	32070.5	7.523
6000.	45.545	5.472	51.017	32830.8	7.685
6100.	45.636	5.509	51.145	33607.6	7.851
6200.	45.725	5.549	51.274	34401.2	8.022
6300.	45.815	5.589	51.404	35212.2	8.199
6400.	45.903	5.631	51.534	36041.2	8.382
6500.	45.991	5.675	51.666	36888.7	8.570
6600.	46.078	5.721	51.798	37755.4	8.765
6700.	46.164	5.767	51.931	38641.9	8.965
6800.	46.250	5.816	52.066	39548.7	9.172
6900.	46.335	5.866	52.201	40476.5	9.386
7000.	46.420	5.918	52.338	41426.1	9.606
273.15	30.101	4.968	35.069	1357.1	4.968
298.15	30.536	4.968	35.504	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 24.32

Table A-13 Thermodynamic Functions for Al

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	23.504	5.440	28.944	272.0	6.379
75.	25.783	5.776	31.558	433.2	6.376
100.	27.463	5.882	33.344	588.2	6.021
125.	28.776	5.878	34.654	734.8	5.725
150.	29.844	5.835	35.679	875.2	5.522
175.	30.739	5.780	36.519	1011.4	5.384
200.	31.508	5.724	37.231	1144.8	5.290
225.	32.179	5.672	37.850	1276.1	5.223
250.	32.774	5.624	38.398	1406.1	5.175
275.	33.308	5.582	38.890	1535.0	5.138
300.	33.792	5.544	39.335	1663.1	5.111
325.	34.234	5.509	39.744	1790.6	5.089
350.	34.641	5.479	40.120	1917.6	5.072
375.	35.018	5.451	40.470	2044.2	5.058
400.	35.369	5.426	40.796	2170.5	5.047
425.	35.698	5.404	41.101	2296.6	5.038
450.	36.006	5.383	41.389	2422.4	5.030
475.	36.296	5.364	41.661	2548.1	5.024
500.	36.571	5.347	41.918	2673.6	5.018
550.	37.079	5.317	42.396	2924.3	5.009
600.	37.541	5.291	42.832	3174.6	5.002
650.	37.963	5.269	43.232	3424.5	4.997
700.	38.353	5.249	43.602	3674.3	4.993
750.	38.715	5.232	43.947	3923.9	4.990
800.	39.052	5.217	44.268	4173.3	4.987
850.	39.368	5.203	44.571	4422.6	4.985
900.	39.665	5.191	44.856	4671.8	4.983
950.	39.945	5.180	45.125	4920.9	4.982
1000.	40.211	5.170	45.380	5170.0	4.980
1050.	40.463	5.161	45.623	5418.9	4.979
1100.	40.702	5.153	45.855	5667.9	4.978
1150.	40.931	5.145	46.076	5916.7	4.977
1200.	41.150	5.138	46.288	6165.6	4.976
1250.	41.360	5.132	46.491	6414.4	4.976
1300.	41.561	5.126	46.686	6663.2	4.975
1350.	41.754	5.120	46.874	6911.9	4.975
1400.	41.940	5.115	47.055	7160.6	4.974
1450.	42.120	5.110	47.230	7409.3	4.974
1500.	42.293	5.105	47.398	7658.0	4.973
1550.	42.460	5.101	47.561	7906.7	4.973
1600.	42.622	5.097	47.719	8155.3	4.973
1650.	42.779	5.093	47.872	8404.0	4.972
1700.	42.931	5.090	48.021	8652.6	4.972
1750.	43.078	5.086	48.165	8901.2	4.972
1800.	43.222	5.083	48.305	9149.8	4.972
1850.	43.361	5.080	48.441	9398.4	4.972
1900.	43.496	5.077	48.574	9646.9	4.971
1950.	43.628	5.075	48.703	9895.5	4.971
2000.	43.757	5.072	48.829	10144.1	4.971
2050.	43.882	5.070	48.951	10392.6	4.971

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.037064
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.15508
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.037040

Table A-13 Thermodynamic Functions for Al - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	44.004	5.067	49.071	10641.2	4.971
2150.	44.123	5.065	49.188	10889.7	4.971
2200.	44.240	5.063	49.302	11138.2	4.971
2250.	44.353	5.061	49.414	11386.7	4.970
2300.	44.465	5.059	49.523	11635.3	4.970
2350.	44.573	5.057	49.630	11883.8	4.970
2400.	44.680	5.055	49.735	12132.3	4.970
2450.	44.784	5.053	49.837	12380.8	4.970
2500.	44.886	5.052	49.938	12629.3	4.970
2600.	45.084	5.049	50.133	13126.3	4.970
2700.	45.275	5.046	50.320	13623.4	4.970
2800.	45.458	5.043	50.501	14120.4	4.970
2900.	45.635	5.040	50.675	14617.4	4.971
3000.	45.806	5.038	50.844	15114.5	4.971
3100.	45.971	5.036	51.007	15611.6	4.972
3200.	46.131	5.034	51.165	16108.8	4.972
3300.	46.286	5.032	51.318	16606.1	4.973
3400.	46.436	5.030	51.466	17103.5	4.975
3500.	46.582	5.029	51.611	17601.1	4.977
3600.	46.723	5.027	51.751	18098.9	4.979
3700.	46.861	5.026	51.887	18597.0	4.982
3800.	46.995	5.025	52.020	19095.4	4.986
3900.	47.126	5.024	52.150	19594.2	4.991
4000.	47.253	5.023	52.276	20093.5	4.996
4100.	47.377	5.023	52.400	20593.5	5.003
4200.	47.498	5.022	52.520	21094.1	5.010
4300.	47.616	5.022	52.638	21595.6	5.019
4400.	47.731	5.022	52.754	22098.0	5.030
4500.	47.844	5.023	52.867	22601.6	5.042
4600.	47.955	5.023	52.978	23106.5	5.055
4700.	48.063	5.024	53.087	23612.8	5.071
4800.	48.169	5.025	53.194	24120.7	5.089
4900.	48.272	5.027	53.299	24630.6	5.108
5000.	48.374	5.029	53.402	25142.5	5.131
5100.	48.473	5.031	53.504	25656.8	5.155
5200.	48.571	5.033	53.604	26173.6	5.182
5300.	48.667	5.036	53.703	26693.3	5.212
5400.	48.761	5.040	53.801	27216.2	5.245
5500.	48.854	5.044	53.898	27742.4	5.281
5600.	48.945	5.049	53.993	28272.4	5.320
5700.	49.034	5.054	54.088	28806.5	5.362
5800.	49.122	5.059	54.181	29345.0	5.408
5900.	49.208	5.066	54.274	29888.3	5.457
6000.	49.294	5.073	54.366	30436.6	5.510
6100.	49.378	5.080	54.458	30990.4	5.567
6200.	49.460	5.089	54.549	31550.1	5.627
6300.	49.542	5.098	54.640	32116.0	5.691
6400.	49.622	5.108	54.730	32688.5	5.760
6500.	49.701	5.118	54.820	33268.1	5.832
6600.	49.780	5.130	54.909	33855.0	5.908
6700.	49.857	5.142	54.999	34449.7	5.988
6800.	49.933	5.155	55.088	35052.7	6.072
6900.	50.008	5.169	55.177	35664.2	6.160
7000.	50.083	5.184	55.266	36284.7	6.251
273.15	33.270	5.585	38.855	1525.5	5.141
298.15	33.758	5.546	39.304	1653.6	5.113

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 26.98

Table A-14 Thermodynamic Functions for Si

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	22.667	6.123	28.790	306.2	7.187
75.	25.223	6.450	31.673	483.7	6.996
100.	27.096	6.551	33.646	655.1	6.698
125.	28.559	6.547	35.106	818.4	6.372
150.	29.748	6.493	36.241	974.0	6.087
175.	30.743	6.419	37.162	1123.3	5.861
200.	31.595	6.338	37.933	1267.5	5.688
225.	32.337	6.258	38.595	1408.0	5.556
250.	32.992	6.182	39.175	1545.6	5.455
275.	33.578	6.113	39.691	1681.0	5.377
300.	34.107	6.049	40.156	1814.6	5.315
325.	34.589	5.990	40.579	1946.8	5.265
350.	35.031	5.937	40.968	2077.9	5.226
375.	35.439	5.888	41.327	2208.1	5.193
400.	35.818	5.844	41.662	2337.6	5.166
425.	36.171	5.803	41.974	2466.5	5.144
450.	36.501	5.766	42.268	2594.8	5.125
475.	36.812	5.732	42.544	2722.7	5.109
500.	37.105	5.701	42.806	2850.3	5.095
550.	37.646	5.644	43.291	3104.4	5.073
600.	38.135	5.596	43.731	3357.6	5.056
650.	38.581	5.554	44.135	3610.1	5.043
700.	38.992	5.517	44.509	3862.0	5.033
750.	39.371	5.485	44.856	4113.4	5.025
800.	39.724	5.456	45.180	4364.6	5.019
850.	40.054	5.430	45.484	4615.4	5.015
900.	40.364	5.407	45.770	4866.1	5.012
950.	40.655	5.386	46.041	5116.7	5.011
1000.	40.931	5.367	46.299	5367.2	5.012
1050.	41.193	5.350	46.543	5617.9	5.013
1100.	41.441	5.335	46.776	5868.6	5.017
1150.	41.678	5.321	46.999	6119.6	5.021
1200.	41.904	5.309	47.213	6370.8	5.027
1250.	42.121	5.298	47.419	6622.3	5.034
1300.	42.328	5.288	47.616	6874.2	5.043
1350.	42.528	5.279	47.807	7126.6	5.052
1400.	42.720	5.271	47.991	7379.5	5.063
1450.	42.904	5.264	48.169	7632.9	5.075
1500.	43.083	5.258	48.341	7887.0	5.087
1550.	43.255	5.253	48.508	8141.6	5.100
1600.	43.422	5.248	48.670	8396.9	5.113
1650.	43.583	5.244	48.827	8653.0	5.128
1700.	43.740	5.241	48.981	8909.7	5.142
1750.	43.892	5.238	49.130	9167.2	5.157
1800.	44.039	5.236	49.276	9425.4	5.172
1850.	44.183	5.235	49.417	9684.3	5.187
1900.	44.322	5.234	49.556	9944.1	5.202
1950.	44.458	5.233	49.691	10204.5	5.217
2000.	44.591	5.233	49.824	10465.7	5.232
2050.	44.720	5.233	49.953	10727.7	5.247

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.035600
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.14895
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.035577

Table A-14 Thermodynamic Functions for Si - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	44.846	5.234	50.080	10990.4	5.261
2150.	44.969	5.234	50.203	11253.8	5.275
2200.	45.089	5.235	50.325	11517.9	5.289
2250.	45.207	5.237	50.444	11782.7	5.303
2300.	45.322	5.238	50.561	12048.2	5.316
2350.	45.435	5.240	50.675	12314.3	5.329
2400.	45.545	5.242	50.787	12581.1	5.341
2450.	45.653	5.244	50.898	12848.4	5.353
2500.	45.759	5.247	51.006	13116.4	5.365
2600.	45.965	5.252	51.217	13653.9	5.386
2700.	46.164	5.257	51.420	14193.5	5.406
2800.	46.355	5.263	51.617	14735.0	5.424
2900.	46.540	5.268	51.808	15278.2	5.440
3000.	46.718	5.274	51.993	15822.9	5.454
3100.	46.891	5.280	52.172	16368.9	5.467
3200.	47.059	5.286	52.345	16916.2	5.478
3300.	47.222	5.292	52.514	17464.4	5.487
3400.	47.380	5.298	52.678	18013.6	5.495
3500.	47.534	5.304	52.837	18563.5	5.502
3600.	47.683	5.309	52.993	19114.0	5.508
3700.	47.829	5.315	53.143	19665.0	5.513
3800.	47.970	5.320	53.291	20216.5	5.516
3900.	48.109	5.325	53.434	20768.2	5.519
4000.	48.244	5.330	53.574	21320.2	5.521
4100.	48.375	5.335	53.710	21872.4	5.522
4200.	48.504	5.339	53.843	22424.6	5.522
4300.	48.630	5.343	53.973	22976.8	5.522
4400.	48.752	5.348	54.100	23529.1	5.522
4500.	48.873	5.351	54.224	24081.2	5.521
4600.	48.990	5.355	54.345	24633.3	5.520
4700.	49.105	5.359	54.464	25185.2	5.518
4800.	49.218	5.362	54.580	25737.0	5.517
4900.	49.329	5.365	54.694	26288.6	5.515
5000.	49.437	5.368	54.805	26840.0	5.513
5100.	49.544	5.371	54.915	27391.2	5.512
5200.	49.648	5.374	55.022	27942.3	5.510
5300.	49.750	5.376	55.126	28493.3	5.509
5400.	49.851	5.379	55.229	29044.1	5.508
5500.	49.950	5.381	55.330	29594.9	5.507
5600.	50.047	5.383	55.430	30145.6	5.507
5700.	50.142	5.385	55.527	30696.4	5.508
5800.	50.236	5.387	55.623	31247.2	5.509
5900.	50.328	5.390	55.717	31798.2	5.511
6000.	50.418	5.392	55.810	32349.4	5.514
6100.	50.507	5.394	55.901	32901.0	5.517
6200.	50.595	5.396	55.991	33452.9	5.522
6300.	50.681	5.398	56.079	34005.4	5.528
6400.	50.766	5.400	56.166	34558.6	5.535
6500.	50.850	5.402	56.252	35112.5	5.544
6600.	50.933	5.404	56.337	35667.3	5.554
6700.	51.014	5.406	56.420	36223.2	5.565
6800.	51.094	5.409	56.503	36780.4	5.578
6900.	51.173	5.411	56.585	37338.9	5.593
7000.	51.251	5.414	56.665	37899.1	5.610
273.15	33.537	6.118	39.655	1671.0	5.382
298.15	34.070	6.053	40.123	1804.7	5.319

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 28.09

Table A-15 Thermodynamic Functions for P

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	25.141	4.968	30.109	248.4	4.968
75.	27.155	4.968	32.123	372.6	4.968
100.	28.585	4.968	33.553	496.8	4.968
125.	29.693	4.968	34.661	621.0	4.968
150.	30.599	4.968	35.567	745.2	4.968
175.	31.365	4.968	36.333	869.4	4.968
200.	32.028	4.968	36.996	993.6	4.968
225.	32.613	4.968	37.581	1117.8	4.968
250.	33.137	4.968	38.105	1242.0	4.968
275.	33.610	4.968	38.578	1366.2	4.968
300.	34.043	4.968	39.011	1490.4	4.968
325.	34.440	4.968	39.408	1614.6	4.968
350.	34.808	4.968	39.777	1738.8	4.968
375.	35.151	4.968	40.119	1863.1	4.968
400.	35.472	4.968	40.440	1987.3	4.968
425.	35.773	4.968	40.741	2111.5	4.968
450.	36.057	4.968	41.025	2235.7	4.968
475.	36.326	4.968	41.294	2359.9	4.968
500.	36.580	4.968	41.549	2484.1	4.968
550.	37.054	4.968	42.022	2732.5	4.968
600.	37.486	4.968	42.454	2980.9	4.968
650.	37.884	4.968	42.852	3229.3	4.968
700.	38.252	4.968	43.220	3477.7	4.968
750.	38.595	4.968	43.563	3726.1	4.968
800.	38.915	4.968	43.884	3974.5	4.968
850.	39.217	4.968	44.185	4222.9	4.968
900.	39.501	4.968	44.469	4471.3	4.968
950.	39.769	4.968	44.737	4719.7	4.968
1000.	40.024	4.968	44.992	4968.2	4.968
1050.	40.266	4.968	45.235	5216.6	4.968
1100.	40.498	4.968	45.466	5465.0	4.969
1150.	40.718	4.968	45.687	5713.4	4.969
1200.	40.930	4.968	45.898	5961.9	4.969
1250.	41.133	4.968	46.101	6210.4	4.970
1300.	41.328	4.968	46.296	6458.9	4.971
1350.	41.515	4.968	46.484	6707.4	4.972
1400.	41.696	4.969	46.664	6956.1	4.974
1450.	41.870	4.969	46.839	7204.8	4.976
1500.	42.039	4.969	47.008	7453.7	4.979
1550.	42.202	4.970	47.171	7702.8	4.983
1600.	42.359	4.970	47.329	7952.0	4.987
1650.	42.512	4.971	47.483	8201.5	4.992
1700.	42.661	4.971	47.632	8451.2	4.999
1750.	42.805	4.972	47.777	8701.4	5.006
1800.	42.945	4.973	47.918	8951.9	5.015
1850.	43.081	4.975	48.056	9202.8	5.025
1900.	43.214	4.976	48.190	9454.3	5.036
1950.	43.343	4.978	48.321	9706.4	5.048
2000.	43.469	4.980	48.449	9959.2	5.062
2050.	43.592	4.982	48.574	10212.7	5.077

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.032284
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.13508
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.032263

Table A-15 Thermodynamic Functions for P - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	43.712	4.984	48.696	10466.9	5.094
2150.	43.830	4.987	48.817	10722.1	5.112
2200.	43.944	4.990	48.934	10978.2	5.132
2250.	44.056	4.993	49.050	11235.3	5.153
2300.	44.166	4.997	49.163	11493.5	5.175
2350.	44.274	5.001	49.275	11752.8	5.199
2400.	44.379	5.006	49.385	12013.4	5.225
2450.	44.482	5.010	49.493	12275.3	5.251
2500.	44.584	5.015	49.599	12538.6	5.279
2600.	44.780	5.027	49.807	13069.4	5.339
2700.	44.970	5.039	50.010	13606.5	5.403
2800.	45.154	5.054	50.208	14150.1	5.471
2900.	45.332	5.069	50.401	14700.8	5.542
3000.	45.504	5.086	50.590	15258.7	5.617
3100.	45.671	5.105	50.775	15824.2	5.693
3200.	45.833	5.124	50.957	16397.5	5.772
3300.	45.991	5.145	51.136	16978.6	5.851
3400.	46.145	5.167	51.312	17567.7	5.931
3500.	46.295	5.190	51.485	18164.8	6.011
3600.	46.442	5.214	51.656	18769.8	6.090
3700.	46.585	5.239	51.823	19382.7	6.168
3800.	46.725	5.264	51.989	20003.4	6.245
3900.	46.862	5.290	52.152	20631.7	6.320
4000.	46.996	5.317	52.313	21267.4	6.393
4100.	47.128	5.344	52.472	21910.3	6.464
4200.	47.257	5.371	52.628	22560.2	6.532
4300.	47.384	5.399	52.783	23216.7	6.597
4400.	47.508	5.427	52.935	23879.5	6.659
4500.	47.630	5.455	53.086	24548.3	6.718
4600.	47.751	5.483	53.234	25222.9	6.773
4700.	47.869	5.511	53.380	25902.9	6.825
4800.	47.985	5.539	53.524	26587.8	6.874
4900.	48.100	5.567	53.667	27277.5	6.919
5000.	48.212	5.594	53.807	27971.5	6.961
5100.	48.323	5.621	53.945	28669.5	6.999
5200.	48.433	5.648	54.081	29371.2	7.034
5300.	48.541	5.675	54.215	30076.2	7.065
5400.	48.647	5.701	54.348	30784.1	7.094
5500.	48.752	5.726	54.478	31494.8	7.119
5600.	48.855	5.751	54.607	32207.8	7.141
5700.	48.957	5.776	54.733	32922.8	7.160
5800.	49.058	5.800	54.858	33639.7	7.176
5900.	49.157	5.823	54.981	34358.0	7.190
6000.	49.255	5.846	55.102	35077.6	7.201
6100.	49.352	5.869	55.221	35798.2	7.210
6200.	49.448	5.890	55.338	36519.6	7.217
6300.	49.542	5.911	55.454	37241.5	7.221
6400.	49.635	5.932	55.567	37963.7	7.223
6500.	49.728	5.952	55.679	38686.1	7.224
6600.	49.819	5.971	55.790	39408.4	7.222
6700.	49.909	5.990	55.898	40130.5	7.220
6800.	49.997	6.008	56.005	40852.3	7.215
6900.	50.085	6.025	56.110	41573.5	7.210
7000.	50.172	6.042	56.214	42294.2	7.203
273.15	33.577	4.968	38.545	1357.1	4.968
298.15	34.012	4.968	38.980	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 30.975

Table A-16 Thermodynamic Functions for S

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	25.687	4.968	30.656	248.4	4.970
75.	27.702	4.973	32.675	373.0	5.003
100.	29.135	4.992	34.127	499.2	5.104
125.	30.253	5.028	35.281	628.5	5.246
150.	31.173	5.076	36.250	761.5	5.389
175.	31.960	5.130	37.090	897.7	5.506
200.	32.648	5.183	37.831	1036.5	5.589
225.	33.262	5.231	38.493	1176.9	5.640
250.	33.815	5.273	39.088	1318.3	5.664
275.	34.319	5.309	39.628	1460.0	5.668
300.	34.783	5.338	40.121	1601.5	5.658
325.	35.211	5.362	40.573	1742.8	5.638
350.	35.609	5.381	40.990	1883.4	5.613
375.	35.981	5.396	41.376	2023.4	5.584
400.	36.329	5.406	41.736	2162.6	5.554
425.	36.657	5.414	42.072	2301.0	5.523
450.	36.967	5.419	42.386	2438.7	5.493
475.	37.260	5.423	42.683	2575.7	5.464
500.	37.538	5.424	42.962	2712.0	5.436
550.	38.055	5.423	43.478	2982.5	5.385
600.	38.527	5.418	43.944	3250.5	5.340
650.	38.960	5.410	44.370	3516.5	5.301
700.	39.361	5.401	44.762	3780.7	5.266
750.	39.733	5.391	45.124	4043.2	5.237
800.	40.081	5.381	45.461	4304.4	5.211
850.	40.407	5.370	45.776	4564.4	5.188
900.	40.713	5.359	46.072	4823.3	5.169
950.	41.003	5.349	46.351	5081.3	5.152
1000.	41.277	5.339	46.615	5338.5	5.137
1050.	41.537	5.329	46.866	5595.0	5.123
1100.	41.785	5.319	47.104	5850.9	5.112
1150.	42.021	5.310	47.331	6106.2	5.102
1200.	42.247	5.301	47.548	6361.1	5.093
1250.	42.463	5.292	47.755	6615.5	5.085
1300.	42.670	5.284	47.955	6869.6	5.079
1350.	42.870	5.277	48.146	7123.5	5.074
1400.	43.061	5.269	48.331	7377.0	5.069
1450.	43.246	5.262	48.509	7630.4	5.066
1500.	43.425	5.256	48.680	7883.7	5.064
1550.	43.597	5.250	48.846	8136.8	5.062
1600.	43.763	5.244	49.007	8389.9	5.062
1650.	43.925	5.238	49.163	8643.0	5.062
1700.	44.081	5.233	49.314	8896.2	5.063
1750.	44.233	5.228	49.461	9149.4	5.065
1800.	44.380	5.224	49.603	9402.7	5.068
1850.	44.523	5.220	49.742	9656.2	5.071
1900.	44.662	5.216	49.878	9909.8	5.075
1950.	44.797	5.212	50.010	10163.7	5.080
2000.	44.929	5.209	50.138	10417.9	5.085
2050.	45.058	5.206	50.264	10672.3	5.091

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.031186
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.13048
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.031165

Table A-16 Thermodynamic Functions for S - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	45.183	5.203	50.387	10927.0	5.097
2150.	45.306	5.201	50.507	11182.0	5.104
2200.	45.425	5.199	50.624	11437.4	5.112
2250.	45.542	5.197	50.739	11693.2	5.119
2300.	45.656	5.195	50.852	11949.3	5.127
2350.	45.768	5.194	50.962	12205.9	5.136
2400.	45.877	5.193	51.070	12462.9	5.144
2450.	45.984	5.192	51.176	12720.4	5.153
2500.	46.089	5.191	51.281	12978.2	5.162
2600.	46.293	5.191	51.483	13495.4	5.181
2700.	46.489	5.191	51.679	14014.5	5.200
2800.	46.678	5.191	51.869	14535.4	5.219
2900.	46.860	5.193	52.052	15058.4	5.239
3000.	47.036	5.194	52.230	15583.2	5.258
3100.	47.206	5.197	52.403	16110.0	5.277
3200.	47.371	5.200	52.571	16638.6	5.295
3300.	47.531	5.203	52.734	17169.0	5.313
3400.	47.687	5.206	52.893	17701.3	5.331
3500.	47.838	5.210	53.048	18235.2	5.347
3600.	47.984	5.214	53.198	18770.7	5.363
3700.	48.127	5.218	53.346	19307.8	5.378
3800.	48.267	5.223	53.489	19846.3	5.392
3900.	48.402	5.227	53.629	20386.2	5.406
4000.	48.535	5.232	53.767	20927.5	5.419
4100.	48.664	5.237	53.900	21469.9	5.430
4200.	48.790	5.241	54.031	22013.5	5.441
4300.	48.914	5.246	54.160	22558.1	5.451
4400.	49.034	5.251	54.285	23103.8	5.461
4500.	49.152	5.256	54.408	23650.3	5.470
4600.	49.268	5.260	54.528	24197.7	5.477
4700.	49.381	5.265	54.646	24745.8	5.485
4800.	49.492	5.270	54.762	25294.6	5.491
4900.	49.601	5.274	54.875	25844.0	5.497
5000.	49.707	5.279	54.986	26394.0	5.502
5100.	49.812	5.283	55.095	26944.4	5.507
5200.	49.914	5.288	55.202	27495.4	5.511
5300.	50.015	5.292	55.307	28046.7	5.515
5400.	50.114	5.296	55.410	28598.3	5.518
5500.	50.211	5.300	55.511	29150.2	5.521
5600.	50.307	5.304	55.611	29702.4	5.523
5700.	50.401	5.308	55.709	30254.8	5.525
5800.	50.493	5.312	55.805	30807.4	5.526
5900.	50.584	5.315	55.899	31360.1	5.528
6000.	50.673	5.319	55.992	31912.9	5.529
6100.	50.761	5.322	56.084	32465.8	5.529
6200.	50.848	5.326	56.173	33018.7	5.530
6300.	50.933	5.329	56.262	33571.7	5.530
6400.	51.017	5.332	56.349	34124.7	5.530
6500.	51.100	5.335	56.435	34677.7	5.530
6600.	51.181	5.338	56.519	35230.7	5.530
6700.	51.261	5.341	56.602	35783.6	5.529
6800.	51.341	5.344	56.684	36336.5	5.529
6900.	51.419	5.346	56.765	36889.4	5.529
7000.	51.496	5.349	56.844	37442.3	5.528
273.15	34.284	5.306	39.590	1449.5	5.668
298.15	34.750	5.336	40.086	1591.1	5.659

The tables are in units of calories, moles and °K. See reverse side for conversion factors to otner units. The atomic weight = 32.066

Table A-17 Thermodynamic Functions for Cl

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	25.544	4.968	30.512	248.4	4.968
75.	27.558	4.968	32.526	372.6	4.968
100.	28.987	4.968	33.956	496.8	4.969
125.	30.096	4.969	35.065	621.1	4.972
150.	31.002	4.970	35.972	745.5	4.983
175.	31.768	4.973	36.742	870.3	5.005
200.	32.433	4.979	37.412	995.9	5.039
225.	33.020	4.988	38.008	1122.3	5.081
250.	33.546	5.000	38.546	1249.9	5.128
275.	34.023	5.014	39.037	1378.7	5.176
300.	34.460	5.029	39.489	1508.7	5.224
325.	34.863	5.046	39.909	1639.9	5.268
350.	35.238	5.063	40.301	1772.1	5.307
375.	35.588	5.081	40.668	1905.2	5.342
400.	35.916	5.098	41.014	2039.1	5.371
425.	36.226	5.115	41.340	2173.7	5.394
450.	36.518	5.131	41.649	2308.8	5.413
475.	36.796	5.146	41.942	2444.3	5.427
500.	37.061	5.160	42.221	2580.1	5.436
550.	37.554	5.186	42.739	2852.2	5.446
600.	38.006	5.208	43.213	3124.5	5.445
650.	38.423	5.225	43.649	3396.6	5.437
700.	38.811	5.240	44.051	3668.1	5.423
750.	39.173	5.252	44.425	3938.9	5.407
800.	39.512	5.261	44.773	4208.8	5.389
850.	39.831	5.268	45.099	4477.7	5.370
900.	40.133	5.273	45.406	4745.8	5.351
950.	40.418	5.277	45.695	5012.8	5.332
1000.	40.689	5.279	45.968	5279.0	5.314
1050.	40.946	5.280	46.226	5544.2	5.296
1100.	41.192	5.281	46.472	5808.6	5.279
1150.	41.427	5.280	46.707	6072.1	5.263
1200.	41.651	5.279	46.930	6334.9	5.248
1250.	41.867	5.278	47.144	6596.9	5.234
1300.	42.074	5.276	47.349	6858.3	5.220
1350.	42.273	5.273	47.546	7119.0	5.208
1400.	42.465	5.271	47.735	7379.1	5.196
1450.	42.649	5.268	47.917	7638.6	5.185
1500.	42.828	5.265	48.093	7897.6	5.175
1550.	43.001	5.262	48.263	8156.1	5.165
1600.	43.168	5.259	48.426	8414.1	5.156
1650.	43.329	5.256	48.585	8671.7	5.147
1700.	43.486	5.252	48.738	8928.8	5.139
1750.	43.638	5.249	48.887	9185.6	5.132
1800.	43.786	5.246	49.032	9442.0	5.125
1850.	43.930	5.242	49.172	9698.1	5.118
1900.	44.070	5.239	49.309	9953.8	5.112
1950.	44.206	5.236	49.441	10209.3	5.106
2000.	44.338	5.232	49.570	10464.5	5.100
2050.	44.467	5.229	49.696	10719.3	5.095

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.028203
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.11800
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.028185

Table A-17 Thermodynamic Functions for Cl - continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	44.593	5.226	49.819	10974.0	5.090
2150.	44.716	5.222	49.939	11228.4	5.086
2200.	44.836	5.219	50.056	11482.5	5.081
2250.	44.954	5.216	50.170	11736.5	5.077
2300.	45.068	5.213	50.281	11990.2	5.073
2350.	45.180	5.210	50.390	12243.8	5.069
2400.	45.290	5.207	50.497	12497.2	5.066
2450.	45.397	5.204	50.601	12750.4	5.062
2500.	45.502	5.201	50.704	13003.4	5.059
2600.	45.706	5.196	50.902	13509.0	5.053
2700.	45.902	5.190	51.093	14014.0	5.048
2800.	46.091	5.185	51.276	14518.5	5.043
2900.	46.273	5.180	51.453	15022.6	5.038
3000.	46.448	5.175	51.624	15526.2	5.034
3100.	46.618	5.171	51.789	16029.4	5.030
3200.	46.782	5.166	51.948	16532.3	5.027
3300.	46.941	5.162	52.103	17034.8	5.024
3400.	47.095	5.158	52.253	17537.0	5.021
3500.	47.244	5.154	52.398	18038.9	5.018
3600.	47.390	5.150	52.540	18540.6	5.016
3700.	47.531	5.147	52.677	19042.1	5.013
3800.	47.668	5.143	52.811	19543.3	5.011
3900.	47.801	5.140	52.941	20044.3	5.009
4000.	47.931	5.136	53.068	20545.1	5.007
4100.	48.058	5.133	53.191	21045.7	5.005
4200.	48.182	5.130	53.312	21546.2	5.004
4300.	48.303	5.127	53.430	22046.5	5.002
4400.	48.420	5.124	53.545	22546.7	5.001
4500.	48.536	5.121	53.657	23046.7	5.000
4600.	48.648	5.119	53.767	23546.6	4.998
4700.	48.758	5.116	53.874	24046.3	4.997
4800.	48.866	5.114	53.980	24546.0	4.996
4900.	48.971	5.111	54.083	25045.5	4.995
5000.	49.074	5.109	54.183	25545.0	4.994
5100.	49.176	5.107	54.282	26044.3	4.993
5200.	49.275	5.105	54.379	26543.5	4.992
5300.	49.372	5.102	54.474	27042.7	4.991
5400.	49.467	5.100	54.568	27541.8	4.990
5500.	49.561	5.098	54.659	28040.8	4.990
5600.	49.653	5.096	54.749	28539.7	4.989
5700.	49.743	5.094	54.837	29038.6	4.988
5800.	49.832	5.093	54.924	29537.4	4.988
5900.	49.919	5.091	55.009	30036.1	4.987
6000.	50.004	5.089	55.093	30534.8	4.986
6100.	50.088	5.087	55.176	31033.4	4.986
6200.	50.171	5.086	55.257	31531.9	4.985
6300.	50.252	5.084	55.336	32030.4	4.985
6400.	50.332	5.083	55.415	32528.9	4.984
6500.	50.411	5.081	55.492	33027.3	4.984
6600.	50.489	5.080	55.568	33525.7	4.984
6700.	50.565	5.078	55.643	34024.0	4.983
6800.	50.640	5.077	55.717	34522.3	4.983
6900.	50.714	5.075	55.790	35020.6	4.982
7000.	50.787	5.074	55.862	35518.8	4.982
273.15	33.989	5.012	39.002	1369.1	5.173
298.15	34.429	5.028	39.457	1499.1	5.220

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 35.457

Table A-18 Thermodynamic Functions for Ar

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	23.144	4.968	28.112	248.4	4.968
75.	25.158	4.968	30.127	372.6	4.968
100.	26.588	4.968	31.556	496.8	4.968
125.	27.696	4.968	32.664	621.0	4.968
150.	28.602	4.968	33.570	745.2	4.968
175.	29.368	4.968	34.336	869.4	4.968
200.	30.031	4.968	34.999	993.6	4.968
225.	30.616	4.968	35.585	1117.8	4.968
250.	31.140	4.968	36.108	1242.0	4.968
275.	31.613	4.968	36.582	1366.2	4.968
300.	32.046	4.968	37.014	1490.4	4.968
325.	32.443	4.968	37.412	1614.6	4.968
350.	32.812	4.968	37.780	1738.9	4.968
375.	33.154	4.968	38.122	1863.1	4.968
400.	33.475	4.968	38.443	1987.3	4.968
425.	33.776	4.968	38.744	2111.5	4.968
450.	34.060	4.968	39.028	2235.7	4.968
475.	34.329	4.968	39.297	2359.9	4.968
500.	34.584	4.968	39.552	2484.1	4.968
550.	35.057	4.968	40.025	2732.5	4.968
600.	35.489	4.968	40.457	2980.9	4.968
650.	35.887	4.968	40.855	3229.3	4.968
700.	36.255	4.968	41.223	3477.7	4.968
750.	36.598	4.968	41.566	3726.1	4.968
800.	36.919	4.968	41.887	3974.5	4.968
850.	37.220	4.968	42.188	4222.9	4.968
900.	37.504	4.968	42.472	4471.3	4.968
950.	37.772	4.968	42.741	4719.7	4.968
1000.	38.027	4.968	42.995	4968.1	4.968
1050.	38.270	4.968	43.238	5216.6	4.968
1100.	38.501	4.968	43.469	5465.0	4.968
1150.	38.722	4.968	43.690	5713.4	4.968
1200.	38.933	4.968	43.901	5961.8	4.968
1250.	39.136	4.968	44.104	6210.2	4.968
1300.	39.331	4.968	44.299	6458.6	4.968
1350.	39.518	4.968	44.486	6707.0	4.968
1400.	39.699	4.968	44.667	6955.4	4.968
1450.	39.873	4.968	44.841	7203.8	4.968
1500.	40.042	4.968	45.010	7452.2	4.968
1550.	40.205	4.968	45.173	7700.6	4.968
1600.	40.362	4.968	45.330	7949.0	4.968
1650.	40.515	4.968	45.483	8197.4	4.968
1700.	40.663	4.968	45.632	8445.9	4.968
1750.	40.807	4.968	45.776	8694.3	4.968
1800.	40.947	4.968	45.916	8942.7	4.968
1850.	41.084	4.968	46.052	9191.1	4.968
1900.	41.216	4.968	46.184	9439.5	4.968
1950.	41.345	4.968	46.313	9687.9	4.968
2000.	41.471	4.968	46.439	9936.3	4.968
2050.	41.594	4.968	46.562	10184.7	4.968

CONVERSION FACTORS

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.025035
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.10475
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.025019

Table A-18 Thermodynamic Functions for Ar- continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	41.713	4.968	46.681	10433.1	4.968
2150.	41.830	4.968	46.798	10681.5	4.968
2200.	41.944	4.968	46.913	10929.9	4.968
2250.	42.056	4.968	47.024	11178.3	4.968
2300.	42.165	4.968	47.133	11426.7	4.968
2350.	42.272	4.968	47.240	11675.2	4.968
2400.	42.377	4.968	47.345	11923.6	4.968
2450.	42.479	4.968	47.447	12172.0	4.968
2500.	42.579	4.968	47.548	12420.4	4.968
2600.	42.774	4.968	47.742	12917.2	4.968
2700.	42.962	4.968	47.930	13414.0	4.968
2800.	43.143	4.968	48.111	13910.8	4.968
2900.	43.317	4.968	48.285	14407.6	4.968
3000.	43.485	4.968	48.453	14904.4	4.968
3100.	43.648	4.968	48.616	15401.3	4.968
3200.	43.806	4.968	48.774	15898.1	4.968
3300.	43.959	4.968	48.927	16394.9	4.968
3400.	44.107	4.968	49.075	16891.7	4.968
3500.	44.251	4.968	49.219	17388.5	4.968
3600.	44.391	4.968	49.359	17885.3	4.968
3700.	44.527	4.968	49.495	18382.2	4.968
3800.	44.660	4.968	49.628	18879.0	4.968
3900.	44.789	4.968	49.757	19375.8	4.968
4000.	44.915	4.968	49.883	19872.6	4.968
4100.	45.037	4.968	50.005	20369.4	4.968
4200.	45.157	4.968	50.125	20866.2	4.968
4300.	45.274	4.968	50.242	21363.0	4.968
4400.	45.388	4.968	50.356	21859.9	4.968
4500.	45.500	4.968	50.468	22356.7	4.968
4600.	45.609	4.968	50.577	22853.5	4.968
4700.	45.716	4.968	50.684	23350.3	4.968
4800.	45.820	4.968	50.788	23847.1	4.968
4900.	45.923	4.968	50.891	24343.9	4.968
5000.	46.023	4.968	50.991	24840.7	4.968
5100.	46.122	4.968	51.090	25337.6	4.968
5200.	46.218	4.968	51.186	25834.4	4.968
5300.	46.313	4.968	51.281	26331.2	4.968
5400.	46.405	4.968	51.374	26828.0	4.968
5500.	46.497	4.968	51.465	27324.8	4.968
5600.	46.586	4.968	51.554	27821.6	4.968
5700.	46.674	4.968	51.642	28318.5	4.968
5800.	46.761	4.968	51.729	28815.3	4.968
5900.	46.845	4.968	51.814	29312.1	4.968
6000.	46.929	4.968	51.897	29808.9	4.968
6100.	47.011	4.968	51.979	30305.7	4.968
6200.	47.092	4.968	52.060	30802.5	4.968
6300.	47.171	4.968	52.139	31299.3	4.968
6400.	47.250	4.968	52.218	31796.2	4.968
6500.	47.327	4.968	52.295	32293.0	4.968
6600.	47.402	4.968	52.371	32789.8	4.968
6700.	47.477	4.968	52.445	33286.6	4.968
6800.	47.551	4.968	52.519	33783.4	4.968
6900.	47.623	4.968	52.591	34280.2	4.968
7000.	47.695	4.968	52.663	34777.1	4.968
273.15	31.580	4.968	36.548	1357.1	4.968
298.15	32.015	4.968	36.983	1481.3	4.968

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The atomic weight = 39.944

Table A-19 Thermodynamic Functions for Li_2

T °K	$\frac{-(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	26.461	6.946	33.408	347.3	6.971
75.	29.281	6.968	36.249	522.6	7.078
100.	31.292	7.023	38.315	702.3	7.310
125.	32.868	7.108	39.976	888.5	7.583
150.	34.173	7.208	41.381	1081.2	7.834
175.	35.292	7.313	42.605	1279.8	8.046
200.	36.275	7.416	43.691	1483.2	8.217
225.	37.154	7.513	44.667	1690.4	8.355
250.	37.951	7.603	45.553	1900.7	8.466
275.	38.679	7.686	46.365	2113.5	8.557
300.	39.351	7.761	47.112	2328.4	8.632
325.	39.975	7.831	47.806	2545.0	8.695
350.	40.558	7.894	48.452	2763.1	8.748
375.	41.105	7.953	49.057	2982.3	8.794
400.	41.620	8.007	49.626	3202.7	8.834
425.	42.106	8.056	50.163	3424.0	8.869
450.	42.568	8.103	50.671	3646.1	8.901
475.	43.008	8.145	51.153	3869.0	8.929
500.	43.426	8.185	51.611	4092.6	8.955
550.	44.210	8.257	52.467	4541.5	9.001
600.	44.931	8.321	53.252	4992.6	9.041
650.	45.600	8.378	53.977	5445.6	9.077
700.	46.222	8.429	54.651	5900.3	9.111
750.	46.805	8.475	55.281	6356.6	9.141
800.	47.354	8.518	55.872	6814.4	9.171
850.	47.871	8.557	56.429	7273.7	9.199
900.	48.362	8.594	56.955	7734.3	9.226
950.	48.827	8.628	57.455	8196.3	9.253
1000.	49.270	8.660	57.930	8659.6	9.279
1050.	49.694	8.690	58.383	9124.2	9.305
1100.	50.099	8.718	58.817	9590.1	9.331
1150.	50.487	8.745	59.232	10057.3	9.356
1200.	50.860	8.771	59.631	10525.8	9.382
1250.	51.218	8.796	60.015	10995.5	9.407
1300.	51.564	8.820	60.384	11466.5	9.433
1350.	51.897	8.844	60.740	11938.8	9.459
1400.	52.219	8.866	61.085	12412.4	9.484
1450.	52.530	8.888	61.418	12887.2	9.510
1500.	52.832	8.909	61.741	13363.4	9.536
1550.	53.125	8.930	62.054	13840.9	9.562
1600.	53.408	8.950	62.358	14319.7	9.589
1650.	53.684	8.970	62.654	14799.8	9.615
1700.	53.952	8.989	62.941	15281.2	9.642
1750.	54.213	9.008	63.221	15764.0	9.669
1800.	54.467	9.027	63.494	16248.1	9.696
1850.	54.715	9.045	63.760	16733.6	9.724
1900.	54.956	9.063	64.019	17220.5	9.752
1950.	55.192	9.081	64.273	17708.8	9.780
2000.	55.422	9.099	64.521	18198.5	9.808
2050.	55.647	9.117	64.764	18689.6	9.836

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.072046
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.30144
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.07199

Table A-19 Thermodynamic Functions for Li_2 - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	55.867	9.134	65.001	19132.1	9.865
2150.	56.082	9.152	65.233	19676.1	9.894
2200.	56.292	9.169	65.461	20171.5	9.923
2250.	56.499	9.186	65.685	20668.4	9.953
2300.	56.701	9.203	65.904	21166.8	9.983
2350.	56.899	9.220	66.119	21666.7	10.013
2400.	57.093	9.237	66.330	22168.1	10.043
2450.	57.284	9.253	66.537	22671.0	10.074
2500.	57.471	9.270	66.741	23175.5	10.105
2600.	57.835	9.303	67.139	24189.1	10.167
2700.	58.187	9.337	67.523	25209.0	10.231
2800.	58.527	9.370	67.897	26235.3	10.296
2900.	58.856	9.403	68.259	27268.2	10.362
3000.	59.176	9.436	68.612	28307.8	10.429
3100.	59.486	9.469	68.955	29354.1	10.498
3200.	59.787	9.502	69.289	30407.4	10.567
3300.	60.080	9.536	69.615	31467.6	10.638
3400.	60.365	9.569	69.934	32535.0	10.710
3500.	60.643	9.603	70.245	33609.6	10.783
3600.	60.914	9.637	70.550	34691.6	10.857
3700.	61.178	9.671	70.849	35781.0	10.932
3800.	61.437	9.705	71.141	36878.1	11.009
3900.	61.689	9.739	71.428	37982.8	11.086
4000.	61.936	9.774	71.710	39095.4	11.165
4100.	62.178	9.809	71.987	40215.9	11.245
4200.	62.415	9.844	72.259	41344.5	11.327
4300.	62.647	9.879	72.526	42481.3	11.409
4400.	62.874	9.915	72.789	43626.4	11.493
4500.	63.097	9.951	73.049	44779.9	11.577
4600.	63.317	9.987	73.304	45941.9	11.663
4700.	63.532	10.024	73.556	47112.5	11.750
4800.	63.743	10.061	73.804	48292.0	11.839
4900.	63.951	10.098	74.049	49480.3	11.928
5000.	64.155	10.136	74.291	50677.6	12.019
5100.	64.356	10.173	74.530	51884.1	12.111
5200.	64.554	10.211	74.766	53099.8	12.204
5300.	64.749	10.250	74.999	54324.8	12.298
5400.	64.941	10.289	75.230	55559.4	12.393
5500.	65.130	10.328	75.458	56803.5	12.490
5600.	65.317	10.367	75.684	58057.3	12.587
5700.	65.501	10.407	75.908	59321.0	12.686
5800.	65.682	10.447	76.129	60594.6	12.786
5900.	65.861	10.488	76.349	61878.3	12.888
6000.	66.038	10.529	76.566	63172.2	12.990
273.15	38.627	7.680	46.307	2097.7	8.551
298.15	39.303	7.756	47.059	2312.4	8.627

MOLECULAR WEIGHT 13.880 MOLECULAR SYMMETRY 2.
BE 6.796 E-01 ALPHAE 7.31 E-03 GAMMA 0. DE 1.007E-05
YEWE -9.9 E-03 XEWE 2.582 OMEGAE 353.06
ELECTRONIC MULTIPLICITY 1.

Table A-20 Thermodynamic Functions for LiF (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	28.247	6.929	35.176	346.5	6.957
75.	31.059	6.939	37.997	520.4	6.958
100.	33.056	6.944	39.999	694.4	6.960
125.	34.605	6.948	41.553	868.4	6.968
150.	35.873	6.953	42.825	1042.9	6.990
175.	36.945	6.961	43.906	1218.1	7.035
200.	37.875	6.974	44.849	1394.8	7.102
225.	38.698	6.993	45.690	1573.4	7.188
250.	39.436	7.017	46.453	1754.3	7.287
275.	40.106	7.047	47.152	1937.8	7.393
300.	40.720	7.080	47.800	2124.0	7.501
325.	41.288	7.116	48.405	2312.8	7.606
350.	41.817	7.155	48.972	2504.3	7.708
375.	42.312	7.195	49.507	2698.2	7.804
400.	42.778	7.236	50.014	2894.4	7.893
425.	43.218	7.277	50.495	3092.8	7.976
450.	43.635	7.318	50.953	3293.2	8.053
475.	44.032	7.359	51.390	3495.4	8.123
500.	44.410	7.399	51.809	3699.3	8.188
550.	45.119	7.476	52.595	4111.6	8.302
600.	45.773	7.549	53.321	4529.1	8.398
650.	46.379	7.617	53.997	4951.1	8.479
700.	46.946	7.681	54.627	5376.8	8.548
750.	47.478	7.741	55.219	5805.7	8.608
800.	47.980	7.797	55.777	6237.4	8.659
850.	48.454	7.849	56.303	6671.6	8.704
900.	48.904	7.898	56.802	7107.8	8.744
950.	49.332	7.943	57.275	7545.9	8.780
1000.	49.741	7.986	57.726	7985.7	8.811
1050.	50.131	8.026	58.157	8427.0	8.840
1100.	50.506	8.063	58.569	8869.6	8.866
1150.	50.865	8.099	58.964	9313.5	8.889
1200.	51.210	8.132	59.342	9758.5	8.911
1250.	51.543	8.164	59.707	10204.6	8.931
1300.	51.864	8.194	60.057	10651.6	8.950
1350.	52.173	8.222	60.395	11099.6	8.968
1400.	52.473	8.249	60.722	11548.4	8.985
1450.	52.763	8.275	61.037	11998.1	9.000
1500.	53.044	8.299	61.343	12448.5	9.015
1550.	53.316	8.322	61.639	12899.6	9.030
1600.	53.581	8.345	61.925	13351.4	9.043
1650.	53.838	8.366	62.204	13803.9	9.056
1700.	54.088	8.386	62.474	14257.0	9.069
1750.	54.331	8.406	62.738	14710.8	9.081
1800.	54.568	8.425	62.994	15165.2	9.093
1850.	54.800	8.443	63.243	15620.1	9.105
1900.	55.025	8.461	63.486	16075.7	9.116
1950.	55.245	8.478	63.723	16531.8	9.127
2000.	55.460	8.494	63.954	16988.4	9.138
2050.	55.670	8.510	64.180	17445.6	9.149

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.038551
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.16130
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.038526

Table A-20 Thermodynamic Functions for LiF (gas) - continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	55.875	8.525	64.400	17903.3	9.159
2150.	56.076	8.540	64.616	18361.5	9.170
2200.	56.272	8.555	64.827	18820.2	9.180
2250.	56.465	8.569	65.033	19279.5	9.190
2300.	56.653	8.582	65.235	19739.2	9.200
2350.	56.838	8.595	65.433	20199.4	9.209
2400.	57.019	8.608	65.627	20660.1	9.219
2450.	57.197	8.621	65.818	21121.3	9.229
2500.	57.371	8.633	66.004	21583.0	9.238
2600.	57.710	8.657	66.367	22507.8	9.257
2700.	58.037	8.679	66.717	23434.5	9.276
2800.	58.353	8.701	67.054	24363.0	9.295
2900.	58.659	8.722	67.381	25293.5	9.313
3000.	58.955	8.742	67.697	26225.7	9.332
3100.	59.242	8.761	68.003	27159.8	9.350
3200.	59.520	8.780	68.300	28095.8	9.369
3300.	59.791	8.798	68.589	29033.6	9.387
3400.	60.054	8.816	68.869	29973.3	9.406
3500.	60.309	8.833	69.142	30914.8	9.424
3600.	60.558	8.849	69.408	31858.2	9.443
3700.	60.801	8.866	69.667	32803.4	9.462
3800.	61.038	8.882	69.920	33750.6	9.481
3900.	61.269	8.897	70.166	34699.6	9.499
4000.	61.494	8.913	70.407	35650.4	9.518
4100.	61.714	8.928	70.642	36603.2	9.537
4200.	61.930	8.942	70.872	37557.9	9.557
4300.	62.140	8.957	71.097	38514.5	9.576
4400.	62.346	8.971	71.318	39473.1	9.595
4500.	62.548	8.985	71.533	40433.6	9.615
4600.	62.746	8.999	71.745	41396.0	9.634
4700.	62.940	9.013	71.952	42360.4	9.654
4800.	63.129	9.026	72.156	43326.8	9.674
4900.	63.316	9.040	72.355	44295.2	9.694
5000.	63.498	9.053	72.552	45265.6	9.714
5100.	63.678	9.066	72.744	46238.1	9.734
5200.	63.854	9.079	72.933	47212.5	9.755
5300.	64.027	9.092	73.119	48189.1	9.776
5400.	64.197	9.105	73.302	49167.6	9.796
5500.	64.364	9.118	73.482	50148.3	9.817
5600.	64.529	9.131	73.659	51131.1	9.838
5700.	64.690	9.143	73.834	52115.9	9.859
5800.	64.850	9.156	74.005	53102.9	9.881
5900.	65.006	9.168	74.174	54092.1	9.902
6000.	65.160	9.181	74.341	55083.4	9.924
273.15	40.058	7.044	47.103	1924.2	7.385
298.15	40.676	7.077	47.754	2110.1	7.493

MOLECULAR WEIGHT 25.94 MOLECULAR SYMMETRY 1.
BE 1.4221 ALPHAE 1.5 E-02 GAMMA 0. DE 1.275E-05
YEWE 0. XEWE 7.0 OMEGAE 900.
ELECTRONIC MULTIPLICITY 1.

Table A-21 Thermodynamic Functions for LiCl (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	31.076	6.943	38.019	347.1	6.957
75.	33.892	6.948	40.840	521.1	6.960
100.	35.891	6.952	42.844	695.2	6.976
125.	37.444	6.962	44.405	870.2	7.028
150.	38.714	6.980	45.694	1047.0	7.123
175.	39.792	7.009	46.802	1226.6	7.251
200.	40.731	7.048	47.779	1409.7	7.395
225.	41.564	7.095	48.659	1596.4	7.543
250.	42.314	7.147	49.461	1786.8	7.684
275.	42.998	7.202	50.200	1980.6	7.816
300.	43.627	7.258	50.885	2177.5	7.935
325.	44.210	7.315	51.524	2377.2	8.042
350.	44.754	7.370	52.124	2579.5	8.138
375.	45.264	7.424	52.688	2784.0	8.222
400.	45.745	7.476	53.221	2990.5	8.297
425.	46.200	7.527	53.726	3198.8	8.363
450.	46.631	7.575	54.206	3408.6	8.422
475.	47.042	7.621	54.663	3619.9	8.475
500.	47.434	7.665	55.099	3832.3	8.522
550.	48.169	7.746	55.915	4260.5	8.603
600.	48.846	7.821	56.666	4692.4	8.669
650.	49.475	7.888	57.363	5127.2	8.723
700.	50.061	7.949	58.011	5564.6	8.770
750.	50.612	8.005	58.617	6004.0	8.809
800.	51.130	8.057	59.187	6445.4	8.843
850.	51.620	8.104	59.724	6888.3	8.873
900.	52.084	8.147	60.232	7332.7	8.900
950.	52.526	8.188	60.714	7778.3	8.924
1000.	52.947	8.225	61.172	8225.0	8.946
1050.	53.349	8.260	61.609	8672.9	8.966
1100.	53.734	8.292	62.027	9121.6	8.985
1150.	54.103	8.323	62.426	9571.3	9.002
1200.	54.458	8.352	62.810	10021.8	9.018
1250.	54.800	8.378	63.178	10473.1	9.033
1300.	55.129	8.404	63.533	10925.1	9.048
1350.	55.446	8.428	63.875	11377.9	9.062
1400.	55.753	8.451	64.204	11831.3	9.075
1450.	56.050	8.473	64.523	12285.4	9.088
1500.	56.338	8.493	64.831	12740.2	9.101
1550.	56.617	8.513	65.130	13195.5	9.113
1600.	56.887	8.532	65.419	13651.4	9.125
1650.	57.150	8.550	65.700	14108.0	9.136
1700.	57.406	8.568	65.973	14565.1	9.148
1750.	57.654	8.584	66.239	15022.7	9.159
1800.	57.896	8.601	66.497	15481.0	9.170
1850.	58.132	8.616	66.748	15939.8	9.181
1900.	58.362	8.631	66.993	16399.1	9.192
1950.	58.587	8.646	67.232	16858.9	9.202
2000.	58.806	8.660	67.465	17319.3	9.213
2050.	59.020	8.673	67.693	17780.2	9.223

This table is in units of calories, moles and °K.

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.023587
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.098688
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.023572

Table A-21 Thermodynamic Functions for LiCl (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	59.229	8.686	67.915	18241.6	9.234
2150.	59.433	8.699	68.133	18703.6	9.244
2200.	59.633	8.712	68.345	19166.1	9.255
2250.	59.829	8.724	68.553	19629.1	9.265
2300.	60.021	8.736	68.757	20092.6	9.275
2350.	60.209	8.747	68.957	20556.6	9.285
2400.	60.394	8.759	69.152	21021.1	9.296
2450.	60.574	8.770	69.344	21486.2	9.306
2500.	60.752	8.781	69.532	21951.7	9.316
2600.	61.096	8.802	69.898	22884.4	9.337
2700.	61.429	8.822	70.251	23819.1	9.357
2800.	61.750	8.841	70.591	24755.8	9.378
2900.	62.061	8.860	70.921	25694.6	9.399
3000.	62.361	8.879	71.240	26635.5	9.419
3100.	62.653	8.896	71.549	27578.5	9.440
3200.	62.935	8.914	71.849	28523.6	9.461
3300.	63.210	8.931	72.141	29470.8	9.482
3400.	63.477	8.947	72.424	30420.1	9.504
3500.	63.736	8.963	72.700	31371.5	9.525
3600.	63.989	8.979	72.968	32325.1	9.547
3700.	64.235	8.995	73.230	33280.9	9.569
3800.	64.475	9.010	73.486	34238.9	9.591
3900.	64.710	9.025	73.735	35199.1	9.613
4000.	64.938	9.040	73.979	36161.5	9.635
4100.	65.162	9.055	74.217	37126.2	9.658
4200.	65.380	9.070	74.450	38093.1	9.681
4300.	65.594	9.084	74.678	39062.3	9.704
4400.	65.803	9.099	74.901	40033.9	9.727
4500.	66.007	9.113	75.120	41007.7	9.750
4600.	66.208	9.127	75.335	41983.9	9.774
4700.	66.404	9.141	75.545	42962.5	9.798
4800.	66.597	9.155	75.752	43943.4	9.822
4900.	66.786	9.169	75.955	44926.8	9.846
5000.	66.971	9.183	76.154	45912.6	9.870
5100.	67.153	9.196	76.349	46900.8	9.895
5200.	67.332	9.210	76.542	47891.5	9.920
5300.	67.507	9.224	76.731	48884.7	9.945
5400.	67.680	9.237	76.917	49880.4	9.970
5500.	67.850	9.251	77.100	50878.7	9.995
5600.	68.016	9.264	77.281	51879.5	10.021
5700.	68.180	9.278	77.458	52882.9	10.047
5800.	68.342	9.291	77.633	53888.8	10.073
5900.	68.501	9.305	77.806	54897.4	10.099
6000.	68.657	9.318	77.976	55908.7	10.126
273.15	42.949	7.198	50.147	1966.1	7.807
298.15	43.582	7.254	50.836	2162.8	7.927

MOLECULAR WEIGHT 42.397 MOLECULAR SYMMETRY 1.
BE 7.103 E-01 ALPHAE 6.2 E-03 GAMMA 0. DE 3.393E-06
YEWE 0. XEWE 4.3 OMEGAE 650.
ELECTRONIC MULTIPLICITY 1.

Table A-22 Thermodynamic Functions for BeO (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
100.	32.653	6.941	39.593	694.1	6.957
125.	34.202	6.944	41.146	868.0	6.958
150.	35.468	6.946	42.414	1041.9	6.958
175.	36.539	6.948	43.487	1215.9	6.960
200.	37.467	6.950	44.417	1390.0	6.965
225.	38.286	6.952	45.238	1564.2	6.974
250.	39.018	6.955	45.973	1738.7	6.991
275.	39.681	6.959	46.641	1913.8	7.016
300.	40.287	6.965	47.252	2089.6	7.049
325.	40.845	6.973	47.818	2266.3	7.091
350.	41.362	6.983	48.345	2444.2	7.140
375.	41.844	6.996	48.840	2623.4	7.194
400.	42.296	7.010	49.306	2804.0	7.254
425.	42.722	7.026	49.748	2986.1	7.316
450.	43.124	7.044	50.168	3169.8	7.380
475.	43.505	7.063	50.568	3355.1	7.445
500.	43.868	7.084	50.952	3542.0	7.510
550.	44.545	7.129	51.674	3920.8	7.637
600.	45.167	7.176	52.344	4305.7	7.757
650.	45.744	7.225	52.969	4696.3	7.868
700.	46.281	7.275	53.556	5092.3	7.970
750.	46.785	7.324	54.109	5493.2	8.062
800.	47.259	7.373	54.632	5898.4	8.146
850.	47.707	7.421	55.128	6307.6	8.221
900.	48.133	7.467	55.600	6720.4	8.288
950.	48.538	7.512	56.050	7136.3	8.349
1000.	48.924	7.555	56.479	7555.2	8.404
1050.	49.294	7.597	56.891	7976.7	8.454
1100.	49.648	7.637	57.285	8400.6	8.499
1150.	49.988	7.675	57.664	8826.6	8.540
1200.	50.316	7.712	58.028	9254.5	8.578
1250.	50.631	7.747	58.379	9684.3	8.612
1300.	50.936	7.781	58.717	10115.7	8.644
1350.	51.230	7.814	59.044	10548.6	8.673
1400.	51.515	7.845	59.360	10982.9	8.699
1450.	51.791	7.875	59.666	11418.5	8.724
1500.	52.058	7.904	59.962	11855.3	8.747
1550.	52.318	7.931	60.249	12293.2	8.768
1600.	52.570	7.958	60.528	12732.1	8.788
1650.	52.815	7.983	60.798	13172.0	8.807
1700.	53.054	8.008	61.062	13612.8	8.824
1750.	53.286	8.031	61.318	14054.4	8.841
1800.	53.513	8.054	61.567	14496.9	8.857
1850.	53.734	8.076	61.810	14940.1	8.871
1900.	53.950	8.097	62.046	15384.0	8.885
1950.	54.160	8.117	62.277	15828.6	8.899
2000.	54.366	8.137	62.503	16273.9	8.911
2050.	54.567	8.156	62.723	16719.7	8.924

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.039979
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.16727
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.039953

Table A-22 Thermodynamic Functions for BeO (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	54.764	8.174	62.938	17166.2	8.935
2150.	54.956	8.192	63.149	17613.2	8.946
2200.	55.145	8.209	63.354	18060.8	8.957
2250.	55.330	8.226	63.556	18508.9	8.967
2300.	55.511	8.242	63.753	18957.6	8.977
2350.	55.688	8.258	63.946	19406.7	8.987
2400.	55.862	8.273	64.136	19856.3	8.996
2450.	56.033	8.288	64.321	20306.3	9.005
2500.	56.200	8.303	64.503	20756.8	9.014
2600.	56.527	8.330	64.857	21659.0	9.031
2700.	56.842	8.357	65.198	22562.9	9.047
2800.	57.146	8.382	65.527	23468.4	9.062
2900.	57.440	8.405	65.846	24375.3	9.077
3000.	57.726	8.428	66.154	25283.7	9.091
3100.	58.002	8.450	66.452	26193.5	9.105
3200.	58.271	8.470	66.741	27104.6	9.118
3300.	58.532	8.490	67.022	28017.0	9.131
3400.	58.786	8.509	67.295	28930.7	9.143
3500.	59.033	8.527	67.560	29845.7	9.156
3600.	59.273	8.545	67.818	30761.9	9.168
3700.	59.507	8.562	68.069	31679.3	9.180
3800.	59.736	8.578	68.314	32597.9	9.192
3900.	59.959	8.594	68.553	33517.7	9.203
4000.	60.177	8.610	68.786	34438.6	9.215
4100.	60.390	8.625	69.014	35360.7	9.226
4200.	60.598	8.639	69.237	36283.9	9.238
4300.	60.801	8.653	69.454	37208.2	9.249
4400.	61.000	8.667	69.667	38133.7	9.260
4500.	61.195	8.680	69.875	39060.2	9.271
4600.	61.386	8.693	70.079	39987.9	9.282
4700.	61.573	8.706	70.279	40916.7	9.293
4800.	61.756	8.718	70.475	41846.6	9.305
4900.	61.936	8.730	70.667	42777.6	9.315
5000.	62.113	8.742	70.855	43709.7	9.326
5100.	62.286	8.754	71.040	44642.9	9.337
5200.	62.456	8.765	71.221	45577.2	9.348
5300.	62.623	8.776	71.399	46512.6	9.359
5400.	62.787	8.787	71.574	47449.1	9.370
5500.	62.949	8.798	71.746	48386.7	9.381
5600.	63.107	8.808	71.915	49325.4	9.392
5700.	63.263	8.818	72.082	50265.2	9.403
5800.	63.417	8.829	72.245	51206.0	9.414
5900.	63.568	8.839	72.406	52148.0	9.425
6000.	63.716	8.849	72.565	53091.1	9.436
273.15	39.634	6.959	46.593	1900.8	7.014
298.15	40.244	6.965	47.209	2076.6	7.046

MOLECULAR WEIGHT 25.013 MOLECULAR SYMMETRY 1.
BE 1.651 ALPHAE 1.90 E-02 GAMMA 0. DE 8.139 E-06
YEWE 2.235 E-02 XEWE 11.8281 OMEGAE 1487.220
ELECTRONIC MULTIPLICITY 1.

Table A-23 Thermodynamic Functions for BeF (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	29.766	6.928	36.693	346.4	6.957
75.	32.577	6.937	39.514	520.3	6.957
100.	34.573	6.942	41.516	694.2	6.958
125.	36.123	6.945	43.068	868.2	6.958
150.	37.389	6.948	44.337	1042.2	6.960
175.	38.460	6.950	45.410	1216.2	6.966
200.	39.389	6.953	46.341	1390.5	6.980
225.	40.208	6.957	47.165	1565.3	7.004
250.	40.941	6.963	47.904	1740.8	7.040
275.	41.605	6.972	48.578	1917.4	7.087
300.	42.212	6.984	49.197	2095.3	7.144
325.	42.772	6.999	49.771	2274.7	7.210
350.	43.291	7.017	50.308	2455.8	7.280
375.	43.776	7.037	50.813	2638.7	7.355
400.	44.231	7.059	51.290	2823.6	7.431
425.	44.659	7.083	51.742	3010.3	7.507
450.	45.065	7.109	52.174	3198.9	7.582
475.	45.450	7.136	52.586	3389.4	7.656
500.	45.817	7.163	52.980	3581.7	7.726
550.	46.502	7.221	53.723	3971.4	7.859
600.	47.133	7.279	54.412	4367.3	7.978
650.	47.718	7.337	55.055	4768.9	8.084
700.	48.264	7.394	55.657	5175.5	8.178
750.	48.776	7.449	56.224	5586.6	8.262
800.	49.258	7.502	56.760	6001.5	8.335
850.	49.714	7.553	57.267	6419.9	8.400
900.	50.148	7.602	57.749	6841.4	8.459
950.	50.560	7.648	58.208	7265.7	8.510
1000.	50.953	7.692	58.646	7692.4	8.557
1050.	51.330	7.735	59.064	8121.3	8.598
1100.	51.690	7.775	59.465	8552.1	8.636
1150.	52.037	7.813	59.850	8934.8	8.670
1200.	52.370	7.849	60.219	9419.0	8.701
1250.	52.691	7.884	60.575	9854.8	8.729
1300.	53.001	7.917	60.918	10291.9	8.755
1350.	53.300	7.948	61.249	10730.2	8.779
1400.	53.590	7.978	61.568	11169.7	8.801
1450.	53.871	8.007	61.878	11610.2	8.821
1500.	54.142	8.035	62.177	12051.8	8.840
1550.	54.406	8.061	62.467	12494.2	8.858
1600.	54.663	8.086	62.749	12937.5	8.875
1650.	54.912	8.110	63.022	13381.7	8.890
1700.	55.154	8.133	63.288	13826.6	8.905
1750.	55.390	8.156	63.546	14272.2	8.919
1800.	55.620	8.177	63.797	14718.5	8.932
1850.	55.845	8.198	64.042	15165.4	8.945
1900.	56.064	8.217	64.281	15612.9	8.957
1950.	56.277	8.236	64.514	16061.1	8.969
2000.	56.486	8.255	64.741	16509.8	8.980
2050.	56.690	8.273	64.963	16959.1	8.990

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.035698
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.14936
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.035675

Table A-23 Thermodynamic Functions for BeF (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	56.890	8.290	65.180	17408.8	9.001
2150.	57.085	8.307	65.392	17859.1	9.011
2200.	57.276	8.323	65.599	18309.9	9.020
2250.	57.463	8.338	65.802	18761.1	9.029
2300.	57.647	8.353	66.000	19212.8	9.039
2350.	57.827	8.368	66.195	19665.0	9.047
2400.	58.003	8.382	66.385	20117.6	9.056
2450.	58.176	8.396	66.572	20570.6	9.064
2500.	58.346	8.410	66.755	21024.0	9.072
2600.	58.676	8.435	67.111	21932.0	9.088
2700.	58.995	8.460	67.455	22841.6	9.103
2800.	59.303	8.483	67.786	23752.7	9.118
2900.	59.601	8.505	68.106	24665.2	9.132
3000.	59.890	8.526	68.416	25579.1	9.146
3100.	60.170	8.547	68.716	26494.4	9.160
3200.	60.441	8.566	69.007	27411.1	9.173
3300.	60.705	8.585	69.290	28329.1	9.186
3400.	60.962	8.602	69.564	29248.4	9.199
3500.	61.211	8.620	69.831	30168.9	9.212
3600.	61.454	8.636	70.091	31090.7	9.225
3700.	61.691	8.652	70.344	32013.8	9.237
3800.	61.922	8.668	70.590	32938.2	9.250
3900.	62.147	8.683	70.830	33863.7	9.262
4000.	62.367	8.698	71.065	34790.5	9.274
4100.	62.582	8.712	71.294	35718.6	9.286
4200.	62.793	8.726	71.518	36647.8	9.298
4300.	62.998	8.739	71.737	37578.3	9.311
4400.	63.199	8.752	71.951	38509.9	9.323
4500.	63.396	8.765	72.161	39442.8	9.335
4600.	63.589	8.778	72.366	40376.9	9.347
4700.	63.778	8.790	72.567	41312.2	9.359
4800.	63.963	8.802	72.765	42248.7	9.371
4900.	64.144	8.814	72.958	43186.4	9.383
5000.	64.323	8.825	73.148	44125.3	9.395
5100.	64.497	8.836	73.334	45065.5	9.407
5200.	64.669	8.847	73.517	46006.8	9.420
5300.	64.838	8.858	73.696	46949.4	9.432
5400.	65.003	8.869	73.873	47893.2	9.444
5500.	65.166	8.880	74.046	48838.2	9.456
5600.	65.326	8.890	74.216	49784.4	9.469
5700.	65.484	8.900	74.384	50731.9	9.481
5800.	65.639	8.910	74.549	51680.6	9.493
5900.	65.791	8.920	74.712	52630.5	9.506
6000.	65.941	8.930	74.871	53581.7	9.518
273.15	41.558	6.972	48.530	1904.3	7.083
298.15	42.169	6.983	49.152	2092.1	7.140

MOLECULAR WEIGHT 28.013 MOLECULAR SYMMETRY 1.
BE 1.4877 ALPHAE 1.685 E-02 GAMMA 0. DE 8.209E-06
YEWE 2.259 E-02 XEWE 9.234 OMEGAE 1265.61
ELECTRONIC MULTIPLICITY 2.

Table A-24 Thermodynamic Functions for BeCl (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	32.447	6.941	39.388	347.1	6.957
75.	35.262	6.947	42.209	521.0	6.957
100.	37.261	6.949	44.211	694.9	6.960
125.	38.812	6.952	45.765	869.0	6.971
150.	40.080	6.958	47.038	1043.7	7.002
175.	41.153	6.968	48.121	1219.3	7.058
200.	42.085	6.984	49.069	1396.8	7.139
225.	42.909	7.006	49.915	1576.5	7.238
250.	43.648	7.035	50.683	1758.8	7.347
275.	44.320	7.069	51.389	1943.8	7.460
300.	44.937	7.106	52.043	2131.8	7.573
325.	45.507	7.146	52.653	2322.4	7.681
350.	46.038	7.188	53.226	2515.8	7.783
375.	46.536	7.231	53.766	2711.5	7.878
400.	47.004	7.274	54.278	2909.6	7.965
425.	47.446	7.317	54.763	3109.7	8.046
450.	47.865	7.360	55.225	3311.8	8.119
475.	48.264	7.401	55.666	3515.6	8.186
500.	48.645	7.442	56.087	3721.1	8.247
550.	49.358	7.520	56.878	4136.2	8.353
600.	50.016	7.594	57.609	4556.1	8.442
650.	50.626	7.662	58.288	4980.1	8.517
700.	51.196	7.725	58.921	5407.6	8.580
750.	51.731	7.784	59.515	5837.9	8.633
800.	52.235	7.838	60.074	6270.8	8.680
850.	52.712	7.889	60.601	6705.8	8.720
900.	53.165	7.936	61.101	7142.7	8.755
950.	53.595	7.980	61.575	7581.3	8.787
1000.	54.005	8.021	62.027	8021.3	8.815
1050.	54.398	8.060	62.457	8462.7	8.840
1100.	54.773	8.096	62.869	8905.2	8.862
1150.	55.134	8.129	63.263	9348.9	8.883
1200.	55.481	8.161	63.642	9793.5	8.902
1250.	55.814	8.191	64.006	10239.0	8.919
1300.	56.136	8.220	64.356	10685.4	8.935
1350.	56.447	8.246	64.693	11132.5	8.950
1400.	56.747	8.272	65.019	11580.4	8.965
1450.	57.038	8.296	65.334	12029.0	8.978
1500.	57.320	8.319	65.638	12478.2	8.991
1550.	57.593	8.341	65.933	12928.0	9.003
1600.	57.858	8.362	66.219	13378.4	9.014
1650.	58.115	8.381	66.497	13829.4	9.025
1700.	58.366	8.401	66.766	14280.9	9.036
1750.	58.610	8.419	67.029	14733.0	9.046
1800.	58.847	8.436	67.284	15185.5	9.056
1850.	59.078	8.453	67.532	15638.5	9.065
1900.	59.304	8.470	67.774	16092.1	9.075
1950.	59.524	8.485	68.009	16546.0	9.084
2000.	59.739	8.500	68.240	17000.4	9.093
2050.	59.949	8.515	68.464	17455.3	9.101

This table is in units of calories, moles and °K.

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.022487
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.094086
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.022472

Table A-24 Thermodynamic Functions for BeCl (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ-H^\circ_0)/T$	S°	$H^\circ-H^\circ_0$	C°_p
2100.	60.155	8.529	68.684	17910.6	9.110
2150.	60.356	8.542	68.898	18366.3	9.118
2200.	60.552	8.556	69.108	18822.4	9.127
2250.	60.745	8.568	69.313	19279.0	9.135
2300.	60.933	8.581	69.514	19735.9	9.143
2350.	61.118	8.593	69.711	20193.2	9.151
2400.	61.299	8.605	69.903	20651.0	9.159
2450.	61.476	8.616	70.092	21109.1	9.166
2500.	61.650	8.627	70.278	21567.6	9.174
2600.	61.989	8.648	70.638	22485.8	9.189
2700.	62.316	8.669	70.985	23405.5	9.204
2800.	62.632	8.688	71.320	24326.7	9.219
2900.	62.937	8.707	71.644	25249.3	9.234
3000.	63.232	8.724	71.957	26173.5	9.249
3100.	63.519	8.742	72.260	27099.1	9.263
3200.	63.796	8.758	72.555	28026.2	9.278
3300.	64.066	8.774	72.840	28954.7	9.293
3400.	64.328	8.790	73.118	29884.7	9.307
3500.	64.583	8.805	73.388	30816.2	9.322
3600.	64.832	8.819	73.651	31749.1	9.337
3700.	65.073	8.833	73.907	32683.5	9.351
3800.	65.309	8.847	74.156	33619.3	9.366
3900.	65.539	8.861	74.400	34556.7	9.381
4000.	65.764	8.874	74.638	35495.5	9.396
4100.	65.983	8.887	74.870	36435.8	9.410
4200.	66.197	8.899	75.097	37377.6	9.425
4300.	66.407	8.912	75.319	38320.8	9.440
4400.	66.612	8.924	75.536	39265.6	9.455
4500.	66.813	8.936	75.749	40211.9	9.471
4600.	67.009	8.948	75.957	41159.8	9.486
4700.	67.202	8.959	76.161	42109.1	9.501
4800.	67.390	8.971	76.361	43060.0	9.517
4900.	67.575	8.982	76.558	44012.5	9.532
5000.	67.757	8.993	76.750	44966.5	9.548
5100.	67.935	9.004	76.940	45922.1	9.564
5200.	68.110	9.015	77.125	46879.2	9.579
5300.	68.282	9.026	77.308	47838.0	9.595
5400.	68.451	9.037	77.488	48798.3	9.611
5500.	68.617	9.047	77.664	49760.3	9.628
5600.	68.780	9.058	77.838	50723.8	9.644
5700.	68.940	9.068	78.009	51689.0	9.660
5800.	69.098	9.079	78.177	52655.8	9.677
5900.	69.253	9.089	78.342	53624.3	9.693
6000.	69.406	9.099	78.505	54594.5	9.710
273.15	44.273	7.066	51.338	1930.1	7.452
298.15	44.893	7.103	51.996	2117.8	7.564

MOLECULAR WEIGHT 44.470 MOLECULAR SYMMETRY 1.
BE 7.66 E-01 ALPHAE 7. E-03 GAMMA 0. DE 2.52 E-06
YEWE 0. XEWE 5.10 OMEGAE 845.37
ELECTRONIC MULTIPLICITY 2.

Table A-25 Thermodynamic Functions for MgO (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	31.357	6.945	38.302	347.3	6.956
75.	34.173	6.949	41.122	521.2	6.957
100.	36.173	6.951	43.124	695.1	6.961
125.	37.724	6.955	44.679	869.4	6.980
150.	38.993	6.962	45.955	1044.4	7.025
175.	40.067	6.976	47.043	1220.9	7.101
200.	41.000	6.998	47.998	1399.6	7.201
225.	41.826	7.027	48.853	1581.0	7.316
250.	42.568	7.062	49.630	1765.4	7.438
275.	43.243	7.101	50.344	1952.9	7.559
300.	43.862	7.145	51.007	2143.4	7.676
325.	44.436	7.190	51.626	2336.7	7.786
350.	44.971	7.236	52.207	2532.6	7.888
375.	45.471	7.283	52.754	2731.0	7.982
400.	45.943	7.329	53.272	2931.6	8.066
425.	46.389	7.375	53.763	3134.3	8.143
450.	46.811	7.419	54.231	3338.7	8.213
475.	47.214	7.463	54.677	3544.8	8.276
500.	47.598	7.505	55.103	3752.5	8.333
550.	48.317	7.585	55.902	4171.6	8.431
600.	48.980	7.659	56.639	4595.3	8.513
650.	49.596	7.727	57.323	5022.7	8.581
700.	50.171	7.790	57.961	5453.2	8.638
750.	50.710	7.848	58.559	5886.4	8.687
800.	51.218	7.902	59.121	6321.8	8.729
850.	51.699	7.952	59.651	6759.2	8.766
900.	52.155	7.998	60.153	7198.3	8.798
950.	52.588	8.041	60.629	7638.9	8.826
1000.	53.002	8.081	61.083	8080.8	8.852
1050.	53.397	8.118	61.515	8524.0	8.875
1100.	53.776	8.153	61.928	8968.2	8.895
1150.	54.139	8.186	62.324	9413.5	8.914
1200.	54.488	8.216	62.704	9859.7	8.932
1250.	54.824	8.245	63.069	10306.7	8.948
1300.	55.148	8.273	63.420	10754.5	8.964
1350.	55.460	8.299	63.759	11203.0	8.978
1400.	55.763	8.323	64.086	11652.2	8.991
1450.	56.055	8.346	64.401	12102.1	9.004
1500.	56.338	8.368	64.707	12552.7	9.016
1550.	56.613	8.390	65.003	13003.8	9.028
1600.	56.880	8.410	65.289	13455.5	9.039
1650.	57.139	8.429	65.568	13907.7	9.050
1700.	57.391	8.447	65.838	14360.5	9.061
1750.	57.636	8.465	66.101	14813.7	9.071
1800.	57.875	8.482	66.357	15267.5	9.081
1850.	58.107	8.498	66.606	15721.8	9.090
1900.	58.334	8.514	66.848	16176.5	9.100
1950.	58.555	8.529	67.085	16631.8	9.109
2000.	58.772	8.544	67.315	17087.4	9.118
2050.	58.983	8.558	67.541	17543.5	9.127

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.024802
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.010377
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.024786

Table A-25 Thermodynamic Functions for MgO (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	59.189	8.571	67.761	18000.1	9.136
2150.	59.391	8.585	67.976	18457.1	9.144
2200.	59.588	8.598	68.186	18914.5	9.153
2250.	59.782	8.610	68.392	19372.4	9.161
2300.	59.971	8.622	68.593	19830.6	9.170
2350.	60.157	8.634	68.790	20289.3	9.178
2400.	60.339	8.645	68.984	20748.4	9.186
2450.	60.517	8.656	69.173	21207.9	9.194
2500.	60.692	8.667	69.359	21667.9	9.203
2600.	61.032	8.688	69.720	22588.9	9.219
2700.	61.361	8.708	70.069	23511.6	9.235
2800.	61.678	8.727	70.405	24435.9	9.251
2900.	61.984	8.745	70.730	25361.8	9.267
3000.	62.281	8.763	71.044	26289.2	9.283
3100.	62.569	8.780	71.349	27218.3	9.299
3200.	62.848	8.797	71.644	28149.0	9.315
3300.	63.119	8.812	71.931	29081.2	9.331
3400.	63.382	8.828	72.210	30015.1	9.347
3500.	63.638	8.843	72.481	30950.6	9.363
3600.	63.887	8.858	72.745	31887.7	9.379
3700.	64.130	8.872	73.002	32826.4	9.395
3800.	64.367	8.886	73.253	33766.7	9.412
3900.	64.598	8.900	73.498	34708.7	9.428
4000.	64.823	8.913	73.737	35652.4	9.445
4100.	65.044	8.926	73.970	36597.7	9.461
4200.	65.259	8.939	74.198	37544.6	9.478
4300.	65.469	8.952	74.421	38493.3	9.495
4400.	65.675	8.964	74.640	39443.6	9.512
4500.	65.877	8.977	74.854	40395.6	9.529
4600.	66.074	8.989	75.063	41349.4	9.546
4700.	66.268	9.001	75.269	42304.9	9.564
4800.	66.458	9.013	75.470	43262.1	9.581
4900.	66.643	9.025	75.668	44221.1	9.599
5000.	66.826	9.036	75.862	45181.9	9.616
5100.	67.005	9.048	76.053	46144.4	9.634
5200.	67.181	9.059	76.240	47108.8	9.652
5300.	67.353	9.071	76.424	48074.9	9.671
5400.	67.523	9.082	76.605	49042.9	9.689
5500.	67.690	9.093	76.783	50012.7	9.707
5600.	67.854	9.104	76.958	50984.3	9.726
5700.	68.015	9.115	77.130	51957.8	9.745
5800.	68.174	9.126	77.300	52933.2	9.763
5900.	68.330	9.137	77.467	53910.5	9.782
6000.	68.483	9.148	77.632	54889.7	9.802
273.15	43.195	7.098	50.293	1938.9	7.550
298.15	43.818	7.141	50.960	2129.2	7.668

MOLECULAR WEIGHT 40.32 MOLECULAR SYMMETRY 1.
BE 5.711 E-01 ALPHAE 5. E-03 GAMMA 0. DE 1.22 E-06
YEWE 0. XEWE 5.15 OMEGAE 782.84
ELECTRONIC MULTIPLICITY 1.

Table A-26 Thermodynamic Functions for MgF (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	33.159	6.946	40.105	347.3	6.957
75.	35.976	6.950	42.926	521.2	6.958
100.	37.976	6.952	44.928	695.2	6.966
125.	39.528	6.958	46.486	869.7	6.997
150.	40.797	6.969	47.767	1045.4	7.063
175.	41.873	6.989	48.862	1223.2	7.163
200.	42.808	7.019	49.827	1403.7	7.284
225.	43.637	7.055	50.692	1587.5	7.416
250.	44.382	7.098	51.480	1774.5	7.549
275.	45.061	7.145	52.206	1964.9	7.677
300.	45.685	7.194	52.879	2158.3	7.796
325.	46.263	7.245	53.508	2354.6	7.906
350.	46.801	7.296	54.097	2553.5	8.005
375.	47.307	7.346	54.653	2754.8	8.094
400.	47.782	7.395	55.178	2958.1	8.174
425.	48.232	7.443	55.675	3163.4	8.246
450.	48.659	7.490	56.148	3370.3	8.310
475.	49.065	7.534	56.599	3578.8	8.367
500.	49.452	7.577	57.030	3788.7	8.419
550.	50.179	7.658	57.836	4211.9	8.507
600.	50.848	7.732	58.580	4639.1	8.580
650.	51.470	7.799	59.269	5069.7	8.640
700.	52.050	7.861	59.911	5503.0	8.690
750.	52.594	7.918	60.512	5938.6	8.733
800.	53.107	7.970	61.077	6376.2	8.770
850.	53.592	8.018	61.610	6815.5	8.802
900.	54.051	8.063	62.114	7256.3	8.830
950.	54.488	8.104	62.592	7698.4	8.855
1000.	54.905	8.142	63.047	8141.7	8.877
1050.	55.303	8.177	63.480	8586.1	8.897
1100.	55.684	8.210	63.895	9031.4	8.915
1150.	56.050	8.241	64.291	9477.6	8.932
1200.	56.401	8.270	64.672	9924.6	8.947
1250.	56.739	8.298	65.037	10372.3	8.962
1300.	57.065	8.324	65.389	10820.7	8.975
1350.	57.380	8.348	65.728	11269.8	8.988
1400.	57.684	8.371	66.055	11719.5	9.000
1450.	57.978	8.393	66.371	12169.7	9.011
1500.	58.263	8.414	66.677	12620.5	9.022
1550.	58.539	8.433	66.973	13071.9	9.032
1600.	58.807	8.452	67.260	13523.7	9.042
1650.	59.068	8.470	67.538	13976.1	9.052
1700.	59.321	8.488	67.808	14428.9	9.061
1750.	59.567	8.504	68.071	14882.2	9.070
1800.	59.807	8.520	68.327	15335.9	9.079
1850.	60.040	8.535	68.576	15790.1	9.088
1900.	60.268	8.550	68.818	16244.7	9.096
1950.	60.491	8.564	69.054	16699.7	9.104
2000.	60.708	8.578	69.285	17155.1	9.113
2050.	60.919	8.591	69.510	17610.9	9.121

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.023084
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.096583
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.023069

Table A-26 Thermodynamic Functions for MgF (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	61.127	8.603	69.730	18067.2	9.128
2150.	61.329	8.616	69.945	18523.8	9.136
2200.	61.527	8.628	70.155	18980.8	9.144
2250.	61.721	8.639	70.361	19438.2	9.152
2300.	61.911	8.650	70.562	19895.9	9.159
2350.	62.098	8.661	70.759	20354.1	9.167
2400.	62.280	8.672	70.952	20812.6	9.174
2450.	62.459	8.682	71.141	21271.5	9.182
2500.	62.635	8.692	71.327	21730.8	9.189
2600.	62.976	8.712	71.688	22650.4	9.204
2700.	63.305	8.730	72.035	23571.6	9.218
2800.	63.623	8.748	72.371	24494.1	9.233
2900.	63.930	8.765	72.695	25418.2	9.247
3000.	64.227	8.781	73.009	26343.6	9.262
3100.	64.516	8.797	73.313	27270.5	9.276
3200.	64.795	8.812	73.607	28198.9	9.291
3300.	65.067	8.827	73.893	29128.7	9.305
3400.	65.330	8.841	74.171	30060.0	9.320
3500.	65.587	8.855	74.442	30992.7	9.335
3600.	65.836	8.869	74.705	31926.9	9.349
3700.	66.080	8.882	74.961	32862.6	9.364
3800.	66.317	8.895	75.211	33799.8	9.379
3900.	66.548	8.907	75.455	34738.4	9.394
4000.	66.774	8.920	75.693	35678.5	9.409
4100.	66.994	8.932	75.926	36620.2	9.424
4200.	67.209	8.944	76.153	37563.3	9.439
4300.	67.420	8.955	76.375	38508.0	9.454
4400.	67.626	8.967	76.593	39454.1	9.470
4500.	67.828	8.978	76.806	40401.9	9.485
4600.	68.025	8.989	77.014	41351.1	9.501
4700.	68.218	9.000	77.219	42302.0	9.516
4800.	68.408	9.011	77.419	43254.4	9.532
4900.	68.594	9.022	77.616	44208.4	9.548
5000.	68.776	9.033	77.809	45164.0	9.564
5100.	68.955	9.043	77.999	46121.1	9.580
5200.	69.131	9.054	78.185	47079.9	9.596
5300.	69.304	9.064	78.368	48040.4	9.612
5400.	69.473	9.075	78.548	49002.4	9.629
5500.	69.640	9.085	78.724	49966.1	9.645
5600.	69.803	9.095	78.898	50931.5	9.662
5700.	69.965	9.105	79.070	51898.5	9.679
5800.	70.123	9.115	79.238	52867.2	9.696
5900.	70.279	9.125	79.404	53837.6	9.713
6000.	70.432	9.135	79.567	54809.8	9.730
273.15	45.013	7.141	52.154	1950.7	7.668
298.15	45.640	7.191	52.831	2143.9	7.788

MOLECULAR WEIGHT 43.32 MOLECULAR SYMMETRY 1.
BE 5.13 E-01 ALPHAE 4. E-03 GAMMA 0. DE 1.06 E-06
YEWE 0. XEWE 3.82 OMEGAE 714.8
ELECTRONIC MULTIPLICITY 2.

Table A-27 Thermodynamic Functions for MgCl (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	64.259	8.761	73.020	18398.5	9.175
2150.	64.465	8.771	73.236	18857.4	9.182
2200.	64.667	8.780	73.447	19316.7	9.190
2250.	64.864	8.790	73.654	19776.4	9.197
2300.	65.057	8.798	73.856	20236.4	9.205
2350.	65.247	8.807	74.054	20696.9	9.212
2400.	65.432	8.816	74.248	21157.7	9.220
2450.	65.614	8.824	74.438	21618.8	9.227
2500.	65.792	8.832	74.625	22080.4	9.235
2600.	66.139	8.848	74.987	23004.6	9.250
2700.	66.473	8.863	75.337	23930.4	9.265
2800.	66.796	8.878	75.674	24857.6	9.280
2900.	67.108	8.892	76.000	25786.4	9.296
3000.	67.409	8.906	76.315	26716.8	9.311
3100.	67.702	8.919	76.621	27648.7	9.327
3200.	67.985	8.932	76.917	28582.1	9.342
3300.	68.260	8.945	77.205	29517.2	9.358
3400.	68.527	8.957	77.484	30453.8	9.374
3500.	68.787	8.969	77.756	31392.0	9.390
3600.	69.040	8.981	78.021	32331.8	9.406
3700.	69.286	8.993	78.279	33273.2	9.423
3800.	69.526	9.004	78.530	34216.3	9.439
3900.	69.760	9.016	78.776	35161.0	9.456
4000.	69.989	9.027	79.015	36107.4	9.472
4100.	70.212	9.038	79.250	37055.5	9.489
4200.	70.430	9.049	79.478	38005.3	9.506
4300.	70.643	9.060	79.702	38956.8	9.523
4400.	70.851	9.070	79.921	39909.9	9.541
4500.	71.055	9.081	80.136	40864.9	9.558
4600.	71.255	9.092	80.345	41821.6	9.576
4700.	71.450	9.102	80.552	42780.0	9.593
4800.	71.642	9.113	80.755	43740.2	9.611
4900.	71.830	9.123	80.953	44702.3	9.629
5000.	72.014	9.133	81.148	45666.1	9.648
5100.	72.195	9.143	81.339	46631.8	9.666
5200.	72.373	9.154	81.527	47599.3	9.684
5300.	72.548	9.164	81.711	48568.7	9.703
5400.	72.719	9.174	81.893	49539.9	9.722
5500.	72.887	9.184	82.072	50513.0	9.741
5600.	73.053	9.194	82.247	51488.1	9.760
5700.	73.216	9.204	82.420	52465.0	9.779
5800.	73.376	9.214	82.590	53443.9	9.799
5900.	73.534	9.225	82.758	54424.8	9.818
6000.	73.689	9.235	82.923	55407.6	9.838
273.15	47.572	7.428	55.001	2029.0	8.218
298.15	48.226	7.499	55.725	2235.7	8.315

MOLECULAR WEIGHT 59.777 MOLECULAR SYMMETRY 1.
BE 2.45 E-01 ALPHAE 10. E-04 GAMMA 0. DE 2.72 E-07
YEWE 0. XEWE 2.05 OMEGAE 465.4
ELECTRONIC MULTIPLICITY 2.

Table A-27 Thermodynamic Functions for MgCl (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	35.579	6.951	42.530	347.6	6.957
75.	38.398	6.956	45.354	521.7	6.980
100.	40.401	6.972	47.373	697.2	7.073
125.	41.960	7.008	48.968	876.0	7.240
150.	43.242	7.063	50.305	1059.4	7.439
175.	44.336	7.131	51.467	1247.9	7.639
200.	45.293	7.206	52.499	1441.2	7.820
225.	46.146	7.283	53.430	1638.7	7.978
250.	46.918	7.360	54.277	1839.9	8.113
275.	47.623	7.433	55.056	2044.2	8.226
300.	48.272	7.504	55.776	2251.1	8.322
325.	48.876	7.570	56.445	2460.2	8.403
350.	49.439	7.632	57.071	2671.1	8.471
375.	49.967	7.690	57.657	2883.6	8.530
400.	50.466	7.744	58.209	3097.5	8.580
425.	50.937	7.794	58.731	3312.6	8.624
450.	51.383	7.841	59.225	3528.7	8.661
475.	51.809	7.886	59.694	3745.6	8.695
500.	52.214	7.927	60.141	3963.4	8.724
550.	52.973	8.002	60.975	4400.8	8.773
600.	53.672	8.068	61.740	4840.5	8.813
650.	54.320	8.126	62.447	5282.0	8.846
700.	54.925	8.179	63.103	5725.0	8.873
750.	55.490	8.226	63.716	6169.3	8.897
800.	56.023	8.268	64.291	6614.6	8.917
850.	56.525	8.307	64.832	7060.9	8.935
900.	57.001	8.342	65.343	7508.1	8.952
950.	57.453	8.375	65.828	7956.1	8.966
1000.	57.883	8.405	66.288	8404.7	8.980
1050.	58.294	8.432	66.726	8854.0	8.992
1100.	58.687	8.458	67.145	9303.9	9.004
1150.	59.063	8.482	67.545	9754.4	9.015
1200.	59.425	8.505	67.929	10205.4	9.025
1250.	59.772	8.526	68.298	10656.9	9.035
1300.	60.107	8.545	68.653	11108.9	9.045
1350.	60.430	8.564	68.994	11561.4	9.054
1400.	60.742	8.582	69.324	12014.4	9.063
1450.	61.043	8.598	69.642	12467.7	9.072
1500.	61.335	8.614	69.949	12921.5	9.080
1550.	61.618	8.630	70.247	13375.8	9.089
1600.	61.892	8.644	70.536	13830.4	9.097
1650.	62.158	8.658	70.816	14285.5	9.105
1700.	62.417	8.671	71.088	14740.9	9.113
1750.	62.668	8.684	71.352	15196.8	9.121
1800.	62.913	8.696	71.609	15653.0	9.129
1850.	63.152	8.708	71.860	16109.6	9.136
1900.	63.384	8.719	72.103	16566.6	9.144
1950.	63.611	8.730	72.341	17024.0	9.152
2000.	63.832	8.741	72.573	17481.8	9.159
2050.	64.048	8.751	72.799	17940.0	9.167

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.016729
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.069994
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.016718

Table A-28 Thermodynamic Functions for Al_2

T °K	$\frac{-(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	32.924	6.953	39.877	347.7	6.967
75.	35.746	6.972	42.718	522.9	7.074
100.	37.758	7.024	44.782	702.4	7.306
125.	39.334	7.108	46.442	888.5	7.576
150.	40.638	7.207	47.845	1081.1	7.824
175.	41.757	7.310	49.068	1279.3	8.031
200.	42.740	7.411	50.151	1482.3	8.197
225.	43.618	7.506	51.125	1688.9	8.330
250.	44.414	7.594	52.008	1898.6	8.437
275.	45.141	7.675	52.816	2110.6	8.523
300.	45.812	7.749	53.561	2324.6	8.593
325.	46.435	7.816	54.251	2540.2	8.652
350.	47.017	7.877	54.894	2757.1	8.701
375.	47.562	7.934	55.496	2975.1	8.742
400.	48.076	7.985	56.061	3194.1	8.778
425.	48.562	8.033	56.594	3414.0	8.809
450.	49.022	8.077	57.099	3634.5	8.836
475.	49.460	8.117	57.577	3855.7	8.860
500.	49.877	8.155	58.032	4077.5	8.882
550.	50.658	8.223	58.880	4522.5	8.919
600.	51.376	8.282	59.658	4969.3	8.950
650.	52.041	8.335	60.375	5417.5	8.978
700.	52.660	8.381	61.042	5867.0	9.002
750.	53.240	8.424	61.663	6317.7	9.024
800.	53.785	8.462	62.247	6769.4	9.045
850.	54.299	8.497	62.795	7222.1	9.064
900.	54.785	8.529	63.314	7675.8	9.082
950.	55.247	8.558	63.806	8130.3	9.099
1000.	55.687	8.586	64.273	8585.7	9.116
1050.	56.107	8.611	64.718	9041.9	9.133
1100.	56.508	8.635	65.143	9499.0	9.149
1150.	56.892	8.658	65.550	9956.8	9.165
1200.	57.261	8.680	65.941	10415.4	9.181
1250.	57.616	8.700	66.316	10874.8	9.196
1300.	57.957	8.719	66.677	11335.0	9.212
1350.	58.287	8.738	67.025	11796.0	9.227
1400.	58.605	8.756	67.360	12257.8	9.243
1450.	58.912	8.773	67.685	12720.3	9.258
1500.	59.210	8.789	67.999	13183.6	9.274
1550.	59.499	8.805	68.303	13647.7	9.290
1600.	59.778	8.820	68.599	14112.6	9.305
1650.	60.050	8.835	68.885	14578.2	9.321
1700.	60.314	8.850	69.164	15044.7	9.337
1750.	60.571	8.864	69.435	15512.0	9.353
1800.	60.821	8.878	69.698	15980.0	9.369
1850.	61.064	8.891	69.955	16448.9	9.386
1900.	61.301	8.905	70.206	16918.6	9.402
1950.	61.533	8.917	70.450	17389.1	9.419
2000.	61.759	8.930	70.689	17860.5	9.435
2050.	61.979	8.943	70.922	18332.6	9.452

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	.018532
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	.077538
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	.001852

Table A-28 Thermodynamic Functions for Al_2 - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ-H^\circ_0)/T$	S°	$H^\circ-H^\circ_0$	C°_p
2100.	62.195	8.955	71.150	18805.7	9.469
2150.	62.406	8.967	71.373	19279.6	9.486
2200.	62.612	8.979	71.591	19754.3	9.504
2250.	62.814	8.991	71.805	20229.9	9.521
2300.	63.012	9.003	72.015	20706.4	9.539
2350.	63.206	9.014	72.220	21183.8	9.556
2400.	63.395	9.026	72.421	21662.0	9.574
2450.	63.582	9.037	72.619	22141.2	9.592
2500.	63.764	9.049	72.813	22621.3	9.611
2600.	64.120	9.071	73.191	23584.2	9.648
2700.	64.462	9.093	73.555	24550.8	9.685
2800.	64.794	9.115	73.908	25521.2	9.724
2900.	65.114	9.136	74.250	26495.5	9.763
3000.	65.424	9.158	74.582	27473.8	9.802
3100.	65.724	9.179	74.904	28456.0	9.843
3200.	66.016	9.201	75.217	29442.4	9.884
3300.	66.300	9.222	75.522	30432.9	9.926
3400.	66.575	9.243	75.819	31427.6	9.968
3500.	66.844	9.265	76.108	32426.6	10.012
3600.	67.105	9.286	76.391	33429.9	10.056
3700.	67.360	9.307	76.667	34437.7	10.100
3800.	67.608	9.329	76.937	35450.0	10.146
3900.	67.851	9.350	77.201	36466.9	10.192
4000.	68.088	9.372	77.460	37488.5	10.239
4100.	68.319	9.394	77.713	38514.7	10.286
4200.	68.546	9.416	77.962	39545.8	10.335
4300.	68.768	9.438	78.205	40581.7	10.384
4400.	68.985	9.460	78.445	41622.6	10.434
4500.	69.198	9.482	78.680	42668.5	10.484
4600.	69.407	9.504	78.911	43719.4	10.535
4700.	69.611	9.527	79.138	44775.6	10.587
4800.	69.812	9.549	79.361	45836.9	10.640
4900.	70.009	9.572	79.581	46903.6	10.693
5000.	70.203	9.595	79.798	47975.6	10.747
5100.	70.393	9.618	80.011	49053.1	10.802
5200.	70.580	9.642	80.222	50136.1	10.858
5300.	70.764	9.665	80.429	51224.7	10.914
5400.	70.945	9.689	80.633	52319.0	10.971
5500.	71.123	9.713	80.835	53419.0	11.029
5600.	71.298	9.737	81.035	54524.8	11.088
5700.	71.470	9.761	81.231	55636.5	11.147
5800.	71.640	9.785	81.426	56754.2	11.207
5900.	71.808	9.810	81.618	57877.9	11.267
6000.	71.973	9.835	81.808	59007.7	11.329
273.15	45.090	7.669	52.759	2094.8	8.517
298.15	45.765	7.743	53.508	2308.7	8.589

MOLECULAR WEIGHT 53.96 MOLECULAR SYMMETRY 2.
BE 2.0 E-01 ALPHAE 1.3 E-03 GAMMA 0. DE 2.6 E-07
YEWE -1.05 E-02 XEWE 2.022 OMEGAE 350.01
ELECTRONIC MULTIPLICITY 1.

Table A-29 Thermodynamic Functions for AlO

T °K	$\frac{-(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	32.696	6.944	39.639	347.2	6.956
75.	35.512	6.948	42.460	521.1	6.957
100.	37.511	6.950	44.461	695.0	6.957
125.	39.062	6.952	46.014	869.0	6.961
150.	40.330	6.954	47.284	1043.1	6.974
175.	41.402	6.959	48.361	1217.8	7.003
200.	42.332	6.967	49.299	1393.5	7.052
225.	43.153	6.980	50.133	1570.6	7.119
250.	43.889	6.998	50.888	1749.5	7.201
275.	44.557	7.021	51.578	1930.7	7.292
300.	45.169	7.047	52.217	2114.2	7.389
325.	45.735	7.077	52.812	2300.1	7.487
350.	46.260	7.110	53.370	2488.5	7.583
375.	46.752	7.145	53.897	2679.3	7.677
400.	47.214	7.181	54.395	2872.3	7.766
425.	47.651	7.218	54.868	3067.5	7.849
450.	48.064	7.255	55.319	3264.7	7.927
475.	48.458	7.292	55.750	3463.8	8.000
500.	48.833	7.329	56.162	3664.7	8.067
550.	49.535	7.402	56.937	4071.1	8.187
600.	50.182	7.472	57.653	4483.1	8.289
650.	50.782	7.538	58.320	4899.7	8.376
700.	51.343	7.601	58.944	5320.4	8.450
750.	51.870	7.659	59.529	5744.6	8.514
800.	52.366	7.715	60.080	6171.7	8.570
850.	52.835	7.766	60.601	6601.4	8.618
900.	53.280	7.815	61.095	7033.4	8.661
950.	53.704	7.860	61.565	7467.4	8.698
1000.	54.108	7.903	62.012	7903.2	8.731
1050.	54.495	7.943	62.438	8340.5	8.761
1100.	54.865	7.981	62.847	8779.3	8.788
1150.	55.221	8.017	63.238	9219.3	8.813
1200.	55.563	8.050	63.613	9660.5	8.835
1250.	55.892	8.082	63.974	10102.7	8.855
1300.	56.210	8.112	64.322	10546.0	8.874
1350.	56.516	8.141	64.657	10990.1	8.891
1400.	56.813	8.168	64.981	11435.1	8.907
1450.	57.100	8.194	65.294	11880.8	8.922
1500.	57.378	8.218	65.596	12327.3	8.937
1550.	57.648	8.242	65.890	12774.4	8.950
1600.	57.910	8.264	66.174	13222.3	8.963
1650.	58.165	8.285	66.450	13670.7	8.975
1700.	58.412	8.306	66.718	14119.7	8.986
1750.	58.653	8.325	66.979	14569.3	8.997
1800.	58.888	8.344	67.232	15019.4	9.008
1850.	59.117	8.362	67.479	15470.0	9.018
1900.	59.340	8.380	67.720	15921.2	9.027
1950.	59.558	8.396	67.955	16372.8	9.037
2000.	59.771	8.412	68.183	16824.9	9.046
2050.	59.979	8.428	68.407	17277.4	9.055

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.023267
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.097349
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.023252

Table A-29 Thermodynamic Functions for AlO - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	60.182	8.443	68.625	17730.4	9.064
2150.	60.381	8.458	68.839	18183.8	9.072
2200.	60.576	8.472	69.047	18637.6	9.081
2250.	60.766	8.485	69.251	19091.8	9.089
2300.	60.953	8.498	69.451	19546.4	9.097
2350.	61.136	8.511	69.647	20001.5	9.104
2400.	61.315	8.524	69.839	20456.9	9.112
2450.	61.491	8.536	70.027	20912.7	9.120
2500.	61.663	8.548	70.211	21368.9	9.127
2600.	61.999	8.570	70.569	22282.3	9.142
2700.	62.323	8.592	70.915	23197.3	9.157
2800.	62.636	8.612	71.248	24113.6	9.171
2900.	62.938	8.632	71.570	25031.4	9.185
3000.	63.231	8.650	71.882	25950.6	9.199
3100.	63.515	8.668	72.183	26871.1	9.212
3200.	63.791	8.685	72.476	27793.1	9.226
3300.	64.058	8.702	72.760	28716.3	9.240
3400.	64.318	8.718	73.036	29641.0	9.253
3500.	64.571	8.733	73.305	30567.0	9.267
3600.	64.817	8.748	73.566	31494.3	9.280
3700.	65.057	8.763	73.820	32423.0	9.294
3800.	65.291	8.777	74.068	33353.0	9.307
3900.	65.519	8.791	74.310	34284.4	9.321
4000.	65.742	8.804	74.546	35217.1	9.334
4100.	65.960	8.817	74.777	36151.2	9.348
4200.	66.172	8.830	75.002	37086.7	9.361
4300.	66.380	8.843	75.223	38023.5	9.375
4400.	66.584	8.855	75.439	38961.7	9.389
4500.	66.783	8.867	75.650	39901.2	9.402
4600.	66.978	8.879	75.857	40842.2	9.416
4700.	67.169	8.890	76.059	41784.5	9.430
4800.	67.356	8.902	76.258	42728.2	9.444
4900.	67.540	8.913	76.453	43673.3	9.458
5000.	67.720	8.924	76.644	44619.9	9.472
5100.	67.897	8.935	76.832	45567.8	9.487
5200.	68.070	8.946	77.016	46517.2	9.501
5300.	68.241	8.956	77.197	47468.0	9.515
5400.	68.408	8.967	77.375	48420.3	9.530
5500.	68.573	8.977	77.550	49374.0	9.544
5600.	68.735	8.987	77.722	50329.2	9.559
5700.	68.894	8.998	77.892	51285.8	9.574
5800.	69.051	9.008	78.058	52244.0	9.589
5900.	69.205	9.018	78.222	53203.6	9.604
6000.	69.356	9.027	78.384	54164.7	9.619
273.15	44.510	7.019	51.529	1917.2	7.285
298.15	45.126	7.045	52.171	2100.5	7.382

MOLECULAR WEIGHT 42.98 MOLECULAR SYMMETRY 1.
BE 6.4128 E-01 ALPHAE 5.80 E-03 GAMMA 0. DE 1.10 E-06
YEWE 0. XEWE 6.97 OMEGAE 979.17
ELECTRONIC MULTIPLICITY 2.

Table A-30 Thermodynamic Functions for AlH

T °K	$\frac{-(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	25.601	6.835	32.436	341.8	6.959
75.	28.381	6.877	35.258	515.7	6.960
100.	30.362	6.898	37.260	689.8	6.961
125.	31.903	6.910	38.813	863.8	6.962
150.	33.164	6.919	40.083	1037.9	6.963
175.	34.231	6.925	41.156	1212.0	6.965
200.	35.156	6.931	42.087	1386.1	6.968
225.	35.973	6.935	42.908	1560.4	6.974
250.	36.703	6.939	43.643	1734.8	6.984
275.	37.365	6.944	44.309	1909.6	6.999
300.	37.969	6.950	44.919	2084.9	7.022
325.	38.526	6.956	45.482	2260.8	7.052
350.	39.042	6.964	46.006	2437.5	7.088
375.	39.523	6.974	46.497	2615.2	7.131
400.	39.973	6.985	46.958	2794.1	7.180
425.	40.397	6.998	47.395	2974.3	7.233
450.	40.797	7.013	47.810	3155.8	7.289
475.	41.177	7.029	48.206	3338.7	7.348
500.	41.538	7.046	48.584	3523.2	7.408
550.	42.211	7.085	49.296	3896.6	7.530
600.	42.829	7.127	49.956	4276.1	7.650
650.	43.402	7.172	50.573	4661.5	7.766
700.	43.935	7.218	51.153	5052.6	7.874
750.	44.434	7.265	51.700	5448.9	7.976
800.	44.905	7.313	52.217	5850.0	8.070
850.	45.350	7.360	52.709	6255.7	8.156
900.	45.772	7.406	53.178	6665.5	8.235
950.	46.173	7.452	53.625	7079.1	8.308
1000.	46.557	7.496	54.053	7496.2	8.375
1050.	46.923	7.540	54.463	7916.5	8.436
1100.	47.275	7.582	54.857	8339.8	8.493
1150.	47.613	7.622	55.235	8765.7	8.545
1200.	47.938	7.662	55.600	9194.2	8.594
1250.	48.252	7.700	55.952	9625.1	8.639
1300.	48.555	7.737	56.292	10058.1	8.681
1350.	48.847	7.773	56.620	10493.1	8.720
1400.	49.130	7.807	56.938	10930.0	8.757
1450.	49.405	7.841	57.246	11368.7	8.791
1500.	49.671	7.873	57.544	11809.1	8.823
1550.	49.930	7.904	57.834	12251.0	8.854
1600.	50.181	7.934	58.116	12694.5	8.883
1650.	50.426	7.963	58.389	13139.3	8.911
1700.	50.664	7.991	58.656	13585.5	8.937
1750.	50.896	8.019	58.915	14033.0	8.962
1800.	51.123	8.045	59.168	14481.8	8.986
1850.	51.343	8.071	59.414	14931.7	9.009
1900.	51.559	8.096	59.655	15382.7	9.032
1950.	51.770	8.120	59.890	15834.8	9.053
2000.	51.975	8.144	60.119	16288.0	9.074
2050.	52.177	8.167	60.344	16742.2	9.094

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	.035730
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	.14949
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	.03571

Table A-30 Thermodynamic Functions for AlH - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	52.374	8.189	60.563	17197.4	9.114
2150.	52.567	8.211	60.778	17653.6	9.133
2200.	52.756	8.232	60.988	18110.7	9.151
2250.	52.941	8.253	61.194	18568.7	9.169
2300.	53.123	8.273	61.396	19027.6	9.187
2350.	53.301	8.293	61.593	19487.4	9.204
2400.	53.476	8.312	61.787	19948.0	9.221
2450.	53.647	8.330	61.978	20409.5	9.238
2500.	53.816	8.349	62.164	20871.8	9.254
2600.	54.144	8.384	62.528	21798.8	9.286
2700.	54.461	8.418	62.879	22729.0	9.317
2800.	54.768	8.451	63.218	23662.3	9.348
2900.	55.065	8.482	63.547	24598.6	9.378
3000.	55.353	8.513	63.865	25537.9	9.407
3100.	55.632	8.542	64.174	26480.0	9.436
3200.	55.904	8.570	64.474	27425.1	9.465
3300.	56.168	8.598	64.766	28373.0	9.493
3400.	56.425	8.625	65.050	29323.7	9.521
3500.	56.676	8.651	65.326	30277.2	9.549
3600.	56.920	8.676	65.596	31233.5	9.577
3700.	57.158	8.701	65.858	32192.6	9.605
3800.	57.390	8.725	66.115	33154.5	9.633
3900.	57.617	8.748	66.365	34119.1	9.660
4000.	57.839	8.772	66.610	35086.5	9.688
4100.	58.056	8.794	66.850	36056.7	9.716
4200.	58.268	8.817	67.084	37029.6	9.743
4300.	58.476	8.838	67.314	38005.4	9.771
4400.	58.679	8.860	67.539	38983.9	9.799
4500.	58.878	8.881	67.760	39965.2	9.827
4600.	59.074	8.902	67.976	40949.3	9.855
4700.	59.265	8.923	68.188	41936.2	9.883
4800.	59.454	8.943	68.396	42925.9	9.912
4900.	59.638	8.963	68.601	43918.5	9.940
5000.	59.819	8.983	68.802	44914.0	9.969
5100.	59.997	9.002	69.000	45912.3	9.997
5200.	60.172	9.022	69.194	46913.4	10.026
5300.	60.345	9.041	69.386	47917.5	10.055
5400.	60.514	9.060	69.574	48924.5	10.084
5500.	60.680	9.079	69.759	49934.4	10.114
5600.	60.844	9.098	69.942	50947.2	10.143
5700.	61.005	9.116	70.121	51963.1	10.173
5800.	61.164	9.135	70.299	52981.8	10.203
5900.	61.320	9.153	70.473	54003.6	10.233
6000.	61.474	9.171	70.645	55028.4	10.263
273.15	37.318	6.944	44.262	1896.7	6.998
298.15	37.927	6.949	44.876	2071.9	7.020

MOLECULAR WEIGHT 27.9878 MOLECULAR SYMMETRY 1.
BE 6.38945 ALPHAE 1.8258 E-01 GAMMA 0. DE 3.69 E-04
YEWE 2.389 E-01 XEWE 29.090 OMEGAE 1682.563
ELECTRONIC MULTIPLICITY 1.

Table A-31 Thermodynamic Functions for AlF (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	31.814	6.945	38.760	347.3	6.956
75.	34.631	6.949	41.580	521.2	6.957
100.	36.631	6.951	43.582	695.1	6.960
125.	38.182	6.954	45.136	869.3	6.976
150.	39.451	6.961	46.411	1044.1	7.016
175.	40.524	6.973	47.498	1220.4	7.085
200.	41.457	6.993	48.450	1398.6	7.179
225.	42.282	7.020	49.302	1579.4	7.288
250.	43.023	7.052	50.076	1763.1	7.406
275.	43.697	7.090	50.787	1949.7	7.525
300.	44.316	7.131	51.447	2139.3	7.641
325.	44.888	7.175	52.063	2331.7	7.750
350.	45.422	7.219	52.641	2526.8	7.852
375.	45.921	7.265	53.186	2724.3	7.946
400.	46.391	7.310	53.702	2924.0	8.032
425.	46.836	7.355	54.191	3125.8	8.110
450.	47.258	7.399	54.656	3329.4	8.180
475.	47.659	7.442	55.100	3534.8	8.244
500.	48.042	7.483	55.525	3741.6	8.303
550.	48.759	7.562	56.321	4159.3	8.403
600.	49.420	7.636	57.056	4581.7	8.487
650.	50.034	7.704	57.738	5007.8	8.556
700.	50.607	7.767	58.374	5437.1	8.615
750.	51.145	7.825	58.970	5869.1	8.665
800.	51.652	7.879	59.531	6303.5	8.708
850.	52.131	7.929	60.060	6739.8	8.745
900.	52.585	7.975	60.561	7177.9	8.778
950.	53.018	8.018	61.036	7617.5	8.807
1000.	53.430	8.059	61.489	8058.5	8.832
1050.	53.824	8.096	61.920	8500.7	8.856
1100.	54.202	8.131	62.333	8944.0	8.877
1150.	54.564	8.164	62.728	9388.3	8.896
1200.	54.912	8.195	63.107	9833.6	8.913
1250.	55.247	8.224	63.471	10279.6	8.929
1300.	55.570	8.251	63.821	10726.5	8.944
1350.	55.882	8.277	64.159	11174.1	8.958
1400.	56.183	8.302	64.485	11622.3	8.972
1450.	56.475	8.325	64.800	12071.2	8.984
1500.	56.758	8.347	65.105	12520.7	8.996
1550.	57.032	8.368	65.400	12970.8	9.007
1600.	57.298	8.388	65.686	13421.4	9.018
1650.	57.556	8.408	65.964	13872.6	9.028
1700.	57.808	8.426	66.234	14324.3	9.038
1750.	58.052	8.444	66.496	14776.4	9.048
1800.	58.290	8.461	66.751	15229.1	9.057
1850.	58.522	8.477	66.999	15682.2	9.067
1900.	58.748	8.492	67.241	16135.7	9.075
1950.	58.969	8.508	67.477	16589.7	9.084
2000.	59.185	8.522	67.707	17044.1	9.092
2050.	59.395	8.536	67.932	17499.0	9.101

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.021749
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.090998
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.021735

Table A-31 Thermodynamic Functions for AlF (gas) - Continued

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	59.601	8.550	68.151	17954.2	9.109
2150.	59.803	8.563	68.365	18409.9	9.117
2200.	60.000	8.575	68.575	18865.9	9.125
2250.	60.192	8.588	68.780	19322.4	9.133
2300.	60.381	8.600	68.981	19779.2	9.140
2350.	60.566	8.611	69.178	20236.4	9.148
2400.	60.748	8.622	69.370	20694.0	9.156
2450.	60.926	8.633	69.559	21151.9	9.163
2500.	61.100	8.644	69.744	21610.3	9.171
2600.	61.440	8.665	70.104	22528.1	9.185
2700.	61.767	8.684	70.451	23447.3	9.200
2800.	62.083	8.703	70.786	24368.0	9.214
2900.	62.389	8.721	71.110	25290.2	9.229
3000.	62.685	8.738	71.423	26213.8	9.243
3100.	62.972	8.754	71.726	27138.8	9.257
3200.	63.250	8.770	72.020	28065.2	9.271
3300.	63.520	8.786	72.306	28993.1	9.286
3400.	63.783	8.801	72.583	29922.3	9.300
3500.	64.038	8.815	72.853	30853.1	9.314
3600.	64.286	8.829	73.116	31785.2	9.329
3700.	64.528	8.843	73.371	32718.8	9.343
3800.	64.764	8.856	73.621	33653.8	9.357
3900.	64.995	8.869	73.864	34590.3	9.372
4000.	65.219	8.882	74.101	35528.2	9.387
4100.	65.439	8.895	74.333	36467.6	9.401
4200.	65.653	8.907	74.560	37408.4	9.416
4300.	65.863	8.919	74.782	38350.7	9.431
4400.	66.068	8.931	74.999	39294.6	9.446
4500.	66.269	8.942	75.211	40239.9	9.461
4600.	66.466	8.954	75.419	41186.7	9.476
4700.	66.658	8.965	75.623	42135.0	9.491
4800.	66.847	8.976	75.823	43084.8	9.506
4900.	67.032	8.987	76.019	44036.2	9.521
5000.	67.214	8.998	76.212	44989.1	9.537
5100.	67.392	9.009	76.401	45943.5	9.552
5200.	67.567	9.019	76.587	46899.6	9.568
5300.	67.739	9.030	76.769	47857.2	9.584
5400.	67.908	9.040	76.948	48816.3	9.600
5500.	68.074	9.050	77.125	49777.1	9.616
5600.	68.237	9.061	77.298	50739.5	9.632
5700.	68.398	9.071	77.469	51703.5	9.648
5800.	68.556	9.081	77.637	52669.1	9.664
5900.	68.711	9.091	77.802	53636.3	9.681
6000.	68.864	9.101	77.965	54605.2	9.697
273.15	43.649	7.087	50.736	1935.8	7.516
298.15	44.272	7.128	51.400	2125.2	7.633

MOLECULAR WEIGHT 45.98 MOLECULAR SYMMETRY 1.
BE 5.5228 E-01 ALPHAE 4.83 E-03 GAMMA 0. DE 1.05 E-06
YEWE 0. XEWE 4.70 OMEGAE 801.95
ELECTRONIC MULTIPLICITY 1.

Table A-32 Thermodynamic Functions for AlCl (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	34.368	6.951	41.319	347.6	6.957
75.	37.187	6.955	44.142	521.6	6.975
100.	39.189	6.969	46.158	696.9	7.058
125.	40.748	7.001	47.749	875.1	7.212
150.	42.028	7.052	49.080	1057.8	7.403
175.	43.120	7.116	50.236	1245.3	7.599
200.	44.075	7.188	51.263	1437.6	7.781
225.	44.926	7.263	52.189	1634.2	7.941
250.	45.695	7.338	53.033	1834.5	8.078
275.	46.398	7.411	53.808	2037.9	8.195
300.	47.046	7.480	54.526	2244.1	8.294
325.	47.647	7.546	55.193	2452.5	8.378
350.	48.208	7.608	55.817	2662.9	8.450
375.	48.735	7.666	56.402	2874.9	8.511
400.	49.232	7.721	56.953	3088.4	8.564
425.	49.702	7.772	57.473	3303.1	8.610
450.	50.147	7.820	57.967	3518.8	8.650
475.	50.571	7.864	58.435	3735.5	8.685
500.	50.976	7.906	58.882	3953.1	8.717
550.	51.733	7.982	59.715	4390.3	8.769
600.	52.430	8.050	60.480	4829.8	8.812
650.	53.077	8.110	61.187	5271.3	8.847
700.	53.680	8.163	61.843	5714.4	8.876
750.	54.245	8.212	62.457	6158.9	8.902
800.	54.776	8.256	63.032	6604.5	8.924
850.	55.278	8.296	63.574	7051.3	8.944
900.	55.753	8.332	64.085	7498.9	8.962
950.	56.205	8.366	64.570	7947.4	8.978
1000.	56.635	8.397	65.031	8396.7	8.993
1050.	57.045	8.425	65.470	8846.7	9.007
1100.	57.438	8.452	65.890	9297.4	9.020
1150.	57.814	8.477	66.291	9748.7	9.033
1200.	58.175	8.501	66.676	10200.7	9.044
1250.	58.523	8.523	67.045	10653.2	9.056
1300.	58.857	8.543	67.400	11106.2	9.067
1350.	59.180	8.563	67.743	11559.8	9.077
1400.	59.492	8.581	68.073	12013.9	9.087
1450.	59.793	8.599	68.392	12468.5	9.097
1500.	60.085	8.616	68.701	12923.6	9.107
1550.	60.368	8.632	69.000	13379.2	9.117
1600.	60.642	8.647	69.289	13835.3	9.126
1650.	60.908	8.662	69.570	14291.8	9.135
1700.	61.167	8.676	69.843	14748.9	9.145
1750.	61.419	8.689	70.108	15206.3	9.154
1800.	61.664	8.702	70.366	15664.2	9.163
1850.	61.902	8.715	70.617	16122.6	9.172
1900.	62.135	8.727	70.862	16581.4	9.181
1950.	62.362	8.739	71.101	17040.7	9.190
2000.	62.583	8.750	71.333	17500.4	9.199
2050.	62.799	8.761	71.561	17960.6	9.208

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.016016
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.067011
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.016006

Table A-32 Thermodynamic Functions for AlCl (gas) - Continued

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	63.011	8.772	71.783	18421.2	9.217
2150.	63.217	8.782	72.000	18882.3	9.225
2200.	63.419	8.793	72.212	19343.8	9.234
2250.	63.617	8.803	72.419	19805.7	9.243
2300.	63.811	8.812	72.623	20268.1	9.252
2350.	64.000	8.822	72.822	20730.9	9.261
2400.	64.186	8.831	73.017	21194.2	9.270
2450.	64.368	8.840	73.208	21657.9	9.279
2500.	64.547	8.849	73.396	22122.1	9.288
2600.	64.894	8.866	73.760	23051.7	9.306
2700.	65.229	8.883	74.112	23983.2	9.324
2800.	65.552	8.899	74.451	24916.5	9.342
2900.	65.865	8.914	74.779	25851.6	9.360
3000.	66.167	8.930	75.097	26788.5	9.379
3100.	66.461	8.944	75.405	27727.3	9.397
3200.	66.745	8.959	75.703	28667.9	9.416
3300.	67.021	8.973	75.993	29610.5	9.435
3400.	67.289	8.987	76.275	30554.9	9.454
3500.	67.549	9.000	76.550	31501.3	9.473
3600.	67.803	9.014	76.817	32449.5	9.493
3700.	68.050	9.027	77.077	33399.8	9.512
3800.	68.291	9.040	77.331	34352.0	9.532
3900.	68.526	9.053	77.579	35306.1	9.552
4000.	68.756	9.066	77.821	36262.3	9.572
4100.	68.980	9.078	78.058	37220.5	9.592
4200.	69.198	9.091	78.289	38180.8	9.613
4300.	69.412	9.103	78.516	39143.1	9.634
4400.	69.622	9.115	78.737	40107.5	9.654
4500.	69.827	9.128	78.954	41074.0	9.676
4600.	70.028	9.140	79.167	42042.6	9.697
4700.	70.224	9.152	79.376	43013.4	9.718
4800.	70.417	9.164	79.581	43986.3	9.740
4900.	70.606	9.176	79.782	44961.4	9.762
5000.	70.792	9.188	79.979	45938.7	9.784
5100.	70.974	9.200	80.173	46918.2	9.806
5200.	71.153	9.212	80.364	47899.9	9.829
5300.	71.328	9.223	80.551	48883.9	9.851
5400.	71.501	9.235	80.736	49870.2	9.874
5500.	71.670	9.247	80.917	50858.8	9.897
5600.	71.837	9.259	81.096	51849.7	9.921
5700.	72.001	9.271	81.272	52842.9	9.944
5800.	72.162	9.282	81.445	53838.5	9.968
5900.	72.321	9.294	81.615	54836.5	9.992
6000.	72.477	9.306	81.783	55836.8	10.016
273.15	46.348	7.405	53.753	2022.8	8.187
298.15	46.999	7.475	54.475	2228.7	8.287

MOLECULAR WEIGHT 62.437 MOLECULAR SYMMETRY 1.
BE 2.41 E-01 ALPHAE 2. E-03 GAMMA 0. DE 2.4 E-07
YEWE 0. XEWE 1.94 OMEGAE 479.87
ELECTRONIC MULTIPLICITY 1.

Table A-33 Thermodynamic Functions for AlS

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	35.283	6.951	42.234	347.5	6.956
75.	38.102	6.953	45.054	521.5	6.959
100.	40.102	6.956	47.059	695.6	6.981
125.	41.656	6.967	48.622	870.9	7.046
150.	42.927	6.989	49.916	1048.3	7.156
175.	44.007	7.022	51.030	1228.9	7.297
200.	44.948	7.066	52.014	1413.2	7.450
225.	45.783	7.117	52.900	1601.4	7.602
250.	46.536	7.173	53.709	1793.3	7.745
275.	47.222	7.231	54.453	1988.6	7.875
300.	47.854	7.290	55.143	2186.9	7.992
325.	48.439	7.348	55.787	2388.0	8.095
350.	48.986	7.404	56.391	2591.6	8.186
375.	49.499	7.459	56.958	2797.2	8.266
400.	49.982	7.512	57.494	3004.8	8.336
425.	50.439	7.562	58.001	3214.0	8.398
450.	50.872	7.610	58.483	3424.6	8.452
475.	51.285	7.656	58.941	3636.5	8.501
500.	51.679	7.699	59.378	3849.6	8.544
550.	52.417	7.779	60.196	4278.7	8.617
600.	53.097	7.852	60.948	4711.1	8.677
650.	53.728	7.917	61.645	5146.2	8.726
700.	54.317	7.977	62.293	5583.6	8.767
750.	54.869	8.030	62.899	6022.8	8.801
800.	55.389	8.080	63.468	6463.6	8.831
850.	55.880	8.125	64.004	6905.8	8.857
900.	56.345	8.166	64.511	7349.3	8.880
950.	56.788	8.204	64.992	7793.8	8.900
1000.	57.210	8.239	65.449	8239.3	8.919
1050.	57.613	8.272	65.885	8685.6	8.935
1100.	57.998	8.303	66.301	9132.8	8.951
1150.	58.368	8.331	66.699	9580.7	8.965
1200.	58.723	8.358	67.081	10029.3	8.978
1250.	59.065	8.383	67.447	10478.5	8.990
1300.	59.394	8.406	67.800	10928.3	9.002
1350.	59.712	8.429	68.140	11378.7	9.013
1400.	60.018	8.450	68.468	11829.6	9.024
1450.	60.315	8.470	68.785	12281.1	9.034
1500.	60.603	8.489	69.091	12733.0	9.044
1550.	60.881	8.507	69.388	13185.4	9.053
1600.	61.152	8.524	69.676	13638.3	9.062
1650.	61.414	8.540	69.955	14091.6	9.071
1700.	61.669	8.556	70.226	14545.4	9.080
1750.	61.918	8.571	70.489	14999.6	9.088
1800.	62.159	8.586	70.745	15454.2	9.096
1850.	62.395	8.600	70.994	15909.2	9.105
1900.	62.624	8.613	71.237	16364.7	9.113
1950.	62.848	8.626	71.474	16820.5	9.121
2000.	63.067	8.638	71.705	17276.7	9.129
2050.	63.280	8.650	71.931	17733.3	9.136

This table in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	.016936
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	.070873
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	.016925

Table A-33 Thermodynamic Functions for AlS - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	63.489	8.662	72.151	18190.3	9.144
2150.	63.693	8.673	72.366	18647.7	9.152
2200.	63.892	8.684	72.577	19105.5	9.159
2250.	64.088	8.695	72.783	19563.7	9.167
2300.	64.279	8.705	72.984	20022.2	9.174
2350.	64.466	8.715	73.181	20481.1	9.182.
2400.	64.650	8.725	73.375	20940.4	9.189
2450.	64.830	8.735	73.564	21400.0	9.197
2500.	65.006	8.744	73.750	21860.1	9.204
2600.	65.350	8.762	74.112	22781.2	9.219
2700.	65.681	8.779	74.460	23703.9	9.234
2800.	66.000	8.796	74.796	24628.1	9.249
2900.	66.309	8.812	75.121	25553.7	9.264
3000.	66.608	8.827	75.435	26480.8	9.279
3100.	66.898	8.842	75.740	27409.4	9.294
3200.	67.179	8.856	76.035	28339.5	9.309
3300.	67.451	8.870	76.321	29271.2	9.324
3400.	67.716	8.884	76.600	30204.3	9.339
3500.	67.974	8.897	76.871	31139.0	9.355
3600.	68.225	8.910	77.135	32075.2	9.370
3700.	68.469	8.922	77.392	33013.0	9.386
3800.	68.707	8.935	77.642	33952.4	9.401
3900.	68.940	8.947	77.887	34893.3	9.417
4000.	69.166	8.959	78.125	35835.8	9.433
4100.	69.388	8.971	78.358	36779.8	9.449
4200.	69.604	8.982	78.586	37725.5	9.465
4300.	69.815	8.994	78.809	38672.9	9.481
4400.	70.022	9.005	79.027	39621.8	9.498
4500.	70.225	9.016	79.241	40572.4	9.514
4600.	70.423	9.027	79.450	41524.7	9.531
4700.	70.617	9.038	79.655	42478.6	9.548
4800.	70.808	9.049	79.857	43434.3	9.565
4900.	70.994	9.060	80.054	44391.6	9.582
5000.	71.178	9.070	80.248	45350.7	9.599
5100.	71.357	9.081	80.438	46311.5	9.617
5200.	71.534	9.091	80.625	47274.0	9.634
5300.	71.707	9.102	80.809	48238.3	9.652
5400.	71.877	9.112	80.989	49204.4	9.670
5500.	72.045	9.122	81.167	50172.3	9.688
5600.	72.209	9.132	81.341	51141.9	9.706
5700.	72.371	9.143	81.513	52113.4	9.724
5800.	72.530	9.153	81.683	53086.7	9.742
5900.	72.686	9.163	81.849	54061.9	9.761
6000.	72.840	9.173	82.014	55039.0	9.780
273.15	47.173	7.227	54.400	1974.0	7.866
298.15	47.809	7.285	55.094	2172.2	7.984

MOLECULAR WEIGHT 59.0460 MOLECULAR SYMMETRY 1.
BE 2.795 E-01 ALPHAE 1.8 E-03 GAMMA 0. DE 2.3 E-07
YEWE 0. XEWE 3.33 OMEGAE 616.72
ELECTRONIC MULTIPLICITY 2.

Table A-34 Thermodynamic Functions for F_2 (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	28.934	6.939	35.874	347.0	6.957
75.	31.749	6.945	38.694	520.9	6.957
100.	33.748	6.948	40.696	694.8	6.959
125.	35.298	6.951	42.249	868.9	6.966
150.	36.566	6.955	43.521	1043.2	6.987
175.	37.639	6.962	44.601	1218.4	7.031
200.	38.569	6.975	45.544	1395.0	7.097
225.	39.392	6.993	46.385	1573.4	7.182
250.	40.130	7.017	47.146	1754.2	7.280
275.	40.800	7.045	47.845	1937.5	7.386
300.	41.414	7.078	48.492	2123.5	7.494
325.	41.982	7.114	49.096	2312.2	7.600
350.	42.511	7.153	49.663	2503.5	7.703
375.	43.005	7.193	50.198	2697.3	7.800
400.	43.471	7.234	50.705	2893.4	7.892
425.	43.911	7.275	51.186	3091.8	7.977
450.	44.328	7.316	51.644	3292.2	8.055
475.	44.724	7.357	52.081	3494.5	8.128
500.	45.103	7.397	52.500	3698.6	8.195
550.	45.811	7.475	53.287	4111.4	8.314
600.	46.465	7.549	54.015	4529.6	8.415
650.	47.072	7.619	54.692	4952.6	8.501
700.	47.639	7.685	55.324	5379.5	8.575
750.	48.172	7.747	55.918	5809.9	8.640
800.	48.673	7.804	56.478	6243.3	8.696
850.	49.148	7.858	57.006	6679.4	8.746
900.	49.599	7.909	57.508	7117.9	8.791
950.	50.028	7.956	57.984	7558.4	8.831
1000.	50.437	8.001	58.438	8000.9	8.867
1050.	50.828	8.043	58.871	8445.1	8.901
1100.	51.203	8.083	59.286	8891.0	8.932
1150.	51.564	8.120	59.684	9338.3	8.961
1200.	51.910	8.156	60.066	9787.0	8.987
1250.	52.244	8.190	60.433	10237.0	9.013
1300.	52.565	8.222	60.787	10688.2	9.037
1350.	52.876	8.252	61.129	11140.6	9.060
1400.	53.177	8.282	61.458	11594.2	9.081
1450.	53.468	8.309	61.777	12048.8	9.102
1500.	53.750	8.336	62.086	12504.4	9.123
1550.	54.024	8.362	62.386	12961.0	9.143
1600.	54.290	8.387	62.676	13418.6	9.162
1650.	54.548	8.410	62.959	13877.2	9.181
1700.	54.800	8.433	63.233	14336.7	9.199
1750.	55.044	8.455	63.500	14797.1	9.217
1800.	55.283	8.477	63.760	15258.4	9.235
1850.	55.515	8.498	64.013	15720.6	9.252
1900.	55.742	8.518	64.260	16183.6	9.270
1950.	55.964	8.537	64.501	16647.5	9.287
2000.	56.180	8.556	64.736	17112.3	9.304
2050.	56.392	8.575	64.966	17577.9	9.321

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.026316
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.11011
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.026299

Table A-34 Thermodynamic Functions for F_2 (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ-H^\circ_0)/T$	S°	$H^\circ-H^\circ_0$	C°_p
2100.	56.599	8.593	65.191	18044.3	9.337
2150.	56.801	8.610	65.411	18511.6	9.354
2200.	56.999	8.627	65.626	18979.7	9.371
2250.	57.193	8.644	65.837	19448.7	9.387
2300.	57.383	8.660	66.044	19918.5	9.404
2350.	57.570	8.676	66.246	20389.1	9.421
2400.	57.753	8.692	66.444	20860.5	9.437
2450.	57.932	8.707	66.639	21332.8	9.454
2500.	58.108	8.722	66.830	21805.9	9.470
2600.	58.451	8.752	67.202	22754.6	9.504
2700.	58.782	8.780	67.562	23706.7	9.537
2800.	59.101	8.808	67.909	24662.1	9.571
2900.	59.411	8.835	68.246	25620.9	9.605
3000.	59.711	8.861	68.572	26583.2	9.640
3100.	60.002	8.887	68.889	27548.9	9.674
3200.	60.284	8.912	69.196	28518.1	9.709
3300.	60.559	8.937	69.496	29490.8	9.745
3400.	60.826	8.961	69.787	30467.1	9.781
3500.	61.086	8.985	70.071	31447.0	9.817
3600.	61.340	9.008	70.348	32430.5	9.854
3700.	61.587	9.032	70.619	33417.7	9.891
3800.	61.828	9.055	70.883	34408.7	9.928
3900.	62.063	9.078	71.141	35403.4	9.967
4000.	62.294	9.100	71.394	36402.0	10.005
4100.	62.519	9.123	71.642	37404.4	10.044
4200.	62.739	9.145	71.884	38410.8	10.084
4300.	62.954	9.168	72.122	39421.2	10.124
4400.	63.165	9.190	72.355	40435.5	10.164
4500.	63.372	9.212	72.584	41454.0	10.205
4600.	63.575	9.234	72.809	42476.5	10.246
4700.	63.773	9.256	73.030	43503.3	10.288
4800.	63.969	9.278	73.247	44534.2	10.331
4900.	64.160	9.300	73.460	45569.5	10.374
5000.	64.348	9.322	73.670	46609.0	10.417
5100.	64.533	9.344	73.877	47653.0	10.461
5200.	64.715	9.366	74.080	48701.3	10.506
5300.	64.893	9.388	74.281	49754.2	10.551
5400.	65.069	9.410	74.479	50811.5	10.597
5500.	65.242	9.432	74.673	51873.5	10.643
5600.	65.412	9.454	74.866	52940.1	10.689
5700.	65.579	9.476	75.055	54011.4	10.736
5800.	65.744	9.498	75.242	55087.4	10.784
5900.	65.907	9.520	75.427	56168.2	10.832
6000.	66.067	9.542	75.610	57253.9	10.881
273.15	40.752	7.043	47.795	1923.8	7.378
298.15	41.370	7.076	48.446	2109.6	7.486

MOLECULAR WEIGHT 38.00 MOLECULAR SYMMETRY 2.
BE 8.901 E-01 ALPHAE 1.46 E-02 GAMMA 0. DE 3.34 E-06
YEWE 0. XEWE 13.6 OMEGAE 919.0
ELECTRONIC MULTIPLICITY 1.

Table A-35 Thermodynamic Functions for HF (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	22.527	6.549	29.076	327.4	6.972
75.	25.213	6.688	31.901	501.6	6.964
100.	27.147	6.757	33.904	675.7	6.962
125.	28.660	6.798	35.458	849.7	6.961
150.	29.902	6.825	36.727	1023.8	6.961
175.	30.955	6.845	37.800	1197.8	6.961
200.	31.870	6.859	38.729	1371.9	6.962
225.	32.679	6.871	39.549	1545.9	6.962
250.	33.403	6.880	40.283	1720.0	6.963
275.	34.059	6.887	40.947	1894.1	6.964
300.	34.659	6.894	41.553	2068.1	6.964
325.	35.211	6.899	42.110	2242.3	6.965
350.	35.722	6.904	42.626	2416.4	6.965
375.	36.199	6.908	43.107	2590.5	6.966
400.	36.645	6.912	43.556	2764.7	6.967
425.	37.064	6.915	43.979	2938.9	6.968
450.	37.459	6.918	44.377	3113.1	6.969
475.	37.833	6.921	44.754	3287.3	6.971
500.	38.188	6.923	45.112	3461.6	6.972
550.	38.848	6.928	45.776	3810.4	6.978
600.	39.451	6.932	46.384	4159.4	6.986
650.	40.006	6.937	46.943	4509.0	6.998
700.	40.521	6.942	47.463	4859.3	7.015
750.	41.000	6.947	47.947	5210.6	7.036
800.	41.448	6.954	48.402	5563.0	7.062
850.	41.870	6.961	48.831	5916.9	7.093
900.	42.268	6.969	49.238	6272.4	7.128
950.	42.645	6.979	49.624	6629.7	7.167
1000.	43.004	6.989	49.993	6989.2	7.210
1050.	43.345	7.001	50.346	7350.8	7.255
1100.	43.671	7.013	50.684	7714.7	7.302
1150.	43.983	7.027	51.010	8081.0	7.351
1200.	44.282	7.042	51.324	8449.9	7.402
1250.	44.570	7.057	51.627	8821.2	7.452
1300.	44.847	7.073	51.920	9195.1	7.504
1350.	45.114	7.090	52.204	9571.6	7.555
1400.	45.373	7.108	52.480	9950.6	7.605
1450.	45.622	7.126	52.748	10332.1	7.656
1500.	45.864	7.144	53.008	10716.1	7.705
1550.	46.099	7.163	53.262	11102.6	7.754
1600.	46.326	7.182	53.509	11491.5	7.801
1650.	46.548	7.202	53.749	11882.7	7.847
1700.	46.763	7.221	53.984	12276.2	7.892
1750.	46.973	7.241	54.214	12671.9	7.936
1800.	47.177	7.261	54.438	13069.8	7.979
1850.	47.376	7.281	54.657	13469.8	8.020
1900.	47.571	7.301	54.871	13871.8	8.060
1950.	47.760	7.321	55.081	14275.8	8.099
2000.	47.946	7.341	55.287	14681.7	8.137
2050.	48.128	7.361	55.488	15089.4	8.173

This table is in units of calories, moles and °K.

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.049982
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.20913
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.049949

Table A-35 Thermodynamic Functions for HF (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	48.305	7.380	55.686	15499.0	8.208
2150.	48.479	7.400	55.879	15910.2	8.242
2200.	48.649	7.420	56.069	16323.2	8.275
2250.	48.816	7.439	56.255	16737.7	8.307
2300.	48.980	7.458	56.438	17153.8	8.338
2350.	49.141	7.477	56.618	17571.5	8.367
2400.	49.298	7.496	56.794	17990.6	8.396
2450.	49.453	7.515	56.968	18411.1	8.424
2500.	49.605	7.533	57.138	18832.9	8.451
2600.	49.901	7.569	57.471	19680.6	8.502
2700.	50.188	7.605	57.792	20533.3	8.551
2800.	50.465	7.640	58.104	21390.7	8.596
2900.	50.733	7.673	58.407	22252.4	8.639
3000.	50.994	7.706	58.700	23118.4	8.679
3100.	51.247	7.738	58.985	23988.2	8.718
3200.	51.493	7.769	59.263	24861.8	8.754
3300.	51.733	7.800	59.533	25738.9	8.788
3400.	51.966	7.829	59.796	26619.4	8.821
3500.	52.194	7.858	60.052	27503.1	8.852
3600.	52.415	7.886	60.302	28389.8	8.882
3700.	52.632	7.913	60.545	29279.5	8.911
3800.	52.843	7.940	60.783	30172.0	8.939
3900.	53.050	7.966	61.016	31067.2	8.965
4000.	53.252	7.991	61.243	31965.0	8.991
4100.	53.449	8.016	61.465	32865.3	9.015
4200.	53.643	8.040	61.683	33768.1	9.039
4300.	53.832	8.064	61.896	34673.2	9.062
4400.	54.018	8.086	62.105	35580.5	9.085
4500.	54.200	8.109	62.309	36490.1	9.107
4600.	54.378	8.131	62.509	37401.8	9.128
4700.	54.554	8.152	62.706	38315.7	9.149
4800.	54.725	8.173	62.899	39231.6	9.169
4900.	54.894	8.194	63.088	40149.4	9.189
5000.	55.060	8.214	63.274	41069.3	9.208
5100.	55.223	8.234	63.456	41991.0	9.227
5200.	55.383	8.253	63.636	42914.7	9.246
5300.	55.540	8.272	63.812	43840.2	9.264
5400.	55.695	8.290	63.985	44767.5	9.282
5500.	55.847	8.308	64.156	45696.6	9.300
5600.	55.997	8.326	64.323	46627.5	9.317
5700.	56.145	8.344	64.489	47560.1	9.335
5800.	56.290	8.361	64.651	48494.4	9.352
5900.	56.433	8.378	64.811	49430.4	9.369
6000.	56.574	8.395	64.969	50368.1	9.385
273.15	34.013	6.887	40.900	1881.2	6.963
298.15	34.616	6.893	41.510	2055.3	6.964

MOLECULAR WEIGHT 20.0072 MOLECULAR SYMMETRY 1.
BE 2.09548 E 01 ALPHAE 7.939 E-01 GAMMA 1.0330E-02 DE 2.149E-03
YEWE 7.92 E-01 XEWE 89.652 OMEGAE 4138.33
ELECTRONIC MULTIPLICITY 1.

Table A-36 Thermodynamic Functions for Cl_2 (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	33.373	6.951	40.325	347.6	6.956
75.	36.192	6.954	43.146	521.5	6.962
100.	38.193	6.960	45.153	696.0	7.001
125.	39.748	6.977	46.724	872.1	7.097
150.	41.022	7.008	48.031	1051.2	7.241
175.	42.106	7.053	49.159	1234.3	7.407
200.	43.051	7.108	50.159	1421.6	7.576
225.	43.892	7.169	51.061	1613.0	7.736
250.	44.651	7.233	51.884	1808.3	7.881
275.	45.343	7.298	52.641	2006.9	8.008
300.	45.981	7.362	53.343	2208.6	8.120
325.	46.573	7.424	53.997	2412.8	8.217
350.	47.125	7.484	54.609	2619.3	8.302
375.	47.643	7.541	55.184	2827.8	8.375
400.	48.132	7.595	55.727	3038.0	8.439
425.	48.594	7.646	56.240	3249.7	8.495
450.	49.032	7.695	56.727	3462.7	8.545
475.	49.449	7.741	57.190	3676.9	8.589
500.	49.848	7.784	57.632	3892.1	8.627
550.	50.593	7.864	58.457	4325.2	8.693
600.	51.281	7.935	59.216	4761.2	8.747
650.	51.918	8.000	59.918	5199.7	8.791
700.	52.513	8.057	60.571	5640.2	8.828
750.	53.071	8.110	61.181	6082.4	8.860
800.	53.596	8.158	61.754	6526.2	8.888
850.	54.092	8.201	62.293	6971.2	8.913
900.	54.562	8.242	62.803	7417.4	8.935
950.	55.008	8.279	63.287	7864.7	8.955
1000.	55.434	8.313	63.747	8312.9	8.973
1050.	55.840	8.345	64.185	8762.0	8.990
1100.	56.229	8.374	64.604	9211.9	9.006
1150.	56.602	8.402	65.004	9662.5	9.021
1200.	56.960	8.428	65.389	10113.9	9.035
1250.	57.305	8.453	65.758	10566.0	9.048
1300.	57.637	8.476	66.113	11018.7	9.061
1350.	57.957	8.498	66.455	11472.1	9.073
1400.	58.267	8.519	66.785	11926.0	9.085
1450.	58.566	8.538	67.104	12380.6	9.097
1500.	58.856	8.557	67.413	12835.8	9.108
1550.	59.136	8.575	67.712	13291.5	9.120
1600.	59.409	8.592	68.001	13747.7	9.131
1650.	59.674	8.609	68.282	14204.5	9.142
1700.	59.931	8.625	68.555	14661.9	9.152
1750.	60.181	8.640	68.821	15119.7	9.163
1800.	60.425	8.655	69.079	15578.1	9.173
1850.	60.662	8.669	69.331	16037.1	9.184
1900.	60.893	8.682	69.576	16496.5	9.194
1950.	61.119	8.696	69.815	16956.5	9.204
2000.	61.339	8.708	70.048	17416.9	9.215
2050.	61.555	8.721	70.276	17877.9	9.225

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.014102
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.059003
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.014093

Table A-36 Thermodynamic Functions for Cl_2 (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	61.765	8.733	70.498	18339.4	9.235
2150.	61.971	8.745	70.715	18801.4	9.245
2200.	62.172	8.756	70.928	19264.0	9.256
2250.	62.369	8.768	71.136	19727.0	9.266
2300.	62.561	8.778	71.340	20190.5	9.276
2350.	62.750	8.789	71.540	20654.6	9.286
2400.	62.935	8.800	71.735	21119.1	9.296
2450.	63.117	8.810	71.927	21584.2	9.307
2500.	63.295	8.820	72.115	22049.8	9.317
2600.	63.641	8.839	72.481	22982.6	9.338
2700.	63.975	8.858	72.834	23917.4	9.359
2800.	64.298	8.877	73.174	24854.3	9.380
2900.	64.610	8.894	73.504	25793.4	9.401
3000.	64.911	8.912	73.823	26734.6	9.423
3100.	65.204	8.928	74.132	27677.9	9.444
3200.	65.488	8.945	74.433	28623.4	9.466
3300.	65.763	8.961	74.724	29571.2	9.488
3400.	66.031	8.977	75.008	30521.1	9.511
3500.	66.291	8.992	75.284	31473.3	9.533
3600.	66.545	9.008	75.553	32427.8	9.556
3700.	66.792	9.023	75.815	33384.6	9.579
3800.	67.033	9.038	76.071	34343.7	9.603
3900.	67.268	9.053	76.320	35305.1	9.626
4000.	67.497	9.067	76.564	36269.0	9.650
4100.	67.721	9.082	76.803	37235.2	9.675
4200.	67.940	9.096	77.036	38203.9	9.699
4300.	68.154	9.110	77.265	39175.0	9.724
4400.	68.364	9.125	77.489	40148.6	9.749
4500.	68.569	9.139	77.708	41124.8	9.774
4600.	68.770	9.153	77.923	42103.4	9.800
4700.	68.967	9.167	78.134	43084.7	9.825
4800.	69.160	9.181	78.341	44068.5	9.851
4900.	69.350	9.195	78.545	45055.0	9.878
5000.	69.536	9.209	78.745	46044.1	9.905
5100.	69.718	9.223	78.941	47035.9	9.931
5200.	69.897	9.237	79.134	48030.4	9.959
5300.	70.073	9.250	79.324	49027.6	9.986
5400.	70.247	9.264	79.511	50027.6	10.014
5500.	70.417	9.278	79.695	51030.4	10.042
5600.	70.584	9.292	79.876	52036.1	10.070
5700.	70.749	9.306	80.055	53044.6	10.099
5800.	70.911	9.320	80.231	54055.9	10.128
5900.	71.070	9.334	80.404	55070.2	10.157
6000.	71.227	9.348	80.575	56087.4	10.187
273.15	45.294	7.293	52.587	1992.1	7.999
298.15	45.935	7.357	53.292	2193.6	8.112

MOLECULAR WEIGHT 70.914 MOLECULAR SYMMETRY 2.
BE 2.404 E-01 ALPHAE 1.66 E-03 GAMMA 0. DE 1.766E-07
YEWE 0. XEWE 3.94 OMEGAE 561.0
ELECTRONIC MULTIPLICITY 1.

Table A-37 Thermodynamic Functions for HCl (gas)

T °K	$\frac{-(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	25.465	6.753	32.218	337.7	6.961
75.	28.218	6.822	35.040	511.7	6.959
100.	30.185	6.856	37.042	685.6	6.959
125.	31.718	6.877	38.595	859.6	6.959
150.	32.973	6.891	39.863	1033.6	6.960
175.	34.036	6.901	40.936	1207.6	6.960
200.	34.958	6.908	41.866	1381.6	6.961
225.	35.772	6.914	42.686	1555.7	6.962
250.	36.500	6.919	43.419	1729.7	6.962
275.	37.160	6.923	44.083	1903.8	6.963
300.	37.763	6.926	44.689	2077.9	6.964
325.	38.317	6.929	45.246	2252.0	6.965
350.	38.831	6.932	45.762	2426.1	6.967
375.	39.309	6.934	46.243	2600.3	6.969
400.	39.757	6.936	46.693	2774.6	6.973
425.	40.177	6.939	47.116	2949.0	6.978
450.	40.574	6.941	47.515	3123.5	6.985
475.	40.949	6.944	47.893	3298.2	6.993
500.	41.305	6.946	48.252	3473.2	7.004
550.	41.968	6.953	48.921	3824.0	7.032
600.	42.573	6.961	49.534	4176.5	7.068
650.	43.131	6.971	50.101	4531.0	7.114
700.	43.648	6.983	50.631	4888.0	7.167
750.	44.130	6.997	51.127	5247.8	7.225
800.	44.582	7.013	51.595	5610.6	7.289
850.	45.008	7.031	52.039	5976.7	7.355
900.	45.410	7.051	52.461	6346.1	7.423
950.	45.792	7.073	52.865	6719.0	7.492
1000.	46.155	7.095	53.251	7095.3	7.560
1050.	46.502	7.119	53.621	7475.0	7.628
1100.	46.834	7.144	53.977	7858.0	7.694
1150.	47.152	7.169	54.321	8244.3	7.758
1200.	47.458	7.195	54.652	8633.8	7.821
1250.	47.752	7.221	54.973	9026.4	7.881
1300.	48.036	7.248	55.283	9421.9	7.938
1350.	48.310	7.274	55.584	9820.2	7.994
1400.	48.575	7.301	55.875	10221.2	8.046
1450.	48.831	7.327	56.159	10624.8	8.097
1500.	49.080	7.354	56.434	11030.8	8.145
1550.	49.322	7.380	56.702	11439.2	8.191
1600.	49.556	7.406	56.963	11849.9	8.235
1650.	49.785	7.432	57.217	12262.7	8.276
1700.	50.007	7.457	57.464	12677.5	8.316
1750.	50.223	7.482	57.706	13094.3	8.354
1800.	50.435	7.507	57.942	13512.9	8.390
1850.	50.641	7.532	58.172	13933.3	8.425
1900.	50.842	7.555	58.397	14355.4	8.458
1950.	51.038	7.579	58.617	14779.0	8.489
2000.	51.231	7.602	58.833	15204.3	8.519
2050.	51.419	7.625	59.043	15631.0	8.548

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.027424
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.11474
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.027406

Table A-37 Thermodynamic Functions for HCl (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	51.603	7.647	59.250	16059.1	8.576
2150.	51.783	7.669	59.452	16488.5	8.602
2200.	51.959	7.691	59.650	16919.3	8.628
2250.	52.132	7.712	59.844	17351.3	8.652
2300.	52.302	7.732	60.034	17784.5	8.676
2350.	52.469	7.753	60.221	18218.9	8.698
2400.	52.632	7.773	60.405	18654.3	8.720
2450.	52.792	7.792	60.585	19090.8	8.741
2500.	52.950	7.811	60.761	19528.4	8.761
2600.	53.257	7.849	61.106	20406.5	8.800
2700.	53.554	7.885	61.439	21288.3	8.836
2800.	53.841	7.919	61.761	22173.5	8.870
2900.	54.120	7.952	62.072	23062.1	8.902
3000.	54.390	7.985	62.375	23953.8	8.932
3100.	54.652	8.016	62.668	24848.4	8.961
3200.	54.907	8.046	62.953	25745.9	8.988
3300.	55.155	8.075	63.230	26646.0	9.014
3400.	55.397	8.103	63.499	27548.7	9.039
3500.	55.632	8.130	63.762	28453.9	9.064
3600.	55.862	8.156	64.017	29361.4	9.087
3700.	56.085	8.181	64.267	30271.2	9.110
3800.	56.304	8.206	64.510	31183.3	9.132
3900.	56.517	8.230	64.747	32097.5	9.153
4000.	56.726	8.253	64.979	33013.9	9.174
4100.	56.930	8.276	65.206	33932.3	9.194
4200.	57.130	8.298	65.428	34852.7	9.214
4300.	57.325	8.320	65.645	35775.0	9.233
4400.	57.517	8.341	65.858	36699.3	9.252
4500.	57.704	8.361	66.066	37625.4	9.271
4600.	57.888	8.381	66.270	38553.5	9.289
4700.	58.069	8.401	66.470	39483.3	9.308
4800.	58.246	8.420	66.666	40415.0	9.326
4900.	58.420	8.438	66.858	41348.4	9.343
5000.	58.590	8.457	67.047	42283.6	9.361
5100.	58.758	8.475	67.233	43220.6	9.378
5200.	58.923	8.492	67.415	44159.3	9.395
5300.	59.085	8.509	67.594	45099.6	9.412
5400.	59.244	8.526	67.770	46041.7	9.429
5500.	59.401	8.543	67.943	46985.5	9.446
5600.	59.555	8.559	68.114	47931.0	9.463
5700.	59.706	8.575	68.281	48878.2	9.480
5800.	59.856	8.591	68.446	49827.0	9.496
5900.	60.003	8.606	68.609	50777.4	9.513
6000.	60.147	8.622	68.769	51729.6	9.530
273.15	37.113	6.923	44.036	1890.9	6.963
298.15	37.720	6.926	44.646	2065.0	6.964

MOLECULAR WEIGHT 36.465 MOLECULAR SYMMETRY 1.
BE 1.05896 E 01 ALPHAE 2.993 E-01 GAMMA 0. DE 5.33 E-04
YEWE 5. E-02 XEWE 52.23 OMEGAE 2989.98
ELECTRONIC MULTIPLICITY 1.

Table A-38 Thermodynamic Functions for ClO (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	34.597	6.944	41.541	347.2	6.956
75.	37.413	6.948	44.361	521.1	6.957
100.	39.413	6.950	46.363	695.0	6.959
125.	40.964	6.953	47.916	869.1	6.968
150.	42.232	6.957	49.189	1043.6	6.996
175.	43.305	6.966	50.271	1219.1	7.048
200.	44.236	6.981	51.217	1396.2	7.124
225.	45.059	7.002	52.061	1575.4	7.218
250.	45.798	7.029	52.827	1757.2	7.324
275.	46.470	7.061	53.530	1941.7	7.434
300.	47.086	7.096	54.182	2128.9	7.545
325.	47.655	7.135	54.790	2318.9	7.653
350.	48.185	7.176	55.361	2511.5	7.755
375.	48.682	7.218	55.899	2706.6	7.851
400.	49.149	7.260	56.409	2904.0	7.940
425.	49.590	7.302	56.893	3103.5	8.021
450.	50.009	7.344	57.353	3305.0	8.096
475.	50.407	7.386	57.793	3508.3	8.165
500.	50.787	7.426	58.213	3713.2	8.228
550.	51.499	7.504	59.003	4127.4	8.337
600.	52.155	7.578	59.732	4546.6	8.430
650.	52.764	7.646	60.410	4970.1	8.507
700.	53.333	7.710	61.043	5397.2	8.573
750.	53.867	7.770	61.637	5827.3	8.630
800.	54.370	7.825	62.195	6260.1	8.679
850.	54.846	7.877	62.723	6695.1	8.722
900.	55.298	7.925	63.222	7132.2	8.760
950.	55.727	7.969	63.697	7571.0	8.793
1000.	56.137	8.011	64.149	8011.5	8.823
1050.	56.529	8.051	64.580	8453.3	8.851
1100.	56.905	8.088	64.992	8896.5	8.875
1150.	57.265	8.122	65.387	9340.8	8.898
1200.	57.611	8.155	65.766	9786.2	8.919
1250.	57.945	8.186	66.131	10232.6	8.938
1300.	58.266	8.215	66.482	10680.0	8.956
1350.	58.577	8.243	66.820	11128.2	8.973
1400.	58.877	8.269	67.147	11577.3	8.989
1450.	59.168	8.295	67.462	12027.1	9.004
1500.	59.450	8.318	67.768	12477.7	9.019
1550.	59.723	8.341	68.064	12928.9	9.032
1600.	59.988	8.363	68.351	13380.9	9.046
1650.	60.245	8.384	68.629	13833.5	9.058
1700.	60.496	8.404	68.900	14286.7	9.071
1750.	60.740	8.423	69.163	14740.6	9.083
1800.	60.978	8.442	69.419	15195.0	9.095
1850.	61.209	8.459	69.669	15650.0	9.106
1900.	61.435	8.477	69.912	16105.6	9.117
1950.	61.655	8.493	70.148	16561.7	9.128
2000.	61.871	8.509	70.380	17018.4	9.139
2050.	62.081	8.525	70.605	17475.6	9.149

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.019434
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.081312
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.019421

Table A-38 Thermodynamic Functions for ClO (gas) - Continued

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	62.286	8.540	70.826	17933.3	9.160
2150.	62.488	8.554	71.042	18391.5	9.170
2200.	62.684	8.568	71.253	18850.3	9.180
2250.	62.877	8.582	71.459	19309.6	9.190
2300.	63.066	8.595	71.661	19769.3	9.200
2350.	63.251	8.608	71.859	20229.6	9.210
2400.	63.432	8.621	72.053	20690.3	9.220
2450.	63.610	8.633	72.243	21151.5	9.229
2500.	63.785	8.645	72.430	21613.2	9.239
2600.	64.124	8.669	72.793	22538.1	9.258
2700.	64.452	8.691	73.142	23464.9	9.278
2800.	64.768	8.712	73.480	24393.6	9.297
2900.	65.074	8.732	73.807	25324.2	9.316
3000.	65.371	8.752	74.123	26256.8	9.335
3100.	65.658	8.771	74.429	27191.2	9.354
3200.	65.937	8.790	74.727	28127.5	9.373
3300.	66.207	8.808	75.015	29065.8	9.392
3400.	66.471	8.825	75.296	30006.0	9.411
3500.	66.727	8.842	75.569	30948.1	9.431
3600.	66.976	8.859	75.835	31892.2	9.450
3700.	67.219	8.875	76.094	32838.2	9.470
3800.	67.456	8.891	76.347	33786.1	9.490
3900.	67.687	8.907	76.594	34736.1	9.510
4000.	67.913	8.922	76.835	35688.1	9.530
4100.	68.133	8.937	77.070	36642.0	9.550
4200.	68.349	8.952	77.301	37598.0	9.570
4300.	68.560	8.967	77.526	38556.1	9.591
4400.	68.766	8.981	77.747	39516.1	9.611
4500.	68.968	8.995	77.963	40478.3	9.632
4600.	69.166	9.009	78.175	41442.6	9.653
4700.	69.360	9.023	78.383	42408.9	9.674
4800.	69.550	9.037	78.587	43377.4	9.696
4900.	69.736	9.051	78.787	44348.1	9.717
5000.	69.919	9.064	78.983	45320.9	9.739
5100.	70.099	9.078	79.176	46295.9	9.761
5200.	70.275	9.091	79.366	47273.1	9.783
5300.	70.449	9.104	79.553	48252.5	9.805
5400.	70.619	9.117	79.736	49234.1	9.828
5500.	70.786	9.131	79.917	50218.1	9.850
5600.	70.951	9.144	80.094	51204.2	9.873
5700.	71.113	9.157	80.269	52192.7	9.896
5800.	71.272	9.170	80.442	53183.5	9.920
5900.	71.429	9.182	80.612	54176.7	9.943
6000.	71.583	9.195	80.779	55172.2	9.967
273.15	46.422	7.058	53.480	1927.9	7.426
298.15	47.042	7.094	54.135	2115.0	7.537

MOLECULAR WEIGHT 51.457 MOLECULAR SYMMETRY 1.
BE 6.46 E-01 ALPHAE 7. E-03 GAMMA 0. DE 1.43 E-06
YEWE 0. XEWE 7.5 OMEGAE 868.
ELECTRONIC MULTIPLICITY 4.

Table A-39 Thermodynamic Functions for ClF (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	32.460	6.946	39.406	347.3	6.956
75.	35.277	6.950	42.227	521.2	6.957
100.	37.277	6.952	44.229	695.2	6.961
125.	38.829	6.955	45.784	869.4	6.980
150.	40.097	6.963	47.060	1044.4	7.025
175.	41.171	6.977	48.148	1220.9	7.101
200.	42.104	6.998	49.102	1399.6	7.201
225.	42.930	7.027	49.957	1581.1	7.316
250.	43.672	7.062	50.734	1765.5	7.438
275.	44.347	7.102	51.449	1953.0	7.560
300.	44.967	7.145	52.112	2143.4	7.677
325.	45.541	7.190	52.731	2336.7	7.787
350.	46.075	7.236	53.312	2532.7	7.889
375.	46.576	7.283	53.859	2731.1	7.983
400.	47.048	7.329	54.377	2931.8	8.068
425.	47.493	7.375	54.868	3134.4	8.145
450.	47.916	7.420	55.336	3339.0	8.215
475.	48.318	7.463	55.782	3545.1	8.278
500.	48.702	7.506	56.208	3752.8	8.335
550.	49.422	7.586	57.007	4172.1	8.434
600.	50.085	7.660	57.745	4595.9	8.516
650.	50.701	7.728	58.429	5023.5	8.584
700.	51.276	7.792	59.067	5454.2	8.642
750.	51.815	7.850	59.665	5887.5	8.692
800.	52.324	7.904	60.228	6323.2	8.734
850.	52.804	7.954	60.758	6760.9	8.771
900.	53.260	8.000	61.261	7200.3	8.804
950.	53.694	8.043	61.737	7641.2	8.833
1000.	54.108	8.084	62.191	8083.5	8.859
1050.	54.503	8.121	62.624	8527.0	8.882
1100.	54.882	8.156	63.038	8971.7	8.904
1150.	55.245	8.189	63.434	9417.4	8.924
1200.	55.594	8.220	63.814	9864.0	8.942
1250.	55.930	8.249	64.179	10311.6	8.959
1300.	56.254	8.277	64.531	10759.9	8.974
1350.	56.567	8.303	64.870	11209.0	8.989
1400.	56.870	8.328	65.197	11658.8	9.003
1450.	57.162	8.351	65.513	12109.3	9.017
1500.	57.446	8.374	65.819	12560.5	9.030
1550.	57.721	8.395	66.116	13012.3	9.042
1600.	57.987	8.415	66.403	13464.7	9.054
1650.	58.247	8.435	66.682	13917.7	9.065
1700.	58.499	8.454	66.952	14371.2	9.077
1750.	58.744	8.472	67.216	14825.3	9.087
1800.	58.983	8.489	67.472	15280.0	9.098
1850.	59.216	8.505	67.721	15735.1	9.108
1900.	59.443	8.521	67.964	16190.8	9.118
1950.	59.664	8.537	68.201	16646.9	9.128
2000.	59.881	8.552	68.433	17103.6	9.138
2050.	60.092	8.566	68.658	17560.7	9.148

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.018363
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.076831
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.018351

Table A-39 Thermodynamic Functions for ClF (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	60.299	8.580	68.879	18018.4	9.157
2150.	60.501	8.594	69.094	18476.5	9.167
2200.	60.698	8.607	69.305	18935.0	9.176
2250.	60.892	8.620	69.512	19394.1	9.185
2300.	61.082	8.632	69.714	19853.6	9.194
2350.	61.267	8.644	69.911	20313.5	9.204
2400.	61.450	8.656	70.105	20773.9	9.213
2450.	61.628	8.667	70.295	21234.8	9.222
2500.	61.803	8.678	70.482	21696.1	9.231
2600.	62.144	8.700	70.844	22620.1	9.249
2700.	62.473	8.721	71.194	23545.8	9.266
2800.	62.790	8.740	71.531	24473.3	9.284
2900.	63.097	8.760	71.857	25402.7	9.302
3000.	63.395	8.778	72.173	26333.8	9.320
3100.	63.683	8.796	72.478	27266.7	9.338
3200.	63.962	8.813	72.775	28201.3	9.356
3300.	64.234	8.830	73.063	29137.8	9.374
3400.	64.498	8.846	73.344	30076.1	9.392
3500.	64.754	8.862	73.616	31016.2	9.410
3600.	65.004	8.877	73.881	31958.1	9.428
3700.	65.248	8.892	74.140	32901.9	9.447
3800.	65.485	8.907	74.392	33847.5	9.466
3900.	65.716	8.922	74.638	34795.0	9.484
4000.	65.943	8.936	74.879	35744.4	9.503
4100.	66.163	8.950	75.113	36695.7	9.522
4200.	66.379	8.964	75.343	37648.8	9.541
4300.	66.590	8.978	75.568	38603.9	9.561
4400.	66.797	8.991	75.788	39561.0	9.580
4500.	66.999	9.004	76.003	40520.0	9.600
4600.	67.197	9.018	76.215	41481.0	9.620
4700.	67.391	9.031	76.422	42443.9	9.640
4800.	67.581	9.044	76.625	43408.9	9.660
4900.	67.768	9.056	76.824	44375.9	9.680
5000.	67.951	9.069	77.020	45345.0	9.701
5100.	68.131	9.082	77.212	46316.1	9.721
5200.	68.307	9.094	77.401	47289.3	9.742
5300.	68.481	9.107	77.587	48264.6	9.763
5400.	68.651	9.119	77.770	49242.0	9.785
5500.	68.818	9.131	77.950	50221.5	9.806
5600.	68.983	9.143	78.126	51203.2	9.828
5700.	69.145	9.156	78.301	52187.1	9.850
5800.	69.304	9.168	78.472	53173.1	9.872
5900.	69.461	9.180	78.641	54161.4	9.894
6000.	69.616	9.192	78.808	55151.8	9.916
273.15	44.299	7.099	51.398	1939.0	7.551
298.15	44.923	7.141	52.064	2129.2	7.668

MOLECULAR WEIGHT 54.457 MOLECULAR SYMMETRY 1.
BE 5.14012 E-01 ALPHAE 4.3272 E-03 GAMMA 0. DE 8.83 E-07
YEWE 0. XEWE 6.20 OMEGAE 784.43
ELECTRONIC MULTIPLICITY 1.

Table A-40 Thermodynamic Functions for B_2 (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	28.793	6.933	35.726	346.6	6.957
75.	31.606	6.941	38.546	520.6	6.957
100.	33.603	6.945	40.548	694.5	6.958
125.	35.153	6.948	42.101	868.5	6.960
150.	36.420	6.950	43.370	1042.6	6.968
175.	37.492	6.954	44.446	1217.0	6.988
200.	38.421	6.960	45.381	1392.1	7.023
225.	39.241	6.970	46.211	1568.3	7.076
250.	39.976	6.984	46.960	1746.0	7.143
275.	40.643	7.002	47.644	1925.5	7.221
300.	41.253	7.024	48.276	2107.1	7.308
325.	41.816	7.049	48.865	2290.9	7.398
350.	42.339	7.077	49.417	2477.0	7.490
375.	42.829	7.108	49.936	2665.4	7.580
400.	43.288	7.140	50.428	2856.0	7.668
425.	43.722	7.174	50.896	3048.8	7.752
450.	44.133	7.208	51.341	3243.6	7.832
475.	44.524	7.243	51.767	3440.3	7.907
500.	44.896	7.278	52.174	3638.9	7.977
550.	45.593	7.347	52.940	4041.0	8.104
600.	46.235	7.415	53.650	4449.0	8.213
650.	46.831	7.480	54.312	4862.1	8.308
700.	47.388	7.542	54.930	5279.6	8.390
750.	47.910	7.601	55.512	5700.9	8.462
800.	48.403	7.657	56.060	6125.6	8.524
850.	48.869	7.710	56.578	6553.2	8.579
900.	49.311	7.759	57.070	6983.4	8.627
950.	49.732	7.806	57.538	7415.8	8.670
1000.	50.133	7.850	57.983	7850.3	8.708
1050.	50.517	7.892	58.409	8286.6	8.743
1100.	50.885	7.931	58.817	8724.5	8.774
1150.	51.239	7.969	59.207	9164.0	8.802
1200.	51.578	8.004	59.582	9604.7	8.828
1250.	51.906	8.037	59.943	10046.8	8.852
1300.	52.222	8.069	60.291	10489.9	8.874
1350.	52.527	8.099	60.626	10934.2	8.895
1400.	52.822	8.128	60.950	11379.4	8.914
1450.	53.108	8.156	61.263	11825.6	8.932
1500.	53.385	8.182	61.566	12272.6	8.949
1550.	53.653	8.207	61.860	12720.4	8.965
1600.	53.914	8.231	62.145	13169.1	8.980
1650.	54.168	8.254	62.421	13618.4	8.995
1700.	54.415	8.276	62.690	14068.5	9.008
1750.	54.655	8.297	62.951	14519.3	9.022
1800.	54.889	8.317	63.206	14970.7	9.035
1850.	55.117	8.337	63.453	15422.7	9.047
1900.	55.339	8.355	63.695	15875.4	9.059
1950.	55.557	8.374	63.930	16328.6	9.070
2000.	55.769	8.391	64.160	16782.4	9.082
2050.	55.976	8.408	64.385	17236.7	9.093

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.046211
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.19335
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.046181

Table A-40 Thermodynamic Functions for B_2 (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ-H^\circ_0)/T$	S°	$H^\circ-H^\circ_0$	C°_p
2100.	56.179	8.425	64.604	17691.6	9.103
2150.	56.378	8.440	64.818	18147.1	9.114
2200.	56.572	8.456	65.028	18603.0	9.124
2250.	56.762	8.471	65.233	19059.5	9.134
2300.	56.948	8.485	65.434	19516.4	9.144
2350.	57.131	8.500	65.631	19973.9	9.154
2400.	57.310	8.513	65.823	20431.8	9.163
2450.	57.486	8.527	66.012	20890.2	9.173
2500.	57.658	8.540	66.198	21349.1	9.182
2600.	57.994	8.565	66.558	22268.3	9.201
2700.	58.317	8.589	66.906	23189.3	9.219
2800.	58.630	8.611	67.241	24112.1	9.237
2900.	58.933	8.633	67.566	25036.7	9.255
3000.	59.226	8.654	67.880	25963.0	9.272
3100.	59.510	8.675	68.184	26891.1	9.290
3200.	59.785	8.694	68.480	27820.9	9.307
3300.	60.053	8.713	68.766	28752.5	9.324
3400.	60.314	8.731	69.045	29685.8	9.342
3500.	60.567	8.749	69.316	30620.8	9.359
3600.	60.814	8.766	69.580	31557.6	9.376
3700.	61.054	8.783	69.837	32496.0	9.393
3800.	61.289	8.799	70.088	33436.2	9.411
3900.	61.517	8.815	70.332	34378.2	9.428
4000.	61.741	8.830	70.571	35321.9	9.445
4100.	61.959	8.846	70.805	36267.3	9.463
4200.	62.172	8.861	71.033	37214.5	9.481
4300.	62.381	8.875	71.256	38163.4	9.498
4400.	62.585	8.890	71.475	39114.1	9.516
4500.	62.785	8.904	71.689	40066.6	9.534
4600.	62.981	8.918	71.898	41020.8	9.552
4700.	63.173	8.931	72.104	41976.9	9.570
4800.	63.361	8.945	72.306	42934.8	9.588
4900.	63.546	8.958	72.504	43894.5	9.606
5000.	63.727	8.971	72.698	44856.0	9.624
5100.	63.904	8.984	72.889	45819.4	9.643
5200.	64.079	8.997	73.076	46784.6	9.662
5300.	64.251	9.010	73.260	47751.7	9.680
5400.	64.419	9.022	73.441	48720.6	9.699
5500.	64.585	9.035	73.620	49691.5	9.718
5600.	64.748	9.047	73.795	50664.3	9.737
5700.	64.908	9.059	73.967	51639.0	9.756
5800.	65.066	9.072	74.137	52615.6	9.776
5900.	65.221	9.084	74.304	53594.1	9.795
6000.	65.374	9.096	74.469	54574.7	9.815
273.15	40.595	7.000	47.596	1912.2	7.215
298.15	41.209	7.022	48.231	2093.6	7.301

MOLECULAR WEIGHT 21.64 MOLECULAR SYMMETRY 2.
BE 1.233 ALPHAE 1.4 E-02 GAMMA 0. DE 6.62 E-06
YEWE 0. XEWE 9.56 OMEGAE 1060.5
ELECTRONIC MULTIPLICITY 3.

Table A-41 Thermodynamic Functions for BO (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	29.262	6.921	36.184	346.1	6.956
75.	32.071	6.933	39.004	520.0	6.956
100.	34.067	6.939	41.006	693.9	6.957
125.	35.615	6.942	42.558	867.8	6.957
150.	36.881	6.945	43.826	1041.7	6.957
175.	37.952	6.947	44.899	1215.7	6.957
200.	38.880	6.948	45.828	1389.6	6.958
225.	39.698	6.949	46.647	1563.6	6.960
250.	40.430	6.950	47.381	1737.6	6.963
275.	41.093	6.952	48.045	1911.8	6.969
300.	41.698	6.954	48.652	2086.1	6.979
325.	42.255	6.956	49.211	2260.8	6.994
350.	42.770	6.960	49.730	2435.8	7.014
375.	43.251	6.964	50.215	2611.5	7.038
400.	43.700	6.969	50.670	2787.8	7.069
425.	44.123	6.976	51.099	2964.9	7.103
450.	44.522	6.984	51.506	3143.0	7.142
475.	44.900	6.994	51.894	3322.1	7.185
500.	45.259	7.005	52.263	3502.3	7.230
550.	45.928	7.029	52.957	3866.2	7.327
600.	46.540	7.058	53.599	4235.1	7.428
650.	47.107	7.091	54.197	4609.0	7.529
700.	47.633	7.126	54.759	4987.9	7.627
750.	48.126	7.162	55.288	5371.7	7.722
800.	48.590	7.200	55.790	5760.0	7.811
850.	49.027	7.238	56.266	6152.7	7.894
900.	49.442	7.277	56.719	6549.3	7.972
950.	49.837	7.315	57.152	6949.7	8.043
1000.	50.213	7.354	57.566	7353.6	8.110
1050.	50.572	7.391	57.964	7760.6	8.170
1100.	50.917	7.428	58.345	8170.5	8.227
1150.	51.248	7.464	58.712	8583.2	8.278
1200.	51.567	7.499	59.065	8998.3	8.326
1250.	51.873	7.533	59.406	9415.7	8.370
1300.	52.169	7.566	59.735	9835.2	8.410
1350.	52.456	7.598	60.053	10256.6	8.448
1400.	52.732	7.629	60.361	10679.9	8.482
1450.	53.001	7.658	60.659	11104.8	8.514
1500.	53.261	7.688	60.948	11531.3	8.544
1550.	53.513	7.716	61.229	11959.2	8.572
1600.	53.759	7.743	61.501	12388.4	8.597
1650.	53.997	7.769	61.766	12818.9	8.621
1700.	54.230	7.794	62.024	13250.5	8.644
1750.	54.456	7.819	62.275	13683.3	8.665
1800.	54.677	7.843	62.519	14117.0	8.685
1850.	54.892	7.866	62.758	14551.7	8.703
1900.	55.102	7.888	62.990	14987.3	8.721
1950.	55.307	7.910	63.217	15423.8	8.737
2000.	55.508	7.931	63.438	15861.0	8.753
2050.	55.704	7.951	63.654	16299.1	8.768

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.037286
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.15600
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.037262

Table A-41 Thermodynamic Functions for BO (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	55.895	7.970	63.866	16737.8	8.782
2150.	56.083	7.989	64.073	17177.2	8.795
2200.	56.267	8.008	64.275	17617.3	8.808
2250.	56.447	8.026	64.473	18058.0	8.820
2300.	56.624	8.043	64.667	18499.2	8.831
2350.	56.797	8.060	64.857	18941.1	8.842
2400.	56.967	8.076	65.043	19383.4	8.852
2450.	57.134	8.092	65.226	19826.3	8.862
2500.	57.297	8.108	65.405	20269.7	8.872
2600.	57.616	8.138	65.753	21157.8	8.890
2700.	57.923	8.166	66.089	22047.7	8.907
2800.	58.221	8.193	66.413	22939.2	8.923
2900.	58.509	8.218	66.727	23832.2	8.937
3000.	58.788	8.242	67.030	24726.6	8.951
3100.	59.058	8.265	67.324	25622.4	8.964
3200.	59.321	8.287	67.609	26519.5	8.977
3300.	59.577	8.308	67.885	27417.7	8.988
3400.	59.825	8.329	68.153	28317.1	9.000
3500.	60.067	8.348	68.414	29217.6	9.010
3600.	60.302	8.366	68.668	30119.2	9.021
3700.	60.532	8.384	68.916	31021.8	9.031
3800.	60.755	8.401	69.157	31925.3	9.040
3900.	60.974	8.418	69.392	32829.8	9.050
4000.	61.187	8.434	69.621	33735.2	9.059
4100.	61.396	8.449	69.845	34641.6	9.068
4200.	61.599	8.464	70.063	35548.8	9.076
4300.	61.799	8.478	70.277	36456.8	9.085
4400.	61.994	8.492	70.486	37365.7	9.093
4500.	62.185	8.506	70.690	38275.4	9.101
4600.	62.372	8.519	70.890	39185.9	9.109
4700.	62.555	8.531	71.086	40097.1	9.117
4800.	62.735	8.544	71.278	41009.2	9.124
4900.	62.911	8.556	71.467	41922.0	9.132
5000.	63.084	8.567	71.651	42835.6	9.139
5100.	63.254	8.578	71.832	43749.9	9.147
5200.	63.421	8.589	72.010	44664.9	9.154
5300.	63.584	8.600	72.184	45580.7	9.161
5400.	63.745	8.611	72.356	46497.2	9.169
5500.	63.903	8.621	72.524	47414.4	9.176
5600.	64.059	8.631	72.689	48332.4	9.183
5700.	64.212	8.641	72.852	49251.0	9.190
5800.	64.362	8.650	73.012	50170.3	9.197
5900.	64.510	8.659	73.169	51090.4	9.204
6000.	64.655	8.669	73.324	52011.1	9.211
273.15	41.046	6.952	47.998	1898.9	6.969
298.15	41.655	6.954	48.608	2073.2	6.978

MOLECULAR WEIGHT 26.82 MOLECULAR SYMMETRY 1.
BE 1.7986 ALPHAE 1.648 E-02 GAMMA 0. DE 6.48 E-06
YEWE 0. XEWE 11.89 OMEGAE 1895.1
ELECTRONIC MULTIPLICITY 2.

Table A-42 Thermodynamic Functions for BH (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	21.888	6.726	28.614	336.3	6.963
75.	24.632	6.805	31.437	510.4	6.961
100.	26.596	6.844	33.440	684.4	6.961
125.	28.126	6.867	34.993	858.4	6.962
150.	29.379	6.883	36.262	1032.5	6.963
175.	30.441	6.895	37.336	1206.6	6.964
200.	31.362	6.903	38.266	1380.7	6.965
225.	32.176	6.910	39.086	1554.8	6.967
250.	32.904	6.916	39.820	1729.0	6.968
275.	33.564	6.921	40.485	1903.3	6.971
300.	34.166	6.925	41.091	2077.6	6.974
325.	34.721	6.929	41.650	2252.0	6.980
350.	35.234	6.933	42.167	2426.6	6.988
375.	35.713	6.937	42.650	2601.4	6.999
400.	36.161	6.941	43.102	2776.6	7.014
425.	36.581	6.946	43.528	2952.1	7.032
450.	36.979	6.952	43.930	3128.2	7.053
475.	37.355	6.958	44.312	3304.8	7.079
500.	37.712	6.964	44.676	3482.1	7.108
550.	38.376	6.980	45.356	3839.2	7.174
600.	38.984	7.000	45.984	4199.8	7.251
650.	39.546	7.022	46.568	4564.4	7.334
700.	40.067	7.048	47.114	4933.3	7.422
750.	40.554	7.075	47.629	5306.6	7.511
800.	41.012	7.105	48.117	5684.3	7.599
850.	41.443	7.137	48.580	6066.5	7.686
900.	41.852	7.170	49.022	6452.9	7.770
950.	42.241	7.204	49.444	6843.4	7.851
1000.	42.611	7.238	49.849	7238.0	7.929
1050.	42.965	7.273	50.238	7636.2	8.002
1100.	43.304	7.307	50.612	8038.1	8.072
1150.	43.630	7.342	50.972	8443.3	8.137
1200.	43.943	7.376	51.319	8851.8	8.200
1250.	44.245	7.411	51.655	9263.2	8.258
1300.	44.536	7.444	51.980	9677.5	8.313
1350.	44.818	7.477	52.295	10094.5	8.366
1400.	45.090	7.510	52.600	10514.0	8.415
1450.	45.354	7.542	52.896	10935.9	8.461
1500.	45.610	7.573	53.184	11360.1	8.505
1550.	45.859	7.604	53.463	11786.4	8.547
1600.	46.101	7.634	53.735	12214.8	8.586
1650.	46.337	7.664	54.000	12645.0	8.624
1700.	46.566	7.692	54.258	13077.1	8.660
1750.	46.789	7.721	54.510	13510.9	8.694
1800.	47.007	7.748	54.755	13946.4	8.726
1850.	47.220	7.775	54.995	14383.5	8.757
1900.	47.427	7.801	55.229	14822.1	8.787
1950.	47.630	7.827	55.457	15262.2	8.815
2000.	47.829	7.852	55.681	15703.6	8.842
2050.	48.023	7.876	55.899	16146.4	8.869

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.084545
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.35374
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.084490

Table A-42 Thermodynamic Functions for BH (gas) - Continued

T °K	$\frac{-(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	48.213	7.900	56.113	16590.4	8.894
2150.	48.399	7.924	56.323	17035.7	8.918
2200.	48.582	7.946	56.528	17482.2	8.942
2250.	48.761	7.969	56.729	17929.9	8.965
2300.	48.936	7.991	56.927	18378.7	8.987
2350.	49.108	8.012	57.120	18828.6	9.008
2400.	49.277	8.033	57.310	19279.5	9.029
2450.	49.443	8.054	57.496	19731.5	9.049
2500.	49.606	8.074	57.679	20184.4	9.069
2600.	49.923	8.113	58.036	21093.3	9.107
2700.	50.230	8.150	58.380	22005.8	9.144
2800.	50.527	8.186	58.713	22922.0	9.179
2900.	50.815	8.221	59.036	23841.6	9.213
3000.	51.094	8.255	59.349	24764.5	9.246
3100.	51.365	8.287	59.653	25690.7	9.277
3200.	51.629	8.319	59.948	26620.0	9.309
3300.	51.886	8.349	60.235	27552.3	9.339
3400.	52.135	8.379	60.514	28487.7	9.369
3500.	52.378	8.407	60.786	29426.1	9.398
3600.	52.616	8.435	61.051	30367.3	9.427
3700.	52.847	8.463	61.310	31311.4	9.455
3800.	53.073	8.489	61.562	32258.4	9.483
3900.	53.294	8.515	61.809	33208.1	9.511
4000.	53.510	8.540	62.050	34160.6	9.539
4100.	53.721	8.565	62.286	35115.9	9.567
4200.	53.928	8.589	62.517	36073.9	9.594
4300.	54.130	8.613	62.743	37034.7	9.621
4400.	54.329	8.636	62.964	37998.2	9.648
4500.	54.523	8.659	63.182	38964.3	9.675
4600.	54.713	8.681	63.395	39933.2	9.702
4700.	54.900	8.703	63.603	40904.8	9.729
4800.	55.084	8.725	63.809	41879.1	9.756
4900.	55.264	8.746	64.010	42856.1	9.784
5000.	55.441	8.767	64.208	43835.8	9.811
5100.	55.615	8.788	64.403	44818.2	9.838
5200.	55.785	8.808	64.594	45803.4	9.865
5300.	55.953	8.829	64.782	46791.2	9.892
5400.	56.119	8.848	64.967	47781.8	9.919
5500.	56.281	8.868	65.149	48775.1	9.947
5600.	56.441	8.888	65.329	49771.2	9.974
5700.	56.599	8.907	65.506	50770.0	10.002
5800.	56.754	8.926	65.680	51771.6	10.030
5900.	56.906	8.945	65.852	52775.9	10.058
6000.	57.057	8.964	66.021	53783.1	10.085
273.15	33.517	6.921	40.438	1890.4	6.970
298.15	34.123	6.925	41.048	2064.7	6.974

MOLECULAR WEIGHT 11.828 MOLECULAR SYMMETRY 1.
BE 1.2036 E 01 ALPHAE 4.13 E-01 GAMMA 0. DE 1.22 E-03
YEWE 0. XEWE 49. OMEGAE 2368.
ELECTRONIC MULTIPLICITY 1.

Table A-43 Thermodynamic Functions for BF (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	28.522	6.927	35.449	346.3	6.956
75.	31.333	6.937	38.270	520.3	6.957
100.	33.329	6.942	40.271	694.2	6.957
125.	34.879	6.945	41.824	868.1	6.958
150.	36.145	6.947	43.092	1042.1	6.959
175.	37.216	6.949	44.165	1216.0	6.961
200.	38.144	6.951	45.095	1390.2	6.968
225.	38.963	6.953	45.916	1564.5	6.981
250.	39.696	6.957	46.653	1739.3	7.003
275.	40.359	6.963	47.322	1914.8	7.035
300.	40.965	6.970	47.936	2091.1	7.076
325.	41.524	6.980	48.504	2268.6	7.125
350.	42.041	6.993	49.034	2447.4	7.182
375.	42.524	7.007	49.532	2627.8	7.243
400.	42.977	7.024	50.001	2809.6	7.309
425.	43.403	7.043	50.446	2993.2	7.377
450.	43.807	7.063	50.870	3178.5	7.445
475.	44.189	7.085	51.274	3365.5	7.514
500.	44.553	7.108	51.661	3554.2	7.581
550.	45.233	7.157	52.390	3936.5	7.711
600.	45.858	7.209	53.066	4325.1	7.832
650.	46.437	7.261	53.698	4719.6	7.943
700.	46.977	7.313	54.290	5119.2	8.042
750.	47.483	7.365	54.848	5523.6	8.132
800.	47.960	7.415	55.375	5932.3	8.213
850.	48.411	7.464	55.875	6344.8	8.285
900.	48.839	7.512	56.351	6760.6	8.349
950.	49.246	7.557	56.804	7179.6	8.407
1000.	49.635	7.601	57.236	7601.3	8.459
1050.	50.007	7.643	57.650	8025.5	8.507
1100.	50.364	7.684	58.047	8451.9	8.549
1150.	50.706	7.722	58.428	8880.3	8.588
1200.	51.035	7.759	58.794	9310.6	8.623
1250.	51.353	7.794	59.147	9742.6	8.655
1300.	51.659	7.828	59.487	10176.1	8.685
1350.	51.955	7.860	59.815	10611.0	8.712
1400.	52.242	7.891	60.133	11047.3	8.737
1450.	52.519	7.921	60.440	11484.7	8.761
1500.	52.788	7.949	60.737	11923.3	8.782
1550.	53.049	7.976	61.025	12362.9	8.802
1600.	53.303	8.002	61.305	12803.5	8.821
1650.	53.549	8.027	61.577	13245.1	8.839
1700.	53.789	8.051	61.841	13687.4	8.856
1750.	54.023	8.075	62.098	14130.6	8.871
1800.	54.251	8.097	62.348	14574.6	8.886
1850.	54.473	8.119	62.592	15019.2	8.901
1900.	54.690	8.139	62.829	15464.6	8.914
1950.	54.902	8.159	63.061	15910.6	8.927
2000.	55.108	8.179	63.287	16357.3	8.939
2050.	55.311	8.197	63.508	16804.5	8.951

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.033535
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.14031
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.033513

Table A-43 Thermodynamic Functions for BF (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	55.508	8.215	63.724	17252.3	8.962
2150.	55.702	8.233	63.935	17700.7	8.973
2200.	55.891	8.250	64.141	18149.6	8.983
2250.	56.077	8.266	64.343	18599.0	8.993
2300.	56.259	8.282	64.541	19048.9	9.003
2350.	56.437	8.298	64.735	19499.3	9.012
2400.	56.612	8.313	64.924	19950.1	9.022
2450.	56.783	8.327	65.111	20401.4	9.030
2500.	56.952	8.341	65.293	20853.2	9.039
2600.	57.280	8.368	65.648	21757.9	9.056
2700.	57.596	8.394	65.990	22664.3	9.072
2800.	57.902	8.419	66.320	23572.3	9.087
2900.	58.197	8.442	66.639	24481.8	9.102
3000.	58.484	8.464	66.948	25392.7	9.116
3100.	58.762	8.485	67.247	26305.0	9.130
3200.	59.032	8.506	67.537	27218.8	9.144
3300.	59.294	8.525	67.819	28133.8	9.157
3400.	59.548	8.544	68.093	29050.2	9.171
3500.	59.796	8.562	68.359	29967.9	9.183
3600.	60.038	8.580	68.617	30886.9	9.196
3700.	60.273	8.597	68.870	31807.1	9.209
3800.	60.503	8.613	69.115	32728.6	9.221
3900.	60.726	8.629	69.355	33651.4	9.233
4000.	60.945	8.644	69.589	34575.3	9.246
4100.	61.159	8.659	69.817	35500.5	9.258
4200.	61.368	8.673	70.041	36426.8	9.270
4300.	61.572	8.687	70.259	37354.4	9.282
4400.	61.772	8.701	70.472	38283.2	9.294
4500.	61.967	8.714	70.681	39213.2	9.306
4600.	62.159	8.727	70.886	40144.3	9.318
4700.	62.347	8.740	71.087	41076.7	9.330
4800.	62.531	8.752	71.283	42010.2	9.341
4900.	62.712	8.764	71.476	42945.0	9.353
5000.	62.889	8.776	71.665	43880.9	9.365
5100.	63.063	8.788	71.851	44818.0	9.377
5200.	63.233	8.799	72.033	45756.3	9.389
5300.	63.401	8.811	72.212	46695.8	9.401
5400.	63.566	8.822	72.388	47636.5	9.413
5500.	63.728	8.832	72.560	48578.4	9.425
5600.	63.887	8.843	72.730	49521.5	9.437
5700.	64.044	8.854	72.897	50465.8	9.449
5800.	64.198	8.864	73.062	51411.4	9.461
5900.	64.349	8.874	73.224	52358.1	9.473
6000.	64.499	8.884	73.383	53306.0	9.485
273.15	40.312	6.962	47.274	1901.7	7.032
298.15	40.922	6.970	47.892	2078.0	7.073

MOLECULAR WEIGHT 29.82 MOLECULAR SYMMETRY 1.
BE 1.5278 E 00 ALPHAE 1.68000E-02 GAMMA -1.5 E-04 DE 7. E-06
YEWE 5.7 E-02 XEWE 11.97 OMEGAE 1410.05
ELECTRONIC MULTIPLICITY 1.

Table A-44 Thermodynamic Functions for BCl (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	31.392	6.943	38.335	347.1	6.956
75.	34.209	6.947	41.156	521.1	6.957
100.	36.208	6.950	43.158	695.0	6.959
125.	37.759	6.953	44.711	869.1	6.971
150.	39.027	6.958	45.985	1043.7	7.002
175.	40.100	6.968	47.068	1219.4	7.059
200.	41.031	6.984	48.016	1396.9	7.141
225.	41.855	7.007	48.862	1576.6	7.240
250.	42.595	7.036	49.631	1758.9	7.349
275.	43.267	7.069	50.337	1944.1	7.463
300.	43.884	7.107	50.991	2132.1	7.575
325.	44.454	7.147	51.601	2322.8	7.684
350.	44.985	7.189	52.175	2516.2	7.786
375.	45.483	7.232	52.715	2712.1	7.881
400.	45.951	7.275	53.227	2910.2	7.968
425.	46.393	7.319	53.712	3110.4	8.048
450.	46.813	7.361	54.174	3312.5	8.122
475.	47.212	7.403	54.615	3516.4	8.188
500.	47.593	7.444	55.037	3721.9	8.249
550.	48.306	7.522	55.828	4137.1	8.355
600.	48.964	7.595	56.559	4557.1	8.444
650.	49.574	7.663	57.238	4981.2	8.518
700.	50.145	7.727	57.871	5408.7	8.581
750.	50.680	7.786	58.465	5839.2	8.634
800.	51.184	7.840	59.024	6272.1	8.681
850.	51.661	7.891	59.552	6707.1	8.721
900.	52.113	7.938	60.051	7144.0	8.756
950.	52.544	7.982	60.525	7582.6	8.787
1000.	52.954	8.023	60.977	8022.7	8.815
1050.	53.346	8.061	61.407	8464.1	8.840
1100.	53.722	8.097	61.819	8906.6	8.862
1150.	54.083	8.131	62.214	9350.2	8.883
1200.	54.430	8.162	62.592	9794.9	8.902
1250.	54.763	8.192	62.956	10240.4	8.919
1300.	55.085	8.221	63.306	10686.7	8.935
1350.	55.396	8.247	63.643	11133.9	8.950
1400.	55.696	8.273	63.969	11581.7	8.964
1450.	55.987	8.297	64.284	12030.3	8.978
1500.	56.269	8.320	64.588	12479.4	8.990
1550.	56.542	8.341	64.883	12929.3	9.002
1600.	56.807	8.362	65.169	13379.7	9.014
1650.	57.065	8.382	65.447	13830.6	9.025
1700.	57.315	8.401	65.717	14282.1	9.035
1750.	57.559	8.419	65.979	14734.1	9.045
1800.	57.797	8.437	66.234	15186.6	9.055
1850.	58.028	8.454	66.482	15639.6	9.065
1900.	58.254	8.470	66.724	16093.1	9.074
1950.	58.474	8.486	66.959	16547.0	9.083
2000.	58.689	8.501	67.190	17001.4	9.092
2050.	58.899	8.515	67.414	17456.2	9.101

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.021609
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.090412
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.021595

Table A-44 Thermodynamic Functions for BCl (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	59.104	8.529	67.634	17911.5	9.109
2150.	59.305	8.543	67.848	18367.2	9.118
2200.	59.502	8.556	68.058	18823.3	9.126
2250.	59.694	8.569	68.263	19279.8	9.134
2300.	59.883	8.581	68.464	19736.7	9.142
2350.	60.067	8.593	68.660	20194.0	9.150
2400.	60.248	8.605	68.853	20651.7	9.158
2450.	60.426	8.616	69.042	21109.8	9.166
2500.	60.600	8.627	69.227	21568.2	9.173
2600.	60.939	8.649	69.587	22486.3	9.189
2700.	61.266	8.669	69.934	23406.0	9.204
2800.	61.581	8.688	70.269	24327.1	9.219
2900.	61.886	8.707	70.593	25249.7	9.234
3000.	62.182	8.725	70.907	26173.8	9.248
3100.	62.468	8.742	71.210	27099.4	9.263
3200.	62.746	8.758	71.504	28026.5	9.278
3300.	63.016	8.774	71.790	28955.0	9.293
3400.	63.278	8.790	72.068	29885.0	9.307
3500.	63.533	8.805	72.338	30816.4	9.322
3600.	63.781	8.819	72.600	31749.3	9.337
3700.	64.023	8.833	72.857	32683.7	9.351
3800.	64.259	8.847	73.106	33619.6	9.366
3900.	64.489	8.861	73.350	34557.0	9.381
4000.	64.713	8.874	73.587	35495.9	9.396
4100.	64.933	8.887	73.819	36436.2	9.411
4200.	65.147	8.900	74.046	37378.1	9.426
4300.	65.356	8.912	74.268	38321.5	9.441
4400.	65.561	8.924	74.486	39266.4	9.457
4500.	65.762	8.936	74.698	40212.8	9.472
4600.	65.959	8.948	74.907	41160.8	9.487
4700.	66.151	8.960	75.111	42110.3	9.503
4800.	66.340	8.971	75.311	43061.3	9.519
4900.	66.525	8.982	75.508	44014.0	9.534
5000.	66.707	8.994	75.700	44968.2	9.550
5100.	66.885	9.005	75.890	45924.0	9.566
5200.	67.060	9.016	76.076	46881.4	9.582
5300.	67.232	9.026	76.258	47840.4	9.598
5400.	67.401	9.037	76.438	48801.1	9.614
5500.	67.566	9.048	76.614	49763.3	9.631
5600.	67.730	9.058	76.788	50727.2	9.647
5700.	67.890	9.069	76.959	51692.8	9.664
5800.	68.048	9.079	77.127	52660.0	9.681
5900.	68.203	9.090	77.293	53628.9	9.697
6000.	68.356	9.100	77.456	54599.5	9.714
273.15	43.219	7.067	50.286	1930.3	7.455
298.15	43.840	7.104	50.944	2118.1	7.567

MOLECULAR WEIGHT 46.2770 MOLECULAR SYMMETRY 1.
BE 6.907 E-01 ALPHAE 6.56 E-03 GAMMA 0. DE 1.79 E-06
YEWE 0. XEWE 5.16 OMEGAE 843.37
ELECTRONIC MULTIPLICITY 1.

Table A-45 Thermodynamic Functions for BBr (gas)

T °K	$\frac{-(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	34.048	6.947	40.994	347.3	6.957
75.	36.865	6.950	43.815	521.3	6.958
100.	38.865	6.953	45.818	695.3	6.968
125.	40.417	6.959	47.376	869.9	7.006
150.	41.687	6.973	48.660	1045.9	7.083
175.	42.763	6.996	49.759	1224.3	7.192
200.	43.699	7.029	50.728	1405.7	7.322
225.	44.529	7.069	51.598	1590.5	7.460
250.	45.277	7.115	52.391	1778.7	7.597
275.	45.957	7.165	53.122	1970.3	7.726
300.	46.583	7.216	53.799	2164.9	7.845
325.	47.162	7.269	54.431	2362.4	7.954
350.	47.703	7.322	55.024	2562.5	8.051
375.	48.210	7.373	55.583	2764.9	8.138
400.	48.687	7.423	56.111	2969.4	8.216
425.	49.139	7.472	56.611	3175.6	8.285
450.	49.567	7.519	57.086	3383.6	8.347
475.	49.975	7.564	57.539	3592.9	8.402
500.	50.364	7.607	57.971	3803.6	8.452
550.	51.093	7.688	58.781	4228.4	8.536
600.	51.765	7.762	59.527	4657.0	8.605
650.	52.389	7.829	60.218	5088.7	8.663
700.	52.972	7.890	60.862	5523.1	8.710
750.	53.518	7.946	61.464	5959.7	8.751
800.	54.032	7.998	62.030	6398.1	8.786
850.	54.519	8.045	62.564	6838.2	8.816
900.	54.980	8.088	63.068	7279.6	8.843
950.	55.418	8.129	63.547	7722.4	8.866
1000.	55.836	8.166	64.002	8166.2	8.887
1050.	56.235	8.201	64.436	8611.1	8.906
1100.	56.618	8.233	64.851	9056.8	8.924
1150.	56.984	8.264	65.248	9503.4	8.940
1200.	57.337	8.292	65.629	9950.7	8.954
1250.	57.676	8.319	65.995	10398.8	8.968
1300.	58.002	8.344	66.347	10847.5	8.981
1350.	58.318	8.368	66.686	11296.9	8.993
1400.	58.623	8.391	67.013	11746.8	9.004
1450.	58.917	8.412	67.329	12197.3	9.015
1500.	59.203	8.432	67.635	12648.3	9.026
1550.	59.480	8.452	67.931	13099.8	9.036
1600.	59.748	8.470	68.218	13551.9	9.045
1650.	60.009	8.487	68.497	14004.4	9.055
1700.	60.263	8.504	68.767	14457.3	9.064
1750.	60.510	8.520	69.030	14910.7	9.072
1800.	60.750	8.536	69.286	15364.5	9.081
1850.	60.984	8.551	69.535	15818.8	9.089
1900.	61.212	8.565	69.777	16273.5	9.098
1950.	61.435	8.579	70.014	16728.6	9.106
2000.	61.652	8.592	70.244	17184.0	9.114
2050.	61.864	8.605	70.469	17639.9	9.121

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.011021
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.046112
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.011014

Table A-45 Thermodynamic Functions for BBr (gas)- Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	62.072	8.617	70.689	18096.2	9.129
2150.	62.275	8.629	70.904	18552.8	9.137
2200.	62.473	8.641	71.114	19009.9	9.144
2250.	62.668	8.652	71.320	19467.3	9.152
2300.	62.858	8.663	71.521	19925.1	9.159
2350.	63.044	8.674	71.718	20383.2	9.167
2400.	63.227	8.684	71.911	20841.7	9.174
2450.	63.406	8.694	72.100	21300.6	9.181
2500.	63.582	8.704	72.286	21759.8	9.189
2600.	63.924	8.723	72.647	22679.4	9.203
2700.	64.253	8.741	72.994	23600.4	9.217
2800.	64.572	8.758	73.330	24522.9	9.232
2900.	64.879	8.775	73.654	25446.8	9.246
3000.	65.177	8.791	73.968	26372.1	9.260
3100.	65.465	8.806	74.271	27298.8	9.274
3200.	65.745	8.821	74.566	28226.9	9.289
3300.	66.017	8.835	74.852	29156.5	9.303
3400.	66.281	8.849	75.130	30087.5	9.317
3500.	66.538	8.863	75.400	31020.0	9.332
3600.	66.787	8.876	75.664	31953.9	9.346
3700.	67.031	8.889	75.920	32889.2	9.361
3800.	67.268	8.902	76.170	33826.1	9.375
3900.	67.499	8.914	76.413	34764.3	9.390
4000.	67.725	8.926	76.651	35704.1	9.405
4100.	67.946	8.938	76.884	36645.3	9.420
4200.	68.161	8.950	77.111	37588.0	9.435
4300.	68.372	8.961	77.333	38532.2	9.450
4400.	68.578	8.972	77.550	39478.0	9.465
4500.	68.780	8.983	77.763	40425.2	9.480
4600.	68.977	8.994	77.972	41374.0	9.495
4700.	69.171	9.005	78.176	42324.3	9.511
4800.	69.361	9.016	78.377	43276.2	9.526
4900.	69.547	9.026	78.573	44229.6	9.542
5000.	69.729	9.037	78.766	45184.6	9.558
5100.	69.908	9.047	78.956	46141.2	9.574
5200.	70.084	9.058	79.142	47099.4	9.590
5300.	70.257	9.068	79.324	48059.2	9.606
5400.	70.426	9.078	79.504	49020.6	9.622
5500.	70.593	9.088	79.681	49983.6	9.638
5600.	70.757	9.098	79.855	50948.3	9.655
5700.	70.918	9.108	80.026	51914.6	9.671
5800.	71.076	9.118	80.194	52882.6	9.688
5900.	71.232	9.127	80.360	53852.2	9.705
6000.	71.386	9.137	80.523	54823.5	9.722
273.15	45.909	7.161	53.070	1956.0	7.717
298.15	46.538	7.213	53.751	2150.4	7.837

MOLECULAR WEIGHT 90.7360 MOLECULAR SYMMETRY 1.
BE 4.97 E-01 ALPHAE 3.6 E-03 GAMMA 0. DE 10. E-07
YEWE 0. XEWE 3.57 OMEGAE 689.04
ELECTRONIC MULTIPLICITY 1.

Table A-46 Thermodynamic Functions for BS (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	32.240	6.940	39.180	347.0	6.956
75.	35.055	6.946	42.001	520.9	6.956
100.	37.053	6.948	44.002	694.8	6.957
125.	38.604	6.950	45.554	868.8	6.957
150.	39.871	6.952	46.823	1042.7	6.961
175.	40.943	6.953	47.897	1216.8	6.970
200.	41.872	6.956	48.828	1391.3	6.989
225.	42.691	6.962	49.653	1566.4	7.020
250.	43.425	6.970	50.395	1742.4	7.065
275.	44.090	6.981	51.071	1919.7	7.122
300.	44.698	6.995	51.693	2098.6	7.188
325.	45.259	7.013	52.272	2279.2	7.262
350.	45.779	7.033	52.813	2461.7	7.340
375.	46.265	7.057	53.322	2646.2	7.420
400.	46.721	7.082	53.803	2832.7	7.500
425.	47.152	7.109	54.260	3021.2	7.579
450.	47.559	7.137	54.696	3211.7	7.656
475.	47.945	7.166	55.112	3404.0	7.730
500.	48.314	7.196	55.510	3598.1	7.800
550.	49.002	7.257	56.260	3991.5	7.930
600.	49.636	7.318	56.955	4390.9	8.045
650.	50.225	7.378	57.603	4795.8	8.147
700.	50.773	7.436	58.210	5205.3	8.235
750.	51.288	7.492	58.781	5619.1	8.313
800.	51.774	7.546	59.319	6036.5	8.381
850.	52.233	7.596	59.829	6457.0	8.440
900.	52.668	7.645	60.313	6880.4	8.493
950.	53.083	7.691	60.774	7306.2	8.540
1000.	53.478	7.734	61.213	7734.3	8.582
1050.	53.857	7.776	61.632	8164.3	8.619
1100.	54.219	7.815	62.034	8596.1	8.652
1150.	54.568	7.852	62.419	9029.5	8.682
1200.	54.903	7.887	62.789	9464.3	8.709
1250.	55.225	7.920	63.145	9900.3	8.734
1300.	55.536	7.952	63.488	10337.6	8.757
1350.	55.837	7.982	63.819	10776.0	8.777
1400.	56.128	8.011	64.139	11215.3	8.796
1450.	56.410	8.038	64.448	11655.6	8.814
1500.	56.683	8.064	64.747	12096.7	8.830
1550.	56.947	8.089	65.037	12538.5	8.845
1600.	57.205	8.113	65.318	12981.2	8.859
1650.	57.455	8.136	65.591	13424.5	8.872
1700.	57.698	8.158	65.856	13868.4	8.885
1750.	57.935	8.179	66.113	14312.9	8.897
1800.	58.165	8.199	66.364	14758.0	8.908
1850.	58.390	8.218	66.608	15203.7	8.918
1900.	58.610	8.237	66.846	15649.8	8.928
1950.	58.824	8.255	67.078	16096.5	8.938
2000.	59.033	8.272	67.305	16543.6	8.947
2050.	59.237	8.288	67.526	16991.1	8.955

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.023318
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.097561
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.023302

Table A-46 Thermodynamic Functions for BS (gas) - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	59.437	8.304	67.742	17439.1	8.963
2150.	59.633	8.320	67.953	17887.5	8.971
2200.	59.824	8.335	68.159	18336.2	8.979
2250.	60.012	8.349	68.361	18785.4	8.987
2300.	60.195	8.363	68.558	19234.9	8.994
2350.	60.376	8.376	68.752	19684.8	9.001
2400.	60.552	8.390	68.942	20135.0	9.007
2450.	60.725	8.402	69.127	20585.5	9.014
2500.	60.895	8.415	69.310	21036.4	9.020
2600.	61.225	8.438	69.664	21939.0	9.033
2700.	61.544	8.460	70.005	22842.9	9.044
2800.	61.852	8.481	70.334	23747.9	9.056
2900.	62.150	8.501	70.652	24654.0	9.067
3000.	62.439	8.520	70.959	25561.2	9.077
3100.	62.719	8.539	71.257	26469.4	9.087
3200.	62.990	8.556	71.546	27378.7	9.097
3300.	63.253	8.572	71.826	28288.9	9.107
3400.	63.510	8.588	72.098	29200.1	9.117
3500.	63.759	8.603	72.362	30112.2	9.126
3600.	64.001	8.618	72.620	31025.3	9.135
3700.	64.238	8.632	72.870	31939.3	9.145
3800.	64.468	8.646	73.114	32854.2	9.154
3900.	64.693	8.659	73.352	33770.1	9.163
4000.	64.912	8.672	73.584	34686.8	9.172
4100.	65.127	8.684	73.811	35604.4	9.180
4200.	65.336	8.696	74.032	36522.9	9.189
4300.	65.541	8.707	74.248	37442.2	9.198
4400.	65.741	8.719	74.460	38362.5	9.207
4500.	65.937	8.730	74.667	39283.6	9.215
4600.	66.129	8.740	74.869	40205.6	9.224
4700.	66.317	8.751	75.068	41128.4	9.233
4800.	66.501	8.761	75.262	42052.1	9.241
4900.	66.682	8.771	75.453	42976.7	9.250
5000.	66.859	8.780	75.640	43902.1	9.259
5100.	67.033	8.790	75.823	44828.4	9.267
5200.	67.204	8.799	76.003	45755.5	9.276
5300.	67.372	8.808	76.180	46683.5	9.284
5400.	67.537	8.817	76.354	47612.4	9.293
5500.	67.699	8.826	76.524	48542.1	9.302
5600.	67.858	8.834	76.692	49472.8	9.310
5700.	68.014	8.843	76.857	50404.2	9.319
5800.	68.168	8.851	77.019	51336.6	9.328
5900.	68.319	8.859	77.179	52269.8	9.337
6000.	68.468	8.867	77.336	53203.9	9.345
273.15	44.043	6.980	51.023	1906.6	7.117
298.15	44.655	6.994	51.649	2085.3	7.183

MOLECULAR WEIGHT 42.886 MOLECULAR SYMMETRY 1.
BE 8.0467 E-01 ALPHAE 6.16 E-03 GAMMA 0. DE 1.478E-06
YEWE 0. XEWE 6.39 OMEGAE 1187.4
ELECTRONIC MULTIPLICITY 2.

Table A-47 Thermodynamic Functions for BN (gas)

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	31.352	6.924	38.276	346.2	6.956
75.	34.162	6.935	41.097	520.1	6.957
100.	36.158	6.940	43.098	694.0	6.957
125.	37.707	6.944	44.651	868.0	6.957
150.	38.973	6.946	45.919	1041.9	6.958
175.	40.044	6.948	46.992	1215.9	6.960
200.	40.972	6.950	47.922	1389.9	6.964
225.	41.791	6.951	48.742	1564.1	6.972
250.	42.523	6.954	49.477	1738.6	6.987
275.	43.186	6.958	50.144	1913.5	7.009
300.	43.792	6.964	50.755	2089.1	7.040
325.	44.349	6.971	51.320	2265.5	7.078
350.	44.866	6.980	51.847	2443.0	7.124
375.	45.348	6.991	52.340	2621.8	7.176
400.	45.800	7.005	52.805	2801.9	7.233
425.	46.225	7.020	53.245	2983.5	7.293
450.	46.627	7.037	53.664	3166.6	7.356
475.	47.008	7.055	54.063	3351.3	7.419
500.	47.370	7.075	54.445	3537.5	7.483
550.	48.046	7.118	55.164	3914.8	7.609
600.	48.668	7.164	55.832	4298.3	7.729
650.	49.243	7.212	56.455	4687.6	7.840
700.	49.779	7.260	57.040	5082.2	7.943
750.	50.282	7.309	57.591	5481.7	8.037
800.	50.755	7.357	58.112	5885.7	8.122
850.	51.203	7.404	58.607	6293.8	8.199
900.	51.627	7.451	59.078	6705.5	8.268
950.	52.031	7.495	59.526	7120.5	8.331
1000.	52.417	7.538	59.955	7538.4	8.387
1050.	52.785	7.580	60.366	7959.1	8.439
1100.	53.139	7.620	60.759	8382.2	8.486
1150.	53.479	7.659	61.137	8807.6	8.528
1200.	53.805	7.696	61.501	9235.0	8.567
1250.	54.120	7.731	61.852	9664.2	8.603
1300.	54.424	7.766	62.190	10095.2	8.635
1350.	54.718	7.798	62.516	10527.7	8.666
1400.	55.002	7.830	62.832	10961.7	8.694
1450.	55.277	7.860	63.137	11397.1	8.719
1500.	55.544	7.889	63.433	11833.6	8.743
1550.	55.803	7.917	63.720	12271.4	8.766
1600.	56.055	7.944	63.999	12710.2	8.787
1650.	56.300	7.970	64.270	13150.0	8.807
1700.	56.538	7.995	64.533	13590.8	8.825
1750.	56.770	8.019	64.789	14032.5	8.842
1800.	56.997	8.042	65.038	14475.1	8.859
1850.	57.217	8.064	65.281	14918.4	8.875
1900.	57.433	8.086	65.518	15362.5	8.889
1950.	57.643	8.106	65.749	15807.3	8.904
2000.	57.848	8.126	65.975	16252.9	8.917
2050.	58.049	8.146	66.195	16699.0	8.930

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.040277
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.16852
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.040251

Table A-47 Thermodynamic Functions for BN (gas) - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	58.246	8.165	66.411	17145.8	8.942
2150.	58.438	8.183	66.621	17593.3	8.954
2200.	58.626	8.201	66.827	18041.3	8.966
2250.	58.811	8.218	67.029	18489.8	8.977
2300.	58.992	8.234	67.226	18938.9	8.987
2350.	59.169	8.250	67.419	19388.6	8.998
2400.	59.343	8.266	67.609	19838.7	9.008
2450.	59.514	8.281	67.795	20289.3	9.017
2500.	59.681	8.296	67.977	20740.4	9.027
2600.	60.007	8.325	68.332	21644.0	9.045
2700.	60.322	8.352	68.673	22549.4	9.062
2800.	60.626	8.377	69.003	23456.4	9.079
2900.	60.920	8.402	69.322	24365.1	9.095
3000.	61.205	8.425	69.631	25275.4	9.110
3100.	61.482	8.447	69.930	26187.1	9.125
3200.	61.751	8.469	70.219	27100.4	9.140
3300.	62.011	8.489	70.501	28015.1	9.154
3400.	62.265	8.509	70.774	28931.1	9.168
3500.	62.512	8.528	71.040	29848.6	9.181
3600.	62.753	8.547	71.299	30767.4	9.195
3700.	62.987	8.564	71.551	31687.6	9.208
3800.	63.216	8.581	71.797	32609.1	9.221
3900.	63.439	8.598	72.037	33531.8	9.234
4000.	63.657	8.614	72.271	34455.9	9.247
4100.	63.870	8.630	72.499	35381.3	9.260
4200.	64.078	8.645	72.722	36307.9	9.273
4300.	64.281	8.659	72.941	37235.8	9.285
4400.	64.481	8.674	73.154	38164.9	9.298
4500.	64.676	8.688	73.363	39095.3	9.310
4600.	64.867	8.702	73.568	40026.9	9.323
4700.	65.054	8.715	73.769	40959.8	9.335
4800.	65.238	8.728	73.966	41893.9	9.348
4900.	65.418	8.741	74.158	42829.3	9.360
5000.	65.594	8.753	74.348	43765.9	9.372
5100.	65.768	8.765	74.533	44703.8	9.385
5200.	65.938	8.777	74.716	45642.9	9.397
5300.	66.106	8.789	74.895	46583.2	9.410
5400.	66.270	8.801	75.071	47524.8	9.422
5500.	66.432	8.812	75.244	48467.6	9.435
5600.	66.590	8.824	75.414	49411.7	9.447
5700.	66.747	8.835	75.581	50357.1	9.460
5800.	66.900	8.845	75.746	51303.7	9.472
5900.	67.052	8.856	75.908	52251.5	9.485
6000.	67.201	8.867	76.067	53200.6	9.498
273.15	43.139	6.958	50.097	1900.5	7.007
298.15	43.749	6.963	50.712	2076.0	7.037

MOLECULAR WEIGHT 24.828 MOLECULAR SYMMETRY 1.
BE 1.682 ALPHAE 2.5 E-02 GAMMA 0. DE 8.22 E-06
YEWE 0. XEWE 12.4 OMEGAE 1522.
ELECTRONIC MULTIPLICITY 6.

Table A-48. Thermodynamic Functions for N_2 (gas)

T °K	$-(F^o-H_0^o)/T$	$(H^o-H_0^o)/T$	S^o	$H^o-H_0^o$	C_p^o
50.	26.425	6.917	33.342	345.8	6.956
100.	31.228	6.936	38.164	693.6	6.956
150.	34.042	6.943	40.985	1041.4	6.957
200.	36.039	6.947	42.986	1389.4	6.957
250.	37.589	6.949	44.538	1737.2	6.958
273.15	38.205	6.949	45.154	1898.1	6.959
298.15	38.813	6.950	45.763	2072.1	6.961
300.	38.857	6.950	45.807	2085.0	6.961
350.	39.928	6.953	46.881	2433.6	6.971
400.	40.858	6.955	47.813	2782.0	6.991
450.	41.677	6.961	48.638	3132.4	7.024
500.	42.410	6.971	49.381	3485.5	7.070
550.	43.076	6.981	50.057	3839.6	7.128
600.	43.684	6.996	50.680	4197.6	7.197
650.	44.244	7.015	51.259	4559.8	7.272
700.	44.765	7.036	51.801	4925.2	7.351
750.	45.252	7.059	52.311	5294.2	7.432
800.	45.707	7.085	52.792	5668.0	7.513
850.	46.138	7.113	53.251	6046.0	7.593
900.	46.546	7.141	53.687	6424.9	7.670
950.	46.933	7.171	54.104	6812.4	7.744
1000.	47.301	7.202	54.503	7202.0	7.815
1050.	47.653	7.233	54.886	7594.6	7.882
1100.	47.990	7.264	55.254	7990.4	7.946
1150.	48.314	7.294	55.608	8388.1	8.005
1200.	48.624	7.326	55.950	8791.2	8.061
1250.	48.924	7.356	56.280	9195.0	8.113
1300.	49.214	7.386	56.600	9601.8	8.162
1350.	49.493	7.415	56.908	10010.	8.208
1400.	49.763	7.445	57.208	10423.	8.251
1450.	50.025	7.473	57.498	10836.	8.291
1500.	50.280	7.500	57.780	11250.	8.328
1550.	50.526	7.527	58.053	11667.	8.364
1600.	50.765	7.555	58.320	12088.	8.397
1650.	50.997	7.581	58.578	12509.	8.428
1700.	51.224	7.606	58.830	12930.	8.457
1750.	51.444	7.632	59.076	13356.	8.484
1800.	51.661	7.654	59.315	13777.	8.510
1850.	51.869	7.680	59.549	14208.	8.534
1900.	52.076	7.701	59.777	14632.	8.556
1950.	52.275	7.724	59.999	15062.	8.578
2000.	52.472	7.745	60.217	15490.	8.598
2050.	52.662	7.767	60.429	15922.	8.618
2100.	52.851	7.786	60.637	16351.	8.636
2150.	53.034	7.806	60.840	16783.	8.653
2200.	53.213	7.827	61.040	17219.	8.670

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units. The molecular weight = 28.016

Table A-48. Thermodynamic Functions for N_2 (gas) - Continued

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
2250.	53.390	7.844	61.234	17649.	8.685
2300.	53.563	7.863	61.426	18085.	8.700
2350.	53.732	7.881	61.613	18520.	8.714
2400.	53.898	7.898	61.796	18955.	8.728
2450.	54.061	7.916	61.977	19394.	8.741
2500.	54.220	7.933	62.153	19832.	8.753
2550.	54.377	7.950	62.327	20272.	8.765
2600.	54.532	7.965	62.497	20709.	8.776
2650.	54.683	7.981	62.664	21149.	8.787
2700.	54.834	7.995	62.829	21586.	8.798
2750.	54.982	8.008	62.990	22022.	8.808
2800.	55.125	8.024	63.149	22467.	8.817
2850.	55.268	8.037	63.305	22905.	8.826
2900.	55.407	8.053	63.460	23354.	8.835
2950.	55.544	8.066	63.610	23795.	8.844
3000.	55.681	8.077	63.758	24231.	8.852
3100.	55.945	8.104	64.049	25122.	8.868
3200.	56.204	8.127	64.331	26006.	8.883
3300.	56.454	8.150	64.604	26895.	8.897
3400.	56.697	8.173	64.870	27788.	8.910
3500.	56.935	8.194	65.129	28679.	8.923
3600.	57.166	8.214	65.380	29570.	8.935
3700.	57.392	8.233	65.625	30462.	8.946
3800.	57.611	8.253	65.864	31361.	8.957
3900.	57.825	8.272	66.097	32261.	8.967
4000.	58.036	8.288	66.324	33152.	8.977
4100.	58.241	8.304	66.545	34046.	8.987
4200.	58.441	8.321	66.762	34948.	8.996
4300.	58.636	8.338	66.974	35853.	9.005
4400.	58.829	8.352	67.181	36749.	9.013
4500.	59.016	8.368	67.384	37656.	9.022
4600.	59.200	8.382	67.582	38557.	9.030
4700.	59.381	8.395	67.776	39456.	9.038
4800.	59.558	8.409	67.967	40363.	9.046
4900.	59.731	8.423	68.154	41273.	9.054
5000.	59.902	8.434	68.336	42170.	9.062

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.035694
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.149343
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.035670

Table A-49. Thermodynamic Functions for $(LiF)_2$ (gas)

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
50.	35.755	7.952	43.707	397.6	7.976
75.	38.984	7.987	46.972	599.1	8.180
100.	41.294	8.085	49.379	808.5	8.613
125.	43.115	8.250	51.365	1031.2	9.230
150.	44.638	8.473	53.111	1270.9	9.959
175.	45.963	8.741	54.704	1529.6	10.736
200.	47.150	9.039	56.188	1807.7	11.510
225.	48.233	9.355	57.587	2104.8	12.251
250.	49.235	9.679	58.914	2419.9	12.944
275.	50.173	10.006	60.178	2751.5	13.579
300.	51.057	10.328	61.385	3098.3	14.155
325.	51.896	10.642	62.539	3458.8	14.674
350.	52.696	10.947	63.644	3831.6	15.139
375.	53.462	11.241	64.703	4215.3	15.554
400.	54.196	11.522	65.718	4608.9	15.925
425.	54.903	11.791	66.694	5011.3	16.256
450.	55.584	12.048	67.632	5421.4	16.552
475.	56.242	12.292	68.534	5838.6	16.816
500.	56.879	12.524	69.403	6262.0	17.053
550.	58.093	12.955	71.047	7125.1	17.456
600.	59.237	13.344	72.581	8006.3	17.783
650.	60.319	13.696	74.015	8902.4	18.052
700.	61.346	14.015	75.361	9810.7	18.274
750.	62.323	14.306	76.629	10729.2	18.459
800.	63.255	14.570	77.825	11656.1	18.614
850.	64.146	14.812	78.958	12590.2	18.746
900.	64.999	15.034	80.032	13530.4	18.859
950.	65.817	15.238	81.055	14475.9	18.956
1000.	66.603	15.426	82.029	15425.8	19.040
1050.	67.360	15.600	82.960	16379.7	19.113
1100.	68.090	15.761	83.851	17337.0	19.177
1150.	68.794	15.911	84.704	18297.3	19.234
1200.	69.474	16.050	85.524	19260.3	19.284
1250.	70.132	16.180	86.312	20225.6	19.328
1300.	70.769	16.302	87.071	21193.0	19.368
1350.	71.386	16.417	87.803	22162.3	19.403
1400.	71.985	16.524	88.509	23133.3	19.435
1450.	72.567	16.625	89.191	24105.8	19.464
1500.	73.132	16.720	89.852	25079.6	19.490
1550.	73.682	16.809	90.491	26054.7	19.514
1600.	74.217	16.894	91.111	27030.9	19.535
1650.	74.738	16.975	91.712	28008.2	19.555
1700.	75.246	17.051	92.296	28986.4	19.573
1750.	75.741	17.123	92.864	29965.5	19.589
1800.	76.224	17.192	93.416	30945.3	19.605
1850.	76.696	17.257	93.953	31925.9	19.619
1900.	77.157	17.320	94.477	32907.2	19.632
1950.	77.608	17.379	94.987	33889.1	19.644
2000.	78.049	17.436	95.484	34871.5	19.655
2050.	78.480	17.490	95.970	35854.5	19.665
2100.	78.902	17.542	96.444	36838.0	19.675
2150.	79.315	17.592	96.907	37822.0	19.684
2200.	79.720	17.639	97.360	38806.4	19.692
2250.	80.117	17.685	97.802	39791.2	19.700
2300.	80.506	17.729	98.235	40776.4	19.707
2350.	80.888	17.771	98.659	41761.9	19.714
273.15	50.105	9.981	60.087	2726.4	13.534
298.15	50.993	10.304	61.298	3072.2	14.114

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.019275
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.080647
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.019262

Table A-49. Thermodynamic Functions for $(LiF)_2$ (gas) - Continued

T °K	$-(F^o-H_0^o)/T$	$(H^o-H_0^o)/T$	S^o	$H^o-H_0^o$	C_p^o
2400.	81.263	17.812	99.074	42747.8	19.721
2450.	81.630	17.851	99.481	43733.9	19.727
2500.	81.991	17.888	99.880	44720.4	19.732
2600.	82.694	17.959	100.654	46694.2	19.743
2700.	83.373	18.026	101.399	48669.0	19.752
2800.	84.030	18.087	102.117	50644.6	19.761
2900.	84.666	18.145	102.811	52621.1	19.768
3000.	85.282	18.199	103.481	54598.2	19.775
3100.	85.879	18.250	104.130	56576.0	19.781
3200.	86.460	18.298	104.758	58554.4	19.787
3300.	87.023	18.343	105.367	60533.3	19.792
3400.	87.572	18.386	105.958	62512.8	19.796
3500.	88.105	18.426	106.532	64492.6	19.801
3600.	88.625	18.465	107.090	66472.9	19.805
3700.	89.131	18.501	107.632	68453.5	19.808
3800.	89.625	18.535	108.161	70434.5	19.812
3900.	90.107	18.568	108.675	72415.8	19.815
4000.	90.578	18.599	109.177	74397.4	19.817
4100.	91.037	18.629	109.666	76379.3	19.820
4200.	91.486	18.657	110.144	78361.5	19.823
4300.	91.926	18.685	110.610	80343.8	19.825
4400.	92.356	18.711	111.066	82326.4	19.827
4500.	92.776	18.735	111.512	84309.2	19.829
4600.	93.188	18.759	111.948	86292.2	19.831
4700.	93.592	18.782	112.374	88275.4	19.833
4800.	93.988	18.804	112.792	90258.8	19.834
4900.	94.376	18.825	113.201	92242.3	19.836
5000.	94.756	18.845	113.601	94225.9	19.837
5100.	95.130	18.865	113.994	96209.7	19.839
5200.	95.496	18.883	114.380	98193.7	19.840
5300.	95.856	18.901	114.757	100177.7	19.841
5400.	96.209	18.919	115.128	102161.9	19.842
5500.	96.557	18.936	115.492	104146.2	19.843
5600.	96.898	18.952	115.850	106130.6	19.844
5700.	97.234	18.968	116.201	108115.1	19.845
5800.	97.564	18.983	116.546	110099.6	19.846
5900.	97.888	18.997	116.886	112084.3	19.847
6000.	98.208	19.012	117.219	114069.1	19.848
6100.	98.522	19.025	117.547	116053.9	19.849
6200.	98.832	19.039	117.870	118038.9	19.850
6300.	99.136	19.051	118.188	120023.9	19.850
6400.	99.436	19.064	118.500	122008.9	19.851
6500.	99.732	19.076	118.808	123994.1	19.852
6600.	100.023	19.088	119.111	125979.3	19.852
6700.	100.311	19.099	119.410	127964.5	19.853
6800.	100.594	19.110	119.704	129949.8	19.853
6900.	100.873	19.121	119.994	131935.2	19.854
7000.	101.148	19.132	120.279	133920.6	19.855

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

51.88, 11.51, 2.455, 13.97, 4.

The frequencies and their degeneracies were taken as:

900. (1), 555. (1), 531. (1), 900. (1), 531. (1), 300. (1).

The tables are in units of calories, moles and °K. See reverse side for conversion factors to other units.

Table A-50. Thermodynamic Functions for $(LiCl)_2$ (gas)

T °K	$-\frac{(F^o-H_0^o)}{T}$	$\frac{H^o-H_0^o}{T}$	S^o	$H^o-H_0^o$	C_p^o
50.	39.858	7.954	47.812	397.7	7.996
75.	43.093	8.030	51.123	602.3	8.472
100.	45.431	8.258	53.688	825.8	9.467
125.	47.310	8.617	55.927	1077.1	10.649
150.	48.919	9.053	57.971	1357.9	11.800
175.	50.349	9.521	59.870	1666.1	12.839
200.	51.651	9.994	61.645	1998.7	13.746
225.	52.855	10.455	63.310	2352.4	14.527
250.	53.980	10.896	64.876	2724.1	15.192
275.	55.038	11.313	66.351	3111.2	15.758
300.	56.039	11.704	67.744	3511.3	16.240
325.	56.991	12.069	69.060	3922.6	16.649
350.	57.898	12.409	70.307	4343.3	16.999
375.	58.765	12.726	71.491	4772.1	17.299
400.	59.596	13.020	72.615	5207.9	17.558
425.	60.393	13.293	73.687	5649.7	17.782
450.	61.160	13.548	74.709	6096.8	17.976
475.	61.899	13.786	75.685	6548.3	18.146
500.	62.612	14.008	76.620	7003.9	18.295
550.	63.967	14.409	78.376	7925.0	18.542
600.	65.236	14.762	79.998	8857.2	18.737
650.	66.430	15.074	81.504	9798.0	18.893
700.	67.557	15.351	82.909	10745.9	19.019
750.	68.625	15.599	84.225	11699.6	19.123
800.	69.639	15.822	85.462	12657.9	19.209
850.	70.605	16.024	86.628	13620.3	19.282
900.	71.526	16.207	87.732	14585.9	19.343
950.	72.406	16.373	88.780	15554.4	19.396
1000.	73.250	16.525	89.776	16525.4	19.441
1050.	74.060	16.665	90.725	17498.4	19.480
1100.	74.838	16.794	91.632	18473.3	19.514
1150.	75.587	16.913	92.500	19449.7	19.543
1200.	76.310	17.023	93.332	20427.5	19.570
1250.	77.007	17.125	94.132	21406.6	19.593
1300.	77.680	17.221	94.901	22386.8	19.614
1350.	78.332	17.310	95.641	23367.9	19.632
1400.	78.963	17.393	96.356	24350.0	19.649
1450.	79.574	17.471	97.045	25332.8	19.664
1500.	80.168	17.544	97.712	26316.3	19.677
1550.	80.744	17.613	98.358	27300.5	19.689
1600.	81.305	17.678	98.983	28285.2	19.701
1650.	81.850	17.740	99.589	29270.5	19.711
1700.	82.380	17.798	100.178	30256.3	19.720
1750.	82.897	17.853	100.750	31242.5	19.728
1800.	83.400	17.905	101.305	32229.1	19.736
1850.	83.892	17.955	101.846	33216.1	19.743
1900.	84.371	18.002	102.373	34203.5	19.750
1950.	84.839	18.047	102.886	35191.1	19.756
2000.	85.297	18.090	103.386	36179.1	19.762
2050.	85.744	18.130	103.874	37167.3	19.767
2100.	86.181	18.169	104.351	38155.8	19.772
2150.	86.609	18.207	104.816	39144.5	19.777
2200.	87.028	18.242	105.271	40133.5	19.781
2250.	87.439	18.277	105.715	41122.6	19.785
2300.	87.841	18.310	106.150	42112.0	19.789
2350.	88.235	18.341	106.576	43101.5	19.792
273.15	54.962	11.283	66.245	3082.1	15.720
298.15	55.967	11.676	67.643	3481.3	16.207

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

84.794, 39.54, 3.314, 42.85, 4.

The frequencies and their degeneracies were taken as:

650. (1), 318. (1), 344. (1), 650. (1), 344. (1), 344. (1)

Table A-50. Thermodynamic Functions for $(LiCl)_2$ (gas) - Continued

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
2400.	88.621	18.371	106.993	44091.2	19.796
2450.	89.000	18.400	107.401	45081.1	19.799
2500.	89.372	18.428	107.801	46071.1	19.802
2600.	90.096	18.481	108.578	48051.5	19.807
2700.	90.795	18.531	109.325	50032.4	19.812
2800.	91.469	18.576	110.046	52013.8	19.816
2900.	92.122	18.619	110.741	53995.6	19.820
3000.	92.754	18.659	111.413	55977.8	19.823
3100.	93.366	18.697	112.063	57960.3	19.826
3200.	93.960	18.732	112.693	59943.0	19.829
3300.	94.537	18.765	113.303	61926.1	19.832
3400.	95.098	18.797	113.895	63909.4	19.834
3500.	95.643	18.827	114.470	65892.9	19.836
3600.	96.174	18.855	115.029	67876.6	19.838
3700.	96.691	18.881	115.572	69860.5	19.840
3800.	97.195	18.906	116.101	71844.6	19.842
3900.	97.686	18.930	116.617	73828.9	19.843
4000.	98.166	18.953	117.119	75813.3	19.845
4100.	98.634	18.975	117.609	77797.9	19.846
4200.	99.092	18.996	118.088	79782.5	19.847
4300.	99.539	19.016	118.555	81767.3	19.849
4400.	99.976	19.035	119.011	83752.2	19.850
4500.	100.404	19.053	119.457	85737.2	19.851
4600.	100.823	19.070	119.893	87722.3	19.852
4700.	101.234	19.087	120.320	89707.5	19.852
4800.	101.636	19.103	120.738	91692.8	19.853
4900.	102.030	19.118	121.148	93678.2	19.854
5000.	102.416	19.133	121.549	95663.6	19.855
5100.	102.795	19.147	121.942	97649.2	19.855
5200.	103.167	19.161	122.327	99634.7	19.856
5300.	103.532	19.174	122.706	101620.4	19.857
5400.	103.891	19.186	123.077	103606.1	19.857
5500.	104.243	19.199	123.441	105591.8	19.858
5600.	104.589	19.210	123.799	107577.7	19.858
5700.	104.929	19.222	124.151	109563.5	19.859
5800.	105.263	19.233	124.496	111549.4	19.859
5900.	105.592	19.243	124.835	113535.4	19.860
6000.	105.916	19.254	125.169	115521.4	19.860
6100.	106.234	19.264	125.497	117507.4	19.861
6200.	106.547	19.273	125.820	119493.5	19.861
6300.	106.856	19.282	126.138	121479.6	19.861
6400.	107.159	19.292	126.451	123465.8	19.862
6500.	107.459	19.300	126.759	125452.0	19.862
6600.	107.753	19.309	127.062	127438.2	19.862
6700.	108.044	19.317	127.361	129424.4	19.863
6800.	108.330	19.325	127.655	131410.7	19.863
6900.	108.612	19.333	127.945	133397.0	19.863
7000.	108.890	19.340	128.231	135383.4	19.864

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.011793
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.049342
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.011785

Table A-51 Thermodynamic Functions for BeF_2

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	32.259	6.951	39.210	347.6	6.955
75.	35.078	6.953	42.031	521.4	6.956
100.	37.078	6.954	44.032	695.4	6.964
125.	38.631	6.960	45.590	869.9	7.009
150.	39.901	6.976	46.877	1046.4	7.124
175.	40.978	7.011	47.989	1226.9	7.323
200.	41.918	7.066	48.984	1413.2	7.597
225.	42.754	7.143	49.897	1607.1	7.922
250.	43.512	7.238	50.750	1809.6	8.278
275.	44.207	7.349	51.556	2021.1	8.644
300.	44.851	7.473	52.324	2241.8	9.009
325.	45.455	7.605	53.059	2471.5	9.365
350.	46.023	7.743	53.766	2709.9	9.704
375.	46.562	7.884	54.446	2956.6	10.026
400.	47.076	8.028	55.103	3211.0	10.329
425.	47.567	8.171	55.738	3472.8	10.612
450.	48.038	8.314	56.352	3741.5	10.876
475.	48.491	8.456	56.947	4016.5	11.122
500.	48.928	8.595	57.523	4297.4	11.350
550.	49.760	8.864	58.625	4875.4	11.757
600.	50.543	9.120	59.663	5472.2	12.108
650.	51.282	9.362	60.644	6085.4	12.410
700.	51.985	9.589	61.574	6712.5	12.670
750.	52.654	9.802	62.456	7351.8	12.895
800.	53.293	10.002	63.294	8001.5	13.090
850.	53.905	10.189	64.093	8660.3	13.260
900.	54.492	10.363	64.855	9327.1	13.408
950.	55.057	10.527	65.584	10000.8	13.539
1000.	55.601	10.681	66.281	10680.7	13.653
1050.	56.125	10.825	66.950	11365.9	13.755
1100.	56.632	10.960	67.592	12056.0	13.845
1150.	57.122	11.087	68.209	12750.3	13.926
1200.	57.596	11.207	68.803	13448.4	13.997
1250.	58.056	11.320	69.376	14149.9	14.062
1300.	58.502	11.427	69.929	14854.5	14.120
1350.	58.936	11.527	70.463	15561.8	14.172
1400.	59.356	11.623	70.979	16271.7	14.220
1450.	59.766	11.713	71.479	16983.8	14.263
1500.	60.164	11.799	71.963	17697.9	14.302
1550.	60.553	11.880	72.433	18413.9	14.338
1600.	60.931	11.957	72.888	19131.7	14.371
1650.	61.300	12.031	73.331	19851.0	14.401
1700.	61.660	12.101	73.761	20571.7	14.429
1750.	62.012	12.168	74.180	21293.8	14.454
1800.	62.356	12.232	74.588	22017.1	14.478
1850.	62.692	12.293	74.984	22741.5	14.499
1900.	63.020	12.351	75.371	23467.0	14.519
1950.	63.342	12.407	75.749	24193.5	14.538
2000.	63.657	12.460	76.117	24920.8	14.556
2050.	63.965	12.512	76.477	25649.0	14.572

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.021271
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.088997
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.021257

Table A-51 Thermodynamic Functions for BeF_2 - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	64.267	12.561	76.828	26378.0	14.587
2150.	64.563	12.608	77.171	27107.7	14.601
2200.	64.854	12.654	77.507	27838.0	14.614
2250.	65.138	12.697	77.836	28569.1	14.627
2300.	65.418	12.739	78.157	29300.7	14.638
2350.	65.692	12.780	78.472	30032.9	14.649
2400.	65.962	12.819	78.781	30765.6	14.659
2450.	66.227	12.857	79.083	31498.8	14.669
2500.	66.487	12.893	79.380	32232.5	14.678
2600.	66.994	12.962	79.956	33701.1	14.695
2700.	67.484	13.026	80.511	35171.3	14.710
2800.	67.959	13.087	81.046	36643.0	14.723
2900.	68.419	13.143	81.563	38115.9	14.735
3000.	68.866	13.197	82.062	39590.0	14.746
3100.	69.299	13.247	82.546	41065.1	14.756
3200.	69.721	13.294	83.015	42541.1	14.765
3300.	70.130	13.339	83.469	44018.0	14.773
3400.	70.529	13.381	83.910	45495.7	14.781
3500.	70.918	13.421	84.339	46974.1	14.787
3600.	71.296	13.459	84.756	48453.2	14.794
3700.	71.666	13.495	85.161	49932.9	14.800
3800.	72.026	13.530	85.556	51413.1	14.805
3900.	72.378	13.563	85.940	52893.9	14.810
4000.	72.722	13.594	86.315	54375.1	14.815
4100.	73.058	13.624	86.681	55856.8	14.819
4200.	73.386	13.652	87.038	57338.9	14.823
4300.	73.708	13.679	87.387	58821.4	14.827
4400.	74.023	13.705	87.728	60304.2	14.830
4500.	74.331	13.731	88.061	61787.4	14.833
4600.	74.633	13.755	88.387	63270.8	14.836
4700.	74.929	13.778	88.707	64754.6	14.839
4800.	75.219	13.800	89.019	66238.7	14.842
4900.	75.504	13.821	89.325	67723.0	14.844
5000.	75.783	13.842	89.625	69207.6	14.847
5100.	76.058	13.861	89.919	70692.3	14.849
5200.	76.327	13.880	90.207	72177.4	14.851
5300.	76.592	13.899	90.490	73662.6	14.853
5400.	76.852	13.916	90.768	75148.0	14.855
5500.	77.107	13.933	91.041	76633.5	14.857
5600.	77.358	13.950	91.308	78119.3	14.858
5700.	77.605	13.966	91.571	79605.2	14.860
5800.	77.848	13.981	91.830	81091.3	14.862
5900.	78.088	13.996	92.084	82577.5	14.863
6000.	78.323	14.011	92.334	84063.9	14.864
273.15	44.157	7.341	51.498	2005.1	8.617
298.15	44.805	7.463	52.268	2225.2	8.983

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

47.013, 12.36, 2, 1.

The frequencies and their degeneracies were taken as:

1520. (1), 825. (2), 750. (1).

Table A-52 Thermodynamic Functions for $BeCl_2$

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	35.966	6.954	42.920	347.7	6.956
75.	38.786	6.959	45.745	521.9	6.994
100.	40.791	6.987	47.778	698.7	7.187
125.	42.358	7.064	49.421	882.9	7.579
150.	43.656	7.192	50.848	1078.7	8.097
175.	44.777	7.361	52.138	1288.1	8.657
200.	45.772	7.557	53.330	1511.5	9.205
225.	46.675	7.769	54.444	1748.1	9.714
250.	47.504	7.987	55.492	1996.8	10.178
275.	48.276	8.206	56.482	2256.6	10.596
300.	48.999	8.421	57.420	2526.2	10.970
325.	49.682	8.630	58.312	2804.8	11.306
350.	50.329	8.832	59.161	3091.3	11.607
375.	50.945	9.026	59.971	3384.9	11.877
400.	51.533	9.212	60.745	3684.9	12.120
425.	52.097	9.390	61.487	3990.7	12.337
450.	52.638	9.559	62.198	4301.6	12.533
475.	53.160	9.720	62.880	4617.2	12.710
500.	53.662	9.874	63.536	4937.0	12.870
550.	54.617	10.159	64.776	5587.5	13.145
600.	55.512	10.418	65.930	6250.6	13.371
650.	56.355	10.652	67.008	6924.0	13.559
700.	57.153	10.866	68.018	7606.0	13.716
750.	57.909	11.060	68.969	8295.2	13.849
800.	58.629	11.238	69.867	8990.5	13.961
850.	59.315	11.401	70.716	9691.1	14.057
900.	59.971	11.551	71.522	10396.0	14.140
950.	60.599	11.689	72.289	11104.8	14.211
1000.	61.202	11.817	73.019	11817.0	14.273
1050.	61.782	11.935	73.717	12532.0	14.327
1100.	62.339	12.045	74.384	13249.6	14.375
1150.	62.877	12.147	75.024	13969.4	14.417
1200.	63.396	12.243	75.639	14691.3	14.455
1250.	63.898	12.332	76.230	15414.8	14.488
1300.	64.383	12.415	76.798	16140.0	14.518
1350.	64.853	12.494	77.347	16866.6	14.545
1400.	65.309	12.567	77.876	17594.4	14.569
1450.	65.751	12.637	78.388	18323.4	14.591
1500.	66.181	12.702	78.883	19053.5	14.610
1550.	66.598	12.764	79.362	19784.5	14.628
1600.	67.004	12.823	79.827	20516.3	14.645
1650.	67.400	12.878	80.278	21248.9	14.660
1700.	67.785	12.931	80.716	21982.3	14.674
1750.	68.160	12.981	81.141	22716.3	14.686
1800.	68.527	13.028	81.555	23450.9	14.698
1850.	68.884	13.074	81.958	24186.0	14.709
1900.	69.234	13.117	82.350	24921.7	14.719
1950.	69.575	13.158	82.733	25657.9	14.728
2000.	69.908	13.197	83.106	26394.5	14.736
2050.	70.235	13.235	83.470	27131.5	14.744

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.012511
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.052346
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.012503

Table A-52 Thermodynamic Functions for $BeCl_2$ - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	70.554	13.271	83.825	27868.9	14.752
2150.	70.867	13.305	84.172	28606.7	14.759
2200.	71.173	13.339	84.512	29344.7	14.765
2250.	71.473	13.370	84.844	30083.1	14.771
2300.	71.767	13.401	85.168	30821.8	14.777
2350.	72.056	13.430	85.486	31560.8	14.782
2400.	72.339	13.458	85.797	32300.0	14.787
2450.	72.617	13.486	86.102	33039.5	14.792
2500.	72.889	13.512	86.401	33779.2	14.796
2600.	73.420	13.561	86.982	35259.2	14.804
2700.	73.933	13.607	87.540	36740.0	14.811
2800.	74.429	13.651	88.079	38221.4	14.818
2900.	74.908	13.691	88.599	39703.5	14.824
3000.	75.373	13.729	89.102	41186.1	14.829
3100.	75.824	13.764	89.588	42669.2	14.834
3200.	76.262	13.798	90.059	44152.8	14.838
3300.	76.687	13.829	90.516	45636.8	14.842
3400.	77.100	13.859	90.959	47121.1	14.845
3500.	77.502	13.887	91.389	48605.9	14.849
3600.	77.894	13.914	91.808	50090.9	14.852
3700.	78.275	13.940	92.215	51576.2	14.855
3800.	78.647	13.964	92.611	53061.8	14.857
3900.	79.010	13.987	92.997	54547.6	14.860
4000.	79.365	14.008	93.373	56033.7	14.862
4100.	79.711	14.029	93.740	57520.0	14.864
4200.	80.049	14.049	94.098	59006.4	14.866
4300.	80.380	14.068	94.448	60493.1	14.867
4400.	80.704	14.086	94.790	61979.9	14.869
4500.	81.020	14.104	95.124	63466.9	14.871
4600.	81.331	14.120	95.451	64954.0	14.872
4700.	81.634	14.136	95.771	66441.3	14.873
4800.	81.932	14.152	96.084	67928.7	14.875
4900.	82.224	14.167	96.391	69416.2	14.876
5000.	82.510	14.181	96.691	70903.9	14.877
5100.	82.791	14.194	96.986	72391.7	14.878
5200.	83.067	14.208	97.275	73879.5	14.879
5300.	83.338	14.220	97.558	75367.5	14.880
5400.	83.604	14.233	97.836	76855.5	14.881
5500.	83.865	14.244	98.109	78343.7	14.882
5600.	84.122	14.256	98.378	79831.9	14.883
5700.	84.374	14.267	98.641	81320.2	14.883
5800.	84.623	14.277	98.900	82808.5	14.884
5900.	84.867	14.288	99.154	84297.0	14.885
6000.	85.107	14.298	99.404	85785.5	14.885
273.15	48.221	8.190	56.410	2237.0	10.566
298.15	48.947	8.405	57.352	2505.0	10.944

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

79.927, 36.06, 2, 1.

The frequencies and their degeneracies were taken as:

1113. (1), 482. (2), 550. (1).

Table A-53 Thermodynamic Functions for BeFCl

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	35.575	6.953	42.527	347.6	6.955
75.	38.394	6.954	45.348	521.5	6.958
100.	40.395	6.958	47.352	695.8	6.988
125.	41.949	6.973	48.922	871.6	7.098
150.	43.223	7.011	50.233	1051.6	7.317
175.	44.308	7.076	51.384	1238.3	7.633
200.	45.259	7.169	52.428	1433.8	8.016
225.	46.110	7.286	53.396	1639.4	8.436
250.	46.884	7.423	54.307	1855.7	8.866
275.	47.599	7.573	55.172	2082.6	9.290
300.	48.264	7.733	55.998	2320.0	9.696
325.	48.890	7.899	56.789	2567.2	10.080
350.	49.482	8.068	57.549	2823.8	10.437
375.	50.044	8.237	58.281	3088.9	10.768
400.	50.581	8.405	58.986	3361.9	11.072
425.	51.095	8.570	59.665	3642.2	11.350
450.	51.590	8.732	60.322	3929.2	11.605
475.	52.066	8.889	60.955	4222.3	11.837
500.	52.526	9.042	61.568	4520.9	12.050
550.	53.402	9.333	62.734	5132.9	12.420
600.	54.225	9.603	63.829	5761.9	12.729
650.	55.004	9.854	64.858	6405.1	12.989
700.	55.743	10.086	65.829	7060.1	13.207
750.	56.446	10.300	66.747	7725.2	13.393
800.	57.117	10.499	67.616	8398.9	13.551
850.	57.759	10.682	68.442	9080.0	13.686
900.	58.375	10.853	69.227	9767.3	13.803
950.	58.966	11.011	69.977	10460.0	13.905
1000.	59.535	11.158	70.692	11157.6	13.993
1050.	60.082	11.294	71.377	11859.2	14.071
1100.	60.611	11.422	72.033	12564.5	14.139
1150.	61.121	11.542	72.663	13273.0	14.200
1200.	61.615	11.654	73.268	13984.4	14.254
1250.	62.093	11.759	73.851	14698.3	14.302
1300.	62.556	11.857	74.413	15414.4	14.344
1350.	63.005	11.950	74.955	16132.6	14.383
1400.	63.441	12.038	75.479	16852.7	14.418
1450.	63.865	12.120	75.985	17574.4	14.449
1500.	64.277	12.198	76.476	18297.6	14.478
1550.	64.678	12.272	76.951	19022.1	14.504
1600.	65.069	12.342	77.412	19747.9	14.528
1650.	65.450	12.409	77.859	20474.8	14.549
1700.	65.821	12.472	78.294	21202.8	14.569
1750.	66.184	12.532	78.716	21931.7	14.587
1800.	66.538	12.590	79.127	22661.5	14.604
1850.	66.883	12.644	79.528	23392.1	14.620
1900.	67.221	12.697	79.918	24123.5	14.634
1950.	67.552	12.746	80.298	24855.5	14.648
2000.	67.875	12.794	80.669	25588.2	14.660
2050.	68.192	12.840	81.031	26321.5	14.671

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.015755
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.065919
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.015744

Table A-53 Thermodynamic Functions for BeFCl - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ-H^\circ_0)/T$	S°	$H^\circ-H^\circ_0$	C°_p
2100.	68.501	12.884	81.385	27055.4	14.682
2150.	68.805	12.925	81.731	27789.7	14.692
2200.	69.103	12.966	82.068	28524.6	14.701
2250.	69.395	13.004	82.399	29259.8	14.710
2300.	69.681	13.042	82.722	29995.6	14.718
2350.	69.962	13.077	83.039	30731.7	14.726
2400.	70.237	13.112	83.349	31468.2	14.733
2450.	70.508	13.145	83.653	32205.0	14.740
2500.	70.774	13.177	83.951	32942.2	14.747
2600.	71.292	13.237	84.529	34417.4	14.758
2700.	71.793	13.294	85.087	35893.8	14.769
2800.	72.277	13.347	85.624	37371.1	14.778
2900.	72.746	13.396	86.143	38849.4	14.787
3000.	73.201	13.443	86.644	40328.4	14.794
3100.	73.643	13.487	87.129	41808.2	14.801
3200.	74.072	13.528	87.599	43288.7	14.807
3300.	74.488	13.567	88.055	44769.7	14.813
3400.	74.894	13.603	88.497	46251.3	14.818
3500.	75.289	13.638	88.927	47733.4	14.823
3600.	75.673	13.671	89.345	49215.9	14.828
3700.	76.048	13.702	89.751	50698.9	14.832
3800.	76.414	13.732	90.146	52182.3	14.835
3900.	76.771	13.761	90.532	53666.0	14.839
4000.	77.120	13.788	90.908	55150.0	14.842
4100.	77.461	13.813	91.274	56634.4	14.845
4200.	77.794	13.838	91.632	58119.1	14.848
4300.	78.120	13.861	91.981	59604.0	14.851
4400.	78.439	13.884	92.323	61089.2	14.853
4500.	78.751	13.905	92.657	62574.6	14.855
4600.	79.057	13.926	92.983	64060.2	14.857
4700.	79.357	13.946	93.303	65546.0	14.859
4800.	79.650	13.965	93.615	67032.0	14.861
4900.	79.939	13.983	93.922	68518.2	14.863
5000.	80.221	14.001	94.222	70004.6	14.864
5100.	80.499	14.018	94.517	71491.1	14.866
5200.	80.771	14.034	94.805	72977.8	14.868
5300.	81.039	14.050	95.088	74464.6	14.869
5400.	81.301	14.065	95.366	75951.6	14.870
5500.	81.560	14.080	95.639	77438.7	14.871
5600.	81.813	14.094	95.907	78925.9	14.873
5700.	82.063	14.108	96.170	80413.2	14.874
5800.	82.308	14.121	96.429	81900.6	14.875
5900.	82.550	14.134	96.683	83388.1	14.876
6000.	82.788	14.146	96.933	84875.7	14.877
273.15	47.548	7.562	55.109	2065.5	9.259
298.15	48.217	7.721	55.938	2302.1	9.667

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

63.47, 20.91, 1, 1.

The frequencies and their degeneracies were taken as:

1200. (1), 800. (1), 650. (2).

Table A-54 Thermodynamic Functions for MgF_2

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	34.030	6.953	40.983	347.6	6.959
75.	36.851	6.963	43.814	522.2	7.035
100.	38.859	7.012	45.872	701.2	7.323
125.	40.435	7.121	47.556	890.2	7.822
150.	41.747	7.288	49.036	1093.3	8.437
175.	42.886	7.498	50.384	1312.2	9.079
200.	43.902	7.735	51.637	1547.0	9.695
225.	44.828	7.985	52.812	1796.5	10.260
250.	45.682	8.238	53.920	2059.5	10.766
275.	46.479	8.488	54.968	2334.3	11.212
300.	47.228	8.732	55.960	2619.6	11.604
325.	47.936	8.966	56.903	2914.1	11.945
350.	48.609	9.190	57.799	3216.5	12.242
375.	49.251	9.402	58.653	3525.9	12.502
400.	49.864	9.603	59.467	3841.3	12.729
425.	50.452	9.793	60.245	4162.1	12.928
450.	51.017	9.972	60.989	4487.5	13.102
475.	51.560	10.141	61.702	4817.0	13.256
500.	52.085	10.300	62.385	5150.2	13.392
550.	53.080	10.592	63.673	5825.7	13.621
600.	54.013	10.853	64.866	6511.5	13.803
650.	54.891	11.085	65.977	7205.5	13.951
700.	55.721	11.294	67.015	7906.1	14.071
750.	56.507	11.483	67.989	8612.2	14.170
800.	57.253	11.654	68.907	9322.9	14.254
850.	57.964	11.809	69.773	10037.4	14.324
900.	58.643	11.950	70.593	10755.1	14.383
950.	59.293	12.079	71.373	11475.5	14.434
1000.	59.916	12.198	72.114	12198.3	14.478
1050.	60.514	12.308	72.821	12923.2	14.516
1100.	61.088	12.409	73.497	13649.8	14.549
1150.	61.642	12.503	74.145	14378.1	14.578
1200.	62.176	12.590	74.766	15107.6	14.604
1250.	62.692	12.671	75.362	15838.4	14.627
1300.	63.190	12.746	75.937	16570.3	14.648
1350.	63.673	12.817	76.490	17303.1	14.666
1400.	64.140	12.883	77.023	18036.9	14.682
1450.	64.593	12.946	77.539	18771.3	14.697
1500.	65.033	13.004	78.037	19506.5	14.710
1550.	65.460	13.060	78.520	20242.3	14.722
1600.	65.876	13.112	78.987	20978.7	14.733
1650.	66.280	13.161	79.441	21715.7	14.743
1700.	66.674	13.208	79.881	22453.1	14.753
1750.	67.057	13.252	80.309	23190.9	14.761
1800.	67.431	13.294	80.725	23929.1	14.769
1850.	67.796	13.334	81.130	24667.8	14.776
1900.	68.152	13.372	81.524	25406.7	14.783
1950.	68.500	13.408	81.908	26146.0	14.789
2000.	68.840	13.443	82.282	26885.6	14.794
2050.	69.172	13.476	82.648	27625.4	14.800

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.016046
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.067136
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.016036

Table A-54 Thermodynamic Functions for MgF_2 - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	69.497	13.507	83.004	28365.5	14.804
2150.	69.815	13.538	83.353	29105.9	14.809
2200.	70.127	13.567	83.693	29846.4	14.813
2250.	70.432	13.594	84.026	30587.2	14.817
2300.	70.731	13.621	84.352	31328.1	14.821
2350.	71.024	13.646	84.671	32069.3	14.824
2400.	71.312	13.671	84.983	32810.6	14.828
2450.	71.594	13.695	85.289	33552.0	14.831
2500.	71.871	13.717	85.588	34293.6	14.834
2600.	72.410	13.760	86.170	35777.3	14.839
2700.	72.930	13.801	86.730	37261.4	14.844
2800.	73.432	13.838	87.270	38746.0	14.848
2900.	73.919	13.873	87.791	40231.0	14.852
3000.	74.389	13.905	88.295	41716.3	14.855
3100.	74.846	13.936	88.782	43202.0	14.858
3200.	75.289	13.965	89.254	44688.0	14.861
3300.	75.719	13.992	89.711	46174.2	14.864
3400.	76.137	14.018	90.155	47660.7	14.866
3500.	76.544	14.042	90.586	49147.4	14.868
3600.	76.940	14.065	91.005	50634.3	14.870
3700.	77.325	14.087	91.412	52121.5	14.872
3800.	77.701	14.108	91.809	53608.7	14.874
3900.	78.068	14.127	92.195	55096.2	14.875
4000.	78.426	14.146	92.572	56583.8	14.877
4100.	78.775	14.164	92.939	58071.5	14.878
4200.	79.117	14.181	93.298	59559.4	14.879
4300.	79.451	14.197	93.648	61047.4	14.880
4400.	79.777	14.213	93.990	62535.5	14.881
4500.	80.097	14.227	94.324	64023.7	14.882
4600.	80.410	14.242	94.652	65512.0	14.883
4700.	80.716	14.255	94.972	67000.3	14.884
4800.	81.017	14.269	95.285	68488.8	14.885
4900.	81.311	14.281	95.592	69977.4	14.886
5000.	81.599	14.293	95.893	71466.0	14.887
5100.	81.883	14.305	96.187	72954.7	14.887
5200.	82.161	14.316	96.477	74443.5	14.888
5300.	82.433	14.327	96.760	75932.3	14.889
5400.	82.701	14.337	97.038	77421.2	14.889
5500.	82.964	14.347	97.312	78910.1	14.890
5600.	83.223	14.357	97.580	80399.1	14.890
5700.	83.477	14.366	97.844	81888.2	14.891
5800.	83.727	14.375	98.103	83377.3	14.891
5900.	83.973	14.384	98.357	84866.4	14.892
6000.	84.215	14.393	98.607	86355.6	14.892
273.15	46.422	8.470	54.892	2313.6	11.181
298.15	47.174	8.714	55.889	2598.2	11.576

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

62.32, 19.76, 2, 1.

The frequencies and their degeneracies were taken as:

800. (1), 400. (1), 500. (2).

Table A-55 Thermodynamic Functions for $MgCl_2$

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	37.362	6.964	44.327	348.2	7.041
75.	40.201	7.070	47.271	530.3	7.615
100.	42.266	7.320	49.586	732.0	8.548
125.	43.935	7.662	51.597	957.7	9.497
150.	45.365	8.039	53.404	1205.8	10.331
175.	46.633	8.418	55.051	1473.1	11.028
200.	47.781	8.781	56.562	1756.2	11.603
225.	48.835	9.122	57.957	2052.4	12.076
250.	49.813	9.437	59.250	2359.3	12.464
275.	50.726	9.727	60.454	2675.0	12.785
300.	51.584	9.994	61.578	2998.1	13.052
325.	52.394	10.238	62.632	3327.3	13.274
350.	53.161	10.461	63.622	3661.5	13.461
375.	53.890	10.667	64.557	4000.1	13.619
400.	54.584	10.856	65.440	4342.3	13.754
425.	55.248	11.030	66.277	4687.6	13.870
450.	55.883	11.190	67.073	5035.6	13.969
475.	56.492	11.339	67.831	5386.0	14.056
500.	57.077	11.477	68.554	5738.3	14.131
550.	58.183	11.724	69.907	6448.1	14.255
600.	59.212	11.939	71.151	7163.4	14.352
650.	60.175	12.128	72.303	7883.0	14.429
700.	61.080	12.294	73.375	8606.0	14.491
750.	61.934	12.443	74.376	9331.9	14.542
800.	62.741	12.575	75.316	10060.1	14.585
850.	63.507	12.694	76.202	10790.3	14.620
900.	64.236	12.802	77.038	11522.0	14.650
950.	64.931	12.900	77.831	12255.2	14.675
1000.	65.595	12.989	78.584	12989.5	14.697
1050.	66.230	13.071	79.302	13724.8	14.716
1100.	66.840	13.146	79.987	14461.0	14.732
1150.	67.426	13.216	80.642	15198.0	14.747
1200.	67.990	13.280	81.270	15935.7	14.759
1250.	68.533	13.339	81.872	16673.9	14.770
1300.	69.058	13.394	82.452	17412.7	14.780
1350.	69.564	13.446	83.010	18151.9	14.789
1400.	70.054	13.494	83.548	18891.6	14.797
1450.	70.528	13.539	84.067	19631.7	14.804
1500.	70.988	13.581	84.569	20372.0	14.811
1550.	71.434	13.621	85.055	21112.7	14.817
1600.	71.867	13.659	85.526	21853.7	14.822
1650.	72.288	13.694	85.982	22594.9	14.827
1700.	72.697	13.727	86.425	23336.4	14.831
1750.	73.096	13.759	86.854	24078.1	14.836
1800.	73.484	13.789	87.272	24820.0	14.839
1850.	73.862	13.817	87.679	25562.0	14.843
1900.	74.231	13.844	88.075	26304.2	14.846
1950.	74.591	13.870	88.461	27046.6	14.849
2000.	74.942	13.895	88.837	27789.1	14.852
2050.	75.285	13.918	89.203	28531.8	14.854

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.010500
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.043932
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.010493

Table A-55 Thermodynamic Functions for $MgCl_2$ - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	75.621	13.940	89.561	29274.5	14.856
2150.	75.949	13.962	89.911	30017.4	14.859
2200.	76.271	13.982	90.253	30760.4	14.861
2250.	76.585	14.002	90.587	31503.5	14.863
2300.	76.893	14.020	90.913	32246.7	14.864
2350.	77.195	14.038	91.233	32989.9	14.866
2400.	77.490	14.056	91.546	33733.3	14.868
2450.	77.780	14.072	91.853	34476.7	14.869
2500.	78.065	14.088	92.153	35220.2	14.871
2600.	78.618	14.118	92.736	36707.4	14.873
2700.	79.151	14.146	93.298	38194.8	14.875
2800.	79.666	14.172	93.839	39682.4	14.877
2900.	80.164	14.197	94.361	41170.3	14.879
3000.	80.646	14.219	94.865	42658.3	14.881
3100.	81.112	14.241	95.353	44146.4	14.882
3200.	81.565	14.261	95.826	45634.7	14.884
3300.	82.004	14.280	96.284	47123.2	14.885
3400.	82.430	14.298	96.728	48611.7	14.886
3500.	82.845	14.314	97.160	50100.4	14.887
3600.	83.249	14.330	97.579	51589.2	14.888
3700.	83.641	14.345	97.987	53078.0	14.889
3800.	84.024	14.360	98.384	54566.9	14.890
3900.	84.397	14.373	98.771	56056.0	14.890
4000.	84.761	14.386	99.148	57545.0	14.891
4100.	85.117	14.399	99.515	59034.2	14.892
4200.	85.464	14.410	99.874	60523.4	14.892
4300.	85.803	14.422	100.225	62012.7	14.893
4400.	86.135	14.432	100.567	63502.0	14.893
4500.	86.459	14.443	100.902	64991.4	14.894
4600.	86.777	14.452	101.229	66480.8	14.894
4700.	87.088	14.462	101.550	67970.2	14.895
4800.	87.392	14.471	101.863	69459.7	14.895
4900.	87.691	14.479	102.170	70949.3	14.896
5000.	87.983	14.488	102.471	72438.9	14.896
5100.	88.270	14.496	102.766	73928.5	14.896
5200.	88.552	14.503	103.055	75418.1	14.897
5300.	88.828	14.511	103.339	76907.8	14.897
5400.	89.100	14.518	103.618	78397.5	14.897
5500.	89.366	14.525	103.891	79887.2	14.897
5600.	89.628	14.532	104.159	81377.0	14.898
5700.	89.885	14.538	104.423	82866.8	14.898
5800.	90.138	14.544	104.682	84356.6	14.898
5900.	90.387	14.550	104.937	85846.4	14.898
6000.	90.631	14.556	105.187	87336.2	14.899
273.15	50.661	9.707	60.367	2651.4	12.763
298.15	51.522	9.975	61.497	2974.0	13.033

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

95.234, 55.96, 2, 1.

The frequencies and their degeneracies were taken as:

597. (1), 300. (1), 295. (2).

Table A-56 Thermodynamic Functions for MgFCl

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	37.176	6.954	44.130	347.7	6.961
75.	39.997	6.972	46.969	522.9	7.092
100.	42.012	7.049	49.060	704.9	7.519
125.	43.600	7.206	50.807	900.8	8.182
150.	44.933	7.431	52.364	1114.7	8.933
175.	46.098	7.699	53.797	1347.3	9.667
200.	47.145	7.987	55.132	1597.5	10.333
225.	48.103	8.281	56.384	1863.3	10.917
250.	48.990	8.571	57.561	2142.6	11.419
275.	49.820	8.849	58.670	2433.6	11.846
300.	50.602	9.115	59.716	2734.4	12.209
325.	51.341	9.365	60.706	3043.6	12.518
350.	52.044	9.600	61.644	3359.9	12.781
375.	52.714	9.820	62.533	3682.3	13.006
400.	53.354	10.025	63.379	4010.0	13.199
425.	53.968	10.217	64.184	4342.1	13.366
450.	54.557	10.396	64.953	4678.1	13.510
475.	55.124	10.563	65.687	5017.4	13.636
500.	55.669	10.720	66.389	5359.8	13.747
550.	56.705	11.003	67.708	6051.9	13.930
600.	57.673	11.253	68.926	6752.1	14.073
650.	58.583	11.475	70.058	7458.7	14.188
700.	59.440	11.672	71.113	8170.5	14.281
750.	60.252	11.849	72.101	8886.5	14.357
800.	61.022	12.008	73.029	9606.0	14.421
850.	61.754	12.151	73.905	10328.4	14.474
900.	62.452	12.281	74.734	11053.3	14.519
950.	63.120	12.400	75.520	11780.2	14.557
1000.	63.758	12.509	76.267	12508.9	14.590
1050.	64.371	12.609	76.980	13239.1	14.618
1100.	64.960	12.701	77.661	13970.7	14.643
1150.	65.526	12.786	78.312	14703.4	14.665
1200.	66.072	12.864	78.936	15437.1	14.684
1250.	66.599	12.937	79.536	16171.7	14.701
1300.	67.108	13.006	80.113	16907.2	14.716
1350.	67.600	13.069	80.669	17643.3	14.730
1400.	68.076	13.129	81.205	18380.1	14.742
1450.	68.538	13.184	81.722	19117.5	14.753
1500.	68.986	13.237	82.222	19855.3	14.762
1550.	69.420	13.286	82.707	20593.7	14.771
1600.	69.843	13.333	83.176	21332.4	14.779
1650.	70.254	13.377	83.631	22071.6	14.787
1700.	70.654	13.418	84.072	22811.1	14.793
1750.	71.043	13.458	84.501	23550.9	14.800
1800.	71.423	13.495	84.918	24291.1	14.805
1850.	71.793	13.531	85.324	25031.5	14.811
1900.	72.155	13.564	85.719	25772.1	14.815
1950.	72.507	13.596	86.104	26513.0	14.820
2000.	72.852	13.627	86.479	27254.1	14.824
2050.	73.189	13.656	86.845	27995.4	14.828

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.012694
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.053112
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.012686

Table A-56 Thermodynamic Functions for MgFCl - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	73.518	13.684	87.202	28736.9	14.831
2150.	73.841	13.711	87.552	29478.5	14.835
2200.	74.156	13.737	87.893	30220.4	14.838
2250.	74.465	13.761	88.226	30962.3	14.841
2300.	74.768	13.785	88.552	31704.4	14.844
2350.	75.064	13.807	88.872	32446.7	14.846
2400.	75.355	13.829	89.184	33189.1	14.848
2450.	75.641	13.850	89.490	33931.5	14.851
2500.	75.921	13.870	89.790	34674.1	14.853
2600.	76.465	13.908	90.373	36159.6	14.857
2700.	76.991	13.943	90.934	37645.5	14.860
2800.	77.499	13.976	91.474	39131.6	14.863
2900.	77.990	14.006	91.996	40618.1	14.866
3000.	78.465	14.035	92.500	42104.8	14.869
3100.	78.926	14.062	92.987	43591.8	14.871
3200.	79.372	14.087	93.460	45079.0	14.873
3300.	79.806	14.111	93.917	46566.4	14.875
3400.	80.228	14.134	94.361	48053.9	14.876
3500.	80.638	14.155	94.793	49541.7	14.878
3600.	81.037	14.175	95.212	51029.6	14.880
3700.	81.426	14.194	95.620	52517.6	14.881
3800.	81.804	14.212	96.016	54005.7	14.882
3900.	82.174	14.229	96.403	55494.0	14.883
4000.	82.534	14.246	96.780	56982.4	14.884
4100.	82.886	14.261	97.147	58470.8	14.885
4200.	83.230	14.276	97.506	59959.4	14.886
4300.	83.566	14.290	97.856	61448.1	14.887
4400.	83.895	14.304	98.199	62936.8	14.888
4500.	84.216	14.317	98.533	64425.6	14.888
4600.	84.531	14.329	98.860	65914.5	14.889
4700.	84.839	14.341	99.181	67403.4	14.890
4800.	85.141	14.353	99.494	68892.4	14.890
4900.	85.438	14.364	99.801	70381.5	14.891
5000.	85.728	14.374	100.102	71870.6	14.892
5100.	86.013	14.384	100.397	73359.8	14.892
5200.	86.292	14.394	100.686	74849.0	14.892
5300.	86.566	14.403	100.970	76338.3	14.893
5400.	86.836	14.413	101.248	77827.6	14.893
5500.	87.100	14.421	101.521	79317.0	14.894
5600.	87.360	14.430	101.790	80806.4	14.894
5700.	87.616	14.438	102.053	82295.8	14.894
5800.	87.867	14.446	102.312	83785.3	14.895
5900.	88.114	14.453	102.567	85274.8	14.895
6000.	88.357	14.461	102.817	86764.3	14.895
273.15	49.761	8.829	58.590	2411.7	11.817
298.15	50.545	9.096	59.641	2711.8	12.185

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

78.777, 33.86, 1, 1.

The frequencies and their degeneracies were taken as:

650. (1), 450. (1), 400. (2).

Table A-57. Thermodynamic Functions for Al_2O (gas)

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
50.	38.515	7.949	46.464	397.5	7.950
75.	41.738	7.952	49.690	596.4	7.975
100.	44.028	7.969	51.997	796.9	8.078
125.	45.810	8.008	53.817	1001.0	8.258
150.	47.275	8.068	55.342	1210.2	8.482
175.	48.524	8.144	56.668	1425.2	8.729
200.	49.617	8.233	57.851	1646.7	8.990
225.	50.593	8.333	58.925	1874.8	9.261
250.	51.476	8.439	59.915	2109.8	9.537
275.	52.285	8.552	60.837	2351.7	9.814
300.	53.035	8.668	61.703	2600.4	10.084
325.	53.733	8.787	62.520	2855.8	10.345
350.	54.389	8.907	63.296	3117.6	10.593
375.	55.007	9.028	64.035	3385.3	10.826
400.	55.594	9.147	64.741	3658.7	11.044
425.	56.152	9.264	65.416	3937.4	11.245
450.	56.685	9.380	66.064	4220.9	11.431
475.	57.195	9.492	66.687	4508.8	11.603
500.	57.684	9.602	67.286	4800.9	11.760
550.	58.610	9.811	68.420	5396.0	12.036
600.	59.472	10.006	69.478	6003.8	12.268
650.	60.280	10.188	70.468	6622.2	12.463
700.	61.041	10.357	71.398	7249.6	12.628
750.	61.761	10.513	72.274	7884.6	12.768
800.	62.444	10.658	73.102	8526.0	12.888
850.	63.094	10.792	73.886	9173.1	12.990
900.	63.715	10.917	74.631	9824.9	13.079
950.	64.308	11.032	75.341	10480.8	13.156
1000.	64.877	11.140	76.017	11140.3	13.223
1050.	65.423	11.241	76.664	11802.9	13.281
1100.	65.948	11.335	77.283	12468.3	13.333
1150.	66.454	11.423	77.876	13136.1	13.379
1200.	66.942	11.505	78.447	13806.1	13.420
1250.	67.413	11.582	78.995	14478.0	13.456
1300.	67.869	11.655	79.524	15151.6	13.488
1350.	68.310	11.724	80.033	15826.8	13.517
1400.	68.737	11.788	80.525	16503.3	13.544
1450.	69.152	11.849	81.001	17181.1	13.567
1500.	69.555	11.907	81.461	17860.0	13.589
1550.	69.946	11.961	81.907	18540.0	13.609
1600.	70.327	12.013	82.340	19220.8	13.627
1650.	70.697	12.062	82.759	19902.6	13.643
1700.	71.058	12.109	83.167	20585.1	13.658
1750.	71.409	12.153	83.563	21268.4	13.672
1800.	71.752	12.196	83.948	21952.3	13.685
1850.	72.087	12.236	84.323	22636.8	13.696
1900.	72.414	12.275	84.689	23321.9	13.707
1950.	72.733	12.312	85.045	24007.5	13.717
2000.	73.045	12.347	85.392	24693.6	13.726
2050.	73.351	12.381	85.731	25380.1	13.735
2100.	73.649	12.413	86.062	26067.1	13.743
2150.	73.942	12.444	86.386	26754.5	13.751
2200.	74.228	12.474	86.702	27442.2	13.758
2250.	74.509	12.502	87.011	28130.2	13.764
2300.	74.784	12.530	87.314	28818.6	13.771
2350.	75.054	12.556	87.610	29507.3	13.776

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.014294
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.059806
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.014285

Table A-57. Thermodynamic Functions for Al_2O (gas) - Continued

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
2400.	75.318	12.582	87.900	30196.2	13.782
2450.	75.578	12.606	88.184	30885.5	13.787
2500.	75.833	12.630	88.463	31574.9	13.792
2600.	76.329	12.675	89.004	32954.6	13.801
2700.	76.808	12.717	89.525	34335.0	13.809
2800.	77.272	12.756	90.027	35716.3	13.816
2900.	77.720	12.792	90.512	37098.2	13.822
3000.	78.154	12.827	90.981	38480.7	13.828
3100.	78.575	12.859	91.435	39863.7	13.833
3200.	78.984	12.890	91.874	41247.2	13.838
3300.	79.381	12.919	92.300	42631.2	13.842
3400.	79.767	12.946	92.713	44015.7	13.846
3500.	80.143	12.972	93.114	45400.4	13.850
3600.	80.509	12.996	93.505	46785.6	13.853
3700.	80.865	13.019	93.884	48171.0	13.856
3800.	81.212	13.041	94.254	49556.8	13.859
3900.	81.551	13.062	94.614	50942.8	13.861
4000.	81.882	13.082	94.965	52329.1	13.864
4100.	82.206	13.101	95.307	53715.6	13.866
4200.	82.522	13.120	95.641	55102.3	13.868
4300.	82.831	13.137	95.968	56489.2	13.870
4400.	83.133	13.154	96.286	57876.3	13.872
4500.	83.429	13.170	96.598	59263.6	13.874
4600.	83.718	13.185	96.903	60651.1	13.875
4700.	84.002	13.200	97.202	62038.7	13.877
4800.	84.280	13.214	97.494	63426.4	13.878
4900.	84.553	13.227	97.780	64814.3	13.879
5000.	84.820	13.240	98.060	66202.3	13.881
5100.	85.082	13.253	98.335	67590.4	13.882
5200.	85.340	13.265	98.605	68978.7	13.883
5300.	85.592	13.277	98.869	70367.0	13.884
5400.	85.841	13.288	99.129	71755.5	13.885
5500.	86.085	13.299	99.384	73144.0	13.886
5600.	86.324	13.309	99.634	74532.7	13.887
5700.	86.560	13.320	99.880	75921.4	13.888
5800.	86.792	13.329	100.121	77310.2	13.888
5900.	87.020	13.339	100.359	78699.1	13.889
6000.	87.244	13.348	100.592	80088.0	13.890
6100.	87.465	13.357	100.822	81477.1	13.891
6200.	87.682	13.366	101.047	82866.2	13.891
6300.	87.896	13.374	101.270	84255.3	13.892
6400.	88.107	13.382	101.489	85644.5	13.892
6500.	88.314	13.390	101.704	87033.8	13.893
6600.	88.519	13.397	101.916	88423.1	13.894
6700.	88.720	13.405	102.125	89812.5	13.894
6800.	88.919	13.412	102.331	91201.9	13.895
6900.	89.115	13.419	102.534	92591.4	13.895
7000.	89.308	13.426	102.734	93980.9	13.895
273.15	52.228	8.543	60.771	2333.6	9.793
298.15	52.981	8.659	61.640	2581.8	10.064

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

69.96, 5.1, 9.0, 14.1, 2.

The frequencies and their degeneracies were taken as:

450. (1), 1000. (2)

Table A-58 Thermodynamic Functions for Al_2O_2

T °K	$\frac{-(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	36.837	6.962	43.799	348.1	7.019
75.	39.672	7.049	46.721	528.7	7.524
100.	41.728	7.282	49.010	728.2	8.488
125.	43.389	7.635	51.024	954.3	9.608
150.	44.818	8.055	52.872	1208.2	10.684
175.	46.093	8.500	54.593	1487.5	11.641
200.	47.257	8.946	56.203	1789.1	12.467
225.	48.336	9.377	57.713	2109.9	13.180
250.	49.345	9.790	59.135	2447.4	13.802
275.	50.297	10.180	60.476	2799.4	14.351
300.	51.198	10.548	61.747	3164.5	14.843
325.	52.057	10.896	62.952	3541.2	15.287
350.	52.876	11.224	64.100	3928.5	15.690
375.	53.661	11.534	65.196	4325.4	16.058
400.	54.415	11.828	66.243	4731.1	16.395
425.	55.141	12.106	67.246	5144.9	16.703
450.	55.840	12.369	68.209	5566.0	16.985
475.	56.515	12.619	69.134	5993.9	17.244
500.	57.169	12.856	70.025	6428.1	17.482
550.	58.415	13.296	71.711	7312.9	17.900
600.	59.589	13.695	73.284	8217.0	18.254
650.	60.700	14.058	74.758	9137.4	18.553
700.	61.754	14.388	76.142	10071.6	18.808
750.	62.757	14.690	77.447	11017.6	19.026
800.	63.714	14.967	78.681	11973.6	19.213
850.	64.630	15.222	79.851	12938.4	19.374
900.	65.506	15.456	80.963	13910.7	19.514
950.	66.348	15.673	82.021	14889.5	19.636
1000.	67.157	15.874	83.031	15874.0	19.743
1050.	67.936	16.061	83.997	16863.6	19.837
1100.	68.687	16.234	84.921	17857.5	19.920
1150.	69.412	16.396	85.808	18855.4	19.994
1200.	70.113	16.547	86.661	19856.8	20.059
1250.	70.792	16.689	87.481	20861.2	20.118
1300.	71.449	16.822	88.271	21868.5	20.171
1350.	72.086	16.947	89.033	22878.2	20.218
1400.	72.705	17.064	89.769	23890.2	20.261
1450.	73.306	17.175	90.481	24904.2	20.300
1500.	73.890	17.280	91.170	25920.1	20.335
1550.	74.458	17.379	91.837	26937.7	20.367
1600.	75.011	17.473	92.484	27956.8	20.396
1650.	75.550	17.562	93.112	28977.3	20.423
1700.	76.076	17.646	93.722	29999.0	20.448
1750.	76.588	17.727	94.315	31022.0	20.470
1800.	77.089	17.803	94.892	32046.1	20.491
1850.	77.578	17.876	95.454	33071.1	20.511
1900.	78.055	17.946	96.001	34097.1	20.529
1950.	78.522	18.012	96.535	35123.9	20.545
2000.	78.979	18.076	97.055	36151.6	20.560
2050.	79.426	18.137	97.563	37180.0	20.575

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.011633
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.048672
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.011625

Table A-58 Thermodynamic Functions for Al_2O_2 - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	79.864	18.195	98.059	38209.0	20.588
2150.	80.293	18.251	98.543	39238.8	20.601
2200.	80.713	18.304	99.017	40269.1	20.612
2250.	81.125	18.356	99.480	41300.0	20.623
2300.	81.529	18.405	99.934	42331.4	20.633
2350.	81.925	18.452	100.378	43363.3	20.643
2400.	82.314	18.498	100.812	44395.7	20.652
2450.	82.696	18.542	101.238	45428.5	20.660
2500.	83.071	18.585	101.656	46461.7	20.668
2600.	83.802	18.665	102.467	48529.3	20.683
2700.	84.507	18.740	103.248	50598.3	20.696
2800.	85.190	18.810	104.000	52668.5	20.708
2900.	85.851	18.876	104.727	54739.8	20.719
3000.	86.492	18.937	105.430	56812.2	20.728
3100.	87.114	18.995	106.110	58885.4	20.737
3200.	87.718	19.050	106.768	60959.5	20.745
3300.	88.305	19.101	107.407	63034.3	20.752
3400.	88.876	19.150	108.026	65109.8	20.758
3500.	89.432	19.196	108.628	67186.0	20.764
3600.	89.973	19.240	109.213	69262.7	20.770
3700.	90.501	19.281	109.782	71339.9	20.775
3800.	91.016	19.320	110.336	73417.7	20.780
3900.	91.518	19.358	110.876	75495.9	20.784
4000.	92.009	19.394	111.402	77574.5	20.788
4100.	92.488	19.428	111.916	79653.5	20.792
4200.	92.957	19.460	112.417	81732.8	20.795
4300.	93.415	19.491	112.906	83812.5	20.799
4400.	93.863	19.521	113.384	85892.5	20.802
4500.	94.302	19.550	113.852	87972.8	20.804
4600.	94.732	19.577	114.309	90053.4	20.807
4700.	95.154	19.603	114.757	92134.2	20.809
4800.	95.567	19.628	115.195	94215.3	20.812
4900.	95.972	19.652	115.624	96296.6	20.814
5000.	96.369	19.676	116.044	98378.1	20.816
5100.	96.759	19.698	116.457	100459.8	20.818
5200.	97.141	19.720	116.861	102541.7	20.820
5300.	97.517	19.740	117.258	104623.8	20.822
5400.	97.886	19.760	117.647	106706.0	20.823
5500.	98.249	19.780	118.029	108788.4	20.825
5600.	98.606	19.798	118.404	110870.9	20.826
5700.	98.956	19.816	118.773	112953.6	20.828
5800.	99.301	19.834	119.135	115036.5	20.829
5900.	99.640	19.851	119.491	117119.4	20.830
6000.	99.974	19.867	119.841	119202.5	20.831
273.15	50.228	10.152	60.380	2772.9	14.313
298.15	51.133	10.522	61.655	3137.0	14.808

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

85.96, 50.10, 2, 1.

The frequencies and their degeneracies were taken as:

300. (2), 500. (2), 1200. (1), 340. (1), 1200. (1).

Table A-59 Thermodynamic Functions for O = AlH

T °K	$-\frac{(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	31.765	6.945	38.711	347.3	6.955
75.	34.582	6.949	41.531	521.2	6.955
100.	36.581	6.950	43.532	695.0	6.957
125.	38.133	6.953	45.085	869.1	6.967
150.	39.401	6.958	46.358	1043.7	7.007
175.	40.474	6.970	47.444	1219.8	7.095
200.	41.406	6.994	48.401	1398.9	7.242
225.	42.232	7.033	49.265	1582.4	7.445
250.	42.976	7.086	50.062	1771.5	7.695
275.	43.654	7.154	50.808	1967.4	7.980
300.	44.280	7.236	51.516	2170.7	8.286
325.	44.863	7.329	52.191	2381.8	8.602
350.	45.409	7.431	52.840	2600.8	8.921
375.	45.926	7.541	53.467	2827.8	9.235
400.	46.416	7.656	54.073	3062.5	9.541
425.	46.884	7.776	54.660	3304.7	9.835
450.	47.332	7.898	55.230	3554.2	10.116
475.	47.762	8.022	55.784	3810.4	10.383
500.	48.177	8.146	56.323	4073.2	10.634
550.	48.965	8.394	57.359	4616.6	11.093
600.	49.706	8.636	58.341	5181.5	11.495
650.	50.406	8.870	59.276	5765.2	11.847
700.	51.072	9.093	60.165	6365.4	12.154
750.	51.706	9.307	61.013	6980.0	12.422
800.	52.314	9.509	61.822	7607.1	12.656
850.	52.896	9.700	62.596	8245.1	12.862
900.	53.456	9.881	63.336	8892.8	13.042
950.	53.994	10.052	64.046	9549.0	13.201
1000.	54.514	10.213	64.727	10212.7	13.342
1050.	55.016	10.365	65.381	10883.0	13.467
1100.	55.502	10.508	66.010	11559.2	13.578
1150.	55.972	10.644	66.616	12240.6	13.678
1200.	56.427	10.772	67.200	12926.8	13.767
1250.	56.870	10.894	67.763	13617.1	13.847
1300.	57.299	11.009	68.308	14311.3	13.919
1350.	57.717	11.118	68.834	15008.9	13.984
1400.	58.123	11.221	69.344	15709.6	14.043
1450.	58.518	11.319	69.838	16413.2	14.097
1500.	58.904	11.413	70.317	17119.3	14.146
1550.	59.279	11.502	70.781	17827.7	14.191
1600.	59.646	11.586	71.232	18538.3	14.232
1650.	60.004	11.667	71.671	19250.9	14.270
1700.	60.353	11.744	72.097	19965.2	14.304
1750.	60.695	11.818	72.513	20681.2	14.336
1800.	61.029	11.888	72.917	21398.8	14.366
1850.	61.355	11.956	73.311	22117.8	14.393
1900.	61.675	12.020	73.695	22838.1	14.418
1950.	61.988	12.082	74.070	23559.6	14.442
2000.	62.295	12.141	74.436	24282.3	14.464
2050.	62.595	12.198	74.793	25006.0	14.484

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.022733
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.095115
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.022718

Table A-59 Thermodynamic Functions for O = AlH - Continued

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	62.890	12.253	75.142	25730.6	14.503
2150.	63.179	12.305	75.484	26456.3	14.521
2200.	63.462	12.356	75.818	27182.7	14.538
2250.	63.740	12.404	76.145	27910.0	14.553
2300.	64.014	12.451	76.465	28638.0	14.568
2350.	64.282	12.496	76.778	29366.8	14.581
2400.	64.545	12.540	77.085	30096.2	14.594
2450.	64.804	12.582	77.386	30826.2	14.607
2500.	65.059	12.623	77.682	31556.8	14.618
2600.	65.556	12.700	78.255	33019.7	14.639
2700.	66.036	12.772	78.808	34484.5	14.658
2800.	66.502	12.840	79.342	35951.2	14.675
2900.	66.954	12.903	79.857	37419.5	14.690
3000.	67.392	12.963	80.355	38889.2	14.704
3100.	67.818	13.019	80.837	40360.2	14.716
3200.	68.232	13.073	81.305	41832.4	14.728
3300.	68.635	13.123	81.758	43305.7	14.738
3400.	69.028	13.171	82.198	44780.0	14.748
3500.	69.410	13.216	82.626	46255.2	14.756
3600.	69.783	13.259	83.042	47731.2	14.764
3700.	70.147	13.299	83.446	49208.0	14.772
3800.	70.502	13.338	83.840	50685.5	14.779
3900.	70.849	13.375	84.224	52163.7	14.785
4000.	71.188	13.411	84.599	53642.5	14.791
4100.	71.520	13.444	84.964	55121.8	14.796
4200.	71.844	13.477	85.321	56601.7	14.801
4300.	72.162	13.507	85.669	58082.0	14.806
4400.	72.472	13.537	86.009	59562.9	14.810
4500.	72.777	13.565	86.342	61044.1	14.814
4600.	73.075	13.593	86.668	62525.7	14.818
4700.	73.368	13.619	86.987	64007.7	14.822
4800.	73.655	13.644	87.299	65490.1	14.825
4900.	73.937	13.668	87.605	66972.7	14.828
5000.	74.213	13.691	87.904	68455.7	14.831
5100.	74.484	13.714	88.198	69939.0	14.834
5200.	74.751	13.735	88.486	71422.5	14.837
5300.	75.013	13.756	88.769	72906.4	14.839
5400.	75.270	13.776	89.046	74390.4	14.842
5500.	75.523	13.795	89.318	75874.7	14.844
5600.	75.772	13.814	89.586	77359.2	14.846
5700.	76.016	13.832	89.849	78843.9	14.848
5800.	76.257	13.850	90.107	80328.8	14.850
5900.	76.494	13.867	90.361	81813.9	14.852
6000.	76.727	13.883	90.610	83299.2	14.854
273.15	43.606	7.149	50.755	1952.7	7.958
298.15	44.235	7.229	51.464	2155.4	8.262

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

43.988, 5.31, 1, 1.

The frequencies and their degeneracies were taken as:

1600. (1), 900. (1), 1000. (2).

Table A-60. Thermodynamic Functions for O = AlOH (gas)

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
50.	36.600	7.949	44.549	397.5	7.952
75.	39.824	7.957	47.781	596.8	8.017
100.	42.117	7.997	50.114	799.7	8.245
125.	43.910	8.083	51.993	1010.4	8.631
150.	45.395	8.213	53.608	1232.0	9.109
175.	46.673	8.378	55.051	1466.1	9.622
200.	47.804	8.566	56.369	1713.1	10.138
225.	48.824	8.768	57.593	1972.9	10.640
250.	49.759	8.980	58.739	2245.0	11.122
275.	50.625	9.196	59.821	2528.8	11.581
300.	51.434	9.413	60.847	2823.8	12.014
325.	52.196	9.629	61.825	3129.3	12.422
350.	52.918	9.842	62.760	3444.7	12.802
375.	53.604	10.051	63.655	3769.2	13.156
400.	54.259	10.256	64.515	4102.2	13.484
425.	54.887	10.455	65.341	4443.2	13.788
450.	55.490	10.648	66.138	4791.4	14.068
475.	56.071	10.835	66.905	5146.4	14.327
500.	56.631	11.015	67.646	5507.6	14.567
550.	57.697	11.358	69.055	6246.9	14.993
600.	58.699	11.677	70.376	7006.0	15.361
650.	59.646	11.973	71.618	7782.2	15.680
700.	60.543	12.248	72.791	8573.3	15.961
750.	61.397	12.504	73.901	9377.8	16.212
800.	62.212	12.743	74.954	10194.1	16.436
850.	62.991	12.966	75.957	11021.1	16.640
900.	63.738	13.175	76.913	11857.8	16.826
950.	64.456	13.372	77.828	12703.4	16.997
1000.	65.146	13.557	78.704	13557.3	17.155
1050.	65.812	13.732	79.544	14418.7	17.301
1100.	66.455	13.897	80.352	15287.2	17.437
1150.	67.076	14.054	81.130	16162.3	17.564
1200.	67.677	14.203	81.880	17043.4	17.682
1250.	68.260	14.344	82.604	17930.3	17.792
1300.	68.825	14.479	83.304	18822.5	17.895
1350.	69.374	14.607	83.981	19719.7	17.992
1400.	69.908	14.730	84.637	20621.6	18.082
1450.	70.427	14.847	85.273	21527.8	18.167
1500.	70.932	14.959	85.891	22438.2	18.247
1550.	71.424	15.066	86.490	23352.4	18.321
1600.	71.904	15.169	87.073	24270.2	18.392
1650.	72.372	15.268	87.640	25191.5	18.458
1700.	72.830	15.362	88.192	26115.9	18.520
1750.	73.276	15.453	88.730	27043.4	18.578
1800.	73.713	15.541	89.254	27973.7	18.633
1850.	74.140	15.625	89.765	28906.7	18.685
1900.	74.557	15.706	90.264	29842.2	18.734
1950.	74.966	15.785	90.751	30780.1	18.781
2000.	75.367	15.860	91.227	31720.2	18.824
2050.	75.760	15.933	91.693	32662.5	18.866
2100.	76.144	16.003	92.148	33606.7	18.905
2150.	76.522	16.071	92.593	34552.9	18.942
2200.	76.892	16.137	93.029	35500.8	18.977
2250.	77.255	16.200	93.456	36450.5	19.010
2300.	77.612	16.262	93.874	37401.8	19.041
2350.	77.962	16.321	94.284	38354.6	19.071

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.016670
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.069747
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.016659

Table A-60. Thermodynamic Functions for O = AlOH (gas) - Continued

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
2400.	78.307	16.379	94.685	39308.9	19.100
2450.	78.645	16.435	95.079	40264.6	19.127
2500.	78.978	16.489	95.466	41221.6	19.152
2600.	79.626	16.592	96.218	43139.2	19.200
2700.	80.254	16.689	96.944	45061.4	19.243
2800.	80.863	16.781	97.644	46987.8	19.283
2900.	81.453	16.868	98.322	48917.9	19.319
3000.	82.027	16.950	98.977	50851.4	19.352
3100.	82.584	17.028	99.612	52788.1	19.382
3200.	83.125	17.102	100.228	54727.7	19.409
3300.	83.653	17.173	100.826	56669.9	19.435
3400.	84.166	17.240	101.406	58614.6	19.458
3500.	84.667	17.303	101.970	60561.5	19.480
3600.	85.155	17.364	102.519	62510.5	19.500
3700.	85.632	17.422	103.054	64461.5	19.519
3800.	86.097	17.477	103.575	66414.2	19.536
3900.	86.552	17.530	104.082	68368.6	19.552
4000.	86.997	17.581	104.578	70324.5	19.567
4100.	87.431	17.630	105.061	72281.9	19.581
4200.	87.857	17.676	105.533	74240.7	19.594
4300.	88.273	17.721	105.994	76200.7	19.606
4400.	88.681	17.764	106.445	78161.8	19.617
4500.	89.081	17.805	106.886	80124.1	19.628
4600.	89.472	17.845	107.318	82087.5	19.638
4700.	89.857	17.883	107.740	84051.8	19.648
4800.	90.234	17.920	108.154	86017.0	19.657
4900.	90.603	17.956	108.559	87983.1	19.665
5000.	90.967	17.990	108.956	89950.0	19.673
5100.	91.323	18.023	109.346	91917.6	19.680
5200.	91.673	18.055	109.728	93886.0	19.687
5300.	92.018	18.086	110.103	95855.1	19.694
5400.	92.356	18.116	110.472	97824.8	19.701
5500.	92.689	18.145	110.833	99795.2	19.707
5600.	93.016	18.173	111.188	101766.1	19.712
5700.	93.338	18.200	111.537	103737.6	19.718
5800.	93.654	18.226	111.880	105709.7	19.723
5900.	93.966	18.251	112.217	107682.2	19.728
6000.	94.273	18.276	112.549	109655.2	19.732
6100.	94.575	18.300	112.875	111628.7	19.737
6200.	94.873	18.323	113.196	113602.6	19.741
6300.	95.167	18.346	113.512	115576.9	19.745
6400.	95.456	18.367	113.823	117551.6	19.749
6500.	95.741	18.389	114.129	119526.7	19.753
6600.	96.021	18.409	114.431	121502.1	19.756
6700.	96.298	18.430	114.728	123477.9	19.760
6800.	96.572	18.449	115.021	125454.0	19.763
6900.	96.841	18.468	115.309	127430.5	19.766
7000.	97.107	18.487	115.594	129407.2	19.769
273.15	50.563	9.180	59.743	2507.4	11.548
298.15	51.376	9.397	60.773	2801.6	11.983

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

59.988, 0.13, 16.9, 17.0, 1

The frequencies and their degeneracies were taken as:

3400. (1), 1200. (1), 1100. (1), 700. (1), 500. (1), 400. (1).

Table A-61 Thermodynamic Functions for OAlF

T °K	$\frac{-(F^\circ - H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	34.907	6.952	41.859	347.6	6.956
75.	37.726	6.956	44.682	521.7	6.981
100.	39.729	6.976	46.705	697.6	7.116
125.	41.291	7.030	48.322	878.8	7.408
150.	42.581	7.127	49.708	1069.0	7.827
175.	43.689	7.262	50.951	1270.8	8.319
200.	44.669	7.426	52.095	1485.2	8.839
225.	45.555	7.612	53.166	1712.7	9.354
250.	46.367	7.811	54.178	1952.7	9.846
275.	47.121	8.017	55.138	2204.7	10.303
300.	47.827	8.225	56.053	2467.6	10.722
325.	48.494	8.432	56.926	2740.4	11.100
350.	49.126	8.635	57.761	3022.3	11.441
375.	49.729	8.833	58.561	3312.2	11.746
400.	50.305	9.023	59.328	3609.3	12.018
425.	50.857	9.207	60.064	3912.8	12.261
450.	51.389	9.383	60.771	4222.1	12.478
475.	51.901	9.551	61.451	4536.6	12.672
500.	52.395	9.711	62.106	4855.6	12.846
550.	53.334	10.010	63.344	5505.5	13.142
600.	54.217	10.281	64.499	6168.8	13.381
650.	55.050	10.528	65.578	6842.9	13.578
700.	55.839	10.751	66.590	7526.0	13.740
750.	56.587	10.955	67.543	8216.5	13.875
800.	57.300	11.141	68.442	8913.2	13.989
850.	57.981	11.312	69.293	9615.1	14.085
900.	58.632	11.468	70.100	10321.5	14.167
950.	59.256	11.612	70.868	11031.6	14.238
1000.	59.855	11.745	71.600	11745.1	14.299
1050.	60.431	11.868	72.299	12461.5	14.353
1100.	60.986	11.982	72.968	13180.3	14.399
1150.	61.521	12.088	73.609	13901.3	14.440
1200.	62.038	12.187	74.224	14624.2	14.477
1250.	62.537	12.279	74.816	15348.9	14.509
1300.	63.020	12.365	75.386	16075.1	14.538
1350.	63.488	12.446	75.935	16802.6	14.564
1400.	63.942	12.522	76.465	17531.4	14.587
1450.	64.383	12.594	76.977	18261.3	14.608
1500.	64.811	12.661	77.473	18992.1	14.627
1550.	65.227	12.725	77.953	19723.9	14.644
1600.	65.632	12.785	78.418	20456.5	14.660
1650.	66.027	12.842	78.869	21189.8	14.674
1700.	66.411	12.896	79.307	21923.9	14.687
1750.	66.786	12.948	79.733	22658.5	14.699
1800.	67.151	12.997	80.147	23393.7	14.710
1850.	67.508	13.043	80.551	24129.5	14.720
1900.	67.856	13.087	80.943	24865.7	14.730
1950.	68.197	13.129	81.326	25602.4	14.738
2000.	68.530	13.170	81.699	26339.6	14.746
2050.	68.855	13.208	82.064	27077.1	14.754

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.016134
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.067505
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.016123

Table A-61 Thermodynamic Functions for OAlF - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	69.174	13.245	82.419	27814.9	14.761
2150.	69.486	13.281	82.767	28553.1	14.767
2200.	69.792	13.314	83.106	29291.7	14.773
2250.	70.091	13.347	83.438	30030.5	14.779
2300.	70.385	13.378	83.763	30769.6	14.784
2350.	70.673	13.408	84.081	31508.9	14.789
2400.	70.956	13.437	84.392	32248.5	14.794
2450.	71.233	13.465	84.698	32988.3	14.799
2500.	71.505	13.491	84.997	33728.4	14.803
2600.	72.035	13.542	85.577	35209.0	14.810
2700.	72.547	13.589	86.136	36690.4	14.817
2800.	73.042	13.633	86.675	38172.4	14.823
2900.	73.521	13.674	87.196	39655.0	14.829
3000.	73.986	13.713	87.698	41138.1	14.834
3100.	74.436	13.749	88.185	42621.7	14.838
3200.	74.873	13.783	88.656	44105.7	14.842
3300.	75.298	13.815	89.113	45590.1	14.846
3400.	75.711	13.846	89.556	47074.9	14.849
3500.	76.112	13.874	89.987	48560.0	14.852
3600.	76.504	13.901	90.405	50045.4	14.855
3700.	76.885	13.927	90.812	51531.0	14.858
3800.	77.257	13.952	91.208	53016.9	14.860
3900.	77.619	13.975	91.594	54503.0	14.862
4000.	77.973	13.997	91.971	55989.4	14.864
4100.	78.319	14.019	92.338	57475.9	14.866
4200.	78.657	14.039	92.696	58962.7	14.868
4300.	78.988	14.058	93.046	60449.6	14.870
4400.	79.311	14.077	93.388	61936.6	14.871
4500.	79.628	14.094	93.722	63423.8	14.873
4600.	79.938	14.111	94.049	64911.2	14.874
4700.	80.241	14.127	94.369	66398.7	14.875
4800.	80.539	14.143	94.682	67886.3	14.877
4900.	80.831	14.158	94.989	69374.0	14.878
5000.	81.117	14.172	95.289	70861.8	14.879
5100.	81.398	14.186	95.584	72349.8	14.880
5200.	81.673	14.200	95.873	73837.8	14.881
5300.	81.944	14.212	96.156	75325.9	14.882
5400.	82.210	14.225	96.435	76814.1	14.882
5500.	82.471	14.237	96.708	78302.4	14.883
5600.	82.727	14.248	96.976	79790.8	14.884
5700.	82.980	14.260	97.239	81279.2	14.885
5800.	83.228	14.270	97.498	82767.7	14.885
5900.	83.472	14.281	97.753	84256.3	14.886
6000.	83.712	14.291	98.003	85744.9	14.887
273.15	47.067	8.002	55.068	2185.7	10.271
298.15	47.776	8.210	55.986	2447.8	10.692

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

61.98, 15.48, 1, 1.

The frequencies and their degeneracies were taken as:

900. (1), 500. (2), 750. (1).

Table A-62 Thermodynamic Functions for OAlCl

T °K	$-\frac{(F^\circ-H^\circ_0)}{T}$	$\frac{H^\circ - H^\circ_0}{T}$	S°	$H^\circ - H^\circ_0$	C°_p
50.	36.831	6.955	43.786	347.8	6.973
75.	39.656	6.990	46.645	524.2	7.200
100.	41.680	7.105	48.785	710.5	7.749
125.	43.286	7.304	50.589	913.0	8.456
150.	44.639	7.555	52.194	1133.3	9.164
175.	45.824	7.832	53.656	1370.6	9.809
200.	46.889	8.115	55.004	1623.1	10.374
225.	47.861	8.394	56.255	1888.7	10.866
250.	48.759	8.663	57.422	2165.8	11.293
275.	49.597	8.920	58.517	2452.9	11.665
300.	50.383	9.162	59.546	2748.7	11.989
325.	51.126	9.391	60.517	3052.0	12.274
350.	51.830	9.606	61.436	3362.1	12.523
375.	52.500	9.808	62.307	3677.9	12.742
400.	53.139	9.997	63.136	3999.9	12.935
425.	53.750	10.175	63.925	4324.5	13.106
450.	54.337	10.342	64.679	4654.1	13.257
475.	54.900	10.499	65.399	4987.2	13.391
500.	55.442	10.647	66.089	5323.5	13.511
550.	56.470	10.917	67.387	6004.3	13.713
600.	57.430	11.157	68.587	6694.2	13.877
650.	58.332	11.371	69.703	7391.5	14.010
700.	59.182	11.564	70.746	8094.8	14.120
750.	59.986	11.738	71.723	8803.2	14.212
800.	60.748	11.895	72.643	9515.7	14.288
850.	61.474	12.037	73.511	10231.8	14.353
900.	62.166	12.168	74.333	10950.9	14.409
950.	62.827	12.287	75.114	11672.5	14.456
1000.	63.460	12.396	75.856	12396.4	14.498
1050.	64.067	12.497	76.564	13122.2	14.534
1100.	64.651	12.591	77.241	13849.7	14.565
1150.	65.212	12.677	77.889	14578.6	14.593
1200.	65.753	12.757	78.511	15308.9	14.617
1250.	66.276	12.832	79.108	16040.3	14.639
1300.	66.780	12.902	79.683	16772.7	14.658
1350.	67.269	12.967	80.236	17506.1	14.675
1400.	67.741	13.029	80.770	18240.2	14.691
1450.	68.200	13.086	81.286	18975.1	14.705
1500.	68.644	13.140	81.785	19710.7	14.718
1550.	69.076	13.192	82.267	20446.9	14.729
1600.	69.495	13.240	82.735	21183.6	14.740
1650.	69.904	13.285	83.189	21920.9	14.750
1700.	70.301	13.329	83.629	22658.6	14.758
1750.	70.688	13.370	84.057	23396.7	14.766
1800.	71.065	13.408	84.473	24135.2	14.774
1850.	71.433	13.445	84.878	24874.1	14.781
1900.	71.792	13.481	85.273	25613.3	14.787
1950.	72.142	13.514	85.657	26352.8	14.793
2000.	72.485	13.546	86.031	27092.5	14.798
2050.	72.820	13.577	86.397	27832.6	14.803

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.012749
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.053342
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.012741

Table A-62 Thermodynamic Functions for OAlCl - Continued

T °K	$-(F^\circ-H^\circ_0)/T$	$(H^\circ - H^\circ_0)/T$	S°	$H^\circ - H^\circ_0$	C°_p
2100.	73.147	13.606	86.754	28572.9	14.808
2150.	73.468	13.634	87.102	29313.4	14.812
2200.	73.782	13.661	87.443	30054.1	14.816
2250.	74.089	13.687	87.776	30795.0	14.820
2300.	74.390	13.711	88.101	31536.1	14.824
2350.	74.685	13.735	88.420	32277.4	14.827
2400.	74.975	13.758	88.732	33018.8	14.830
2450.	75.259	13.780	89.038	33760.4	14.833
2500.	75.537	13.801	89.338	34502.2	14.836
2600.	76.079	13.841	89.920	35986.0	14.841
2700.	76.602	13.878	90.480	37470.4	14.846
2800.	77.108	13.913	91.020	38955.2	14.850
2900.	77.596	13.945	91.541	40440.4	14.854
3000.	78.070	13.975	92.045	41925.9	14.857
3100.	78.528	14.004	92.532	43411.7	14.860
3200.	78.973	14.031	93.004	44897.9	14.863
3300.	79.406	14.056	93.461	46384.2	14.865
3400.	79.825	14.080	93.905	47870.9	14.867
3500.	80.234	14.102	94.336	49357.7	14.869
3600.	80.632	14.124	94.755	50844.7	14.871
3700.	81.019	14.144	95.163	52332.0	14.873
3800.	81.396	14.163	95.559	53819.4	14.875
3900.	81.764	14.181	95.946	55306.9	14.876
4000.	82.124	14.199	96.322	56794.6	14.878
4100.	82.474	14.215	96.690	58282.4	14.879
4200.	82.817	14.231	97.048	59770.4	14.880
4300.	83.152	14.246	97.398	61258.4	14.881
4400.	83.480	14.261	97.740	62746.6	14.882
4500.	83.800	14.274	98.075	64234.9	14.883
4600.	84.114	14.288	98.402	65723.3	14.884
4700.	84.422	14.300	98.722	67211.7	14.885
4800.	84.723	14.313	99.036	68700.3	14.886
4900.	85.018	14.324	99.342	70188.9	14.887
5000.	85.308	14.336	99.643	71677.6	14.887
5100.	85.592	14.346	99.938	73166.3	14.888
5200.	85.870	14.357	100.227	74655.1	14.889
5300.	86.144	14.367	100.511	76144.0	14.889
5400.	86.413	14.376	100.789	77633.0	14.890
5500.	86.676	14.386	101.062	79122.0	14.890
5600.	86.936	14.395	101.331	80611.0	14.891
5700.	87.191	14.404	101.594	82100.1	14.891
5800.	87.441	14.412	101.853	83589.3	14.892
5900.	87.688	14.420	102.108	85078.4	14.892
6000.	87.930	14.428	102.358	86567.7	14.892
273.15	49.537	8.901	58.438	2431.4	11.639
298.15	50.327	9.145	59.472	2726.5	11.967

This table has been computed for the harmonic oscillator-rigid rotator approximation for linear polyatomic molecules using the following data for molecular weight, moment of inertia (in units of 10^{-39} gm cm^2), symmetry, and electronic multiplicity:

78.437, 28.65, 1, 1.

The frequencies and their degeneracies were taken as:

900. (1), 350. (2), 450. (1).

Table A-63 Thermodynamic Functions for AlF_2 (gas)

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
50.	39.203	7.949	47.151	397.4	7.975
75.	42.431	7.983	50.414	598.7	8.159
100.	44.737	8.064	52.802	806.4	8.466
125.	46.549	8.178	54.726	1022.2	8.796
150.	48.051	8.308	56.359	1246.2	9.124
175.	49.342	8.448	57.790	1478.4	9.451
200.	50.480	8.594	59.073	1718.8	9.777
225.	51.500	8.743	60.244	1967.2	10.098
250.	52.429	8.894	61.324	2223.5	10.407
275.	53.284	9.045	62.329	2487.4	10.699
300.	54.078	9.194	63.272	2758.3	10.971
325.	54.819	9.341	64.160	3035.8	11.222
350.	55.517	9.484	65.000	3319.2	11.449
375.	56.176	9.622	65.797	3608.1	11.656
400.	56.801	9.755	66.556	3901.9	11.842
425.	57.396	9.882	67.279	4200.0	12.010
450.	57.965	10.005	67.970	4502.2	12.161
475.	58.509	10.122	68.631	4808.0	12.297
500.	59.031	10.234	69.265	5116.9	12.419
550.	60.016	10.442	70.459	5743.3	12.628
600.	60.933	10.632	71.565	6379.1	12.799
650.	61.791	10.804	72.595	7022.7	12.940
700.	62.597	10.961	73.559	7672.8	13.057
750.	63.359	11.104	74.463	8328.1	13.155
800.	64.080	11.235	75.315	8988.0	13.238
850.	64.764	11.355	76.119	9651.7	13.308
900.	65.417	11.465	76.882	10318.7	13.368
950.	66.039	11.567	77.606	10988.4	13.420
1000.	66.635	11.661	78.295	11660.5	13.465
1050.	67.206	11.747	78.953	12334.8	13.504
1100.	67.754	11.828	79.582	13010.8	13.538
1150.	68.282	11.903	80.185	13688.5	13.568
1200.	68.790	11.973	80.763	14367.6	13.595
1250.	69.280	12.038	81.318	15047.9	13.619
1300.	69.753	12.100	81.853	15729.4	13.640
1350.	70.211	12.157	82.368	16411.8	13.659
1400.	70.654	12.211	82.865	17095.2	13.676
1450.	71.084	12.262	83.345	17779.4	13.691
1500.	71.500	12.310	83.810	18464.3	13.705
1550.	71.904	12.355	84.259	19149.9	13.718
1600.	72.297	12.398	84.695	19836.1	13.729
1650.	72.679	12.438	85.118	20522.8	13.740
1700.	73.051	12.477	85.528	21210.1	13.750
1750.	73.414	12.513	85.927	21897.8	13.759
1800.	73.767	12.548	86.314	22585.9	13.767
1850.	74.111	12.581	86.692	23274.4	13.774
1900.	74.447	12.612	87.059	23963.3	13.781
1950.	74.775	12.642	87.417	24652.6	13.788
2000.	75.095	12.671	87.766	25342.1	13.794
2050.	75.408	12.698	88.107	26031.9	13.799

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.015389
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.064388
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.015379

Table A-63 Thermodynamic Functions for AlF_2 (gas) - Continued

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
2100.	75.715	12.725	88.439	26722.0	13.804
2150.	76.014	12.750	88.764	27412.4	13.809
2200.	76.308	12.774	89.082	28102.9	13.814
2250.	76.595	12.797	89.392	28793.7	13.818
2300.	76.877	12.819	89.696	29484.7	13.822
2350.	77.153	12.841	89.993	30175.9	13.826
2400.	77.423	12.861	90.284	30867.3	13.829
2450.	77.689	12.881	90.570	31558.8	13.832
2500.	77.949	12.900	90.849	32250.5	13.835
2600.	78.456	12.936	91.392	33634.3	13.841
2700.	78.944	12.970	91.914	35018.7	13.846
2800.	79.417	13.001	92.418	36403.5	13.851
2900.	79.873	13.031	92.904	37788.8	13.855
3000.	80.316	13.058	93.374	39174.4	13.858
3100.	80.744	13.084	93.828	40560.4	13.862
3200.	81.160	13.108	94.268	41946.7	13.865
3300.	81.564	13.131	94.695	43333.3	13.867
3400.	81.956	13.153	95.109	44720.2	13.870
3500.	82.338	13.174	95.511	46107.3	13.872
3600.	82.709	13.193	95.902	47494.6	13.874
3700.	83.071	13.211	96.282	48882.1	13.876
3800.	83.423	13.229	96.652	50269.8	13.878
3900.	83.767	13.246	97.013	51657.7	13.880
4000.	84.103	13.261	97.364	53045.8	13.881
4100.	84.430	13.277	97.707	54434.0	13.883
4200.	84.751	13.291	98.042	55822.3	13.884
4300.	85.063	13.305	98.368	57210.7	13.885
4400.	85.369	13.318	98.687	58599.3	13.886
4500.	85.669	13.331	99.000	59988.0	13.887
4600.	85.962	13.343	99.305	61376.8	13.888
4700.	86.249	13.354	99.604	62765.7	13.889
4800.	86.530	13.366	99.896	64154.6	13.890
4900.	86.806	13.376	100.182	65543.7	13.891
5000.	87.076	13.387	100.463	66932.8	13.892
5100.	87.342	13.396	100.738	68322.1	13.893
5200.	87.602	13.406	101.008	69711.4	13.893
5300.	87.857	13.415	101.273	71100.7	13.894
5400.	88.108	13.424	101.532	72490.1	13.895
5500.	88.355	13.433	101.787	73879.6	13.895
5600.	88.597	13.441	102.038	75269.1	13.896
5700.	88.835	13.449	102.284	76658.7	13.896
5800.	89.069	13.457	102.525	78048.4	13.897
5900.	89.299	13.464	102.763	79438.1	13.897
6000.	89.525	13.471	102.996	80827.8	13.898
6100.	89.748	13.478	103.226	82217.6	13.898
6200.	89.967	13.485	103.452	83607.4	13.898
6300.	90.183	13.492	103.674	84997.3	13.899
6400.	90.395	13.498	103.893	86387.2	13.899
6500.	90.605	13.504	104.109	87777.1	13.900
6600.	90.811	13.510	104.321	89167.1	13.900
6700.	91.014	13.516	104.530	90557.1	13.900
6800.	91.214	13.522	104.736	91947.1	13.901
6900.	91.412	13.527	104.939	93337.2	13.901
7000.	91.606	13.532	105.139	94727.3	13.901
273.15	53.223	9.034	62.257	2467.6	10.678
298.15	54.021	9.184	63.204	2738.1	10.952

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

64.98, 1.89, 13.67, 15.56, 2.

The frequencies and their degeneracies were taken as:

900. (1), 700. (1), 300. (1)

The electronic multiplicity was taken to be 2.

Table A-64. Thermodynamic Functions for AlF_3 (gas)

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
50.	38.930	7.955	46.885	397.8	8.004
75.	42.166	8.029	50.194	602.2	8.424
100.	44.499	8.218	52.717	821.8	9.184
125.	46.361	8.496	54.858	1062.1	10.033
150.	47.939	8.821	56.760	1323.2	10.849
175.	49.324	9.166	58.490	1604.5	11.608
200.	50.571	9.516	60.087	1903.1	12.312
225.	51.712	9.863	61.575	2219.2	12.966
250.	52.769	10.204	62.973	2551.0	13.571
275.	53.757	10.536	64.293	2897.4	14.126
300.	54.687	10.856	65.544	3256.9	14.632
325.	55.569	11.165	66.733	3628.6	15.090
350.	56.407	11.460	67.867	4011.1	15.504
375.	57.207	11.742	68.950	4403.4	15.876
400.	57.974	12.011	69.985	4804.6	16.211
425.	58.710	12.267	70.977	5213.7	16.510
450.	59.418	12.511	71.929	5629.8	16.779
475.	60.101	12.742	72.842	6052.4	17.021
500.	60.760	12.961	73.721	6480.7	17.238
550.	62.015	13.368	75.382	7352.1	17.609
600.	63.194	13.734	76.928	8240.4	17.912
650.	64.306	14.065	78.372	9142.4	18.161
700.	65.360	14.365	79.725	10055.8	18.368
750.	66.360	14.638	80.999	10978.7	18.541
800.	67.313	14.887	82.200	11909.4	18.686
850.	68.223	15.114	83.337	12846.9	18.810
900.	69.092	15.322	84.415	13790.1	18.916
950.	69.926	15.514	85.440	14738.2	19.007
1000.	70.726	15.691	86.417	15690.6	19.086
1050.	71.496	15.854	87.350	16646.7	19.155
1100.	72.237	16.005	88.242	17606.0	19.215
1150.	72.952	16.146	89.098	18568.1	19.268
1200.	73.642	16.277	89.919	19532.7	19.315
1250.	74.309	16.400	90.708	20499.5	19.357
1300.	74.954	16.514	91.468	21468.4	19.395
1350.	75.579	16.621	92.201	22438.9	19.428
1400.	76.186	16.722	92.908	23411.1	19.458
1450.	76.774	16.817	93.591	24384.7	19.486
1500.	77.346	16.906	94.252	25359.6	19.510
1550.	77.901	16.991	94.892	26335.7	19.533
1600.	78.442	17.071	95.513	27312.9	19.553
1650.	78.969	17.146	96.115	28291.0	19.572
1700.	79.482	17.218	96.699	29270.0	19.589
1750.	79.982	17.286	97.267	30249.8	19.604
1800.	80.470	17.350	97.820	31230.4	19.619
1850.	80.946	17.412	98.357	32211.7	19.632
1900.	81.411	17.470	98.881	33193.6	19.644
1950.	81.865	17.526	99.392	34176.1	19.656
2000.	82.310	17.580	99.889	35159.1	19.666
2050.	82.745	17.631	100.375	36142.7	19.676
2100.	83.170	17.679	100.849	37126.7	19.685
2150.	83.586	17.726	101.313	38111.1	19.694
2200.	83.995	17.771	101.765	39096.0	19.701
2250.	84.394	17.814	102.208	40081.3	19.709
2300.	84.786	17.855	102.642	41066.9	19.716
2350.	85.171	17.895	103.066	42052.9	19.722

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.011908
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.049823
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.011900

Table A-64. Thermodynamic Functions for AlF_3 (gas) - Continued

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
2400.	85.548	17.933	103.481	43039.1	19.728
2450.	85.918	17.970	103.888	44025.7	19.734
2500.	86.281	18.005	104.286	45012.5	19.740
2600.	86.989	18.072	105.061	46987.0	19.750
2700.	87.672	18.134	105.806	48962.4	19.758
2800.	88.333	18.192	106.525	50938.7	19.766
2900.	88.972	18.247	107.219	52915.7	19.774
3000.	89.592	18.298	107.889	54893.4	19.780
3100.	90.192	18.346	108.538	56871.7	19.786
3200.	90.776	18.391	109.166	58850.5	19.791
3300.	91.342	18.433	109.775	60829.9	19.796
3400.	91.893	18.473	110.366	62809.7	19.800
3500.	92.429	18.511	110.940	64789.9	19.804
3600.	92.951	18.547	111.498	66770.5	19.808
3700.	93.460	18.581	112.041	68751.5	19.812
3800.	93.956	18.614	112.570	70732.8	19.815
3900.	94.440	18.645	113.084	72714.5	19.818
4000.	94.912	18.674	113.586	74696.4	19.820
4100.	95.373	18.702	114.075	76678.5	19.823
4200.	95.824	18.729	114.553	78660.9	19.825
4300.	96.265	18.754	115.020	80643.6	19.827
4400.	96.697	18.779	115.476	82626.4	19.829
4500.	97.119	18.802	115.921	84609.4	19.831
4600.	97.533	18.824	116.357	86592.6	19.833
4700.	97.938	18.846	116.784	88576.0	19.835
4800.	98.335	18.867	117.201	90559.6	19.836
4900.	98.724	18.886	117.610	92543.3	19.838
5000.	99.106	18.905	118.011	94527.1	19.839
5100.	99.480	18.924	118.404	96511.1	19.840
5200.	99.848	18.941	118.789	98495.2	19.842
5300.	100.209	18.958	119.167	100479.4	19.843
5400.	100.563	18.975	119.538	102463.7	19.844
5500.	100.912	18.991	119.902	104448.2	19.845
5600.	101.254	19.006	120.260	106432.7	19.846
5700.	101.590	19.021	120.611	108417.4	19.847
5800.	101.921	19.035	120.956	110402.1	19.848
5900.	102.247	19.049	121.296	112386.9	19.849
6000.	102.567	19.062	121.629	114371.8	19.849
6100.	102.882	19.075	121.957	116356.7	19.850
6200.	103.193	19.087	122.280	118341.8	19.851
6300.	103.498	19.100	122.598	120326.9	19.851
6400.	103.799	19.111	122.910	122312.1	19.852
6500.	104.095	19.123	123.218	124297.3	19.853
6600.	104.387	19.134	123.521	126282.6	19.853
6700.	104.675	19.144	123.820	128268.0	19.854
6800.	104.959	19.155	124.114	130253.4	19.854
6900.	105.239	19.165	124.404	132238.9	19.855
7000.	105.515	19.175	124.689	134224.4	19.855
273.15	53.686	10.512	64.198	2871.3	14.086
298.15	54.620	10.833	65.453	3229.9	14.596

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

83.98, 13.67, 13.67, 27.34, 6.

The frequencies and their degeneracies were taken as:

700. (1), 400. (1), 900. (2), 300. (2)

Table A-65. Thermodynamic Functions for AlF_2Cl (gas)

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
50.	42.761	7.997	50.758	399.8	8.245
75.	46.038	8.213	54.252	616.0	9.107
100.	48.447	8.563	57.010	856.3	10.117
125.	50.401	8.970	59.371	1121.3	11.064
150.	52.074	9.392	61.465	1408.8	11.920
175.	53.553	9.809	63.362	1716.6	12.697
200.	54.889	10.215	65.105	2043.0	13.405
225.	56.115	10.606	66.721	2386.3	14.047
250.	57.252	10.979	68.232	2744.9	14.626
275.	58.315	11.335	69.650	3117.1	15.145
300.	59.316	11.672	70.988	3501.7	15.608
325.	60.263	11.991	72.254	3897.1	16.018
350.	61.163	12.292	73.455	4302.2	16.381
375.	62.021	12.575	74.596	4715.8	16.702
400.	62.841	12.842	75.683	5136.9	16.986
425.	63.627	13.094	76.721	5564.8	17.237
450.	64.382	13.330	77.713	5998.6	17.460
475.	65.109	13.553	78.662	6437.6	17.659
500.	65.810	13.763	79.572	6881.3	17.835
550.	67.140	14.147	81.287	7780.8	18.134
600.	68.386	14.490	82.875	8693.7	18.375
650.	69.558	14.796	84.354	9617.5	18.571
700.	70.665	15.072	85.736	10550.2	18.732
750.	71.713	15.320	87.033	11490.2	18.866
800.	72.709	15.546	88.255	12436.4	18.978
850.	73.658	15.750	89.408	13387.7	19.073
900.	74.563	15.937	90.501	14343.5	19.154
950.	75.430	16.108	91.538	15302.9	19.223
1000.	76.260	16.266	92.526	16265.6	19.283
1050.	77.057	16.411	93.468	17231.1	19.336
1100.	77.824	16.545	94.368	18199.1	19.381
1150.	78.562	16.669	95.231	19169.2	19.421
1200.	79.274	16.784	96.058	20141.1	19.457
1250.	79.961	16.892	96.853	21114.8	19.488
1300.	80.626	16.992	97.618	22089.9	19.516
1350.	81.269	17.086	98.355	23066.4	19.542
1400.	81.892	17.174	99.066	24044.0	19.564
1450.	82.496	17.257	99.753	25022.7	19.585
1500.	83.082	17.335	100.417	26002.4	19.603
1550.	83.652	17.408	101.060	26983.0	19.620
1600.	84.206	17.478	101.683	27964.4	19.635
1650.	84.745	17.543	102.288	28946.5	19.649
1700.	85.269	17.605	102.875	29929.2	19.662
1750.	85.780	17.664	103.445	30912.6	19.673
1800.	86.279	17.720	103.999	31896.6	19.684
1850.	86.765	17.774	104.539	32881.0	19.694
1900.	87.240	17.824	105.064	33865.9	19.703
1950.	87.703	17.872	105.576	34851.3	19.711
2000.	88.156	17.919	106.075	35837.1	19.719
2050.	88.599	17.963	106.562	36823.2	19.727
2100.	89.033	18.005	107.037	37809.7	19.733
2150.	89.457	18.045	107.502	38796.6	19.740
2200.	89.872	18.083	107.956	39783.7	19.746
2250.	90.279	18.120	108.399	40771.1	19.751
2300.	90.678	18.156	108.834	41758.8	19.756
2350.	91.068	18.190	109.259	42746.7	19.761

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0099565
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.041658
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.0099500

Table A-65. Thermodynamic Functions for AlF_2Cl (gas) - Continued

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
2400.	91.452	18.223	109.675	43734.9	19.766
2450.	91.828	18.254	110.082	44723.3	19.770
2500.	92.197	18.285	110.482	45711.9	19.774
2600.	92.915	18.342	111.257	47689.7	19.781
2700.	93.608	18.396	112.004	49668.2	19.788
2800.	94.278	18.445	112.724	51647.3	19.794
2900.	94.927	18.492	113.419	53626.9	19.799
3000.	95.554	18.536	114.090	55607.1	19.804
3100.	96.163	18.577	114.739	57587.7	19.808
3200.	96.753	18.615	115.368	59568.7	19.812
3300.	97.326	18.652	115.978	61550.1	19.816
3400.	97.884	18.686	116.570	63531.9	19.819
3500.	98.426	18.718	117.144	65514.0	19.822
3600.	98.954	18.749	117.703	67496.3	19.825
3700.	99.468	18.778	118.246	69478.9	19.827
3800.	99.969	18.806	118.775	71461.8	19.830
3900.	100.458	18.832	119.290	73444.9	19.832
4000.	100.935	18.857	119.792	75428.1	19.834
4100.	101.401	18.881	120.282	77411.6	19.836
4200.	101.856	18.904	120.760	79395.3	19.837
4300.	102.301	18.925	121.226	81379.1	19.839
4400.	102.736	18.946	121.683	83363.1	19.841
4500.	103.162	18.966	122.128	85347.2	19.842
4600.	103.579	18.985	122.565	87331.5	19.843
4700.	103.988	19.003	122.991	89315.9	19.845
4800.	104.388	19.021	123.409	91300.4	19.846
4900.	104.781	19.038	123.818	93285.0	19.847
5000.	105.165	19.054	124.219	95269.8	19.848
5100.	105.543	19.070	124.612	97254.6	19.849
5200.	105.913	19.085	124.998	99239.5	19.850
5300.	106.277	19.099	125.376	101224.5	19.851
5400.	106.634	19.113	125.747	103209.6	19.851
5500.	106.985	19.126	126.111	105194.8	19.852
5600.	107.330	19.139	126.469	107180.0	19.853
5700.	107.668	19.152	126.820	109165.3	19.854
5800.	108.002	19.164	127.166	111150.7	19.854
5900.	108.329	19.176	127.505	113136.2	19.855
6000.	108.652	19.187	127.839	115121.7	19.855
6100.	108.969	19.198	128.167	117107.3	19.856
6200.	109.281	19.209	128.490	119092.9	19.856
6300.	109.589	19.219	128.807	121078.5	19.857
6400.	109.891	19.229	129.120	123064.3	19.857
6500.	110.190	19.238	129.428	125050.0	19.858
6600.	110.483	19.248	129.731	127035.8	19.858
6700.	110.773	19.257	130.030	129021.7	19.859
6800.	111.058	19.266	130.324	131007.6	19.859
6900.	111.340	19.274	130.614	132993.5	19.860
7000.	111.617	19.283	130.900	134979.5	19.860
273.15	58.239	11.309	69.548	3089.1	15.109
298.15	59.244	11.648	70.892	3472.8	15.575

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

100.437, 13.67, 27.6, 41.27, 2.

The frequencies and their degeneracies were taken as:

850. (1), 750. (1), 550. (1), 350. (1), 250. (1), 200. (1)

Table A-66. Thermodynamic Functions $AlFCl_2$ (gas)

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
50.	44.284	8.105	52.389	405.2	8.694
75.	47.639	8.498	56.136	637.3	9.885
100.	50.150	8.988	59.138	898.8	11.012
125.	52.210	9.494	61.704	1186.8	12.002
150.	53.984	9.986	63.971	1498.0	12.878
175.	55.559	10.457	66.016	1829.9	13.662
200.	56.985	10.902	67.887	2180.4	14.362
225.	58.294	11.321	69.615	2547.3	14.982
250.	59.507	11.715	71.223	2928.9	15.527
275.	60.641	12.084	72.725	3323.1	16.004
300.	61.708	12.429	74.136	3728.6	16.420
325.	62.715	12.750	75.465	4143.7	16.781
350.	63.671	13.049	76.720	4567.2	17.095
375.	64.581	13.328	77.909	4998.1	17.368
400.	65.450	13.588	79.038	5435.3	17.607
425.	66.281	13.831	80.112	5878.2	17.816
450.	67.078	14.058	81.135	6325.9	17.999
475.	67.844	14.269	82.113	6777.9	18.160
500.	68.581	14.467	83.048	7233.7	18.302
550.	69.977	14.827	84.804	8155.1	18.541
600.	71.281	15.145	86.426	9087.0	18.731
650.	72.504	15.427	87.932	10027.6	18.885
700.	73.657	15.679	89.336	10975.0	19.010
750.	74.747	15.904	90.651	11928.2	19.113
800.	75.780	16.108	91.887	12886.1	19.199
850.	76.762	16.292	93.053	13847.9	19.272
900.	77.698	16.459	94.157	14813.1	19.334
950.	78.592	16.612	95.204	15781.1	19.386
1000.	79.448	16.752	96.199	16751.6	19.432
1050.	80.268	16.880	97.148	17724.2	19.471
1100.	81.056	16.999	98.055	18698.6	19.506
1150.	81.814	17.108	98.923	19674.7	19.536
1200.	82.544	17.210	99.755	20652.2	19.563
1250.	83.249	17.305	100.554	21630.9	19.586
1300.	83.929	17.393	101.322	22610.8	19.607
1350.	84.587	17.475	102.063	23591.6	19.626
1400.	85.224	17.552	102.777	24573.4	19.643
1450.	85.842	17.625	103.466	25555.9	19.658
1500.	86.440	17.693	104.133	26539.2	19.672
1550.	87.021	17.757	104.778	27523.1	19.685
1600.	87.586	17.817	105.403	28507.6	19.696
1650.	88.135	17.874	106.010	29492.7	19.706
1700.	88.670	17.928	106.598	30478.3	19.716
1750.	89.190	17.980	107.170	31464.3	19.725
1800.	89.697	18.028	107.725	32450.7	19.733
1850.	90.192	18.074	108.266	33437.5	19.740
1900.	90.675	18.118	108.793	34424.7	19.747
1950.	91.146	18.160	109.306	35412.2	19.753
2000.	91.606	18.200	109.806	36400.0	19.759
2050.	92.056	18.238	110.294	37388.1	19.764
2100.	92.496	18.274	110.770	38376.4	19.769
2150.	92.926	18.309	111.236	39365.0	19.774
2200.	93.347	18.343	111.690	40353.8	19.779
2250.	93.760	18.375	112.135	41342.9	19.783
2300.	94.164	18.405	112.570	42332.1	19.786
2350.	94.560	18.435	112.995	43321.5	19.790

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0085548
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0357931
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.0085492

Table A-66. Thermodynamic Functions $AlFCl_2$ (gas) - Continued

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
2400.	94.949	18.463	113.412	44311.1	19.793
2450.	95.330	18.490	113.820	45300.8	19.797
2500.	95.704	18.516	114.220	46290.8	19.800
2600.	96.431	18.566	114.997	48271.0	19.805
2700.	97.132	18.612	115.744	50251.7	19.810
2800.	97.810	18.655	116.465	52233.0	19.814
2900.	98.465	18.695	117.160	54214.6	19.818
3000.	99.100	18.732	117.832	56196.6	19.822
3100.	99.715	18.767	118.482	58178.9	19.825
3200.	100.311	18.800	119.111	60161.6	19.828
3300.	100.890	18.832	119.722	62144.5	19.831
3400.	101.453	18.861	120.314	64127.7	19.833
3500.	102.000	18.889	120.889	66111.1	19.835
3600.	102.532	18.915	121.447	68094.7	19.837
3700.	103.051	18.940	121.991	70078.6	19.839
3800.	103.556	18.964	122.520	72062.6	19.841
3900.	104.049	18.986	123.035	74046.7	19.842
4000.	104.530	19.008	123.538	76031.1	19.844
4100.	105.000	19.028	124.028	78015.5	19.845
4200.	105.458	19.048	124.506	80000.1	19.847
4300.	105.907	19.066	124.973	81984.8	19.848
4400.	106.345	19.084	125.429	83969.7	19.849
4500.	106.774	19.101	125.875	85954.6	19.850
4600.	107.194	19.117	126.312	87939.7	19.851
4700.	107.606	19.133	126.739	89924.8	19.852
4800.	108.009	19.148	127.157	91910.0	19.853
4900.	108.404	19.162	127.566	93895.4	19.854
5000.	108.791	19.176	127.967	95880.7	19.854
5100.	109.171	19.189	128.360	97866.2	19.855
5200.	109.544	19.202	128.746	99851.7	19.856
5300.	109.909	19.215	129.124	101837.3	19.856
5400.	110.269	19.226	129.495	103823.0	19.857
5500.	110.622	19.238	129.860	105808.7	19.857
5600.	110.968	19.249	130.217	107794.5	19.858
5700.	111.309	19.260	130.569	109780.3	19.858
5800.	111.644	19.270	130.914	111766.2	19.859
5900.	111.974	19.280	131.254	113752.1	19.859
6000.	112.298	19.290	131.587	115738.1	19.860
6100.	112.617	19.299	131.916	117724.1	19.860
6200.	112.931	19.308	132.239	119710.1	19.861
6300.	113.240	19.317	132.556	121696.2	19.861
6400.	113.544	19.325	132.869	123682.3	19.861
6500.	113.844	19.334	133.177	125668.5	19.862
6600.	114.139	19.342	133.480	127654.7	19.862
6700.	114.430	19.349	133.779	129640.9	19.862
6800.	114.716	19.357	134.073	131627.1	19.863
6900.	114.999	19.364	134.363	133613.4	19.863
7000.	115.278	19.371	134.649	135599.7	19.863
273.15	60.560	12.058	72.617	3293.6	15.971
298.15	61.631	12.404	74.035	3698.2	16.391

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

116.894, 19.57, 38.94, 58.51, 2.

The frequencies and their degeneracies were taken as:

750. (1), 650. (1), 450. (1), 300. (1), 200. (1), 150. (1)

Table A-67 Thermodynamic Functions for $AlCl_2$ (gas)

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
50.	43.123	8.065	51.187	403.2	8.465
75.	46.436	8.306	54.742	622.9	9.100
100.	48.862	8.577	57.440	857.7	9.674
125.	50.806	8.850	59.656	1106.2	10.199
150.	52.443	9.115	61.558	1367.2	10.673
175.	53.867	9.368	63.235	1639.5	11.096
200.	55.134	9.608	64.742	1921.6	11.464
225.	56.279	9.832	66.111	2212.2	11.780
250.	57.325	10.041	67.366	2510.2	12.050
275.	58.292	10.234	68.526	2814.4	12.278
300.	59.190	10.413	69.602	3123.8	12.472
325.	60.030	10.578	70.607	3437.7	12.637
350.	60.819	10.730	71.549	3755.4	12.777
375.	61.565	10.870	72.435	4076.4	12.897
400.	62.270	11.000	73.271	4400.1	13.000
425.	62.941	11.121	74.062	4726.3	13.089
450.	63.580	11.232	74.812	5054.5	13.166
475.	64.190	11.336	75.526	5384.5	13.234
500.	64.774	11.432	76.206	5716.1	13.292
550.	65.872	11.606	77.478	6383.3	13.390
600.	66.888	11.758	78.646	7054.8	13.467
650.	67.835	11.892	79.727	7729.7	13.528
700.	68.720	12.011	80.731	8407.4	13.578
750.	69.553	12.116	81.669	9087.3	13.619
800.	70.338	12.211	82.549	9769.1	13.652
850.	71.081	12.297	83.378	10452.5	13.681
900.	71.786	12.375	84.160	11137.1	13.705
950.	72.457	12.445	84.902	11822.9	13.725
1000.	73.097	12.510	85.606	12509.6	13.743
1050.	73.709	12.569	86.277	13197.1	13.758
1100.	74.295	12.623	86.918	13885.4	13.771
1150.	74.857	12.673	87.530	14574.2	13.783
1200.	75.397	12.720	88.117	15263.6	13.793
1250.	75.917	12.763	88.680	15953.5	13.802
1300.	76.419	12.803	89.222	16643.8	13.810
1350.	76.903	12.840	89.743	17334.5	13.817
1400.	77.370	12.875	90.246	18025.5	13.824
1450.	77.823	12.908	90.731	18716.9	13.830
1500.	78.261	12.939	91.200	19408.5	13.835
1550.	78.685	12.968	91.653	20100.3	13.840
1600.	79.098	12.995	92.093	20792.4	13.844
1650.	79.498	13.021	92.519	21484.7	13.848
1700.	79.887	13.045	92.932	22177.2	13.852
1750.	80.265	13.069	93.334	22869.9	13.855
1800.	80.634	13.090	93.724	23562.7	13.858
1850.	80.993	13.111	94.104	24255.7	13.861
1900.	81.343	13.131	94.474	24948.8	13.863
1950.	81.684	13.150	94.834	25642.0	13.866
2000.	82.017	13.168	95.185	26335.3	13.868
2050.	82.343	13.185	95.527	27028.8	13.870

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0102151
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0427400
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.0102084

Table A-67 Thermodynamic Functions for $AlCl_2$ (gas) - Continued

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
2100.	82.661	13.201	95.862	27722.3	13.872
2150.	82.971	13.217	96.188	28416.0	13.874
2200.	83.275	13.232	96.507	29109.7	13.875
2250.	83.573	13.246	96.819	29803.5	13.877
2300.	83.864	13.260	97.124	30497.4	13.878
2350.	84.149	13.273	97.422	31191.3	13.880
2400.	84.429	13.286	97.715	31885.3	13.881
2450.	84.703	13.298	98.001	32579.4	13.882
2500.	84.972	13.309	98.281	33273.5	13.883
2600.	85.494	13.332	98.826	34662.0	13.885
2700.	85.998	13.352	99.350	36050.6	13.887
2800.	86.484	13.371	99.855	37439.4	13.889
2900.	86.953	13.389	100.342	38828.3	13.890
3000.	87.408	13.406	100.813	40217.4	13.892
3100.	87.847	13.422	101.269	41606.7	13.893
3200.	88.274	13.436	101.710	42996.0	13.894
3300.	88.687	13.450	102.138	44385.5	13.895
3400.	89.089	13.463	102.552	45775.0	13.896
3500.	89.480	13.476	102.955	47164.6	13.897
3600.	89.859	13.487	103.347	48554.3	13.897
3700.	90.229	13.498	103.727	49944.1	13.898
3800.	90.589	13.509	104.098	51334.0	13.899
3900.	90.940	13.519	104.459	52723.9	13.899
4000.	91.283	13.528	104.811	54113.9	13.900
4100.	91.617	13.538	105.154	55503.9	13.901
4200.	91.943	13.546	105.489	56894.0	13.901
4300.	92.262	13.554	105.816	58284.1	13.901
4400.	92.574	13.562	106.136	59674.3	13.902
4500.	92.878	13.570	106.448	61064.5	13.902
4600.	93.177	13.577	106.754	62454.7	13.903
4700.	93.469	13.584	107.053	63845.0	13.903
4800.	93.755	13.591	107.346	65235.3	13.903
4900.	94.035	13.597	107.632	66625.7	13.904
5000.	94.310	13.603	107.913	68016.1	13.904
5100.	94.579	13.609	108.189	69406.5	13.904
5200.	94.844	13.615	108.459	70796.9	13.904
5300.	95.103	13.620	108.723	72187.3	13.905
5400.	95.358	13.626	108.983	73577.8	13.905
5500.	95.608	13.631	109.238	74968.3	13.905
5600.	95.853	13.636	109.489	76358.8	13.905
5700.	96.095	13.640	109.735	77749.4	13.905
5800.	96.332	13.645	109.977	79139.9	13.906
5900.	96.565	13.649	110.215	80530.5	13.906
6000.	96.795	13.654	110.448	81921.1	13.906
6100.	97.021	13.658	110.678	83311.7	13.906
6200.	97.243	13.662	110.904	84702.3	13.906
6300.	97.461	13.666	111.127	86093.0	13.906
6400.	97.677	13.669	111.346	87483.6	13.907
6500.	97.889	13.673	111.561	88874.3	13.907
6600.	98.097	13.677	111.774	90265.0	13.907
6700.	98.303	13.680	111.983	91655.7	13.907
6800.	98.506	13.683	112.189	93046.4	13.907
6900.	98.705	13.687	112.392	94437.1	13.907
7000.	98.902	13.690	112.592	95827.8	13.907
273.15	58.223	10.220	68.443	2791.7	12.263
298.15	59.125	10.400	69.525	3100.7	12.459

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

97.894, 3.58, 38.95, 42.52, 2.

The frequencies and their degeneracies were taken as:

600. (1), 350. (1), 150. (1)

The electronic multiplicity was taken to be 2.

Table A-68. Thermodynamic Functions for $AlCl_3$ (gas)

T °K	$-\frac{(F^o-H_0^o)}{T}$	$\frac{H^o-H_0^o}{T}$	S^o	$H^o-H_0^o$	C_p^o
50.	43.513	8.292	51.805	414.6	9.360
75.	46.988	8.910	55.898	668.2	10.889
100.	49.641	9.565	59.207	956.5	12.129
125.	51.843	10.183	62.025	1272.8	13.144
150.	53.750	10.750	64.500	1612.5	14.007
175.	55.447	11.270	66.717	1972.2	14.757
200.	56.984	11.748	68.731	2349.5	15.408
225.	58.393	12.186	70.579	2741.9	15.970
250.	59.698	12.589	72.287	3147.3	16.451
275.	60.916	12.959	73.875	3563.9	16.862
300.	62.058	13.300	75.358	3989.9	17.212
325.	63.135	13.612	76.747	4424.0	17.511
350.	64.154	13.900	78.055	4865.1	17.767
375.	65.123	14.166	79.288	5312.1	17.987
400.	66.045	14.410	80.455	5764.2	18.176
425.	66.925	14.637	81.562	6220.7	18.340
450.	67.768	14.847	82.615	6681.0	18.482
475.	68.576	15.041	83.617	7144.6	18.607
500.	69.352	15.222	84.574	7611.2	18.716
550.	70.819	15.549	86.367	8551.7	18.897
600.	72.184	15.834	88.018	9500.3	19.040
650.	73.461	16.085	89.546	10455.2	19.154
700.	74.662	16.308	90.969	11415.3	19.247
750.	75.794	16.506	92.300	12379.7	19.323
800.	76.865	16.684	93.549	13347.5	19.387
850.	77.881	16.845	94.726	14318.2	19.440
900.	78.848	16.990	95.839	15291.3	19.485
950.	79.771	17.123	96.893	16266.5	19.523
1000.	80.652	17.244	97.895	17243.5	19.556
1050.	81.496	17.354	98.850	18222.1	19.585
1100.	82.306	17.456	99.762	19202.0	19.610
1150.	83.084	17.550	100.634	20183.0	19.632
1200.	83.833	17.638	101.470	21165.1	19.651
1250.	84.554	17.718	102.273	22148.0	19.668
1300.	85.251	17.794	103.044	23131.8	19.683
1350.	85.923	17.864	103.787	24116.3	19.697
1400.	86.574	17.930	104.504	25101.4	19.709
1450.	87.205	17.991	105.196	26087.2	19.720
1500.	87.816	18.049	105.864	27073.4	19.729
1550.	88.408	18.103	106.512	28060.1	19.738
1600.	88.984	18.155	107.138	29047.2	19.747
1650.	89.543	18.203	107.746	30034.7	19.754
1700.	90.087	18.249	108.336	31022.6	19.761
1750.	90.617	18.292	108.909	32010.8	19.767
1800.	91.133	18.333	109.466	32999.3	19.773
1850.	91.636	18.372	110.008	33988.1	19.778
1900.	92.126	18.409	110.535	34977.1	19.783
1950.	92.605	18.444	111.049	35966.4	19.787
2000.	93.072	18.478	111.550	36955.9	19.792
2050.	93.529	18.510	112.039	37945.5	19.795
2100.	93.975	18.541	112.516	38935.4	19.799
2150.	94.412	18.570	112.982	39925.4	19.802
2200.	94.839	18.598	113.437	40915.6	19.806
2250.	95.257	18.625	113.882	41906.0	19.808
2300.	95.667	18.651	114.318	42896.5	19.811
2350.	96.068	18.675	114.744	43887.1	19.814

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0074990
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0313759
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.0074941

Table A-68. Thermodynamic Functions for $AlCl_3$ (gas) - Continued

T °K	$-(F^o-H^o_0)/T$	$(H^o-H^o_0)/T$	S^o	$H^o-H^o_0$	C^o_p
2400.	96.462	18.699	115.161	44877.9	19.816
2450.	96.848	18.722	115.569	45868.7	19.818
2500.	97.226	18.744	115.970	46859.7	19.821
2600.	97.962	18.785	116.747	48842.0	19.825
2700.	98.672	18.824	117.496	50824.6	19.828
2800.	99.357	18.860	118.217	52807.6	19.831
2900.	100.019	18.893	118.913	54790.8	19.834
3000.	100.660	18.925	119.585	56774.3	19.836
3100.	101.281	18.954	120.236	58758.1	19.839
3200.	101.884	18.982	120.866	60742.1	19.841
3300.	102.468	19.008	121.476	62726.3	19.843
3400.	103.036	19.033	122.068	64710.6	19.844
3500.	103.588	19.056	122.644	66695.1	19.846
3600.	104.125	19.078	123.203	68679.8	19.847
3700.	104.648	19.099	123.747	70664.6	19.849
3800.	105.158	19.118	124.276	72649.6	19.850
3900.	105.655	19.137	124.792	74634.6	19.851
4000.	106.139	19.155	125.294	76619.8	19.852
4100.	106.612	19.172	125.784	78605.1	19.853
4200.	107.075	19.188	126.263	80590.4	19.854
4300.	107.526	19.204	126.730	82575.9	19.855
4400.	107.968	19.219	127.187	84561.4	19.856
4500.	108.400	19.233	127.633	86547.0	19.857
4600.	108.823	19.246	128.069	88532.7	19.857
4700.	109.237	19.259	128.496	90518.5	19.858
4800.	109.643	19.272	128.914	92504.3	19.858
4900.	110.040	19.284	129.324	94490.2	19.859
5000.	110.430	19.295	129.725	96476.1	19.860
5100.	110.812	19.306	130.118	98462.1	19.860
5200.	111.187	19.317	130.504	100448.1	19.861
5300.	111.555	19.327	130.882	102434.2	19.861
5400.	111.916	19.337	131.253	104420.3	19.861
5500.	112.271	19.347	131.618	106406.5	19.862
5600.	112.620	19.356	131.976	108392.7	19.862
5700.	112.963	19.365	132.327	110378.9	19.863
5800.	113.300	19.373	132.673	112365.2	19.863
5900.	113.631	19.382	133.012	114351.5	19.863
6000.	113.957	19.390	133.346	116337.8	19.864
6100.	114.277	19.397	133.675	118324.2	19.864
6200.	114.593	19.405	133.998	120310.6	19.864
6300.	114.903	19.412	134.315	122297.0	19.864
6400.	115.209	19.419	134.628	124283.5	19.865
6500.	115.510	19.426	134.936	126269.9	19.865
6600.	115.807	19.433	135.239	128256.4	19.865
6700.	116.099	19.439	135.538	130243.0	19.865
6800.	116.387	19.446	135.833	132229.5	19.866
6900.	116.671	19.452	136.123	134216.1	19.866
7000.	116.951	19.458	136.408	136202.7	19.866
273.15	60.828	12.933	73.761	3532.7	16.833
298.15	61.976	13.275	75.251	3958.1	17.188

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

133.351, 38.9406, 38.9406, 77.8812, 6.

The frequencies and their degeneracies were taken as:

345. (1), 230. (1), 610. (2), 135. (2)

Table A-69 Thermodynamic Functions for Al_2Cl_6 (gas)

T °K	$-\frac{(F^o-H^o_0)}{T}$	$\frac{H^o-H^o_0}{T}$	S^o	$H^o-H^o_0$	C^o_p
50.	51.435	10.473	61.908	523.7	14.858
75.	56.108	12.742	68.851	955.7	19.548
100.	60.078	14.932	75.010	1493.2	23.314
125.	63.628	16.926	80.554	2115.8	26.400
150.	66.876	18.727	85.603	2809.0	28.986
175.	69.887	20.352	90.239	3561.6	31.156
200.	72.702	21.819	94.521	4363.8	32.968
225.	75.350	23.144	98.494	5207.4	34.473
250.	77.851	24.341	102.193	6085.4	35.722
275.	80.223	25.425	105.647	6991.8	36.761
300.	82.478	26.406	108.884	7921.9	37.627
325.	84.627	27.298	111.926	8872.0	38.353
350.	86.680	28.110	114.791	9838.6	38.965
375.	88.646	28.852	117.497	10819.4	39.483
400.	90.530	29.530	120.060	11812.2	39.926
425.	92.339	30.153	122.492	12815.2	40.305
450.	94.079	30.727	124.805	13827.0	40.633
475.	95.754	31.256	127.010	14846.4	40.917
500.	97.370	31.745	129.115	15872.5	41.165
550.	100.438	32.621	133.059	17941.4	41.574
600.	103.310	33.381	136.690	20028.5	41.894
650.	106.008	34.046	140.054	22129.8	42.149
700.	108.553	34.632	143.186	24242.5	42.354
750.	110.961	35.153	146.114	26364.6	42.523
800.	113.245	35.618	148.863	28494.3	42.662
850.	115.417	36.036	151.453	30630.4	42.779
900.	117.487	36.413	153.901	32771.9	42.877
950.	119.465	36.756	156.221	34917.9	42.961
1000.	121.359	37.068	158.427	37067.8	43.033
1050.	123.174	37.353	160.528	39221.1	43.096
1100.	124.918	37.616	162.534	41377.3	43.150
1150.	126.596	37.857	164.453	43536.0	43.198
1200.	128.212	38.081	166.292	45696.9	43.239
1250.	129.770	38.288	168.058	47859.9	43.277
1300.	131.276	38.480	169.756	50024.5	43.309
1350.	132.732	38.660	171.391	52190.8	43.339
1400.	134.141	38.827	172.968	54358.4	43.365
1450.	135.506	38.984	174.490	56527.2	43.389
1500.	136.830	39.131	175.962	58697.2	43.410
1550.	138.115	39.270	177.385	60868.2	43.430
1600.	139.364	39.400	178.764	63040.2	43.448
1650.	140.579	39.523	180.102	65213.0	43.464
1700.	141.760	39.639	181.399	67386.5	43.478
1750.	142.911	39.749	182.660	69560.8	43.492
1800.	144.032	39.853	183.885	71735.7	43.504
1850.	145.125	39.952	185.077	73911.2	43.516
1900.	146.192	40.046	186.238	76087.2	43.526
1950.	147.233	40.135	187.369	78263.8	43.536
2000.	148.251	40.220	188.471	80440.8	43.545
2050.	149.245	40.302	189.546	82618.3	43.553

This table is in units of calories, moles and °K

To Convert Tabulated Values to Quantities Having the Dimensions Indicated Below	Multiply By
cal g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0037495
joules g^{-1} $°K^{-1}$ (or $°C^{-1}$)	0.0156879
Btu lb^{-1} $°R^{-1}$ (or $°F^{-1}$)	0.00374705

Table A-69 Thermodynamic Functions for Al_2Cl_6 (gas) - Continued

T °K	$-\frac{(F^o-H_0^o)}{T}$	$\frac{H^o-H_0^o}{T}$	S^o	$H^o-H_0^o$	C_p^o
2100.	150.217	40.379	190.596	84796.1	43.561
2150.	151.168	40.453	191.621	86974.4	43.568
2200.	152.099	40.524	192.623	89153.0	43.575
2250.	153.010	40.592	193.602	91331.9	43.581
2300.	153.903	40.657	194.560	93511.1	43.587
2350.	154.778	40.719	195.498	95690.6	43.593
2400.	155.636	40.779	196.415	97870.4	43.598
2450.	156.478	40.837	197.314	100050.4	43.603
2500.	157.303	40.892	198.195	102230.7	43.608
2600.	158.909	40.997	199.906	106591.8	43.616
2700.	160.458	41.094	201.552	110953.8	43.624
2800.	161.954	41.184	203.139	115316.5	43.630
2900.	163.401	41.269	204.670	119679.9	43.636
3000.	164.801	41.348	206.149	124043.8	43.642
3100.	166.158	41.422	207.580	123408.2	43.647
3200.	167.475	41.492	208.966	132773.1	43.651
3300.	168.752	41.557	210.309	137138.4	43.655
3400.	169.994	41.619	211.613	141504.1	43.659
3500.	171.201	41.677	212.878	145870.2	43.662
3600.	172.376	41.732	214.108	150236.6	43.666
3700.	173.520	41.785	215.305	154603.3	43.668
3800.	174.635	41.834	216.469	158970.3	43.671
3900.	175.722	41.881	217.604	163337.5	43.674
4000.	176.783	41.926	218.710	167705.0	43.676
4100.	177.819	41.969	219.788	172072.7	43.678
4200.	178.831	42.010	220.841	176440.5	43.680
4300.	179.820	42.049	221.868	180808.6	43.682
4400.	180.787	42.086	222.873	185176.9	43.683
4500.	181.733	42.121	223.854	189545.3	43.685
4600.	182.659	42.155	224.815	193913.9	43.687
4700.	183.566	42.188	225.754	198282.6	43.688
4800.	184.455	42.219	226.674	202651.5	43.689
4900.	185.326	42.249	227.575	207020.5	43.690
5000.	186.180	42.278	228.457	211389.6	43.692
5100.	187.017	42.306	229.323	215758.8	43.693
5200.	187.839	42.332	230.171	220128.1	43.694
5300.	188.645	42.358	231.003	224497.5	43.695
5400.	189.437	42.383	231.820	228867.0	43.696
5500.	190.215	42.407	232.622	233236.6	43.696
5600.	190.980	42.430	233.409	237606.3	43.697
5700.	191.731	42.452	234.183	241976.1	43.698
5800.	192.469	42.473	234.943	246345.9	43.699
5900.	193.195	42.494	235.690	250715.9	43.700
6000.	193.910	42.514	236.424	255085.9	43.700
6100.	194.613	42.534	237.147	259455.9	43.701
6200.	195.305	42.553	237.857	263826.0	43.701
6300.	195.986	42.571	238.556	268196.2	43.702
6400.	196.656	42.588	239.245	272566.4	43.703
6500.	197.317	42.606	239.922	276936.7	43.703
6600.	197.967	42.622	240.589	281307.0	43.704
6700.	198.608	42.638	241.247	285677.4	43.704
6800.	199.240	42.654	241.894	290047.8	43.705
6900.	199.863	42.669	242.532	294418.3	43.705
7000.	200.477	42.684	243.161	293788.8	43.705
273.15	80.051	25.348	105.400	6923.8	36.690
298.15	82.315	26.337	108.652	7852.4	37.568

This table has been computed for the harmonic oscillator-rigid rotator approximation using the following data for molecular weight, I_A, I_B, I_C, (in units of 10^{-39} gm cm^2) and σ respectively:

266,702, 96.63, 229.60 279.68, 4.

The frequencies and their degeneracies were taken as:

506. (1), 340. (1), 217. (1), 112. (1), 75. (1), 438. (1), 164. (1), 625. (1), 202. (1), 42. (1), 606. (1), 164. (1), 420. (1), 108. (1), 160. (1), 484. (1), 301. (1), 177. (1)

Appendix B

THERMODYNAMIC FUNCTIONS OF SOLIDS AND LIQUIDS

Analysis of Low-Temperature Data:

George T. Furukawa, Martin L. Reilly,
and Jeanette H. Piccirelli

Analysis of High-Temperature Data:

Thomas B. Douglas, Andrew C. Victor,
and Adrienne R. Beaudoin

Analysis of Graphite:

William H. Evans

Procedures and sources of data used in obtaining and estimating the thermodynamic functions given for solids and liquids in this appendix are described in detail in NBS Reports Nos. 6297 and 6645. The heat-capacity values from low-temperature measurements and those derived from high-temperature enthalpy measurements have been joined "smoothly". The "smooth-joining" process has raised the lower temperature limits of applicability of high-temperature enthalpy equations by which the original data have been represented. The tabular values given above the temperatures of "smooth-joining" can be obtained from the original enthalpy equations with the constant terms slightly modified. The temperatures of "smooth-joining" are given in the discussion dealing with each substance (see NBS Reports Nos. 6297 and 6645).

Dr. K. K. Kelley of the U. S. Bureau of Mines at Berkeley, California, has kindly made available to us prior to publication both the low-temperature heat-capacity values and high-temperature relative-enthalpy values on aluminum nitride (AlN) recently obtained in his laboratories. In the low temperature range, the smoothed heat-capacity values available at 25-degree intervals were interpolated to obtain values at 5-degree intervals. These interpolated values were smoothed and joined with those derived from an enthalpy equation fitted by least squares to the observed high-temperature enthalpy data.

There was mentioned in the NBS Report 6645 that new data have become available on lithium, lithium chloride, and aluminum chloride. The analysis of these data shows considerable discrepancy (1 percent and higher in heat capacity) where the low and high temperature data overlap. At this time the analyses to obtain a revised table of thermodynamic properties for these substances have not been completed. The tables given are the same as those in NBS Report No. 6484. A major revision in these tables should be expected in the near future.

TABLE B-1

THERMODYNAMIC FUNCTIONS FOR ALUMINUM (AL)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.= 26.98 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0006	0.0011	0.002	0.005	0.003	0.003
10.00	0.0020	0.0033	0.005	0.033	0.009	0.020
15.00	0.0040	0.0075	0.012	0.113	0.024	0.060
20.00	0.0071	0.0151	0.022	0.301	0.054	0.142
25.00	0.0117	0.0279	0.040	0.698	0.109	0.294
30.00	0.0185	0.0483	0.067	1.449	0.197	0.555
35.00	0.0280	0.0781	0.106	2.734	0.323	0.981
40.00	0.0410	0.1187	0.160	4.748	0.488	1.640
45.00	0.0578	0.1704	0.228	7.669	0.685	2.603
50.00	0.0789	0.2327	0.312	11.635	0.905	3.946
55.00	0.1044	0.3044	0.409	16.739	1.139	5.742
60.00	0.1342	0.3839	0.518	23.031	1.379	8.054
65.00	0.1683	0.4696	0.638	30.525	1.619	10.940
70.00	0.2064	0.5602	0.767	39.214	1.856	14.448
75.00	0.2482	0.6543	0.903	49.075	2.088	18.618
80.00	0.2936	0.7510	1.045	60.078	2.312	23.484
85.00	0.3420	0.8492	1.191	72.184	2.529	29.071
90.00	0.3934	0.9483	1.342	85.348	2.735	35.402
95.00	0.4473	1.0476	1.495	99.520	2.932	42.493
100.00	0.5035	1.1465	1.650	114.65	3.117	50.354
105.00	0.5619	1.2445	1.806	130.67	3.291	58.995
110.00	0.6220	1.3413	1.963	147.54	3.453	68.419
115.00	0.6837	1.4364	2.120	165.19	3.605	78.628
120.00	0.7468	1.5298	2.277	183.57	3.746	89.620
125.00	0.8111	1.6211	2.432	202.64	3.879	101.390
130.00	0.8765	1.7103	2.587	222.34	4.003	113.94
135.00	0.9427	1.7974	2.740	242.65	4.119	127.26
140.00	1.0096	1.8823	2.892	263.53	4.230	141.34
145.00	1.0771	1.9651	3.042	284.94	4.335	156.17
150.00	1.1451	2.0458	3.191	306.87	4.434	171.76
155.00	1.2134	2.1243	3.338	329.27	4.527	188.08
160.00	1.2821	2.2008	3.483	352.13	4.615	205.13
165.00	1.3509	2.2753	3.626	375.42	4.698	222.91
170.00	1.4199	2.3477	3.768	399.11	4.777	241.39
175.00	1.4890	2.4182	3.907	423.18	4.851	260.58
180.00	1.5581	2.4867	4.045	447.61	4.921	280.46
185.00	1.6272	2.5534	4.181	472.38	4.986	301.02
190.00	1.6961	2.6182	4.314	497.46	5.048	322.26
195.00	1.7649	2.6813	4.446	522.85	5.106	344.16
200.00	1.8336	2.7426	4.576	548.52	5.161	366.72
205.00	1.9021	2.8022	4.704	574.45	5.211	389.92
210.00	1.9703	2.8601	4.830	600.63	5.258	413.76
215.00	2.0383	2.9164	4.955	627.03	5.301	438.22
220.00	2.1059	2.9711	5.077	653.63	5.342	463.30
225.00	2.1733	3.0242	5.198	680.44	5.380	488.99
230.00	2.2403	3.0758	5.316	707.43	5.417	515.28
235.00	2.3070	3.1260	5.433	734.61	5.453	542.15
240.00	2.3733	3.1749	5.548	761.96	5.489	569.60
245.00	2.4393	3.2224	5.662	789.49	5.523	597.63
250.00	2.5049	3.2688	5.774	817.19	5.557	626.22
255.00	2.5700	3.3140	5.884	845.06	5.589	655.36
260.00	2.6348	3.3580	5.993	873.08	5.620	685.05
265.00	2.6992	3.4010	6.100	901.26	5.651	715.29
270.00	2.7632	3.4429	6.206	929.58	5.680	746.05
273.15	2 8032	3.4688	6.272	947.50	5.697	765.71
275.00	2.8267	3.4838	6.311	958.05	5.708	777.35
280.00	2.8898	3.5238	6.414	986.66	5.735	809.16
285.00	2.9526	3.5628	6.515	1015.4	5.760	841.48
290.00	3.0149	3.6009	6.616	1044.3	5.785	874.31
295.00	3.0767	3.6381	6.715	1073.2	5.808	907.64
298.15	3.1155	3.6611	6.777	1091.6	5.821	928.88
300.00	3.1382	3.6744	6.813	1102.3	5.829	941.45

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-1 (CONT.)

THERMODYNAMIC FUNCTIONS FOR ALUMINUM (AL)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.= 26.98 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	3.1382	3.6744	6.813	1102.3	5.829	941.45
310.00	3.2598	3.7446	7.004	1160.8	5.866	1010.5
320.00	3.3798	3.8114	7.191	1219.6	5.899	1081.5
330.00	3.4980	3.8751	7.373	1278.8	5.930	1154.4
340.00	3.6146	3.9360	7.551	1338.2	5.958	1229.0
350.00	3.7296	3.9941	7.724	1397.9	5.985	1305.3
360.00	3.8429	4.0498	7.893	1457.9	6.011	1383.4
370.00	3.9546	4.1031	8.058	1518.2	6.039	1463.2
373.15	3.9894	4.1195	8.109	1537.2	6.048	1488.7
380.00	4.0647	4.1545	8.219	1578.7	6.069	1544.6
390.00	4.1732	4.2039	8.377	1639.5	6.098	1627.6
400.00	4.2803	4.2516	8.532	1700.7	6.127	1712.1
425.00	4.5414	4.3641	8.906	1854.8	6.201	1930.1
450.00	4.7939	4.4682	9.262	2010.7	6.274	2157.2
475.00	5.038	4.565	9.603	2168.4	6.346	2393.1
500.00	5.275	4.656	9.931	2328.0	6.420	2637.3
550.00	5.726	4.823	10.549	2652.7	6.568	3149.4
600.00	6.153	4.975	11.127	2984.8	6.716	3691.5
650.00	6.556	5.114	11.671	3324.3	6.864	4261.6
700.00	6.940	5.245	12.185	3671.2	7.012	4858.1
750.00	7.306	5.367	12.674	4025.5	7.160	5479.6
800.00	7.656	5.484	13.140	4387.2	7.308	6125.1
850.00	7.992	5.596	13.588	4756.3	7.456	6793.3
900.00	8.315	5.703	14.018	5132.8	7.604	7483.6
932.00	8.515	5.770	14.285	5377.6	7.699	7936.4
			(LIQUID)			
932.00	8.515	8.526	17.042	7946.6	7.000	7936.4
950.00	8.678	8.497	17.176	8072.6	7.000	8244.4
1000.00	9.112	8.423	17.535	8422.6	7.000	9112.2
1050.00	9.522	8.355	17.876	8772.6	7.000	9997.6
1100.00	9.909	8.293	18.202	9122.6	7.000	10899.6
1150.00	10.276	8.237	18.513	9472.6	7.000	11817.5
1200.00	10.626	8.185	18.811	9822.6	7.000	12750.7
1250.00	10.959	8.138	19.097	10172.6	7.000	13698.4
1300.00	11.277	8.094	19.371	10522.6	7.000	14660.2
1350.00	11.582	8.054	19.636	10872.6	7.000	15635.4
1400.00	11.874	8.016	19.890	11222.6	7.000	16623.6
1450.00	12.155	7.981	20.136	11572.6	7.000	17624.3
1500.00	12.425	7.948	20.373	11922.6	7.000	18637.0
1550.00	12.685	7.918	20.603	12272.6	7.000	19661.5
1600.00	12.936	7.889	20.825	12622.6	7.000	20697.2
1650.00	13.178	7.862	21.040	12972.6	7.000	21743.8
1700.00	13.412	7.837	21.249	13322.6	7.000	22801.1
1750.00	13.639	7.813	21.452	13672.6	7.000	23868.6
1800.00	13.859	7.790	21.649	14022.6	7.000	24946.2
1850.00	14.072	7.769	21.841	14372.6	7.000	26033.5
1900.00	14.279	7.749	22.028	14722.6	7.000	27130.2
1950.00	14.480	7.730	22.210	15072.6	7.000	28236.2
2000.00	14.676	7.711	22.387	15422.6	7.000	29351.1
2050.00	14.866	7.694	22.560	15772.6	7.000	30474.8
2100.00	15.051	7.677	22.728	16122.6	7.000	31607.0
2150.00	15.231	7.662	22.893	16472.6	7.000	32747.6
2200.00	15.407	7.647	23.054	16822.6	7.000	33896.3
2250.00	15.579	7.632	23.211	17172.6	7.000	35052.9
2300.00	15.747	7.619	23.365	17522.6	7.000	36217.3
2350.00	15.910	7.605	23.516	17872.6	7.000	37389.4
2400.00	16.070	7.593	23.663	18222.6	7.000	38568.9
2450.00	16.227	7.581	23.807	18572.6	7.000	39755.6
2500.00	16.380	7.569	23.949	18922.6	7.000	40949.6

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-2

THERMODYNAMIC FUNCTIONS FOR ALUMINUM OXIDE (ALPHA-AL_2O_3)
SOLID PHASE

GRAM MOLECULAR WT.=101.96 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0001	0.000	0.000	0.000	0.000
10.00	0.0002	0.0006	0.001	0.006	0.002	0.002
15.00	0.0006	0.0018	0.002	0.028	0.007	0.009
20.00	0.0015	0.0044	0.006	0.088	0.018	0.029
25.00	0.0029	0.0086	0.011	0.214	0.034	0.072
30.00	0.0050	0.0150	0.020	0.450	0.063	0.149
35.00	0.0080	0.0246	0.033	0.862	0.105	0.278
40.00	0.0121	0.0382	0.050	1.528	0.165	0.483
45.00	0.0176	0.0567	0.074	2.552	0.249	0.791
50.00	0.0248	0.0811	0.106	4.053	0.357	1.238
55.00	0.0339	0.1122	0.146	6.169	0.495	1.864
60.00	0.0453	0.1509	0.196	9.053	0.664	2.715
65.00	0.0591	0.1979	0.257	12.864	0.865	3.843
70.00	0.0758	0.2536	0.329	17.752	1.095	5.305
75.00	0.0954	0.3182	0.414	23.863	1.355	7.157
80.00	0.1183	0.3920	0.510	31.356	1.648	9.461
85.00	0.1445	0.4752	0.620	40.393	1.971	12.280
90.00	0.1742	0.5678	0.742	51.102	2.316	15.679
95.00	0.2076	0.6694	0.877	63.591	2.682	19.722
100.00	0.2447	0.7796	1.024	77.959	3.069	24.470
105.00	0.2856	0.8982	1.184	94.312	3.476	29.985
110.00	0.3303	1.0250	1.355	112.74	3.900	36.327
115.00	0.3788	1.1595	1.538	133.34	4.341	43.556
120.00	0.4311	1.3014	1.733	156.17	4.794	51.728
125.00	0.4872	1.4503	1.938	181.29	5.256	60.899
130.00	0.5471	1.6057	2.153	208.75	5.727	71.121
135.00	0.6107	1.7672	2.378	238.57	6.203	82.443
140.00	0.6780	1.9341	2.612	270.78	6.682	94.915
145.00	0.7488	2.1061	2.855	305.39	7.163	108.58
150.00	0.8232	2.2827	3.106	342.41	7.644	123.48
155.00	0.9010	2.4634	3.364	381.83	8.123	139.65
160.00	0.9821	2.6477	3.630	423.64	8.601	157.13
165.00	1.0664	2.8353	3.902	467.83	9.075	175.96
170.00	1.1539	3.0258	4.180	514.38	9.545	196.16
175.00	1.2444	3.2187	4.463	563.27	10.009	217.76
180.00	1.3378	3.4137	4.752	614.46	10.467	240.80
185.00	1.4340	3.6104	5.044	667.93	10.917	265.29
190.00	1.5329	3.8086	5.341	723.62	11.361	291.25
195.00	1.6344	4.0078	5.642	781.52	11.796	318.71
200.00	1.7384	4.2078	5.946	841.57	12.223	347.68
205.00	1.8448	4.4084	6.253	903.73	12.641	378.17
210.00	1.9534	4.6093	6.563	967.96	13.050	410.21
215.00	2.0642	4.8103	6.875	1034.2	13.451	443.81
220.00	2.1771	5.0112	7.188	1102.5	13.843	478.96
225.00	2.2920	5.2117	7.504	1172.6	14.227	515.69
230.00	2.4087	5.4118	7.821	1244.7	14.602	554.00
235.00	2.5272	5.6113	8.138	1318.6	14.969	593.90
240.00	2.6475	5.8100	8.457	1394.4	15.327	635.39
245.00	2.7693	6.0078	8.777	1471.9	15.676	678.47
250.00	2.8926	6.2045	9.097	1551.1	16.016	723.16
255.00	3.0174	6.4002	9.418	1632.1	16.349	769.45
260.00	3.1436	6.5946	9.738	1714.6	16.673	817.34
265.00	3.2711	6.7878	10.059	1798.8	16.988	866.83
270.00	3.3997	6.9795	10.379	1884.5	17.296	917.92
273.15	3.4814	7.0996	10.581	1939.3	17.486	950.94
275.00	3.5295	7.1699	10.699	1971.7	17.596	970.62
280.00	3.6604	7.3586	11.019	2060.4	17.887	1024.9
285.00	3.7923	7.5459	11.338	2150.6	18.172	1080.8
290.00	3.9252	7.7315	11.657	2242.1	18.448	1138.3
295.00	4.0589	7.9154	11.974	2335.0	18.717	1197.4
298.15	4.1436	8.0304	12.174	2394.3	18.883	1235.4
300.00	4.1935	8.0976	12.291	2429.3	18.979	1258.0

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-2 (CONT.)

THERMODYNAMIC FUNCTIONS FOR ALUMINUM OXIDE (ALPHA-AL_2O_3)
SOLID PHASE

GRAM MOLECULAR WT.=101.96 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG-MOLE	$(H_T-H_0)/T$ CAL/DEG-MOLE	(S_T-S_0) CAL/DEG-MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG-MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	4.1935	8.0976	12.291	2429.3	18.979	1258.0
310.00	4.4649	8.4568	12.922	2621.6	19.482	1384.1
320.00	4.7389	8.8088	13.548	2818.8	19.957	1516.5
330.00	5.0153	9.1535	14.169	3020.7	20.408	1655.0
340.00	5.2936	9.4909	14.784	3226.9	20.836	1799.8
350.00	5.5735	9.8209	15.394	3437.3	21.243	1950.7
360.00	5.8547	10.144	15.998	3651.7	21.633	2107.7
370.00	6.1369	10.459	16.596	3869.9	22.003	2270.7
373.15	6.2260	10.557	16.783	3939.4	22.114	2323.2
380.00	6.4200	10.768	17.188	4091.7	22.349	2439.6
390.00	6.7036	11.069	17.772	4316.8	22.677	2614.4
400.00	6.9875	11.363	18.350	4545.2	22.986	2795.0
425.00	7.697	12.068	19.765	5128.7	23.685	3271.4
450.00	8.406	12.731	21.136	5728.7	24.302	3782.7
475.00	9.111	13.354	22.465	6343.3	24.852	4327.8
500.00	9.811	13.942	23.753	6970.9	25.345	4905.6
550.00	11.191	15.018	26.210	8260.0	26.191	6155.3
600.00	12.540	15.979	28.519	9587.5	26.889	7524.1
650.00	13.854	16.842	30.695	10947.0	27.474	9005.0
700.00	15.131	17.619	32.750	12333.4	27.969	10591.6
750.00	16.371	18.324	34.695	13742.8	28.393	12278.2
800.00	17.574	18.965	36.539	15171.8	28.758	14059.4
850.00	18.742	19.550	38.292	16617.8	29.076	15930.6
900.00	19.875	20.087	39.962	18078.7	29.354	17887.3
950.00	20.974	20.582	41.556	19552.7	29.599	19925.5
1000.00	22.042	21.038	43.080	21038.1	29.814	22041.7
1050.00	23.079	21.461	44.539	22533.7	30.006	24232.4
1100.00	24.086	21.853	45.939	24038.3	30.176	26494.6
1150.00	25.066	22.218	47.284	25551.0	30.328	28825.4
1200.00	26.018	22.559	48.578	27070.9	30.464	31222.2
1250.00	26.946	22.878	49.824	28597.2	30.586	33682.4
1300.00	27.849	23.176	51.025	30129.2	30.695	36203.8
1350.00	28.729	23.457	52.186	31666.5	30.793	38784.2
1400.00	29.587	23.720	53.307	33208.3	30.881	41421.7
1450.00	30.424	23.969	54.392	34754.4	30.960	44114.3
1500.00	31.240	24.203	55.443	36304.2	31.032	46860.3
1550.00	32.037	24.424	56.462	37857.5	31.096	49658.1
1600.00	32.816	24.634	57.450	39413.7	31.153	52506.0
1650.00	33.577	24.832	58.409	40972.7	31.205	55402.6
1700.00	34.321	25.020	59.341	42534.1	31.251	58346.5
1750.00	35.049	25.199	60.248	44097.6	31.292	61336.3
1800.00	35.762	25.368	61.130	45663.2	31.328	64370.9
1850.00	36.459	25.530	61.989	47230.4	31.361	67448.9
1900.00	37.142	25.684	62.826	48799.2	31.389	70569.4
1950.00	37.811	25.830	63.641	50369.3	31.414	73731.1
2000.00	38.467	25.970	64.437	51940.5	31.436	76933.2
2050.00	39.110	26.104	65.213	53512.8	31.454	80174.5
2100.00	39.740	26.231	65.971	55085.9	31.470	83454.2
2150.00	40.359	26.353	66.712	56659.8	31.483	86771.4
2200.00	40.966	26.470	67.436	58234.2	31.494	90125.1
2250.00	41.562	26.582	68.144	59809.1	31.502	93514.7
2300.00	42.148	26.689	68.836	61384.4	31.509	96939.3

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-3

THERMODYNAMIC FUNCTIONS FOR ALUMINA MONOHYDRATE ($AL_2O_3 \cdot H_2O$, BOEHMITE)
SOLID PHASE

GRAM MOLECULAR WT.=119.976 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0003	0.0017	0.002	0.009	0.009	0.002
10.00	0.0058	0.0193	0.025	0.193	0.072	0.058
15.00	0.0196	0.0534	0.073	0.802	0.177	0.294
20.00	0.0412	0.1014	0.143	2.027	0.320	0.825
25.00	0.0702	0.1626	0.233	4.065	0.502	1.755
30.00	0.1062	0.2372	0.343	7.115	0.724	3.187
35.00	0.1492	0.3250	0.474	11.373	0.985	5.222
40.00	0.1990	0.4256	0.625	17.025	1.282	7.961
45.00	0.2556	0.5388	0.794	24.245	1.612	11.501
50.00	0.3187	0.6641	0.983	33.207	1.978	15.936
55.00	0.3884	0.8016	1.190	44.086	2.380	21.361
60.00	0.4645	0.9511	1.416	57.065	2.818	27.867
65.00	0.5469	1.1127	1.660	72.325	3.292	35.547
70.00	0.6356	1.2863	1.922	90.038	3.798	44.493
75.00	0.7306	1.4714	2.202	110.36	4.333	54.795
80.00	0.8318	1.6676	2.499	133.41	4.892	66.541
85.00	0.9390	1.8742	2.813	159.31	5.470	79.816
90.00	1.0522	2.0904	3.143	188.13	6.064	94.700
95.00	1.1712	2.3155	3.487	219.97	6.672	111.27
100.00	1.2959	2.5488	3.845	254.88	7.293	129.59
105.00	1.4261	2.7897	4.216	292.92	7.925	149.74
110.00	1.5615	3.0377	4.599	334.14	8.567	171.77
115.00	1.7021	3.2922	4.994	378.60	9.218	195.75
120.00	1.8477	3.5528	5.401	426.34	9.876	221.73
125.00	1.9982	3.8190	5.817	477.38	10.541	249.77
130.00	2.1532	4.0904	6.244	531.75	11.210	279.92
135.00	2.3128	4.3666	6.679	589.49	11.883	312.22
140.00	2.4766	4.6471	7.124	650.59	12.559	346.73
145.00	2.6446	4.9315	7.576	715.07	13.236	383.47
150.00	2.8167	5.2196	8.036	782.95	13.913	422.50
155.00	2.9926	5.5110	8.504	854.21	14.590	463.85
160.00	3.1722	5.8053	8.977	928.85	15.266	507.55
165.00	3.3553	6.1022	9.458	1006.9	15.940	553.63
170.00	3.5420	6.4014	9.943	1088.2	16.610	602.13
175.00	3.7319	6.7026	10.434	1173.0	17.277	653.07
180.00	3.9249	7.0056	10.930	1261.0	17.939	706.48
185.00	4.1210	7.3100	11.431	1352.3	18.596	762.39
190.00	4.3200	7.6156	11.936	1447.0	19.248	820.80
195.00	4.5218	7.9221	12.444	1544.8	19.893	881.75
200.00	4.7262	8.2294	12.956	1645.9	20.531	945.25
205.00	4.9332	8.5371	13.470	1750.1	21.163	1011.3
210.00	5.1426	8.8452	13.988	1857.5	21.786	1080.0
215.00	5.3544	9.1533	14.508	1968.0	22.402	1151.2
220.00	5.5683	9.4613	15.030	2081.5	23.009	1225.0
225.00	5.7844	9.7691	15.553	2198.0	23.607	1301.5
230.00	6.0025	10.076	16.079	2317.6	24.197	1380.6
235.00	6.2225	10.383	16.605	2440.0	24.778	1462.3
240.00	6.4443	10.689	17.133	2565.3	25.350	1546.6
245.00	6.6678	10.994	17.662	2693.5	25.912	1633.6
250.00	6.8930	11.298	18.191	2824.4	26.466	1723.2
255.00	7.1197	11.600	18.720	2958.1	27.010	1815.5
260.00	7.3479	11.902	19.250	3094.5	27.545	1910.4
265.00	7.5774	12.202	19.780	3233.5	28.071	2008.0
270.00	7.8083	12.501	20.309	3375.2	28.588	2108.2
273.15	7.9544	12.688	20.643	3465.8	28.910	2172.7
275.00	8.0404	12.798	20.838	3519.4	29.097	2211.1
280.00	8.2737	13.093	21.367	3666.2	29.597	2316.6
285.00	8.5030	13.387	21.895	3815.4	30.089	2424.8
290.00	8.7434	13.679	22.423	3967.0	30.574	2535.6
295.00	8.9797	13.970	22.950	4121.1	31.051	2649.0
298.15	9.1290	14.152	23.281	4219.4	31.348	2721.8
300.00	9.2169	14.258	23.475	4277.5	31.521	2765.1

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-4

THERMODYNAMIC FUNCTIONS FOR ALUMINA TRIHYDRATE ($Al_2O_3 \cdot 3H_2O$, GIBBSITE)
SOLID PHASE

GRAM MOLECULAR WT.=156.008 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL / DEG MOLE	$(H_T-H_0)/T$ CAL / DEG MOLE	(S_T-S_0) CAL / DEG MOLE	(H_T-H_0) CAL / MOLE	C_P CAL / DEG MOLE	$-(F_T-H_0)$ CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0005	0.0026	0.003	0.013	0.014	0.003
10.00	0.0088	0.0291	0.038	0.291	0.110	0.088
15.00	0.0296	0.0808	0.110	1.212	0.268	0.444
20.00	0.0623	0.1532	0.216	3.065	0.483	1.246
25.00	0.1060	0.2455	0.351	6.136	0.756	2.650
30.00	0.1604	0.3573	0.518	10.717	1.086	4.810
35.00	0.2250	0.4882	0.713	17.086	1.470	7.875
40.00	0.2997	0.6375	0.937	25.499	1.903	11.990
45.00	0.3843	0.8043	1.189	36.194	2.383	17.293
50.00	0.4784	0.9881	1.467	49.407	2.910	23.920
55.00	0.5819	1.1887	1.771	65.380	3.487	32.002
60.00	0.6945	1.4061	2.101	84.367	4.116	41.669
65.00	0.8162	1.6404	2.457	106.63	4.797	53.051
70.00	0.9468	1.8917	2.839	132.42	5.526	66.278
75.00	1.0864	2.1595	3.246	161.96	6.300	81.479
80.00	1.2347	2.4435	3.678	195.48	7.111	98.779
85.00	1.3918	2.7427	4.135	233.13	7.956	118.30
90.00	1.5574	3.0564	4.614	275.08	8.828	140.16
95.00	1.7313	3.3837	5.115	321.45	9.725	164.48
100.00	1.9135	3.7237	5.637	372.37	10.645	191.35
105.00	2.1036	4.0755	6.179	427.93	11.583	220.88
110.00	2.3015	4.4384	6.740	488.22	12.536	253.17
115.00	2.5070	4.8115	7.319	553.32	13.503	288.31
120.00	2.7199	5.1939	7.914	623.27	14.479	326.38
125.00	2.9398	5.5849	8.525	698.11	15.461	367.47
130.00	3.1666	5.9837	9.150	777.88	16.446	411.65
135.00	3.4000	6.3894	9.789	862.58	17.433	459.00
140.00	3.6398	6.8015	10.441	952.21	18.419	509.57
145.00	3.8857	7.2190	11.105	1046.8	19.403	563.43
150.00	4.1376	7.6415	11.779	1146.2	20.383	620.63
155.00	4.3951	8.0683	12.463	1250.6	21.358	681.24
160.00	4.6580	8.4987	13.157	1359.8	22.326	745.28
165.00	4.9262	8.9323	13.858	1473.8	23.287	812.82
170.00	5.1993	9.3685	14.568	1592.6	24.239	883.88
175.00	5.4772	9.8069	15.284	1716.2	25.181	958.51
180.00	5.7596	10.247	16.006	1844.4	26.112	1036.7
185.00	6.0464	10.688	16.735	1977.3	27.032	1118.6
190.00	6.3373	11.130	17.467	2114.7	27.940	1204.1
195.00	6.6321	11.573	18.205	2256.7	28.835	1293.3
200.00	6.9307	12.015	18.946	2403.1	29.717	1386.1
205.00	7.2328	12.458	19.690	2553.8	30.585	1482.7
210.00	7.5383	12.899	20.438	2708.9	31.440	1583.0
215.00	7.8470	13.340	21.187	2868.2	32.281	1687.1
220.00	8.1588	13.780	21.939	3031.7	33.108	1794.9
225.00	8.4734	14.219	22.692	3199.3	33.921	1906.5
230.00	8.7907	14.656	23.447	3370.9	34.721	2021.9
235.00	9.1105	15.091	24.202	3546.4	35.507	2141.0
240.00	9.4328	15.525	24.957	3725.9	36.280	2263.9
245.00	9.7573	15.956	25.713	3909.2	37.041	2390.5
250.00	10.084	16.385	26.469	4096.3	37.790	2521.0
255.00	10.413	16.812	27.225	4287.1	38.527	2655.2
260.00	10.743	17.237	27.980	4481.5	39.253	2793.3
265.00	11.076	17.659	28.735	4679.6	39.969	2935.0
270.00	11.410	18.079	29.488	4881.2	40.676	3080.6
273.15	11.621	18.342	29.963	5010.0	41.117	3174.2
275.00	11.745	18.496	30.241	5086.3	41.375	3229.9
280.00	12.082	18.911	30.993	5295.0	42.066	3383.0
285.00	12.421	19.323	31.743	5507.0	42.752	3539.8
290.00	12.760	19.733	32.493	5722.5	43.433	3700.4
295.00	13.101	20.140	33.241	5941.3	44.110	3864.8
298.15	13.316	20.396	33.712	6080.9	44.535	3970.2
300.00	13.443	20.545	33.988	6163.6	44.785	4032.8

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-5

THERMODYNAMIC FUNCTIONS FOR ALUMINUM FLUORIDE (ALF_3)
SOLID PHASE

GRAM MOLECULAR WT.=83.98 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID-ALPHA)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0001	0.0003	0.000	0.001	0.001	0.000
10.00	0.0010	0.0035	0.005	0.035	0.015	0.010
15.00	0.0038	0.0119	0.016	0.179	0.046	0.057
20.00	0.0091	0.0273	0.036	0.545	0.106	0.183
25.00	0.0177	0.0521	0.070	1.301	0.204	0.442
30.00	0.0302	0.0889	0.119	2.667	0.351	0.907
35.00	0.0476	0.1401	0.188	4.905	0.553	1.665
40.00	0.0705	0.2073	0.278	8.292	0.811	2.819
45.00	0.0996	0.2911	0.391	13.100	1.120	4.481
50.00	0.1353	0.3914	0.527	19.569	1.474	6.764
55.00	0.1779	0.5073	0.685	27.901	1.864	9.785
60.00	0.2275	0.6376	0.865	38.255	2.282	13.652
65.00	0.2841	0.7808	1.065	50.753	2.720	18.469
70.00	0.3476	0.9354	1.283	65.479	3.172	24.331
75.00	0.4177	1.0999	1.518	82.489	3.633	31.326
80.00	0.4941	1.2727	1.767	101.82	4.099	39.532
85.00	0.5767	1.4527	2.029	123.48	4.566	49.017
90.00	0.6649	1.6386	2.304	147.48	5.033	59.845
95.00	0.7586	1.8295	2.588	173.80	5.497	72.070
100.00	0.8574	2.0244	2.882	202.44	5.959	85.741
105.00	0.9610	2.2227	3.184	233.38	6.416	100.90
110.00	1.0690	2.4235	3.493	266.59	6.868	117.59
115.00	1.1812	2.6265	3.808	302.05	7.314	135.84
120.00	1.2973	2.8310	4.128	339.72	7.755	155.68
125.00	1.4170	3.0367	4.454	379.59	8.190	177.13
130.00	1.5402	3.2432	4.783	421.61	8.617	200.22
135.00	1.6664	3.4500	5.116	465.75	9.037	224.97
140.00	1.7956	3.6569	5.453	511.97	9.447	251.39
145.00	1.9276	3.8635	5.791	560.20	9.846	279.50
150.00	2.0620	4.0694	6.131	610.41	10.235	309.30
155.00	2.1988	4.2744	6.473	662.53	10.613	340.81
160.00	2.3377	4.4783	6.816	716.53	10.982	374.04
165.00	2.4786	4.6808	7.159	772.33	11.340	408.98
170.00	2.6214	4.8818	7.503	829.91	11.689	445.63
175.00	2.7658	5.0812	7.847	889.21	12.029	484.01
180.00	2.9117	5.2788	8.190	950.18	12.359	524.10
185.00	3.0590	5.4745	8.533	1012.8	12.681	565.91
190.00	3.2076	5.6683	8.876	1077.0	12.994	609.43
195.00	3.3573	5.8600	9.217	1142.7	13.298	654.67
200.00	3.5080	6.0497	9.558	1209.9	13.594	701.61
205.00	3.6597	6.2373	9.897	1278.6	13.883	750.24
210.00	3.8123	6.4226	10.235	1348.8	14.163	800.57
215.00	3.9655	6.6058	10.571	1420.3	14.436	852.59
220.00	4.1195	6.7868	10.906	1493.1	14.701	906.28
225.00	4.2740	6.9655	11.240	1567.2	14.958	961.65
230.00	4.4290	7.1420	11.571	1642.7	15.208	1018.7
235.00	4.5845	7.3162	11.901	1719.3	15.450	1077.4
240.00	4.7403	7.4882	12.228	1797.2	15.686	1137.7
245.00	4.8965	7.6578	12.554	1876.2	15.914	1199.6
250.00	5.0529	7.8251	12.878	1956.3	16.135	1263.2
255.00	5.2095	7.9902	13.200	2037.5	16.349	1328.4
260.00	5.3662	8.1529	13.519	2119.8	16.556	1395.2
265.00	5.5230	8.3134	13.836	2203.0	16.757	1463.6
270.00	5.6799	8.4715	14.151	2287.3	16.950	1533.6
273.15	5.7737	8.5700	14.349	2340.9	17.068	1578.5
275.00	5.8368	8.6274	14.464	2372.5	17.136	1605.1
280.00	5.9936	8.7809	14.775	2458.7	17.315	1678.2
285.00	6.1504	8.9322	15.083	2545.7	17.485	1752.9
290.00	6.3070	9.0810	15.388	2633.5	17.649	1829.0
295.00	6.4635	9.2276	15.691	2722.1	17.806	1906.7
298.15	6.5620	9.3187	15.881	2778.4	17.903	1956.5
300.00	6.6198	9.3719	15.992	2811.6	17.959	1985.9

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-5 (CONT.)

THERMODYNAMIC FUNCTIONS FOR ALUMINUM FLUORIDE (ALF_3)
SOLID PHASE

GRAM MOLECULAR WT.=83.98 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID-ALPHA)			
300.00	6.6198	9.3719	15.992	2811.6	17.959	1985.9
310.00	6.9317	9.6536	16.585	2992.6	18.248	2148.8
320.00	7.2425	9.9264	17.169	3176.5	18.520	2317.6
330.00	7.5521	10.191	17.743	3363.0	18.776	2492.2
340.00	7.8601	10.447	18.307	3551.9	19.017	2672.4
350.00	8.1665	10.695	18.862	3743.3	19.246	2858.3
360.00	8.4712	10.936	19.407	3936.8	19.464	3049.6
370.00	8.7740	11.169	19.943	4132.5	19.672	3246.4
373.15	8.8690	11.241	20.110	4194.6	19.736	3309.5
380.00	9.0749	11.395	20.470	4330.2	19.872	3448.5
390.00	9.3738	11.615	20.989	4529.9	20.063	3655.8
400.00	9.6705	11.829	21.499	4731.5	20.247	3868.2
425.00	10.403	12.337	22.740	5243.1	20.680	4421.3
450.00	11.122	12.812	23.933	5765.2	21.077	5004.8
475.00	11.827	13.256	25.083	6296.8	21.457	5617.6
500.00	12.517	13.676	26.193	6837.9	21.830	6258.7
550.00	13.858	14.450	28.307	7947.3	22.538	7621.7
600.00	15.146	15.152	30.297	9091.0	23.207	9087.3
650.00	16.384	15.796	32.180	10267.5	23.850	10649.7
650.00	16.384	15.796	32.180	10267.5	23.850	10649.7
700.00	17.577	16.394	33.971	11475.7	24.473	12303.8
727.00	18.203	16.700	34.903	12140.9	24.803	13233.7
			(SOLID-BETA)			
727.00	18.203	16.905	35.108	12289.9	23.111	13233.7
750.00	18.733	17.096	35.829	12822.2	23.180	14049.6
800.00	19.849	17.481	37.330	13985.0	23.330	15878.9
850.00	20.919	17.830	38.749	15155.2	23.480	17781.2
900.00	21.947	18.148	40.095	16333.0	23.630	19752.6
950.00	22.936	18.440	41.377	17518.2	23.780	21789.6
1000.00	23.889	18.711	42.600	18711.0	23.930	23889.3
1050.00	24.808	18.963	43.771	19911.2	24.080	26048.8
1100.00	25.696	19.199	44.895	21119.0	24.230	28265.7
1150.00	26.554	19.421	45.976	22334.2	24.380	30537.6
1200.00	27.385	19.631	47.016	23557.0	24.530	32862.5
1250.00	28.191	19.830	48.021	24787.2	24.680	35238.6
1300.00	28.972	20.019	48.992	26025.0	24.830	37664.1
1350.00	29.731	20.200	49.931	27270.2	24.980	40137.3
1400.00	30.469	20.374	50.843	28523.0	25.130	42656.7
1450.00	31.187	20.540	51.727	29783.2	25.280	45221.1
1500.00	31.886	20.701	52.587	31051.0	25.430	47829.0
1550.00	32.567	20.856	53.423	32326.2	25.580	50479.4

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-6

THERMODYNAMIC FUNCTIONS FOR ALUMINUM CHLORIDE ($AlCl_3$)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=133.351 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T - H_{298.15})/T$	$(H_T - H_{298.15})/T$	$(S_T - S_0)$	$(H_T - H_{298.15})$	C_P	$-(F_T - H_{298.15})$
DEG K	CAL/DEG MOLE	CAL/DEG MOLE	CAL/DEG MOLE	CAL/MOLE	CAL/DEG MOLE	CAL/MOLE
			(SOLID)			
298.15	22.430	0.000	22.430	0.0	21.598	6687.7
300.00	22.431	0.133	22.564	40.0	21.650	6729.3
325.00	22.509	1.815	24.325	590.0	22.350	7315.6
350.00	22.700	3.307	26.007	1157.5	23.050	7944.9
375.00	22.974	4.647	27.621	1742.5	23.750	8615.3
400.00	23.314	5.862	29.176	2345.0	24.450	9325.4
425.00	23.703	6.976	30.679	2965.0	25.150	10073.7
450.00	24.131	8.006	32.137	3602.5	25.850	10859.0
465.60	24.414	8.611	33.025	4009.2	26.287	11367.3
			(LIQUID)			
465.60	24.414	26.867	51.281	12509.2	31.200	11367.3
475.00	24.952	26.953	51.905	12802.5	31.200	11852.3
500.00	26.340	27.165	53.505	13582.5	31.200	13170.1
550.00	28.947	27.532	56.479	15142.5	31.200	15920.9
600.00	31.356	27.837	59.194	16702.5	31.200	18813.7
650.00	33.595	28.096	61.691	18262.5	31.200	21836.6
700.00	35.685	28.318	64.003	19822.5	31.200	24979.7
750.00	37.646	28.510	66.156	21382.5	31.200	28234.3
800.00	39.491	28.678	68.169	22942.5	31.200	31592.9
850.00	41.234	28.826	70.061	24502.5	31.200	35049.2
900.00	42.886	28.958	71.844	26062.5	31.200	38597.2
950.00	44.455	29.076	73.531	27622.5	31.200	42232.0
1000.00	45.949	29.182	75.131	29182.5	31.200	45948.9
1050.00	47.375	29.279	76.654	30742.5	31.200	49743.8
1100.00	48.739	29.366	78.105	32302.5	31.200	53613.1
1150.00	50.046	29.446	79.492	33862.5	31.200	57553.3
1200.00	51.301	29.519	80.820	35422.5	31.200	61561.3
1250.00	52.507	29.586	82.093	36982.5	31.200	65634.3
1300.00	53.669	29.648	83.317	38542.5	31.200	69769.8
1350.00	54.789	29.706	84.495	40102.5	31.200	73965.3
1400.00	55.870	29.759	85.629	41662.5	31.200	78218.6
1450.00	56.916	29.809	86.724	43222.5	31.200	82527.6
1500.00	57.927	29.855	87.782	44782.5	31.200	86890.4
1550.00	58.907	29.898	88.805	46342.5	31.200	91305.2

S_0 APPLIES TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

$H_{298.15}$ APPLIES TO THE REFERENCE STATE OF THE SOLID AT 298.15 DEG K

TABLE B-7

THERMODYNAMIC FUNCTIONS FOR BERYLLIUM (BE)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=9.013 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0001	0.000	0.000	0.000	0.000
10.00	0.0002	0.0003	0.000	0.003	0.001	0.002
15.00	0.0004	0.0007	0.001	0.010	0.002	0.005
20.00	0.0006	0.0011	0.002	0.023	0.003	0.012
25.00	0.0009	0.0018	0.003	0.046	0.006	0.023
30.00	0.0014	0.0028	0.004	0.084	0.009	0.041
35.00	0.0019	0.0041	0.006	0.143	0.015	0.066
40.00	0.0025	0.0058	0.008	0.232	0.021	0.101
45.00	0.0033	0.0080	0.011	0.360	0.030	0.150
50.00	0.0043	0.0108	0.015	0.538	0.041	0.216
55.00	0.0055	0.0142	0.020	0.779	0.056	0.302
60.00	0.0069	0.0183	0.025	1.100	0.073	0.414
65.00	0.0086	0.0234	0.032	1.521	0.095	0.556
70.00	0.0105	0.0295	0.040	2.064	0.123	0.736
75.00	0.0128	0.0368	0.050	2.758	0.156	0.959
80.00	0.0154	0.0454	0.061	3.635	0.196	1.234
85.00	0.0185	0.0557	0.074	4.734	0.244	1.571
90.00	0.0220	0.0677	0.090	6.092	0.300	1.979
95.00	0.0260	0.0816	0.108	7.747	0.363	2.472
100.00	0.0306	0.0974	0.128	9.737	0.434	3.059
105.00	0.0358	0.1152	0.151	12.094	0.510	3.755
110.00	0.0416	0.1350	0.177	14.845	0.591	4.573
115.00	0.0480	0.1567	0.205	18.015	0.677	5.525
120.00	0.0552	0.1802	0.235	21.624	0.767	6.624
125.00	0.0631	0.2055	0.269	25.690	0.860	7.883
130.00	0.0717	0.2325	0.304	30.228	0.956	9.314
135.00	0.0810	0.2611	0.342	35.253	1.055	10.929
140.00	0.0910	0.2913	0.382	40.777	1.155	12.739
145.00	0.1018	0.3228	0.425	46.809	1.258	14.755
150.00	0.1133	0.3557	0.469	53.358	1.362	16.988
155.00	0.1255	0.3899	0.515	60.430	1.467	19.448
160.00	0.1384	0.4252	0.564	68.029	1.573	22.144
165.00	0.1520	0.4616	0.614	76.157	1.679	25.087
170.00	0.1664	0.4989	0.665	84.816	1.785	28.283
175.00	0.1814	0.5372	0.719	94.005	1.891	31.742
180.00	0.1971	0.5762	0.773	103.72	1.996	35.471
185.00	0.2134	0.6160	0.829	113.96	2.101	39.477
190.00	0.2304	0.6565	0.887	124.73	2.204	43.768
195.00	0.2479	0.6975	0.945	136.01	2.307	48.348
200.00	0.2661	0.7390	1.005	147.79	2.408	53.223
205.00	0.2849	0.7809	1.066	160.08	2.507	58.400
210.00	0.3042	0.8231	1.127	172.86	2.605	63.882
215.00	0.3241	0.8657	1.190	186.12	2.700	69.675
220.00	0.3445	0.9084	1.253	199.86	2.794	75.781
225.00	0.3654	0.9514	1.317	214.05	2.885	82.205
230.00	0.3867	0.9944	1.381	228.70	2.974	88.949
235.00	0.4086	1.0374	1.446	243.79	3.060	96.017
240.00	0.4309	1.0804	1.511	259.30	3.145	103.41
245.00	0.4536	1.1234	1.577	275.23	3.226	111.13
250.00	0.4767	1.1662	1.643	291.56	3.305	119.18
255.00	0.5002	1.2089	1.709	308.27	3.381	127.56
260.00	0.5241	1.2514	1.776	325.36	3.455	136.27
265.00	0.5484	1.2936	1.842	342.82	3.526	145.32
270.00	0.5729	1.3356	1.909	360.62	3.594	154.69
273.15	0.5886	1.3619	1.951	372.00	3.636	160.77
275.00	0.5978	1.3773	1.975	378.75	3.660	164.40
280.00	0.6230	1.4186	2.042	397.21	3.723	174.44
285.00	0.6485	1.4596	2.108	415.98	3.784	184.82
290.00	0.6742	1.5002	2.174	435.05	3.842	195.52
295.00	0.7002	1.5403	2.241	454.40	3.898	206.56
298.15	0.7167	1.5654	2.282	466.73	3.932	213.68
300.00	0.7264	1.5801	2.307	474.02	3.951	217.93

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-7 (CONT.)

THERMODYNAMIC FUNCTIONS FOR BERYLLIUM (BE)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=9.013 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	0.7264	1.5801	2.307	474.02	3.951	217.93
310.00	0.7795	1.6582	2.438	514.05	4.053	241.65
320.00	0.8334	1.7345	2.568	555.06	4.148	266.68
330.00	0.8879	1.8091	2.697	597.00	4.240	293.00
340.00	0.9430	1.8819	2.825	639.84	4.327	320.61
350.00	0.9986	1.9529	2.952	683.53	4.411	349.50
360.00	1.0546	2.0223	3.077	728.04	4.491	379.64
370.00	1.1109	2.0901	3.201	773.33	4.567	411.03
373.15	1.1287	2.1111	3.240	787.75	4.590	421.18
380.00	1.1675	2.1562	3.324	819.36	4.639	443.66
390.00	1.2244	2.2208	3.445	866.10	4.708	477.50
400.00	1.2814	2.2838	3.565	913.51	4.773	512.55
425.00	1.4244	2.4346	3.859	1034.7	4.920	605.38
450.00	1.5676	2.5763	4.144	1159.3	5.046	705.43
475.00	1.7105	2.7093	4.420	1286.9	5.159	812.50
500.00	1.8527	2.8344	4.687	1417.2	5.260	926.35
550.00	2.1337	3.0632	5.196	1684.7	5.436	1173.5
600.00	2.4091	3.2674	5.676	1960.4	5.588	1445.5
650.00	2.6780	3.4512	6.129	2243.3	5.723	1740.7
700.00	2.9400	3.6179	6.557	2532.5	5.846	2058.0
750.00	3.1949	3.7703	6.965	2827.8	5.961	2396.2
800.00	3.4428	3.9108	7.353	3128.6	6.072	2754.2
850.00	3.6838	4.0411	7.724	3434.9	6.179	3131.2
900.00	3.9183	4.1629	8.081	3746.6	6.287	3526.4
950.00	4.1465	4.2775	8.424	4063.7	6.395	3939.1
1000.00	4.3686	4.3862	8.754	4386.2	6.508	4368.6
1050.00	4.5852	4.4901	9.075	4714.6	6.627	4814.4
1100.00	4.7964	4.5901	9.386	5049.2	6.758	5276.0
1150.00	5.0026	4.6876	9.690	5390.7	6.905	5753.0
1200.00	5.2041	4.7831	9.987	5739.7	7.054	6244.9
1250.00	5.4013	4.8769	10.278	6096.1	7.203	6751.6
1300.00	5.5943	4.9693	10.564	6460.0	7.352	7272.7
1350.00	5.7836	5.0603	10.844	6831.4	7.502	7807.9
1400.00	5.9693	5.1502	11.119	7210.3	7.651	8357.0
1450.00	6.1515	5.2390	11.391	7596.6	7.800	8919.7
1500.00	6.3306	5.3269	11.658	7990.3	7.949	9495.8
1550.00	6.5067	5.4139	11.921	8391.5	8.099	10085.0
1556.00	6.5276	5.4243	11.952	8440.1	8.117	10157.0
			(LIQUID)			
1556.00	6.528	7.224	13.751	11240.1	7.500	10157.0
1600.00	6.729	7.231	13.960	11570.1	7.500	10766.7
1650.00	6.952	7.239	14.191	11945.1	7.500	11470.5
1700.00	7.168	7.247	14.415	12320.1	7.500	12185.7
1750.00	7.378	7.254	14.633	12695.1	7.500	12911.9
1800.00	7.583	7.261	14.844	13070.1	7.500	13648.8
1850.00	7.782	7.268	15.049	13445.1	7.500	14396.2
1900.00	7.976	7.274	15.249	13820.1	7.500	15153.7
1950.00	8.165	7.280	15.444	14195.1	7.500	15921.1
2000.00	8.349	7.285	15.634	14570.1	7.500	16698.0
2050.00	8.529	7.290	15.819	14945.1	7.500	17484.4
2100.00	8.705	7.295	16.000	15320.1	7.500	18279.9
2150.00	8.876	7.300	16.176	15695.1	7.500	19084.3
2200.00	9.044	7.305	16.349	16070.1	7.500	19887.5
2250.00	9.209	7.309	16.517	16445.1	7.500	20719.1
2300.00	9.369	7.313	16.682	16820.1	7.500	21549.1
2350.00	9.527	7.317	16.844	17195.1	7.500	22387.3
2400.00	9.681	7.321	17.001	17570.1	7.500	23233.5
2450.00	9.832	7.325	17.156	17945.1	7.500	24087.4
2500.00	9.980	7.328	17.308	18320.1	7.500	24949.0

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-8

THERMODYNAMIC FUNCTIONS FOR BERYLLIUM OXIDE (BE O)
SOLID PHASE

GRAM MOLECULAR WT.=25.013 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0000	0.000	0.000	0.000	0.000
10.00	0.0001	0.0002	0.000	0.002	0.001	0.001
15.00	0.0002	0.0007	0.001	0.011	0.003	0.003
20.00	0.0005	0.0016	0.002	0.032	0.006	0.011
25.00	0.0010	0.0031	0.004	0.076	0.012	0.026
30.00	0.0018	0.0052	0.007	0.156	0.021	0.053
35.00	0.0028	0.0083	0.011	0.289	0.033	0.098
40.00	0.0042	0.0124	0.017	0.495	0.050	0.166
45.00	0.0059	0.0177	0.024	0.797	0.072	0.266
50.00	0.0081	0.0244	0.032	1.219	0.098	0.405
55.00	0.0108	0.0325	0.043	1.788	0.130	0.594
60.00	0.0140	0.0422	0.056	2.529	0.167	0.842
65.00	0.0178	0.0534	0.071	3.470	0.210	1.159
70.00	0.0223	0.0663	0.089	4.637	0.258	1.558
75.00	0.0273	0.0808	0.108	6.058	0.311	2.048
80.00	0.0330	0.0970	0.130	7.759	0.370	2.643
85.00	0.0394	0.1150	0.154	9.771	0.436	3.353
90.00	0.0466	0.1348	0.181	12.128	0.508	4.191
95.00	0.0544	0.1565	0.211	14.864	0.588	5.170
100.00	0.0630	0.1802	0.243	18.018	0.675	6.304
105.00	0.0725	0.2060	0.278	21.632	0.772	7.607
110.00	0.0827	0.2341	0.317	25.747	0.876	9.094
115.00	0.0937	0.2644	0.358	30.401	0.987	10.780
120.00	0.1057	0.2969	0.403	35.629	1.105	12.680
125.00	0.1185	0.3317	0.450	41.463	1.229	14.811
130.00	0.1322	0.3687	0.501	47.926	1.357	17.187
135.00	0.1469	0.4077	0.555	55.040	1.489	19.824
140.00	0.1624	0.4487	0.611	62.822	1.624	22.737
145.00	0.1789	0.4917	0.671	71.289	1.763	25.940
150.00	0.1963	0.5364	0.733	80.456	1.905	29.447
155.00	0.2147	0.5828	0.797	90.338	2.049	33.272
160.00	0.2339	0.6309	0.865	100.95	2.195	37.426
165.00	0.2541	0.6806	0.935	112.30	2.344	41.924
170.00	0.2752	0.7317	1.007	124.39	2.495	46.777
175.00	0.2971	0.7843	1.081	137.24	2.646	51.997
180.00	0.3200	0.8381	1.158	150.86	2.799	57.594
185.00	0.3437	0.8932	1.237	165.24	2.953	63.581
190.00	0.3682	0.9494	1.318	180.39	3.107	69.966
195.00	0.3936	1.0067	1.400	196.31	3.261	76.761
200.00	0.4199	1.0650	1.485	213.00	3.415	83.973
205.00	0.4469	1.1242	1.571	230.46	3.569	91.612
210.00	0.4747	1.1842	1.659	248.69	3.722	99.687
215.00	0.5033	1.2450	1.748	267.68	3.873	108.20
220.00	0.5326	1.3065	1.839	287.42	4.024	117.17
225.00	0.5627	1.3685	1.931	307.91	4.173	126.60
230.00	0.5934	1.4311	2.025	329.15	4.320	136.49
235.00	0.6249	1.4941	2.119	351.11	4.466	146.84
240.00	0.6570	1.5575	2.215	373.80	4.609	157.68
245.00	0.6898	1.6212	2.311	397.20	4.750	168.99
250.00	0.7232	1.6852	2.408	421.30	4.889	180.79
255.00	0.7572	1.7493	2.507	446.08	5.024	193.07
260.00	0.7918	1.8136	2.605	471.53	5.156	205.85
265.00	0.8269	1.8779	2.705	497.64	5.286	219.13
270.00	0.8626	1.9422	2.805	524.38	5.413	232.90
273.15	0.8854	1.9827	2.868	541.56	5.493	241.84
275.00	0.8988	2.0064	2.905	551.77	5.539	247.18
280.00	0.9356	2.0706	3.006	579.78	5.664	261.96
285.00	0.9728	2.1348	3.108	608.41	5.787	277.24
290.00	1.0105	2.1988	3.209	637.65	5.909	293.03
295.00	1.0486	2.2627	3.311	667.50	6.030	309.33
298.15	1.0728	2.3029	3.376	686.61	6.105	319.87
300.00	1.0872	2.3265	3.414	697.94	6.148	326.15

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-8 (CONT.)

THERMODYNAMIC FUNCTIONS FOR BERYLLIUM OXIDE (BE O)
SOLID PHASE

GRAM MOLECULAR WT.=25.013 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	1.0872	2.3265	3.414	697.94	6.148	326.15
310.00	1.1655	2.4535	3.619	760.59	6.379	361.31
320.00	1.2454	2.5797	3.825	825.49	6.600	398.53
330.00	1.3267	2.7047	4.031	892.55	6.811	437.81
340.00	1.4093	2.8285	4.238	961.69	7.016	479.16
350.00	1.4930	2.9510	4.444	1032.8	7.215	522.56
360.00	1.5779	3.0721	4.650	1106.0	7.408	568.04
370.00	1.6637	3.1918	4.856	1181.0	7.591	615.56
373.15	1.6909	3.2292	4.920	1205.0	7.647	630.96
380.00	1.7504	3.3099	5.060	1257.8	7.764	665.14
390.00	1.8379	3.4262	5.264	1336.2	7.927	716.77
400.00	1.9261	3.5407	5.467	1416.3	8.083	770.42
425.00	2.149	3.819	5.967	1623.0	8.443	913.1
450.00	2.374	4.085	6.459	1838.1	8.764	1068.5
475.00	2.602	4.338	6.940	2060.8	9.051	1236.0
500.00	2.831	4.581	7.412	2290.4	9.310	1415.4
550.00	3.289	5.032	8.320	2767.4	9.756	1808.9
600.00	3.745	5.441	9.186	3264.8	10.128	2246.8
650.00	4.195	5.814	10.009	3779.3	10.443	2726.8
700.00	4.639	6.155	10.793	4308.4	10.714	3247.1
750.00	5.074	6.466	11.541	4850.1	10.948	3805.5
800.00	5.501	6.753	12.254	5402.7	11.154	4400.6
850.00	5.913	7.017	12.936	5965.1	11.336	5030.4
900.00	6.327	7.262	13.588	6536.0	11.498	5693.7
950.00	6.725	7.489	14.214	7114.6	11.644	6388.9
1000.00	7.115	7.700	14.815	7700.2	11.776	7114.7
1050.00	7.496	7.897	15.392	8292.0	11.895	7870.0
1100.00	7.866	8.082	15.948	8889.5	12.005	8653.5
1150.00	8.229	8.255	16.484	9492.3	12.105	9464.5
1200.00	8.584	8.417	17.001	10099.9	12.197	10301.6
1250.00	8.931	8.570	17.501	10711.9	12.282	11164.3
1300.00	9.270	8.714	17.984	11328.0	12.361	12051.4
1350.00	9.601	8.851	18.452	11947.9	12.435	12962.4
1400.00	9.926	8.980	18.905	12571.4	12.503	13896.5
1450.00	10.243	9.103	19.345	13198.2	12.568	14852.8
1500.00	10.553	9.219	19.772	13828.1	12.628	15830.8
1550.00	10.858	9.330	20.187	14460.9	12.685	16829.8
1600.00	11.155	9.436	20.591	15096.5	12.738	17849.4
1650.00	11.447	9.536	20.984	15734.7	12.788	18888.7
1700.00	11.733	9.633	21.366	16375.3	12.836	19947.6
1750.00	12.014	9.725	21.739	17018.2	12.882	21025.2
1800.00	12.289	9.813	22.103	17663.4	12.925	22121.3
1850.00	12.559	9.898	22.457	18310.7	12.966	23235.3
1900.00	12.824	9.979	22.804	18960.0	13.005	24366.9
1950.00	13.085	10.057	23.142	19611.2	13.042	25515.6
2000.00	13.340	10.132	23.472	20264.2	13.078	26680.9
2050.00	13.591	10.205	23.796	20919.0	13.112	27862.7
2100.00	13.838	10.274	24.112	21575.4	13.145	29060.4
2150.00	14.081	10.341	24.422	22233.5	13.177	30273.8
2200.00	14.319	10.406	24.725	22893.1	13.207	31502.5
2250.00	14.554	10.469	25.022	23554.2	13.236	32746.2
2300.00	14.784	10.529	25.314	24216.7	13.265	34004.6
2350.00	15.011	10.588	25.599	24880.6	13.292	35277.5
2400.00	15.235	10.644	25.879	25545.9	13.318	36564.5
2450.00	15.455	10.699	26.154	26212.4	13.343	37865.3
2500.00	15.672	10.752	26.424	26880.2	13.368	39179.9
2600.00	16.095	10.854	26.949	28219.4	13.415	41848.7
2700.00	16.507	10.949	27.456	29563.1	13.459	44569.1
2800.00	16.907	11.040	27.946	30911.1	13.501	47339.3

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-9

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM (MG)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=24.32 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0002	0.000	0.001	0.001	0.000
10.00	0.0006	0.0022	0.003	0.022	0.010	0.006
15.00	0.0025	0.0081	0.011	0.122	0.034	0.037
20.00	0.0063	0.0203	0.027	0.407	0.086	0.126
25.00	0.0130	0.0421	0.055	1.052	0.180	0.324
30.00	0.0235	0.0767	0.100	2.301	0.328	0.704
35.00	0.0388	0.1266	0.165	4.431	0.532	1.359
40.00	0.0599	0.1926	0.252	7.703	0.783	2.394
45.00	0.0871	0.2738	0.361	12.319	1.067	3.918
50.00	0.1207	0.3679	0.489	18.394	1.365	6.034
55.00	0.1606	0.4722	0.633	25.971	1.665	8.831
60.00	0.2064	0.5839	0.790	35.035	1.959	12.384
65.00	0.2577	0.7006	0.958	45.538	2.240	16.752
70.00	0.3140	0.8202	1.134	57.413	2.507	21.980
75.00	0.3747	0.9411	1.316	70.585	2.759	28.103
80.00	0.4393	1.0622	1.502	84.974	2.994	35.145
85.00	0.5073	1.1823	1.690	100.50	3.212	43.123
90.00	0.5783	1.3007	1.879	117.06	3.413	52.044
95.00	0.6517	1.4168	2.069	134.60	3.598	61.913
100.00	0.7273	1.5302	2.258	153.02	3.769	72.729
105.00	0.8046	1.6406	2.445	172.26	3.925	84.486
110.00	0.8834	1.7478	2.631	192.25	4.069	97.178
115.00	0.9634	1.8516	2.815	212.94	4.203	110.79
120.00	1.0444	1.9523	2.997	234.27	4.328	125.32
125.00	1.1261	2.0496	3.176	256.20	4.444	140.76
130.00	1.2083	2.1438	3.352	278.69	4.551	157.08
135.00	1.2909	2.2348	3.526	301.70	4.651	174.27
140.00	1.3738	2.3228	3.697	325.19	4.743	192.33
145.00	1.4568	2.4077	3.865	349.12	4.828	211.23
150.00	1.5398	2.4897	4.030	373.45	4.905	230.97
155.00	1.6227	2.5688	4.192	398.16	4.976	251.52
160.00	1.7055	2.6450	4.351	423.21	5.042	272.88
165.00	1.7880	2.7186	4.507	448.57	5.102	295.02
170.00	1.8702	2.7895	4.660	474.22	5.158	317.94
175.00	1.9521	2.8579	4.810	500.14	5.209	341.62
180.00	2.0335	2.9239	4.958	526.31	5.258	366.04
185.00	2.1145	2.9876	5.102	552.71	5.303	391.19
190.00	2.1950	3.0491	5.244	579.33	5.346	417.05
195.00	2.2750	3.1086	5.384	606.17	5.387	443.62
200.00	2.3544	3.1660	5.520	633.20	5.426	470.88
205.00	2.4333	3.2216	5.655	660.42	5.463	498.82
210.00	2.5116	3.2754	5.787	687.82	5.499	527.43
215.00	2.5893	3.3275	5.917	715.41	5.534	556.69
220.00	2.6663	3.3780	6.044	743.16	5.568	586.59
225.00	2.7428	3.4271	6.170	771.09	5.602	617.13
230.00	2.8186	3.4747	6.293	799.18	5.634	648.29
235.00	2.8939	3.5210	6.415	827.43	5.665	680.06
240.00	2.9685	3.5660	6.534	855.83	5.695	712.43
245.00	3.0425	3.6097	6.652	884.38	5.724	745.40
250.00	3.1158	3.6523	6.768	913.07	5.751	778.95
255.00	3.1885	3.6937	6.882	941.89	5.777	813.08
260.00	3.2607	3.7340	6.995	970.83	5.801	847.77
265.00	3.3322	3.7732	7.105	999.89	5.824	883.02
270.00	3.4030	3.8114	7.214	1029.1	5.846	918.82
273.15	3.4474	3.8349	7.282	1047.5	5.859	941.65
275.00	3.4733	3.8486	7.322	1058.4	5.867	955.16
280.00	3.5430	3.8848	7.428	1087.7	5.887	992.04
285.00	3.6121	3.9201	7.532	1117.2	5.906	1029.4
290.00	3.6805	3.9545	7.635	1146.8	5.923	1067.4
295.00	3.7484	3.9880	7.736	1176.5	5.941	1105.8
298.15	3.7909	4.0087	7.800	1195.2	5.951	1130.3
300.00	3.8157	4.0207	7.836	1206.2	5.957	1144.7

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-9 (CONT.)

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM (MG)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=24.32 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	3.8157	4.0207	7.836	1206.2	5.957	1144.7
310.00	3.9486	4.0836	8.032	1265.9	5.988	1224.1
320.00	4.0792	4.1436	8.223	1325.9	6.016	1305.3
330.00	4.2076	4.2007	8.408	1386.2	6.043	1388.5
340.00	4.3338	4.2553	8.589	1446.8	6.068	1473.5
350.00	4.4579	4.3074	8.765	1507.6	6.093	1560.3
360.00	4.5800	4.3574	8.937	1568.6	6.117	1648.8
370.00	4.7000	4.4052	9.105	1629.9	6.141	1739.0
373.15	4.7374	4.4199	9.157	1649.3	6.148	1767.8
380.00	4.8181	4.4512	9.269	1691.5	6.164	1830.9
390.00	4.9343	4.4954	9.430	1753.2	6.188	1924.4
400.00	5.0487	4.5380	9.587	1815.2	6.212	2019.5
425.00	5.3268	4.6383	9.965	1971.3	6.274	2263.9
450.00	5.5946	4.7309	10.326	2128.9	6.340	2517.6
475.00	5.8527	4.8175	10.670	2288.3	6.413	2780.0
500.00	6.102	4.899	11.001	2449.5	6.490	3050.8
550.00	6.576	5.051	11.627	2778.0	6.647	3616.7
600.00	7.021	5.191	12.212	3114.4	6.808	4212.8
650.00	7.442	5.321	12.763	3458.8	6.972	4837.3
700.00	7.841	5.445	13.286	3811.5	7.137	5488.6
750.00	8.221	5.563	13.784	4172.5	7.303	6165.5
800.00	8.583	5.677	14.261	4541.8	7.470	6866.7
850.00	8.931	5.788	14.719	4919.6	7.638	7591.2
900.00	9.265	5.895	15.160	5305.7	7.807	8338.2
923.00	9.414	5.944	15.358	5486.2	7.885	8689.2
			(LIQUID)			
923.00	9.414	8.248	17.662	7613.2	7.678	8689.2
950.00	9.652	8.233	17.885	7821.5	7.749	9169.1
1000.00	10.073	8.212	18.286	8212.2	7.880	10073.4
1050.00	10.474	8.200	18.673	8609.5	8.011	10997.4
1100.00	10.855	8.194	19.049	9013.3	8.142	11940.5
1150.00	11.219	8.195	19.414	9423.7	8.273	12902.1
1200.00	11.568	8.201	19.769	9840.6	8.404	13881.7
1250.00	11.903	8.211	20.114	10264.1	8.534	14878.9
1300.00	12.225	8.226	20.452	10694.1	8.665	15893.0
1350.00	12.536	8.245	20.781	11130.6	8.796	16923.9
1400.00	12.836	8.267	21.103	11573.6	8.926	17971.0
1450.00	13.127	8.292	21.419	12023.2	9.056	19034.1
1500.00	13.409	8.320	21.728	12479.3	9.187	20112.8
1550.00	13.682	8.350	22.031	12941.9	9.317	21206.8
1600.00	13.947	8.382	22.329	13411.0	9.447	22315.9
1650.00	14.206	8.416	22.622	13886.6	9.578	23439.7
1700.00	14.458	8.452	22.910	14368.7	9.708	24578.0
1750.00	14.703	8.490	23.193	14857.4	9.838	25730.6
1800.00	14.943	8.529	23.472	15352.5	9.968	26897.2
1850.00	15.177	8.570	23.747	15854.2	10.099	28077.7
1900.00	15.406	8.612	24.018	16362.4	10.229	29271.8
1950.00	15.630	8.655	24.285	16877.1	10.359	30479.5
2000.00	15.850	8.699	24.549	17398.3	10.489	31700.3
2050.00	16.066	8.744	24.810	17926.0	10.619	32934.3
2100.00	16.277	8.791	25.067	18460.2	10.749	34181.3
2150.00	16.484	8.838	25.322	19000.9	10.879	35441.0
2200.00	16.688	8.886	25.573	19548.2	11.010	36713.4
2250.00	16.888	8.934	25.822	20101.9	11.140	37998.3
2300.00	17.085	8.984	26.069	20662.1	11.270	39295.6
2350.00	17.279	9.034	26.312	21228.9	11.400	40605.1
2400.00	17.469	9.084	26.554	21802.1	11.530	41926.8
2450.00	17.657	9.135	26.793	22381.9	11.660	43260.5
2500.00	17.842	9.187	27.030	22968.1	11.790	44606.0

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-10

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM OXIDE (MG O)
MACRO-CRYSTALLINE SOLID PHASE

GRAM MOLECULAR WT.=40.32 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0000	0.000	0.000	0.000	0.000
10.00	0.0001	0.0003	0.000	0.003	0.001	0.001
15.00	0.0003	0.0010	0.001	0.015	0.004	0.005
20.00	0.0008	0.0023	0.003	0.045	0.009	0.015
25.00	0.0015	0.0044	0.006	0.110	0.018	0.037
30.00	0.0026	0.0078	0.010	0.233	0.033	0.077
35.00	0.0041	0.0128	0.017	0.449	0.055	0.144
40.00	0.0063	0.0201	0.026	0.803	0.089	0.251
45.00	0.0092	0.0302	0.039	1.358	0.136	0.414
50.00	0.0130	0.0438	0.057	2.188	0.199	0.652
55.00	0.0180	0.0615	0.079	3.381	0.281	0.990
60.00	0.0243	0.0839	0.108	5.035	0.384	1.457
65.00	0.0321	0.1116	0.144	7.255	0.507	2.084
70.00	0.0415	0.1449	0.186	10.145	0.652	2.906
75.00	0.0528	0.1841	0.237	13.808	0.816	3.961
80.00	0.0661	0.2293	0.295	18.340	0.999	5.288
85.00	0.0815	0.2803	0.362	23.825	1.197	6.927
90.00	0.0991	0.3371	0.436	30.337	1.409	8.919
95.00	0.1190	0.3993	0.518	37.937	1.633	11.302
100.00	0.1411	0.4668	0.608	46.677	1.865	14.114
105.00	0.1657	0.5390	0.705	56.595	2.104	17.393
110.00	0.1925	0.6157	0.808	67.722	2.348	21.172
115.00	0.2216	0.6964	0.918	80.080	2.596	25.485
120.00	0.2530	0.7807	1.034	93.684	2.846	30.362
125.00	0.2867	0.8683	1.155	108.54	3.097	35.831
130.00	0.3225	0.9589	1.281	124.65	3.348	41.920
135.00	0.3604	1.0520	1.412	142.01	3.596	48.652
140.00	0.4004	1.1472	1.548	160.61	3.842	56.050
145.00	0.4423	1.2444	1.687	180.43	4.085	64.135
150.00	0.4862	1.3430	1.829	201.45	4.322	72.923
155.00	0.5318	1.4429	1.975	223.65	4.555	82.431
160.00	0.5792	1.5437	2.123	246.99	4.783	92.674
165.00	0.6283	1.6452	2.274	271.46	5.004	103.66
170.00	0.6789	1.7472	2.426	297.03	5.220	115.41
175.00	0.7310	1.8494	2.580	323.65	5.429	127.93
180.00	0.7846	1.9517	2.736	351.31	5.632	141.22
185.00	0.8394	2.0539	2.893	379.96	5.829	155.29
190.00	0.8956	2.1557	3.051	409.59	6.019	170.15
195.00	0.9529	2.2571	3.210	440.14	6.203	185.81
200.00	1.0113	2.3580	3.369	471.60	6.380	202.25
205.00	1.0707	2.4582	3.529	503.94	6.551	219.50
210.00	1.1312	2.5577	3.689	537.11	6.716	237.54
215.00	1.1925	2.6562	3.849	571.09	6.876	256.39
220.00	1.2547	2.7539	4.009	605.85	7.029	276.03
225.00	1.3177	2.8505	4.168	641.37	7.177	296.47
230.00	1.3814	2.9462	4.328	677.62	7.321	317.71
235.00	1.4457	3.0407	4.487	714.57	7.460	339.75
240.00	1.5107	3.1342	4.645	752.21	7.595	362.58
245.00	1.5763	3.2266	4.803	790.51	7.727	386.20
250.00	1.6424	3.3179	4.960	829.47	7.856	410.61
255.00	1.7090	3.4081	5.117	869.07	7.982	435.80
260.00	1.7761	3.4973	5.273	909.29	8.104	461.78
265.00	1.8435	3.5853	5.429	950.11	8.224	488.53
270.00	1.9113	3.6723	5.584	991.51	8.339	516.06
273.15	1.9543	3.7265	5.681	1017.9	8.409	533.80
275.00	1.9795	3.7581	5.738	1033.5	8.450	544.37
280.00	2.0480	3.8429	5.891	1076.0	8.556	573.44
285.00	2.1167	3.9265	6.043	1119.0	8.658	603.27
290.00	2.1858	4.0089	6.195	1162.6	8.756	633.87
295.00	2.2550	4.0902	6.345	1206.6	8.850	665.22
298.15	2.2987	4.1407	6.439	1234.6	8.906	685.35
300.00	2.3244	4.1702	6.495	1251.1	8.939	697.32

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-10 (CONT.)

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM OXIDE (MG O)
MACRO-CRYSTALLINE SOLID PHASE

GRAM MOLECULAR WT.=40.32 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	2.3244	4.1702	6.495	1251.1	8.939	697.32
310.00	2.4637	4.3268	6.791	1341.3	9.107	763.75
320.00	2.6035	4.4786	7.082	1433.2	9.261	833.11
330.00	2.7436	4.6257	7.369	1526.5	9.401	905.38
340.00	2.8838	4.7681	7.652	1621.2	9.530	980.48
350.00	3.0240	4.9059	7.930	1717.1	9.649	1058.4
360.00	3.1641	5.0392	8.203	1814.1	9.760	1139.1
370.00	3.3039	5.1682	8.472	1912.2	9.865	1222.4
373.15	3.3479	5.2080	8.556	1943.4	9.897	1249.3
380.00	3.4434	5.2931	8.736	2011.4	9.964	1308.5
390.00	3.5825	5.4141	8.997	2111.5	10.058	1397.2
400.00	3.7210	5.5313	9.252	2212.5	10.148	1488.4
425.00	4.0648	5.8091	9.874	2468.9	10.355	1727.5
450.00	4.4042	6.0669	10.471	2730.1	10.541	1981.9
475.00	4.739	6.307	11.046	2995.7	10.706	2250.9
500.00	5.068	6.531	11.599	3265.3	10.854	2534.0
550.00	5.710	6.936	12.646	3814.6	11.110	3140.5
600.00	6.329	7.293	13.622	4375.6	11.323	3797.4
650.00	6.926	7.610	14.535	4946.3	11.502	4501.6
700.00	7.500	7.893	15.393	5525.4	11.656	5250.0
750.00	8.053	8.149	16.202	6111.6	11.789	6040.1
800.00	8.587	8.380	16.967	6704.0	11.905	6869.5
850.00	9.101	8.590	17.692	7301.9	12.007	7736.1
900.00	9.598	8.783	18.381	7904.5	12.098	8638.1
950.00	10.078	8.959	19.037	8511.5	12.178	9573.6
1000.00	10.541	9.122	19.663	9122.2	12.251	10541.3
1050.00	10.990	9.273	20.263	9736.4	12.316	11539.5
1100.00	11.425	9.412	20.837	10353.7	12.375	12567.1
1150.00	11.846	9.542	21.388	10973.9	12.429	13622.9
1200.00	12.255	9.664	21.918	11596.6	12.478	14705.6
1250.00	12.652	9.777	22.429	12221.6	12.523	15814.4
1300.00	13.037	9.884	22.921	12848.8	12.565	16948.2
1350.00	13.412	9.984	23.396	13478.0	12.603	18106.2
1400.00	13.777	10.078	23.855	14109.1	12.638	19287.5
1450.00	14.132	10.167	24.299	14741.8	12.671	20491.4
1500.00	14.478	10.251	24.729	15376.1	12.701	21717.1
1550.00	14.816	10.330	25.146	16011.9	12.730	22964.1
1600.00	15.145	10.406	25.550	16649.1	12.756	24231.5
1650.00	15.466	10.477	25.943	17287.5	12.781	25518.9
1700.00	15.780	10.545	26.325	17927.1	12.804	26825.6
1750.00	16.086	10.610	26.697	18567.8	12.825	28151.2
1800.00	16.386	10.672	27.058	19209.6	12.845	29495.1
1850.00	16.679	10.731	27.410	19852.3	12.864	30856.9
1900.00	16.966	10.787	27.754	20496.0	12.882	32236.0
1950.00	17.247	10.841	28.089	21140.6	12.899	33632.1
2000.00	17.522	10.893	28.415	21785.9	12.915	35044.7
2050.00	17.792	10.942	28.734	22432.1	12.930	36473.5
2100.00	18.056	10.990	29.046	23078.9	12.945	37918.1
2150.00	18.315	11.036	29.351	23726.5	12.958	39378.0
2200.00	18.570	11.079	29.649	24374.7	12.971	40853.0
2250.00	18.819	11.122	29.941	25023.6	12.983	42342.8
2300.00	19.064	11.162	30.226	25673.0	12.994	43847.0
2350.00	19.304	11.201	30.506	26323.0	13.005	45365.3
2400.00	19.541	11.239	30.780	26973.5	13.016	46897.5
2450.00	19.773	11.275	31.048	27624.5	13.025	48443.2
2500.00	20.001	11.310	31.311	28276.1	13.035	50002.2
2600.00	20.446	11.377	31.823	29580.4	13.052	53159.1
2700.00	20.876	11.439	32.316	30886.4	13.068	56366.1
2800.00	21.293	11.498	32.791	32193.9	13.082	59621.6
2900.00	21.698	11.553	33.251	33502.8	13.095	62923.8
3000.00	22.090	11.604	33.695	34812.9	13.107	66271.2

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-11

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM OXIDE (MG O)
MICRO-CRYSTALLINE SOLID PHASE

GRAM MOLECULAR WT.=40.32 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0005	0.0009	0.001	0.005	0.002	0.003
10.00	0.0016	0.0024	0.004	0.024	0.006	0.016
15.00	0.0029	0.0044	0.007	0.066	0.012	0.044
20.00	0.0046	0.0073	0.012	0.145	0.021	0.091
25.00	0.0066	0.0113	0.018	0.283	0.035	0.165
30.00	0.0091	0.0169	0.026	0.506	0.056	0.274
35.00	0.0123	0.0243	0.037	0.852	0.084	0.429
40.00	0.0161	0.0340	0.050	1.360	0.121	0.645
45.00	0.0208	0.0463	0.067	2.083	0.170	0.936
50.00	0.0264	0.0616	0.088	3.081	0.232	1.322
55.00	0.0332	0.0806	0.114	4.434	0.312	1.825
60.00	0.0412	0.1040	0.145	6.241	0.414	2.470
65.00	0.0506	0.1326	0.183	8.620	0.542	3.287
70.00	0.0616	0.1672	0.229	11.704	0.696	4.314
75.00	0.0745	0.2083	0.283	15.626	0.876	5.590
80.00	0.0895	0.2563	0.346	20.504	1.078	7.157
85.00	0.1066	0.3110	0.418	26.432	1.296	9.062
90.00	0.1261	0.3720	0.498	33.475	1.523	11.347
95.00	0.1480	0.4387	0.587	41.676	1.758	14.056
100.00	0.1723	0.5106	0.683	51.063	1.998	17.227
105.00	0.1990	0.5872	0.786	61.660	2.242	20.897
110.00	0.2282	0.6681	0.896	73.494	2.492	25.100
115.00	0.2597	0.7530	1.013	86.589	2.746	29.870
120.00	0.2936	0.8414	1.135	100.96	3.004	35.237
125.00	0.3298	0.9330	1.263	116.63	3.261	41.229
130.00	0.3683	1.0275	1.396	133.57	3.516	47.874
135.00	0.4089	1.1243	1.533	151.78	3.766	55.194
140.00	0.4515	1.2230	1.675	171.22	4.010	63.212
145.00	0.4962	1.3233	1.819	191.87	4.248	71.946
150.00	0.5427	1.4246	1.967	213.69	4.479	81.411
155.00	0.5911	1.5268	2.118	236.65	4.704	91.623
160.00	0.6412	1.6295	2.271	260.72	4.924	102.590
165.00	0.6929	1.7326	2.426	285.88	5.140	114.33
170.00	0.7462	1.8359	2.582	312.11	5.352	126.85
175.00	0.8009	1.9394	2.740	339.39	5.560	140.16
180.00	0.8570	2.0428	2.900	367.70	5.763	154.26
185.00	0.9144	2.1460	3.060	397.02	5.963	169.16
190.00	0.9730	2.2490	3.222	427.32	6.157	184.86
195.00	1.0327	2.3517	3.384	458.58	6.346	201.38
200.00	1.0935	2.4538	3.547	490.77	6.528	218.71
205.00	1.1554	2.5554	3.711	523.85	6.703	236.85
210.00	1.2182	2.6561	3.874	557.78	6.871	255.82
215.00	1.2818	2.7560	4.038	592.54	7.031	275.60
220.00	1.3463	2.8549	4.201	628.08	7.184	296.19
225.00	1.4116	2.9527	4.364	664.37	7.330	317.61
230.00	1.4775	3.0494	4.527	701.37	7.469	339.84
235.00	1.5442	3.1449	4.689	739.05	7.602	362.88
240.00	1.6114	3.2391	4.850	777.38	7.731	386.73
245.00	1.6791	3.3320	5.011	816.35	7.856	411.38
250.00	1.7473	3.4238	5.171	855.94	7.979	436.84
255.00	1.8160	3.5142	5.330	896.13	8.098	463.09
260.00	1.8851	3.6035	5.489	936.92	8.216	490.14
265.00	1.9546	3.6916	5.646	978.29	8.331	517.97
270.00	2.0244	3.7786	5.803	1020.2	8.443	546.60
273.15	2.0686	3.8328	5.901	1046.9	8.512	565.03
275.00	2.0946	3.8644	5.959	1062.7	8.551	576.00
280.00	2.1650	3.9490	6.114	1105.7	8.656	606.19
285.00	2.2356	4.0325	6.268	1149.3	8.757	637.14
290.00	2.3064	4.1148	6.421	1193.3	8.854	668.87
295.00	2.3775	4.1960	6.573	1237.8	8.947	701.35
298.15	2.4223	4.2464	6.669	1266.1	9.004	722.21
300.00	2.4487	4.2759	6.725	1282.8	9.036	734.60

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-11 (CONT.)

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM OXIDE (MG O)
MICRO-CRYSTALLINE SOLID PHASE

GRAM MOLECULAR WT.=40.32 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL DEG-MOLE	$(H_T-H_0)/T$ CAL DEG-MOLE	(S_T-S_0) CAL DEG-MOLE	(H_T-H_0) CAL MOLE	C_P CAL DEG-MOLE	$-(F_T-H_0)$ CAL MOLE
			(SOLID)			
300.00	2.4487	4.2759	6.725	1282.8	9.036	734.60
305.00	2.5200	4.3546	6.875	1328.2	9.121	768.60
310.00	2.5914	4.4322	7.024	1374.0	9.201	803.34
315.00	2.6630	4.5085	7.171	1420.2	9.278	838.83
320.00	2.7345	4.5836	7.318	1466.7	9.350	875.05
325.00	2.8062	4.6574	7.464	1513.7	9.419	912.01
330.00	2.8778	4.7301	7.608	1560.9	9.483	949.69
335.00	2.9495	4.8015	7.751	1608.5	9.544	988.09
340.00	3.0212	4.8716	7.893	1656.4	9.601	1027.2
345.00	3.0928	4.9406	8.033	1704.5	9.654	1067.0
350.00	3.1644	5.0083	8.173	1752.9	9.704	1107.5
355.00	3.2359	5.0747	8.311	1801.5	9.750	1148.7
360.00	3.3073	5.1400	8.447	1850.4	9.794	1190.6
365.00	3.3787	5.2040	8.583	1899.5	9.834	1233.2
370.00	3.4499	5.2668	8.717	1948.7	9.871	1276.5
373.15	3.4947	5.3058	8.800	1979.9	9.894	1304.0
375.00	3.5210	5.3285	8.849	1998.2	9.906	1320.4
380.00	3.5920	5.3889	8.981	2047.8	9.939	1364.9
385.00	3.6628	5.4482	9.111	2097.6	9.969	1410.2
390.00	3.7335	5.5064	9.240	2147.5	9.997	1456.1
395.00	3.8040	5.5634	9.367	2197.5	10.024	1502.6
400.00	3.8743	5.6193	9.494	2247.7	10.049	1549.7
405.00	3.9445	5.6741	9.619	2298.0	10.073	1597.5
410.00	4.0144	5.7279	9.742	2348.4	10.096	1645.9
415.00	4.0842	5.7807	9.865	2399.0	10.118	1694.9
420.00	4.1537	5.8324	9.986	2449.6	10.139	1744.6
425.00	4.2230	5.8832	10.106	2500.4	10.161	1794.8
430.00	4.2921	5.9331	10.225	2551.2	10.182	1845.6
435.00	4.3610	5.9821	10.343	2602.2	10.204	1897.0
440.00	4.4297	6.0302	10.460	2653.3	10.226	1949.0
445.00	4.4981	6.0774	10.575	2704.5	10.249	2001.6
450.00	4.5662	6.1239	10.690	2755.8	10.273	2054.8
455.00	4.6341	6.1697	10.804	2807.2	10.299	2108.5
460.00	4.7018	6.2147	10.917	2858.8	10.326	2162.8
465.00	4.7692	6.2591	11.028	2910.5	10.356	2217.7
470.00	4.8364	6.3028	11.139	2962.3	10.387	2273.1
475.00	4.9033	6.3460	11.249	3014.3	10.421	2329.1
480.00	4.9700	6.3886	11.359	3066.5	10.458	2385.6
485.00	5.0364	6.4308	11.467	3118.9	10.498	2442.7
490.00	5.1026	6.4725	11.575	3171.5	10.542	2500.3
495.00	5.1685	6.5138	11.682	3224.3	10.589	2558.4
500.00	5.2342	6.5548	11.789	3277.4	10.640	2617.1

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-12

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM HYDRIDE ($MG H_2$)
SOLID PHASE

GRAM MOLECULAR WT.=26.336 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0006	0.0015	0.002	0.007	0.004	0.003
10.00	0.0027	0.0053	0.008	0.053	0.015	0.027
15.00	0.0059	0.0113	0.017	0.169	0.033	0.088
20.00	0.0103	0.0204	0.031	0.409	0.065	0.205
25.00	0.0162	0.0341	0.050	0.852	0.116	0.405
30.00	0.0240	0.0536	0.078	1.609	0.191	0.721
35.00	0.0342	0.0804	0.115	2.815	0.296	1.198
40.00	0.0471	0.1155	0.163	4.620	0.431	1.886
45.00	0.0632	0.1595	0.223	7.177	0.596	2.844
50.00	0.0827	0.2124	0.295	10.622	0.785	4.133
55.00	0.1057	0.2739	0.380	15.063	0.994	5.814
60.00	0.1325	0.3430	0.476	20.582	1.216	7.948
65.00	0.1629	0.4190	0.582	27.235	1.447	10.587
70.00	0.1969	0.5008	0.698	35.057	1.683	13.782
75.00	0.2344	0.5876	0.822	44.070	1.923	17.578
80.00	0.2752	0.6786	0.954	54.284	2.162	22.014
85.00	0.3191	0.7728	1.092	65.687	2.398	27.126
90.00	0.3660	0.8695	1.236	78.252	2.626	32.942
95.00	0.4157	0.9677	1.383	91.929	2.843	39.488
100.00	0.4678	1.0666	1.534	106.66	3.047	46.781
105.00	0.5222	1.1655	1.688	122.38	3.238	54.836
110.00	0.5787	1.2639	1.843	139.02	3.418	63.661
115.00	0.6371	1.3613	1.998	156.55	3.590	73.263
120.00	0.6971	1.4576	2.155	174.91	3.754	83.645
125.00	0.7585	1.5527	2.311	194.08	3.914	94.810
130.00	0.8212	1.6465	2.468	214.05	4.071	106.76
135.00	0.8851	1.7391	2.624	234.79	4.225	119.49
140.00	0.9500	1.8306	2.781	256.29	4.376	133.00
145.00	1.0158	1.9210	2.937	278.54	4.526	147.29
150.00	1.0824	2.0103	3.093	301.54	4.673	162.37
155.00	1.1498	2.0985	3.248	325.27	4.818	178.22
160.00	1.2178	2.1857	3.404	349.72	4.961	194.85
165.00	1.2864	2.2720	3.558	374.88	5.102	212.25
170.00	1.3555	2.3573	3.713	400.74	5.242	230.43
175.00	1.4250	2.4416	3.867	427.29	5.379	249.38
180.00	1.4950	2.5251	4.020	454.52	5.514	269.10
185.00	1.5653	2.6077	4.173	482.43	5.649	289.58
190.00	1.6359	2.6895	4.325	511.00	5.781	310.83
195.00	1.7068	2.7705	4.477	540.24	5.913	332.83
200.00	1.7780	2.8506	4.629	570.13	6.043	355.60
205.00	1.8494	2.9301	4.780	600.67	6.173	379.12
210.00	1.9209	3.0088	4.930	631.86	6.301	403.39
215.00	1.9926	3.0869	5.080	663.68	6.429	428.42
220.00	2.0645	3.1643	5.229	696.14	6.556	454.19
225.00	2.1365	3.2410	5.378	729.24	6.682	480.70
230.00	2.2085	3.3172	5.526	762.96	6.807	507.96
235.00	2.2807	3.3928	5.674	797.30	6.931	535.96
240.00	2.3529	3.4678	5.821	832.27	7.055	564.70
245.00	2.4252	3.5423	5.967	867.85	7.178	594.17
250.00	2.4975	3.6162	6.114	904.05	7.301	624.37
255.00	2.5698	3.6896	6.260	940.86	7.423	655.30
260.00	2.6422	3.7626	6.405	978.28	7.544	686.96
265.00	2.7145	3.8351	6.550	1016.3	7.664	719.35
270.00	2.7869	3.9071	6.694	1054.9	7.784	752.46
273.15	2.8325	3.9523	6.785	1079.6	7.859	773.69
275.00	2.8592	3.9787	6.838	1094.1	7.903	786.29
280.00	2.9316	4.0498	6.981	1133.9	8.022	820.84
285.00	3.0039	4.1205	7.124	1174.4	8.139	856.10
290.00	3.0761	4.1908	7.267	1215.3	8.256	892.08
295.00	3.1484	4.2607	7.409	1256.9	8.372	928.77
298.15	3.1939	4.3045	7.498	1283.4	8.445	952.25
300.00	3.2206	4.3302	7.551	1299.1	8.487	966.17

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-13

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM HYDROXIDE ($MG(OH)_2$)
SOLID PHASE

GRAM MOLECULAR WT.=58.336 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL DEG-MOLE	$(H_T-H_0)/T$ CAL DEG-MOLE	(S_T-S_0) CAL DEG-MOLE	(H_T-H_0) CAL MOLE	C_P CAL DEG-MOLE	$-(F_T-H_0)$ CAL MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0001	0.000	0.001	0.001	0.000
10.00	0.0006	0.0021	0.003	0.021	0.009	0.006
15.00	0.0024	0.0080	0.010	0.119	0.033	0.036
20.00	0.0061	0.0197	0.026	0.393	0.082	0.122
25.00	0.0125	0.0398	0.052	0.995	0.165	0.312
30.00	0.0223	0.0707	0.093	2.120	0.292	0.668
35.00	0.0362	0.1138	0.150	3.981	0.460	1.268
40.00	0.0549	0.1694	0.224	6.776	0.664	2.196
45.00	0.0786	0.2371	0.316	10.669	0.898	3.539
50.00	0.1076	0.3159	0.423	15.793	1.157	5.380
55.00	0.1418	0.4050	0.547	22.275	1.441	7.799
60.00	0.1812	0.5041	0.685	30.244	1.752	10.873
65.00	0.2258	0.6130	0.839	39.842	2.093	14.677
70.00	0.2755	0.7317	1.007	51.222	2.464	19.286
75.00	0.3303	0.8604	1.191	64.530	2.864	24.775
80.00	0.3902	0.9988	1.389	79.905	3.290	31.218
85.00	0.4552	1.1466	1.602	97.463	3.737	38.689
90.00	0.5251	1.3033	1.828	117.30	4.200	47.259
95.00	0.6000	1.4683	2.068	139.49	4.676	56.995
100.00	0.6796	1.6407	2.320	164.07	5.159	67.962
105.00	0.7640	1.8198	2.584	191.08	5.646	80.218
110.00	0.8529	2.0048	2.858	220.53	6.132	93.817
115.00	0.9462	2.1948	3.141	252.40	6.615	108.81
120.00	1.0437	2.3889	3.433	286.67	7.094	125.24
125.00	1.1452	2.5866	3.732	323.32	7.565	143.15
130.00	1.2505	2.7870	4.038	362.31	8.028	162.57
135.00	1.3595	2.9895	4.349	403.59	8.482	183.53
140.00	1.4719	3.1937	4.666	447.12	8.928	206.07
145.00	1.5876	3.3990	4.987	492.85	9.365	230.20
150.00	1.7063	3.6050	5.311	540.75	9.793	255.94
155.00	1.8278	3.8114	5.639	590.77	10.212	283.31
160.00	1.9521	4.0178	5.970	642.85	10.622	312.34
165.00	2.0789	4.2241	6.303	696.97	11.024	343.02
170.00	2.2081	4.4299	6.638	753.08	11.416	375.37
175.00	2.3394	4.6350	6.974	811.12	11.800	409.40
180.00	2.4729	4.8392	7.312	871.06	12.174	445.12
185.00	2.6082	5.0424	7.651	932.84	12.539	482.52
190.00	2.7454	5.2444	7.990	996.43	12.894	521.62
195.00	2.8842	5.4450	8.329	1061.8	13.240	562.42
200.00	3.0246	5.6441	8.669	1128.8	13.577	604.91
205.00	3.1664	5.8416	9.008	1197.5	13.905	649.11
210.00	3.3095	6.0374	9.347	1267.8	14.223	694.99
215.00	3.4538	6.2313	9.685	1339.7	14.532	742.57
220.00	3.5993	6.4234	10.023	1413.2	14.832	791.84
225.00	3.7458	6.6135	10.359	1488.0	15.122	842.80
230.00	3.8932	6.8015	10.695	1564.4	15.403	895.43
235.00	4.0415	6.9875	11.029	1642.1	15.676	949.74
240.00	4.1905	7.1713	11.362	1721.1	15.939	1005.7
245.00	4.3402	7.3528	11.693	1801.4	16.194	1063.4
250.00	4.4906	7.5321	12.023	1883.0	16.440	1122.6
255.00	4.6415	7.7091	12.351	1965.8	16.678	1183.6
260.00	4.7929	7.8838	12.677	2049.8	16.908	1246.2
265.00	4.9447	8.0562	13.001	2134.9	17.129	1310.3
270.00	5.0969	8.2262	13.323	2221.1	17.343	1376.2
273.15	5.1929	8.3321	13.525	2275.9	17.473	1418.4
275.00	5.2494	8.3938	13.643	2308.3	17.549	1443.6
280.00	5.4021	8.5591	13.961	2396.5	17.748	1512.6
285.00	5.5550	8.7220	14.277	2485.8	17.939	1583.2
290.00	5.7081	8.8825	14.591	2575.9	18.124	1655.4
295.00	5.8613	9.0407	14.902	2667.0	18.303	1729.1
298.15	5.9579	9.1391	15.097	2724.8	18.412	1776.3
300.00	6.0146	9.1965	15.211	2758.9	18.475	1804.4

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-13 (CONT.)

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM HYDROXIDE ($MG(OH)_2$)
SOLID PHASE

GRAM MOLECULAR WT.=58.336 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
300.00	6.0146	9.1965	15.211	2758.9	18.475	1804.4
305.00	6.1678	9.3500	15.518	2851.7	18.642	1881.2
310.00	6.3211	9.5011	15.822	2945.4	18.803	1959.5
315.00	6.4743	9.6500	16.124	3039.8	18.959	2039.4
320.00	6.6274	9.7967	16.424	3134.9	19.110	2120.8
325.00	6.7805	9.9411	16.722	3230.9	19.257	2203.6
330.00	6.9333	10.083	17.017	3327.5	19.401	2288.0
335.00	7.0860	10.223	17.309	3424.9	19.541	2373.8
340.00	7.2385	10.361	17.600	3522.9	19.678	2461.1
345.00	7.3907	10.497	17.888	3621.6	19.812	2549.8
350.00	7.5428	10.631	18.174	3721.0	19.945	2640.0
355.00	7.6945	10.764	18.458	3821.1	20.076	2731.5
360.00	7.8459	10.894	18.740	3921.8	20.207	2824.5
365.00	7.9971	11.022	19.019	4023.1	20.337	2918.9
370.00	8.1479	11.149	19.297	4125.1	20.467	3014.7
373.15	8.2428	11.228	19.471	4189.8	20.550	3075.8
375.00	8.2984	11.274	19.573	4227.8	20.599	3111.9
380.00	8.4486	11.398	19.846	4331.1	20.731	3210.5
385.00	8.5984	11.520	20.118	4435.1	20.866	3310.4
390.00	8.7478	11.641	20.388	4539.8	21.004	3411.6
395.00	8.8968	11.760	20.657	4645.2	21.145	3514.2
400.00	9.0455	11.878	20.924	4751.3	21.290	3618.2

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-14

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM FLUORIDE (MgF_2)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=62.32 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0001	0.0003	0.000	0.001	0.001	0.000
10.00	0.0010	0.0035	0.005	0.035	0.015	0.010
15.00	0.0038	0.0119	0.016	0.179	0.046	0.057
20.00	0.0091	0.0273	0.036	0.546	0.106	0.183
25.00	0.0177	0.0521	0.070	1.302	0.203	0.442
30.00	0.0302	0.0886	0.119	2.657	0.346	0.906
35.00	0.0474	0.1385	0.186	4.847	0.537	1.660
40.00	0.0699	0.2026	0.273	8.103	0.772	2.797
45.00	0.0982	0.2806	0.379	12.628	1.043	4.417
50.00	0.1323	0.3717	0.504	18.584	1.343	6.617
55.00	0.1725	0.4745	0.647	26.097	1.666	9.487
60.00	0.2186	0.5879	0.806	35.271	2.007	13.114
65.00	0.2704	0.7107	0.981	46.197	2.366	17.577
70.00	0.3278	0.8423	1.170	58.959	2.742	22.949
75.00	0.3907	0.9818	1.373	73.638	3.132	29.300
80.00	0.4587	1.1288	1.588	90.303	3.536	36.695
85.00	0.5317	1.2824	1.814	109.01	3.947	45.194
90.00	0.6095	1.4421	2.052	129.78	4.364	54.854
95.00	0.6919	1.6068	2.299	152.65	4.781	65.726
100.00	0.7786	1.7759	2.555	177.59	5.196	77.855
105.00	0.8694	1.9486	2.818	204.60	5.608	91.283
110.00	0.9641	2.1242	3.088	233.66	6.014	106.05
115.00	1.0624	2.3020	3.364	264.73	6.415	122.18
120.00	1.1642	2.4816	3.646	297.80	6.809	139.70
125.00	1.2691	2.6625	3.932	332.81	7.196	158.64
130.00	1.3771	2.8442	4.221	369.74	7.574	179.02
135.00	1.4878	3.0262	4.514	408.54	7.943	200.86
140.00	1.6012	3.2082	4.809	449.15	8.298	224.17
145.00	1.7169	3.3896	5.107	491.50	8.641	248.96
150.00	1.8349	3.5702	5.405	535.54	8.972	275.23
155.00	1.9549	3.7497	5.705	581.20	9.291	303.01
160.00	2.0768	3.9276	6.004	628.42	9.597	332.28
165.00	2.2003	4.1039	6.304	677.15	9.893	363.05
170.00	2.3254	4.2784	6.604	727.33	10.177	395.32
175.00	2.4519	4.4509	6.903	778.90	10.450	429.09
180.00	2.5797	4.6212	7.201	831.82	10.714	464.35
185.00	2.7086	4.7893	7.498	886.02	10.967	501.10
190.00	2.8386	4.9551	7.794	941.47	11.211	539.33
195.00	2.9694	5.1185	8.088	998.12	11.445	579.03
200.00	3.1010	5.2796	8.381	1055.9	11.671	620.20
205.00	3.2333	5.4381	8.671	1114.8	11.889	662.83
210.00	3.3663	5.5942	8.960	1174.8	12.100	706.91
215.00	3.4997	5.7479	9.248	1235.8	12.302	752.44
220.00	3.6336	5.8991	9.533	1297.8	12.496	799.39
225.00	3.7678	6.0478	9.816	1360.7	12.683	847.76
230.00	3.9023	6.1940	10.096	1424.6	12.862	897.54
235.00	4.0371	6.3377	10.375	1489.4	13.034	948.72
240.00	4.1720	6.4789	10.651	1554.9	13.200	1001.3
245.00	4.3070	6.6177	10.925	1621.3	13.359	1055.2
250.00	4.4421	6.7541	11.196	1688.5	13.512	1110.5
255.00	4.5772	6.8880	11.465	1756.4	13.659	1167.2
260.00	4.7122	7.0196	11.732	1825.1	13.801	1225.2
265.00	4.8472	7.1489	11.996	1894.5	13.938	1284.5
270.00	4.9820	7.2758	12.258	1964.5	14.070	1345.1
273.15	5.0668	7.3547	12.421	2008.9	14.151	1384.0
275.00	5.1166	7.4005	12.517	2035.1	14.197	1407.1
280.00	5.2511	7.5230	12.774	2106.4	14.320	1470.3
285.00	5.3853	7.6433	13.029	2178.3	14.438	1534.8
290.00	5.5192	7.7614	13.281	2250.8	14.553	1600.6
295.00	5.6529	7.8775	13.530	2323.9	14.663	1667.6
295.00	5.6529	7.8775	13.530	2323.9	14.663	1667.6
298.15	5.7370	7.9495	13.687	2370.2	14.730	1710.5
300.00	5.7863	7.9915	13.778	2397.4	14.770	1735.9

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-14 (CONT.)

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM FLUORIDE (MgF_2)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=62.32 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	5.7863	7.9915	13.778	2397.4	14.770	1735.9
310.00	6.0520	8.2134	14.265	2546.2	14.972	1876.1
320.00	6.3161	8.4276	14.744	2696.8	15.162	2021.2
330.00	6.5786	8.6344	15.213	2849.4	15.340	2170.9
340.00	6.8394	8.8341	15.674	3003.6	15.507	2325.4
350.00	7.0983	9.0270	16.125	3159.5	15.663	2484.4
360.00	7.3552	9.2134	16.569	3316.8	15.811	2647.9
370.00	7.6101	9.3936	17.004	3475.6	15.950	2815.7
373.15	7.6900	9.4492	17.139	3526.0	15.992	2869.5
380.00	7.8629	9.5679	17.431	3635.8	16.081	2987.9
390.00	8.1137	9.7365	17.850	3797.2	16.204	3164.3
400.00	8.3622	9.8997	18.262	3959.9	16.321	3344.9
425.00	8.9741	10.285	19.259	4371.3	16.585	3814.0
450.00	9.5722	10.642	20.214	4788.8	16.813	4307.5
475.00	10.157	10.972	21.129	5211.6	17.014	4824.4
500.00	10.727	11.279	22.006	5639.3	17.194	5363.7
550.00	11.829	11.831	23.660	6507.0	17.507	6505.8
600.00	12.879	12.315	25.195	7389.2	17.774	7727.7
650.00	13.882	12.744	26.627	8283.9	18.008	9023.6
700.00	14.841	13.128	27.969	9189.7	18.218	10388.9
750.00	15.759	13.474	29.233	10105.4	18.411	11819.2
800.00	16.639	13.788	30.427	11030.5	18.590	13311.0
850.00	17.483	14.076	31.559	11964.3	18.759	14860.9
900.00	18.296	14.340	32.636	12906.3	18.920	16466.0
950.00	19.078	14.585	33.663	13856.1	19.074	18123.6
1000.00	19.832	14.814	34.645	14813.6	19.223	19831.5
1050.00	20.559	15.027	35.586	15778.4	19.368	21587.5
1100.00	21.263	15.228	36.491	16750.3	19.509	23389.5
1150.00	21.944	15.417	37.361	17729.2	19.648	25236.0
1200.00	22.604	15.596	38.200	18715.1	19.784	27125.1
1250.00	23.244	15.766	39.011	19707.6	19.918	29055.5
1300.00	23.866	15.928	39.794	20706.9	20.051	31025.7
1350.00	24.470	16.083	40.553	21712.7	20.182	33034.5
1400.00	25.058	16.232	41.290	22725.0	20.311	35080.7
1450.00	25.630	16.375	42.005	23743.8	20.440	37163.1
1500.00	26.187	16.513	42.700	24769.0	20.568	39280.8
1536.00	26.580	16.609	43.189	25511.1	20.659	40826.9
			(LIQUID)			
1536.00	26.580	25.710	52.290	39491.1	22.570	40826.9
1550.00	26.813	25.682	52.495	39807.1	22.570	41560.4
1600.00	27.627	25.585	53.212	40935.6	22.570	44203.2
1650.00	28.413	25.493	53.906	42064.1	22.570	46881.2
1700.00	29.173	25.407	54.580	43192.6	22.570	49593.4
1750.00	29.908	25.326	55.234	44321.1	22.570	52338.9
1800.00	30.620	25.250	55.870	45449.6	22.570	55116.6
1850.00	31.311	25.177	56.488	46578.1	22.570	57925.6
1900.00	31.982	25.109	57.090	47706.6	22.570	60765.1
1950.00	32.633	25.044	57.677	48835.1	22.570	63634.4
2000.00	33.266	24.982	58.248	49963.6	22.570	66532.6
2050.00	33.882	24.923	58.805	51092.1	22.570	69459.0
2100.00	34.482	24.867	59.349	52220.6	22.570	72412.9
2150.00	35.067	24.814	59.880	53349.1	22.570	75393.7
2200.00	35.637	24.763	60.399	54477.6	22.570	78400.7
2250.00	36.193	24.714	60.906	55606.1	22.570	81433.4
2300.00	36.735	24.667	61.403	56734.6	22.570	84491.2
2350.00	37.265	24.623	61.888	57863.1	22.570	87573.5
2400.00	37.783	24.580	62.363	58991.6	22.570	90679.8
2450.00	38.290	24.539	62.828	60120.1	22.570	93809.6
2500.00	38.785	24.499	63.284	61248.6	22.570	96962.5

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-15

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CHLORIDE (MG CL_2)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=95.234 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0002	0.0010	0.001	0.005	0.006	0.001
10.00	0.0045	0.0173	0.022	0.173	0.074	0.045
15.00	0.0186	0.0595	0.078	0.892	0.229	0.279
20.00	0.0447	0.1311	0.176	2.622	0.481	0.895
25.00	0.0845	0.2354	0.320	5.884	0.841	2.113
30.00	0.1391	0.3734	0.513	11.202	1.301	4.173
35.00	0.2090	0.5434	0.752	19.018	1.836	7.315
40.00	0.2942	0.7411	1.035	29.645	2.421	11.768
45.00	0.3940	0.9616	1.356	43.274	3.034	17.731
50.00	0.5076	1.2001	1.708	60.006	3.662	25.377
55.00	0.6337	1.4529	2.087	79.907	4.300	34.853
60.00	0.7714	1.7171	2.488	103.02	4.947	46.281
65.00	0.9195	1.9906	2.910	129.39	5.598	59.770
70.00	1.0773	2.2713	3.349	158.99	6.244	75.411
75.00	1.2437	2.5573	3.801	191.80	6.877	93.279
80.00	1.4180	2.8465	4.265	227.72	7.488	113.44
85.00	1.5993	3.1368	4.736	266.63	8.071	135.94
90.00	1.7868	3.4265	5.213	308.38	8.624	160.81
95.00	1.9798	3.7139	5.694	352.82	9.147	188.08
100.00	2.1775	3.9981	6.176	399.81	9.641	217.75
105.00	2.3793	4.2780	6.657	449.19	10.107	249.83
110.00	2.5847	4.5530	7.138	500.83	10.548	284.32
115.00	2.7931	4.8228	7.616	554.63	10.964	321.21
120.00	3.0040	5.0870	8.091	610.44	11.357	360.47
125.00	3.2169	5.3452	8.562	668.15	11.725	402.11
130.00	3.4314	5.5973	9.029	727.65	12.071	446.09
135.00	3.6473	5.8432	9.490	788.83	12.396	492.39
140.00	3.8642	6.0827	9.947	851.58	12.700	540.98
145.00	4.0817	6.3159	10.398	915.80	12.986	591.85
150.00	4.2997	6.5427	10.842	981.41	13.254	644.95
155.00	4.5178	6.7633	11.281	1048.3	13.507	700.26
160.00	4.7359	6.9778	11.714	1116.5	13.744	757.75
165.00	4.9539	7.1863	12.140	1185.7	13.967	817.39
170.00	5.1714	7.3888	12.560	1256.1	14.177	879.14
175.00	5.3885	7.5856	12.974	1327.5	14.374	942.98
180.00	5.6048	7.7768	13.382	1399.8	14.559	1008.9
185.00	5.8205	7.9624	13.783	1473.0	14.732	1076.8
190.00	6.0352	8.1427	14.178	1547.1	14.895	1146.7
195.00	6.2490	8.3179	14.567	1622.0	15.048	1218.6
200.00	6.4617	8.4880	14.950	1697.6	15.193	1292.3
205.00	6.6734	8.6532	15.327	1773.9	15.328	1368.0
210.00	6.8838	8.8136	15.697	1850.9	15.458	1445.6
215.00	7.0931	8.9696	16.063	1928.5	15.582	1525.0
220.00	7.3010	9.1212	16.422	2006.7	15.700	1606.2
225.00	7.5077	9.2687	16.776	2085.5	15.812	1689.2
230.00	7.7129	9.4121	17.125	2164.8	15.919	1774.0
235.00	7.9169	9.5516	17.468	2244.6	16.021	1860.5
240.00	8.1194	9.6874	17.807	2325.0	16.118	1948.7
245.00	8.3205	9.8196	18.140	2405.8	16.210	2038.5
250.00	8.5202	9.9483	18.469	2487.1	16.300	2130.0
255.00	8.7184	10.074	18.792	2568.8	16.387	2223.2
260.00	8.9152	10.196	19.111	2650.9	16.473	2318.0
265.00	9.1106	10.315	19.426	2733.5	16.558	2414.3
270.00	9.3045	10.432	19.736	2816.5	16.643	2512.2
273.15	9.4259	10.504	19.929	2869.0	16.696	2574.7
275.00	9.4969	10.545	20.042	2900.0	16.727	2611.7
280.00	9.6879	10.656	20.344	2983.8	16.808	2712.6
285.00	9.8775	10.765	20.643	3068.0	16.887	2815.1
290.00	10.066	10.871	20.937	3152.7	16.961	2919.0
295.00	10.252	10.975	21.227	3237.6	17.033	3024.5
298.15	10.369	11.039	21.409	3291.4	17.077	3091.6
300.00	10.438	11.077	21.514	3323.0	17.102	3131.3

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-15 (CONT.)

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CHLORIDE ($MG\ CL_2$)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=95.234 GRAMS — 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG-MOLE	$(H_T-H_0)/T$ CAL/DEG-MOLE	(S_T-S_0) CAL/DEG-MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG-MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	10.438	11.077	21.514	3323.0	17.102	3131.3
310.00	10.804	11.273	22.077	3494.7	17.233	3349.3
320.00	11.165	11.461	22.626	3667.6	17.356	3572.8
330.00	11.521	11.642	23.162	3841.8	17.472	3801.8
340.00	11.871	11.815	23.685	4017.0	17.580	4036.0
350.00	12.216	11.981	24.197	4193.4	17.683	4275.4
360.00	12.555	12.141	24.696	4370.7	17.781	4519.9
370.00	12.890	12.294	25.185	4549.0	17.874	4769.3
373.15	12.994	12.342	25.336	4605.3	17.902	4848.9
380.00	13.220	12.442	25.662	4728.1	17.963	5023.6
390.00	13.545	12.585	26.130	4908.2	18.048	5282.5
400.00	13.865	12.723	26.588	5089.1	18.130	5546.1
425.00	14.646	13.047	27.693	5544.8	18.321	6224.8
450.00	15.401	13.345	28.745	6005.0	18.498	6930.3
475.00	16.130	13.620	29.750	6469.5	18.659	7661.6
500.00	16.835	13.875	30.710	6937.6	18.786	8417.5
550.00	18.179	14.332	32.511	7882.4	19.000	9998.7
600.00	19.444	14.728	34.172	8837.0	19.180	11666.3
650.00	20.637	15.077	35.714	9800.0	19.335	13413.9
700.00	21.766	15.386	37.152	10770.3	19.474	15235.9
750.00	22.837	15.663	38.500	11747.1	19.599	17127.6
800.00	23.856	15.912	39.768	12730.0	19.714	19084.6
850.00	24.827	16.139	40.967	13718.4	19.822	21103.2
900.00	25.756	16.347	42.103	14712.1	19.924	23180.2
950.00	26.645	16.538	43.182	15710.7	20.021	25312.5
987.00	27.279	16.669	43.949	16452.8	20.090	26924.4
			(LIQUID)			
987.00	27.279	27.105	54.384	26752.8	22.100	26924.4
1000.00	27.633	27.040	54.673	27040.1	22.100	27633.2
1050.00	28.947	26.805	55.752	28145.1	22.100	30394.0
1100.00	30.189	26.591	56.780	29250.1	22.100	33207.5
1150.00	31.366	26.396	57.762	30355.1	22.100	36071.2
1200.00	32.486	26.217	58.703	31460.1	22.100	38983.0
1250.00	33.553	26.052	59.605	32565.1	22.100	41940.9
1300.00	34.571	25.900	60.472	33670.1	22.100	44942.9
1350.00	35.546	25.759	61.306	34775.1	22.100	47987.5
1400.00	36.481	25.629	62.109	35880.1	22.100	51073.0
1450.00	37.378	25.507	62.885	36985.1	22.100	54197.9
1500.00	38.241	25.393	63.634	38090.1	22.100	57361.0
1550.00	39.072	25.287	64.359	39195.1	22.100	60560.9
1600.00	39.873	25.188	65.060	40300.1	22.100	63796.5
1650.00	40.646	25.094	65.740	41405.1	22.100	67066.6
1700.00	41.394	25.006	66.400	42510.1	22.100	70370.2
1750.00	42.118	24.923	67.041	43615.1	22.100	73706.3
1800.00	42.819	24.844	67.663	44720.1	22.100	77074.0
1850.00	43.499	24.770	68.269	45825.1	22.100	80472.3
1900.00	44.158	24.700	68.858	46930.1	22.100	83900.6
1950.00	44.799	24.633	69.432	48035.1	22.100	87357.9
2000.00	45.422	24.570	69.992	49140.1	22.100	90843.6
2050.00	46.028	24.510	70.538	50245.1	22.100	94356.9
2100.00	46.618	24.452	71.070	51350.1	22.100	97897.1
2150.00	47.192	24.398	71.590	52455.1	22.100	101463.7
2200.00	47.753	24.345	72.098	53560.1	22.100	105055.9
2250.00	48.299	24.296	72.595	54665.1	22.100	108673.3
2300.00	48.833	24.248	73.081	55770.1	22.100	112315.2
2350.00	49.354	24.202	73.556	56875.1	22.100	115981.2
2400.00	49.863	24.158	74.021	57980.1	22.100	119670.7
2450.00	50.360	24.116	74.477	59085.1	22.100	123383.1
2500.00	50.847	24.076	74.923	60190.1	22.100	127118.2

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-16

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CHLORIDE MONOHYDRATE ($MgCl_2 \cdot H_2O$)
SOLID PHASE

GRAM MOLECULAR WT.=113.250 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0001	0.0010	0.001	0.005	0.008	0.001
10.00	0.0075	0.0335	0.041	0.335	0.161	0.075
15.00	0.0371	0.1297	0.167	1.945	0.512	0.557
20.00	0.0944	0.2856	0.380	5.712	1.018	1.889
25.00	0.1796	0.4935	0.673	12.336	1.651	4.490
30.00	0.2913	0.7466	1.038	22.398	2.388	8.739
35.00	0.4278	1.0385	1.466	36.349	3.202	14.974
40.00	0.5874	1.3626	1.950	54.506	4.067	23.494
45.00	0.7678	1.7125	2.480	77.063	4.959	34.553
50.00	0.9673	2.0824	3.050	104.12	5.864	48.363
55.00	1.1837	2.4674	3.651	135.71	6.771	65.103
60.00	1.4153	2.8637	4.279	171.82	7.674	84.919
65.00	1.6605	3.2682	4.929	212.43	8.568	107.930
70.00	1.9176	3.6783	5.596	257.48	9.447	134.23
75.00	2.1855	4.0916	6.277	306.87	10.305	163.91
80.00	2.4628	4.5061	6.969	360.49	11.137	197.02
85.00	2.7484	4.9198	7.668	418.18	11.936	233.61
90.00	3.0413	5.3310	8.372	479.79	12.702	273.71
95.00	3.3404	5.7384	9.079	545.15	13.435	317.34
100.00	3.6450	6.1409	9.786	614.09	14.136	364.50
105.00	3.9543	6.5378	10.492	686.46	14.809	415.20
110.00	4.2675	6.9285	11.196	762.14	15.456	469.42
115.00	4.5839	7.3129	11.897	840.99	16.080	527.15
120.00	4.9032	7.6908	12.594	922.90	16.680	588.38
125.00	5.2247	8.0620	13.287	1007.8	17.257	653.09
130.00	5.5480	8.4264	13.974	1095.4	17.811	721.24
135.00	5.8727	8.7839	14.657	1185.8	18.341	792.82
140.00	6.1986	9.1342	15.333	1278.8	18.842	867.80
145.00	6.5251	9.4772	16.002	1374.2	19.319	946.14
150.00	6.8521	9.8129	16.665	1471.9	19.772	1027.8
155.00	7.1792	10.141	17.320	1571.9	20.203	1112.8
160.00	7.5062	10.462	17.968	1673.9	20.614	1201.0
165.00	7.8330	10.776	18.609	1778.0	21.007	1292.4
170.00	8.1593	11.082	19.241	1884.0	21.384	1387.1
175.00	8.4848	11.382	19.867	1991.8	21.745	1484.8
180.00	8.8096	11.674	20.484	2101.4	22.093	1585.7
185.00	9.1334	11.961	21.094	2212.7	22.428	1689.7
190.00	9.4561	12.240	21.696	2325.7	22.752	1796.7
195.00	9.7776	12.514	22.291	2440.2	23.065	1906.6
200.00	10.098	12.782	22.879	2556.3	23.369	2019.6
205.00	10.417	13.043	23.460	2673.9	23.664	2135.4
210.00	10.734	13.300	24.034	2792.9	23.950	2254.1
215.00	11.050	13.551	24.601	2913.4	24.229	2375.7
220.00	11.364	13.796	25.161	3035.2	24.499	2500.1
225.00	11.677	14.037	25.714	3158.4	24.762	2627.3
230.00	11.988	14.273	26.261	3282.8	25.017	2757.2
235.00	12.298	14.504	26.802	3408.5	25.264	2889.9
240.00	12.605	14.731	27.336	3535.4	25.504	3025.3
245.00	12.911	14.953	27.865	3663.5	25.735	3163.3
250.00	13.216	15.171	28.387	3792.8	25.958	3303.9
255.00	13.518	15.385	28.903	3923.1	26.172	3447.1
260.00	13.819	15.594	29.413	4054.5	26.376	3592.9
265.00	14.118	15.799	29.917	4186.9	26.570	3741.3
270.00	14.415	16.001	30.416	4320.2	26.753	3892.1
273.15	14.601	16.125	30.727	4404.6	26.863	3988.4
275.00	14.711	16.198	30.908	4454.4	26.925	4045.4
280.00	15.004	16.391	31.395	4589.4	27.084	4201.2
285.00	15.296	16.580	31.876	4725.2	27.229	4359.3
290.00	15.586	16.764	32.350	4861.7	27.359	4519.9
295.00	15.874	16.945	32.819	4998.7	27.474	4682.8
298.15	16.055	17.056	33.111	5085.4	27.538	4786.7
300.00	16.160	17.121	33.282	5136.4	27.573	4848.1

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-17

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CHLORIDE DIHYDRATE ($MgCl_2 \cdot 2H_2O$)
SOLID PHASE

GRAM MOLECULAR WT.=131.266 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL / DEG MOLE	$(H_T-H_0)/T$ CAL / DEG MOLE	(S_T-S_0) CAL / DEG MOLE	(H_T-H_0) CAL / MOLE	C_P CAL / DEG MOLE	$-(F_T-H_0)$ CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0002	0.0011	0.001	0.006	0.009	0.001
10.00	0.0100	0.0467	0.057	0.467	0.232	0.100
15.00	0.0527	0.1898	0.242	2.847	0.763	0.790
20.00	0.1372	0.4228	0.560	8.456	1.511	2.745
25.00	0.2632	0.7285	0.992	18.213	2.414	6.581
30.00	0.4274	1.0922	1.520	32.766	3.421	12.823
35.00	0.6260	1.5006	2.127	52.521	4.488	21.910
40.00	0.8549	1.9422	2.797	77.687	5.581	34.196
45.00	1.1104	2.4076	3.518	108.34	6.681	49.966
50.00	1.3889	2.8899	4.279	144.50	7.781	69.444
55.00	1.6874	3.3846	5.072	186.15	8.881	92.809
60.00	2.0035	3.8884	5.892	233.30	9.979	120.21
65.00	2.3348	4.3990	6.734	285.94	11.073	151.76
70.00	2.6797	4.9144	7.594	344.00	12.152	187.58
75.00	3.0364	5.4322	8.468	407.41	13.206	227.73
80.00	3.4035	5.9502	9.354	476.01	14.228	272.28
85.00	3.7797	6.4663	10.246	549.63	15.213	321.28
90.00	4.1639	6.9787	11.143	628.08	16.162	374.75
95.00	4.5548	7.4862	12.041	711.19	17.076	432.71
100.00	4.9516	7.9879	12.940	798.79	17.960	495.16
105.00	5.3533	8.4833	13.837	890.75	18.818	562.10
110.00	5.7593	8.9721	14.731	986.94	19.653	633.52
115.00	6.1688	9.4543	15.623	1087.2	20.465	709.41
120.00	6.5812	9.9296	16.511	1191.6	21.256	789.75
125.00	6.9961	10.398	17.394	1299.8	22.023	874.51
130.00	7.4129	10.860	18.272	1411.7	22.767	963.68
135.00	7.8313	11.314	19.145	1527.4	23.486	1057.2
140.00	8.2509	11.761	20.012	1646.6	24.179	1155.1
145.00	8.6713	12.201	20.872	1769.1	24.845	1257.3
150.00	9.0922	12.633	21.725	1895.0	25.485	1363.8
155.00	9.5134	13.058	22.571	2023.9	26.101	1474.6
160.00	9.9346	13.475	23.409	2155.9	26.695	1589.5
165.00	10.355	13.884	24.239	2290.9	27.267	1708.7
170.00	10.776	14.286	25.062	2428.6	27.820	1831.9
175.00	11.196	14.680	25.876	2569.0	28.355	1959.3
180.00	11.615	15.067	26.682	2712.1	28.874	2090.7
185.00	12.033	15.447	27.480	2857.7	29.377	2226.1
190.00	12.450	15.820	28.270	3005.9	29.866	2365.4
195.00	12.865	16.187	29.052	3156.4	30.342	2508.8
200.00	13.280	16.546	29.826	3309.3	30.807	2656.0
205.00	13.693	16.900	30.592	3464.4	31.260	2807.0
210.00	14.104	17.247	31.351	3621.8	31.703	2961.9
215.00	14.514	17.588	32.102	3781.4	32.137	3120.5
220.00	14.922	17.924	32.846	3943.2	32.561	3282.9
225.00	15.329	18.254	33.582	4107.0	32.977	3448.9
230.00	15.733	18.578	34.311	4272.9	33.385	3618.7
235.00	16.136	18.897	35.034	4440.9	33.785	3792.0
240.00	16.538	19.212	35.749	4610.8	34.177	3969.0
245.00	16.937	19.521	36.458	4782.6	34.562	4149.5
250.00	17.334	19.826	37.160	4956.4	34.938	4333.6
255.00	17.730	20.126	37.855	5132.0	35.307	4521.1
260.00	18.124	20.421	38.544	5309.4	35.668	4712.1
265.00	18.515	20.712	39.227	5488.7	36.021	4906.5
270.00	18.905	20.999	39.904	5669.6	36.365	5104.4
273.15	19.150	21.177	40.327	5784.5	36.577	5230.7
275.00	19.293	21.281	40.574	5852.3	36.700	5305.6
280.00	19.679	21.559	41.238	6036.6	37.026	5510.1
285.00	20.063	21.834	41.897	6222.6	37.342	5717.9
290.00	20.445	22.104	42.549	6410.0	37.648	5929.1
295.00	20.825	22.370	43.195	6599.0	37.942	6143.4
298.15	21.064	22.535	43.599	6718.8	38.121	6280.1
300.00	21.203	22.631	43.835	6789.4	38.224	6361.0

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-18

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CHLORIDE TETRAHYDRATE ($MgCl_2 \cdot 4H_2O$)
SOLID PHASE

GRAM MOLECULAR WT.=167.298 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0002	0.0013	0.002	0.007	0.012	0.001
10.00	0.0147	0.0723	0.087	0.723	0.375	0.147
15.00	0.0834	0.3110	0.394	4.665	1.273	1.251
20.00	0.2230	0.6991	0.922	13.982	2.495	4.459
25.00	0.4308	1.1969	1.628	29.922	3.905	10.770
30.00	0.6990	1.7731	2.472	53.194	5.416	20.971
35.00	1.0192	2.4041	3.423	84.145	6.968	35.673
40.00	1.3836	3.0720	4.456	122.88	8.525	55.343
45.00	1.7852	3.7637	5.549	169.36	10.067	80.333
50.00	2.2182	4.4704	6.689	223.52	11.593	110.91
55.00	2.6779	5.1869	7.865	285.28	13.108	147.28
60.00	3.1601	5.9099	9.070	354.59	14.615	189.61
65.00	3.6619	6.6371	10.299	431.41	16.110	238.02
70.00	4.1804	7.3666	11.547	515.66	17.584	292.63
75.00	4.7136	8.0960	12.810	607.20	19.025	353.52
80.00	5.2593	8.8230	14.082	705.84	20.422	420.74
85.00	5.8159	9.5452	15.361	811.34	21.770	494.35
90.00	6.3818	10.261	16.642	923.46	23.071	574.36
95.00	6.9555	10.968	17.924	1042.0	24.332	660.77
100.00	7.5359	11.667	19.203	1166.7	25.563	753.59
105.00	8.1219	12.358	20.480	1297.6	26.773	852.80
110.00	8.7126	13.040	21.753	1434.4	27.965	958.39
115.00	9.3072	13.715	23.022	1577.2	29.141	1070.3
120.00	9.9050	14.382	24.287	1725.8	30.298	1188.6
125.00	10.505	15.041	25.547	1880.2	31.433	1313.2
130.00	11.108	15.693	26.801	2040.1	32.539	1444.1
135.00	11.712	16.337	28.050	2205.5	33.618	1581.2
140.00	12.318	16.973	29.291	2376.2	34.661	1724.5
145.00	12.925	17.600	30.525	2552.1	35.673	1874.1
150.00	13.532	18.219	31.751	2732.9	36.656	2029.8
155.00	14.139	18.829	32.969	2918.6	37.611	2191.6
160.00	14.747	19.431	34.178	3109.0	38.541	2359.5
165.00	15.354	20.024	35.377	3303.9	39.447	2533.3
170.00	15.960	20.608	36.568	3503.4	40.330	2713.2
175.00	16.566	21.184	37.750	3707.2	41.193	2899.0
180.00	17.171	21.752	38.922	3915.3	42.036	3090.7
185.00	17.774	22.311	40.085	4127.5	42.861	3288.2
190.00	18.376	22.862	41.239	4343.9	43.669	3491.5
195.00	18.977	23.406	42.384	4564.2	44.462	3700.6
200.00	19.577	23.942	43.519	4788.5	45.239	3915.4
205.00	20.174	24.471	44.646	5016.6	46.002	4135.8
210.00	20.770	24.993	45.763	5248.5	46.751	4361.8
215.00	21.365	25.507	46.872	5484.1	47.487	4593.4
220.00	21.957	26.015	47.972	5723.3	48.209	4830.5
225.00	22.547	26.516	49.063	5966.1	48.919	5073.1
230.00	23.135	27.011	50.146	6212.5	49.616	5321.1
235.00	23.721	27.499	51.220	6462.3	50.301	5574.5
240.00	24.305	27.981	52.287	6715.5	50.973	5833.3
245.00	24.887	28.457	53.344	6972.0	51.633	6097.4
250.00	25.467	28.927	54.394	7231.8	52.280	6366.7
255.00	26.044	29.391	55.436	7494.8	52.913	6641.3
260.00	26.620	29.850	56.469	7760.9	53.534	6921.1
265.00	27.192	30.302	57.495	8030.1	54.141	7206.0
270.00	27.763	30.749	58.512	8302.3	54.734	7496.0
273.15	28.121	31.028	59.149	8475.3	55.101	7681.3
275.00	28.331	31.191	59.522	8577.4	55.313	7791.1
280.00	28.897	31.626	60.524	8855.4	55.878	8091.2
285.00	29.461	32.057	61.517	9136.1	56.427	8396.3
290.00	30.022	32.481	62.503	9419.6	56.961	8706.4
295.00	30.581	32.901	63.482	9705.7	57.480	9021.3
298.15	30.932	33.162	64.094	9887.3	57.798	9222.3
300.00	31.137	33.315	64.452	9994.4	57.982	9341.2

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-19

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CHLORIDE HEXAHYDRATE (MG $CL_2 \cdot 6H_2O$)
SOLID PHASE

GRAM MOLECULAR WT.=203.330 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0002	0.0017	0.002	0.009	0.016	0.001
10.00	0.0215	0.1089	0.130	1.089	0.579	0.215
15.00	0.1273	0.4834	0.611	7.250	1.994	1.910
20.00	0.3448	1.0896	1.434	21.791	3.874	6.896
25.00	0.6680	1.8544	2.522	46.359	5.981	16.699
30.00	1.0819	2.7258	3.808	81.773	8.197	32.458
35.00	1.5723	3.6686	5.241	128.40	10.458	55.029
40.00	2.1264	4.6589	6.785	186.36	12.723	85.057
45.00	2.7339	5.6799	8.414	255.59	14.968	123.03
50.00	3.3861	6.7196	10.106	335.98	17.181	169.30
55.00	4.0757	7.7699	11.846	427.34	19.357	224.17
60.00	4.7970	8.8248	13.622	529.49	21.492	287.82
65.00	5.5451	9.8799	15.425	642.20	23.583	360.43
70.00	6.3158	10.932	17.248	765.24	25.624	442.10
75.00	7.1057	11.978	19.084	898.35	27.610	532.93
80.00	7.9119	13.015	20.927	1041.2	29.537	632.95
85.00	8.7319	14.043	22.774	1193.6	31.406	742.21
90.00	9.5633	15.058	24.621	1355.2	33.220	860.70
95.00	10.404	16.060	26.465	1525.7	34.986	988.42
100.00	11.253	17.050	28.303	1705.0	36.713	1125.3
105.00	12.109	18.027	30.136	1892.8	38.403	1271.4
110.00	12.970	18.991	31.961	2089.0	40.063	1426.7
115.00	13.835	19.943	33.778	2293.4	41.694	1591.0
120.00	14.704	20.882	35.586	2505.8	43.273	1764.4
125.00	15.575	21.809	37.384	2726.1	44.835	1946.9
130.00	16.448	22.724	39.172	2954.1	46.333	2138.3
133.00	16.973	23.266	40.239	3094.4	47.192	2257.4
Δ 133 TO 140	1.225	1.219	2.444	333.5		290.3
140.00	18.198	24.485	42.683	3427.9	46.866	2547.7
145.00	19.071	25.279	44.350	3665.4	48.130	2765.3
150.00	19.941	26.061	46.002	3909.1	49.356	2991.2
155.00	20.808	26.832	47.640	4158.9	50.548	3225.3
160.00	21.672	27.591	49.263	4414.6	51.708	3467.6
165.00	22.533	28.339	50.872	4675.9	52.839	3717.9
170.00	23.390	29.076	52.466	4942.9	53.942	3976.3
175.00	24.243	29.802	54.045	5215.3	55.020	4242.5
180.00	25.093	30.517	55.610	5493.1	56.074	4516.7
185.00	25.939	31.222	57.160	5776.0	57.105	4798.6
190.00	26.780	31.916	58.697	6064.1	58.115	5088.3
195.00	27.618	32.601	60.219	6357.2	59.105	5385.6
200.00	28.452	33.276	61.728	6655.1	60.075	5690.4
205.00	29.282	33.941	63.223	6957.9	61.027	6002.8
210.00	30.108	34.597	64.705	7265.4	61.961	6322.6
215.00	30.930	35.244	66.174	7577.5	62.877	6649.8
220.00	31.747	35.882	67.629	7894.1	63.776	6984.4
225.00	32.561	36.512	69.073	8215.2	64.658	7326.1
230.00	33.370	37.133	70.503	8540.7	65.524	7675.1
235.00	34.175	37.746	71.921	8870.3	66.373	8031.1
240.00	34.976	38.351	73.328	9204.3	67.205	8394.2
245.00	35.773	38.949	74.722	9542.3	68.020	8764.3
250.00	36.566	39.538	76.104	9884.5	68.817	9141.5
255.00	37.355	40.120	77.474	10231.0	69.597	9525.3
260.00	38.139	40.694	78.833	10580.0	70.359	9916.2
265.00	38.920	41.261	80.181	10934.0	71.103	10314.0
270.00	39.696	41.820	81.516	11291.0	71.827	10718.0
273.15	40.183	42.169	82.352	11518.0	72.273	10976.0
275.00	40.469	42.372	82.841	11652.0	72.531	11129.0
280.00	41.237	42.917	84.154	12017.0	73.214	11546.0
285.00	42.001	43.454	85.456	12384.0	73.875	11970.0
290.00	42.762	43.984	86.746	12755.0	74.513	12401.0
295.00	43.518	44.507	88.025	13130.0	75.128	12838.0
298.15	43.992	44.833	88.825	13130.0	75.502	13116.0
300.00	44.270	45.022	89.293	13507.0	75.717	13281.0

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-20

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM ALUMINATE ($MG\ O.AL_2O_3$)
SOLID PHASE

GRAM MOLECULAR WT.=142.280 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0001	0.000	0.001	0.001	0.000
10.00	0.0005	0.0020	0.003	0.020	0.008	0.005
15.00	0.0021	0.0066	0.009	0.100	0.026	0.032
20.00	0.0051	0.0151	0.020	0.303	0.058	0.102
25.00	0.0098	0.0288	0.039	0.720	0.113	0.246
30.00	0.0168	0.0491	0.066	1.474	0.194	0.503
35.00	0.0264	0.0776	0.104	2.717	0.309	0.922
40.00	0.0391	0.1155	0.155	4.621	0.459	1.563
45.00	0.0554	0.1638	0.219	7.370	0.647	2.491
50.00	0.0756	0.2232	0.299	11.158	0.875	3.780
55.00	0.1001	0.2943	0.394	16.186	1.143	5.506
60.00	0.1292	0.3777	0.507	22.663	1.455	7.752
65.00	0.1631	0.4739	0.637	30.805	1.810	10.604
70.00	0.2022	0.5833	0.786	40.833	2.209	14.153
75.00	0.2465	0.7062	0.953	52.968	2.652	18.490
80.00	0.2964	0.8428	1.139	67.420	3.136	23.712
85.00	0.3519	0.9928	1.345	84.388	3.657	29.914
90.00	0.4132	1.1561	1.569	104.05	4.214	37.191
95.00	0.4804	1.3324	1.813	126.58	4.802	45.639
100.00	0.5535	1.5212	2.075	152.12	5.418	55.350
105.00	0.6325	1.7219	2.354	180.80	6.058	66.415
110.00	0.7175	1.9340	2.651	212.74	6.720	78.923
115.00	0.8083	2.1567	2.965	248.02	7.397	92.957
120.00	0.9050	2.3893	3.294	286.72	8.085	108.60
125.00	1.0074	2.6310	3.639	328.88	8.779	125.93
130.00	1.1154	2.8809	3.996	374.52	9.477	145.01
135.00	1.2290	3.1381	4.367	423.55	10.174	165.91
140.00	1.3478	3.4019	4.750	476.26	10.870	188.70
145.00	1.4719	3.6714	5.143	532.35	11.564	213.43
150.00	1.6010	3.9460	5.547	591.90	12.255	240.15
155.00	1.7349	4.2251	5.960	654.89	12.941	268.91
160.00	1.8735	4.5081	6.382	721.30	13.621	299.76
165.00	2.0166	4.7945	6.811	791.09	14.291	332.74
170.00	2.1640	5.0835	7.248	864.20	14.952	367.88
175.00	2.3156	5.3748	7.690	940.58	15.601	405.23
180.00	2.4711	5.6677	8.139	1020.2	16.237	444.80
185.00	2.6304	5.9618	8.592	1102.9	16.862	486.62
190.00	2.7933	6.2567	9.050	1188.8	17.473	530.73
195.00	2.9596	6.5521	9.512	1277.7	18.073	577.13
200.00	3.1292	6.8474	9.977	1369.5	18.659	625.85
205.00	3.3020	7.1425	10.444	1464.2	19.233	676.90
210.00	3.4776	7.4371	10.915	1561.8	19.794	730.30
215.00	3.6561	7.7309	11.387	1662.1	20.343	786.05
220.00	3.8371	8.0237	11.861	1765.2	20.879	844.17
225.00	4.0207	8.3152	12.336	1870.9	21.403	904.66
230.00	4.2067	8.6053	12.812	1979.2	21.914	967.53
235.00	4.3948	8.8937	13.289	2090.0	22.412	1032.8
240.00	4.5851	9.1805	13.766	2203.3	22.899	1100.4
245.00	4.7773	9.4653	14.243	2319.0	23.374	1170.4
250.00	4.9714	9.7481	14.720	2437.0	23.837	1242.8
255.00	5.1672	10.029	15.196	2557.4	24.290	1317.6
260.00	5.3646	10.307	15.672	2679.9	24.731	1394.8
265.00	5.5636	10.584	16.147	2804.6	25.162	1474.4
270.00	5.7640	10.857	16.621	2931.5	25.583	1556.3
273.15	5.8909	11.029	16.920	3012.5	25.843	1609.1
275.00	5.9657	11.129	17.095	3060.5	25.994	1640.6
280.00	6.1686	11.398	17.567	3191.4	26.395	1727.2
285.00	6.3727	11.665	18.037	3324.4	26.787	1816.2
290.00	6.5779	11.929	18.506	3459.3	27.169	1907.6
295.00	6.7840	12.190	18.974	3596.1	27.542	2001.3
298.15	6.9144	12.353	19.268	3683.2	27.772	2061.5
300.00	6.9911	12.449	19.440	3734.7	27.905	2097.3

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-20 (CONT.)

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM ALUMINATE ($MG\ O \cdot AL_2O_3$)
SOLID PHASE

GRAM MOLECULAR WT.=142.280 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
300.00	6.9911	12.449	19.440	3734.7	27.905	2097.3
310.00	7.4076	12.959	20.367	4017.3	28.606	2296.4
320.00	7.8270	13.458	21.285	4306.7	29.270	2504.6
330.00	8.2486	13.947	22.196	4602.6	29.899	2722.0
340.00	8.6721	14.425	23.097	4904.5	30.491	2948.5
350.00	9.0970	14.892	23.989	5212.3	31.044	3184.0
360.00	9.5230	15.348	24.871	5525.3	31.555	3428.3
370.00	9.9496	15.792	25.742	5843.2	32.025	3681.3
373.15	10.084	15.930	26.014	5944.3	32.165	3762.9
380.00	10.376	16.225	26.602	6165.7	32.460	3943.1
390.00	10.803	16.647	27.450	6492.3	32.866	4213.3
400.00	11.230	17.057	28.287	6822.9	33.247	4492.0
425.00	12.294	18.035	30.329	7665.1	34.105	5224.9
450.00	13.351	18.949	32.300	8527.2	34.850	6007.9
475.00	14.399	19.804	34.202	9406.8	35.505	6839.3
500.00	15.435	20.604	36.039	10302.0	36.088	7717.5
550.00	17.468	22.059	39.527	12132.0	37.087	9607.6
600.00	19.444	23.347	42.791	14008.0	37.923	11666.0
650.00	21.359	24.496	45.855	15923.0	38.645	13883.0
700.00	23.213	25.530	48.743	17871.0	39.284	16249.0
750.00	25.007	26.467	51.473	19850.0	39.861	18755.0
800.00	26.743	27.321	54.063	21856.0	40.392	21394.0
850.00	28.423	28.104	56.527	23889.0	40.886	24159.0
900.00	30.050	28.827	58.877	25945.0	41.353	27045.0
950.00	31.627	29.498	61.125	28023.0	41.796	30045.0
1000.00	33.156	30.124	63.280	30124.0	42.222	33156.0
1050.00	34.640	30.710	65.350	32245.0	42.633	36372.0
1100.00	36.081	31.261	67.342	34387.0	43.032	39689.0
1150.00	37.483	31.781	69.264	36548.0	43.420	43105.0
1200.00	38.846	32.274	71.120	38729.0	43.801	46615.0
1250.00	40.173	32.743	72.915	40928.0	44.174	50216.0
1300.00	41.466	33.189	74.655	43146.0	44.541	53905.0
1350.00	42.726	33.617	76.343	45382.0	44.903	57681.0
1400.00	43.956	34.026	77.982	47637.0	45.261	61539.0
1450.00	45.157	34.420	79.577	49908.0	45.615	65478.0
1500.00	46.331	34.799	81.129	52198.0	45.965	69496.0
1550.00	47.478	35.164	82.642	54505.0	46.313	73590.0
1600.00	48.600	35.518	84.118	56829.0	46.658	77759.0
1650.00	49.698	35.861	85.559	59171.0	47.001	82002.0
1700.00	50.773	36.194	86.967	61529.0	47.342	86315.0
1750.00	51.827	36.517	88.344	63905.0	47.681	90698.0
1800.00	52.860	36.832	89.692	66297.0	48.018	95149.0
1850.00	53.874	37.139	91.012	68707.0	48.354	99666.0
1900.00	54.868	37.438	92.306	71133.0	48.689	104250.0
1950.00	55.844	37.731	93.576	73577.0	49.023	108900.0
2000.00	56.803	38.017	94.821	76035.0	49.356	113610.0

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-21

THERMODYNAMIC FUNCTIONS FOR LITHIUM (LI)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=6.940 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0001	0.0005	0.001	0.002	0.003	0.000
10.00	0.0015	0.0051	0.007	0.051	0.019	0.015
15.00	0.0052	0.0142	0.019	0.213	0.048	0.078
20.00	0.0110	0.0278	0.039	0.555	0.091	0.220
25.00	0.0191	0.0462	0.065	1.155	0.152	0.478
30.00	0.0296	0.0704	0.100	2.111	0.234	0.887
35.00	0.0426	0.1011	0.144	3.539	0.342	1.492
40.00	0.0585	0.1394	0.198	5.575	0.478	2.342
45.00	0.0776	0.1860	0.264	8.369	0.645	3.490
50.00	0.1000	0.2414	0.341	12.072	0.841	4.997
55.00	0.1259	0.3059	0.432	16.822	1.063	6.925
60.00	0.1556	0.3788	0.534	22.728	1.302	9.335
65.00	0.1890	0.4593	0.648	29.857	1.550	12.287
70.00	0.2262	0.5462	0.772	38.232	1.799	15.835
75.00	0.2670	0.6379	0.905	47.839	2.043	20.025
80.00	0.3112	0.7330	1.044	58.643	2.277	24.895
85.00	0.3586	0.8305	1.189	70.593	2.501	30.477
90.00	0.4088	0.9293	1.338	83.635	2.714	36.793
95.00	0.4617	1.0285	1.490	97.710	2.915	43.863
100.00	0.5170	1.1276	1.645	112.76	3.104	51.699
105.00	0.5744	1.2260	1.800	128.73	3.281	60.311
110.00	0.6337	1.3232	1.957	145.55	3.447	69.704
115.00	0.6946	1.4189	2.114	163.18	3.601	79.881
120.00	0.7570	1.5129	2.270	181.55	3.745	90.839
125.00	0.8206	1.6049	2.426	200.61	3.879	102.58
130.00	0.8853	1.6948	2.580	220.32	4.003	115.09
135.00	0.9509	1.7824	2.733	240.63	4.120	128.38
140.00	1.0173	1.8679	2.885	261.50	4.229	142.42
145.00	1.0843	1.9511	3.035	282.91	4.332	157.23
150.00	1.1518	2.0321	3.184	304.81	4.429	172.78
155.00	1.2198	2.1109	3.331	327.19	4.521	189.06
160.00	1.2880	2.1876	3.476	350.01	4.608	206.08
165.00	1.3565	2.2622	3.619	373.26	4.691	223.82
170.00	1.4251	2.3348	3.760	396.92	4.770	242.26
175.00	1.4938	2.4054	3.899	420.95	4.844	261.41
180.00	1.5625	2.4742	4.037	445.35	4.914	281.25
185.00	1.6312	2.5410	4.172	470.08	4.980	301.77
190.00	1.6998	2.6060	4.306	495.14	5.042	322.97
195.00	1.7684	2.6692	4.438	520.49	5.100	344.83
200.00	1.8367	2.7307	4.567	546.14	5.156	367.34
205.00	1.9049	2.7905	4.695	572.05	5.208	390.50
210.00	1.9728	2.8486	4.821	598.21	5.258	414.29
215.00	2.0405	2.9052	4.946	624.62	5.305	438.71
220.00	2.1079	2.9602	5.068	651.25	5.349	463.75
225.00	2.1751	3.0138	5.189	678.11	5.392	489.39
230.00	2.2419	3.0660	5.308	705.17	5.433	515.63
235.00	2.3084	3.1167	5.425	732.43	5.472	542.47
240.00	2.3745	3.1662	5.541	759.89	5.509	569.88
245.00	2.4403	3.2144	5.655	787.52	5.546	597.87
250.00	2.5057	3.2614	5.767	815.34	5.581	626.43
255.00	2.5707	3.3072	5.878	843.33	5.615	655.54
260.00	2.6354	3.3519	5.987	871.49	5.648	685.20
265.00	2.6997	3.3955	6.095	899.81	5.681	715.41
270.00	2.7635	3.4381	6.202	928.29	5.713	746.15
273.15	2.8036	3.4645	6.268	946.32	5.733	765.79
275.00	2.8270	3.4798	6.307	956.94	5.745	777.42
280.00	2.8901	3.5205	6.411	985.74	5.777	809.22
285.00	2.9527	3.5604	6.513	1014.7	5.807	841.53
290.00	3.0150	3.5994	6.614	1043.8	5.837	874.35
295.00	3.0768	3.6375	6.714	1073.1	5.866	907.67
298.15	3.1156	3.6612	6.777	1091.6	5.884	928.92
300.00	3.1383	3.6749	6.813	1102.5	5.894	941.49

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-21 (CONT.)

THERMODYNAMIC FUNCTIONS FOR LITHIUM (LI)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=6.940 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG-MOLE	$(H_T-H_0)/T$ CAL/DEG-MOLE	(S_T-S_0) CAL/DEG-MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG-MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	3.1383	3.6749	6.813	1102.5	5.894	941.49
310.00	3.2600	3.7473	7.007	1161.7	5.946	1010.6
320.00	3.3801	3.8169	7.197	1221.4	6.000	1081.6
330.00	3.4985	3.8839	7.383	1281.7	6.059	1154.5
340.00	3.6155	3.9489	7.564	1342.6	6.125	1229.3
350.00	3.7308	4.0121	7.743	1404.2	6.197	1305.8
360.00	3.8447	4.0738	7.919	1466.6	6.273	1384.1
370.00	3.9572	4.1343	8.091	1529.7	6.351	1464.2
373.15	3.9923	4.1531	8.145	1549.7	6.377	1489.7
380.00	4.0682	4.1937	8.262	1593.6	6.433	1545.9
390.00	4.1779	4.2522	8.430	1658.3	6.516	1629.4
400.00	4.286	4.310	8.596	1723.9	6.599	1714.4
425.00	4.551	4.451	9.002	1891.5	6.805	1934.4
450.00	4.810	4.587	9.396	2064.0	6.996	2164.4
453.70	4.848	4.606	9.454	2090.0	7.022	2199.4
			(LIQUID)			
453.70	4.848	6.187	11.035	2807.0	7.350	2199.4
475.00	5.133	6.237	11.370	2962.8	7.280	2438.1
500.00	5.454	6.288	11.742	3143.9	7.212	2727.0
550.00	6.057	6.367	12.424	3501.8	7.109	3331.5
600.00	6.614	6.426	13.039	3855.4	7.038	3968.3
650.00	7.130	6.471	13.601	4205.9	6.989	4634.5
700.00	7.611	6.506	14.117	4554.5	6.954	5327.6
750.00	8.061	6.535	14.596	4901.6	6.931	6045.6
800.00	8.483	6.560	15.043	5247.7	6.915	6786.7
850.00	8.882	6.580	15.462	5593.2	6.904	7549.5
900.00	9.258	6.598	15.856	5938.2	6.897	8332.5
950.00	9.616	6.614	16.229	6282.9	6.892	9134.7
1000.00	9.955	6.627	16.583	6627.4	6.889	9955.1
1050.00	10.279	6.640	16.919	6971.8	6.886	10792.7
1100.00	10.588	6.651	17.239	7316.1	6.884	11646.7
1150.00	10.884	6.661	17.545	7660.2	6.881	12516.4
1200.00	11.167	6.670	17.838	8004.2	6.878	13401.0

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-22

THERMODYNAMIC FUNCTIONS FOR LITHIUM OXIDE (LI_2O)
SOLID PHASE

GRAM MOLECULAR WT.=29.880 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0001	0.000	0.001	0.000	0.000
10.00	0.0003	0.0006	0.001	0.006	0.002	0.003
15.00	0.0006	0.0015	0.002	0.022	0.005	0.010
20.00	0.0013	0.0032	0.004	0.063	0.012	0.025
25.00	0.0023	0.0061	0.008	0.152	0.025	0.057
30.00	0.0038	0.0110	0.015	0.330	0.048	0.113
35.00	0.0060	0.0187	0.025	0.654	0.084	0.210
40.00	0.0092	0.0301	0.039	1.204	0.139	0.368
45.00	0.0136	0.0461	0.060	2.074	0.213	0.613
50.00	0.0195	0.0674	0.087	3.371	0.309	0.976
55.00	0.0272	0.0947	0.122	5.206	0.428	1.495
60.00	0.0368	0.1282	0.165	7.691	0.569	2.208
65.00	0.0486	0.1683	0.217	10.937	0.733	3.159
70.00	0.0628	0.2151	0.278	15.055	0.919	4.392
75.00	0.0794	0.2688	0.348	20.161	1.128	5.953
80.00	0.0986	0.3296	0.428	26.370	1.360	7.890
85.00	0.1206	0.3976	0.518	33.797	1.615	10.252
90.00	0.1454	0.4728	0.618	42.551	1.890	13.089
95.00	0.1732	0.5550	0.728	52.728	2.183	16.451
100.00	0.2039	0.6441	0.848	64.410	2.491	20.387
105.00	0.2376	0.7396	0.977	77.659	2.810	24.946
110.00	0.2743	0.8412	1.116	92.528	3.138	30.174
115.00	0.3141	0.9483	1.262	109.05	3.473	36.116
120.00	0.3568	1.0605	1.417	127.26	3.812	42.811
125.00	0.4024	1.1774	1.580	147.18	4.154	50.301
130.00	0.4509	1.2985	1.749	168.80	4.497	58.621
135.00	0.5023	1.4233	1.926	192.15	4.841	67.806
140.00	0.5563	1.5515	2.108	217.21	5.183	77.887
145.00	0.6131	1.6826	2.296	243.97	5.522	88.894
150.00	0.6724	1.8162	2.489	272.42	5.858	100.85
155.00	0.7341	1.9519	2.686	302.54	6.189	113.79
160.00	0.7982	2.0894	2.888	334.31	6.515	127.72
165.00	0.8647	2.2284	3.093	367.68	6.835	142.67
170.00	0.9333	2.3685	3.302	402.65	7.149	158.66
175.00	1.0040	2.5095	3.513	439.16	7.455	175.69
180.00	1.0766	2.6510	3.728	477.18	7.753	193.79
185.00	1.1512	2.7929	3.944	516.68	8.045	212.97
190.00	1.2276	2.9348	4.162	557.62	8.329	233.24
195.00	1.3056	3.0767	4.382	599.96	8.607	254.60
200.00	1.3853	3.2184	4.604	643.67	8.878	277.06
205.00	1.4665	3.3596	4.826	688.72	9.143	300.64
210.00	1.5492	3.5004	5.050	735.09	9.400	325.33
215.00	1.6332	3.6405	5.274	782.72	9.651	351.13
220.00	1.7185	3.7799	5.498	831.58	9.895	378.06
225.00	1.8050	3.9185	5.723	881.65	10.132	406.12
230.00	1.8926	4.0560	5.949	932.89	10.362	435.30
235.00	1.9813	4.1926	6.174	985.26	10.586	465.61
240.00	2.0710	4.3281	6.399	1038.7	10.804	497.04
245.00	2.1616	4.4624	6.624	1093.3	11.015	529.60
250.00	2.2531	4.5955	6.849	1148.9	11.221	563.28
255.00	2.3454	4.7274	7.073	1205.5	11.421	598.08
260.00	2.4385	4.8580	7.297	1263.1	11.616	634.00
265.00	2.5322	4.9873	7.520	1321.6	11.807	671.05
270.00	2.6267	5.1153	7.742	1381.1	11.991	709.20
273.15	2.6865	5.1953	7.882	1419.1	12.105	733.81
275.00	2.7217	5.2420	7.964	1441.5	12.170	748.46
280.00	2.8173	5.3673	8.184	1502.8	12.344	788.83
285.00	2.9134	5.4912	8.404	1565.0	12.513	830.31
290.00	3.0099	5.6137	8.624	1628.0	12.677	872.88
295.00	3.1069	5.7347	8.842	1691.7	12.836	916.54
298.15	3.1682	5.8103	8.978	1732.3	12.934	944.61
300.00	3.2043	5.8544	9.059	1756.3	12.991	961.29

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-22 (CONT.)

THERMODYNAMIC FUNCTIONS FOR LITHIUM OXIDE (LI_2O)
SOLID PHASE

GRAM MOLECULAR WT.=29.880 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	3.2043	5.8544	9.059	1756.3	12.991	961.29
310.00	3.4001	6.0894	9.489	1887.7	13.286	1054.0
320.00	3.5971	6.3187	9.916	2022.0	13.564	1151.1
330.00	3.7950	6.5422	10.337	2158.9	13.826	1252.3
340.00	3.9935	6.7601	10.754	2298.4	14.072	1357.8
350.00	4.1925	6.9723	11.165	2440.3	14.304	1467.4
360.00	4.3919	7.1790	11.571	2584.5	14.521	1581.1
370.00	4.5913	7.3803	11.972	2730.7	14.726	1698.8
373.15	4.6542	7.4426	12.097	2777.2	14.788	1736.7
380.00	4.7908	7.5762	12.367	2878.9	14.919	1820.5
390.00	4.9900	7.7668	12.757	3029.1	15.101	1946.1
400.00	5.1890	7.9523	13.141	3180.9	15.272	2075.6
425.00	5.6845	8.3945	14.079	3567.7	15.660	2415.9
450.00	6.1762	8.8079	14.984	3963.6	16.005	2779.3
475.00	6.663	9.195	15.858	4367.8	16.329	3165.0
500.00	7.144	9.560	16.704	4779.8	16.627	3572.0
550.00	8.087	10.227	18.314	5624.9	17.166	4447.9
600.00	9.003	10.826	19.829	6495.4	17.648	5401.9
650.00	9.891	11.368	21.259	7389.0	18.091	6429.4
700.00	10.752	11.863	22.615	8304.1	18.505	7526.5
750.00	11.586	12.319	23.905	9239.2	18.898	8689.8
800.00	12.395	12.742	25.137	10193.6	19.275	9916.1
850.00	13.180	13.137	26.317	11166.5	19.639	11202.6
900.00	13.941	13.508	27.449	12157.4	19.994	12547.0
950.00	14.681	13.859	28.540	13165.7	20.340	13946.9
1000.00	15.400	14.191	29.592	14191.3	20.681	15400.3
1050.00	16.100	14.508	30.609	15233.8	21.016	16905.4
1100.00	16.782	14.812	31.594	16292.9	21.348	18460.6
1150.00	17.447	15.103	32.550	17368.5	21.675	20064.4
1200.00	18.096	15.384	33.480	18460.4	22.000	21715.2
1250.00	18.730	15.655	34.384	19568.4	22.323	23411.9
1300.00	19.349	15.917	35.266	20692.6	22.643	25153.3
1350.00	19.954	16.172	36.127	21832.7	22.962	26938.2
1400.00	20.547	16.421	36.967	22988.7	23.279	28765.6
1450.00	21.127	16.662	37.790	24160.6	23.594	30634.6
1500.00	21.696	16.899	38.595	25348.1	23.909	32544.3
1550.00	22.254	17.130	39.384	26551.4	24.222	34493.8
1600.00	22.802	17.356	40.158	27770.3	24.535	36482.4
1650.00	23.339	17.579	40.918	29004.9	24.847	38509.4
1700.00	23.867	17.797	41.664	30255.0	25.158	40574.0
1750.00	24.386	18.012	42.398	31520.7	25.469	42675.6
1800.00	24.896	18.223	43.120	32801.9	25.779	44813.6
1850.00	25.399	18.432	43.830	34098.6	26.088	46987.4
1900.00	25.893	18.637	44.530	35410.7	26.397	49196.4
1950.00	26.380	18.840	45.220	36738.3	26.706	51440.2
2000.00	26.859	19.041	45.900	38081.3	27.014	53718.2

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-23

THERMODYNAMIC FUNCTIONS FOR LITHIUM HYDROXIDE (LI O H)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=23.948 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0001	0.0004	0.000	0.002	0.002	0.000
10.00	0.0017	0.0063	0.008	0.063	0.027	0.017
15.00	0.0067	0.0210	0.028	0.314	0.079	0.101
20.00	0.0158	0.0449	0.061	0.898	0.160	0.316
25.00	0.0293	0.0789	0.108	1.972	0.274	0.732
30.00	0.0474	0.1231	0.171	3.694	0.419	1.422
35.00	0.0703	0.1773	0.248	6.206	0.589	2.461
40.00	0.0980	0.2404	0.338	9.617	0.777	3.921
45.00	0.1304	0.3110	0.441	13.996	0.976	5.866
50.00	0.1670	0.3877	0.555	19.383	1.180	8.352
55.00	0.2078	0.4691	0.677	25.801	1.388	11.428
60.00	0.2522	0.5544	0.807	33.264	1.598	15.134
65.00	0.3001	0.6429	0.943	41.786	1.812	19.505
70.00	0.3510	0.7341	1.085	51.387	2.029	24.573
75.00	0.4049	0.8279	1.233	62.091	2.253	30.365
80.00	0.4614	0.9241	1.386	73.931	2.484	36.909
85.00	0.5203	1.0229	1.543	86.949	2.724	44.229
90.00	0.5817	1.1243	1.706	101.19	2.973	52.350
95.00	0.6452	1.2283	1.874	116.69	3.230	61.297
100.00	0.7109	1.3350	2.046	133.50	3.495	71.093
105.00	0.7787	1.4443	2.223	151.65	3.767	81.764
110.00	0.8485	1.5561	2.405	171.18	4.043	93.331
115.00	0.9202	1.6703	2.591	192.09	4.323	105.82
120.00	0.9937	1.7867	2.780	214.40	4.604	119.24
125.00	1.0690	1.9050	2.974	238.13	4.885	133.63
130.00	1.1461	2.0250	3.171	263.25	5.166	148.99
135.00	1.2248	2.1465	3.371	289.78	5.444	165.34
140.00	1.3050	2.2692	3.574	317.69	5.720	182.71
145.00	1.3868	2.3929	3.780	346.97	5.992	201.09
150.00	1.4700	2.5173	3.987	377.60	6.259	220.51
155.00	1.5546	2.6423	4.197	409.55	6.522	240.97
160.00	1.6405	2.7676	4.408	442.81	6.780	262.48
165.00	1.7276	2.8930	4.621	477.35	7.033	285.05
170.00	1.8158	3.0184	4.834	513.13	7.280	308.69
175.00	1.9051	3.1436	5.049	550.13	7.521	333.39
180.00	1.9954	3.2685	5.264	588.33	7.756	359.17
185.00	2.0867	3.3929	5.480	627.69	7.986	386.03
190.00	2.1788	3.5167	5.696	668.18	8.210	413.97
195.00	2.2717	3.6399	5.912	709.78	8.428	442.99
200.00	2.3654	3.7623	6.128	752.45	8.641	473.09
205.00	2.4598	3.8838	6.344	796.18	8.848	504.27
210.00	2.5549	4.0044	6.559	840.92	9.049	536.52
215.00	2.6505	4.1240	6.775	886.66	9.245	569.86
220.00	2.7467	4.2426	6.989	933.37	9.436	604.27
225.00	2.8433	4.3601	7.203	981.02	9.622	639.75
230.00	2.9404	4.4764	7.417	1029.6	9.803	676.30
235.00	3.0379	4.5917	7.630	1079.0	9.980	713.92
240.00	3.1358	4.7057	7.842	1129.4	10.152	752.59
245.00	3.2340	4.8186	8.053	1180.6	10.319	792.33
250.00	3.3325	4.9302	8.263	1232.6	10.482	833.12
255.00	3.4312	5.0407	8.472	1285.4	10.642	874.96
260.00	3.5301	5.1499	8.680	1339.0	10.797	917.84
265.00	3.6293	5.2579	8.887	1393.3	10.949	961.75
270.00	3.7285	5.3646	9.093	1448.4	11.097	1006.7
273.15	3.7911	5.4313	9.222	1483.5	11.188	1035.6
275.00	3.8279	5.4702	9.298	1504.3	11.241	1052.7
280.00	3.9274	5.5745	9.502	1560.9	11.383	1099.7
285.00	4.0270	5.6776	9.705	1618.1	11.520	1147.7
290.00	4.1267	5.7795	9.906	1676.1	11.655	1196.7
295.00	4.2263	5.8802	10.107	1734.7	11.787	1246.8
298.15	4.2891	5.9431	10.232	1771.9	11.868	1278.6
300.00	4.3260	5.9797	10.306	1793.9	11.916	1297.8

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-23 (CONT.)

THERMODYNAMIC FUNCTIONS FOR LITHIUM HYDROXIDE (LI O H)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=23.948 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T-H_0)/T$	$(H_T-H_0)/T$	(S_T-S_0)	(H_T-H_0)	C_P	$-(F_T-H_0)$
DEG K	CAL/DEG MOLE	CAL/DEG MOLE	CAL/DEG MOLE	CAL/MOLE	CAL/DEG MOLE	CAL/MOLE
			(SOLID)			
300.00	4.3260	5.9797	10.306	1793.9	11.916	1297.8
310.00	4.5252	6.1753	10.701	1914.3	12.164	1402.8
320.00	4.7243	6.3661	11.090	2037.2	12.401	1511.8
330.00	4.9231	6.5525	11.476	2162.3	12.628	1624.6
340.00	5.1214	6.7343	11.856	2289.7	12.837	1741.3
350.00	5.3192	6.9114	12.231	2419.0	13.026	1861.7
360.00	5.5163	7.0837	12.600	2550.1	13.203	1985.9
370.00	5.7127	7.2515	12.964	2683.1	13.379	2113.7
373.15	5.7744	7.3034	13.078	2725.3	13.433	2154.7
380.00	5.9083	7.4150	13.323	2817.7	13.548	2245.1
390.00	6.1029	7.5743	13.677	2954.0	13.710	2380.1
400.00	6.2967	7.7297	14.026	3091.9	13.867	2518.7
425.00	6.7766	8.1017	14.878	3443.2	14.236	2880.0
450.00	7.2497	8.4522	15.702	3803.5	14.580	3262.3
475.00	7.715	8.783	16.499	4172.1	14.900	3664.8
500.00	8.174	9.097	17.271	4548.4	15.204	4087.0
550.00	9.069	9.678	18.747	5323.0	15.773	4987.8
600.00	9.934	10.208	20.142	6125.1	16.304	5960.3
650.00	10.771	10.697	21.467	6953.0	16.809	7000.8
700.00	11.580	11.151	22.731	7805.7	17.295	8106.0
744.30	12.276	11.529	23.805	8581.1	17.713	9137.0
			(LIQUID)			
744.30	12.276	18.235	30.511	13572.1	20.740	9137.0
750.00	12.415	18.254	30.669	13690.3	20.740	9311.4
800.00	13.598	18.409	32.007	14727.3	20.740	10878.6
850.00	14.719	18.546	33.265	15764.3	20.740	12510.7
900.00	15.782	18.668	34.450	16801.3	20.740	14203.9
950.00	16.794	18.777	35.572	17838.3	20.740	15954.7
1000.00	17.760	18.875	36.635	18875.3	20.740	17760.1
1050.00	18.683	18.964	37.647	19912.3	20.740	19617.4
1100.00	19.567	19.045	38.612	20949.3	20.740	21524.0
1150.00	20.416	19.119	39.534	21986.3	20.740	23477.9
1200.00	21.231	19.186	40.417	23023.3	20.740	25476.8
1250.00	22.015	19.248	41.263	24060.3	20.740	27518.9
1300.00	22.771	19.306	42.077	25097.3	20.740	29602.6
1350.00	23.501	19.359	42.860	26134.3	20.740	31726.1
1400.00	24.206	19.408	43.614	27171.3	20.740	33888.1
1450.00	24.888	19.454	44.342	28208.3	20.740	36087.1
1500.00	25.548	19.497	45.045	29245.3	20.740	38321.8
1550.00	26.188	19.537	45.725	30282.3	20.740	40591.1
1600.00	26.809	19.575	46.383	31319.3	20.740	42893.9
1650.00	27.412	19.610	47.021	32356.3	20.740	45229.1
1700.00	27.998	19.643	47.641	33393.3	20.740	47595.8
1750.00	28.567	19.674	48.242	34430.3	20.740	49992.9
1800.00	29.122	19.704	48.826	35467.3	20.740	52419.7
1850.00	29.662	19.732	49.394	36504.3	20.740	54875.2
1900.00	30.189	19.759	49.947	37541.3	20.740	57358.8
1950.00	30.702	19.784	50.486	38578.3	20.740	59869.7
2000.00	31.204	19.808	51.011	39615.3	20.740	62407.2

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-24

THERMODYNAMIC FUNCTIONS FOR LITHIUM HYDROXIDE MONOHYDRATE (LI O H.H_2O)
SOLID PHASE

GRAM MOLECULAR WT.=41.964 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0000	0.000	0.000	0.000	0.000
10.00	0.0005	0.0024	0.003	0.024	0.013	0.005
15.00	0.0030	0.0126	0.016	0.188	0.060	0.045
20.00	0.0094	0.0352	0.045	0.704	0.156	0.188
25.00	0.0211	0.0746	0.096	1.864	0.320	0.528
30.00	0.0396	0.1342	0.174	4.025	0.557	1.189
35.00	0.0661	0.2159	0.282	7.556	0.866	2.315
40.00	0.1015	0.3197	0.421	12.790	1.236	4.059
45.00	0.1461	0.4441	0.590	19.982	1.647	6.576
50.00	0.2001	0.5861	0.786	29.304	2.085	10.006
55.00	0.2632	0.7428	1.006	40.853	2.536	14.477
60.00	0.3350	0.9112	1.246	54.673	2.992	20.100
65.00	0.4149	1.0889	1.504	70.775	3.448	26.969
70.00	0.5023	1.2736	1.776	89.153	3.902	35.162
75.00	0.5967	1.4639	2.061	109.79	4.353	44.749
80.00	0.6973	1.6584	2.356	132.67	4.799	55.785
85.00	0.8038	1.8562	2.660	157.78	5.242	68.321
90.00	0.9155	2.0565	2.972	185.08	5.680	82.398
95.00	1.0321	2.2585	3.291	214.56	6.112	98.052
100.00	1.1531	2.4619	3.615	246.19	6.537	115.31
105.00	1.2782	2.6659	3.944	279.92	6.957	134.21
110.00	1.4069	2.8704	4.277	315.74	7.370	154.76
115.00	1.5390	3.0749	4.614	353.61	7.777	176.99
120.00	1.6742	3.2792	4.953	393.50	8.178	200.91
125.00	1.8122	3.4831	5.295	435.38	8.575	226.53
130.00	1.9528	3.6864	5.639	479.24	8.966	253.86
135.00	2.0957	3.8891	5.985	525.03	9.351	282.92
140.00	2.2408	4.0910	6.332	572.74	9.729	313.71
145.00	2.3879	4.2918	6.680	622.31	10.101	346.24
150.00	2.5367	4.4915	7.028	673.73	10.466	380.51
155.00	2.6873	4.6901	7.377	726.96	10.825	416.52
160.00	2.8393	4.8873	7.727	781.97	11.177	454.28
165.00	2.9927	5.0831	8.076	838.72	11.523	493.79
170.00	3.1473	5.2775	8.425	897.18	11.862	535.04
175.00	3.3031	5.4705	8.773	957.33	12.196	578.04
180.00	3.4599	5.6618	9.122	1019.1	12.523	622.78
185.00	3.6176	5.8517	9.469	1082.6	12.845	669.25
190.00	3.7761	6.0399	9.816	1147.6	13.161	717.47
195.00	3.9355	6.2265	10.162	1214.2	13.472	767.41
200.00	4.0954	6.4114	10.507	1282.3	13.777	819.09
205.00	4.2560	6.5948	10.851	1351.9	14.077	872.48
210.00	4.4171	6.7764	11.194	1423.1	14.373	927.59
215.00	4.5787	6.9565	11.535	1495.6	14.663	984.41
220.00	4.7406	7.1349	11.876	1569.7	14.949	1042.9
225.00	4.9030	7.3117	12.215	1645.1	15.231	1103.2
230.00	5.0656	7.4868	12.552	1722.0	15.508	1165.1
235.00	5.2285	7.6604	12.889	1800.2	15.781	1228.7
240.00	5.3915	7.8324	13.224	1879.8	16.051	1294.0
245.00	5.5548	8.0029	13.558	1960.7	16.317	1360.9
250.00	5.7182	8.1718	13.890	2042.9	16.580	1429.5
255.00	5.8817	8.3392	14.221	2126.5	16.841	1499.8
260.00	6.0452	8.5052	14.550	2211.3	17.098	1571.8
265.00	6.2088	8.6697	14.879	2297.5	17.354	1645.3
270.00	6.3724	8.8329	15.205	2384.9	17.607	1720.5
273.15	6.4754	8.9350	15.410	2440.6	17.766	1768.8
275.00	6.5359	8.9947	15.531	2473.5	17.859	1797.4
280.00	6.6994	9.1553	15.855	2563.5	18.110	1875.8
285.00	6.8629	9.3145	16.177	2654.6	18.360	1955.9
290.00	7.0262	9.4726	16.499	2747.1	18.609	2037.6
295.00	7.1895	9.6296	16.819	2840.7	18.858	2120.9
298.15	7.2923	9.7279	17.020	2900.4	19.016	2174.2
300.00	7.3527	9.7855	17.138	2935.7	19.108	2205.8

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-25

THERMODYNAMIC FUNCTIONS FOR LITHIUM FLUORIDE (LI F)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.25.940 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0001	0.000	0.000	0.000	0.000
10.00	0.0002	0.0006	0.001	0.006	0.003	0.002
15.00	0.0007	0.0021	0.003	0.031	0.008	0.010
20.00	0.0016	0.0048	0.006	0.096	0.019	0.032
25.00	0.0031	0.0095	0.013	0.238	0.040	0.078
30.00	0.0055	0.0171	0.023	0.514	0.074	0.165
35.00	0.0090	0.0288	0.038	1.007	0.127	0.313
40.00	0.0138	0.0456	0.059	1.825	0.205	0.553
45.00	0.0205	0.0690	0.089	3.104	0.312	0.922
50.00	0.0293	0.0999	0.129	4.996	0.451	1.464
55.00	0.0406	0.1394	0.180	7.665	0.622	2.232
60.00	0.0547	0.1879	0.243	11.271	0.825	3.283
65.00	0.0720	0.2456	0.318	15.964	1.056	4.678
70.00	0.0926	0.3125	0.405	21.873	1.311	6.479
75.00	0.1166	0.3880	0.505	29.100	1.583	8.748
80.00	0.1443	0.4715	0.616	37.723	1.868	11.545
85.00	0.1756	0.5623	0.738	47.793	2.161	14.925
90.00	0.2104	0.6594	0.870	59.343	2.460	18.940
95.00	0.2488	0.7620	1.011	72.392	2.760	23.638
100.00	0.2906	0.8695	1.160	86.948	3.062	29.062
105.00	0.3357	0.9811	1.317	103.01	3.364	35.251
110.00	0.3840	1.0962	1.480	120.58	3.665	42.241
115.00	0.4353	1.2144	1.650	139.65	3.964	50.064
120.00	0.4896	1.3351	1.825	160.22	4.260	58.748
125.00	0.5466	1.4580	2.005	182.25	4.553	68.319
130.00	0.6062	1.5826	2.189	205.74	4.840	78.800
135.00	0.6682	1.7084	2.377	230.64	5.120	90.212
140.00	0.7327	1.8351	2.568	256.92	5.390	102.57
145.00	0.7993	1.9622	2.762	284.52	5.649	115.89
150.00	0.8679	2.0892	2.957	313.38	5.896	130.19
155.00	0.9385	2.2159	3.154	343.46	6.132	145.47
160.00	1.0108	2.3418	3.353	374.69	6.357	161.74
165.00	1.0848	2.4667	3.552	407.01	6.572	179.00
170.00	1.1603	2.5905	3.751	440.39	6.777	197.25
175.00	1.2372	2.7129	3.950	474.76	6.973	216.50
180.00	1.3153	2.8339	4.149	510.10	7.162	236.75
185.00	1.3946	2.9533	4.348	546.37	7.342	258.00
190.00	1.4749	3.0711	4.546	583.51	7.515	280.23
195.00	1.5562	3.1872	4.743	621.50	7.680	303.45
200.00	1.6383	3.3015	4.940	660.30	7.838	327.66
205.00	1.7212	3.4140	5.135	699.87	7.990	352.85
210.00	1.8048	3.5247	5.330	740.19	8.135	379.01
215.00	1.8890	3.6335	5.523	781.21	8.274	406.14
220.00	1.9738	3.7405	5.714	822.92	8.408	434.24
225.00	2.0590	3.8457	5.905	865.28	8.536	463.29
230.00	2.1447	3.9490	6.094	908.27	8.659	493.28
235.00	2.2307	4.0505	6.281	951.87	8.778	524.22
240.00	2.3170	4.1502	6.467	996.04	8.892	556.09
245.00	2.4036	4.2481	6.652	1040.8	9.001	588.89
250.00	2.4904	4.3442	6.835	1086.1	9.108	622.61
255.00	2.5774	4.4386	7.016	1131.8	9.211	657.23
260.00	2.6645	4.5314	7.196	1178.2	9.311	692.76
265.00	2.7517	4.6225	7.374	1225.0	9.408	729.19
270.00	2.8389	4.7120	7.551	1272.2	9.503	766.50
273.15	2.8939	4.7676	7.661	1302.3	9.561	790.46
275.00	2.9262	4.7999	7.726	1320.0	9.594	804.70
280.00	3.0134	4.8863	7.900	1368.2	9.683	843.76
285.00	3.1007	4.9713	8.072	1416.8	9.769	883.69
290.00	3.1879	5.0547	8.242	1465.9	9.851	924.48
295.00	3.2750	5.1366	8.412	1515.3	9.930	966.11
298.15	3.3298	5.1875	8.517	1546.7	9.978	992.78
300.00	3.3620	5.2172	8.579	1565.2	10.006	1008.6

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-25 (CONT.)

THERMODYNAMIC FUNCTIONS FOR LITHIUM FLUORIDE (LI F)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.25.940 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
300.00	3.3620	5.2172	8.579	1565.2	10.006	1008.6
310.00	3.5356	5.3741	8.910	1666.0	10.153	1096.0
320.00	3.7086	5.5256	9.234	1768.2	10.294	1186.8
330.00	3.8809	5.6722	9.553	1871.8	10.429	1280.7
340.00	4.0524	5.8140	9.866	1976.7	10.554	1377.8
350.00	4.2229	5.9510	10.174	2082.9	10.668	1478.0
360.00	4.3924	6.0835	10.476	2190.1	10.772	1581.3
370.00	4.5608	6.2116	10.772	2298.3	10.871	1687.5
373.15	4.6137	6.2511	10.865	2332.6	10.902	1721.6
380.00	4.7282	6.3355	11.064	2407.5	10.966	1796.7
390.00	4.8943	6.4554	11.350	2517.6	11.056	1908.8
400.00	5.0592	6.5715	11.631	2628.6	11.142	2023.7
425.00	5.466	6.846	12.312	2909.7	11.341	2323.0
450.00	5.864	7.101	12.965	3195.5	11.520	2639.0
475.00	6.255	7.338	13.593	3485.5	11.682	2971.0
500.00	6.637	7.559	14.196	3779.5	11.831	3318.4
550.00	7.377	7.960	15.336	4377.8	12.098	4057.1
600.00	8.085	8.315	16.399	4988.8	12.336	4850.7
650.00	8.763	8.633	17.395	5611.2	12.557	5695.9
700.00	9.413	8.921	18.334	6244.4	12.770	6589.3
750.00	10.038	9.184	19.222	6888.2	12.982	7528.4
800.00	10.639	9.428	20.067	7542.7	13.200	8510.8
850.00	11.217	9.657	20.874	8208.4	13.430	9534.5
900.00	11.775	9.873	21.649	8886.0	13.677	10597.7
950.00	12.315	10.081	22.395	9576.5	13.945	11698.9
1000.00	12.837	10.281	23.118	10281.0	14.239	12836.8
1050.00	13.343	10.477	23.820	11000.9	14.563	14010.3
1100.00	13.835	10.671	24.506	11737.9	14.922	15218.5
1121.00	14.038	10.752	24.790	12052.9	15.083	15736.1
			(LIQUID)			
1121.00	14.038	16.524	30.561	18522.9	15.310	15736.1
1150.00	14.459	16.493	30.952	18966.9	15.310	16628.1
1200.00	15.160	16.444	31.604	19732.4	15.310	18192.1
1250.00	15.830	16.398	32.229	20497.9	15.310	19788.0
1300.00	16.473	16.356	32.829	21263.4	15.310	21414.6
1350.00	17.089	16.318	33.407	22028.9	15.310	23070.6
1400.00	17.682	16.282	33.964	22794.4	15.310	24754.9
1450.00	18.253	16.248	34.501	23559.9	15.310	26466.6
1500.00	18.803	16.217	35.020	24325.4	15.310	28204.7
1550.00	19.334	16.188	35.522	25090.9	15.310	29968.3
1600.00	19.848	16.160	36.008	25856.4	15.310	31756.7
1650.00	20.345	16.134	36.479	26621.9	15.310	33568.9
1700.00	20.826	16.110	36.936	27387.4	15.310	35404.3
1750.00	21.293	16.087	37.380	28152.9	15.310	37262.3
1800.00	21.746	16.066	37.811	28918.4	15.310	39142.1
1850.00	22.186	16.045	38.231	29683.9	15.310	41043.3
1900.00	22.613	16.026	38.639	30449.4	15.310	42965.1
1950.00	23.029	16.008	39.037	31214.9	15.310	44907.0
2000.00	23.434	15.990	39.424	31980.4	15.310	46868.6
2050.00	23.829	15.974	39.803	32745.9	15.310	48849.3
2100.00	24.214	15.958	40.171	33511.4	15.310	50848.7
2150.00	24.589	15.943	40.532	34276.9	15.310	52866.3
2200.00	24.955	15.928	40.884	35042.4	15.310	54901.7
2250.00	25.313	15.915	41.228	35807.9	15.310	56954.5
2300.00	25.663	15.901	41.564	36573.4	15.310	59024.4
2350.00	26.005	15.889	41.894	37338.9	15.310	61110.8
2400.00	26.339	15.877	42.216	38104.4	15.310	63213.6
2450.00	26.666	15.865	42.532	38869.9	15.310	65332.3
2500.00	26.987	15.854	42.841	39635.4	15.310	67466.6

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-26

THERMODYNAMIC FUNCTIONS FOR LITHIUM CHLORIDE (LI CL)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=42.397 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL DEG MOLE	$(H_T-H_0)/T$ CAL DEG MOLE	(S_T-S_0) CAL DEG MOLE	(H_T-H_0) CAL MOLE	C_P CAL DEG MOLE	$-(F_T-H_0)$ CAL MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0001	0.0004	0.000	0.002	0.002	0.000
10.00	0.0014	0.0051	0.007	0.051	0.021	0.014
15.00	0.0055	0.0169	0.022	0.253	0.065	0.082
20.00	0.0129	0.0378	0.051	0.756	0.143	0.259
25.00	0.0246	0.0706	0.095	1.764	0.269	0.616
30.00	0.0414	0.1179	0.159	3.538	0.450	1.243
35.00	0.0642	0.1819	0.246	6.366	0.691	2.246
40.00	0.0936	0.2635	0.357	10.540	0.988	3.743
45.00	0.1302	0.3627	0.493	16.320	1.332	5.858
50.00	0.1742	0.4783	0.653	23.914	1.711	8.711
55.00	0.2258	0.6085	0.834	33.467	2.113	12.419
60.00	0.2848	0.7510	1.036	45.062	2.526	17.087
65.00	0.3509	0.9035	1.254	58.724	2.938	22.806
70.00	0.4236	1.0633	1.487	74.431	3.343	29.653
75.00	0.5026	1.2283	1.731	92.124	3.732	37.694
80.00	0.5872	1.3965	1.984	111.72	4.102	46.977
85.00	0.6770	1.5660	2.243	133.11	4.452	57.542
90.00	0.7713	1.7356	2.507	156.21	4.781	69.415
95.00	0.8696	1.9041	2.774	180.89	5.090	82.616
100.00	0.9716	2.0707	3.042	207.07	5.380	97.156
105.00	1.0766	2.2349	3.311	234.66	5.652	113.04
110.00	1.1843	2.3961	3.580	263.57	5.910	130.27
115.00	1.2943	2.5542	3.849	293.73	6.154	148.84
120.00	1.4063	2.7091	4.115	325.09	6.386	168.75
125.00	1.5199	2.8606	4.381	357.58	6.609	189.99
130.00	1.6350	3.0089	4.644	391.16	6.823	212.56
135.00	1.7513	3.1541	4.905	425.80	7.031	236.43
140.00	1.8686	3.2961	5.165	461.46	7.232	261.61
145.00	1.9867	3.4352	5.422	498.11	7.428	288.07
150.00	2.1055	3.5716	5.677	535.74	7.621	315.82
155.00	2.2248	3.7052	5.930	574.31	7.809	344.84
160.00	2.3445	3.8364	6.181	613.82	7.994	375.12
165.00	2.4645	3.9651	6.430	654.25	8.176	406.65
170.00	2.5848	4.0916	6.676	695.57	8.355	439.41
175.00	2.7052	4.2159	6.921	737.79	8.530	473.41
180.00	2.8257	4.3382	7.164	780.87	8.703	508.62
185.00	2.9462	4.4585	7.405	824.81	8.873	545.04
190.00	3.0666	4.5768	7.644	869.60	9.039	582.66
195.00	3.1870	4.6933	7.880	915.20	9.201	621.47
200.00	3.3073	4.8080	8.115	961.60	9.360	661.46
205.00	3.4274	4.9209	8.348	1008.8	9.514	702.62
210.00	3.5474	5.0321	8.579	1056.7	9.664	744.94
215.00	3.6670	5.1415	8.809	1105.4	9.810	788.41
220.00	3.7865	5.2492	9.036	1154.8	9.952	833.03
225.00	3.9056	5.3553	9.261	1204.9	10.090	878.77
230.00	4.0245	5.4597	9.484	1255.7	10.223	925.63
235.00	4.1430	5.5624	9.705	1307.2	10.353	973.61
240.00	4.2612	5.6635	9.925	1359.2	10.479	1022.7
245.00	4.3790	5.7630	10.142	1411.9	10.599	1072.8
250.00	4.4964	5.8609	10.357	1465.2	10.715	1124.1
255.00	4.6134	5.9572	10.571	1519.1	10.824	1176.4
260.00	4.7300	6.0518	10.782	1573.5	10.928	1229.8
265.00	4.8462	6.1447	10.991	1628.3	11.026	1284.2
270.00	4.9619	6.2360	11.198	1683.7	11.117	1339.7
273.15	5.0345	6.2926	11.327	1718.8	11.171	1375.2
275.00	5.0771	6.3255	11.403	1739.5	11.202	1396.2
280.00	5.1919	6.4133	11.605	1795.7	11.282	1453.7
285.00	5.3062	6.4994	11.806	1852.3	11.356	1512.3
290.00	5.4199	6.5837	12.004	1909.3	11.424	1571.8
295.00	5.5332	6.6663	12.199	1966.6	11.487	1632.3
298.15	5.6043	6.7174	12.322	2002.8	11.524	1670.9
300.00	5.6459	6.7471	12.393	2024.1	11.545	1693.8

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-26 (CONT.)

THERMODYNAMIC FUNCTIONS FOR LITHIUM CHLORIDE (LI CL)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=42.397 GRAMS 1 CAL=4.1840 ABS J
T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL / DEG MOLE	$(H_T-H_0)/T$ CAL / DEG MOLE	(S_T-S_0) CAL / DEG MOLE	(H_T-H_0) CAL / MOLE	C_P CAL / DEG MOLE	$-(F_T-H_0)$ CAL / MOLE
			(SOLID)			
300.00	5.6459	6.7471	12.393	2024.1	11.545	1693.8
310.00	5.8697	6.9036	12.773	2140.1	11.648	1819.6
320.00	6.0913	7.0532	13.144	2257.0	11.733	1949.2
330.00	6.3105	7.1962	13.507	2374.7	11.805	2082.5
340.00	6.5274	7.3326	13.860	2493.1	11.867	2219.3
350.00	6.7418	7.4630	14.205	2612.0	11.922	2359.6
360.00	6.9538	7.5876	14.541	2731.5	11.977	2503.4
370.00	7.1634	7.7070	14.870	2851.6	12.033	2650.4
373.15	7.2289	7.7436	14.972	2889.5	12.052	2697.4
380.00	7.3704	7.8216	15.192	2972.2	12.092	2800.8
390.00	7.5750	7.9319	15.507	3093.4	12.153	2954.3
400.00	7.7772	8.0382	15.815	3215.3	12.212	3110.9
425.00	8.272	8.288	16.560	3522.5	12.358	3515.7
450.00	8.753	8.518	17.271	3833.2	12.501	3938.6
475.00	9.219	8.732	17.950	4147.5	12.640	4379.0
500.00	9.672	8.930	18.602	4465.2	12.777	4835.9
550.00	10.540	9.292	19.833	5110.8	13.045	5797.2
600.00	11.363	9.616	20.979	5769.5	13.306	6817.8
650.00	12.144	9.910	22.054	6441.3	13.562	7893.9
700.00	12.889	10.180	23.068	7125.7	13.815	9022.2
750.00	13.600	10.430	24.030	7822.7	14.064	10199.9
800.00	14.281	10.665	24.946	8532.1	14.311	11424.4
850.00	14.934	10.887	25.821	9253.8	14.556	12693.8
880.00	15.314	11.014	26.328	9692.7	14.702	13476.1
			(LIQUID)			
880.00	15.314	16.372	31.686	14407.7	15.731	13476.1
900.00	15.682	16.358	32.039	14722.0	15.701	14113.4
950.00	16.565	16.321	32.886	15505.1	15.625	15736.7
1000.00	17.401	16.285	33.686	16284.5	15.549	17401.2
1050.00	18.195	16.248	34.443	17060.1	15.473	19104.6
1100.00	18.950	16.211	35.161	17831.8	15.397	20844.8
1150.00	19.670	16.174	35.843	18599.8	15.321	22620.0
1200.00	20.357	16.137	36.494	19363.9	15.245	24428.6
1250.00	21.015	16.099	37.115	20124.3	15.169	26268.9
1300.00	21.646	16.062	37.708	20880.8	15.093	28139.6
1350.00	22.251	16.025	38.276	21633.6	15.017	30039.3
1400.00	22.833	15.988	38.821	22382.5	14.941	31966.8
1450.00	23.394	15.950	39.344	23127.7	14.865	33921.0
1500.00	23.934	15.913	39.847	23869.0	14.789	35900.9
1550.00	24.455	15.875	40.330	24606.6	14.713	37905.4
1600.00	24.959	15.838	40.796	25340.4	14.637	39933.6
1650.00	25.445	15.800	41.245	26070.3	14.561	41984.7
1700.00	25.916	15.763	41.679	26796.5	14.485	44057.9
1750.00	26.373	15.725	42.098	27518.8	14.409	46152.4
1800.00	26.815	15.687	42.503	28237.4	14.333	48267.5
1850.00	27.245	15.650	42.894	28952.1	14.257	50402.5
1900.00	27.661	15.612	43.274	29663.1	14.181	52556.7
1950.00	28.066	15.574	43.641	30370.2	14.105	54729.6
2000.00	28.460	15.537	43.997	31073.6	14.029	56920.6
2050.00	28.843	15.499	44.343	31773.2	13.953	59129.2
2100.00	29.217	15.461	44.678	32468.9	13.877	61354.7
2150.00	29.580	15.424	45.004	33160.9	13.801	63596.8
2200.00	29.934	15.386	45.320	33849.0	13.725	65854.9
2250.00	30.279	15.348	45.628	34533.4	13.649	68128.6
2300.00	30.616	15.310	45.927	35213.9	13.573	70417.5
2350.00	30.945	15.273	46.218	35890.7	13.497	72721.2
2400.00	31.266	15.235	46.501	36563.6	13.421	75039.2
2450.00	31.580	15.197	46.777	37232.8	13.345	77371.2
2500.00	31.887	15.159	47.046	37898.1	13.269	79716.8

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-27

THERMODYNAMIC PROPERTIES FOR LITHIUM ALUMINATE (LI AL O_2)
SOLID PHASE

GRAM MOLECULAR WT.=65.920 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T DEG K	$-(F_T-H_0)/T$ CAL/DEG MOLE	$(H_T-H_0)/T$ CAL/DEG MOLE	(S_T-S_0) CAL/DEG MOLE	(H_T-H_0) CAL/MOLE	C_P CAL/DEG MOLE	$-(F_T-H_0)$ CAL/MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0002	0.000	0.001	0.001	0.000
10.00	0.0006	0.0022	0.003	0.022	0.009	0.006
15.00	0.0024	0.0075	0.010	0.112	0.029	0.036
20.00	0.0057	0.0171	0.023	0.341	0.066	0.115
25.00	0.0111	0.0326	0.044	0.815	0.128	0.277
30.00	0.0189	0.0557	0.075	1.672	0.220	0.568
35.00	0.0298	0.0879	0.118	3.077	0.348	1.043
40.00	0.0442	0.1302	0.174	5.209	0.511	1.768
45.00	0.0625	0.1831	0.246	8.239	0.707	2.811
50.00	0.0850	0.2466	0.332	12.328	0.934	4.248
55.00	0.1118	0.3204	0.432	17.620	1.188	6.151
60.00	0.1432	0.4041	0.547	24.244	1.466	8.593
65.00	0.1792	0.4972	0.676	32.316	1.767	11.647
70.00	0.2197	0.5992	0.819	41.943	2.088	15.379
75.00	0.2648	0.7096	0.974	53.223	2.427	19.857
80.00	0.3143	0.8280	1.142	66.238	2.782	25.144
85.00	0.3682	0.9536	1.322	81.058	3.148	31.299
90.00	0.4265	1.0860	1.512	97.737	3.524	38.381
95.00	0.4889	1.2243	1.713	116.31	3.907	46.441
100.00	0.5553	1.3681	1.923	136.81	4.294	55.528
105.00	0.6256	1.5167	2.142	159.25	4.683	65.689
110.00	0.6997	1.6695	2.369	183.64	5.073	76.964
115.00	0.7773	1.8259	2.603	209.98	5.463	89.393
120.00	0.8584	1.9855	2.844	238.27	5.852	103.01
125.00	0.9427	2.1479	3.091	268.49	6.239	117.84
130.00	1.0302	2.3127	3.343	300.65	6.623	133.92
135.00	1.1206	2.4794	3.600	334.72	7.004	151.28
140.00	1.2138	2.6477	3.862	370.68	7.381	169.93
145.00	1.3097	2.8174	4.127	408.52	7.754	189.90
150.00	1.4080	2.9881	4.396	448.21	8.121	211.21
155.00	1.5088	3.1595	4.668	489.73	8.484	233.87
160.00	1.6118	3.3315	4.943	533.04	8.841	257.90
165.00	1.7170	3.5038	5.221	578.13	9.192	283.31
170.00	1.8242	3.6762	5.500	624.96	9.537	310.11
175.00	1.9332	3.8485	5.782	673.49	9.876	338.31
180.00	2.0440	4.0206	6.065	723.71	10.209	367.93
185.00	2.1565	4.1923	6.349	775.57	10.535	398.96
190.00	2.2706	4.3634	6.634	829.05	10.854	431.42
195.00	2.3862	4.5338	6.920	884.10	11.166	465.30
200.00	2.5031	4.7035	7.207	940.70	11.472	500.62
205.00	2.6213	4.8722	7.494	998.81	11.771	537.37
210.00	2.7407	5.0400	7.781	1058.4	12.063	575.55
215.00	2.8613	5.2066	8.068	1119.4	12.348	615.18
220.00	2.9829	5.3721	8.355	1181.9	12.626	656.23
225.00	3.1054	5.5363	8.642	1245.7	12.898	698.73
230.00	3.2289	5.6993	8.928	1310.8	13.163	742.65
235.00	3.3532	5.8608	9.214	1377.3	13.421	788.01
240.00	3.4783	6.0210	9.499	1445.0	13.673	834.79
245.00	3.6041	6.1797	9.784	1514.0	13.919	883.00
250.00	3.7305	6.3369	10.067	1584.2	14.159	932.63
255.00	3.8575	6.4926	10.350	1655.6	14.393	983.67
260.00	3.9851	6.6467	10.632	1728.1	14.621	1036.1
265.00	4.1132	6.7992	10.912	1801.8	14.843	1090.0
270.00	4.2417	6.9502	11.192	1876.6	15.060	1145.2
273.15	4.3228	7.0445	11.367	1924.2	15.195	1180.8
275.00	4.3706	7.0996	11.470	1952.4	15.273	1201.9
280.00	4.4998	7.2474	11.747	2029.3	15.480	1259.9
285.00	4.6294	7.3936	12.023	2107.2	15.683	1319.4
290.00	4.7592	7.5383	12.298	2186.1	15.882	1380.2
295.00	4.8893	7.6814	12.571	2266.0	16.077	1442.3
298.15	4.9714	7.7707	12.742	2316.8	16.199	1482.2
300.00	5.0196	7.8229	12.843	2346.9	16.269	1505.9

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-28

THERMODYNAMIC FUNCTIONS FOR LITHIUM NITRIDE (Li_3N)
SOLID PHASE

GRAM MOLECULAR WT. = 34.83 GRAMS 1 CAL = 4.1840 ABS J.

T DEG K = 273.15 + T DEG C.

T	$-\frac{(F^\circ_T - H^\circ_{298})}{T}$	$\frac{(H^\circ_T - H^\circ_{298})}{T}$	$(S^\circ_T - S^\circ_0)$	$(H^\circ_T - H^\circ_{298})$	C°_p	$-(F^\circ_T - H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
298.15	9.00	0.00	9.00	0.	18.09	2683.
300.00	9.00	0.11	9.11	33.	18.19	2700.
325.00	9.06	1.55	10.61	504.	19.42	2946.
350.00	9.23	2.86	12.09	1002.	20.43	3230.
375.00	9.47	4.06	13.53	1524.	21.29	3551.
400.00	9.76	5.16	14.93	2066.	22.04	3907.
425.00	10.11	6.17	16.29	2626.	22.69	4297.
450.00	10.49	7.11	17.60	3200.	23.26	4721.
475.00	10.90	7.97	18.87	3788.	23.77	5177.
500.00	11.33	8.77	20.10	4389.	24.23	5665.
550.00	12.23	10.22	22.45	5621.	25.03	6729.
600.00	13.18	11.48	24.66	6890.	25.71	7908.
650.00	14.14	12.60	26.74	8190.	26.28	9194.
700.00	15.11	13.59	28.71	9517.	26.77	10581.
750.00	16.08	14.48	30.57	10867.	27.19	12063.
800.00	17.04	15.29	32.34	12236.	27.55	13636.
850.00	17.99	16.02	34.02	13622.	27.87	15296.
900.00	18.93	16.69	35.62	15022.	28.13	17037.
950.00	19.85	17.29	37.14	16434.	28.34	18857.
1000.00	20.75	17.85	38.60	17856.	28.52	20751.
1050.00	21.63	18.36	40.00	19286.	28.65	22717.
1100.00	22.50	18.83	41.33	20721.	28.75	24750.
1150.00	23.34	19.27	42.61	22160.	28.80	26849.
1200.00	24.17	19.66	43.84	23601.	28.82	29011.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-29

THERMODYNAMIC FUNCTIONS FOR BERYLLIUM NITRIDE (Be_3N_2)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT. = 55.06 GRAMS

1 CAL = 4.1840 ABS J.

T DEG K = 273.15 + T DEG C

T	$-\frac{(F^\circ_T - H^\circ_{298})}{T}$	$\frac{(H^\circ_T - H^\circ_{298})}{T}$	$(S^\circ_T - S^\circ_0)$	$(H^\circ_T - H^\circ_{298})$	C°_p	$-(F^\circ_T - H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
298.15	12.00	0.00	12.00	0.	16.01	3577.
300.00	12.00	0.09	12.09	29.	16.15	3600.
325.00	12.06	1.40	13.46	456.	17.88	3919.
350.00	12.20	2.63	14.84	921.	19.31	4273.
375.00	12.43	3.78	16.21	1419.	20.51	4661.
400.00	12.71	4.86	17.57	1946.	21.55	5084.
425.00	13.03	5.87	18.90	2496.	22.45	5540.
450.00	13.39	6.81	20.21	3068.	23.25	6029.
475.00	13.79	7.70	21.49	3658.	23.96	6550.
500.00	14.20	8.53	22.73	4265.	24.61	7103.
550.00	15.09	10.04	25.13	5525.	25.73	8301.
600.00	16.02	11.39	27.42	6836.	26.70	9615.
650.00	16.98	12.60	29.59	8193.	27.55	11041.
700.00	17.96	13.70	31.66	9590.	28.31	12573.
750.00	18.94	14.69	33.64	11024.	29.00	14206.
800.00	19.92	15.61	35.53	12490.	29.63	15935.
850.00	20.89	16.45	37.34	13987.	30.22	17758.
900.00	21.85	17.23	39.09	15512.	30.76	19669.
950.00	22.80	17.96	40.76	17063.	31.27	21665.
1000.00	23.74	18.63	42.38	18639.	31.75	23744.
1050.00	24.67	19.27	43.94	20237.	32.19	25903.
1100.00	25.58	19.87	45.45	21858.	32.62	28138.
1150.00	26.47	20.43	46.91	23499.	33.01	30447.
1200.00	27.35	20.96	48.32	25160.	33.39	32828.
1250.00	28.22	21.47	49.69	26838.	33.74	35279.
1300.00	29.07	21.94	51.02	28534.	34.07	37797.
1350.00	29.91	22.40	52.31	30245.	34.38	40381.
1400.00	30.73	22.83	53.57	31972.	34.67	43028.
1450.00	31.54	23.25	54.79	33713.	34.95	45737.
1500.00	32.33	23.64	55.98	35467.	35.20	48507.
1550.00	33.12	24.02	57.14	37233.	35.44	51335.
1600.00	33.88	24.38	58.27	39011.	35.66	54221.
1650.00	34.64	24.72	59.37	40799.	35.86	57162.
1700.00	35.38	25.05	60.44	42596.	36.04	60157.
1750.00	36.11	25.37	61.49	44403.	36.21	63206.
1800.00	36.83	25.67	62.51	46217.	36.36	66306.
1850.00	37.54	25.96	63.51	48039.	36.49	69457.
1900.00	38.24	26.24	64.48	49866.	36.60	72657.
1950.00	38.92	26.51	65.43	51699.	36.70	75905.
2000.00	39.60	26.76	66.36	53537.	36.79	79200.
2050.00	40.26	27.01	67.27	55378.	36.85	82541.
2100.00	40.91	27.24	68.16	57222.	36.90	85928.
2150.00	41.56	27.47	69.03	59069.	36.94	89358.
2200.00	42.19	27.68	69.88	60916.	36.96	92831.
2250.00	42.82	27.89	70.71	62765.	36.96	96346.
2300.00	43.43	28.09	71.52	64613.	36.94	99902.
2350.00	44.04	28.28	72.32	66459.	36.91	103498.
2400.00	44.63	28.46	73.10	68304.	36.87	107134.
2450.00	45.22	28.63	73.85	70146.	36.81	110808.
2470.00	45.46	28.69	74.15	70882.	36.78	112288.
			(LIQUID)			
2470.00	45.46	41.19	86.65	101757.	39.02	112288.
2500.00	45.95	41.17	87.12	102926.	38.90	114895.
2600.00	47.57	41.07	88.64	106796.	38.50	123684.
2700.00	49.11	40.97	90.09	110626.	38.10	132622.
2800.00	50.60	40.86	91.47	114416.	37.70	141701.
2900.00	52.03	40.74	92.78	118166.	37.30	150914.
3000.00	53.41	40.62	94.04	121876.	36.90	160256.
3100.00	54.74	40.49	95.24	125546.	36.50	169721.
3200.00	56.03	40.36	96.40	129176.	36.10	179304.
3300.00	57.27	40.23	97.50	132766.	35.70	188999.
3400.00	58.47	40.09	98.56	136316.	35.30	198803.
3500.00	59.63	39.95	99.58	139826.	34.90	208711.
3600.00	60.75	39.80	100.56	143296.	34.50	218718.
3700.00	61.84	39.65	101.50	146726.	34.10	228822.
3800.00	62.89	39.50	102.40	150116.	33.70	239017.
3900.00	63.92	39.35	103.27	153466.	33.30	249301.
4000.00	64.91	39.19	104.11	156776.	32.90	259671.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-30

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM NITRIDE (Mg_3N_2)
SOLID PHASES

GRAM MOLECULAR WT. = 100.98 GRAMS 1 CAL = 4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-\frac{(F^\circ_T - H^\circ_{298})}{T}$	$\frac{(H^\circ_T - H^\circ_{298})}{T}$	$(S^\circ_T - S^\circ_0)$	$(H^\circ_T - H^\circ_{298})$	C°_p	$-(F^\circ_T - H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
			(SOLID-ALPHA)			
298.15	21.00	0.00	21.00	0.	24.98	6261.
300.00	21.00	0.15	21.15	46.	25.00	6300.
325.00	21.09	2.07	23.16	673.	25.18	6854.
350.00	21.30	3.73	25.03	1305.	25.36	7457.
375.00	21.61	5.17	26.79	1941.	25.54	8105.
400.00	21.99	6.45	28.44	2582.	25.73	8795.
425.00	22.41	7.59	30.01	3228.	25.91	9526.
450.00	22.87	8.61	31.49	3878.	26.09	10295.
475.00	23.37	9.54	32.91	4533.	26.27	11101.
500.00	23.88	10.38	34.26	5192.	26.46	11940.
550.00	24.94	11.86	36.80	6524.	26.82	13718.
600.00	26.03	13.12	39.15	7874.	27.19	15618.
650.00	27.12	14.22	41.34	9243.	27.55	17631.
700.00	28.21	15.18	43.40	10630.	27.92	19750.
750.00	29.29	16.04	45.34	12035.	28.28	21969.
800.00	30.35	16.82	47.17	13458.	28.65	24282.
823.00	30.83	17.15	47.99	14119.	28.81	25377.
			(SOLID-BETA)			
823.00	30.83	17.42	48.25	14339.	29.60	25377.
850.00	31.40	17.81	49.21	15138.	29.60	26693.
900.00	32.44	18.46	50.90	16618.	29.60	29196.
950.00	33.45	19.05	52.50	18098.	29.60	31782.
1000.00	34.44	19.57	54.02	19578.	29.60	34445.
1050.00	35.41	20.05	55.46	21058.	29.60	37183.
1061.00	35.62	20.15	55.77	21384.	29.60	37795.
			(SOLID-GAMMA)			
1061.00	35.62	20.40	56.02	21644.	29.54	37795.
1100.00	36.36	20.72	57.08	22796.	29.54	40001.
1150.00	37.29	21.10	58.40	24273.	29.54	42888.
1200.00	38.20	21.45	59.65	25750.	29.54	45840.
1250.00	39.08	21.78	60.86	27227.	29.54	48853.
1300.00	39.94	22.08	62.02	28704.	29.54	51926.
1350.00	40.78	22.35	63.13	30181.	29.54	55055.
1400.00	41.59	22.61	64.21	31658.	29.54	58239.
1450.00	42.39	22.85	65.24	33135.	29.54	61475.
1500.00	43.17	23.07	66.25	34612.	29.54	64763.
1550.00	43.93	23.28	67.21	36089.	29.54	68100.
1600.00	44.67	23.47	68.15	37566.	29.54	71484.
1650.00	45.40	23.66	69.06	39043.	29.54	74915.
1700.00	46.11	23.83	69.94	40520.	29.54	78391.
1750.00	46.80	23.99	70.80	41997.	29.54	81910.
1800.00	47.48	24.15	71.63	43474.	29.54	85471.
1850.00	48.14	24.29	72.44	44951.	29.54	89073.
1900.00	48.79	24.43	73.23	46428.	29.54	92715.
1950.00	49.43	24.56	74.00	47905.	29.54	96396.
2000.00	50.05	24.69	74.74	49382.	29.54	100115.
2050.00	50.66	24.81	75.47	50859.	29.54	103870.
2100.00	51.26	24.92	76.19	52336.	29.54	107662.
2150.00	51.85	25.03	76.88	53813.	29.54	111489.
2200.00	52.43	25.13	77.56	55290.	29.54	115350.
2250.00	52.99	25.23	78.22	56767.	29.54	119245.
2300.00	53.55	25.32	78.87	58244.	29.54	123173.
2350.00	54.09	25.41	79.51	59721.	29.54	127133.
2400.00	54.63	25.49	80.13	61198.	29.54	131124.
2450.00	55.16	25.58	80.74	62675.	29.54	135146.
2500.00	55.67	25.66	81.34	64152.	29.54	139198.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-31

THERMODYNAMIC FUNCTIONS FOR ALUMINUM NITRIDE (AL N)
SOLID PHASE

GRAM MOLECULAR WT.= 40.99 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T^0-H_0^0)/T$	$(H_T^0-H_0^0)/T$	$(S_T^0-S_0^0)$	$(H_T^0-H_0^0)$	C_P^0	$-(F_T^0-H_0^0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0000	0.000	0.000	0.000	0.000
10.00	0.0001	0.0005	0.001	0.005	0.002	0.001
15.00	0.0005	0.0016	0.002	0.024	0.006	0.008
20.00	0.0012	0.0035	0.005	0.071	0.013	0.024
25.00	0.0023	0.0066	0.009	0.166	0.025	0.058
30.00	0.0039	0.0112	0.015	0.336	0.044	0.117
35.00	0.0061	0.0176	0.024	0.617	0.070	0.213
40.00	0.0090	0.0263	0.035	1.053	0.106	0.359
45.00	0.0127	0.0376	0.050	1.694	0.152	0.571
50.00	0.0174	0.0519	0.069	2.596	0.210	0.869
55.00	0.0231	0.0694	0.093	3.819	0.281	1.271
60.00	0.0300	0.0904	0.120	5.425	0.363	1.802
65.00	0.0382	0.1150	0.153	7.472	0.458	2.484
70.00	0.0477	0.1431	0.191	10.017	0.562	3.342
75.00	0.0587	0.1748	0.233	13.111	0.676	4.401
80.00	0.0711	0.2100	0.281	16.796	0.799	5.685
85.00	0.0849	0.2484	0.333	21.115	0.930	7.219
90.00	0.1003	0.2900	0.390	26.103	1.067	9.026
95.00	0.1172	0.3347	0.452	31.797	1.211	11.129
100.00	0.1355	0.3823	0.518	38.227	1.361	13.552
105.00	0.1554	0.4325	0.588	45.417	1.515	16.314
110.00	0.1767	0.4853	0.662	53.384	1.672	19.438
115.00	0.1995	0.5404	0.740	62.141	1.831	22.941
120.00	0.2237	0.5975	0.821	71.695	1.991	26.842
125.00	0.2493	0.6564	0.906	82.052	2.152	31.157
130.00	0.2762	0.7171	0.993	93.220	2.315	35.904
135.00	0.3044	0.7793	1.084	105.21	2.480	41.095
140.00	0.3339	0.8430	1.177	118.03	2.647	46.745
145.00	0.3646	0.9082	1.273	131.68	2.815	52.869
150.00	0.3965	0.9745	1.371	146.18	2.984	59.477
155.00	0.4296	1.0421	1.472	161.52	3.153	66.583
160.00	0.4637	1.1107	1.574	177.71	3.321	74.197
165.00	0.4990	1.1802	1.679	194.73	3.488	82.330
170.00	0.5353	1.2505	1.786	212.59	3.654	90.992
175.00	0.5725	1.3216	1.894	231.27	3.818	100.19
180.00	0.6108	1.3932	2.004	250.77	3.981	109.94
185.00	0.6499	1.4653	2.115	271.08	4.141	120.23
190.00	0.6900	1.5378	2.228	292.18	4.301	131.09
195.00	0.7308	1.6107	2.342	314.08	4.459	142.51
200.00	0.7725	1.6838	2.456	336.77	4.616	154.51
205.00	0.8150	1.7572	2.572	360.24	4.772	167.08
210.00	0.8582	1.8309	2.689	384.49	4.928	180.23
215.00	0.9022	1.9047	2.807	409.51	5.082	193.97
220.00	0.9468	1.9786	2.926	435.30	5.234	208.30
225.00	0.9921	2.0526	3.045	461.85	5.383	223.23
230.00	1.0380	2.1266	3.165	489.13	5.529	238.75
235.00	1.0846	2.2006	3.285	517.13	5.671	254.87
240.00	1.1317	2.2743	3.406	545.83	5.808	271.60
245.00	1.1793	2.3478	3.527	575.21	5.942	288.93
250.00	1.2275	2.4210	3.649	605.24	6.072	306.87
255.00	1.2762	2.4938	3.770	635.92	6.198	325.42
260.00	1.3253	2.5662	3.892	667.22	6.322	344.57
265.00	1.3748	2.6383	4.013	699.14	6.443	364.33
270.00	1.4248	2.7098	4.135	731.64	6.560	384.70
273.15	1.4565	2.7546	4.211	752.42	6.632	397.85
275.00	1.4752	2.7808	4.256	764.73	6.674	405.68
280.00	1.5259	2.8513	4.377	798.37	6.783	427.26
285.00	1.5770	2.9212	4.498	832.55	6.889	449.45
290.00	1.6284	2.9905	4.619	867.25	6.990	472.25
295.00	1.6801	3.0591	4.739	902.44	7.086	495.64
298.15	1.7129	3.1020	4.815	924.86	7.145	510.69
300.00	1.7321	3.1270	4.859	938.11	7.179	519.64

H_0^0 AND S_0^0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-31 (CONT.)

THERMODYNAMIC FUNCTIONS FOR ALUMINUM NITRIDE (AL N)
SOLID PHASE

GRAM MOLECULAR WT.= 40.99 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T^0-H_0^0)/T$	$(H_T^0-H_0^0)/T$	$(S_T^0-S_0^0)$	$(H_T^0-H_0^0)$	C_P^0	$-(F_T^0-H_0^0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
300.00	1.7321	3.1270	4.859	938.11	7.179	519.64
305.00	1.7844	3.1942	4.979	974.22	7.267	544.23
310.00	1.8368	3.2605	5.097	1010.8	7.351	569.42
315.00	1.8895	3.3261	5.216	1047.7	7.433	595.21
320.00	1.9424	3.3909	5.333	1085.1	7.513	621.58
325.00	1.9955	3.4549	5.450	1122.9	7.592	648.54
330.00	2.0487	3.5182	5.567	1161.0	7.671	676.08
335.00	2.1021	3.5808	5.683	1199.6	7.750	704.21
340.00	2.1556	3.6427	5.798	1238.5	7.829	732.91
345.00	2.2092	3.7039	5.913	1277.9	7.907	762.19
350.00	2.2630	3.7645	6.028	1317.6	7.985	792.04
355.00	2.3168	3.8245	6.141	1357.7	8.061	822.46
360.00	2.3707	3.8839	6.255	1398.2	8.137	853.45
365.00	2.4247	3.9426	6.367	1439.1	8.211	885.01
370.00	2.4787	4.0008	6.480	1480.3	8.284	917.12
373.15	2.5128	4.0372	6.550	1506.5	8.330	937.65
375.00	2.5328	4.0584	6.591	1521.9	8.357	949.80
380.00	2.5869	4.1154	6.702	1563.9	8.427	983.04
385.00	2.6411	4.1719	6.813	1606.2	8.497	1016.8
390.00	2.6953	4.2278	6.923	1648.8	8.566	1051.2
395.00	2.7495	4.2831	7.033	1691.8	8.633	1086.1
400.00	2.8037	4.3379	7.142	1735.2	8.699	1121.5
425.00	3.0748	4.6037	7.679	1956.6	9.009	1306.8
450.00	3.3451	4.8564	8.201	2185.4	9.290	1505.3
475.00	3.6142	5.0965	8.711	2420.8	9.542	1716.7
500.00	3.8814	5.3245	9.206	2662.3	9.769	1940.7
550.00	4.4091	5.7467	10.156	3160.7	10.155	2425.0
600.00	4.9257	6.1276	11.053	3676.5	10.468	2955.4
650.00	5.4300	6.4716	11.902	4206.5	10.723	3529.5
700.00	5.9212	6.7830	12.704	4748.1	10.932	4144.8
750.00	6.3989	7.0655	13.464	5299.2	11.106	4799.2
800.00	6.8633	7.3227	14.186	5858.2	11.250	5490.6
850.00	7.3144	7.5574	14.872	6423.8	11.371	6217.2
900.00	7.7524	7.7721	15.525	6994.9	11.472	6977.2
950.00	8.1780	7.9692	16.147	7570.7	11.558	7769.1
1000.00	8.5914	8.1505	16.742	8150.5	11.631	8591.4
1050.00	8.9932	8.3178	17.311	8733.6	11.693	9442.9
1100.00	9.3838	8.4724	17.856	9319.7	11.746	10322.
1150.00	9.7636	8.6157	18.379	9908.1	11.791	11228.
1200.00	10.133	8.7489	18.882	10499.	11.830	12160.
1250.00	10.493	8.8728	19.366	11091.	11.863	13116.
1300.00	10.843	8.9883	19.831	11685.	11.891	14096.
1350.00	11.184	9.0963	20.281	12280.	11.914	15099.
1400.00	11.517	9.1973	20.714	12876.	11.935	16124.
1450.00	11.841	9.2920	21.133	13473.	11.951	17170.
1500.00	12.158	9.3809	21.539	14071.	11.966	18237.
1550.00	12.467	9.4644	21.931	14670.	11.977	19324.
1600.00	12.769	9.5431	22.312	15269.	11.987	20430.
1650.00	13.063	9.6173	22.681	15869.	11.994	21555.
1700.00	13.352	9.6873	23.039	16468.	12.000	22698.
1750.00	13.633	9.7534	23.387	17069.	12.004	23858.
1800.00	13.909	9.8160	23.725	17669.	12.007	25036.

H_0^0 AND S_0^0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-32

THERMODYNAMIC FUNCTIONS FOR TITANIUM NITRIDE (TI N)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=61.908 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F^\circ_T-H^\circ_0)/T$	$(H^\circ_T-H^\circ_0)/T$	$(S^\circ_T-S^\circ_0)$	$(H^\circ_T-H^\circ_0)$	C_P°	$-(F^\circ_T-H^\circ_0)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0001	0.0001	0.000	0.000	0.000	0.000
10.00	0.0001	0.0001	0.000	0.001	0.000	0.001
15.00	0.0002	0.0004	0.001	0.006	0.002	0.003
20.00	0.0004	0.0012	0.002	0.023	0.006	0.008
25.00	0.0009	0.0031	0.004	0.076	0.017	0.022
30.00	0.0018	0.0073	0.009	0.218	0.043	0.053
35.00	0.0034	0.0156	0.019	0.545	0.092	0.120
40.00	0.0064	0.0299	0.036	1.198	0.174	0.255
45.00	0.0111	0.0521	0.063	2.346	0.291	0.499
50.00	0.0181	0.0831	0.101	4.156	0.438	0.905
55.00	0.0278	0.1230	0.151	6.763	0.608	1.530
60.00	0.0405	0.1711	0.212	10.267	0.795	2.431
65.00	0.0564	0.2267	0.283	14.737	0.994	3.664
70.00	0.0754	0.2890	0.364	20.228	1.203	5.279
75.00	0.0976	0.3572	0.455	26.786	1.421	7.323
80.00	0.1230	0.4306	0.554	34.452	1.646	9.841
85.00	0.1514	0.5089	0.660	43.254	1.876	12.873
90.00	0.1828	0.5912	0.774	53.211	2.108	16.456
95.00	0.2171	0.6772	0.894	64.330	2.340	20.624
100.00	0.2541	0.7661	1.020	76.610	2.572	25.408
105.00	0.2937	0.8576	1.151	90.043	2.802	30.834
110.00	0.3357	0.9511	1.287	104.62	3.030	36.928
115.00	0.3801	1.0464	1.426	120.34	3.256	43.709
120.00	0.4267	1.1431	1.570	137.18	3.479	51.199
125.00	0.4753	1.2410	1.716	155.13	3.700	59.413
130.00	0.5259	1.3398	1.866	174.17	3.918	68.367
135.00	0.5783	1.4392	2.018	194.30	4.131	78.074
140.00	0.6325	1.5391	2.172	215.48	4.342	88.546
145.00	0.6882	1.6394	2.328	237.71	4.548	99.793
150.00	0.7455	1.7397	2.485	260.96	4.751	111.82
155.00	0.8042	1.8400	2.644	285.21	4.949	124.65
160.00	0.8642	1.9402	2.804	310.44	5.143	138.27
165.00	0.9254	2.0401	2.966	336.62	5.332	152.69
170.00	0.9878	2.1397	3.127	363.75	5.517	167.92
175.00	1.0513	2.2388	3.290	391.79	5.698	183.97
180.00	1.1157	2.3373	3.453	420.72	5.873	200.83
185.00	1.1811	2.4352	3.616	450.51	6.045	218.50
190.00	1.2473	2.5324	3.780	481.16	6.211	236.99
195.00	1.3143	2.6288	3.943	512.62	6.373	256.30
200.00	1.3821	2.7244	4.107	544.88	6.531	276.42
205.00	1.4505	2.8191	4.270	577.92	6.684	297.36
210.00	1.5196	2.9129	4.433	611.72	6.833	319.12
215.00	1.5892	3.0058	4.595	646.24	6.977	341.69
220.00	1.6594	3.0976	4.757	681.48	7.117	365.07
225.00	1.7300	3.1884	4.919	717.40	7.252	389.26
230.00	1.8011	3.2782	5.079	753.99	7.383	414.25
235.00	1.8725	3.3669	5.240	791.22	7.511	440.05
240.00	1.9443	3.4545	5.399	829.09	7.634	466.64
245.00	2.0165	3.5411	5.558	867.56	7.754	494.04
250.00	2.0889	3.6265	5.715	906.63	7.871	522.22
255.00	2.1615	3.7109	5.872	946.27	7.986	551.19
260.00	2.2344	3.7942	6.029	986.48	8.099	580.94
265.00	2.3074	3.8765	6.184	1027.3	8.211	611.47
270.00	2.3807	3.9577	6.338	1068.6	8.321	642.78
273.15	2.4269	4.0085	6.435	1094.9	8.390	662.90
275.00	2.4540	4.0381	6.492	1110.5	8.431	674.85
280.00	2.5275	4.1175	6.645	1152.9	8.539	707.70
285.00	2.6011	4.1960	6.797	1195.9	8.646	741.30
290.00	2.6747	4.2736	6.948	1239.4	8.751	775.67
295.00	2.7484	4.3504	7.099	1283.4	8.854	810.78
298.15	2.7949	4.3983	7.193	1311.4	8.918	833.29
300.00	2.8222	4.4263	7.249	1327.9	8.995	846.65

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-32 (CONT.)

THERMODYNAMIC FUNCTIONS FOR TITANIUM NITRIDE (TI N)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=61.908 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T^\circ-H_0^\circ)/T$	$(H_T^\circ-H_0^\circ)/T$	$(S_T^\circ-S_0^\circ)$	$(H_T^\circ-H_0^\circ)$	C_P°	$-(F_T^\circ-H_0^\circ)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
300.00	2.82	4.42	7.25	1328.	9.00	846.6
325.00	3.19	4.79	7.98	1557.	9.42	1037.
350.00	3.55	5.13	8.69	1798.	9.82	1245.
375.00	3.92	5.46	9.38	2048.	10.15	1471.
400.00	4.28	5.76	10.05	2305.	10.43	1714.
425.00	4.64	6.04	10.69	2569.	10.67	1974.
450.00	4.99	6.30	11.30	2839.	10.87	2249.
475.00	5.34	6.55	11.90	3113.	11.04	2539.
500.00	5.68	6.78	12.47	3391.	11.19	2844.
550.00	6.35	7.19	13.55	3957.	11.44	3495.
600.00	6.99	7.55	14.55	4535.	11.65	4197.
650.00	7.61	7.88	15.49	5122.	11.82	4949.
700.00	8.20	8.16	16.37	5716.	11.96	5746.
750.00	8.78	8.42	17.20	6318.	12.08	6586.
800.00	9.33	8.65	17.98	6925.	12.19	7466.
850.00	9.86	8.86	18.73	7537.	12.29	8384.
900.00	10.37	9.06	19.43	8155.	12.39	9338.
950.00	10.87	9.23	20.11	8776.	12.47	10327.
1000.00	11.34	9.40	20.75	9402.	12.55	11349.
1050.00	11.81	9.55	21.36	10032.	12.62	12402.
1100.00	12.25	9.69	21.95	10665.	12.69	13485.
1150.00	12.69	9.82	22.52	11302.	12.76	14597.
1200.00	13.11	9.95	23.06	11942.	12.83	15737.
1250.00	13.52	10.06	23.59	12585.	12.89	16903.
1300.00	13.92	10.17	24.09	13231.	12.95	18096.
1350.00	14.30	10.28	24.58	13880.	13.01	19313.
1400.00	14.68	10.38	25.06	14533.	13.07	20554.
1450.00	15.04	10.47	25.52	15188.	13.13	21819.
1500.00	15.40	10.56	25.96	15846.	13.18	23106.
1550.00	15.75	10.65	26.40	16507.	13.24	24415.
1600.00	16.09	10.73	26.82	17170.	13.29	25746.
1650.00	16.42	10.81	27.23	17837.	13.35	27098.
1700.00	16.74	10.88	27.63	18506.	13.40	28469.
1750.00	17.06	10.95	28.02	19177.	13.45	29861.
1800.00	17.37	11.02	28.40	19851.	13.51	31271.
1850.00	17.67	11.09	28.77	20528.	13.56	32701.
1900.00	17.97	11.16	29.13	21208.	13.61	34149.
1950.00	18.26	11.22	29.49	21890.	13.66	35614.
2000.00	18.54	11.28	29.83	22574.	13.71	37097.
2050.00	18.82	11.34	30.17	23261.	13.76	38598.
2100.00	19.10	11.40	30.50	23951.	13.81	40115.
2150.00	19.37	11.46	30.83	24643.	13.86	41648.
2200.00	19.63	11.51	31.15	25337.	13.91	43198.
2250.00	19.89	11.57	31.46	26035.	13.96	44764.
2300.00	20.15	11.62	31.77	26734.	14.01	46345.
2350.00	20.40	11.67	32.07	27436.	14.06	47941.
2400.00	20.64	11.72	32.37	28141.	14.11	49552.
2450.00	20.88	11.77	32.66	28848.	14.16	51178.
2500.00	21.12	11.82	32.95	29557.	14.21	52818.
2600.00	21.59	11.91	33.51	30983.	14.31	56142.
2700.00	22.04	12.00	34.05	32419.	14.40	59520.
2800.00	22.48	12.09	34.57	33865.	14.50	62951.
2900.00	22.90	12.17	35.08	35320.	14.60	66435.
3000.00	23.32	12.26	35.58	36785.	14.69	69968.
3100.00	23.72	12.34	36.06	38259.	14.79	73551.
3200.00	24.11	12.42	36.53	39743.	14.88	77182.
			(LIQUID)			
3200.00	24.11	17.42	41.53	55743.	15.60	77182.
3300.00	24.65	17.36	42.01	57295.	15.44	81360.
3400.00	25.17	17.30	42.47	58831.	15.28	85585.
3500.00	25.67	17.24	42.91	60351.	15.12	89854.
3600.00	26.15	17.18	43.34	61855.	14.96	94167.
3700.00	26.62	17.12	43.74	63343.	14.80	98522.
3800.00	27.08	17.05	44.14	64815.	14.64	102916.
3900.00	27.52	16.99	44.51	66271.	14.48	107349.
4000.00	27.95	16.92	44.88	67711.	14.32	111819.

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-33

THERMODYNAMIC FUNCTIONS FOR LITHIUM CARBIDE (Li_2C_2)
SOLID PHASE

GRAM MOLECULAR WT. = 37.90 GRAMS 1 CAL = 4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-\frac{(F^\circ_T-H^\circ_{298})}{T}$	$\frac{(H^\circ_T-H^\circ_{298})}{T}$	$(S^\circ_T-S^\circ_0)$	$(H^\circ_T-H^\circ_{298})$	C°_p	$-(F^\circ_T-H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
298.15	14.00	0.00	14.00	0.	17.10	4174.
300.00	14.00	0.10	14.10	31.	17.20	4200.
325.00	14.06	1.47	15.53	477.	18.43	4570.
350.00	14.21	2.71	16.93	951.	19.41	4976.
375.00	14.44	3.85	18.30	1447.	20.22	5417.
400.00	14.72	4.90	19.63	1961.	20.89	5891.
425.00	15.05	5.86	20.91	2490.	21.45	6398.
450.00	15.41	6.74	22.15	3033.	21.94	6937.
475.00	15.80	7.55	23.35	3587.	22.36	7505.
500.00	16.20	8.30	24.51	4150.	22.72	8104.
550.00	17.06	9.64	26.70	5303.	23.34	9385.
600.00	17.95	10.80	28.76	6483.	23.83	10772.
650.00	18.86	11.82	30.68	7685.	24.25	12259.
700.00	19.77	12.72	32.49	8907.	24.60	13839.
750.00	20.67	13.52	34.20	10145.	24.91	15506.
800.00	21.57	14.24	35.82	11397.	25.18	17257.
850.00	22.45	14.89	37.35	12663.	25.43	19087.
900.00	23.32	15.49	38.81	13940.	25.66	20992.
950.00	24.17	16.03	40.20	15229.	25.87	22967.
1000.00	25.01	16.52	41.54	16527.	26.07	25011.
1050.00	25.82	16.98	42.81	17836.	26.26	27120.
1100.00	26.63	17.41	44.04	19153.	26.43	29292.
1150.00	27.41	17.80	45.22	20480.	26.61	31524.
1200.00	28.17	18.17	46.35	21814.	26.77	33813.
1250.00	28.92	18.52	47.45	23157.	26.93	36159.
1300.00	29.66	18.85	48.51	24508.	27.09	38558.
1350.00	30.37	19.16	49.53	25866.	27.24	41010.
1400.00	31.08	19.45	50.53	27232.	27.39	43512.
1450.00	31.76	19.72	51.49	28606.	27.54	46062.
1500.00	32.44	19.99	52.43	29986.	27.68	48661.
1550.00	33.10	20.24	53.34	31374.	27.82	51305.
1600.00	33.74	20.48	54.22	32769.	27.96	53994.
1650.00	34.38	20.71	55.09	34171.	28.10	56728.
1700.00	35.00	20.93	55.93	35580.	28.24	59503.
1750.00	35.61	21.14	56.75	36995.	28.37	62320.
1800.00	36.21	21.34	57.55	38418.	28.51	65178.
1850.00	36.79	21.53	58.33	39847.	28.64	68075.
1900.00	37.37	21.72	59.10	41282.	28.78	71011.
1950.00	37.94	21.91	59.85	42725.	28.91	73985.
2000.00	38.49	22.08	60.58	44173.	29.04	76996.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-34

THERMODYNAMIC FUNCTIONS FOR BERYLLIUM CARBIDE (Be_2C)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT. = 30.05 GRAMS 1 CAL = 4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-\frac{(F^\circ_T - H^\circ_{298})}{T}$	$\frac{(H^\circ_T - H^\circ_{298})}{T}$	$(S^\circ_T - S^\circ_0)$	$(H^\circ_T - H^\circ_{298})$	C°_p	$-(F^\circ_T - H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
298.15	4.00	0.00	4.00	0.	9.91	1192.
300.00	4.00	0.06	4.06	18.	9.96	1200.
325.00	4.03	0.84	4.88	274.	10.52	1311.
350.00	4.12	1.55	5.67	543.	11.01	1443.
375.00	4.25	2.19	6.45	824.	11.45	1595.
400.00	4.41	2.79	7.20	1116.	11.85	1766.
425.00	4.60	3.33	7.93	1417.	12.22	1955.
450.00	4.80	3.83	8.64	1726.	12.55	2163.
475.00	5.02	4.30	9.33	2044.	12.87	2387.
500.00	5.25	4.74	9.99	2370.	13.17	2629.
550.00	5.74	5.53	11.28	3042.	13.73	3161.
600.00	6.26	6.23	12.49	3742.	14.24	3756.
650.00	6.78	6.87	13.65	4466.	14.72	4410.
700.00	7.31	7.44	14.76	5213.	15.17	5121.
750.00	7.84	7.97	15.82	5982.	15.59	5886.
800.00	8.37	8.46	16.84	6772.	16.00	6703.
850.00	8.90	8.92	17.82	7582.	16.38	7570.
900.00	9.42	9.34	18.77	8410.	16.75	8485.
950.00	9.94	9.74	19.68	9256.	17.10	9447.
1000.00	10.45	10.12	20.57	10120.	17.44	10453.
1050.00	10.95	10.47	21.43	11000.	17.76	11503.
1100.00	11.45	10.81	22.26	11895.	18.06	12596.
1150.00	11.93	11.13	23.07	12806.	18.36	13730.
1200.00	12.42	11.44	23.86	13731.	18.64	14903.
1250.00	12.89	11.73	24.62	14670.	18.91	16116.
1300.00	13.35	12.01	25.37	15622.	19.16	17366.
1350.00	13.81	12.28	26.10	16586.	19.41	18653.
1400.00	14.26	12.54	26.81	17562.	19.64	19976.
1450.00	14.71	12.79	27.50	18549.	19.86	21334.
1500.00	15.15	13.03	28.18	19547.	20.06	22726.
1550.00	15.58	13.26	28.84	20555.	20.26	24152.
1600.00	16.00	13.48	29.49	21573.	20.44	25610.
1650.00	16.42	13.69	30.12	22599.	20.61	27101.
1700.00	16.83	13.90	30.73	23633.	20.76	28622.
1750.00	17.24	14.10	31.34	24675.	20.91	30174.
1800.00	17.64	14.29	31.93	25724.	21.04	31756.
1850.00	18.03	14.47	32.51	26779.	21.17	33368.
1900.00	18.42	14.65	33.07	27841.	21.28	35007.
1950.00	18.80	14.82	33.63	28907.	21.38	36675.
2000.00	19.18	14.98	34.17	29978.	21.47	38370.
2050.00	19.55	15.14	34.70	31054.	21.54	40092.
2100.00	19.92	15.30	35.22	32132.	21.61	41841.
2150.00	20.28	15.44	35.73	33214.	21.66	43615.
2200.00	20.64	15.59	36.23	34298.	21.70	45414.
2250.00	20.99	15.72	36.72	35384.	21.73	47238.
2300.00	21.34	15.85	37.19	36471.	21.75	49086.
2350.00	21.68	15.98	37.66	37558.	21.75	50958.
2400.00	22.02	16.10	38.12	38646.	21.75	52853.
			(LIQUID)			
2400.00	22.02	23.60	45.62	56646.	23.40	52853.
2450.00	22.50	23.59	46.10	57813.	23.28	55146.
2500.00	22.98	23.59	46.57	58974.	23.16	57463.
2600.00	23.91	23.56	47.47	61278.	22.92	62166.
2700.00	24.79	23.54	48.33	63558.	22.68	66958.
2800.00	25.65	23.50	49.16	65814.	22.44	71833.
2900.00	26.47	23.46	49.94	68046.	22.20	76788.
3000.00	27.27	23.41	50.69	70254.	21.96	81820.
3100.00	28.04	23.36	51.40	72438.	21.72	86926.
3200.00	28.78	23.31	52.09	74598.	21.48	92101.
3300.00	29.49	23.25	52.75	76734.	21.24	97343.
3400.00	30.19	23.19	53.38	78846.	21.00	102650.
3500.00	30.86	23.12	53.98	80934.	20.76	108019.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-35

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CARBIDE (MgC_2)
SOLID PHASE

GRAM MOLECULAR WT. = 48.34 GRAMS 1 CAL = 4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F^\circ_T-H^\circ_{298})/T$	$(H^\circ_T-H^\circ_{298})/T$	$(S^\circ_T-S^\circ_0)$	$(H^\circ_T-H^\circ_{298})$	C°_p	$-(F^\circ_T-H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
298.15	13.00	0.00	13.00	0.	13.44	3875.
300.00	13.00	0.08	13.08	24.	13.49	3899.
325.00	13.04	1.14	14.18	370.	14.12	4240.
350.00	13.16	2.08	15.25	730.	14.62	4609.
375.00	13.34	2.93	16.27	1101.	15.04	5003.
400.00	13.55	3.70	17.26	1481.	15.39	5422.
425.00	13.80	4.40	18.20	1870.	15.68	5866.
450.00	14.07	5.03	19.10	2265.	15.94	6332.
475.00	14.36	5.61	19.97	2667.	16.16	6821.
500.00	14.66	6.14	20.80	3073.	16.35	7330.
550.00	15.29	7.09	22.38	3899.	16.68	8411.
600.00	15.94	7.90	23.84	4740.	16.94	9567.
650.00	16.60	8.60	25.21	5593.	17.17	10794.
700.00	17.26	9.22	26.49	6457.	17.36	12087.
750.00	17.92	9.77	27.69	7329.	17.53	13442.
800.00	18.56	10.26	28.83	8210.	17.69	14855.
850.00	19.20	10.70	29.91	9098.	17.83	16324.
900.00	19.82	11.10	30.93	9993.	17.96	17845.
950.00	20.43	11.46	31.90	10894.	18.08	19416.
1000.00	21.03	11.80	32.83	11801.	18.20	21035.
1050.00	21.61	12.10	33.72	12714.	18.31	22699.
1100.00	22.18	12.39	34.58	13633.	18.41	24407.
1150.00	22.74	12.65	35.40	14556.	18.52	26157.
1200.00	23.29	12.90	36.19	15484.	18.61	27947.
1250.00	23.82	13.13	36.95	16418.	18.71	29776.
1300.00	24.34	13.35	37.69	17356.	18.81	31642.
1350.00	24.84	13.55	38.40	18299.	18.90	33545.
1400.00	25.34	13.74	39.09	19246.	18.99	35482.
1450.00	25.83	13.93	39.76	20198.	19.08	37454.
1500.00	26.30	14.10	40.40	21154.	19.17	39458.
1550.00	26.77	14.26	41.03	22115.	19.25	41494.
1600.00	27.22	14.42	41.65	23080.	19.34	43562.
1650.00	27.67	14.57	42.24	24049.	19.42	45659.
1700.00	28.11	14.72	42.83	25023.	19.51	47786.
1750.00	28.53	14.85	43.39	26001.	19.59	49942.
1800.00	28.95	14.99	43.95	26983.	19.68	52125.
1850.00	29.37	15.11	44.49	27969.	19.76	54337.
1900.00	29.77	15.24	45.01	28959.	19.84	56574.
1950.00	30.17	15.36	45.53	29954.	19.92	58838.
2000.00	30.56	15.47	46.04	30952.	20.01	61128.
2050.00	30.94	15.58	46.53	31955.	20.09	63442.
2100.00	31.32	15.69	47.02	32961.	20.17	65781.
2150.00	31.69	15.80	47.49	33972.	20.25	68144.
2200.00	32.05	15.90	47.96	34986.	20.33	70530.
2250.00	32.41	16.00	48.42	36005.	20.41	72940.
2300.00	32.77	16.09	48.87	37028.	20.49	75372.
2350.00	33.11	16.19	49.31	38055.	20.57	77827.
2400.00	33.46	16.28	49.74	39085.	20.65	80303.
2450.00	33.79	16.37	50.17	40120.	20.73	82801.
2500.00	34.12	16.46	50.59	41159.	20.81	85320.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-36

THERMODYNAMIC FUNCTIONS FOR MAGNESIUM CARBIDE (Mg_2C_3)
SOLID PHASE

GRAM MOLECULAR WT. = 84.67 GRAMS 1 CAL = 4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-\frac{(F^\circ_T - H^\circ_{298})}{T}$	$\frac{(H^\circ_T - H^\circ_{298})}{T}$	$(S^\circ_T - S^\circ_0)$	$(H^\circ_T - H^\circ_{298})$	C°_p	$-(F^\circ_T - H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
298.15	24.00	0.00	24.00	0.	22.41	7155.
300.00	24.00	0.13	24.13	41.	22.50	7200.
325.00	24.08	1.90	25.98	617.	23.55	7826.
350.00	24.28	3.47	27.76	1217.	24.39	8498.
375.00	24.57	4.89	29.46	1836.	25.08	9214.
400.00	24.92	6.17	31.10	2470.	25.66	9971.
425.00	25.33	7.33	32.67	3118.	26.15	10768.
450.00	25.78	8.39	34.18	3778.	26.57	11604.
475.00	26.26	9.36	35.63	4447.	26.94	12477.
500.00	26.77	10.25	37.02	5125.	27.26	13385.
550.00	27.82	11.82	39.64	6502.	27.81	15303.
600.00	28.91	13.17	42.08	7904.	28.25	17347.
650.00	30.01	14.34	44.36	9326.	28.62	19509.
700.00	31.11	15.38	46.49	10766.	28.95	21781.
750.00	32.20	16.29	48.50	12221.	29.23	24156.
800.00	33.28	17.11	50.40	13689.	29.49	26629.
850.00	34.34	17.84	52.19	15170.	29.72	29195.
900.00	35.38	18.51	53.90	16662.	29.94	31847.
950.00	36.40	19.12	55.52	18164.	30.14	34583.
1000.00	37.39	19.67	57.07	19677.	30.34	37399.
1050.00	38.37	20.18	58.56	21198.	30.52	40290.
1100.00	39.32	20.66	59.98	22729.	30.70	43254.
1150.00	40.25	21.10	61.35	24268.	30.87	46288.
1200.00	41.15	21.51	62.67	25816.	31.03	49388.
1250.00	42.04	21.89	63.94	27372.	31.19	52554.
1300.00	42.90	22.25	65.16	28936.	31.35	55782.
1350.00	43.75	22.59	66.35	30507.	31.50	59070.
1400.00	44.58	22.91	67.50	32087.	31.65	62417.
1450.00	45.39	23.22	68.61	33673.	31.80	65820.
1500.00	46.18	23.51	69.69	35267.	31.95	69278.
1550.00	46.96	23.78	70.74	36869.	32.09	72789.
1600.00	47.72	24.04	71.76	38477.	32.24	76352.
1650.00	48.46	24.29	72.76	40093.	32.38	79965.
1700.00	49.19	24.53	73.73	41716.	32.52	83628.
1750.00	49.90	24.76	74.67	43345.	32.66	87338.
1800.00	50.60	24.99	75.59	44982.	32.80	91095.
1850.00	51.29	25.20	76.50	46626.	32.94	94898.
1900.00	51.97	25.40	77.38	48276.	33.07	98745.
1950.00	52.63	25.60	78.24	49933.	33.21	102635.
2000.00	53.28	25.79	79.08	51598.	33.35	106568.
2050.00	53.92	25.98	79.90	53268.	33.48	110543.
2100.00	54.55	26.16	80.71	54946.	33.62	114559.
2150.00	55.17	26.34	81.51	56631.	33.75	118615.
2200.00	55.77	26.51	82.28	58322.	33.88	122710.
2250.00	56.37	26.67	83.05	60019.	34.02	126843.
2300.00	56.96	26.83	83.80	61724.	34.15	131015.
2350.00	57.54	26.99	84.53	63435.	34.28	135223.
2400.00	58.11	27.14	85.25	65153.	34.42	139468.
2450.00	58.67	27.29	85.97	66877.	34.55	143749.
2500.00	59.22	27.44	86.66	68608.	34.68	148065.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-37

THERMODYNAMIC FUNCTIONS FOR ALUMINUM CARBIDE (Al_4C_3)
SOLID PHASE

GRAM MOLECULAR WT. = 143.93 GRAMS 1 CAL = 4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-\frac{(F^\circ_T - H^\circ_{298})}{T}$	$\frac{(H^\circ_T - H^\circ_{298})}{T}$	$(S^\circ_T - S^\circ_0)$	$(H^\circ_T - H^\circ_{298})$	C°_p	$-(F^\circ_T - H^\circ_{298})$
deg K	cal / deg mole	cal / deg mole	cal / deg mole	cal / mole	cal / deg mole	cal / mole
298.15	25.00	0.00	25.00	0.	32.63	7453.
300.00	25.00	0.20	25.20	60.	32.79	7500.
325.00	25.12	2.78	27.90	904.	34.63	8164.
350.00	25.41	5.11	30.52	1789.	36.12	8894.
375.00	25.83	7.22	33.06	2708.	37.33	9689.
400.00	26.36	9.13	35.50	3654.	38.33	10547.
425.00	26.97	10.87	37.85	4623.	39.18	11464.
450.00	27.64	12.47	40.11	5612.	39.91	12439.
475.00	28.35	13.93	42.29	6618.	40.53	13469.
500.00	29.10	15.27	44.38	7638.	41.08	14552.
550.00	30.67	17.66	48.34	9716.	41.98	16872.
600.00	32.30	19.72	52.02	11834.	42.71	19382.
650.00	33.95	21.51	55.47	13985.	43.31	22070.
700.00	35.60	23.09	58.70	16164.	43.83	24926.
750.00	37.25	24.49	61.74	18367.	44.27	27937.
800.00	38.87	25.73	64.61	20591.	44.66	31097.
850.00	40.46	26.86	67.33	22833.	45.02	34396.
900.00	42.03	27.88	69.91	25093.	45.34	37828.
950.00	43.56	28.80	72.37	27367.	45.64	41385.
1000.00	45.06	29.65	74.72	29656.	45.91	45063.
1050.00	46.53	30.43	76.96	31959.	46.17	48856.
1100.00	47.96	31.15	79.12	34274.	46.42	52758.
1150.00	49.36	31.82	81.19	36601.	46.66	56766.
1200.00	50.73	32.45	83.18	38940.	46.88	60876.
1250.00	52.06	33.03	85.09	41290.	47.10	65083.
1300.00	53.37	33.57	86.95	43651.	47.32	69385.
1350.00	54.65	34.09	88.74	46022.	47.52	73777.
1400.00	55.89	34.57	90.47	48403.	47.73	78258.
1450.00	57.12	35.03	92.15	50795.	47.92	82824.
1500.00	58.31	35.46	93.77	53196.	48.12	87472.
1550.00	59.48	35.87	95.36	55607.	48.31	92201.
1600.00	60.63	36.26	96.89	58027.	48.50	97007.
1650.00	61.75	36.64	98.39	60457.	48.68	101890.
1700.00	62.85	36.99	99.84	62896.	48.86	106846.
1750.00	63.92	37.34	101.26	65344.	49.04	111874.
1800.00	64.98	37.66	102.65	67801.	49.22	116972.
1850.00	66.02	37.98	104.00	70267.	49.40	122139.
1900.00	67.03	38.28	105.32	72741.	49.58	127372.
1950.00	68.03	38.57	106.61	75225.	49.75	132670.
2000.00	69.01	38.85	107.87	77717.	49.93	138033.
2050.00	69.97	39.13	109.11	80218.	50.10	143458.
2100.00	70.92	39.39	110.32	82727.	50.27	148943.
2150.00	71.85	39.64	111.50	85245.	50.44	154489.
2200.00	72.77	39.89	112.66	87772.	50.61	160093.
2250.00	73.66	40.13	113.80	90307.	50.78	165755.
2300.00	74.55	40.37	114.92	92851.	50.95	171474.
2350.00	75.42	40.59	116.02	95402.	51.12	177247.
2400.00	76.28	40.81	117.10	97963.	51.28	183076.
2450.00	77.12	41.03	118.15	100531.	51.45	188957.
2500.00	77.95	41.24	119.20	103108.	51.62	194891.
2600.00	79.58	41.64	121.23	108287.	51.95	206913.
2700.00	81.16	42.03	123.19	113499.	52.28	219135.
2800.00	82.69	42.40	125.10	118744.	52.61	231551.
2900.00	84.19	42.76	126.95	124021.	52.93	244154.
3000.00	85.64	43.11	128.75	129331.	53.26	256941.

S°_0 applies to the reference state of the solid at zero deg K.

H°_{298} (actually should be read $H^\circ_{298.15}$) applies to the reference state of the solid at 298.15 deg K.

TABLE B-38

THERMODYNAMIC FUNCTIONS FOR TITANIUM CARBIDE (TI C)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=59.911 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T^\circ-H_0^\circ)/T$	$(H_T^\circ-H_0^\circ)/T$	$(S_T^\circ-S_0^\circ)$	$(H_T^\circ-H_0^\circ)$	C_p°	$-(F_T^\circ-H_0^\circ)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0000	0.0000	0.000	0.000	0.000	0.000
10.00	0.0001	0.0002	0.000	0.002	0.001	0.001
15.00	0.0003	0.0010	0.001	0.015	0.004	0.004
20.00	0.0008	0.0026	0.003	0.051	0.011	0.015
25.00	0.0016	0.0051	0.007	0.129	0.021	0.040
30.00	0.0029	0.0092	0.012	0.276	0.039	0.086
35.00	0.0047	0.0153	0.020	0.534	0.066	0.165
40.00	0.0073	0.0238	0.031	0.952	0.104	0.291
45.00	0.0107	0.0354	0.046	1.595	0.156	0.482
50.00	0.0152	0.0508	0.066	2.539	0.224	0.761
55.00	0.0209	0.0704	0.091	3.871	0.311	1.151
60.00	0.0281	0.0947	0.123	5.685	0.417	1.684
65.00	0.0368	0.1243	0.161	8.077	0.542	2.391
70.00	0.0472	0.1591	0.206	11.137	0.685	3.306
75.00	0.0595	0.1993	0.259	14.947	0.842	4.466
80.00	0.0738	0.2447	0.318	19.573	1.011	5.906
85.00	0.0901	0.2949	0.385	25.068	1.189	7.662
90.00	0.1085	0.3497	0.458	31.472	1.374	9.768
95.00	0.1290	0.4086	0.538	38.815	1.564	12.255
100.00	0.1515	0.4712	0.623	47.119	1.758	15.153
105.00	0.1761	0.5372	0.713	56.403	1.956	18.491
110.00	0.2027	0.6062	0.809	66.680	2.155	22.294
115.00	0.2312	0.6779	0.909	77.959	2.357	26.587
120.00	0.2616	0.7521	1.014	90.248	2.559	31.392
125.00	0.2938	0.8284	1.122	103.55	2.761	36.731
130.00	0.3279	0.9066	1.234	117.86	2.964	42.621
135.00	0.3636	0.9866	1.350	133.18	3.165	49.081
140.00	0.4009	1.0679	1.469	149.51	3.365	56.127
145.00	0.4398	1.1506	1.590	166.84	3.564	63.774
150.00	0.4802	1.2343	1.715	185.15	3.761	72.036
155.00	0.5221	1.3190	1.841	204.44	3.956	80.924
160.00	0.5653	1.4044	1.970	224.70	4.148	90.450
165.00	0.6098	1.4904	2.100	245.91	4.337	100.62
170.00	0.6556	1.5769	2.232	268.07	4.524	111.46
175.00	0.7026	1.6637	2.366	291.15	4.707	122.95
180.00	0.7507	1.7508	2.501	315.14	4.888	135.12
185.00	0.7998	1.8379	2.638	340.02	5.065	147.97
190.00	0.8500	1.9251	2.775	365.78	5.238	161.50
195.00	0.9011	2.0123	2.913	392.39	5.408	175.72
200.00	0.9532	2.0992	3.052	419.85	5.574	190.63
205.00	1.0061	2.1860	3.192	448.13	5.737	206.25
210.00	1.0598	2.2724	3.332	477.21	5.896	222.56
215.00	1.1143	2.3585	3.473	507.08	6.050	239.57
220.00	1.1695	2.4441	3.614	537.70	6.200	257.28
225.00	1.2254	2.5292	3.755	569.07	6.346	275.70
230.00	1.2819	2.6137	3.896	601.16	6.489	294.83
235.00	1.3390	2.6977	4.037	633.95	6.628	314.66
240.00	1.3967	2.7810	4.178	667.44	6.766	335.20
245.00	1.4548	2.8637	4.319	701.60	6.901	356.44
250.00	1.5135	2.9458	4.459	736.45	7.036	378.38
255.00	1.5727	3.0273	4.600	771.96	7.169	401.03
260.00	1.6322	3.1082	4.740	808.13	7.300	424.38
265.00	1.6922	3.1885	4.881	844.96	7.429	448.43
270.00	1.7525	3.2682	5.021	882.42	7.556	473.19
273.15	1.7907	3.3181	5.109	906.35	7.635	489.14
275.00	1.8132	3.3473	5.161	920.51	7.680	498.64
280.00	1.8743	3.4258	5.300	959.22	7.801	524.79
285.00	1.9356	3.5036	5.439	998.52	7.920	551.64
290.00	1.9972	3.5807	5.578	1038.4	8.036	579.18
295.00	2.0590	3.6572	5.716	1078.9	8.150	607.42
298.15	2.0981	3.7050	5.803	1104.7	8.220	625.56
300.00	2.1212	3.7330	5.854	1119.9	8.261	636.35

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-38 (CONT.)

THERMODYNAMIC FUNCTIONS FOR TITANIUM CARBIDE (TI C)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.=59.911 GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T^\circ-H_0^\circ)/T$	$(H_T^\circ-H_0^\circ)/T$	$(S_T^\circ-S_0^\circ)$	$(H_T^\circ-H_0^\circ)$	C_P°	$-(F_T^\circ-H_0^\circ)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
300.00	2.12	3.73	5.85	1120.	8.26	636.4
325.00	2.43	4.10	6.53	1333.	8.77	791.
350.00	2.75	4.45	7.20	1558.	9.21	963.
375.00	3.07	4.78	7.85	1793.	9.59	1151.
400.00	3.38	5.09	8.48	2037.	9.91	1355.
425.00	3.70	5.38	9.09	2288.	10.18	1575.
450.00	4.02	5.65	9.68	2546.	10.42	1809.
475.00	4.33	5.91	10.24	2809.	10.62	2058.
500.00	4.64	6.15	10.79	3077.	10.79	2321.
550.00	5.25	6.59	11.84	3624.	11.08	2888.
600.00	5.84	6.97	12.81	4185.	11.31	3504.
650.00	6.41	7.31	13.73	4755.	11.50	4168.
700.00	6.96	7.62	14.58	5334.	11.65	4876.
750.00	7.50	7.89	15.39	5921.	11.79	5626.
800.00	8.02	8.14	16.16	6513.	11.91	6415.
850.00	8.52	8.36	16.88	7112.	12.01	7242.
900.00	9.00	8.57	17.57	7715.	12.10	8103.
950.00	9.47	8.76	18.23	8322.	12.19	8999.
1000.00	9.92	8.93	18.86	8934.	12.27	9926.
1050.00	10.36	9.09	19.46	9549.	12.34	10884.
1100.00	10.79	9.24	20.03	10168.	12.41	11872.
1150.00	11.20	9.38	20.59	10791.	12.47	12888.
1200.00	11.60	9.51	21.12	11416.	12.54	13931.
1250.00	12.00	9.63	21.63	12045.	12.60	15000.
1300.00	12.38	9.75	22.13	12676.	12.65	16094.
1350.00	12.75	9.86	22.61	13311.	12.71	17213.
1400.00	13.11	9.96	23.07	13948.	12.76	18355.
1450.00	13.46	10.06	23.52	14587.	12.82	19520.
1500.00	13.80	10.15	23.95	15230.	12.87	20707.
1550.00	14.13	10.24	24.38	15874.	12.92	21915.
1600.00	14.46	10.32	24.79	16522.	12.97	23145.
1650.00	14.78	10.40	25.19	17171.	13.01	24394.
1700.00	15.09	10.48	25.58	17823.	13.06	25664.
1750.00	15.40	10.55	25.96	18478.	13.11	26952.
1800.00	15.70	10.63	26.33	19135.	13.16	28260.
1850.00	15.99	10.70	26.69	19794.	13.20	29585.
1900.00	16.27	10.76	27.04	20455.	13.25	30929.
1950.00	16.55	10.83	27.38	21119.	13.29	32290.
2000.00	16.83	10.89	27.72	21785.	13.34	33668.
2050.00	17.10	10.95	28.05	22453.	13.38	35062.
2100.00	17.36	11.01	28.38	23123.	13.42	36473.
2150.00	17.62	11.06	28.69	23796.	13.47	37900.
2200.00	17.88	11.12	29.00	24471.	13.51	39343.
2250.00	18.13	11.17	29.31	25147.	13.55	40801.
2300.00	18.38	11.22	29.60	25826.	13.60	42274.
2350.00	18.62	11.28	29.90	26508.	13.64	43761.
2400.00	18.86	11.33	30.19	27191.	13.68	45264.
2450.00	19.09	11.37	30.47	27876.	13.73	46780.
2500.00	19.32	11.42	30.75	28564.	13.77	48311.
2600.00	19.77	11.51	31.29	29946.	13.85	51413.
2700.00	20.21	11.60	31.81	31335.	13.94	54569.
2800.00	20.63	11.69	32.32	32734.	14.02	57776.
2900.00	21.04	11.77	32.81	34140.	14.10	61033.
3000.00	21.44	11.85	33.29	35555.	14.19	64339.
3100.00	21.83	11.92	33.76	36978.	14.27	67693.
3200.00	22.21	12.00	34.22	38410.	14.35	71092.
3300.00	22.58	12.07	34.66	39849.	14.43	74536.
3400.00	22.94	12.14	35.09	41297.	14.51	78024.
3410.00	22.98	12.15	35.13	41442.	14.52	78376.
			(LIQUID)			
3410.00	22.98	17.15	40.13	58492.	15.60	78376.
3500.00	23.43	17.11	40.54	59890.	15.46	82006.
3600.00	23.91	17.06	40.97	61428.	15.30	86082.
3700.00	24.37	17.01	41.39	62950.	15.14	90201.
3800.00	24.83	16.96	41.79	64456.	14.98	94360.
3900.00	25.27	16.90	42.18	65946.	14.82	98559.
4000.00	25.69	16.85	42.55	67420.	14.66	102796.

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-39

THERMODYNAMIC PROPERTIES FOR CARBON (C)
SOLID PHASE-GRAPHITE

GRAM MOLECULAR WT. = 12.011 GRAMS 1 CAL = 4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T^\circ - H_0^\circ)/T$	$(H_T^\circ - H_0^\circ)/T$	$(S_T^\circ - S_0^\circ)$	$(H_T^\circ - H_0^\circ)$	C_P°	$-(F_T^\circ - H_0^\circ)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID)			
0.00	0.	0.	0.	0.	0.	0.
50.00	0.0225	0.0404	0.0629	2.020	0.1210	1.125
100.00	0.0807	0.1468	0.2275	14.680	0.3963	8.07
150.00	0.1666	0.2897	0.4563	43.455	0.7719	24.99
200.00	0.2762	0.4623	0.7385	92.46	1.180	55.24
250.00	0.3997	0.6514	1.0511	162.85	1.629	99.92
273.15	0.4685	0.7426	1.2111	202.84	1.827	127.97
298.15	0.5294	0.8425	1.3719	251.19	2.038	157.84
300.00	0.5348	0.8499	1.3847	254.97	2.053	160.44
400.00	0.836	1.256	2.092	502.4	2.851	334.4
500.00	1.158	1.641	2.799	820.5	3.496	579.0
600.00	1.489	1.996	3.485	1197.6	4.03	893.4
700.00	1.821	2.317	4.138	1621.9	4.44	1274.7
800.00	2.150	2.603	4.753	2082.4	4.74	1720.0
900.00	2.471	2.854	5.325	2568.6	4.97	2223.9
1000.00	2.784	3.074	5.858	3074.0	5.15	2784.0
1100.00	3.086	3.268	6.354	3594.8	5.30	3394.6
1200.00	3.378	3.443	6.821	4131.6	5.42	4053.6
1300.00	3.660	3.600	7.260	4680.0	5.52	4758.0
1400.00	3.932	3.740	7.672	5236.	5.60	5504.8
1500.00	4.194	3.866	8.060	5799.	5.67	6291.0
1600.00	4.45	3.98	8.43	6368.	5.73	7120.
1700.00	4.69	4.09	8.78	6953.	5.77	7973.
1800.00	4.93	4.18	9.11	7524.	5.80	8874.
1900.00	5.16	4.27	9.43	8113.	5.83	9804.
2000.00	5.38	4.35	9.73	8700.	5.85	10760.
2100.00	5.59	4.42	10.01	9282.	5.9	11739.
2200.00	5.80	4.48	10.28	9856.	5.9	12760.
2300.00	6.00	4.54	10.54	10442.	5.9	13800.
2400.00	6.20	4.60	10.80	11040.	5.9	14880.
2500.00	6.39	4.66	11.05	11650.	6.0	15975.
2750.00	6.83	4.78	11.61	13145.	6.0	18782.
3000.00	7.25	4.88	12.13	14640.	6.0	21750.
3250.00	7.80	4.97	12.77	16152.	6.1	25350.
3500.00	8.02	5.05	13.07	17675.	6.1	28070.
3750.00	8.37	5.13	13.50	19237.	6.2	31388.
4000.00	8.70	5.20	13.90	20800.	6.2	34800.

H_0 and S_0 apply to the reference state of the solid at zero deg K.

TABLE B-40

THERMODYNAMIC FUNCTIONS FOR TITANIUM (TI)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT.= 47.90GRAMS 1 CAL=4.1840 ABS J

T DEG K = 273.15 + T DEG C

T	$-(F_T^\circ-H_0^\circ)/T$	$(H_T^\circ-H_0^\circ)/T$	$(S_T^\circ-S_0^\circ)$	$(H_T^\circ-H_0^\circ)$	C_P°	$-(F_T^\circ-H_0^\circ)$
DEG K	CAL/DEG MOLE	CAL/DEG MOLE	CAL/DEG MOLE	CAL/MOLE	CAL/DEG MOLE	CAL/MOLE
			(SOLID-ALPHA)			
0.00	0.0000	0.0000	0.000	0.000	0.000	0.000
5.00	0.0010	0.0018	0.003	0.009	0.005	0.005
10.00	0.0033	0.0054	0.009	0.054	0.015	0.033
15.00	0.0065	0.0117	0.018	0.175	0.036	0.098
20.00	0.0112	0.0226	0.034	0.453	0.079	0.225
25.00	0.0181	0.0407	0.059	1.017	0.153	0.452
30.00	0.0278	0.0684	0.096	2.052	0.268	0.833
35.00	0.0411	0.1080	0.149	3.779	0.430	1.439
40.00	0.0588	0.1605	0.219	6.421	0.634	2.352
45.00	0.0814	0.2260	0.307	10.171	0.871	3.661
50.00	0.1091	0.3033	0.412	15.164	1.129	5.454
55.00	0.1420	0.3904	0.532	21.471	1.395	7.810
60.00	0.1800	0.4851	0.665	29.109	1.660	10.799
65.00	0.2227	0.5855	0.808	38.055	1.918	14.478
70.00	0.2699	0.6895	0.959	48.268	2.166	18.894
75.00	0.3211	0.7960	1.117	59.696	2.404	24.084
80.00	0.3759	0.9036	1.280	72.288	2.631	30.073
85.00	0.4339	1.0117	1.446	85.992	2.849	36.885
90.00	0.4948	1.1195	1.614	100.76	3.055	44.534
95.00	0.5582	1.2266	1.785	116.53	3.251	53.031
100.00	0.6238	1.3324	1.956	133.24	3.434	62.384
105.00	0.6914	1.4366	2.128	150.84	3.604	72.594
110.00	0.7606	1.5387	2.299	169.26	3.761	83.663
115.00	0.8312	1.6385	2.470	188.43	3.906	95.586
120.00	0.9030	1.7358	2.639	208.30	4.040	108.36
125.00	0.9758	1.8305	2.806	228.82	4.165	121.97
130.00	1.0494	1.9226	2.972	249.94	4.282	136.42
135.00	1.1236	2.0120	3.136	271.62	4.391	151.69
140.00	1.1984	2.0988	3.297	293.83	4.493	167.77
145.00	1.2735	2.1831	3.457	316.54	4.589	184.66
150.00	1.3489	2.2648	3.614	339.72	4.679	202.33
155.00	1.4244	2.3440	3.768	363.32	4.763	220.79
160.00	1.5001	2.4208	3.921	387.33	4.840	240.01
165.00	1.5757	2.4953	4.071	411.72	4.913	259.99
170.00	1.6513	2.5674	4.219	436.46	4.981	280.72
175.00	1.7267	2.6373	4.364	461.52	5.045	302.18
180.00	1.8020	2.7050	4.507	486.90	5.106	324.35
185.00	1.8770	2.7707	4.648	512.58	5.163	347.24
190.00	1.9517	2.8344	4.786	538.53	5.217	370.83
195.00	2.0262	2.8962	4.922	564.75	5.269	395.10
200.00	2.1002	2.9561	5.056	591.22	5.318	420.05
205.00	2.1739	3.0143	5.188	617.93	5.365	445.66
210.00	2.2473	3.0708	5.318	644.87	5.411	471.93
215.00	2.3202	3.1257	5.446	672.03	5.454	498.84
220.00	2.3926	3.1791	5.572	699.41	5.495	526.38
225.00	2.4647	3.2310	5.696	726.98	5.535	554.55
230.00	2.5362	3.2816	5.818	754.76	5.574	583.34
235.00	2.6073	3.3307	5.938	782.72	5.611	612.73
240.00	2.6780	3.3786	6.057	810.87	5.647	642.71
245.00	2.7481	3.4253	6.173	839.19	5.682	673.29
250.00	2.8178	3.4707	6.289	867.68	5.715	704.44
255.00	2.8869	3.5151	6.402	896.34	5.747	736.17
260.00	2.9556	3.5583	6.514	925.15	5.778	768.46
265.00	3.0238	3.6004	6.624	954.12	5.808	801.31
270.00	3.0915	3.6416	6.733	983.22	5.836	834.70
273.15	3.1339	3.6670	6.801	1001.6	5.853	856.02
275.00	3.1587	3.6817	6.840	1012.5	5.863	868.64
280.00	3.2254	3.7209	6.946	1041.8	5.889	903.10
285.00	3.2916	3.7592	7.051	1071.4	5.913	938.10
290.00	3.3573	3.7965	7.154	1101.0	5.936	973.61
295.00	3.4225	3.8330	7.255	1130.7	5.958	1009.6
298.15	3.4633	3.8555	7.319	1149.5	5.971	1032.6
300.00	3.4872	3.8685	7.356	1160.6	5.978	1046.2

H_0 AND S_0 APPLY TO THE REFERENCE STATE OF THE SOLID AT ZERO DEG K

TABLE B-40 (CONT.)

THERMODYNAMIC FUNCTIONS FOR TITANIUM (Ti)
SOLID AND LIQUID PHASES

GRAM MOLECULAR WT. = 47.90 GRAMS 1 CAL = 4.1840 ABS J
T DEG K = 273.15 + T DEG C

T	$-(F_T^\circ-H_0^\circ)/T$	$(H_T^\circ-H_0^\circ)/T$	$(S_T^\circ-S_0^\circ)$	$(H_T^\circ-H_0^\circ)$	C_P°	$-(F_T^\circ-H_0^\circ)$
DEG K	CAL / DEG MOLE	CAL / DEG MOLE	CAL / DEG MOLE	CAL / MOLE	CAL / DEG MOLE	CAL / MOLE
			(SOLID-ALPHA)			
300.00	3.48	3.86	7.35	1160.	5.98	1045.
325.00	3.80	4.03	7.83	1311.	6.06	1235.
350.00	4.10	4.18	8.29	1463.	6.14	1437.
375.00	4.40	4.31	8.71	1618.	6.21	1650.
400.00	4.68	4.43	9.12	1774.	6.28	1873.
425.00	4.95	4.54	9.50	1932.	6.35	2106.
450.00	5.21	4.65	9.86	2092.	6.42	2348.
475.00	5.47	4.74	10.21	2253.	6.48	2599.
500.00	5.71	4.83	10.55	2416.	6.55	2858.
550.00	6.18	4.99	11.18	2747.	6.67	3402.
600.00	6.62	5.14	11.76	3084.	6.79	3976.
650.00	7.04	5.27	12.31	3427.	6.92	4578.
700.00	7.43	5.39	12.83	3776.	7.03	5207.
750.00	7.81	5.50	13.32	4131.	7.15	5861.
800.00	8.17	5.61	13.79	4492.	7.27	6539.
850.00	8.51	5.71	14.23	4858.	7.39	7240.
900.00	8.84	5.81	14.66	5231.	7.50	7962.
950.00	9.16	5.90	15.06	5609.	7.62	8705.
1000.00	9.46	5.99	15.46	5993.	7.73	9469.
1050.00	9.76	6.07	15.84	6382.	7.85	10252.
1100.00	10.04	6.16	16.21	6778.	7.96	11053.
1150.00	10.32	6.24	16.57	7179.	8.08	11873.
1156.00	10.36	6.25	16.61	7228.	8.09	11974.
			(SOLID-BETA)			
1156.00	10.36	7.07	17.43	8178.	7.50	11974.
1200.00	10.62	7.09	17.71	8508.	7.50	12746.
1250.00	10.91	7.11	18.02	8883.	7.50	13640.
1300.00	11.19	7.12	18.31	9258.	7.50	14548.
1350.00	11.46	7.14	18.60	9633.	7.50	15471.
1400.00	11.72	7.15	18.87	10008.	7.50	16408.
1450.00	11.97	7.16	19.13	10383.	7.50	17357.
1500.00	12.21	7.17	19.38	10758.	7.50	18320.
1550.00	12.45	7.18	19.63	11133.	7.50	19296.
1600.00	12.68	7.19	19.87	11508.	7.50	20284.
1650.00	12.90	7.20	20.10	11883.	7.50	21282.
1700.00	13.11	7.21	20.32	12258.	7.50	22293.
1750.00	13.32	7.22	20.54	12633.	7.50	23315.
1800.00	13.53	7.23	20.75	13008.	7.50	24347.
1850.00	13.72	7.23	20.96	13383.	7.50	25389.
1900.00	13.92	7.24	21.16	13758.	7.50	26442.
1950.00	14.10	7.25	21.35	14133.	7.50	27505.
			(LIQUID)			
1950.00	14.10	9.14	23.25	17833.	7.80	27505.
2000.00	14.34	9.11	23.45	18222.	7.76	28672.
2050.00	14.56	9.08	23.64	18609.	7.72	29849.
2100.00	14.78	9.04	23.82	18994.	7.68	31035.
2150.00	14.99	9.01	24.00	19377.	7.64	32232.
2200.00	15.20	8.98	24.18	19758.	7.60	33436.
2250.00	15.40	8.95	24.35	20137.	7.56	34648.
2300.00	15.60	8.92	24.52	20514.	7.52	35871.
2350.00	15.79	8.89	24.68	20889.	7.48	37100.
2400.00	15.97	8.86	24.83	21262.	7.44	38338.
2450.00	16.16	8.83	24.99	21633.	7.40	39582.
2500.00	16.33	8.80	25.14	22002.	7.36	40835.
2600.00	16.68	8.74	25.42	22734.	7.28	43363.
2700.00	17.01	8.69	25.70	23458.	7.20	45922.
2800.00	17.32	8.63	25.96	24174.	7.12	48503.
2900.00	17.62	8.58	26.20	24882.	7.04	51112.
3000.00	17.92	8.53	26.44	25582.	6.96	53745.
3100.00	18.19	8.48	26.67	26274.	6.88	56401.
3200.00	18.46	8.42	26.89	26958.	6.80	59078.
3300.00	18.72	8.37	27.09	27634.	6.72	61776.
3400.00	18.97	8.32	27.29	28302.	6.64	64498.
3500.00	19.21	8.28	27.48	28962.	6.56	67235.

H_0° and S_0° apply to the reference state of the solid at 0°K.

Appendix C

HEAT OF FORMATION AND DISSOCIATION ENERGY

G. T. Armstrong, H. W. Woolley, W. H. Evans, and L. A. Krieger

The heats of formation of the elements considered in this report are listed in table C-1. In this table are shown the heats of formation in the standard states at 0°K and 298.15°K and the energy of dissociation to atoms at 0°K and 298.15°K. Values are expressed in terms of the defined calorie: 1 calorie = 4.1840 absolute joules. All values in table C-1 are from Stull and Sinke [37]* except those for fluorine, which are based on the correlation by Stamper and Barrow [38], nitrogen, which are given in the review by Brewer and Searcy [39], and carbon. The value for gaseous carbon is obtained by combining the dissociation energy of CO(g) reported by Douglas [41] with the heat of formation from [30] and the dissociation energy of O_2. As Brewer and Searcy [39] have pointed out, there is an uncertainty in this value because the exact dissociation products are not known. We have assumed them to be the atoms in their ground states, $^3P_0$ for C and $^3P_2$ for O. If other configurations such as $^3P_2$ and $^3P_0$ are assumed to be the products, the heat of sublimation of carbon would be lowered by up to 0.7 kcal.

Heats of formation and dissociation energies at the same temperature for the compounds and molecular species of the elements are shown in table C-2. In this table the value for a given element of compound with the smaller number of significant figures indicates the accuracy of the value. Derived quantities are shown with larger numbers of significant figures in some cases, to show differences. The various values listed for a given substance are consistent with values for $(H_{298} - H_0)$ given in the tables of thermodynamic functions.

Some discussion of the compounds tabulated is given in several preceding reports of this series. In NBS Report No. 6297 the aluminum oxides and oxyhydrates are discussed in more detail than in other reports. In NBS Report No. 6484 is contained the most complete set of discussions of individual compounds. A few values were modified and a few additional compounds are discussed in later reports. NBS Report 6684 contains a discussion of the carbides and nitrides of Aℓ, Be, Mg, Li and Ti and TiO_2. It also gives errata in earlier reports, new values for AℓF(g), AlF_3(c) and BeF_2(c) and lists additional data received but not incorporated into the tables. The present report lists more additional data which has not been incorporated, and gives discussions and revisions of data for AℓN, MgF_2, and $BeCl_2$, together with changes in other compounds dependent upon them. The differences in heats of formation at 0°K and 298°K are based upon the thermal tables in NBS Report 6484. Slightly revised tables for Li, LiCℓ(c), AℓN(c), and $AlCl_3$(c) are in preparation but have not been used here.

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* Numbers in brackets refer to references at the end of Chapter 4.

Table C-1

Standard Heats of Formation and Dissociation Energies of the Elements

Substance	State	$\Delta Hf°$		ΔH to gaseous atoms	
		at 0°K kcal/mole	at 298.15°K kcal/mole	at 0°K kcal/mole	at 298.15°K kcal/mole
H	g	51.621	52.090	0	0
H_2	g	0	0	103.242	104.180
O	g	58.980	59.550	0	0
O_2	g	0	0	117.960	119.100
F	g	18.357	18.860	0	0
F_2	g	0	0	36.714	37.720
Cl	g	28.540	28.942	0	0
Cl_2	g	0	0	57.080	57.884
Al	c	0	0	76.940	77.500
Al	g	76.940	77.5	0	0
Be	c	0	0	76.887	77.900
Be	g	76.887	77.9	0	0
Mg	c	0	0	35.313	35.600
Mg	g	35.313	35.6	0	0
Li	c	0	0	38.050	38.439
Li	g	38.05	38.439	0	0
N	g	112.52	112.96	0	0
N_2	g	0	0	225.04	225.93
C	c,graphite	0	0	169.988	171.299
C	g	169.988	171.299	0	0
Ti	c	0	0	112.76	113.41
Ti	g	112.76	113.41	0	0

Table C-2. Standard Heat of Formation and Dissociation Energy of Compounds and Gaseous Metals.

Substance	State	ΔHf		ΔH to gaseous atoms	
		at 0°K kcal/mole	at 298.15°K kcal/mole	at 0°K kcal/mole	at 298.15°K kcal/mole
			Aluminum Compounds		
Al_2	g	103.88		50. ±30	
Al_2O	g	-38.76	-39.4 ±5	251.62	253.95
AlO	g	16.92	16.89	119. ±8	120.16
Al_2O_2	g	-104.16	-105.28	376. ±30	379.38
AlO_2^-	(aq,a=1)		-221. ±3		
Al_2O_3-α	c	-397.5	-400.4 ±3	728.32	734.05
Al_2O_3-γ	c		-384.8 ±3		718.45
Al_2O_3-ρ	c		-394.0 ±4		727.65
$Al_2O_3 \cdot H_2O$-α	c	-459.26	-463.4 ±3	952.30	960.78
$Al_2O_3 \cdot H_2O$-β	c		-478. ±4		975.38
$Al_2O_3 \cdot 3H_2O$-α	c	-607.02	-615.4 ±5	1424.51	1440.24
$Al_2O_3 \cdot 3H_2O$-β	c		-612.6 ±6		1437.44
AlH	g	57.56		71. ±20	
AlH_3	g		18. ±10		215.77
$(AlH_3)_x$	c		-3. ±10		236.77
$Al(OH)_3$	amorph		-304. ±4		716.42
AlF	g	-61.28	-61.3 ±2	156.58	157.66
AlF_3	c	-354.82	-356.3 ±2	486.83	490.38
AlF_3	g	-283.77	-284.8 ±6	415.78	418.88
$AlCl$	g	-11.34	-11.3 ±1	116.82	117.74
$AlCl_2$	g	-77.81	-78. ±5	211.83	213.38
$AlCl_3$	g	-138.48	-138.9 ±2	301.04	303.23
$AlCl_3 \cdot 6H_2O$	c		-643.6 ±0.5		1790.31
Al_2Cl_6	c		-337.14 ±0.5		

Table C-2. - Continued

Substance	State	ΔHf at 0°K kcal/mole	ΔHf at 298.15°K kcal/mole	ΔH to gaseous atoms at 0°K kcal/mole	ΔH to gaseous atoms at 298.15°K kcal/mole
Al_2Cl_6	g	-311.39	-312.3 ±2	636.51	640.95
AlN	c		-76.0		266.46
AlC	g	209.		37.93	
Al_2C_2	g		121. ±10		376.60
Al_4C_3	c		-48.6 ±10		
		Beryllium Compounds			
Be_2	g	137.77		16. ±10	
BeO	c	-142.28	-143.1 ±4	278.15	280.55
BeO	g	29.87	30.44	106. ±5	107.01
BeH	g	77.51		51. ±7	
$Be(OH)_2$	c		-213.9 ±5		515.08
$Be(OH)_2$	g		-162.4		463.58
BeF	g	3.24	3.80	92. ±30	92.96
BeF_2	c		-241.2 ±2		356.82
BeF_2	g	-182.55	-182.9 ±6	296.15	298.52
BeCl	g	36.43	36.98	69. ±30	69.86
$BeCl_2$	c		-118.0 ±1		253.78
$BeCl_2$	g	-86.35	-86.5 ±6	220.32	222.28
Be_2Cl_4	g		-205.6 ±10		477.17
Be_3N_2	c		-132. ±3		591.62
BeC_2	g	>134.3 ±10		>282.56	
Be_2C	c		- 22.2 ±5		349.3
		Magnesium Compounds			

(See next page)

Table C-2. - Continued

Substance	State	ΔHf at 0°K kcal/mole	ΔHf at 298.15°K kcal/mole	ΔH to gaseous atoms at 0°K kcal/mole	ΔH to gaseous atoms at 298.15°K kcal/mole
Mg_2	g	63.43		7.2 ±2	
MgO	c	-142.70	-143.7 ±0.3	236.99	238.85
MgO	g	4.29	4.19	90. ±5	90.96
MgO_2	c		-148.9 ±4		303.60
MgH	g	40.93		46. ±10	
MgH_2	c	-16.06	-18. ±5	154.62	157.78
$Mg(OH)_2$	c	-218.43	-221.0 ±0.7	474.95	479.88
MgF	g	-20.33	-20.44	74. ±20	74.90
MgF_2	c	-263.07	-264.0 ±4	335.10	337.32
MgF_2	g	-178.09	-178.8	250.12	252.12
MgCℓ	g	1.85	1.80	62. ±20	62.74
$MgCℓ_2$	c	-153.30	-153.40 ±0.2	245.69	246.88
$MgCℓ_2$	g	-107.23	-107.64 ±0.6	199.62	201.12
$MgCℓ_2 \cdot H_2O$	c	-229.79	-231.15 ±0.2	484.41	488.36
$MgCℓ_2 \cdot 2H_2O$	c	-303.20	-305.99 ±0.2	720.04	726.93
$MgCℓ_2 \cdot 4H_2O$	c	-448.25	-454.00 ±0.25	1189.53	1202.40
$MgCℓ_2 \cdot 6H_2O$	c	-588.79	-597.42 ±0.30	1654.52	1673.28
Mg_3N_2	c		-110.2 ±1		442.92
MgC_2	c		21. ±5		357.20
Mg_2C_3	c		19. ±8		566.10
		Lithium Compounds			
Li_2	g	50.35	50.47	25.76 ±0.10	26.41
LiO	g	14.03		83. ±5	
Li_2O	c	-140.91	-142.4 ±0.5	275.99	278.83
Li_2O_2	c		-151.5 ±5		347.48
LiH	c		-21.64 ±1.5		112.17
LiH	g	33.67		56.0 ±10	

Table C-2. - Continued

Substance	State	ΔHf at 0°K kcal/mole	ΔHf at 298.15°K kcal/mole	ΔGf at 0°K kcal/mole	ΔGf at 298.15°K kcal/mole
LiOH	c	-115.03	-116.4 ±0.2	263.68	266.48
LiF	c	-145.70	-146.3 ±2	202.11	203.60
LiF	g	-79.26	-79.3 ±3	135.67	136.60
$(LiF)_2$	g	-221.24	-222.6 ±5	334.05	337.20
$(LiF)_3$	g		-345.3 ±8		517.20
$LiHF_2$	c		-224.2 ±1		352.45
LiCℓ	c	-97.51	-97.70 ±2	164.10	165.09
LiCℓ	g	-45.21	-45.24	111.8 ±4	112.62
$(LiC\ell)_2$	g	-143.22	-144.12	276.4 ±3	278.88
$(LiC\ell)_3$	g	-224.4	-226.	424.2 ±5	428.34
$Li_2FC\ell$	g	-182.2	-183.3	305.2	307.98
Li_3N	c		-47.5 ±2		275.78
Li_2C_2	c		-14.2 ±2		433.68
		Titanium Compounds			
TiO_2 (rutile)	c	-224.34	-225.5 ±1.0	455.06	458.01
TiN	c	-79.63	-80.5 ±1.5	304.91	306.87
TiC	c	-43.5	-43.8 ±2	326.25	328.51

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