NASA SP–3088
NBSIR 74–374

THERMODYNAMIC AND RELATED PROPERTIES OF PARAHYDROGEN FROM THE TRIPLE POINT TO 300 K AT PRESSURES TO 1000 BAR

By L. A. Weber
Cryogenics Division, Institute for Basic Standards
National Bureau of Standards, Boulder, Colorado

Prepared for NASA Lewis Research Center

Scientific and Technical Information Office 1975
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

Contents

Page

1. Introduction 1

2. Experimental Method 2

2.1 Description of Apparatus 2

2.2 Experimental Procedure. 3

3. Experimental Results 4

3.1 The Data 4

3.2 Representation of the Data. 4

3.3 Estimate of Uncertainty of the PVT Data 7

3.4 Comparisons with Previous Data 8

3.5 Thermodynamic Properties 9

4. Acknowledgments 12

5. References 13

Appendix A. Interpolation Functions and Parameters Defining the Second and Third Virial Coefficients. 15

Appendix B. Fixed Points and Phase Equilibrium Boundaries Used for Parahydrogen, Taken from Reference [2]. 18

List of Figures

Figure 1. Density-temperature diagram showing location of the new data as well as the earlier data. 21

Figure 2. Density-temperature diagram showing the three regions used for the representation of the data. . . . 22

Figure 3. Comparison of data with the surface given in ref. [3]; 0 - 40 K, □ - 60 K, Δ - 90 K 23

List of Figures (Continued)

Page

Figure 4. Comparison with the data of Michels et al. [4] as represented by the surface given in ref. [3]; Δ - 120 K, □ - 200 K, 0 - 300 K. 24

Figure 5. Density differences between normal and para-hydrogen at a given temperature and pressure . . 25

Figure 6. Comparison of enthalpy with values calculated by Michels et al., [4]. 26

List of Tables

Table I Experimental PVT data for parahydrogen 27

Table II Parameters used in equation (2) 37

Table III Parameters used in equation (3) 42

Table IV Parameters for equation (4) 48

Table V Thermodynamic properties of parahydrogen on the liquid-vapor boundary 49

Table VI Thermodynamic properties of parahydrogen on isobars 50

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 300 K at Pressures to 1000 Bar*

L. A. Weber

NBS compressibility measurements and thermodynamic properties data for parahydrogen have been extended to higher temperatures and pressures. Results of an experimental program are presented in the form of new PVT data in the temperature range 23-300 K at pressures up to 800 bar. Also given are tables of thermodynamic properties on isobars to 1000 bar including density, internal energy, enthalpy, entropy, specific heats at constant volume and constant pressure, velocity of sound, and the surface derivatives $(\partial P/\partial T)_V$ and $(\partial P/\partial \rho)_T$. The accuracy of the data is discussed and comparisons are made with previous data.

Key words: density, enthalpy, entropy, hydrogen, properties of fluids, specific heat, velocity of sound.

1. Introduction

Approximately ten years ago this laboratory published accurate measurements of the densities, compressibilities and thermodynamic properties of parahydrogen in the range from the triple point to 100 K at pressures up to 340 bar [1, 2]. That work was sponsored by NASA and it satisfied most of the requirements of the U.S. space program at that time for properties data on hydrogen. In recent years, however, new programs have resulted in the need for an accurate knowledge of the properties of hydrogen, and other fluids, over a much wider range of temperatures and pressures. An interim report [3] attempted to satisfy those needs by extrapolating the available data to higher pressures. We have now extended our previous PVT measurements to higher temperatures (300 K) and pressures (800 bar). This report presents the results of that experimental program. Approximately 374 PVT data points were measured.

*This work was carried out at the National Bureau of Standards under the sponsorship of the National Aeronautics and Space Administration.

at 31 densities ranging from 10 to 44 mol/ℓ. Experimental pressures ranged up to about 800 bar, and the tables of derived properties have been extrapolated to 1000 bar for the convenience of the user.

The data have been smoothed and represented analytically to allow calculation of the thermal properties. The results have been compared with the earlier NBS data and, above 100 K, with the data of Michels et al. [4].

2. Experimental Method

2.1 Description of the Apparatus

The apparatus originally designed and described by Goodwin [5] was used with some modifications. Only a brief description is given here. The sample holder consists of a heavy-walled copper container with a small cavity having a volume of about 27 cm^3. Temperatures are measured with a platinum resistance thermometer mounted in a well in the sample holder. The sample is introduced into the cavity via a stainless steel capillary having a diameter of about 0.033 cm. The sample holder is mounted in a nearly adiabatic cryostat, and the small amount of residual cooling is balanced by means of a temperature controller and a heater wrapped around the outside of the copper container. Pressure is measured by means of an oil-operated dead weight gage. The pressure measuring system was described in more detail by Weber [6]. The amount of sample is determined by releasing it into a set of four calibrated, thermostated glass bulbs having volumes from one to twenty liters. Pressure in the bulbs is measured by means of a quartz spiral bourdon gage. A more complete description of the apparatus in its present form has been given by Prydz and Straty [7] in their work on fluorine. The parts of the apparatus dealing with the problems of sample preparation and disposal, unique to fluorine, were dismantled for this work. The sample preparation system for the hydrogen samples consisted of a

Molecular sieve trap at 76 K to remove any water and an ortho-para conversion trap maintained at 20 K. The ortho-para composition was monitored by means of an analyzer operating on the principle of a thermal conductivity bridge. Samples were taken from cylinders of ultra high purity hydrogen.

The volume calibrations given in reference [7] for the various parts of the apparatus were used in this work with two exceptions. The differential pressure indicator, used to separate the hydrogen sample from the working fluid of the pressure measuring system, was replaced with one in which the parts in contact with the hydrogen were fabricated from A-286 steel. The volume of this device is an important factor in computing the density. It was redetermined by gas expansion into a calibrated glass bulb and found to be 0.59 cm^3. The other volume change was that of the sample holder itself. This container is made of electrolytic tough pitch copper, and its elastic limit was estimated by means of a model for thick-wall vessels to be in the neighborhood of 1000 bar. However, after it was pressurized to a maximum pressure of 850 bar its volume was found to have increased inelastically by 5.1%. This fact was determined by comparing the PVT data taken before and after the pressurization with the earlier results from the same apparatus in reference [1]. This pressure was never exceeded during the subsequent experimental work, and numerous similar comparisons confirmed the fact that the volume did not increase further. The volume of the sample holder at 293 K and a pressure of one bar used here is 27.199 cm^3. Suitable adjustments for changes in temperature and pressure were made as given in reference [7].

2.2 Experimental Procedure

In practice the sample, having passed through the preparation system, is loaded into the sample holder at some predetermined filling conditions and sealed off by means of a stainless steel valve mounted

on top of the cryostat. During this procedure some of the gas is bled off into the ortho-para analyzer. Pressure is measured as a function of temperature at discreet, integral temperatures along a path of nearly constant density. When the maximum temperature or pressure is reached, the sample is released into the glass bulbs. The bulbs are chosen in such a way that the final pressure is about one bar. Measurement of this pressure, coupled with the use of room temperature virial coefficients, which are generally known, allows the calculation of the amount of sample.

3. Experimental Results

3.1 The Data

Approximately 374 new data points were taken along 31 lines of constant density (isochores). Data on each isochore were measured on a set of predetermined temperatures so that the ultimate result would be a set of isotherms. Temperatures above 90 K were measured on the IPTS 1948 and, below 90 K, on the NBS 1955 temperature scales so that the results could be integrated with the earlier NBS data in reference [1]. For each experimental density one or more data points were measured within the range of the data of reference [1] in order to insure the continued compatibility of the two sets of data. The data are given in Table I and their location with respect to the earlier data is shown in Figure 1. Experimental temperatures on the IPTS 68 scale are also included in the table.

3.2 Representation of the Data

The combined sets of the present data and those from [1] were used in the formulation of the PVT surface. No attempt has been made to fit all the data to one wide-range equation of state. Instead the data were divided into three regions, by density, and each region was smoothed and interpolated by the means which seemed most appropriate. Location of the three regions is shown in Figure 2, and they are discussed separately below.

Low density region. In order to insure proper behavior of some of the thermodynamic properties, such as entropy, it is necessary to represent the low density region with an analytic surface having a virial-type expansion in density. A truncated virial expression with two coefficients,

$$P = RT\rho(1 + B\rho + C\rho^2) \tag{1}$$

was found to represent the data with sufficient accuracy up to a density of 7 mol/l, or about one half critical density. The temperature dependence of the virial coefficients, B and C, is especially important due to the fact that the derived thermodynamic properties depend on the first and second temperature derivatives of these quantities. Thus the success of a given mathematical representation should be judged not only by how well the experimental densities are reproduced but also by how well any experimental thermodynamic properties can be reproduced. The latter criterion is much more stringent. The expressions for B and C in reference [2] were successfully used to calculate specific heats in agreement with experimental values at temperatures up to 100 K, and they are used here. For temperatures above 100 K we have data only for densities greater than about 10 mol/ℓ. Therefore we were forced to look elsewhere for virial coefficients. The correlation by Goodwin et al. [8] gives expressions for B and C from 15 to 423 K. These appear to have the proper behavior in the region of interest here and they were incorporated into the PVT surface for the range 100 to 300 K. A complete description of the functions and parameters used for B and C is given in Appendix A.

Intermediate densities. The data in this region are represented by 58 isotherm polynomials of the form

$$P = RT\rho + \sum_{J=1}^{N} A_J \rho^{(J+1)} . \tag{2}$$

The number of coefficients varied from a maximum of 15 for the 33 K isotherm to a minimum of 3. These isotherms fit the data with standard deviations of 0.01-0.03% in density. The isotherms were used to interpolate the data to even increments in density. The pressure-temperature pairs thus obtained for a given density were fit with an isochore polynomial of the form,

$$P = \sum_{J=1}^{5} A_J T^{(3-J)} . \qquad (3)$$

A total of 68 isochore polynomials were used between 6.5 and 40 mol/ℓ, with a 0.5 mol/ℓ increment in density. The parameters used in equations (2) and (3) are given in Tables II and III respectively.

High densities. The high density compressed liquid data, bounded by the melting curve and the 38 mol/ℓ isochore, were represented by means of a fourteen parameter empirical surface given by

$$P = RT\rho + (A_1T^2+A_2T+A_3+A_4/T) + (A_5T^2+A_6T+A_7+A_8/T+A_9/T^2)\rho$$

$$+ (A_{10}T^2+A_{11}T+A_{12})\rho^2 + (A_{13}T^2 + A_{14}T)\rho^3 . \qquad (4)$$

The values of the parameters are given in Table IV. The surface was constrained to the triple point given in [2]. Standard deviation for the fit of this surface was 0.014% in density, and it was used for representing the PVT surface at densities greater than 40 mol/ℓ.

Other data. The critical parameters, melting pressures, liquid-vapor two phase boundary, and vapor pressure curve were all taken from [2]. and they are repeated in Appendix B for the convenience of the reader.

Interpolation methods for densities. Equations (1-4) are all explicit in pressure. Therefore the density at a given temperature and

pressure must be found by iteration. In the low and high density regions a simple Newton's iteration was used along an isotherm of the analytic surfaces (1) or (4). In the intermediate density region densities were found by a linear interpolation between the isochores tabulated in Table III.

3.3 Estimate of Uncertainty of the PVT Data

Based upon a consideration of the uncertainties in the calibration procedure and upon the results of several workers over a period of years, the volume of the sample holder is believed to be known to within 0.1%. The uncertainty in the room temperature volumes connected to the sample holder is about 0.02 cm^3. Thus the maximum uncertainty from these two sources varies from 0.1% for a low temperature compressed liquid to 0.17% for the room temperature gas data. Corrections were made for the temperature variation of the sample holder volume using well known thermal expansion data for copper. Uncertainties due to this source are estimated to be of the order of 0.01%. Corrections for the volume change with pressure were also made using the Young's modulus for copper and a relationship applicable to thick-wall containers. The remaining uncertainty is probably of the order of several hundredths of one percent at the highest pressures. The accuracy of the pressure gage is claimed to be 0.01%. Corrections were made for the hydrostatic pressure heads in the apparatus connected to the sample holder during measurements. Errors due to this source are considered negligible. Temperatures were measured and reproduced to within about 0.001 K. Overall accuracy of the potentiometric measurement of the absolute temperature is less, however, and varies from 0.002 K at 50 K to 0.028 K at room temperature. The above uncertainties are systematic and the total is seen to vary from a minimum of about 0.1% for the low pressure compressed liquid to about 0.2% for the high

pressure room temperature gas data. The experimental precision is about 0.02% in density.

The above uncertainties apply to the experimental data. It is inevitable that the interpolation functions used to calculate the final tables will degrade the accuracy somewhat. This effect may be seen by using the experimental data as input test points for the computer program which is used to calculate the smoothed tables. When this is done the standard deviation of all the data from the calculated surface is 0.04% in density. The deviation of the individual points is given in the last column in Table I.

3.4 Comparisons with Previous Data

The present data have been compared to the earlier data of [1] and [4] via the surface representation in reference [3], which was fit to the data of [1] below 90 K and to the data of [4] above 100 K. The average deviation of the new data from the earlier NBS data of [1] is 0.021% in density based on a comparison of 37 data points. Reference [3] also included an extrapolation of the data of [1] up to a pressure of 10,000 psia (689 bar). Figure 3 is a comparison of that extrapolation with the present data at three temperatures. It is seen that the differences approach one percent in density at the highest pressures. The apparent scatter shown in the figure is mostly in the calculated extrapolation rather than the experimental data.

Comparison with the work of Michels et al., [4], is more complex as the differences exhibit systematic trends with both temperature and density. A comparison at three temperatures is given in Figure 4. Deviations are seen to be as large as 0.25%. The data of Michels et al. were measured on normal hydrogen while our data are for para-hydrogen. It has not been determined whether the above differences

could be due to the different compositions. As part of the preliminary work for this project some PVT measurements were made at lower temperatures on hydrogen of approximately normal composition. Those results along with some earlier measurements, [5, 9], are compared with the parahydrogen PVT surface in Figure 5. Although the three sets of data shown are not completely consistent, the figure suggests that while the difference between the densities of liquid normal and parahydrogen is large, at higher temperatures it should be less than 0.1%. The present results are based entirely on parahydrogen data.

3.5 Thermodynamic Properties.

Accurate representation of precise PVT data allows calculation of the equilibrium thermodynamic properties by means of the appropriate thermodynamic relationships. These relationships and calculation techniques have been given in reference [2] and elsewhere, and they will not be repeated here. Only the change of each property with density at constant temperature is calculated, and to this must be added the ideal gas value at that temperature. The thermodynamic properties of the ideal gas used here are the same as used in reference [3], which were originally taken from the work of Woolley, Scott, and Brickwedde [10]. The results are tabulated for the liquid-vapor coexistence boundary in Table V and along isobars from 1-1000 bar in Table VI. For the low and high density regions, described by equations (1) and (4), thermodynamic properties such as enthalpy could be calculated explicitly as functions of density and temperature. For the intermediate densities, however, there are no closed form calculations, and numerical integrations were used to calculate the derived properties. The tables use the gram as the unit of mass, and the molecular weight was taken to be 2.01572.

A rigorous calculation of the uncertainties in the derived properties is generally not possible. Comparison with experimentally measured values is to be preferred when the latter are available. Often

it is necessary to rely on the estimate of the author and on comparisons of values calculated from the data of different laboratories. In reference [2] calculated and experimental values of C_v were found to agree to within 1%. A similar comparison with experimental velocity of sound values showed agreement to within 0.5%. In the broader range of temperature and pressure considered here, where no experimental data exist for C_v or velocity of sound, we may expect the calculated values to have about the same accuracy. We may arrive at the same estimate by considering the thermodynamic relationship used to calculate C_v. The contribution of the PVT surface to the specific heat depends on the second derivative of the PVT surface in the integral $\int (\partial^2 P/\partial T^2)_v \, d\rho/\rho^2$. The precision of the experimental data leads us to believe that we can calculate this isochore second derivative with an accuracy of about 10%. However, except in the critical region, this contribution amounts to only about 10% of the total specific heat. The uncertainty in the 90% contribution from the ideal gas is negligible for simple molecules. The specific heat at constant pressure, C_P, is derived from C_v by means of first derivatives of the PVT surface, $(\partial P/\partial T)_v$ and $(\partial P/\partial \rho)_T$, which are tabulated in Tables V and VI. The uncertainties in these quantities are of the order of 1%, leading to a similar uncertainty in C_P.

The uncertainty in the tabulated values for enthalpy and entropy may be estimated in similar fashion. For example, enthalpy is obtained via the relation,

$$H(T,\rho) = H^o(T) + P/\rho - RT + \int_o^\rho \left[P - T\left(\frac{\partial P}{\partial T}\right)_\rho\right] \frac{d\rho}{\rho^2}, \qquad (5)$$

where H^o refers to the ideal gas. The integrand in equation (5) vanishes for an ideal gas and for a real gas such as hydrogen at room temperature it becomes a small difference between two large quantities. Fortunately in such cases where the relative uncertainty is large, this term makes

only a small contribution to the calculated enthalpy. By the use of such arguments we may say that we expect the tabulated enthalpy to have an uncertainty which varies from zero at the low density limit to a maximum of about 10 J/mol for the liquid and the high pressure gas. This uncertainty would also apply to the internal energy. Uncertainty in the entropy varies from zero to about 0.05 J/mol-K for the compressed gas and about 0.1 J/mol-K for the liquid. Uncertainties for all properties are larger in the critical region.

A comparison between the tabulated enthalpies and those calculated by Michels et al. [4] is given in Figure 6. It is seen that the difference between the two calculations reaches a maximum of 27 J/mol at room temperature. The density differences in this region, shown in Figure 4, would account for about 3 J/mol. Comparison was also made with the recent direct enthalpy measurements of Dawe and Snowdon [11], which were performed on normal hydrogen at pressures up to 100 bar (densities up to about 5 mol/ℓ) along five isotherms between 222 and 367 K. Their results agree very well with our calculations and with those of Michels et al. in this low density range.

4. Acknowledgments

The author is indebted to D. E. Diller and G. C. Straty for many helpful discussions and to R. D. McCarty for the least-squares program used here. This work was supported by NASA Contract C-32369-C.

5. References

[1] Goodwin, R. D., Diller, D. E., Roder, H. M., and Weber, L. A., Pressure-Density-Temperature Relations of Fluid Para Hydrogen From 15 to 100°K at Pressures to 350 Atmospheres, J. Res. Nat. Bur. Stand. 67A, No. 2, 173-192 (1963).

[2] Roder, H. M., Weber, L. A., and Goodwin, R. D., Thermodynamic and Related Properties of Parahydrogen From the Triple Point to 100 K at Pressures to 340 Atmospheres, Nat. Bur. Stand. Monograph 94 (1965).

[3] McCarty, R. D., and Weber, L. A., Thermophysical Properties of Parahydrogen from the Freezing Line to 5000 R for Pressures to 10,000 Psia, Nat. Bur. Stand. Tech. Note 617 (1972).

[4] Michels, A., De Graaff, W., Wassenaar, T., Levelt, J. M. H., and Louwerse, P., Compressibility Isotherms of Hydrogen and Deuterium at Temperatures Between -175 C and 150 C, Physica 25, 25-42 (1959);

and

Michels, A., De Graaff, W., and Wolkers, G. J., Thermodynamic Properties of Hydrogen and Deuterium at Temperatures Between -175 C and 150 C at Densities up to 840 Amagat, Physica 25, 1097-1124 (1959).

[5] Goodwin, R. D., Apparatus for Determination of Pressure-Density-Temperature Relations and Specific Heats of Hydrogen to 350 Atmospheres at Temperatures Above 14 K, J. Res. Nat. Bur. Stand. 65C, No. 4, 231-243 (1961).

[6] Weber, L. A., PVT, Thermodynamic and Related Properties of Oxygen from the Triple Point to 300 K at Pressures to 33 MN/m^2, J. Res. Nat. Bur. Stand. 74A, No. 1, 93-129 (1969).

[7] Prydz, R., and Straty, G. C., The Thermodynamic Properties of Gaseous and Liquid Fluorine, Nat. Bur. Stand. Tech. Note 392 (1970).

[8] Goodwin, R. D., Diller, D. E., Roder, H. M., and Weber, L.A., Second and Third Virial Coefficients for Hydrogen, J. Res. Nat. Bur. Stand. 68A, No. 1, 121-125 (1963).

[9] Goodwin, R. D., Diller, D. E., Roder, H. M., and Weber, L. A., The Densities of Saturated Liquid Hydrogen, Cryogenics 2, 81-83 (1961).

[10] Woolley, H. W., Scott, R. B., and Brickwedde, F. G., Compilation of Thermal Properties of Hydrogen in its Various Isotopic and Ortho-para Modifications, J. Res. Nat. Bur. Stand. 41, 379-475 (1948).

[11] Dawe, R. A. and Snowdon, P. N., Experimental Enthalpies for Gaseous Hydrogen in the Range 1 to 100 bar and 367.00 to 222.15 K, Physica 74, 435 (1974).

[12] McCarty, R. D., A Modified Benedict-Webb-Rubin Equation of State for Parahydrogen, Nat. Bur. Stand. NBSIR 74-357 (1974).

Appendix A. Interpolation Functions and Parameters Defining the Second and Third Virial Coefficients

B is in cm^3/mol, C in $\left(cm^3/mol\right)^2$.

(a) Second virial coefficient.

For temperatures less than 100 K [2]:

$$RTB = A_1T + A_2 + A_3/T + A_4/T^2 \qquad (1a)$$

with

$$A_1 = 1.939\ 7741 \times 10^3$$

$$A_2 = -1.927\ 9522 \times 10^5$$

$$A_3 = -2.289\ 0051 \times 10^6$$

$$A_4 = 1.109\ 4088 \times 10^7$$

Temperatures greater than 100 K [8]:

$$B = B_1x^{1/4} + B_2x^{3/4} + B_3x^{5/4} + B_4x^{7/4} \qquad (2a)$$

where $x = 109.781/T$ and

$$B_1 = 42.464$$

$$B_2 = -37.1172$$

$$B_3 = -2.2982$$

$$B_4 = -3.0484$$

(b) Third virial coefficient.

Temperatures less than 55 K [2]:

$$RTC = C_1T^2 + C_2T + C_3 + C_4/T + C_5/T^2 + C_6/T^3 \qquad (1b)$$

Two sets of parameters were used

	$T<T_c$	$T_c<T<55$
C_1	$1.054\ 1776 \times 10^5$	$1.697\ 1294 \times 10^3$
C_2	$-1.659\ 7141 \times 10^7$	$-5.085\ 4223 \times 10^5$
C_3	$1.043\ 1411 \times 10^9$	$6.728\ 4118 \times 10^7$
C_4	$-3.253\ 8718 \times 10^{10}$	$-3.804\ 5171 \times 10^9$
C_5	$5.140\ 5848 \times 10^{11}$	$1.078\ 9413 \times 10^{11}$
C_6	$-3.312\ 3453 \times 10^{12}$	$-1.151\ 5642 \times 10^{12}$

Temperatures between 55 and 100 K [2]:

$$RTC = RTC_1 e^{C_2/T} \left\{ 1 - e^{C_3 \left[1 - (T/C_4)^{C_5} \right]} \right\} \qquad (2b)$$

with

$$C_1 = 388.682$$

$$C_2 = 45.5$$

$$C_3 = 0.60$$

$$C_4 = 20.0$$

$$C_5 = 4.0$$

Appendix A. (Continued)

For temperatures greater than 100 K [8]:

$$C = C_1 x^{1/2} \left[1 + C_2 x^3 \right] \left[1 - e^{(1 - x^{-3})} \right] \tag{3b}$$

with

$$x = 20.615/T$$

$$C_1 = 1310.5$$

$$C_2 = 2.1486$$

Appendix B. Fixed Points and Phase Equilibrium Boundaries Used for parahydrogen, taken from reference [2]

(a) Triple point:

$$P_t = 0.0704 \text{ bar}$$

$$T_t = 13.803 \text{ K}$$

$$\rho_t \text{ (liquid)} = 38.21 \text{ mol}/\ell$$

(b) Normal boiling point:

$$P_b = 1.01325 \text{ bar}$$

$$T_b = 20.268 \text{ K}$$

$$\rho_b \text{ (liquid)} = 35.11 \text{ mol}/\ell$$

$$\rho_b \text{ (gas)} = 0.6636 \text{ mol}/\ell$$

(c) Critical point:

$$P_c = 12.928 \text{ bar}$$

$$T_c = 32.976 \text{ K}$$

$$\rho_c = 15.59 \text{ mol}/\ell$$

Note: More recent data indicate that the true critical temperature is probably closer to 32.93 K. See ref. [12]. However, that value was not used here pending further verification.

(d) Melting pressures: in atmospheres

$$P = P_t + (T - T_t) \left[A_1 e^{-\alpha/T} + A_2 T \right]$$

$$A_1 = 30.3312$$

$$A_2 = 0.6667$$

$$\alpha = 5.693$$

(e) Liquid-vapor coexistence densities:

liquid, density in mol/cm^3,

$$\rho \text{ sat } \ell = \rho_c + A_1 (\Delta T)^{0.380} + A_2 (\Delta T) + A_3 (\Delta T)^{4/3} + A_4 (\Delta T)^{5/3} + A_5 (\Delta T)^2$$

$$A_1 = 7.323\ 4603 \times 10^{-3}$$

$$A_2 = -4.407\ 4261 \times 10^{-4}$$

$$A_3 = 6.620\ 7946 \times 10^{-4}$$

$$A_4 = -2.922\ 6363 \times 10^{-4}$$

$$A_5 = 4.008\ 4907 \times 10^{-5}$$

$$\Delta T = T_c - T$$

vapor $T_b \leq T \leq T_c$, density in mol/cm^3

$$\rho \text{ sat } G = \rho_c + A_1 (\Delta T)^{0.370} + A_2 (\Delta T) + A_3 (\Delta T)^{0.7} + A_4 (\Delta T)^{0.8}$$

$$A_1 = -7.196\ 7724 \times 10^{-3}$$

$$A_2 = 1.449\ 5527 \times 10^{-3}$$

$$A_3 = 3.240\ 3120 \times 10^{-3}$$

$$A_4 = -4.464\ 0177 \times 10^{-3}$$

Saturated vapor densities for temperatures below the normal boiling point are calculated using equation (1) in the text and the vapor pressure equation below:

(f) Vapor pressure: in atmospheres, for $T \leq 29$ K,

$$\log_{10} P_a = A_1 + \frac{A_2}{T + A_3} + A_4 T$$

$$A_1 = 2.000\ 620$$

$$A_2 = -50.09\ 708$$

$$A_3 = 1.0044$$

$$A_4 = 1.748\ 495 \times 10^{-2}$$

for $T > 29$K,

$$P = P_a + A_5 (T - 29)^3 + A_6 (T - 29)^5 + A_7 (T - 29)^7$$

$$A_5 = 1.317 \times 10^{-3}$$

$$A_6 = -5.926 \times 10^{-5}$$

$$A_7 = 3.913 \times 10^{-6}$$

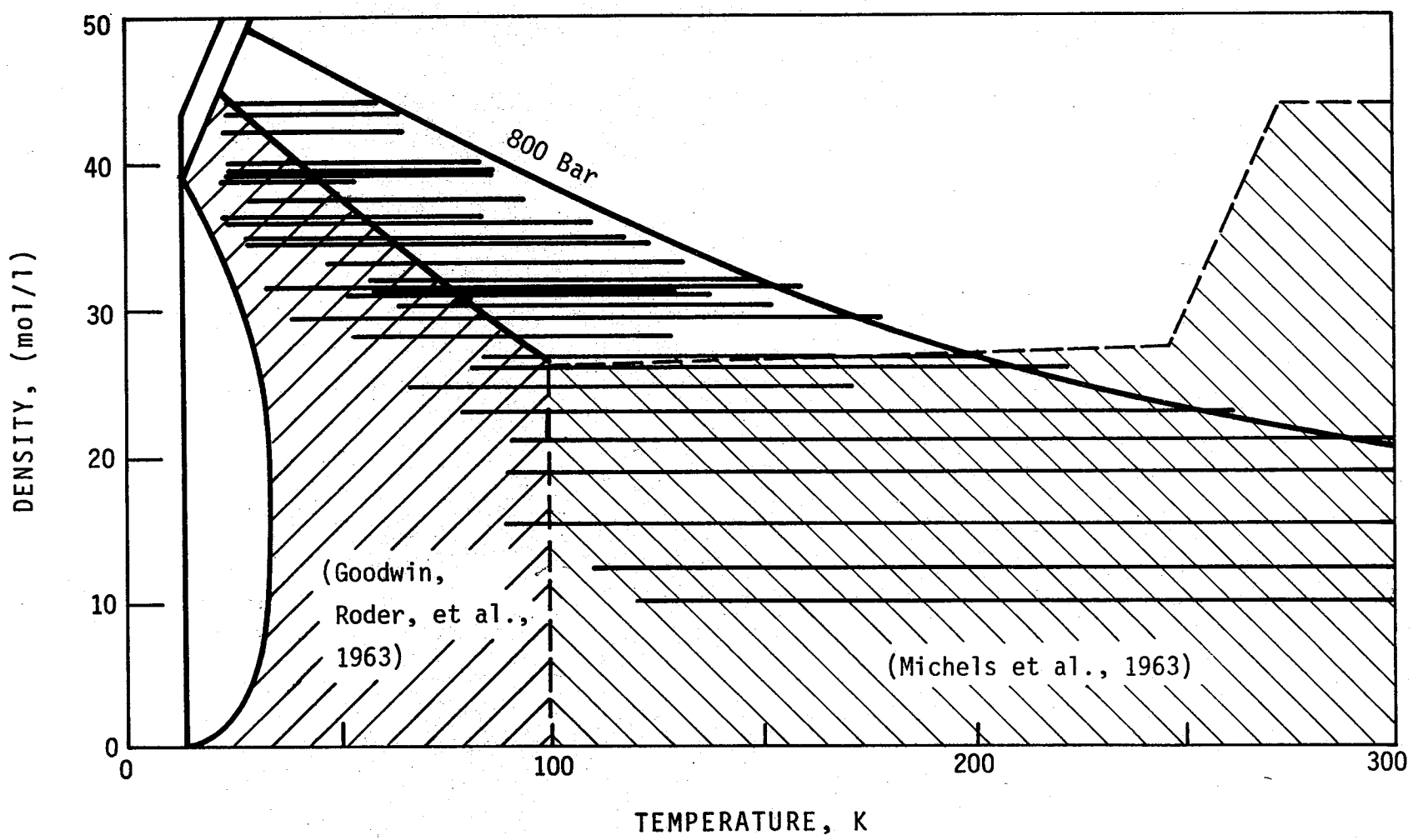

Figure 1. Density-temperature diagram showing location of the new data as well as the earlier data.

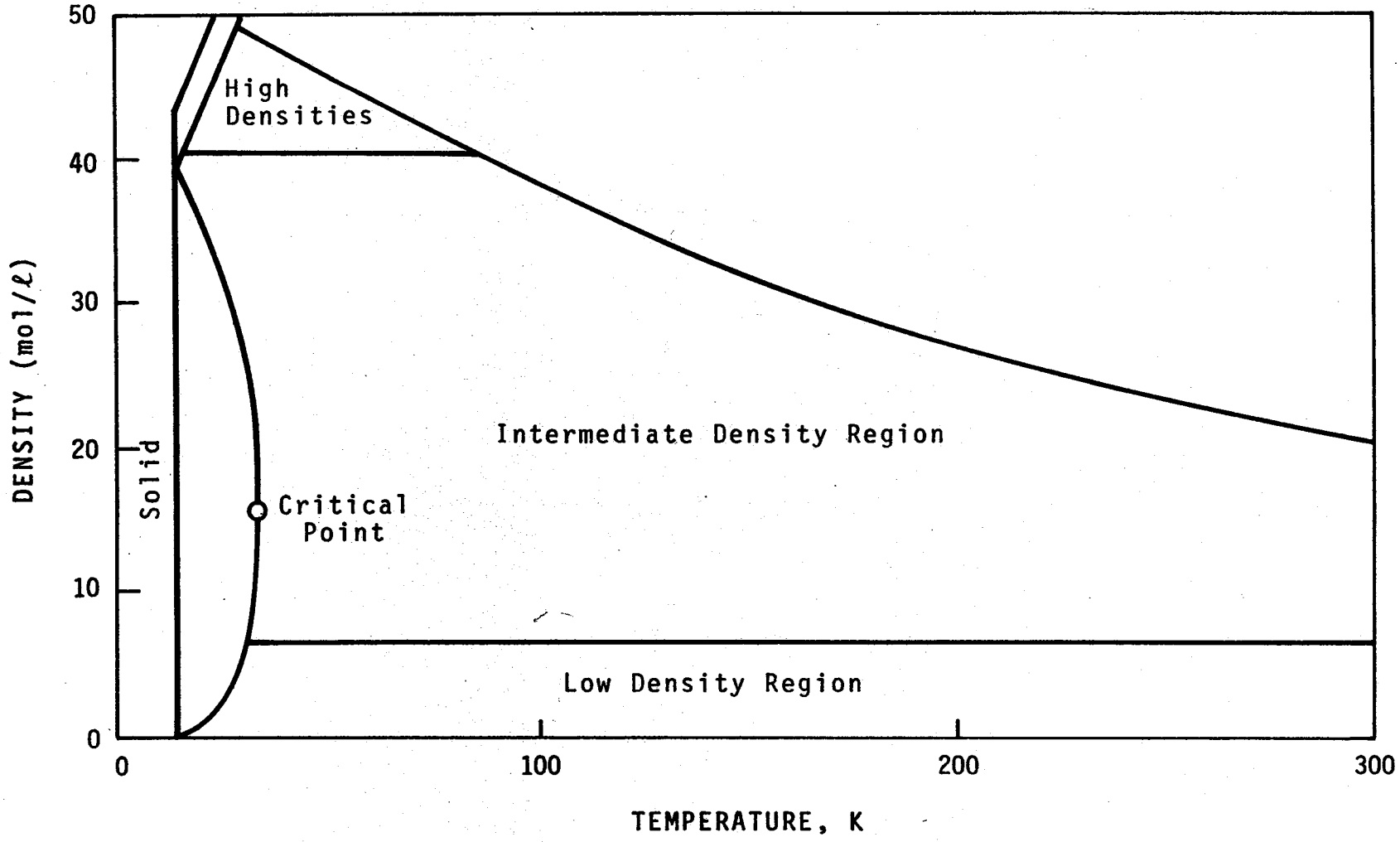

Figure 2. Density-temperature diagram showing the three regions used for the representation of the data.

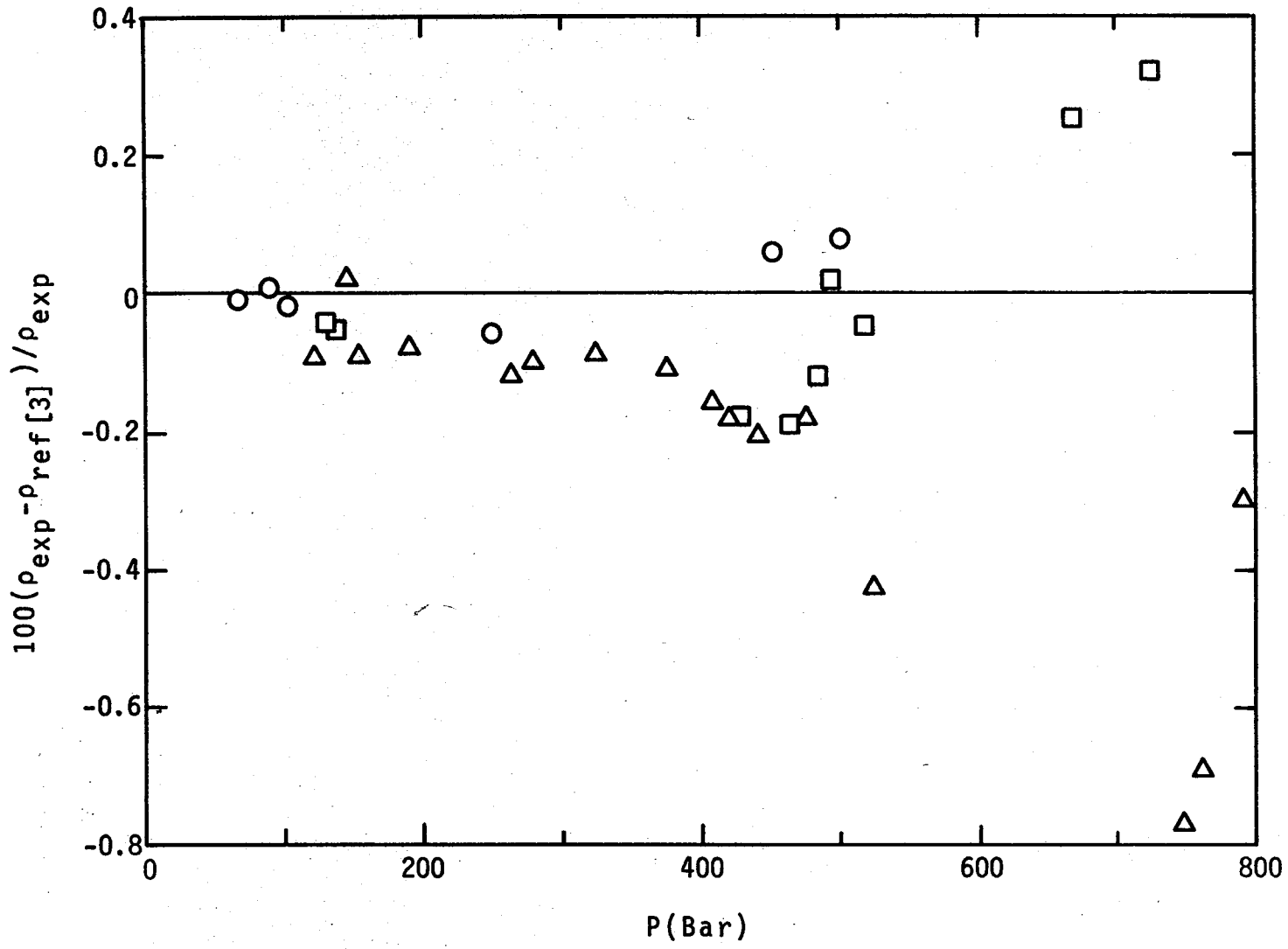

Figure 3. Comparison of data with the surface given in ref. [3]; 0-40 K, □-60 K, Δ-90 K.

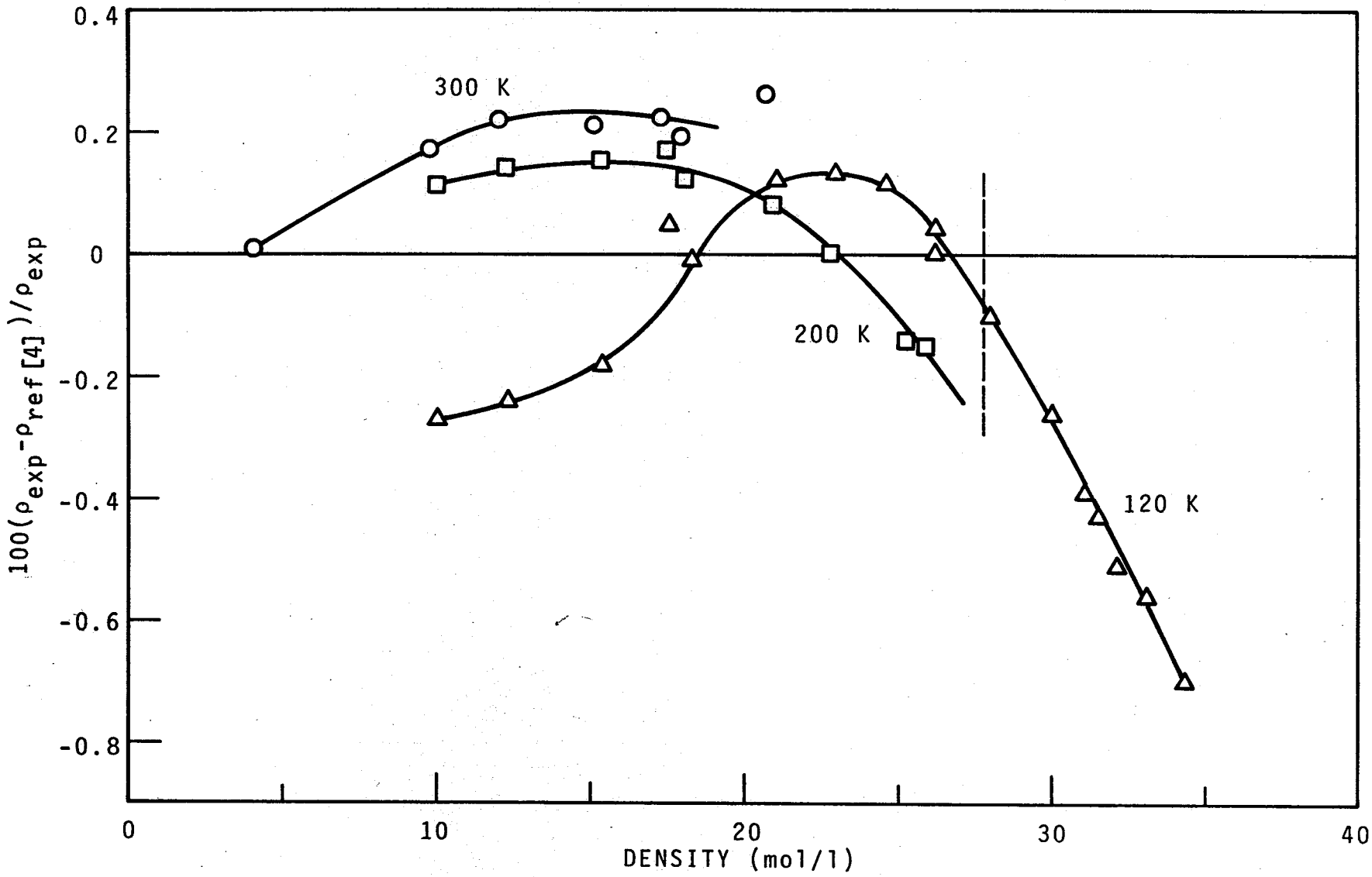

Figure 4. Comparison with the data of Michels et al. [4] as represented by the surface given in ref. [3]; Δ -120 K, -200 K, 0-300 K. The dashed line indicates the upper limit of the data of [4] beyond which the surface was extrapolated.

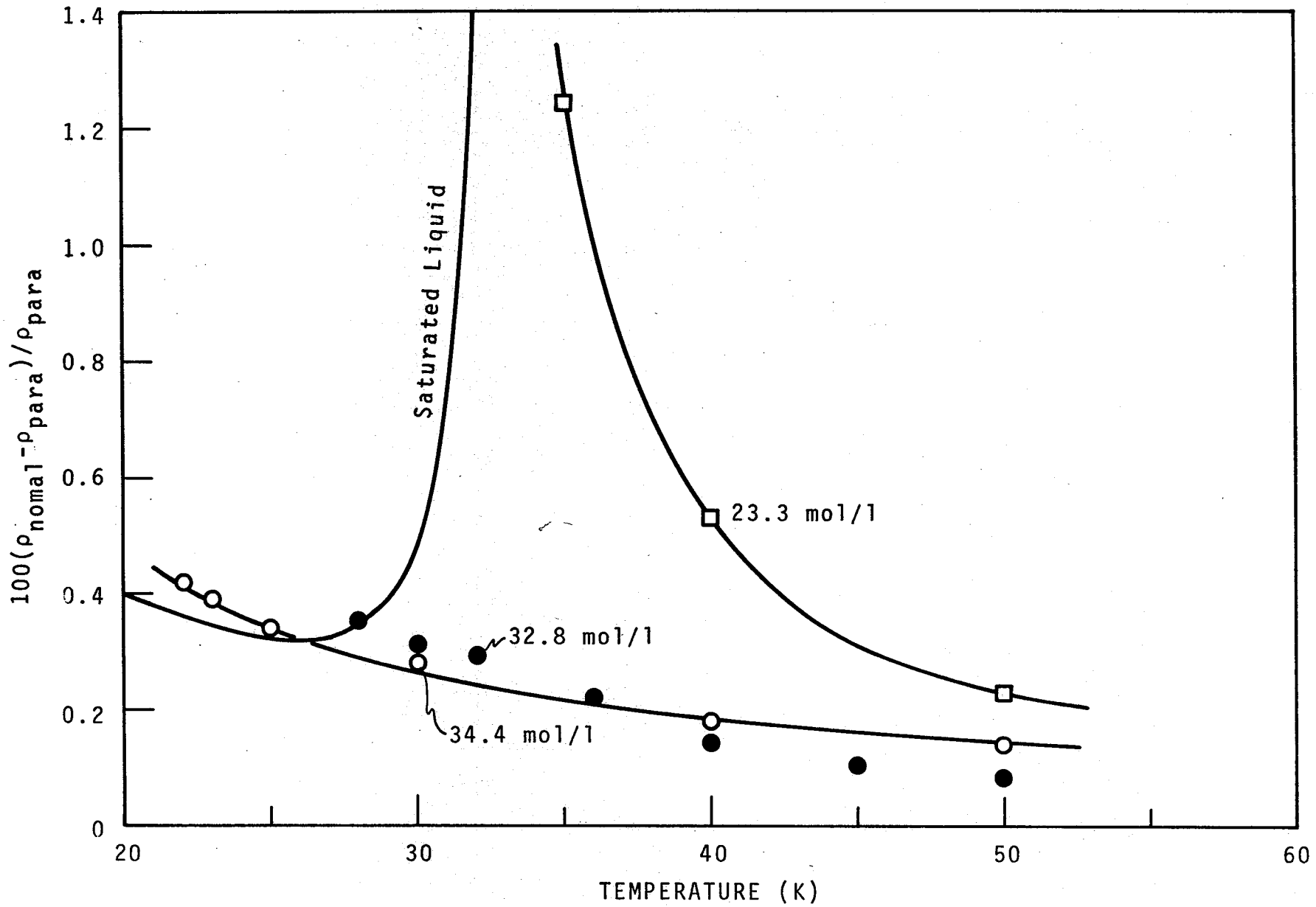

Figure 5. Density differences between normal and parahydrogen at a given temperature and pressure.

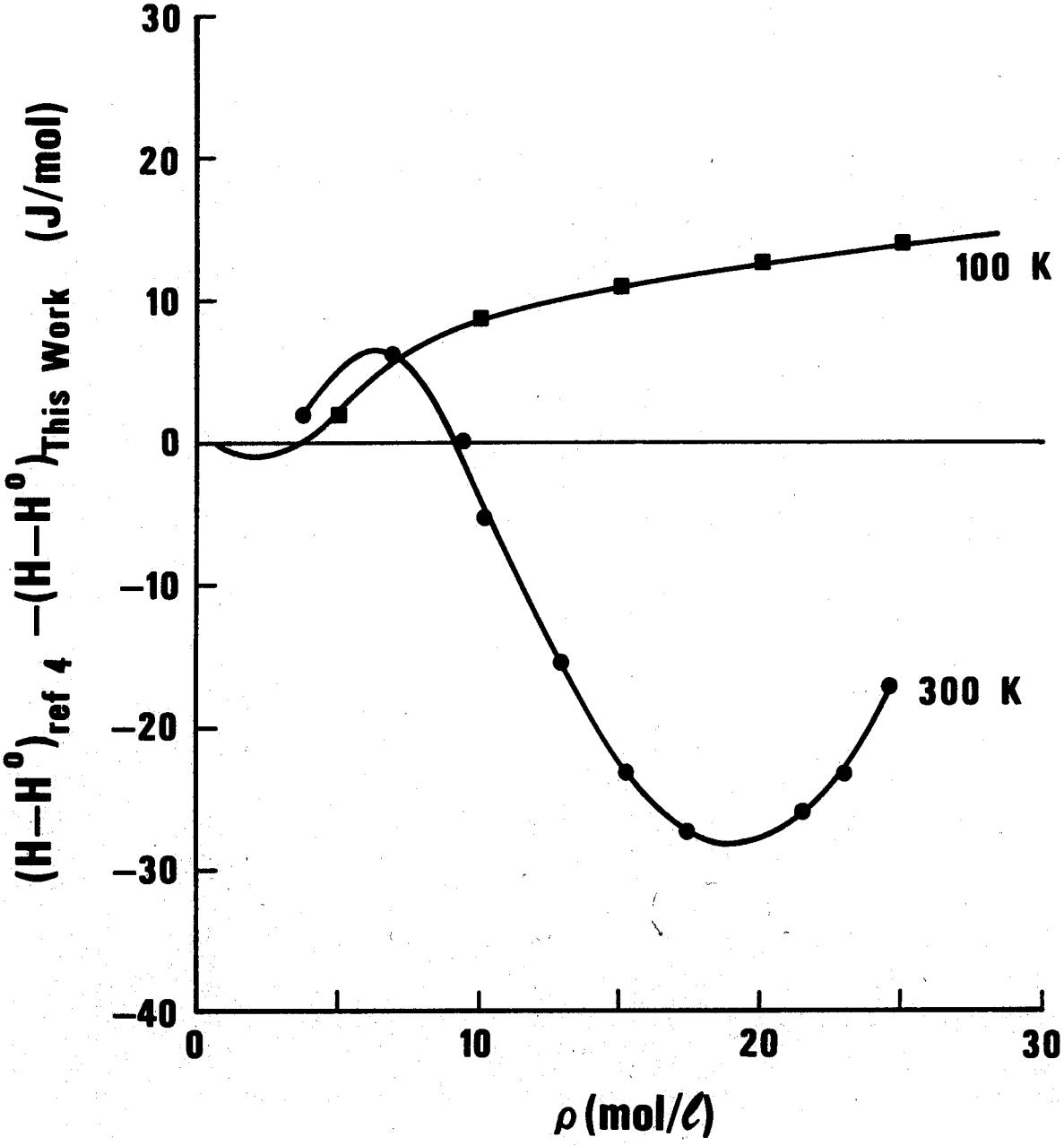

Figure 6. Comparison of enthalpy with values calculated by Michels et al. [4].

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
101	30	30.008	123.895	36.994	37.003	0.02
103	60	59.999	385.529	36.767	36.778	0.03
104	65	65.000	426.996	36.735	36.744	0.02
105	70	70.000	467.841	36.705	36.709	0.01
106	75	74.994	508.000	36.677	36.673	-0.01
107	80	79.991	547.680	36.649	36.640	-0.02
108	85	84.997	586.809	36.622	36.608	-0.04
109	90	90.010	625.490	36.596	36.580	-0.04
201	35	35.011	116.484	34.665	34.678	0.04
202	75	74.994	419.581	34.403	34.413	0.03
203	80	79.991	454.949	34.376	34.380	0.01
204	85	84.997	489.906	34.350	34.349	-0.00
205	90	90.010	524.430	34.325	34.319	-0.02
206	95	95.013	558.809	34.301	34.297	-0.01
207	100	100.010	592.528	34.278	34.270	-0.02
208	110	109.998	658.702	34.230	34.218	-0.03
209	120	119.989	723.294	34.187	34.171	-0.05
210	130	129.987	786.512	34.145	34.128	-0.05
301	30	30.008	107.368	36.300	36.302	0.01
302	60	59.999	360.675	36.075	36.086	0.03
303	65	65.000	400.773	36.044	36.052	0.02
304	70	70.000	440.262	36.014	36.018	0.01
305	75	74.994	479.182	35.986	35.985	-0.00
306	80	79.991	517.482	35.959	35.951	-0.02
307	85	84.997	555.369	35.932	35.921	-0.03
308	90	90.010	592.845	35.907	35.894	-0.04
309	95	95.013	629.738	35.882	35.865	-0.05
310	100	100.010	666.148	35.858	35.838	-0.06
311	110	109.998	737.598	35.809	35.787	-0.06
401	30	30.008	40.992	32.212	32.207	-0.02
402	80	79.991	372.324	31.906	31.909	0.01
403	85	84.997	403.043	31.882	31.881	-0.00
404	90	90.010	433.419	31.858	31.856	-0.01
405	95	95.013	463.405	31.836	31.830	-0.02
406	100	100.010	492.849	31.813	31.799	-0.04
407	110	109.998	551.127	31.767	31.751	-0.05
408	120	119.989	608.200	31.727	31.708	-0.06
409	130	129.987	664.244	31.688	31.671	-0.05
410	140	139.992	719.257	31.651	31.642	-0.03
411	150	150.000	773.207	31.614	31.614	-0.00
412	160	160.010	825.783	31.578	31.577	-0.00

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
501	40	40.015	82.956	29.917	29.921	0.01
502	90	90.010	366.450	29.659	29.675	0.06
503	95	95.013	392.967	29.638	29.652	0.05
504	100	100.010	419.152	29.617	29.626	0.03
505	110	109.998	470.697	29.575	29.575	0.00
506	120	119.989	521.223	29.536	29.527	-0.03
507	130	129.987	570.855	29.500	29.483	-0.06
508	140	139.992	619.731	29.464	29.442	-0.07
509	150	150.000	667.783	29.429	29.404	-0.08
510	160	160.010	715.114	29.396	29.369	-0.09
511	170	170.019	761.553	29.363	29.332	-0.10
512	180	180.027	807.236	29.330	29.298	-0.11
601	80	79.991	241.430	26.408	26.412	0.01
602	120	119.989	413.023	26.254	26.257	0.01
603	140	139.992	494.456	26.186	26.177	-0.03
604	160	160.010	573.555	26.121	26.103	-0.07
605	180	180.027	650.750	26.058	26.040	-0.07
701	28	28.007	204.566	40.265	40.271	0.01
702	44	44.015	367.958	40.121	40.136	0.04
703	46	46.015	388.035	40.105	40.118	0.03
704	48	48.014	407.974	40.089	40.099	0.03
705	50	50.013	427.847	40.074	40.082	0.02
706	55	55.007	477.063	40.036	40.039	0.01
707	60	59.999	525.557	40.001	39.999	-0.01
708	65	65.000	573.466	39.967	39.973	0.01
709	70	70.000	620.656	39.934	39.937	0.01
710	75	74.994	667.092	39.903	39.901	-0.00
711	80	79.991	712.839	39.873	39.867	-0.02
712	85	84.997	758.108	39.844	39.837	-0.02
713	90	90.010	802.792	39.816	39.812	-0.01
801	28	28.007	186.982	39.781	39.785	0.01
802	44	44.015	347.318	39.637	39.652	0.04
803	46	46.015	366.981	39.620	39.635	0.04
804	48	48.014	386.541	39.605	39.619	0.04
805	50	50.013	406.032	39.589	39.603	0.04
806	55	55.007	454.141	39.553	39.561	0.02
807	60	59.999	501.635	39.517	39.521	0.01
808	65	65.000	548.547	39.483	39.483	-0.00
809	70	70.000	594.701	39.451	39.445	-0.01
810	75	74.994	640.100	39.420	39.408	-0.03
811	80	79.991	684.951	39.391	39.374	-0.04
812	85	84.997	729.251	39.362	39.344	-0.05
813	90	90.010	773.070	39.334	39.319	-0.04
814	95	95.013	816.135	39.307	39.295	-0.03

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
901	30	30.008	198.656	39.526	39.526	0.00
902	48	48.014	376.428	39.370	39.381	0.03
903	50	50.013	395.783	39.355	39.366	0.03
904	55	55.007	443.515	39.317	39.326	0.02
905	60	59.999	490.594	39.282	39.287	0.01
906	65	65.000	537.024	39.248	39.249	0.00
907	70	70.000	582.834	39.216	39.214	-0.00
908	75	74.994	627.959	39.185	39.178	-0.02
909	80	79.991	672.326	39.155	39.144	-0.03
910	85	84.997	716.248	39.126	39.115	-0.03
911	90	90.010	759.688	39.099	39.092	-0.02
912	95	95.013	802.405	39.072	39.071	-0.00
1001	24	24.008	125.289	39.166	39.157	-0.02
1002	26	26.007	145.004	39.146	39.141	-0.01
1003	30	30.008	184.472	39.107	39.108	0.00
1004	34	34.010	223.862	39.069	39.076	0.02
1005	50	50.013	378.367	38.936	38.951	0.04
1006	55	55.007	425.284	38.899	38.911	0.03
1007	60	59.999	471.557	38.864	38.872	0.02
1101	32	32.008	95.319	34.871	34.868	-0.01
1102	50	50.013	238.891	34.727	34.745	0.05
1103	70	70.000	389.473	34.597	34.618	0.06
1104	75	74.994	425.712	34.568	34.586	0.05
1105	85	84.997	496.795	34.513	34.524	0.03
1106	90	90.010	531.718	34.487	34.497	0.03
1107	95	95.013	566.091	34.462	34.468	0.02
1108	100	100.010	600.086	34.437	34.440	0.01
1109	110	109.998	666.875	34.390	34.390	-0.00
1110	120	119.989	732.188	34.345	34.345	0.00
1201	50	50.013	89.657	24.862	24.865	0.01
1202	60	59.999	131.441	24.817	24.823	0.02
1203	100	100.010	291.109	24.660	24.681	0.08
1204	110	109.998	329.195	24.625	24.640	0.06
1205	120	119.989	366.654	24.592	24.598	0.03
1206	130	129.987	403.570	24.560	24.560	-0.00
1207	150	150.000	475.892	24.497	24.488	-0.04
1208	170	170.019	546.394	24.437	24.422	-0.06

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
1301	32	32.008	59.937	32.596	32.586	-0.03
1302	75	74.994	352.603	32.311	32.332	0.07
1303	80	79.991	384.451	32.284	32.306	0.07
1304	85	84.997	415.894	32.259	32.280	0.06
1305	90	90.010	446.920	32.234	32.253	0.06
1306	95	95.013	477.572	32.210	32.227	0.05
1307	100	100.010	507.845	32.186	32.201	0.05
1308	110	109.998	567.328	32.141	32.151	0.03
1309	120	119.989	625.492	32.100	32.106	0.02
1310	130	129.987	682.573	32.058	32.066	0.03
1311	140	139.992	738.622	32.019	32.037	0.05
1312	150	150.000	793.538	31.980	32.007	0.08
1401	30	30.008	58.358	33.620	33.598	-0.07
1402	50	50.013	207.837	33.463	33.463	-0.00
1403	75	74.994	382.639	33.308	33.313	0.02
1404	80	79.991	416.178	33.282	33.285	0.01
1405	85	84.997	449.311	33.255	33.258	0.01
1406	90	90.010	482.028	33.230	33.231	0.00
1407	95	95.013	514.302	33.205	33.204	-0.00
1408	100	100.010	546.197	33.181	33.178	-0.01
1409	110	109.998	608.714	33.136	33.125	-0.03
1410	120	119.989	669.997	33.092	33.083	-0.03
1411	130	129.987	729.976	33.049	33.042	-0.02
1501	40	40.015	88.842	30.459	30.452	-0.02
1502	90	90.010	381.413	30.184	30.199	0.05
1503	95	95.013	408.790	30.161	30.176	0.05
1504	100	100.010	435.752	30.140	30.149	0.03
1505	110	109.998	488.889	30.098	30.099	0.00
1506	120	119.989	540.928	30.057	30.051	-0.02
1507	130	129.987	592.073	30.018	30.007	-0.04
1508	140	139.992	642.361	29.980	29.968	-0.04
1509	150	150.000	691.791	29.944	29.930	-0.05
1601	40	40.015	108.357	31.952	31.954	0.00
1602	85	84.997	397.237	31.685	31.697	0.04
1603	90	90.010	427.302	31.660	31.671	0.04
1604	95	95.013	456.954	31.637	31.644	0.02
1605	100	100.010	486.298	31.614	31.619	0.02
1606	110	109.998	543.922	31.570	31.568	-0.01
1607	120	119.989	600.411	31.528	31.525	-0.01

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
1701	40	40.015	103.003	31.570	31.576	0.02
1702	85	84.997	385.634	31.306	31.322	0.05
1703	90	90.010	415.149	31.281	31.299	0.06
1704	95	95.013	444.215	31.258	31.273	0.05
1705	100	100.010	472.905	31.235	31.246	0.04
1706	110	109.998	529.322	31.191	31.194	0.01
1707	120	119.989	584.640	31.149	31.148	-0.00
1708	130	129.987	638.928	31.109	31.107	-0.01
1709	140	139.992	692.286	31.070	31.074	0.01
1801	40	40.015	68.910	28.426	28.425	-0.00
1802	90	90.010	327.437	28.170	28.195	0.09
1803	95	95.013	351.749	28.149	28.174	0.09
1804	100	100.010	375.753	28.128	28.150	0.08
1805	110	109.998	423.038	28.088	28.102	0.05
1806	120	119.989	469.466	28.050	28.055	0.02
1807	130	129.987	515.069	28.013	28.009	-0.02
1901	24	24.008	278.691	43.021	42.998	-0.05
1902	32	32.008	368.296	42.945	42.936	-0.02
1903	33	33.009	379.592	42.935	42.929	-0.01
1904	34	34.010	390.784	42.926	42.919	-0.02
1905	35	35.011	402.045	42.917	42.912	-0.01
1906	36	36.012	413.308	42.909	42.904	-0.01
1907	37	37.013	424.501	42.900	42.895	-0.01
1908	38	38.014	435.729	42.891	42.887	-0.01
1909	39	39.015	446.957	42.883	42.879	-0.01
1910	40	40.015	458.150	42.874	42.871	-0.01
1911	42	42.016	480.504	42.858	42.855	-0.01
1912	44	44.015	502.720	42.841	42.838	-0.01
1913	46	46.015	524.588	42.825	42.816	-0.02
1914	48	48.014	546.840	42.810	42.803	-0.02
1915	50	50.013	568.919	42.794	42.789	-0.01
1916	55	55.007	623.689	42.757	42.755	-0.01
1917	60	59.999	677.705	42.721	42.721	0.00
1918	65	65.000	731.138	42.688	42.692	0.01
1919	70	70.000	783.712	42.655	42.664	0.02

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
2001	23	23.009	312.698	43.898	43.876	-0.05
2002	24	24.008	324.063	43.888	43.869	-0.04
2003	26	26.007	346.928	43.869	43.854	-0.04
2004	28	28.007	369.863	43.850	43.837	-0.03
2005	30	30.008	392.936	43.832	43.821	-0.03
2006	31	31.008	404.507	43.822	43.813	-0.02
2007	32	32.008	416.078	43.813	43.805	-0.02
2008	33	33.009	427.650	43.805	43.797	-0.02
2009	34	34.010	439.223	43.796	43.789	-0.02
2010	35	35.011	450.862	43.787	43.782	-0.01
2011	36	36.012	462.401	43.779	43.773	-0.01
2012	37	37.013	474.007	43.770	43.766	-0.01
2013	38	38.014	485.580	43.761	43.758	-0.01
2014	39	39.015	497.152	43.753	43.750	-0.01
2015	42	42.016	531.729	43.728	43.727	-0.00
2015	40	40.015	508.686	43.745	43.742	-0.01
2017	44	44.015	554.704	43.712	43.712	-0.00
2018	46	46.015	577.609	43.697	43.697	-0.00
2019	48	48.014	600.408	43.681	43.682	0.00
2020	50	50.013	623.142	43.666	43.667	0.00
2021	55	55.007	679.500	43.629	43.632	0.01
2022	60	59.999	735.171	43.594	43.599	0.01
2023	65	65.000	790.154	43.560	43.569	0.02
2101	24	24.008	225.819	41.882	41.865	-0.04
2102	26	26.007	247.336	41.863	41.851	-0.03
2104	34	34.010	334.042	41.788	41.789	0.00
2105	36	36.012	355.737	41.770	41.773	0.01
2106	38	38.014	377.398	41.752	41.757	0.01
2107	40	40.015	398.956	41.735	41.741	0.01
2108	42	42.016	420.478	41.718	41.725	0.02
2109	44	44.015	441.832	41.702	41.707	0.01
2110	46	46.015	463.185	41.686	41.691	0.01
2111	48	48.014	484.398	41.670	41.675	0.01
2112	50	50.013	505.545	41.655	41.659	0.01
2113	55	55.007	557.865	41.618	41.619	0.00
2114	60	59.999	609.567	41.582	41.583	0.00
2115	65	65.000	660.616	41.548	41.549	0.00
2116	70	70.000	711.014	41.515	41.520	0.01

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
2201	30	30.008	157.922	38.255	38.258	0.01
2202	40	40.015	252.794	38.164	38.188	0.06
2203	55	55.007	390.663	38.047	38.078	0.08
2204	60	59.999	435.320	38.013	38.041	0.07
2205	65	65.000	479.370	37.979	38.005	0.07
2206	70	70.000	524.833	37.946	38.015	0.18
2207	75	74.994	565.476	37.917	37.936	0.05
2208	80	79.991	607.601	37.887	37.903	0.04
2209	85	84.997	649.245	37.859	37.875	0.04
2210	90	90.010	690.340	37.832	37.849	0.04
2211	95	95.013	730.853	37.805	37.825	0.05
2301	60	59.999	141.529	25.729	25.738	0.03
2302	90	90.010	270.164	25.602	25.635	0.13
2303	110	109.998	351.804	25.528	25.554	0.10
2305	130	129.987	430.771	25.459	25.474	0.06
2306	140	139.992	469.379	25.426	25.437	0.04
2307	150	150.000	507.403	25.394	25.400	0.02
2308	160	160.010	544.981	25.362	25.365	0.01
2309	170	170.019	582.008	25.331	25.331	-0.00
2310	180	180.027	618.659	25.301	25.300	-0.00
2311	190	190.032	654.759	25.271	25.270	-0.00
2312	200	200.035	690.517	25.241	25.242	0.00
2313	220	220.030	760.801	25.184	25.191	0.03
2402	110	109.998	293.108	23.035	23.051	0.07
2403	120	119.989	326.842	23.004	23.015	0.05
2404	130	129.987	360.140	22.973	22.981	0.04
2405	140	139.992	392.995	22.943	22.948	0.02
2406	150	150.000	425.403	22.914	22.915	0.00
2407	160	160.010	457.434	22.885	22.884	-0.01
2408	180	180.027	520.362	22.828	22.822	-0.02
2409	190	190.032	551.291	22.800	22.793	-0.03
2410	200	200.035	581.946	22.773	22.766	-0.03
2411	220	220.030	642.195	22.720	22.713	-0.03
2412	240	240.020	701.378	22.666	22.665	-0.01
2413	260	260.008	759.220	22.615	22.616	0.00

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
2501	75	74.994	218.132	26.356	26.376	0.08
2502	90	90.010	284.399	26.293	26.322	0.11
2503	110	109.998	369.686	26.217	26.238	0.08
2504	120	119.989	411.185	26.181	26.195	0.05
2505	130	129.987	452.061	26.147	26.154	0.03
2506	140	139.992	492.322	26.113	26.115	0.01
2507	150	150.000	531.966	26.080	26.077	-0.01
2508	160	160.010	571.131	26.048	26.041	-0.03
2509	170	170.019	609.744	26.016	26.007	-0.04
2510	180	180.027	647.880	25.985	25.978	-0.03
2511	190	190.032	685.499	25.955	25.947	-0.03
2512	200	200.035	722.705	25.925	25.918	-0.03
2601	90	90.010	156.817	18.359	18.369	0.05
2602	110	109.998	205.359	18.308	18.322	0.08
2603	120	119.989	229.174	18.284	18.297	0.07
2604	130	129.987	252.750	18.259	18.273	0.07
2605	140	139.992	276.062	18.236	18.248	0.07
2606	150	150.000	299.141	18.212	18.223	0.06
2607	160	160.010	321.972	18.189	18.198	0.05
2608	170	170.019	344.632	18.167	18.175	0.05
2609	180	180.027	367.002	18.144	18.150	0.03
2610	190	190.032	389.217	18.122	18.125	0.02
2611	200	200.035	411.235	18.100	18.101	0.01
2612	240	240.020	497.406	18.013	18.008	-0.03
2613	260	260.008	539.599	17.969	17.968	-0.01
2614	260	260.008	539.738	17.972	17.971	-0.01
2615	280	279.997	581.278	17.929	17.931	0.01
2616	300	299.992	622.235	17.885	17.892	0.04
2701	90	90.010	148.812	17.700	17.689	-0.06
2702	110	109.998	194.811	17.651	17.650	-0.01
2703	120	119.989	217.364	17.628	17.626	-0.01
2704	130	129.987	239.653	17.605	17.600	-0.03
2705	140	139.992	261.781	17.582	17.578	-0.02
2706	150	150.000	283.773	17.560	17.559	-0.00
2707	160	160.010	305.502	17.538	17.538	-0.00
2708	170	170.019	327.037	17.516	17.517	0.00
2709	180	180.027	348.330	17.494	17.493	-0.01
2710	190	190.032	369.429	17.473	17.469	-0.02
2711	200	200.035	390.357	17.452	17.447	-0.03
2712	220	220.030	431.688	17.409	17.402	-0.04
2713	220	220.030	431.788	17.409	17.405	-0.02
2714	240	240.020	472.475	17.368	17.362	-0.03
2715	260	260.008	512.554	17.326	17.321	-0.03
2716	280	279.997	552.092	17.285	17.282	-0.02
2717	300	299.992	591.119	17.243	17.245	0.01

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
2801	90	90.010	125.090	15.492	15.506	0.09
2802	110	109.998	163.128	15.451	15.468	0.11
2803	120	119.989	181.823	15.431	15.444	0.09
2804	130	129.987	200.324	15.411	15.420	0.06
2805	140	139.992	218.687	15.391	15.399	0.05
2806	150	150.000	236.887	15.372	15.377	0.03
2807	160	160.010	254.928	15.353	15.356	0.02
2808	170	170.019	272.833	15.334	15.336	0.01
2809	180	180.027	290.588	15.315	15.316	0.00
2810	190	190.032	308.184	15.296	15.295	-0.01
2811	200	200.035	325.630	15.278	15.274	-0.02
2812	220	220.030	360.177	15.241	15.236	-0.03
2813	240	240.020	394.200	15.204	15.199	-0.04
2814	260	260.008	427.862	15.167	15.166	-0.01
2815	280	279.997	461.046	15.130	15.134	0.03
2816	300	299.992	493.856	15.094	15.105	0.07
2901	110	109.998	123.395	12.334	12.342	0.06
2902	120	119.989	137.165	12.319	12.321	0.01
2903	130	129.987	150.861	12.303	12.302	-0.00
2904	140	139.992	164.465	12.288	12.285	-0.02
2905	150	150.000	177.996	12.273	12.270	-0.02
2906	160	160.010	191.354	12.257	12.252	-0.04
2907	170	170.019	204.668	12.242	12.236	-0.05
2908	180	180.027	217.866	12.227	12.219	-0.06
2909	190	190.032	230.996	12.212	12.205	-0.06
2910	200	200.035	243.995	12.197	12.188	-0.07
2911	220	220.030	269.775	12.167	12.158	-0.07
2912	240	240.020	295.275	12.137	12.132	-0.04
2913	260	260.008	320.391	12.107	12.105	-0.02
2914	280	279.997	345.310	12.077	12.082	0.04
2915	300	299.992	369.931	12.047	12.061	0.11
3001	120	119.989	108.442	10.063	10.065	0.02
3002	130	129.987	119.044	10.051	10.051	0.00
3003	140	139.992	129.535	10.039	10.035	-0.04
3004	150	150.000	139.977	10.026	10.021	-0.05
3005	160	160.010	150.362	10.014	10.008	-0.06
3006	170	170.019	160.668	10.002	9.995	-0.07
3007	180	180.027	170.906	9.989	9.981	-0.08
3008	190	190.032	181.086	9.977	9.969	-0.08
3009	200	200.035	191.208	9.964	9.956	-0.08
3010	220	220.030	211.270	9.940	9.932	-0.08
3011	240	240.020	231.147	9.916	9.911	-0.05
3012	260	260.008	250.762	9.891	9.890	-0.01
3013	280	279.997	270.209	9.866	9.871	0.05
3014	300	299.992	289.509	9.841	9.855	0.14

TABLE I. EXPERIMENTAL PVT DATA FOR PARAHYDROGEN.

IDENT	T K	T1968 K	PRESSURE BAR	DENSITY MOL/L EXP	DENSITY MOL/L CALC	DIFFERENCE PERCENT
3101	90	90.010	194.700	21.223	21.235	0.06
3102	110	109.998	255.139	21.163	21.175	0.06
3103	120	119.989	284.741	21.134	21.145	0.05
3104	130	129.987	313.941	21.106	21.114	0.04
3105	140	139.992	342.799	21.078	21.084	0.03
3106	150	150.000	371.346	21.051	21.055	0.02
3107	160	160.010	399.551	21.025	21.027	0.01
3108	170	170.019	427.447	20.999	20.999	0.00
3109	180	180.027	455.033	20.974	20.971	-0.01
3110	190	190.032	482.285	20.949	20.942	-0.03
3111	200	200.035	509.356	20.924	20.917	-0.04
3112	220	220.030	562.623	20.874	20.864	-0.05
3113	240	240.020	614.990	20.826	20.817	-0.04
3114	260	260.008	666.444	20.777	20.771	-0.03
3115	280	279.997	717.092	20.729	20.730	0.00
3116	300	299.992	766.252	20.680	20.678	-0.01
1	300	299.992	110.696	4.160	4.164	0.09

TABLE II. PARAMETERS USED IN EQUATIONS (2), WITH P IN ATMOSPHERES, IN MOL/CM^3.

T = 17			
1.7927586453+006	-1.5192441462+008	3.8076380874+009	-2.8011219719+010
T = 18			
1.5031197572+007	-1.5512871509+009	5.9237216873+010	-1.0027960622+012
6.4214968758+012			
T = 19			
-1.1392285021+006	1.2356609580+008	-5.7620943087+009	1.1774618892+011
-8.1884732011+011			
T = 20			
-8.9024745380+007	1.1556129859+010	-6.0013225905+011	1.5555518278+013
-2.0113758594+014	1.0388479790+015		
T = 21			
-1.5722719776+006	1.9651870236+008	-1.0575412034+010	2.7455063588+011
-3.3294287572+012	1.5784513601+013		
T = 22			
-6.2220964791+006	8.1215152736+008	-4.3140892647+010	1.1354740706+012
-1.4701306157+013	7.5808848429+013		
T = 23			
1.1938646749+007	-1.5789479208+009	8.2547745700+010	-2.1610303925+012
2.8440149149+013	-1.4958283915+014		
T = 24			
-2.3878490330+005	3.0395018355+007	-1.3734369824+010	1.8909616802+012
-1.2142525399+014	4.2564284763+015	-8.4197211599+016	8.8715230634+017
-3.8860226726+018			
T = 25			
1.9101085827+007	-1.3258059406+010	2.0705538414+012	-1.5338042955+014
6.4844143415+015	-1.6611547693+017	2.5633271853+018	-2.2002900684+019
8.0936167398+019			
T = 26			
-2.1530400926+005	5.6158308351+006	-1.2726310972+009	2.7828310003+011
-2.3982606455+013	1.0294067329+015	-2.3633418379+016	2.8068341347+017
-1.3625971008+018			
T = 27			
6.3601655201+006	-3.4433188539+009	5.1608398468+011	-3.7921435957+013
1.6073005389+015	-4.1465379553+016	6.4586567057+017	-5.6034492132+018
2.0849174834+019			

TABLE II. PARAMETERS USED IN EQUATIONS (2), WITH P IN ATMOSPHERES, IN MOL/CM^3.

T = 28

-2.0595703167+005	4.5182352997+006	-6.8612022421+008	1.7592192748+011
-1.6152013770+013	7.1802377310+014	-1.6868583740+016	2.0429300583+017
-1.0112661614+018			

T = 29

-1.3428110367+007	5.6575732735+009	-8.2947559839+011	6.2421479049+013
-2.7579075595+015	7.4796689348+016	-1.2297564767+018	1.1284301969+019
-4.4448339829+019			

T = 30

-2.0017952378+005	5.3964044936+006	-4.2058231059+008	2.6939742148+010
4.8294203363+012	-7.6785061024+014	4.5537740208+016	-1.4318146279+018
2.5469426200+019	-2.4344222806+020	9.7614646410+020	

T = 31

-1.9516670204+005	3.6574613418+006	3.7466996841+008	-1.3784282679+011
2.3239446305+013	-2.0061113068+015	9.8185403161+016	-2.8568579115+018
4.9261084486+019	-4.6663844523+020	1.8758074023+021	

T = 32

-1.9206741710+005	4.6845686588+006	-3.6150845963+008	1.2104653786+011
-2.6458186348+013	3.7166512756+015	-3.2574421486+017	1.8132111800+019
-6.5371484854+020	1.5269776599+022	-2.2367832329+023	1.8715165426+024
-6.8355209137+024			

T = 33

-1.8784938302+005	2.6577854073+006	1.4510362165+009	-6.7103915231+011
1.7491421424+014	-2.8719174322+016	3.1652595468+018	-2.4196373064+020
1.3041812918+022	-4.9821628964+023	1.3400288556+025	-2.4805831839+026
3.0081285610+027	-2.1514260620+028	6.8799325371+028	

T = 34

-1.8585184564+005	5.5750148466+006	-7.6024834019+008	2.0507512304+011
-3.4321343187+013	3.8295375311+015	-2.8662841004+017	1.4381045765+019
-4.8273615233+020	1.0697128449+022	-1.5028432355+023	1.2137075915+024
-4.2943871162+024			

T = 35

-1.8119509449+005	3.7749485685+006	1.9397696413+008	-5.7703648590+010
8.8885819309+012	-7.4038751137+014	3.5528922435+016	-1.0158372332+018
1.7266459572+019	-1.6217236626+020	6.5142512016+020	

T = 36

-1.7811391467+005	4.1182933578+006	2.4961851164+007	-1.8655489452+010
3.8454860809+012	-3.5775575669+014	1.7787367946+016	-5.0468821411+017
8.3049534499+018	-7.4389397677+019	2.8224550378+020	

TABLE II. PARAMETERS USED IN EQUATIONS (2), WITH P IN ATMOSPHERES, IN MOL/CM^3.

T = 37

-1.7504164625+005	4.3478341863+006	-7.8940145097+007	3.7751222751+009
1.0481902322+012	-1.5188318013+014	8.6169811247+015	-2.5436161152+017
4.2115621654+018	-3.7645346224+019	1.4349996701+020	

T = 38

-1.7188655461+005	4.4164814100+006	-1.2310743431+008	1.5313645270+010
-6.4757887779+011	-9.4967659665+012	1.4841742662+015	-3.5097239605+016
1.3185365598+017	4.6721412435+018	-4.4688264278+019	

T = 39

-1.6871486896+005	4.3494489187+006	-9.6149707960+007	9.3603784130+009
5.1049105615+010	-6.3993969203+013	4.4733401634+015	-1.4374657538+017
2.5526792404+018	-2.4969242889+019	1.0756029041+020	

T = 40

-1.6528799255+005	4.0424879157+006	-6.4224280969+006	-4.2051370364+009
1.1853205298+012	-1.2229345288+014	6.4811436791+015	-1.9139164278+017
3.3010243575+018	-3.1872436252+019	1.3536613430+020	

T = 42

-1.6005141176+005	4.7838903840+006	-2.9327650297+003	5.1102200113+010
-5.1559965190+012	3.3297229502+014	-1.4362689717+016	4.1737762048+017
-7.6922454819+018	8.0054237088+019	-3.5598893687+020	

T = 44

-1.5415213997+005	4.5484784748+006	-1.7363000323+008	2.2532145910+010
-1.5170646500+012	5.5621434507+013	-9.9586051707+014	8.4449832218+015
-2.6782002109+016			

T = 46

-1.4849319717+005	4.4556006236+006	-1.3686177327+008	1.6333384342+010
-1.0266946025+012	3.6133000363+013	-5.8512342722+014	4.0570803551+015
-8.2553809655+015			

T = 48

-1.4323003079+005	4.6101570489+006	-1.7559747323+008	2.1142514479+010
-1.3855258854+012	5.3741360391+013	-1.1000290742+015	1.1984378664+016
-5.7512269202+016			

T = 50

-1.3755039297+005	4.4337521733+006	-1.2683328076+008	1.4384430007+010
-8.7711843003+011	3.3093906556+013	-6.3704229711+014	6.5595795531+015
-3.1619037425+016			

TABLE II. PARAMETERS USED IN EQUATIONS (2), WITH P IN ATMOSPHERES, IN MOL/CM^3.

T = 55			
-1.2444464680+005	4.4263980428+006	-1.1117629197+008	1.1536268864+010
-6.2833472919+011	2.4237788412+013	-5.1031540831+014	6.3172360032+015
-3.8295182637+016			
T = 60			
-1.1121912936+005	3.7936057214+006	9.6693596677+007	-1.7339142479+010
1.5493318633+012	-6.7845664772+013	1.6933951450+015	-2.1656447852+016
1.0813339700+017			
T = 65			
-9.8720106145+004	3.7003113011+006	1.4986070139+008	-2.5788521979+010
2.3050068184+012	-1.0443828491+014	2.6776241089+015	-3.5561177409+016
1.8848759867+017			
T = 70			
-8.8718903663+004	5.1753661577+006	-2.0146770020+008	1.7718411591+010
-6.6024659429+011	1.4663058585+013	-1.2203529654+014	
T = 75			
-7.8025954959+004	5.6523931462+006	-2.6639813355+008	2.3447414566+010
-9.0042851805+011	1.9664936592+013	-1.6363534789+014	
T = 80			
-6.6186969522+004	5.5655865573+006	-2.3514178364+008	2.1345811734+010
-8.1467914805+011	1.7944899990+013	-1.5097001241+014	
T = 85			
-5.4213554657+004	5.3107666819+006	-1.6977750444+008	1.6309382732+010
-6.0735692987+011	1.3818270020+013	-1.2005059027+014	
T = 90			
-4.2626080752+004	5.2768485401+006	-1.4350544917+008	1.4119783096+010
-4.9336104804+011	1.0974869627+013	-9.4195262066+013	
T = 95			
-3.2113968030+004	5.2533557761+006	-6.7826875035+007	5.0485456231+009
-2.2003037414+010			
T = 100			
-2.1222851074+004	5.2732115183+006	-5.7074800540+007	4.8860145629+009
-2.2358853579+010			
T = 110			
3.1412601495+003	4.6471082519+006	2.4531366095+007	2.3853498831+009
3.2830235464+009			

TABLE II. PARAMETERS USED IN EQUATIONS (2), WITH P IN ATMOSPHERES, IN MOL/CM^3.

T = 120			
2.6464489657+004	4.2070808336+006	8.6352691620+007	4.6370803380+008
2.4430261682+010			
T = 130			
5.2710390907+004	3.3607590684+006	1.5809499545+003	-1.1687218877+009
3.5545800087+010			
T = 140			
8.2889587155+004	1.2750268682+006	3.4805726513+008	-7.3716422103+009
1.0762848479+011			
T = 150			
9.9132598618+004	2.2950896275+006	2.9170405067+008	-5.4215509909+009
8.2837449894+010			
T = 160			
1.1224730815+005	4.1479952727+006	1.4623482040+008	3.9067965812+008
T = 170			
1.3448226329+005	3.8039602304+006	1.8450776633+008	-3.3170631876+008
T = 180			
1.5862494924+005	3.0672011100+006	2.4310127954+008	-1.3859042662+009
T = 190			
1.5923196446+005	6.7083029471+006	4.3210883954+007	2.3675454063+009
T = 200			
1.7980369731+005	6.5195371178+006	7.0124286979+007	1.8674921622+009
T = 220			
2.0871873375+005	8.3738065048+006	-1.3391815780+007	3.5010356047+009
T = 240			
2.5891748980+005	5.9776163601+006	1.6315401519+008	
T = 260			
2.8886298627+005	7.0503327034+006	1.4305482371+008	
T = 280			
3.2088095893+005	7.8342761934+006	1.2893277428+008	
T = 300			
3.5755211794+005	8.0856780617+006	1.2555978890+003	

TABLE III. PARAMETERS USED IN EQUATIONS (3), WITH P IN ATMOSPHERES, T IN KELVINS

DENSITY = 6.5 -7.6666428981-005 -1.3723015815+003	6.4889324389-001	-1.0560439364+001	4.1486997680+001
DENSITY = 7.0 -8.9392590199-005 -1.5778819633+003	7.0920300077-001	-1.2219671284+001	4.9285316151+001
DENSITY = 7.5 -1.0310817375-004 -1.7805277932+003	7.7113012411-001	-1.3990496075+001	5.7339421316+001
DENSITY = 8.0 -1.1698229150-004 -1.9059440030+003	8.3423216275-001	-1.5796543231+001	6.1486587428+001
DENSITY = 8.5 -1.3284976883-004 -2.0548102677+003	8.9939102824-001	-1.7756597363+001	6.7878239674+001
DENSITY = 9.0 -1.4912593340-004 -2.1381172519+003	9.6593136529-001	-1.9768827828+001	7.1287047861+001
DENSITY = 9.5 -1.6628762469-004 -2.1510413760+003	1.0340097016+000	-2.1839611598+001	7.1752505542+001
DENSITY = 10.0 -1.8406316617-004 -2.0853791385+003	1.1035650202+000	-2.3956861843+001	6.8806216972+001
DENSITY = 10.5 -2.0281663628-004 -1.9482430327+003	1.1747759895+000	-2.6133539628+001	6.3005369257+001
DENSITY = 11.0 -2.2166027077-004 -1.6739112287+003	1.2472128086+000	-2.8297966602+001	5.0585120801+001
DENSITY = 11.5 -2.4044928444-004 -1.2476121362+003	1.3208187953+000	-3.0432582623+001	3.0675323653+001
DENSITY = 12.0 -2.5967662789-004 -7.1412208830+002	1.3959153104+000	-3.2579537251+001	5.7436924150+000

TABLE III. PARAMETERS USED IN EQUATIONS (3), WITH P IN ATMOSPHERES, T IN KELVINS

DENSITY = 12.5			
-2.7918357967-004	1.4722853870+000	-3.4680906805+001	-2.7772007371+001
-6.1037073737+000			
DENSITY = 13.0			
-2.9777461516-004	1.5495290307+000	-3.6685447966+001	-7.1822131921+001
9.0049463026+002			
DENSITY = 13.5			
-3.1605166459-004	1.6278862572+000	-3.8613579542+001	-1.2525881061+002
1.9832367622+003			
DENSITY = 14.0			
-3.3204868781-004	1.7064927083+000	-4.0335172103+001	-1.9461489701+002
3.3501531897+003			
DENSITY = 14.5			
-3.4864900231-004	1.7866512877+000	-4.2014584333+001	-2.7143927277+002
4.8574584515+003			
DENSITY = 15.0			
-3.6286133800-004	1.8671292494+000	-4.3489711873+001	-3.6302893837+002
6.6131573431+003			
DENSITY = 15.5			
-3.7652194243-004	1.9486140659+000	-4.4825812174+001	-4.6639488299+002
8.5690768140+003			
DENSITY = 16.0			
-3.9100330874-004	2.0318440570+000	-4.6124333611+001	-5.7563349879+002
1.0615910309+004			
DENSITY = 16.5			
-4.0694793565-004	2.1170981674+000	-4.7411338208+001	-6.8915329640+002
1.2721817915+004			
DENSITY = 17.0			
-4.2678358720-004	2.2055136732+000	-4.8837369723+001	-7.9860799256+002
1.4737172571+004			
DENSITY = 17.5			
-4.5129002783-004	2.2974534329+000	-5.0440187644+001	-9.0187925049+002
1.6623968680+004			
DENSITY = 18.0			
-4.8092247617-004	2.3930439609+000	-5.2209334753+001	-9.9939387760+002
1.8384625906+004			

TABLE III. PARAMETERS USED IN EQUATIONS (3), WITH P IN ATMOSPHERES, T IN KELVINS

DENSITY = 18.5			
-5.1662927605-004	2.4929175099+000	-5.4252622222+001	-1.0844076794+003
1.9895090407+004			
DENSITY = 19.0			
-5.6026091605-004	2.5977551126+000	-5.6620537258+001	-1.1548393399+003
2.1124027606+004			
DENSITY = 19.5			
-6.0869367563-004	2.7061903277+000	-5.9122678866+001	-1.2194874530+003
2.2208351187+004			
DENSITY = 20.0			
-6.6464806264-004	2.8195529676+000	-6.1937710560+001	-1.2686550257+003
2.2982552559+004			
DENSITY = 20.5			
-7.2822975811-004	2.9377376776+000	-6.5011302816+001	-1.3053997152+003
2.3500466689+004			
DENSITY = 21.0			
-7.9590436431-004	3.0593081485+000	-6.8162965927+001	-1.3373241903+003
2.3874998505+004			
DENSITY = 21.5			
-8.6659371504-004	3.1836726515+000	-7.1274100484+001	-1.3706258429+003
2.4212836938+004			
DENSITY = 22.0			
-9.4506387180-004	3.3129245139+000	-7.4611121251+001	-1.3915502648+003
2.4289115793+004			
DENSITY = 22.5			
-1.0254464941-003	3.4444448770+000	-7.7804822046+001	-1.4180654901+003
2.4398654675+004			
DENSITY = 23.0			
-1.1142088279-003	3.5809738506+000	-8.1193235975+001	-1.4332331763+003
2.4269517476+004			
DENSITY = 23.5			
-1.2044517637-003	3.7195130539+000	-8.4364625867+001	-1.4568058535+003
2.4224237866+004			
DENSITY = 24.0			
-1.3056456005-003	3.8639972870+000	-8.7804140092+001	-1.4648366274+003
2.3883581627+004			

TABLE III. PARAMETERS USED IN EQUATIONS (3), WITH P IN ATMOSPHERES, T IN KELVINS

DENSITY = 24.5			
-1.4118449586-003	4.0115588186+000	-9.1082621401+001	-1.4788881030+003
2.3608500067+004			
DENSITY = 25.0			
-1.5264256169-003	4.1638961193+000	-9.4439672702+001	-1.4854592999+003
2.3174332497+004			
DENSITY = 25.5			
-1.6438495961-003	4.3189140826+000	-9.7603172639+001	-1.4964420354+003
2.2766428211+004			
DENSITY = 26.0			
-1.7674617671-003	4.4776596905+000	-1.0065892913+002	-1.5079973928+003
2.2339656459+004			
DENSITY = 26.5			
-1.8923165270-003	4.6385981045+000	-1.0344091470+002	-1.5256288954+003
2.1966370526+004			
DENSITY = 27.0			
-2.0311078165-003	4.8054612690+000	-1.0627787242+002	-1.5368689852+003
2.1499165614+004			
DENSITY = 27.5			
-2.1724394000-003	4.9749360987+000	-1.0884246334+002	-1.5530231397+003
2.1085163319+004			
DENSITY = 28.0			
-2.3404026908-003	5.1539588441+000	-1.1176839755+002	-1.5495435076+003
2.0410494137+004			
DENSITY = 28.5			
-2.5265859246-003	5.3395759942+000	-1.1469084384+002	-1.5420544900+003
1.9717483704+004			
DENSITY = 29.0			
-2.7506604636-003	5.5368370357+000	-1.1801840046+002	-1.5161487461+003
1.8848416196+004			
DENSITY = 29.5			
-3.0719684173-003	5.7627076342+000	-1.2330299982+002	-1.4140666331+003
1.7083226902+004			
DENSITY = 30.0			
-3.3529624632-003	5.9788901308+000	-1.2706382481+002	-1.3595079958+003
1.5946552995+004			

TABLE III. PARAMETERS USED IN EQUATIONS (3), WITH P IN ATMOSPHERES, T IN KELVINS

DENSITY = 30.5			
-3.6886223750-003	6.2105404644+000	-1.3145149633+002	-1.2776734018+003
1.4557620546+004			
DENSITY = 31.0			
-4.1451173488-003	6.4748422528+000	-1.3787294982+002	-1.1220867633+003
1.2411705580+004			
DENSITY = 31.5			
-4.5989647572-003	6.7381078753+000	-1.4332429298+002	-9.9615977609+002
1.0735620242+004			
DENSITY = 32.0			
-5.0913908298-003	7.0108340831+000	-1.4865992838+002	-8.7048409069+002
9.1945146758+003			
DENSITY = 32.5			
-5.4183373440-003	7.2448843864+000	-1.5019535043+002	-8.5378432591+002
8.8850152588+003			
DENSITY = 33.0			
-5.7272313747-003	7.4763626986+000	-1.5077566948+002	-8.5592197308+002
8.8481730109+003			
DENSITY = 33.5			
-6.0178344832-003	7.7059714334+000	-1.5050950969+002	-8.6936716044+002
8.9658721604+003			
DENSITY = 34.0			
-6.2907160416-003	7.9342801176+000	-1.4945335898+002	-8.9018782398+002
9.1876411433+003			
DENSITY = 34.5			
-6.5910430508-003	8.1722251405+000	-1.4845966436+002	-8.9034620468+002
9.2177457870+003			
DENSITY = 35.0			
-6.9613538388-003	8.4297028668+000	-1.4826905949+002	-8.4592077499+002
8.8094985045+003			
DENSITY = 35.5			
-7.5003011209-003	8.7248357718+000	-1.4990641342+002	-7.3373888901+002
7.8065751133+003			
DENSITY = 36.0			
-8.1325053971-003	9.0417693036+000	-1.5227573599+002	-5.8182463568+002
6.4633243029+003			

TABLE III. PARAMETERS USED IN EQUATIONS (3), WITH P IN ATMOSPHERES, T IN KELVINS

DENSITY = 36.5			
-8.8717791259-003	9.3798354063+000	-1.5505645275+002	-4.0410495824+002
4.9608079265+003			
DENSITY = 37.0			
-9.6788862967-003	9.7325335485+000	-1.5790233941+002	-2.0575755133+002
3.3227862365+003			
DENSITY = 37.5			
-1.0511037493-002	1.0093206023+001	-1.6046136798+002	6.5460022949+000
1.6142950629+003			
DENSITY = 38.0			
-1.1625105121-002	1.0503637936+001	-1.6484889204+002	2.7439908482+002
-4.1452110643+002			
DENSITY = 38.5			
-1.2233295531-002	1.0809519817+001	-1.6114807693+002	3.5204600243+002
-7.4622608285+002			
DENSITY = 39.0			
-1.2845705646-002	1.1107299550+001	-1.5540630418+002	3.9174368978+002
-6.6609064097+002			
DENSITY = 39.5			
-1.3051621429-002	1.1341373749+001	-1.4545735257+002	3.6900397649+002
-1.5025754560+002			
DENSITY = 40.0			
-1.3422778913-002	1.1602672392+001	-1.3600730390+002	3.8197790412+002
1.1007715102+002			

Table IV. Parameters for Equation (4), for T in K and ρ in mol/cm^3.

A_1	1.3902 9009 18
A_2	$-1.8543\ 3546\ 54 \times 10^2$
A_3	$2.9602\ 3725\ 60 \times 10^3$
A_4	$-2.0125\ 2307\ 80 \times 10^3$
A_5	$-1.0175\ 8396\ 61 \times 10^2$
A_6	$1.3356\ 9761\ 21 \times 10^4$
A_7	$-1.7573\ 1404\ 86 \times 10^5$
A_8	$7.7488\ 2413\ 51 \times 10^4$
A_9	$-1.2636\ 6439\ 24 \times 10^5$
A_{10}	$2.4661\ 1537\ 96 \times 10^3$
A_{11}	$-3.1417\ 2527\ 76 \times 10^5$
A_{12}	$2.4375\ 4908\ 01 \times 10^6$
A_{13}	$-2.0047\ 3646\ 67 \times 10^4$
A_{14}	$2.5432\ 6216\ 67 \times 10^6$
R	82.0597

TABLE V. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN ON THE LIQUID-VAPOR BOUNDARY

TEMPERA -TURE DEG K	PRESSURE BAR	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G - K	SPECIFIC HEAT CV J /G - K	SPECIFIC HEAT CP J /G - K	VELOCITY OF SOUND M/SEC	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
13.803	0.070	12.98	-309.0	-308.9	4.97	4.67	6.37	1264	9.23	11726
13.803	0.070	7965.79	84.2	140.3	37.52	6.21	10.52	306	0.01	552
14.000	0.079	13.01	-307.7	-307.6	5.06	4.72	6.47	1256	9.23	11493
14.000	0.079	7203.09	85.3	142.1	37.19	6.21	10.54	308	0.01	558
15.000	0.134	13.16	-300.9	-300.7	5.53	4.92	6.91	1228	9.16	10737
15.000	0.134	4489.45	90.7	151.1	35.65	6.24	10.67	317	0.01	588
16.000	0.216	13.32	-293.7	-293.4	5.99	5.12	7.36	1200	8.89	10028
16.000	0.216	2954.52	95.9	159.6	34.31	6.28	10.85	326	0.01	615
17.000	0.329	13.48	-286.1	-285.6	6.45	5.30	7.88	1168	8.75	9177
17.000	0.329	2032.06	100.7	167.6	33.11	6.32	11.07	334	0.12	637
18.000	0.482	13.66	-278.0	-277.3	6.92	5.47	8.42	1140	8.61	8442
18.000	0.482	1449.03	105.1	175.0	32.05	6.37	11.34	341	0.03	654
19.000	0.682	13.86	-269.4	-268.4	7.38	5.62	8.93	1120	8.46	7894
19.000	0.682	1064.57	109.1	181.7	31.08	6.43	11.66	348	0.04	667
20.000	0.935	14.07	-260.2	-258.9	7.85	5.75	9.45	1100	8.30	7365
20.000	0.935	801.74	112.7	187.7	30.19	6.49	12.05	354	0.05	674
20.268	1.013	14.13	-257.7	-256.3	7.98	5.78	9.66	1089	8.25	7094
20.268	1.013	747.55	113.6	189.3	29.97	6.51	12.15	355	0.06	675
21.000	1.250	14.30	-250.6	-248.8	8.32	5.86	10.13	1070	8.12	6620
21.000	1.250	617.79	115.8	193.0	29.37	6.55	12.49	359	0.07	675
22.000	1.634	14.55	-240.3	-237.9	8.80	5.95	10.82	1044	7.91	5994
22.000	1.634	482.90	118.3	197.3	28.60	6.61	13.03	363	0.09	670
23.000	2.096	14.84	-229.4	-226.3	9.29	6.03	11.69	1010	7.67	5264
23.000	2.096	382.90	120.2	200.5	27.86	6.68	13.69	367	0.12	658
24.000	2.645	15.15	-217.9	-213.9	9.78	6.09	12.52	980	7.39	4675
24.000	2.645	307.27	121.4	202.7	27.15	6.74	14.50	371	0.15	639
25.000	3.288	15.51	-205.5	-200.4	10.29	6.14	13.44	948	7.06	4109
25.000	3.288	248.97	121.7	203.6	26.46	6.81	15.52	373	0.19	613
26.000	4.035	15.92	-192.4	-185.9	10.81	6.20	14.81	903	6.68	3410
26.000	4.035	203.21	121.1	203.1	25.79	6.90	16.86	376	0.23	578
27.000	4.892	16.39	-178.2	-170.2	11.36	6.26	16.18	860	6.25	2858
27.000	4.892	166.69	119.3	200.9	25.11	6.99	18.67	377	0.29	534
28.000	5.871	16.96	-162.8	-152.9	11.93	6.33	18.48	806	5.79	2225
28.000	5.871	137.04	116.1	196.5	24.41	7.12	21.24	378	0.36	479
29.000	6.978	17.66	-145.9	-133.6	12.54	6.41	22.05	747	5.30	1624
29.000	6.978	112.54	111.0	189.5	23.68	7.28	25.20	378	0.45	414
30.000	8.225	18.54	-127.0	-111.7	13.20	6.51	26.59	689	4.76	1164
30.000	8.225	91.86	103.2	178.8	22.89	7.50	32.00	378	0.57	334
31.000	9.627	19.77	-104.9	-85.8	13.96	6.66	36.55	619	4.15	698
31.000	9.627	73.86	91.5	162.6	21.98	7.82	46.57	375	0.74	237
32.000	11.198	21.74	-76.8	-52.4	14.92	6.91	65.38	534	3.42	302
32.000	11.198	57.15	72.1	136.1	20.81	8.12	87.03	372	0.99	129
32.976	12.928	31.82	-2.8	38.3	17.57				1.90	
32.976	12.928	31.82	-3.1	38.1	17.56				1.90	

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

1 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 13.834	12.98	-308.9	-307.6	4.97	4.68	6.38	1262	9.24	11686
14	13.00	-307.8	-306.5	5.05	4.71	6.48	1254	9.24	11443
15	13.14	-301.2	-299.8	5.51	4.92	6.98	1216	9.10	10410
16	13.30	-294.0	-292.6	5.97	5.12	7.43	1190	8.93	9750
17	13.47	-286.3	-284.9	6.44	5.30	7.91	1166	8.77	9113
18	13.65	-278.1	-276.8	6.91	5.47	8.41	1143	8.63	8502
19	13.85	-269.5	-268.1	7.38	5.62	8.95	1119	8.48	7854
20	14.07	-260.3	-258.9	7.85	5.75	9.53	1094	8.30	7222
* 20.224	14.12	-258.1	-256.7	7.96	5.77	9.64	1090	8.26	7122
* 20.224	754.62	113.4	188.9	30.00	6.50	12.14	355	0.06	675
21	791.87	119.0	198.2	30.45	6.43	11.86	364	0.05	717
22	838.92	126.0	209.9	30.99	6.37	11.60	375	0.05	771
23	885.17	132.9	221.4	31.51	6.33	11.41	385	0.05	822
24	930.78	139.7	232.8	31.99	6.30	11.27	395	0.05	872
25	975.89	146.4	244.0	32.45	6.29	11.16	404	0.04	921
26	1020.59	153.0	255.1	32.88	6.27	11.07	413	0.04	969
27	1064.95	159.6	266.1	33.30	6.26	10.99	422	0.04	1017
28	1109.02	166.2	277.1	33.70	6.26	10.93	431	0.04	1063
29	1152.83	172.7	288.0	34.08	6.25	10.88	439	0.04	1110
30	1196.43	179.2	298.8	34.45	6.25	10.83	448	0.04	1156
31	1239.84	185.7	309.7	34.80	6.24	10.79	456	0.03	1201
32	1283.08	192.1	320.4	35.14	6.24	10.75	463	0.03	1246
33	1326.17	198.5	331.2	35.47	6.23	10.72	471	0.03	1291
34	1369.13	205.0	341.9	35.79	6.23	10.69	479	0.03	1336
35	1411.97	211.3	352.5	36.10	6.23	10.66	486	0.03	1380
36	1454.70	217.7	363.2	36.40	6.23	10.64	493	0.03	1425
37	1497.34	224.1	373.8	36.69	6.23	10.62	501	0.03	1469
38	1539.89	230.5	384.4	36.98	6.22	10.60	508	0.03	1513
39	1582.36	236.8	395.0	37.25	6.22	10.59	514	0.03	1556
40	1624.76	243.1	405.6	37.52	6.22	10.58	521	0.03	1600
42	1709.36	255.8	426.8	38.04	6.23	10.55	535	0.02	1686
44	1793.75	268.5	447.8	38.53	6.23	10.54	547	0.02	1773
46	1877.94	281.1	468.9	38.99	6.25	10.53	560	0.02	1859
48	1961.97	293.8	490.0	39.44	6.26	10.53	572	0.02	1944
50	2045.86	306.5	511.1	39.87	6.28	10.54	583	0.02	2029
55	2255.09	338.4	563.9	40.88	6.37	10.60	611	0.02	2242
60	2463.76	370.8	617.2	41.81	6.50	10.71	636	0.02	2453
65	2672.01	403.9	671.1	42.67	6.69	10.89	658	0.02	2663
70	2879.94	438.2	726.2	43.49	6.94	11.13	679	0.01	2872
75	3087.63	473.8	782.5	44.26	7.25	11.42	697	0.01	3082
80	3295.11	511.0	840.5	45.01	7.60	11.77	714	0.01	3290
85	3502.44	550.1	900.3	45.74	7.99	12.16	729	0.01	3499
90	3709.54	591.1	962.1	46.44	8.41	12.57	744	0.01	3707
95	3916.72	634.3	1026.0	47.13	8.84	13.00	759	0.01	3915
100	4123.72	679.7	1092.1	47.81	9.28	13.43	773	0.01	4123
110	4537.48	776.7	1230.5	49.13	10.10	14.25	800	0.01	4538
120	4951.00	881.6	1376.7	50.40	10.83	14.97	827	0.01	4952
130	5364.35	993.0	1529.4	51.62	11.40	15.54	855	0.01	5366
140	5777.57	1109.3	1687.1	52.79	11.82	15.96	883	0.01	5780
150	6190.68	1229.0	1848.1	53.90	12.08	16.22	912	0.01	6194
160	6603.70	1350.7	2011.0	54.95	12.21	16.35	940	0.01	6608
170	7016.65	1473.0	2174.7	55.95	12.24	16.37	969	0.01	7021
180	7429.54	1595.3	2338.2	56.88	12.19	16.32	998	0.01	7434
190	7842.38	1716.7	2501.0	57.76	12.08	16.21	1026	0.01	7847
200	8255.19	1836.9	2662.4	58.59	11.95	16.08	1054	0.01	8261
220	9080.69	2072.8	2980.8	60.11	11.63	15.76	1110	0.00	9087
240	9906.10	2302.4	3293.0	61.46	11.33	15.46	1163	0.00	9912
260	10731.43	2526.4	3599.5	62.69	11.07	15.20	1214	0.00	10738
280	11556.70	2745.8	3901.5	63.81	10.87	15.00	1263	0.00	11564
300	12381.92	2961.7	4199.9	64.84	10.72	14.85	1310	0.00	12389

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

2 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 13.868	12.97	-308.9	-306.3	4.97	4.69	6.38	1265	9.26	11750
14	12.99	-308.0	-305.4	5.03	4.71	6.46	1260	9.25	11598
15	13.13	-301.4	-298.7	5.49	4.91	6.97	1221	9.14	10514
16	13.28	-294.2	-291.5	5.95	5.11	7.41	1195	8.96	9848
17	13.45	-286.6	-283.9	6.42	5.30	7.89	1171	8.81	9210
18	13.63	-278.5	-275.7	6.89	5.46	8.38	1149	8.66	8604
19	13.83	-269.9	-267.1	7.36	5.61	8.92	1124	8.51	7953
20	14.04	-260.7	-257.9	7.83	5.74	9.48	1100	8.34	7324
21	14.28	-251.0	-248.1	8.30	5.86	10.12	1073	8.15	6662
22	14.54	-240.6	-237.7	8.79	5.95	10.83	1044	7.93	5996
* 22.805	14.78	-231.6	-228.7	9.19	6.02	11.52	1017	7.72	5396
* 22.805	400.19	119.9	199.9	28.00	6.67	13.55	367	0.11	661
23	405.36	121.5	202.6	28.11	6.64	13.41	369	0.11	674
24	431.62	129.3	215.7	28.67	6.52	12.84	381	0.10	738
25	457.01	136.9	228.3	29.19	6.45	12.44	392	0.10	799
26	481.75	144.2	240.6	29.67	6.40	12.15	403	0.09	856
27	505.99	151.4	252.6	30.12	6.37	11.92	413	0.09	912
28	529.82	158.5	264.4	30.55	6.35	11.74	423	0.08	966
29	553.32	165.4	276.1	30.96	6.33	11.59	432	0.08	1019
30	576.53	172.3	287.6	31.35	6.32	11.47	441	0.07	1070
31	599.51	179.1	299.0	31.73	6.30	11.36	449	0.07	1121
32	622.28	185.9	310.4	32.09	6.30	11.27	458	0.07	1170
33	644.88	192.6	321.6	32.43	6.29	11.19	466	0.07	1220
34	667.32	199.3	332.7	32.76	6.29	11.12	474	0.06	1268
35	689.62	205.9	343.8	33.09	6.27	11.05	482	0.06	1316
36	711.80	212.5	354.9	33.40	6.27	11.01	489	0.06	1363
37	733.88	219.1	365.9	33.70	6.26	10.96	497	0.06	1410
38	755.86	225.6	376.8	33.99	6.26	10.92	504	0.06	1457
39	777.75	232.1	387.7	34.27	6.25	10.88	511	0.05	1503
40	799.56	238.6	398.6	34.55	6.25	10.85	518	0.05	1549
42	842.98	251.6	420.2	35.08	6.25	10.79	532	0.05	1640
44	886.16	264.5	441.7	35.58	6.26	10.75	545	0.05	1730
46	929.14	277.4	463.2	36.05	6.27	10.72	558	0.05	1820
48	971.95	290.3	484.7	36.51	6.28	10.71	570	0.04	1908
50	1014.61	303.1	506.1	36.95	6.30	10.70	582	0.04	1996
55	1120.75	335.4	559.6	37.97	6.38	10.72	610	0.04	2215
60	1226.31	368.1	613.4	38.90	6.51	10.81	635	0.03	2431
65	1331.45	401.5	667.8	39.78	6.70	10.97	658	0.03	2645
70	1436.26	436.0	723.2	40.60	6.95	11.20	679	0.03	2858
75	1540.82	471.8	779.9	41.38	7.25	11.48	697	0.03	3070
80	1645.19	509.1	838.2	42.13	7.60	11.82	714	0.03	3281
85	1749.39	548.3	898.2	42.86	7.99	12.20	730	0.02	3492
90	1853.46	589.5	960.2	43.57	8.41	12.61	745	0.02	3702
95	1957.42	632.8	1024.3	44.26	8.84	13.03	759	0.02	3911
100	2061.29	678.3	1090.6	44.94	9.28	13.46	773	0.02	4120
110	2268.80	775.5	1229.3	46.26	10.11	14.28	801	0.02	4538
120	2476.07	880.5	1375.7	47.53	10.83	14.99	828	0.02	4954
130	2683.18	992.0	1528.6	48.76	11.41	15.56	856	0.02	5370
140	2890.14	1108.4	1686.4	49.93	11.82	15.97	884	0.01	5786
150	3097.00	1228.2	1847.6	51.04	12.08	16.23	913	0.01	6201
160	3303.77	1349.9	2010.6	52.09	12.21	16.36	941	0.01	6615
170	3510.47	1472.3	2174.4	53.08	12.24	16.38	970	0.01	7030
180	3717.12	1594.6	2338.0	54.02	12.19	16.33	999	0.01	7444
190	3923.71	1716.1	2500.8	54.90	12.08	16.22	1027	0.01	7858
200	4130.27	1836.3	2662.4	55.73	11.95	16.08	1055	0.01	8271
220	4543.28	2072.3	2980.9	57.24	11.63	15.77	1110	0.01	9098
240	4956.19	2301.9	3293.2	58.60	11.33	15.46	1164	0.01	9925
260	5369.03	2526.0	3599.8	59.83	11.08	15.21	1215	0.01	10751
280	5781.80	2745.4	3901.8	60.95	10.87	15.00	1264	0.01	11577
300	6194.53	2961.3	4200.2	61.98	10.72	14.85	1311	0.01	12403

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

3 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 13.901	12.96	-308.9	-305.0	4.97	4.69	6.39	1268	9.27	11814
14	12.97	-308.2	-304.3	5.02	4.71	6.43	1267	9.27	11751
15	13.11	-301.6	-297.6	5.48	4.91	6.96	1226	9.18	10617
16	13.27	-294.4	-290.5	5.94	5.11	7.40	1200	8.99	9946
17	13.43	-286.9	-282.8	6.41	5.29	7.87	1176	8.84	9306
18	13.61	-278.8	-274.7	6.87	5.46	8.35	1154	8.69	8704
19	13.80	-270.2	-266.1	7.34	5.61	8.89	1130	8.54	8052
20	14.01	-261.2	-257.0	7.80	5.74	9.44	1105	8.37	7424
21	14.25	-251.5	-247.2	8.28	5.85	10.06	1079	8.18	6766
22	14.50	-241.2	-236.8	8.76	5.95	10.75	1051	7.96	6107
23	14.80	-230.1	-225.6	9.26	6.03	11.56	1019	7.71	5414
24	15.13	-218.2	-213.6	9.77	6.09	12.49	983	7.41	4708
* 24.571	15.35	-210.9	-206.3	10.07	6.12	13.04	962	7.21	4346
* 24.571	272.23	121.7	203.4	26.76	6.78	15.05	372	0.17	625
25	280.77	125.5	209.8	27.02	6.71	14.59	378	0.16	658
26	299.69	134.0	223.9	27.57	6.59	13.80	391	0.15	730
27	317.79	142.1	237.4	28.08	6.52	13.25	403	0.14	797
28	335.28	149.9	250.5	28.56	6.47	12.84	413	0.13	861
29	352.31	157.5	263.2	29.00	6.43	12.52	424	0.12	921
30	368.96	164.9	275.6	29.42	6.40	12.27	433	0.12	980
31	385.30	172.1	287.7	29.82	6.38	12.07	443	0.11	1036
32	401.39	179.3	299.7	30.20	6.36	11.89	452	0.11	1092
33	417.27	186.3	311.5	30.56	6.35	11.75	460	0.10	1145
34	432.96	193.3	323.2	30.91	6.33	11.62	469	0.10	1198
35	448.48	200.2	334.8	31.25	6.32	11.51	477	0.10	1250
36	463.88	207.1	346.2	31.57	6.31	11.42	485	0.09	1301
37	479.14	213.9	357.6	31.88	6.30	11.34	493	0.09	1351
38	494.31	220.6	368.9	32.18	6.29	11.26	501	0.09	1400
39	509.37	227.3	380.1	32.48	6.29	11.20	508	0.08	1449
40	524.35	234.0	391.3	32.76	6.28	11.15	515	0.08	1498
42	554.09	247.3	413.5	33.30	6.28	11.05	530	0.08	1594
44	583.57	260.5	435.5	33.81	6.28	10.98	543	0.07	1688
46	612.83	273.6	457.4	34.30	6.28	10.92	556	0.07	1781
48	641.92	286.7	479.3	34.76	6.30	10.88	569	0.07	1873
50	670.86	299.7	501.0	35.21	6.31	10.86	581	0.06	1964
55	742.65	332.4	555.2	36.24	6.39	10.85	609	0.06	2188
60	813.85	365.5	609.6	37.19	6.52	10.92	635	0.05	2409
65	884.62	399.1	664.5	38.07	6.71	11.06	658	0.05	2627
70	955.07	433.8	720.3	38.89	6.95	11.27	679	0.04	2844
75	1025.25	469.7	777.3	39.68	7.26	11.54	697	0.04	3058
80	1095.24	507.3	835.8	40.43	7.61	11.87	715	0.04	3272
85	1165.07	546.6	896.1	41.17	8.00	12.25	730	0.04	3485
90	1234.76	587.9	958.4	41.88	8.42	12.65	745	0.03	3697
95	1304.35	631.3	1022.6	42.57	8.85	13.07	760	0.03	3908
100	1373.84	676.9	1089.0	43.25	9.23	13.49	774	0.03	4118
110	1512.59	774.2	1228.0	44.57	10.11	14.30	801	0.03	4538
120	1651.12	879.4	1374.7	45.85	10.83	15.01	829	0.03	4957
130	1789.46	991.0	1527.8	47.08	11.41	15.58	857	0.02	5375
140	1927.68	1107.5	1685.8	48.25	11.82	15.99	885	0.02	5791
150	2065.78	1227.3	1847.1	49.36	12.09	16.24	913	0.02	6207
160	2203.80	1349.1	2010.2	50.41	12.22	16.37	942	0.02	6623
170	2341.76	1471.6	2174.1	51.41	12.24	16.39	971	0.02	7038
180	2479.65	1593.9	2337.8	52.34	12.19	16.34	999	0.02	7453
190	2617.50	1715.5	2500.7	53.22	12.09	16.23	1028	0.02	7868
200	2755.30	1835.7	2662.3	54.05	11.95	16.09	1056	0.02	8282
220	3030.82	2071.8	2981.0	55.57	11.63	15.77	1111	0.01	9110
240	3306.23	2301.5	3293.3	56.93	11.33	15.47	1165	0.01	9938
260	3581.56	2525.6	3600.0	58.16	11.08	15.21	1216	0.01	10765
280	3856.84	2745.1	3902.1	59.28	10.87	15.01	1265	0.01	11591
300	4132.07	2961.0	4200.6	60.31	10.72	14.85	1311	0.01	12418

* TWO PHASE BOUNDARY

weber

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

4 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 13.935	12.95	-308.8	-303.6	4.98	4.69	6.39	1271	9.28	11878
14	12.96	-308.4	-303.2	5.01	4.71	6.41	1273	9.28	11903
15	13.10	-301.8	-296.5	5.47	4.91	6.95	1231	9.21	10719
16	13.25	-294.7	-289.4	5.93	5.10	7.38	1205	9.02	10043
17	13.41	-287.1	-281.8	6.39	5.29	7.85	1181	8.87	9402
18	13.59	-279.1	-273.7	6.85	5.45	8.32	1160	8.73	8827
19	13.78	-270.6	-265.1	7.31	5.60	8.84	1137	8.58	8191
20	13.99	-261.6	-256.0	7.78	5.73	9.40	1111	8.40	7524
21	14.22	-252.0	-246.3	8.26	5.85	10.01	1085	8.21	6868
22	14.47	-241.8	-236.0	8.74	5.94	10.69	1057	8.00	6216
23	14.76	-230.8	-224.9	9.23	6.02	11.46	1026	7.75	5532
24	15.09	-219.0	-213.0	9.74	6.09	12.37	991	7.45	4832
25	15.46	-206.3	-200.1	10.26	6.14	13.46	950	7.10	4122
* 25.957	15.90	-192.9	-186.6	10.79	6.19	14.75	905	6.69	3437
* 25.957	204.98	121.2	203.2	25.82	6.89	16.79	376	0.23	579
26	205.74	121.6	203.9	25.84	6.88	16.71	376	0.23	583
27	221.63	131.2	219.9	26.45	6.72	15.34	390	0.21	668
28	236.50	140.1	234.7	26.99	6.62	14.44	403	0.19	745
29	250.66	148.6	248.8	27.48	6.56	13.80	415	0.18	817
30	264.29	156.7	262.4	27.94	6.51	13.33	425	0.17	884
31	277.50	164.5	275.5	28.37	6.47	12.96	436	0.16	948
32	290.39	172.2	288.3	28.78	6.44	12.66	445	0.15	1009
33	303.01	179.7	300.9	29.17	6.42	12.42	455	0.15	1068
34	315.41	187.0	313.2	29.53	6.39	12.21	464	0.14	1126
35	327.62	194.3	325.3	29.89	6.37	12.03	473	0.13	1182
36	339.66	201.4	337.3	30.22	6.35	11.88	481	0.13	1237
37	351.57	208.5	349.1	30.55	6.34	11.76	489	0.12	1290
38	363.36	215.4	360.8	30.86	6.33	11.65	497	0.12	1343
39	375.04	222.4	372.4	31.16	6.32	11.55	505	0.12	1395
40	386.63	229.3	383.9	31.45	6.31	11.47	513	0.11	1446
42	409.56	242.9	406.7	32.01	6.30	11.33	527	0.11	1547
44	432.22	256.4	429.2	32.53	6.30	11.22	541	0.10	1645
46	454.65	269.7	451.6	33.03	6.30	11.14	555	0.09	1742
48	476.89	283.0	473.8	33.50	6.31	11.07	568	0.09	1837
50	498.97	296.3	495.9	33.95	6.33	11.03	580	0.09	1931
55	553.61	329.4	550.9	35.00	6.40	10.98	609	0.08	2162
60	607.64	362.8	605.8	35.96	6.53	11.02	635	0.07	2388
65	661.23	396.7	661.2	36.84	6.72	11.14	658	0.06	2610
70	714.49	431.6	717.4	37.68	6.96	11.34	679	0.06	2830
75	767.49	467.7	774.7	38.47	7.26	11.60	698	0.05	3047
80	820.29	505.4	833.5	39.22	7.61	11.92	715	0.05	3263
85	872.93	544.9	894.1	39.96	8.00	12.29	731	0.05	3478
90	925.43	586.3	956.5	40.67	8.42	12.69	746	0.05	3692
95	977.83	629.8	1021.0	41.37	8.85	13.10	760	0.04	3905
100	1030.13	675.5	1087.5	42.05	9.28	13.52	774	0.04	4117
110	1134.51	773.0	1226.8	43.38	10.11	14.33	802	0.04	4539
120	1238.65	878.3	1373.7	44.65	10.84	15.04	830	0.03	4960
130	1342.62	990.0	1527.0	45.88	11.41	15.60	857	0.03	5379
140	1446.46	1106.6	1685.1	47.05	11.83	16.00	886	0.03	5797
150	1550.19	1226.5	1846.6	48.17	12.09	16.26	914	0.03	6214
160	1653.83	1348.3	2009.9	49.22	12.22	16.38	943	0.03	6631
170	1757.40	1470.9	2173.8	50.22	12.24	16.40	972	0.02	7047
180	1860.92	1593.3	2337.6	51.15	12.19	16.35	1000	0.02	7463
190	1964.39	1714.8	2500.6	52.03	12.09	16.24	1029	0.02	7878
200	2067.82	1835.2	2662.3	52.86	11.95	16.10	1057	0.02	8293
220	2274.59	2071.2	2981.1	54.38	11.64	15.78	1112	0.02	9122
240	2481.25	2301.0	3293.5	55.74	11.33	15.47	1165	0.02	9950
260	2687.83	2525.2	3600.3	56.97	11.08	15.21	1217	0.02	10778
280	2894.36	2744.7	3902.4	58.09	10.88	15.01	1266	0.01	11605
300	3100.84	2960.7	4201.0	59.12	10.72	14.86	1312	0.01	12432

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

5 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM³/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM³/G
* 13.968	12.94	-308.8	-302.3	4.98	4.70	6.39	1274	9.29	11942
14	12.94	-308.6	-302.1	4.99	4.71	6.38	1279	9.29	12054
15	13.08	-302.0	-295.4	5.45	4.91	6.93	1237	9.25	10821
16	13.23	-294.9	-288.3	5.91	5.10	7.37	1210	9.06	10139
17	13.39	-287.4	-280.7	6.37	5.28	7.81	1189	8.91	9560
18	13.57	-279.5	-272.7	6.83	5.45	8.29	1166	8.76	8928
19	13.75	-271.0	-264.1	7.29	5.60	8.81	1142	8.61	8296
20	13.96	-262.0	-255.0	7.76	5.73	9.35	1118	8.44	7653
21	14.19	-252.5	-245.4	8.23	5.84	9.97	1090	8.25	6969
22	14.44	-242.3	-235.1	8.71	5.94	10.62	1063	8.03	6324
23	14.72	-231.5	-224.1	9.20	6.02	11.37	1033	7.79	5648
24	15.04	-219.8	-212.3	9.70	6.09	12.25	998	7.50	4952
25	15.41	-207.3	-199.6	10.22	6.14	13.29	959	7.16	4251
26	15.85	-193.6	-185.6	10.77	6.19	14.61	912	6.75	3528
27	16.38	-178.4	-170.2	11.35	6.25	16.43	856	6.26	2793
* 27.115	16.45	-176.5	-168.2	11.42	6.26	16.62	850	6.20	2725
* 27.116	162.92	119.0	200.5	25.03	7.01	18.92	378	0.30	528
28	175.44	128.6	216.3	25.60	6.84	17.03	391	0.27	615
29	188.41	138.4	232.6	26.17	6.72	15.69	405	0.25	701
30	200.56	147.6	247.8	26.69	6.64	14.78	417	0.23	780
31	212.13	156.2	262.3	27.16	6.58	14.13	428	0.21	854
32	223.25	164.5	276.1	27.60	6.53	13.63	439	0.20	923
33	234.04	172.6	289.6	28.02	6.50	13.23	449	0.19	988
34	244.55	180.4	302.6	28.41	6.45	12.90	458	0.18	1051
35	254.83	188.0	315.4	28.78	6.42	12.64	468	0.17	1112
36	264.92	195.5	327.9	29.13	6.40	12.42	477	0.17	1171
37	274.85	202.8	340.3	29.47	6.38	12.23	485	0.16	1229
38	284.65	210.1	352.4	29.79	6.36	12.07	494	0.15	1285
39	294.33	217.2	364.4	30.10	6.35	11.94	502	0.15	1340
40	303.90	224.3	376.3	30.40	6.34	11.82	510	0.14	1394
42	322.78	238.3	399.7	30.98	6.33	11.63	525	0.13	1500
44	341.37	252.1	422.8	31.51	6.32	11.48	539	0.13	1603
46	359.71	265.8	445.7	32.02	6.32	11.36	553	0.12	1703
48	377.86	279.4	468.3	32.50	6.33	11.27	566	0.11	1802
50	395.84	292.8	490.8	32.96	6.35	11.20	579	0.11	1899
55	440.20	326.4	546.5	34.02	6.42	11.11	608	0.10	2136
60	483.93	360.1	602.1	34.99	6.54	11.13	634	0.09	2367
65	527.22	394.3	657.9	35.89	6.72	11.23	658	0.08	2593
70	570.17	429.4	714.5	36.72	6.97	11.41	679	0.07	2816
75	612.85	465.7	772.1	37.52	7.27	11.66	698	0.07	3036
80	655.34	503.6	831.2	38.28	7.62	11.98	715	0.06	3255
85	697.66	543.2	892.0	39.02	8.01	12.33	731	0.06	3472
90	739.85	584.7	954.6	39.73	8.42	12.73	746	0.06	3687
95	781.93	628.3	1019.3	40.43	8.85	13.14	761	0.05	3902
100	823.92	674.0	1086.0	41.12	9.28	13.55	775	0.05	4115
110	907.67	771.7	1225.6	42.44	10.12	14.35	803	0.05	4540
120	991.18	877.1	1372.7	43.73	10.84	15.06	830	0.04	4963
130	1074.52	988.9	1526.2	44.95	11.41	15.61	858	0.04	5383
140	1157.73	1105.6	1684.5	46.13	11.83	16.02	886	0.04	5803
150	1240.83	1225.6	1846.1	47.24	12.09	16.27	915	0.03	6221
160	1323.85	1347.5	2009.5	48.30	12.22	16.39	944	0.03	6639
170	1406.80	1470.2	2173.6	49.29	12.24	16.41	972	0.03	7056
180	1489.69	1592.6	2337.5	50.23	12.19	16.35	1001	0.03	7472
190	1572.53	1714.2	2500.5	51.11	12.09	16.25	1030	0.03	7888
200	1655.34	1834.6	2662.3	51.94	11.95	16.10	1058	0.03	8304
220	1820.85	2070.7	2981.2	53.46	11.64	15.78	1113	0.02	9134
240	1986.26	2300.6	3293.7	54.82	11.33	15.48	1166	0.02	9963
260	2151.60	2524.8	3600.6	56.05	11.08	15.22	1217	0.02	10791
280	2316.88	2744.3	3902.8	57.17	10.88	15.01	1266	0.02	11619
300	2482.11	2960.4	4201.4	58.20	10.72	14.86	1313	0.02	12446

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

6 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 14.001	12.93	-308.7	-301.0	4.98	4.70	6.38	1280	9.30	12079
15	13.06	-302.2	-294.4	5.44	4.90	6.92	1242	9.28	10921
16	13.21	-295.2	-287.3	5.89	5.10	7.33	1219	9.10	10322
17	13.37	-287.7	-279.7	6.35	5.28	7.79	1194	8.94	9661
18	13.55	-279.8	-271.6	6.81	5.44	8.27	1171	8.79	9028
19	13.73	-271.4	-263.1	7.28	5.59	8.77	1148	8.64	8399
20	13.93	-262.4	-254.1	7.74	5.72	9.31	1123	8.47	7756
21	14.16	-253.0	-244.5	8.21	5.84	9.90	1098	8.28	7108
22	14.41	-242.9	-234.2	8.68	5.93	10.56	1069	8.07	6429
23	14.68	-232.1	-223.3	9.17	6.01	11.29	1040	7.83	5761
24	14.99	-220.6	-211.6	9.67	6.08	12.12	1007	7.54	5082
25	15.35	-208.2	-199.0	10.18	6.14	13.14	968	7.21	4376
26	15.78	-194.7	-185.3	10.72	6.19	14.38	923	6.81	3665
27	16.29	-179.9	-170.1	11.29	6.25	16.08	869	6.35	2934
28	16.94	-163.1	-152.9	11.92	6.32	18.57	807	5.81	2216
* 28.123	17.04	-160.8	-150.6	12.00	6.34	18.60	802	5.73	2190
* 28.123	133.77	115.6	195.8	24.32	7.13	21.64	378	0.37	472
29	145.31	126.3	213.5	24.94	6.95	18.80	393	0.33	570
30	157.00	137.1	231.3	25.55	6.81	16.93	407	0.30	667
31	167.78	146.9	247.6	26.08	6.72	15.73	420	0.28	752
32	177.93	156.1	262.9	26.57	6.64	14.88	431	0.26	831
33	187.63	164.9	277.5	27.02	6.59	14.25	442	0.24	905
34	196.98	173.3	291.4	27.43	6.53	13.75	453	0.23	974
35	206.04	181.4	305.0	27.83	6.48	13.35	463	0.22	1041
36	214.88	189.2	318.2	28.20	6.45	13.03	472	0.21	1105
37	223.54	196.9	331.1	28.55	6.42	12.77	482	0.20	1166
38	232.04	204.5	343.7	28.89	6.40	12.55	490	0.19	1226
39	240.41	211.9	356.2	29.21	6.38	12.37	499	0.18	1285
40	248.66	219.3	368.5	29.52	6.37	12.21	507	0.18	1342
42	264.87	233.7	392.6	30.11	6.35	11.95	523	0.17	1453
44	280.77	247.8	416.3	30.66	6.34	11.75	538	0.16	1560
46	296.40	261.8	439.6	31.18	6.34	11.59	552	0.15	1665
48	311.83	275.6	462.7	31.67	6.35	11.47	565	0.14	1767
50	327.08	289.3	485.6	32.14	6.36	11.38	578	0.13	1867
55	364.60	323.3	542.1	33.22	6.43	11.25	608	0.12	2110
60	401.47	357.4	598.3	34.19	6.55	11.23	634	0.11	2346
65	437.89	391.9	654.6	35.10	6.73	11.32	658	0.10	2576
70	473.97	427.2	711.6	35.94	6.97	11.48	679	0.09	2802
75	509.78	463.7	769.6	36.74	7.27	11.72	698	0.08	3026
80	545.39	501.7	828.9	37.51	7.62	12.03	716	0.08	3247
85	580.83	541.4	889.9	38.25	8.01	12.38	732	0.07	3466
90	616.15	583.1	952.8	38.96	8.42	12.77	747	0.07	3683
95	651.35	626.8	1017.6	39.67	8.85	13.17	761	0.06	3899
100	686.46	672.6	1084.5	40.35	9.29	13.58	776	0.06	4114
110	756.45	770.5	1224.4	41.68	10.12	14.38	803	0.06	4541
120	826.21	876.0	1371.7	42.96	10.84	15.08	831	0.05	4966
130	895.80	987.9	1525.4	44.19	11.41	15.63	859	0.05	5388
140	965.25	1104.7	1683.9	45.37	11.83	16.03	887	0.04	5809
150	1034.60	1224.8	1845.6	46.48	12.09	16.28	916	0.04	6229
160	1103.87	1346.8	2009.1	47.54	12.22	16.40	945	0.04	6647
170	1173.07	1469.4	2173.3	48.53	12.25	16.42	973	0.04	7065
180	1242.21	1591.9	2337.3	49.47	12.19	16.36	1002	0.03	7482
190	1311.30	1713.6	2500.4	50.35	12.09	16.25	1030	0.03	7899
200	1380.35	1834.0	2662.2	51.18	11.95	16.11	1059	0.03	8315
220	1518.36	2070.2	2981.2	52.70	11.64	15.79	1114	0.03	9146
240	1656.27	2300.1	3293.9	54.06	11.33	15.48	1167	0.03	9976
260	1794.11	2524.4	3600.8	55.29	11.08	15.22	1218	0.02	10805
280	1931.89	2744.0	3903.1	56.41	10.88	15.02	1267	0.02	11633
300	2069.62	2960.0	4201.8	57.44	10.72	14.86	1314	0.02	12461

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

7 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 14.034	12.92	-308.7	-299.7	4.98	4.71	6.38	1283	9.31	12146
15	13.05	-302.4	-293.3	5.42	4.90	6.88	1254	9.31	11213
16	13.19	-295.4	-286.2	5.88	5.09	7.32	1224	9.13	10427
17	13.35	-288.0	-278.6	6.34	5.27	7.77	1199	8.97	9762
18	13.53	-280.1	-270.6	6.80	5.44	8.25	1176	8.82	9126
19	13.71	-271.7	-262.1	7.26	5.59	8.74	1153	8.67	8501
20	13.91	-262.8	-253.1	7.72	5.72	9.28	1129	8.50	7858
21	14.13	-253.4	-243.5	8.18	5.83	9.85	1104	8.31	7214
22	14.37	-243.4	-233.4	8.66	5.93	10.48	1076	8.10	6555
23	14.64	-232.8	-222.5	9.14	6.01	11.21	1046	7.87	5872
24	14.95	-221.4	-210.9	9.63	6.08	12.02	1014	7.59	5201
25	15.30	-209.1	-198.4	10.14	6.13	13.00	976	7.26	4498
26	15.71	-195.9	-184.9	10.67	6.18	14.14	934	6.88	3816
27	16.20	-181.4	-170.0	11.24	6.24	15.68	883	6.43	3102
28	16.82	-165.0	-153.3	11.85	6.31	18.03	822	5.91	2364
29	17.65	-146.0	-133.6	12.53	6.41	21.71	750	5.30	1660
* 29.019	17.67	-145.6	-133.2	12.55	6.41	21.70	749	5.29	1659
* 29.019	112.13	110.8	189.3	23.67	7.28	25.29	378	0.45	412
30	124.49	124.6	211.7	24.43	7.04	20.53	396	0.39	537
31	135.21	136.3	230.9	25.06	6.89	18.10	411	0.36	641
32	144.94	146.8	248.2	25.61	6.78	16.60	424	0.33	733
33	154.04	156.5	264.3	26.10	6.70	15.56	435	0.30	817
34	162.66	165.6	279.5	26.55	6.62	14.79	447	0.28	894
35	170.94	174.3	294.0	26.97	6.55	14.21	458	0.27	967
36	178.95	182.7	307.9	27.37	6.50	13.75	468	0.26	1036
37	186.74	190.8	321.5	27.74	6.47	13.39	478	0.24	1102
38	194.34	198.7	334.7	28.09	6.44	13.09	487	0.23	1167
39	201.80	206.4	347.7	28.43	6.42	12.84	496	0.22	1229
40	209.13	214.0	360.4	28.75	6.40	12.63	504	0.21	1289
42	223.46	228.9	385.3	29.36	6.38	12.29	521	0.20	1406
44	237.45	243.4	409.7	29.93	6.36	12.04	536	0.19	1518
46	251.16	257.7	433.5	30.46	6.36	11.84	550	0.18	1627
48	264.66	271.8	457.1	30.96	6.36	11.69	564	0.17	1732
50	277.96	285.7	480.3	31.43	6.38	11.57	577	0.16	1835
55	310.61	320.2	537.7	32.52	6.44	11.39	607	0.14	2085
60	342.59	354.7	594.5	33.51	6.56	11.34	634	0.13	2326
65	374.10	389.4	651.3	34.42	6.74	11.40	658	0.11	2560
70	405.27	425.0	708.7	35.27	6.98	11.56	680	0.11	2789
75	436.17	461.7	767.0	36.08	7.28	11.79	699	0.10	3016
80	466.86	499.8	826.6	36.85	7.63	12.08	716	0.09	3239
85	497.40	539.7	887.9	37.59	8.01	12.42	732	0.09	3460
90	527.80	581.5	950.9	38.31	8.43	12.80	748	0.08	3679
95	558.09	625.3	1016.0	39.01	8.86	13.20	762	0.08	3896
100	588.28	671.2	1083.0	39.70	9.29	13.61	776	0.07	4113
110	648.45	769.2	1223.2	41.03	10.12	14.40	804	0.06	4542
120	708.38	874.9	1370.8	42.32	10.84	15.10	832	0.06	4969
130	768.15	986.9	1524.6	43.55	11.42	15.65	860	0.05	5393
140	827.78	1103.8	1683.2	44.73	11.83	16.05	888	0.05	5815
150	887.30	1223.9	1845.1	45.84	12.09	16.29	917	0.05	6236
160	946.74	1346.0	2008.7	46.90	12.22	16.41	945	0.04	6655
170	1006.12	1468.7	2173.0	47.89	12.25	16.43	974	0.04	7074
180	1065.43	1591.3	2337.1	48.83	12.19	16.37	1003	0.04	7492
190	1124.71	1713.0	2500.3	49.71	12.09	16.26	1031	0.04	7909
200	1183.94	1833.4	2662.2	50.54	11.95	16.12	1059	0.04	8326
220	1302.30	2069.7	2981.3	52.07	11.64	15.80	1115	0.03	9158
240	1420.57	2299.7	3294.1	53.43	11.33	15.49	1168	0.03	9989
260	1538.76	2524.0	3601.1	54.66	11.08	15.23	1219	0.03	10818
280	1656.89	2743.6	3903.4	55.78	10.88	15.02	1268	0.03	11647
300	1774.98	2959.7	4202.2	56.81	10.73	14.86	1315	0.02	12475

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

8 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 14.067	12.91	-308.7	-298.3	4.99	4.71	6.38	1286	9.32	12213
15	13.04	-302.6	-292.2	5.41	4.90	6.85	1259	9.32	11343
16	13.18	-295.6	-285.1	5.87	5.09	7.30	1229	9.16	10531
17	13.34	-288.2	-277.6	6.32	5.27	7.75	1204	9.00	9861
18	13.51	-280.4	-269.6	6.78	5.43	8.22	1181	8.85	9224
19	13.69	-272.0	-261.1	7.24	5.58	8.71	1159	8.70	8601
20	13.89	-263.2	-252.1	7.70	5.71	9.24	1134	8.53	7958
21	14.10	-253.9	-242.6	8.16	5.83	9.80	1109	8.35	7319
22	14.34	-244.0	-232.5	8.63	5.93	10.42	1082	8.14	6662
23	14.61	-233.4	-221.7	9.11	6.01	11.14	1053	7.90	5980
24	14.91	-222.1	-210.2	9.60	6.08	11.92	1021	7.63	5316
25	15.25	-210.0	-197.8	10.11	6.13	12.83	985	7.31	4638
26	15.65	-197.0	-184.5	10.63	6.18	13.94	944	6.94	3951
27	16.12	-182.7	-169.8	11.18	6.24	15.39	895	6.51	3243
28	16.70	-166.9	-153.5	11.78	6.30	17.39	838	6.01	2545
29	17.47	-148.6	-134.6	12.44	6.39	20.66	769	5.43	1831
* 29.828	18.37	-130.4	-115.7	13.08	6.49	25.51	700	4.86	1248
* 29.828	95.20	104.8	181.0	23.03	7.46	30.50	378	0.55	349
30	97.84	108.2	186.5	23.22	7.39	28.36	382	0.53	379
31	109.58	123.5	211.2	24.03	7.12	22.06	400	0.46	516
32	119.46	136.1	231.6	24.68	6.95	19.10	415	0.41	627
33	128.35	147.2	249.9	25.24	6.84	17.33	428	0.37	723
34	136.58	157.3	266.5	25.74	6.71	16.12	441	0.35	810
35	144.36	166.7	282.2	26.19	6.63	15.25	453	0.32	890
36	151.80	175.7	297.1	26.61	6.56	14.61	464	0.31	966
37	158.98	184.3	311.5	27.00	6.52	14.10	474	0.29	1037
38	165.95	192.6	325.4	27.37	6.49	13.70	484	0.28	1106
39	172.75	200.7	338.9	27.73	6.45	13.37	493	0.26	1172
40	179.41	208.6	352.1	28.06	6.43	13.10	502	0.25	1236
42	192.36	224.0	377.9	28.69	6.40	12.67	518	0.23	1359
44	204.94	238.9	402.9	29.27	6.39	12.35	534	0.22	1476
46	217.22	253.6	427.3	29.81	6.38	12.10	549	0.20	1588
48	229.27	267.9	451.3	30.32	6.38	11.91	563	0.19	1698
50	241.13	282.1	475.0	30.81	6.39	11.77	576	0.18	1804
55	270.12	317.1	533.2	31.92	6.45	11.54	607	0.16	2060
60	298.43	351.9	590.7	32.92	6.57	11.46	634	0.15	2306
65	326.27	387.0	648.0	33.84	6.75	11.49	658	0.13	2544
70	353.75	422.8	705.8	34.69	6.99	11.63	680	0.12	2777
75	380.97	459.6	764.4	35.50	7.28	11.85	699	0.11	3006
80	407.98	498.0	824.4	36.27	7.63	12.13	717	0.10	3231
85	434.83	538.0	885.8	37.02	8.02	12.47	733	0.10	3454
90	461.54	579.9	949.1	37.74	8.43	12.84	748	0.09	3675
95	488.15	623.8	1014.3	38.45	8.86	13.24	763	0.09	3894
100	514.66	669.8	1081.5	39.14	9.29	13.64	777	0.08	4112
110	567.45	768.0	1222.0	40.47	10.12	14.43	805	0.07	4544
120	620.02	873.8	1369.8	41.76	10.84	15.12	832	0.07	4972
130	672.41	985.9	1523.8	42.99	11.42	15.67	861	0.06	5398
140	724.67	1102.9	1682.6	44.17	11.83	16.06	889	0.06	5821
150	776.83	1223.1	1844.6	45.29	12.09	16.31	917	0.05	6243
160	828.90	1345.2	2008.3	46.34	12.22	16.42	946	0.05	6664
170	880.91	1468.0	2172.7	47.34	12.25	16.44	975	0.05	7083
180	932.86	1590.6	2336.9	48.28	12.20	16.38	1004	0.04	7502
190	984.76	1712.4	2500.2	49.16	12.09	16.27	1032	0.04	7920
200	1036.63	1832.9	2662.2	49.99	11.95	16.12	1060	0.04	8337
220	1140.26	2069.2	2981.4	51.51	11.64	15.80	1116	0.04	9170
240	1243.79	2299.2	3294.3	52.87	11.34	15.49	1169	0.03	10001
260	1347.25	2523.6	3601.4	54.10	11.08	15.23	1220	0.03	10832
280	1450.65	2743.3	3903.8	55.22	10.88	15.02	1269	0.03	11661
300	1554.01	2959.4	4202.6	56.25	10.73	14.87	1316	0.03	12490

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

9 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 14.100	12.90	-308.6	-297.0	4.99	4.72	6.38	1289	9.34	12279
15	13.02	-302.8	-291.1	5.40	4.90	6.83	1265	9.33	11473
16	13.16	-295.9	-284.0	5.85	5.09	7.29	1234	9.18	10634
17	13.32	-288.5	-276.5	6.31	5.27	7.73	1209	9.03	9960
18	13.49	-280.7	-268.5	6.76	5.43	8.20	1186	8.88	9320
19	13.67	-272.4	-260.1	7.22	5.58	8.69	1164	8.73	8701
20	13.86	-263.6	-251.1	7.68	5.71	9.21	1140	8.56	8058
21	14.08	-254.3	-241.7	8.14	5.82	9.76	1115	8.38	7422
22	14.31	-244.5	-231.6	8.61	5.92	10.37	1088	8.17	6768
23	14.57	-234.0	-220.9	9.08	6.01	11.05	1060	7.94	6110
24	14.87	-222.8	-209.5	9.57	6.07	11.82	1028	7.67	5429
25	15.20	-210.9	-197.2	10.07	6.13	12.70	993	7.36	4762
26	15.59	-198.0	-184.0	10.59	6.18	13.76	953	7.00	4081
27	16.04	-184.0	-169.6	11.13	6.23	15.13	906	6.58	3378
28	16.60	-168.6	-153.6	11.71	6.29	16.96	851	6.10	2692
29	17.31	-151.0	-135.4	12.35	6.37	19.69	788	5.55	2011
30	18.33	-129.9	-113.4	13.10	6.48	24.86	709	4.89	1312
* 30.567	19.18	-114.9	-97.7	13.62	6.59	31.35	650	4.42	889
* 30.567	81.40	97.2	170.5	22.39	7.67	38.61	376	0.66	281
31	87.69	106.9	185.8	22.89	7.46	30.61	387	0.59	365
32	98.65	123.4	212.1	23.73	7.18	23.21	405	0.51	507
33	107.77	136.6	233.6	24.39	7.01	19.86	420	0.46	622
34	115.89	148.1	252.4	24.95	6.83	17.88	434	0.42	721
35	123.40	158.5	269.6	25.45	6.71	16.57	447	0.39	811
36	130.48	168.2	285.7	25.90	6.63	15.64	459	0.36	893
37	137.24	177.4	301.0	26.32	6.57	14.94	470	0.34	971
38	143.76	186.2	315.6	26.71	6.52	14.40	480	0.32	1044
39	150.07	194.7	329.8	27.08	6.49	13.97	490	0.31	1115
40	156.22	203.0	343.6	27.43	6.46	13.62	499	0.29	1182
42	168.13	218.9	370.3	28.08	6.43	13.08	516	0.27	1311
44	179.63	234.3	396.0	28.68	6.41	12.68	533	0.25	1433
46	190.81	249.3	421.0	29.23	6.40	12.38	548	0.24	1551
48	201.75	264.0	445.6	29.76	6.40	12.15	562	0.22	1663
50	212.48	278.4	469.7	30.25	6.41	11.97	576	0.21	1773
55	238.65	314.0	528.7	31.37	6.47	11.69	607	0.18	2036
60	264.10	349.1	586.8	32.39	6.58	11.57	634	0.17	2286
65	289.08	384.5	644.7	33.31	6.75	11.58	658	0.15	2528
70	313.70	420.5	702.9	34.17	6.99	11.70	680	0.14	2765
75	338.05	457.6	761.9	34.99	7.29	11.91	700	0.13	2996
80	362.20	496.1	822.1	35.77	7.63	12.18	717	0.12	3224
85	386.18	536.2	883.8	36.51	8.02	12.51	734	0.11	3449
90	410.02	578.3	947.3	37.24	8.43	12.88	749	0.10	3672
95	433.76	622.3	1012.7	37.95	8.86	13.27	763	0.10	3892
100	457.41	668.4	1080.0	38.64	9.29	13.67	778	0.09	4111
110	504.46	766.8	1220.8	39.98	10.13	14.45	805	0.08	4545
120	551.30	872.7	1368.8	41.26	10.85	15.14	833	0.08	4976
130	597.96	984.9	1523.1	42.50	11.42	15.68	861	0.07	5403
140	644.49	1102.0	1682.0	43.68	11.83	16.08	890	0.07	5828
150	690.91	1222.3	1844.1	44.79	12.09	16.32	918	0.06	6251
160	737.25	1344.4	2008.0	45.85	12.22	16.44	947	0.06	6672
170	783.53	1467.3	2172.5	46.85	12.25	16.45	976	0.05	7092
180	829.75	1589.9	2336.7	47.79	12.20	16.39	1005	0.05	7512
190	875.92	1711.7	2500.1	48.67	12.09	16.28	1033	0.05	7930
200	922.05	1832.3	2662.1	49.50	11.95	16.13	1061	0.05	8348
220	1014.23	2068.7	2981.5	51.02	11.64	15.81	1117	0.04	9182
240	1106.30	2298.8	3294.4	52.39	11.34	15.49	1170	0.04	10014
260	1198.30	2523.2	3601.6	53.62	11.08	15.23	1221	0.03	10845
280	1290.24	2742.9	3904.1	54.74	10.88	15.03	1270	0.03	11675
300	1382.14	2959.1	4203.0	55.77	10.73	14.87	1317	0.03	12504

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

10 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 14.133	12.89	-308.6	-295.7	4.99	4.72	6.38	1292	9.35	12345
15	13.01	-303.0	-290.0	5.38	4.90	6.81	1270	9.34	11601
16	13.15	-296.1	-282.9	5.84	5.08	7.27	1239	9.21	10736
17	13.30	-288.7	-275.4	6.29	5.26	7.71	1214	9.06	10057
18	13.47	-281.0	-267.5	6.75	5.43	8.18	1191	8.91	9415
19	13.65	-272.7	-259.1	7.20	5.57	8.66	1169	8.76	8799
20	13.84	-264.0	-250.2	7.66	5.71	9.17	1145	8.59	8156
21	14.05	-254.8	-240.7	8.12	5.82	9.72	1121	8.41	7524
22	14.28	-245.0	-230.7	8.58	5.92	10.32	1094	8.21	6872
23	14.54	-234.6	-220.1	9.06	6.00	10.97	1066	7.98	6220
24	14.83	-223.5	-208.7	9.54	6.07	11.74	1035	7.71	5539
25	15.15	-211.7	-196.6	10.04	6.13	12.58	1001	7.41	4883
26	15.53	-199.0	-183.5	10.55	6.18	13.59	962	7.06	4208
27	15.97	-185.3	-169.3	11.08	6.23	14.84	917	6.65	3532
28	16.50	-170.2	-153.7	11.65	6.29	16.52	865	6.19	2850
29	17.17	-153.2	-136.0	12.27	6.36	19.00	804	5.66	2166
30	18.09	-133.2	-115.1	12.98	6.46	23.26	731	5.04	1485
31	19.58	-107.2	-87.6	13.88	6.63	33.89	633	4.24	784
* 31.248	20.16	-98.7	-78.5	14.17	6.71	40.60	600	3.98	594
* 31.248	69.66	87.6	157.3	21.72	7.93	52.16	374	0.79	213
32	80.44	107.0	187.5	22.68	7.50	31.66	393	0.65	367
33	90.53	124.2	214.8	23.52	7.22	23.86	411	0.56	511
34	98.88	137.8	236.7	24.17	6.97	20.33	427	0.50	627
35	106.33	149.6	255.9	24.73	6.81	18.27	442	0.46	728
36	113.22	160.2	273.4	25.22	6.70	16.91	454	0.43	819
37	119.70	170.1	289.9	25.67	6.63	15.94	466	0.40	903
38	125.89	179.5	305.4	26.09	6.57	15.22	477	0.38	982
39	131.84	188.5	320.3	26.48	6.53	14.65	487	0.36	1057
40	137.61	197.1	334.8	26.84	6.50	14.20	497	0.34	1128
42	148.71	213.7	362.4	27.52	6.45	13.52	515	0.31	1264
44	159.36	229.6	389.0	28.13	6.43	13.03	531	0.29	1391
46	169.67	245.0	414.7	28.70	6.42	12.67	547	0.27	1513
48	179.72	260.0	439.7	29.24	6.42	12.40	561	0.25	1630
50	189.57	274.7	464.3	29.74	6.42	12.18	575	0.24	1742
55	213.47	310.8	524.2	30.88	6.48	11.84	606	0.21	2012
60	236.65	346.4	583.0	31.91	6.59	11.69	634	0.19	2267
65	259.34	382.0	641.4	32.84	6.76	11.68	659	0.17	2513
70	281.67	418.3	700.0	33.71	7.00	11.78	681	0.15	2753
75	303.73	455.6	759.3	34.53	7.29	11.97	700	0.14	2987
80	325.58	494.2	819.8	35.31	7.64	12.24	718	0.13	3217
85	347.27	534.5	881.8	36.06	8.02	12.56	734	0.12	3444
90	368.82	576.7	945.5	36.79	8.44	12.92	749	0.12	3668
95	390.26	620.8	1011.1	37.50	8.87	13.31	764	0.11	3890
100	411.61	667.0	1078.6	38.19	9.30	13.70	778	0.10	4111
110	454.08	765.5	1219.6	39.53	10.13	14.48	806	0.09	4547
120	496.32	871.6	1367.9	40.82	10.85	15.16	834	0.09	4979
130	538.40	983.9	1522.3	42.06	11.42	15.70	862	0.08	5408
140	580.34	1101.0	1681.4	43.23	11.84	16.09	891	0.07	5834
150	622.18	1221.4	1843.6	44.35	12.10	16.33	919	0.07	6258
160	663.94	1343.7	2007.6	45.41	12.23	16.45	948	0.06	6681
170	705.63	1466.6	2172.2	46.41	12.25	16.46	977	0.06	7102
180	747.26	1589.3	2336.5	47.35	12.20	16.40	1005	0.06	7522
190	788.85	1711.1	2500.0	48.23	12.09	16.28	1034	0.05	7941
200	830.40	1831.7	2662.1	49.06	11.96	16.14	1062	0.05	8359
220	913.40	2068.2	2981.6	50.59	11.64	15.81	1117	0.05	9194
240	996.31	2298.3	3294.6	51.95	11.34	15.50	1171	0.04	10027
260	1079.14	2522.8	3601.9	53.18	11.08	15.24	1222	0.04	10859
280	1161.91	2742.6	3904.5	54.30	10.88	15.03	1271	0.04	11689
300	1244.64	2958.8	4203.4	55.33	10.73	14.87	1317	0.03	12519

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

12.5 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 14.215	12.87	-308.5	-292.4	5.00	4.73	6.38	1299	9.36	12510
15	12.97	-303.4	-287.2	5.35	4.89	6.75	1282	9.37	11918
16	13.11	-296.6	-280.2	5.80	5.08	7.24	1251	9.29	10987
17	13.26	-289.4	-272.8	6.25	5.25	7.67	1226	9.13	10297
18	13.42	-281.7	-264.9	6.70	5.42	8.13	1203	8.98	9649
19	13.59	-273.5	-256.5	7.15	5.57	8.59	1181	8.83	9041
20	13.78	-264.9	-247.7	7.61	5.70	9.09	1158	8.67	8396
21	13.99	-255.8	-238.4	8.06	5.81	9.62	1134	8.49	7773
22	14.21	-246.2	-228.5	8.52	5.91	10.19	1108	8.29	7124
23	14.46	-236.0	-218.0	8.99	5.99	10.81	1081	8.06	6486
24	14.73	-225.2	-206.8	9.46	6.07	11.51	1052	7.81	5836
25	15.04	-213.7	-194.9	9.95	6.12	12.30	1019	7.52	5173
26	15.39	-201.4	-182.2	10.45	6.17	13.21	983	7.19	4520
27	15.80	-188.2	-168.4	10.97	6.22	14.31	942	6.81	3862
28	16.28	-173.8	-153.5	11.51	6.27	15.74	895	6.38	3192
29	16.87	-158.0	-136.9	12.09	6.33	17.62	842	5.90	2546
30	17.62	-140.0	-118.0	12.73	6.41	20.41	780	5.36	1911
31	18.68	-118.7	-95.3	13.48	6.51	25.39	705	4.72	1277
32	20.47	-90.1	-64.5	14.45	6.72	39.00	603	3.89	627
* 32.746	25.12	-43.4	-12.0	16.07	7.88	242.52	413	2.51	55
* 32.746	43.03	40.9	94.7	19.33	9.18	375.55	365	1.40	33
33	51.74	68.2	132.8	20.49	8.50	86.56	378	1.11	140
34	65.28	102.6	184.2	22.03	7.55	35.79	408	0.83	352
35	74.02	121.9	214.4	22.91	7.15	26.12	427	0.70	499
36	81.15	136.8	238.2	23.58	6.93	21.92	443	0.63	620
37	87.46	149.5	258.9	24.14	6.79	19.52	457	0.57	726
38	93.26	161.0	277.5	24.64	6.69	17.94	469	0.53	821
39	98.70	171.5	294.9	25.09	6.63	16.82	480	0.49	910
40	103.87	181.4	311.3	25.51	6.58	15.99	491	0.47	992
42	113.62	200.0	342.0	26.26	6.52	14.82	510	0.42	1146
44	122.81	217.3	370.8	26.93	6.48	14.03	528	0.38	1288
46	131.60	233.8	398.3	27.54	6.46	13.48	544	0.35	1421
48	140.08	249.7	424.8	28.10	6.46	13.06	559	0.33	1547
50	148.33	265.2	450.6	28.63	6.46	12.75	574	0.31	1668
55	168.19	302.7	512.9	29.82	6.51	12.24	606	0.27	1954
60	187.27	339.3	573.4	30.87	6.61	11.99	634	0.24	2221
65	205.85	375.8	633.1	31.83	6.78	11.91	660	0.21	2477
70	224.05	412.7	692.8	32.71	7.01	11.97	682	0.20	2724
75	241.98	450.5	753.0	33.54	7.31	12.13	702	0.18	2965
80	259.70	489.6	814.2	34.33	7.65	12.37	719	0.17	3201
85	277.26	530.2	876.8	35.09	8.03	12.67	736	0.16	3433
90	294.67	572.6	941.0	35.82	8.44	13.02	751	0.15	3661
95	311.99	617.0	1007.0	36.54	8.87	13.39	766	0.14	3887
100	329.21	663.4	1075.0	37.23	9.30	13.78	780	0.13	4111
110	363.41	762.4	1216.7	38.58	10.14	14.54	808	0.12	4553
120	397.39	868.8	1365.5	39.88	10.86	15.21	836	0.11	4989
130	431.21	981.4	1520.4	41.12	11.43	15.74	864	0.10	5422
140	464.89	1098.8	1679.9	42.30	11.84	16.13	893	0.09	5851
150	498.47	1219.3	1842.4	43.42	12.10	16.36	921	0.08	6277
160	531.98	1341.8	2006.7	44.48	12.23	16.47	950	0.08	6702
170	565.41	1464.8	2171.6	45.48	12.25	16.48	979	0.07	7125
180	598.79	1587.6	2336.1	46.42	12.20	16.42	1008	0.07	7547
190	632.13	1709.6	2499.8	47.30	12.10	16.30	1036	0.07	7968
200	665.42	1830.3	2662.0	48.14	11.96	16.15	1064	0.06	8388
220	731.92	2066.9	2981.8	49.66	11.64	15.82	1120	0.06	9225
240	798.32	2297.2	3295.1	51.02	11.34	15.51	1173	0.05	10060
260	864.65	2521.8	3602.6	52.26	11.08	15.25	1224	0.05	10893
280	930.92	2741.7	3905.3	53.38	10.88	15.04	1273	0.04	11724
300	997.15	2958.0	4204.4	54.41	10.73	14.88	1319	0.04	12555

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

15 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 14.296	12.85	-308.4	-289.1	5.00	4.74	6.38	1306	9.38	12674
15	12.94	-303.9	-284.5	5.32	4.89	6.70	1295	9.40	12228
16	13.07	-297.1	-277.5	5.76	5.07	7.20	1263	9.36	11234
17	13.22	-290.0	-270.1	6.21	5.25	7.62	1240	9.20	10598
18	13.37	-282.4	-262.3	6.66	5.41	8.06	1217	9.05	9939
19	13.54	-274.3	-254.0	7.11	5.56	8.52	1194	8.90	9303
20	13.73	-265.8	-245.2	7.56	5.69	9.00	1172	8.74	8676
21	13.92	-256.9	-236.0	8.01	5.80	9.51	1148	8.56	8045
22	14.14	-247.4	-226.2	8.47	5.90	10.06	1123	8.36	7408
23	14.38	-237.4	-215.8	8.93	5.99	10.65	1097	8.15	6765
24	14.64	-226.8	-204.8	9.39	6.05	11.32	1068	7.90	6103
25	14.93	-215.6	-193.2	9.87	6.12	12.05	1037	7.62	5467
26	15.27	-203.6	-180.7	10.36	6.17	12.91	1003	7.31	4806
27	15.64	-190.8	-167.3	10.86	6.22	13.84	966	6.95	4191
28	16.08	-177.1	-152.9	11.39	6.26	15.05	923	6.56	3545
29	16.61	-162.1	-137.2	11.94	6.32	16.60	874	6.11	2909
30	17.26	-145.5	-119.6	12.54	6.38	18.68	820	5.62	2295
31	18.10	-126.6	-99.4	13.20	6.45	21.93	757	5.07	1686
32	19.31	-104.0	-75.0	13.97	6.57	27.62	682	4.42	1106
33	21.40	-73.3	-41.2	15.01	6.80	42.99	581	3.58	534
34	30.16	-1.9	43.4	17.53	8.76	174.98	395	2.05	78
35	48.84	77.1	150.4	20.64	7.70	54.07	415	1.17	245
36	57.99	104.8	191.8	21.81	7.27	33.56	434	0.94	408
37	64.95	123.8	221.2	22.61	7.02	26.25	450	0.82	542
38	70.82	138.9	245.1	23.25	6.85	22.60	465	0.74	657
39	76.14	152.0	266.2	23.80	6.74	20.01	475	0.67	761
40	81.06	163.8	285.4	24.29	6.67	18.44	487	0.62	857
42	90.07	185.0	320.1	25.13	6.58	16.45	508	0.55	1030
44	98.37	204.1	351.7	25.87	6.53	15.23	526	0.49	1187
46	106.19	222.0	381.3	26.53	6.51	14.40	543	0.45	1331
48	113.66	239.0	409.5	27.13	6.50	13.81	559	0.42	1468
50	120.87	255.3	436.6	27.68	6.50	13.37	573	0.39	1597
55	138.05	294.4	501.5	28.92	6.54	12.66	606	0.33	1899
60	154.41	332.2	563.9	30.00	6.64	12.30	635	0.29	2178
65	170.24	369.5	624.9	30.98	6.80	12.15	661	0.26	2444
70	185.69	407.1	685.6	31.88	7.03	12.16	683	0.24	2699
75	200.86	445.4	746.7	32.72	7.32	12.29	703	0.22	2946
80	215.83	484.9	808.6	33.52	7.66	12.50	721	0.20	3187
85	230.62	525.9	871.8	34.29	8.04	12.79	738	0.19	3423
90	245.28	568.6	936.6	35.03	8.45	13.12	753	0.18	3656
95	259.84	613.3	1003.1	35.75	8.88	13.48	768	0.17	3885
100	274.30	659.9	1071.4	36.45	9.31	13.86	782	0.16	4112
110	302.99	759.4	1213.8	37.80	10.14	14.60	810	0.14	4559
120	331.46	866.0	1363.2	39.10	10.86	15.26	838	0.13	5000
130	359.76	978.9	1518.6	40.35	11.43	15.78	866	0.12	5436
140	387.94	1096.5	1678.4	41.53	11.85	16.16	895	0.11	5868
150	416.02	1217.3	1841.3	42.66	12.10	16.39	923	0.10	6297
160	444.01	1339.8	2005.9	43.72	12.23	16.50	952	0.10	6724
170	471.94	1463.0	2171.0	44.72	12.25	16.51	981	0.09	7150
180	499.82	1586.0	2335.7	45.66	12.20	16.44	1010	0.08	7573
190	527.65	1708.1	2499.6	46.54	12.10	16.32	1038	0.08	7995
200	555.45	1828.9	2662.0	47.38	11.96	16.17	1067	0.08	8416
220	610.94	2065.7	2982.1	48.90	11.65	15.84	1122	0.07	9256
240	666.34	2296.1	3295.6	50.27	11.34	15.52	1175	0.06	10092
260	721.66	2520.8	3603.3	51.50	11.09	15.25	1226	0.06	10927
280	776.94	2740.8	3906.2	52.62	10.88	15.04	1275	0.05	11760
300	832.16	2957.2	4205.4	53.65	10.73	14.89	1322	0.05	12592

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

20 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 14.457	12.80	-308.1	-282.5	5.01	4.77	6.38	1319	9.41	12996
15	12.87	-304.7	-279.0	5.25	4.88	6.63	1311	9.45	12651
16	13.00	-298.1	-272.1	5.70	5.06	7.09	1288	9.43	11851
17	13.14	-291.1	-264.8	6.14	5.24	7.53	1264	9.32	11097
18	13.29	-283.6	-257.1	6.58	5.40	7.96	1240	9.18	10415
19	13.45	-275.8	-248.9	7.02	5.54	8.41	1218	9.03	9771
20	13.62	-267.5	-240.2	7.47	5.67	8.86	1196	8.87	9158
21	13.81	-258.8	-231.1	7.91	5.79	9.34	1173	8.70	8528
22	14.01	-249.6	-221.5	8.36	5.89	9.85	1150	8.51	7909
23	14.23	-239.9	-211.4	8.81	5.98	10.39	1125	8.31	7273
24	14.47	-229.7	-200.8	9.26	6.05	10.98	1098	8.08	6647
25	14.74	-218.9	-189.4	9.72	6.11	11.63	1070	7.82	6022
26	15.04	-207.6	-177.5	10.19	6.17	12.35	1039	7.53	5393
27	15.38	-195.5	-164.7	10.67	6.21	13.15	1006	7.21	4780
28	15.76	-182.7	-151.1	11.17	6.26	14.08	969	6.86	4174
29	16.19	-168.9	-136.5	11.68	6.30	15.17	929	6.47	3586
30	16.71	-154.1	-120.7	12.22	6.34	16.57	884	6.05	2994
31	17.34	-137.9	-103.3	12.79	6.40	18.37	835	5.59	2430
32	18.12	-119.9	-83.7	13.41	6.46	20.90	780	5.08	1881
33	19.15	-99.4	-61.1	14.10	6.54	24.61	719	4.53	1373
34	20.62	-75.0	-33.8	14.92	6.67	30.65	649	3.90	915
35	23.03	-43.9	2.1	15.96	6.89	42.22	568	3.17	526
36	27.52	-2.1	53.0	17.39	7.30	59.51	494	2.39	300
37	34.60	43.8	113.0	19.04	7.32	54.87	466	1.76	290
38	41.38	77.1	159.9	20.29	7.23	40.86	468	1.42	388
39	47.12	101.6	195.8	21.22	7.06	31.87	477	1.20	505
40	52.07	120.7	224.9	21.96	6.92	26.66	488	1.06	618
42	60.55	150.9	272.0	23.11	6.73	21.10	508	0.88	824
44	67.77	175.1	310.6	24.01	6.62	18.34	527	0.76	1002
46	74.47	196.5	345.5	24.78	6.58	16.66	544	0.68	1169
48	80.72	216.2	377.6	25.47	6.57	15.56	560	0.62	1324
50	86.64	234.6	407.9	26.09	6.56	14.78	575	0.57	1469
55	100.51	277.5	478.5	27.43	6.60	13.58	609	0.48	1801
60	113.46	317.8	544.7	28.58	6.68	12.94	638	0.41	2103
65	125.85	356.9	608.6	29.61	6.84	12.64	664	0.37	2386
70	137.86	395.8	671.5	30.54	7.06	12.55	687	0.33	2655
75	149.57	435.2	734.3	31.41	7.34	12.60	707	0.30	2914
80	161.08	475.5	797.7	32.22	7.68	12.77	725	0.28	3165
85	172.42	517.3	862.1	33.01	8.06	13.01	742	0.26	3410
90	183.62	560.7	927.9	33.76	8.47	13.31	757	0.24	3650
95	194.72	605.9	995.3	34.49	8.89	13.65	772	0.23	3886
100	205.73	653.0	1064.4	35.20	9.32	14.00	787	0.21	4119
110	227.52	753.2	1208.3	36.56	10.16	14.72	814	0.19	4576
120	249.09	860.6	1358.8	37.87	10.87	15.36	842	0.17	5025
130	270.50	974.0	1515.0	39.12	11.44	15.87	871	0.16	5467
140	291.79	1092.0	1675.6	40.31	11.85	16.23	899	0.15	5905
150	312.98	1213.2	1839.1	41.44	12.11	16.45	928	0.14	6339
160	334.09	1336.1	2004.3	42.51	12.24	16.55	957	0.13	6771
170	355.13	1459.6	2169.8	43.51	12.26	16.55	986	0.12	7199
180	376.13	1582.8	2335.0	44.46	12.21	16.48	1014	0.11	7626
190	397.08	1705.1	2499.2	45.34	12.10	16.35	1043	0.11	8051
200	417.99	1826.0	2662.0	46.18	11.97	16.20	1071	0.10	8475
220	459.73	2063.2	2982.7	47.71	11.65	15.86	1126	0.09	9318
240	501.37	2293.9	3296.7	49.07	11.35	15.54	1180	0.08	10159
260	542.94	2518.8	3604.7	50.31	11.09	15.27	1231	0.08	10996
280	584.45	2739.0	3908.0	51.43	10.89	15.06	1279	0.07	11831
300	625.93	2955.6	4207.5	52.46	10.73	14.90	1326	0.07	12665

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

25 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 14.615	12.76	-307.8	-275.9	5.03	4.79	6.38	1332	9.44	13313
15	12.80	-305.5	-273.4	5.19	4.87	6.55	1329	9.47	13127
16	12.93	-299.0	-266.7	5.63	5.06	7.00	1310	9.50	12384
17	13.06	-292.1	-259.4	6.07	5.23	7.46	1285	9.44	11576
18	13.20	-284.8	-251.8	6.51	5.38	7.87	1264	9.30	10931
19	13.36	-277.1	-243.7	6.94	5.53	8.29	1241	9.15	10273
20	13.52	-269.0	-235.2	7.38	5.66	8.73	1220	9.00	9642
21	13.70	-260.5	-226.2	7.82	5.77	9.18	1198	8.84	9030
22	13.89	-251.6	-216.8	8.25	5.88	9.66	1176	8.65	8412
23	14.10	-242.2	-206.9	8.69	5.96	10.16	1152	8.46	7796
24	14.32	-232.3	-196.5	9.14	6.04	10.70	1127	8.24	7171
25	14.57	-221.9	-185.5	9.59	6.11	11.28	1100	7.99	6555
26	14.84	-211.0	-173.9	10.04	6.16	11.92	1072	7.73	5936
27	15.15	-199.5	-161.6	10.50	6.21	12.60	1042	7.43	5349
28	15.48	-187.4	-148.7	10.98	6.25	13.37	1009	7.11	4768
29	15.86	-174.5	-134.9	11.46	6.29	14.25	974	6.76	4193
30	16.30	-160.9	-120.1	11.96	6.33	15.31	935	6.39	3619
31	16.81	-146.2	-104.2	12.48	6.37	16.52	895	5.98	3089
32	17.40	-130.5	-87.0	13.03	6.42	18.07	850	5.55	2567
33	18.13	-113.2	-67.9	13.62	6.47	20.07	802	5.10	2072
34	19.04	-94.3	-46.6	14.25	6.53	22.59	750	4.60	1628
35	20.23	-72.9	-22.4	14.95	6.62	26.06	695	4.08	1226
36	21.84	-48.6	6.0	15.75	6.73	30.80	638	3.53	888
37	24.11	-20.7	39.6	16.67	6.88	36.58	586	2.98	645
38	27.24	10.1	78.2	17.70	7.05	40.39	540	2.45	509
39	31.15	41.0	118.8	18.76	7.14	39.99	517	2.04	478
40	35.31	68.0	156.3	19.71	7.06	35.52	513	1.73	523
42	43.05	110.7	218.3	21.22	6.91	27.10	520	1.34	690
44	49.77	142.8	267.2	22.36	6.78	22.20	534	1.11	872
46	55.76	169.1	308.5	23.28	6.69	19.31	550	0.96	1048
48	61.25	192.0	345.2	24.06	6.64	17.49	565	0.85	1213
50	66.32	212.8	378.6	24.74	6.63	16.29	579	0.77	1365
55	78.17	259.9	455.4	26.21	6.66	14.57	614	0.64	1721
60	89.06	303.1	525.7	27.43	6.73	13.62	643	0.54	2042
65	99.37	344.1	592.5	28.50	6.88	13.15	669	0.48	2340
70	109.29	384.4	657.6	29.47	7.09	12.94	692	0.43	2621
75	118.92	424.9	722.2	30.36	7.37	12.92	712	0.39	2891
80	128.34	466.2	787.1	31.20	7.70	13.03	730	0.36	3151
85	137.59	508.7	852.7	31.99	8.08	13.23	747	0.33	3404
90	146.72	552.7	919.5	32.75	8.49	13.50	762	0.31	3651
95	155.74	598.5	987.8	33.49	8.90	13.81	777	0.29	3893
100	164.67	646.0	1057.7	34.21	9.33	14.15	792	0.27	4131
110	182.30	747.2	1202.9	35.59	10.17	14.84	819	0.24	4597
120	199.72	855.2	1354.5	36.91	10.88	15.45	847	0.22	5053
130	216.99	969.1	1511.6	38.17	11.45	15.95	875	0.20	5502
140	234.14	1087.6	1672.9	39.36	11.86	16.30	904	0.19	5945
150	251.19	1209.1	1837.1	40.50	12.12	16.51	932	0.17	6384
160	268.16	1332.3	2002.7	41.56	12.25	16.60	961	0.16	6819
170	285.07	1456.1	2168.8	42.57	12.27	16.60	990	0.15	7251
180	301.93	1579.6	2334.4	43.52	12.22	16.52	1019	0.14	7681
190	318.75	1702.1	2499.0	44.41	12.11	16.39	1047	0.13	8108
200	335.53	1823.3	2662.1	45.24	11.97	16.23	1076	0.13	8534
220	369.01	2060.8	2983.3	46.77	11.66	15.89	1131	0.12	9382
240	402.39	2291.8	3297.8	48.14	11.35	15.56	1184	0.11	10226
260	435.71	2516.9	3606.2	49.38	11.09	15.29	1235	0.10	11066
280	468.97	2737.3	3909.7	50.50	10.89	15.08	1284	0.09	11903
300	502.19	2954.1	4209.5	51.54	10.74	14.91	1330	0.08	12739

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

30 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 14.772	12.72	-307.6	-269.4	5.04	4.81	6.38	1345	9.47	13624
15	12.74	-306.2	-267.9	5.14	4.86	6.47	1345	9.49	13586
16	12.86	-299.8	-261.2	5.57	5.05	6.93	1326	9.54	12795
17	12.99	-293.1	-254.1	6.00	5.22	7.37	1306	9.51	12076
18	13.13	-285.9	-246.5	6.43	5.37	7.78	1285	9.40	11409
19	13.27	-278.3	-238.5	6.87	5.52	8.20	1262	9.27	10732
20	13.43	-270.4	-230.1	7.30	5.65	8.62	1241	9.12	10094
21	13.60	-262.1	-221.3	7.73	5.76	9.05	1221	8.96	9489
22	13.78	-253.4	-212.0	8.16	5.86	9.50	1199	8.79	8876
23	13.98	-244.2	-202.3	8.59	5.95	9.97	1177	8.59	8272
24	14.19	-234.7	-192.1	9.02	6.03	10.47	1153	8.39	7656
25	14.42	-224.6	-181.4	9.46	6.10	11.00	1128	8.16	7054
26	14.67	-214.1	-170.1	9.90	6.16	11.57	1102	7.90	6462
27	14.94	-203.1	-158.2	10.35	6.21	12.17	1074	7.63	5885
28	15.25	-191.5	-145.7	10.81	6.26	12.84	1044	7.33	5316
29	15.59	-179.3	-132.5	11.27	6.29	13.57	1013	7.01	4762
30	15.97	-166.4	-118.5	11.74	6.33	14.39	980	6.67	4223
31	16.40	-152.9	-103.7	12.23	6.36	15.36	943	6.31	3688
32	16.89	-138.5	-87.8	12.74	6.40	16.47	905	5.93	3184
33	17.47	-123.1	-70.7	13.26	6.44	17.83	864	5.52	2698
34	18.15	-106.6	-52.1	13.82	6.48	19.38	822	5.10	2258
35	18.97	-88.7	-31.8	14.41	6.53	21.25	778	4.66	1858
36	19.97	-69.4	-9.4	15.04	6.59	23.56	732	4.21	1498
37	21.23	-48.3	15.4	15.72	6.66	26.24	686	3.75	1196
38	22.82	-25.5	43.0	16.45	6.75	28.93	644	3.29	967
39	24.80	-1.2	73.2	17.23	6.84	31.20	607	2.87	809
40	27.17	23.6	105.1	18.04	6.91	32.44	580	2.49	718
42	32.74	69.9	168.1	19.58	6.93	30.17	556	1.92	711
44	38.42	108.5	223.8	20.88	6.86	25.57	556	1.55	830
46	43.69	140.0	271.1	21.93	6.79	22.01	565	1.31	984
48	48.57	166.8	312.5	22.81	6.73	19.56	576	1.14	1144
50	53.12	190.5	349.9	23.57	6.70	17.90	589	1.02	1299
55	63.49	242.1	432.6	25.15	6.71	15.49	620	0.81	1663
60	72.96	288.2	507.1	26.45	6.77	14.31	649	0.69	1998
65	81.86	331.2	576.8	27.57	6.91	13.65	675	0.60	2307
70	90.36	373.1	644.2	28.57	7.12	13.33	698	0.53	2599
75	98.59	414.7	710.5	29.48	7.39	13.24	718	0.48	2877
80	106.60	457.0	776.8	30.34	7.72	13.29	736	0.44	3145
85	114.46	500.2	843.6	31.15	8.09	13.45	752	0.40	3405
90	122.19	544.9	911.4	31.92	8.50	13.69	768	0.38	3658
95	129.81	591.1	980.6	32.67	8.92	13.98	782	0.35	3906
100	137.35	639.2	1051.2	33.39	9.34	14.29	797	0.33	4149
110	152.20	741.2	1197.8	34.79	10.18	14.96	824	0.29	4622
120	166.85	849.9	1350.4	36.12	10.90	15.55	852	0.27	5085
130	181.35	964.3	1508.4	37.38	11.46	16.02	880	0.24	5540
140	195.73	1083.2	1670.4	38.58	11.87	16.37	908	0.22	5988
150	210.02	1205.1	1835.2	39.72	12.13	16.57	937	0.21	6430
160	224.23	1328.7	2001.4	40.79	12.25	16.65	966	0.19	6869
170	238.38	1452.7	2167.9	41.80	12.23	16.64	995	0.18	7305
180	252.49	1576.4	2333.9	42.75	12.22	16.55	1024	0.17	7737
190	266.55	1699.1	2498.8	43.64	12.12	16.42	1052	0.16	8167
200	280.57	1820.5	2662.2	44.48	11.98	16.26	1080	0.15	8595
220	308.54	2058.4	2984.0	46.01	11.66	15.91	1135	0.14	9447
240	336.42	2289.6	3298.9	47.38	11.35	15.58	1189	0.13	10294
260	364.23	2515.0	3607.7	48.62	11.10	15.31	1239	0.12	11136
280	391.99	2735.6	3911.6	49.74	10.89	15.09	1288	0.11	11976
300	419.70	2952.5	4211.6	50.78	10.74	14.93	1334	0.10	12813

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

35 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 14.927	12.68	-307.3	-262.9	5.05	4.83	6.38	1357	9.50	13930
15	12.68	-306.8	-262.4	5.08	4.84	6.41	1358	9.50	13952
16	12.80	-300.6	-255.8	5.51	5.04	6.85	1342	9.58	13239
17	12.92	-293.9	-248.7	5.94	5.21	7.29	1324	9.57	12540
18	13.05	-286.9	-241.2	6.36	5.37	7.71	1304	9.51	11851
19	13.20	-279.5	-233.3	6.79	5.51	8.10	1284	9.37	11225
20	13.34	-271.7	-225.0	7.22	5.64	8.51	1263	9.23	10578
21	13.51	-263.6	-216.3	7.64	5.75	8.92	1243	9.07	9959
22	13.68	-255.0	-207.2	8.07	5.86	9.35	1222	8.91	9358
23	13.86	-246.1	-197.6	8.49	5.95	9.79	1201	8.73	8760
24	14.06	-236.8	-187.6	8.92	6.03	10.25	1178	8.53	8162
25	14.28	-227.1	-177.1	9.35	6.10	10.74	1154	8.31	7562
26	14.51	-216.9	-166.1	9.78	6.16	11.27	1130	8.07	6974
27	14.76	-206.2	-154.6	10.21	6.21	11.82	1104	7.81	6400
28	15.04	-195.1	-142.4	10.65	6.26	12.42	1076	7.53	5828
29	15.35	-183.4	-129.7	11.10	6.30	13.06	1047	7.23	5286
30	15.69	-171.2	-116.3	11.56	6.33	13.73	1017	6.92	4774
31	16.07	-158.4	-102.2	12.02	6.36	14.51	985	6.59	4258
32	16.49	-145.0	-87.3	12.49	6.40	15.39	951	6.24	3763
33	16.97	-130.8	-71.4	12.98	6.43	16.38	916	5.87	3295
34	17.52	-115.8	-54.4	13.49	6.46	17.53	879	5.49	2847
35	18.16	-99.9	-36.3	14.01	6.50	18.81	841	5.10	2442
36	18.91	-83.0	-16.8	14.56	6.54	20.25	802	4.70	2077
37	19.79	-65.0	4.3	15.14	6.58	21.84	763	4.30	1756
38	20.84	-46.0	27.0	15.74	6.63	23.57	726	3.90	1481
39	22.09	-25.9	51.4	16.38	6.68	25.32	690	3.51	1257
40	23.56	-5.1	77.4	17.04	6.73	26.65	660	3.14	1099
42	27.17	37.3	132.4	18.38	6.82	27.90	615	2.51	926
44	31.41	77.2	187.1	19.65	6.84	26.43	595	2.04	917
46	35.78	111.6	236.8	20.76	6.83	23.72	591	1.70	1007
48	40.00	141.6	281.6	21.71	6.79	21.24	596	1.46	1135
50	44.01	168.1	322.1	22.54	6.76	19.34	605	1.29	1278
55	53.22	224.4	410.7	24.23	6.76	16.43	630	1.01	1634
60	61.60	273.3	488.9	25.59	6.81	14.93	657	0.84	1971
65	69.48	318.4	561.6	26.75	6.95	14.14	683	0.72	2289
70	76.95	361.8	631.1	27.78	7.15	13.72	705	0.64	2589
75	84.16	404.6	699.2	28.72	7.42	13.54	724	0.58	2874
80	91.16	447.8	766.8	29.60	7.74	13.54	742	0.52	3148
85	98.01	491.8	834.8	30.42	8.11	13.66	758	0.48	3414
90	104.73	537.1	903.6	31.21	8.51	13.87	774	0.45	3672
95	111.35	583.9	973.6	31.96	8.93	14.13	788	0.42	3925
100	117.89	632.4	1045.0	32.70	9.35	14.43	802	0.39	4172
110	130.74	735.3	1192.9	34.10	10.20	15.07	829	0.35	4652
120	143.40	844.6	1346.5	35.44	10.91	15.64	857	0.31	5121
130	155.92	959.6	1505.3	36.71	11.47	16.10	885	0.29	5581
140	168.32	1078.9	1668.0	37.92	11.89	16.43	913	0.26	6033
150	180.63	1201.2	1833.4	39.06	12.14	16.62	942	0.24	6480
160	192.87	1325.0	2000.1	40.13	12.26	16.70	971	0.23	6922
170	205.05	1449.3	2167.0	41.15	12.28	16.68	1000	0.21	7360
180	217.13	1573.3	2333.4	42.10	12.23	16.59	1028	0.20	7795
190	229.27	1696.2	2498.7	42.99	12.12	16.46	1057	0.19	8228
200	241.33	1817.8	2662.4	43.83	11.98	16.29	1085	0.18	8658
220	265.36	2056.0	2984.7	45.37	11.66	15.94	1140	0.16	9513
240	289.30	2287.5	3300.1	46.74	11.36	15.60	1193	0.15	10362
260	313.18	2513.1	3609.3	47.98	11.10	15.32	1244	0.14	11208
280	337.00	2733.9	3913.4	49.10	10.90	15.10	1292	0.13	12049
300	360.79	2951.0	4213.8	50.14	10.74	14.94	1339	0.12	12888

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

40 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 15.080	12.64	-306.9	-256.4	5.06	4.85	6.40	1364	9.52	14114
16	12.74	-301.3	-250.3	5.45	5.03	6.78	1358	9.61	13669
17	12.86	-294.8	-243.3	5.87	5.20	7.21	1340	9.62	12952
18	12.98	-287.8	-235.9	6.30	5.36	7.63	1322	9.57	12282
19	13.12	-280.6	-228.1	6.72	5.50	8.01	1304	9.47	11685
20	13.26	-272.9	-219.9	7.14	5.63	8.41	1283	9.33	11022
21	13.42	-264.9	-211.3	7.56	5.75	8.81	1263	9.18	10394
22	13.58	-256.6	-202.3	7.98	5.85	9.21	1244	9.02	9818
23	13.76	-247.9	-192.8	8.40	5.94	9.63	1223	8.85	9228
24	13.94	-238.8	-183.0	8.82	6.02	10.07	1202	8.66	8639
25	14.15	-229.3	-172.7	9.24	6.09	10.53	1179	8.45	8052
26	14.37	-219.4	-161.9	9.66	6.15	11.01	1156	8.22	7468
27	14.60	-209.1	-150.7	10.09	6.21	11.53	1130	7.98	6878
28	14.86	-198.3	-138.9	10.51	6.26	12.06	1105	7.71	6335
29	15.14	-187.1	-126.5	10.95	6.30	12.62	1078	7.43	5805
30	15.45	-175.4	-113.6	11.39	6.33	13.22	1051	7.13	5291
31	15.79	-163.2	-100.1	11.83	6.37	13.89	1022	6.83	4785
32	16.16	-150.5	-85.8	12.28	6.40	14.60	992	6.50	4312
33	16.58	-137.1	-70.8	12.74	6.43	15.43	959	6.17	3834
34	17.05	-123.2	-55.0	13.22	6.46	16.27	927	5.82	3410
35	17.57	-108.5	-38.2	13.70	6.49	17.26	893	5.47	2998
36	18.18	-93.2	-20.5	14.20	6.52	18.32	859	5.10	2623
37	18.86	-77.0	-1.6	14.72	6.55	19.45	824	4.74	2287
38	19.65	-60.1	18.5	15.25	6.58	20.64	791	4.37	1993
39	20.56	-42.5	39.7	15.81	6.61	21.84	759	4.01	1742
40	21.61	-24.3	62.1	16.37	6.64	23.02	729	3.67	1532
42	24.13	13.4	110.0	17.54	6.71	24.62	680	3.04	1259
44	27.19	51.0	159.8	18.70	6.77	24.96	647	2.52	1135
46	30.61	85.8	208.3	19.78	6.81	23.88	630	2.12	1131
48	34.13	117.7	254.3	20.76	6.81	22.07	625	1.81	1205
50	37.60	146.3	295.7	21.62	6.79	20.33	627	1.59	1314
55	45.76	206.9	389.9	23.40	6.79	17.26	645	1.22	1637
60	53.26	258.7	471.7	24.83	6.84	15.54	668	1.00	1967
65	60.27	305.7	546.8	26.03	6.97	14.59	691	0.86	2283
70	67.00	350.6	618.6	27.09	7.17	14.07	713	0.75	2590
75	73.42	394.6	688.3	28.05	7.44	13.84	732	0.68	2880
80	79.65	438.7	757.3	28.94	7.76	13.78	749	0.61	3160
85	85.73	483.5	826.4	29.78	8.13	13.87	765	0.56	3430
90	91.69	529.4	896.1	30.58	8.52	14.05	780	0.52	3693
95	97.55	576.7	966.9	31.35	8.94	14.29	794	0.48	3949
100	103.34	625.7	1039.0	32.09	9.36	14.56	808	0.45	4200
110	114.68	729.5	1188.3	33.51	10.21	15.18	834	0.40	4686
120	125.85	839.4	1342.8	34.85	10.92	15.73	862	0.36	5160
130	136.87	954.9	1502.4	36.13	11.48	16.17	890	0.33	5625
140	147.79	1074.7	1665.8	37.34	11.89	16.49	918	0.30	6081
150	158.61	1197.3	1831.7	38.48	12.15	16.68	947	0.28	6531
160	169.37	1321.4	1998.9	39.56	12.27	16.74	976	0.26	6976
170	180.06	1446.0	2166.3	40.58	12.29	16.72	1004	0.24	7417
180	190.71	1570.2	2333.1	41.53	12.24	16.63	1033	0.23	7855
190	201.33	1693.4	2498.7	42.42	12.13	16.49	1062	0.22	8289
200	211.90	1815.1	2662.7	43.27	11.99	16.32	1090	0.21	8721
220	232.98	2053.6	2985.5	44.81	11.67	15.96	1145	0.19	9580
240	253.97	2285.4	3301.3	46.18	11.36	15.62	1198	0.17	10432
260	274.89	2511.3	3610.8	47.42	11.10	15.34	1248	0.16	11280
280	295.77	2732.3	3915.3	48.55	10.90	15.12	1297	0.14	12123
300	316.60	2949.5	4215.9	49.58	10.75	14.95	1343	0.13	12964

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

45 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 15.232	12.60	-306.6	-249.9	5.07	4.87	6.40	1377	9.56	14433
16	12.68	-301.9	-244.9	5.39	5.02	6.72	1371	9.63	14035
17	12.79	-295.5	-237.9	5.81	5.20	7.14	1355	9.66	13368
18	12.92	-288.7	-230.6	6.23	5.36	7.55	1338	9.64	12699
19	13.05	-281.6	-222.8	6.65	5.50	7.94	1321	9.56	12084
20	13.19	-274.1	-214.7	7.07	5.62	8.31	1303	9.43	11496
21	13.33	-266.2	-206.2	7.48	5.74	8.70	1283	9.29	10864
22	13.49	-258.0	-197.3	7.90	5.84	9.10	1264	9.13	10257
23	13.66	-249.5	-188.0	8.31	5.93	9.50	1244	8.96	9671
24	13.84	-240.6	-178.3	8.72	6.02	9.91	1224	8.78	9091
25	14.03	-231.3	-168.2	9.14	6.09	10.34	1202	8.58	8514
26	14.23	-221.7	-157.6	9.55	6.15	10.79	1180	8.36	7937
27	14.45	-211.7	-146.6	9.97	6.21	11.27	1157	8.13	7373
28	14.69	-201.2	-135.1	10.39	6.26	11.76	1132	7.88	6827
29	14.95	-190.4	-123.1	10.81	6.30	12.27	1107	7.61	6302
30	15.24	-179.1	-110.6	11.23	6.34	12.81	1082	7.33	5792
31	15.54	-167.4	-97.5	11.66	6.37	13.38	1054	7.04	5295
32	15.88	-155.2	-83.8	12.10	6.40	14.00	1027	6.74	4825
33	16.25	-142.6	-69.4	12.54	6.43	14.66	998	6.43	4372
34	16.66	-129.4	-54.4	12.99	6.46	15.40	968	6.10	3932
35	17.11	-115.7	-38.6	13.44	6.48	16.21	937	5.77	3515
36	17.62	-101.3	-22.1	13.91	6.51	17.00	907	5.44	3150
37	18.19	-86.5	-4.6	14.39	6.53	17.89	876	5.10	2803
38	18.83	-71.0	13.7	14.88	6.56	18.81	845	4.76	2491
39	19.54	-55.0	33.0	15.38	6.58	19.73	816	4.43	2218
40	20.35	-38.4	53.1	15.89	6.60	20.64	788	4.10	1984
42	22.26	-4.2	96.0	16.93	6.65	22.14	738	3.49	1636
44	24.57	30.7	141.2	17.98	6.70	22.95	701	2.96	1433
46	27.22	64.2	186.7	18.99	6.77	22.91	675	2.52	1345
48	30.08	96.4	231.8	19.95	6.80	22.06	661	2.17	1345
50	33.02	126.0	274.6	20.83	6.81	20.75	656	1.90	1411
55	40.20	189.9	370.8	22.66	6.82	17.90	663	1.45	1677
60	46.93	244.3	455.5	24.14	6.87	16.06	682	1.18	1989
65	53.26	293.3	532.9	25.38	6.99	15.01	702	1.00	2299
70	59.29	339.5	606.3	26.47	7.19	14.42	722	0.87	2600
75	65.09	384.7	677.6	27.45	7.46	14.12	740	0.78	2893
80	70.76	429.7	748.1	28.36	7.78	14.02	757	0.70	3179
85	76.23	475.2	818.3	29.21	8.14	14.06	772	0.64	3453
90	81.59	521.8	888.9	30.02	8.54	14.21	787	0.59	3719
95	86.86	569.7	960.5	30.79	8.95	14.43	801	0.55	3979
100	92.06	619.1	1033.3	31.54	9.37	14.69	815	0.52	4234
110	102.22	723.8	1183.8	32.97	10.23	15.28	840	0.46	4724
120	112.22	834.3	1339.3	34.33	10.93	15.81	867	0.41	5203
130	122.08	950.3	1499.6	35.61	11.49	16.25	895	0.37	5671
140	131.83	1070.5	1663.7	36.82	11.90	16.55	923	0.34	6131
150	141.50	1193.4	1830.2	37.97	12.15	16.73	952	0.32	6585
160	151.10	1317.9	1997.8	39.06	12.28	16.79	981	0.29	7032
170	160.64	1442.8	2165.6	40.07	12.30	16.76	1009	0.28	7476
180	170.14	1567.2	2332.8	41.03	12.24	16.66	1038	0.26	7916
190	179.60	1690.5	2498.7	41.92	12.13	16.52	1066	0.24	8352
200	189.02	1812.5	2663.1	42.77	11.99	16.35	1094	0.23	8786
220	207.80	2051.3	2986.4	44.31	11.67	15.98	1149	0.21	9648
240	226.49	2283.4	3302.6	45.68	11.37	15.64	1202	0.19	10503
260	245.12	2509.4	3612.5	46.93	11.11	15.36	1253	0.18	11352
280	263.70	2730.6	3917.3	48.05	10.90	15.13	1301	0.16	12198
300	282.24	2948.0	4218.1	49.09	10.75	14.96	1347	0.15	13040

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

50 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 15.382	12.56	-306.2	-243.5	5.08	4.88	6.40	1390	9.59	14748
16	12.62	-302.5	-239.4	5.34	5.01	6.66	1384	9.66	14421
17	12.73	-296.2	-232.6	5.75	5.19	7.07	1370	9.70	13772
18	12.85	-289.5	-225.3	6.17	5.35	7.48	1354	9.69	13109
19	12.98	-282.5	-217.6	6.59	5.49	7.87	1337	9.62	12481
20	13.11	-275.1	-209.5	7.00	5.62	8.23	1322	9.51	11938
21	13.25	-267.4	-201.1	7.41	5.73	8.61	1302	9.38	11293
22	13.40	-259.4	-192.3	7.82	5.84	8.99	1284	9.23	10704
23	13.56	-251.0	-183.2	8.23	5.93	9.37	1264	9.07	10117
24	13.73	-242.3	-173.6	8.63	6.01	9.76	1245	8.89	9543
25	13.92	-233.2	-163.6	9.04	6.08	10.17	1225	8.70	8977
26	14.11	-223.8	-153.2	9.45	6.15	10.59	1204	8.50	8410
27	14.32	-214.0	-142.4	9.86	6.21	11.03	1181	8.27	7853
28	14.54	-203.9	-131.2	10.26	6.26	11.49	1158	8.04	7308
29	14.78	-193.4	-119.4	10.68	6.31	11.97	1134	7.78	6783
30	15.04	-182.5	-107.2	11.09	6.34	12.47	1109	7.52	6263
31	15.33	-171.1	-94.5	11.51	6.39	12.98	1084	7.24	5777
32	15.63	-159.4	-81.3	11.93	6.41	13.51	1059	6.95	5320
33	15.97	-147.3	-67.5	12.35	6.44	14.09	1033	6.66	4874
34	16.33	-134.7	-53.1	12.78	6.46	14.72	1005	6.36	4435
35	16.73	-121.7	-39.0	13.22	6.49	15.36	977	6.04	4034
36	17.17	-108.2	-22.3	13.66	6.51	16.08	949	5.73	3646
37	17.66	-94.2	-5.9	14.11	6.53	16.77	921	5.41	3303
38	18.20	-79.8	11.2	14.57	6.55	17.51	893	5.09	2981
39	18.79	-64.9	29.1	15.03	6.57	18.26	865	4.78	2691
40	19.45	-49.5	47.7	15.50	6.58	18.96	839	4.47	2443
42	20.99	-17.9	87.1	16.46	6.62	20.28	791	3.88	2041
44	22.81	14.6	128.7	17.43	6.66	21.22	751	3.36	1771
46	24.92	46.5	171.1	18.37	6.73	21.64	720	2.90	1615
48	27.25	77.9	214.2	19.29	6.78	21.39	701	2.53	1555
50	29.71	107.7	256.3	20.15	6.80	20.66	689	2.22	1565
55	35.98	173.7	353.6	22.01	6.84	18.30	685	1.68	1756
60	42.03	230.4	440.5	23.52	6.89	16.50	698	1.36	2035
65	47.77	281.1	519.9	24.79	7.01	15.37	715	1.15	2333
70	53.25	328.7	595.0	25.90	7.21	14.72	733	1.00	2631
75	58.54	374.9	667.6	26.91	7.47	14.38	749	0.89	2919
80	63.65	420.8	739.1	27.83	7.79	14.25	765	0.80	3204
85	68.68	467.1	810.5	28.70	8.16	14.26	780	0.73	3483
90	73.56	514.3	882.1	29.51	8.55	14.38	794	0.67	3752
95	78.35	562.7	954.4	30.30	8.96	14.57	808	0.62	4015
100	83.06	612.6	1027.9	31.05	9.38	14.82	821	0.58	4272
110	92.28	718.2	1179.6	32.49	10.24	15.38	846	0.51	4766
120	101.34	829.3	1336.0	33.85	10.95	15.90	873	0.46	5249
130	110.26	945.7	1497.1	35.14	11.51	16.31	901	0.42	5721
140	119.08	1066.3	1661.7	36.36	11.91	16.61	929	0.38	6184
150	127.82	1189.7	1828.8	37.52	12.16	16.78	957	0.35	6640
160	136.49	1314.4	1996.9	38.60	12.28	16.83	986	0.33	7091
170	145.11	1439.5	2165.1	39.62	12.31	16.80	1014	0.31	7536
180	153.69	1564.2	2332.6	40.58	12.25	16.70	1043	0.29	7978
190	162.22	1687.8	2498.9	41.48	12.14	16.55	1071	0.27	8417
200	170.73	1809.9	2663.5	42.32	12.00	16.38	1099	0.26	8852
220	187.66	2049.0	2987.3	43.86	11.68	16.01	1154	0.23	9717
240	204.51	2281.3	3303.9	45.24	11.37	15.66	1207	0.21	10574
260	221.30	2507.6	3614.1	46.48	11.11	15.37	1257	0.20	11426
280	238.05	2729.0	3919.2	47.61	10.91	15.15	1305	0.18	12273
300	254.75	2946.5	4220.3	48.65	10.75	14.97	1351	0.17	13116

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

60 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 15.678	12.48	-305.5	-230.6	5.10	4.92	6.41	1414	9.66	15354
16	12.52	-303.6	-228.5	5.24	4.93	6.54	1411	9.70	15186
17	12.62	-297.5	-221.8	5.64	5.17	6.95	1397	9.77	14523
18	12.73	-291.0	-214.6	6.05	5.34	7.35	1383	9.78	13893
19	12.85	-284.2	-207.1	6.46	5.48	7.73	1368	9.75	13277
20	12.97	-277.0	-199.2	6.87	5.61	8.09	1352	9.66	12679
21	13.11	-269.5	-190.9	7.27	5.72	8.43	1339	9.55	12173
22	13.24	-261.8	-182.3	7.67	5.83	8.79	1320	9.42	11549
23	13.39	-253.7	-173.3	8.07	5.92	9.15	1302	9.27	10976
24	13.55	-245.3	-164.0	8.47	6.01	9.52	1284	9.11	10405
25	13.71	-236.6	-154.3	8.86	6.08	9.89	1265	8.93	9848
26	13.89	-227.5	-144.2	9.26	6.15	10.27	1246	8.74	9302
27	14.08	-218.2	-133.8	9.65	6.21	10.66	1226	8.54	8758
28	14.27	-208.5	-122.9	10.05	6.27	11.07	1205	8.32	8224
29	14.49	-198.5	-111.6	10.44	6.31	11.48	1183	8.09	7703
30	14.72	-188.2	-99.9	10.84	6.35	11.90	1161	7.84	7202
31	14.96	-177.6	-87.8	11.24	6.39	12.33	1139	7.59	6723
32	15.22	-166.6	-75.2	11.63	6.43	12.78	1116	7.32	6260
33	15.50	-155.3	-62.2	12.03	6.45	13.26	1092	7.05	5803
34	15.81	-143.6	-48.8	12.44	6.48	13.73	1068	6.78	5386
35	16.13	-131.6	-34.8	12.84	6.50	14.22	1045	6.50	4991
36	16.49	-119.2	-20.3	13.25	6.52	14.74	1020	6.22	4610
37	16.87	-106.5	-5.3	13.66	6.54	15.28	996	5.94	4245
38	17.28	-93.4	10.3	14.08	6.56	15.81	972	5.65	3915
39	17.73	-80.0	26.3	14.49	6.57	16.36	947	5.36	3604
40	18.22	-66.4	42.9	14.91	6.58	16.86	924	5.08	3333
42	19.31	-38.2	77.7	15.76	6.60	17.86	880	4.54	2862
44	20.59	-9.2	114.3	16.61	6.63	18.71	841	4.03	2505
46	22.04	19.6	151.9	17.45	6.70	19.33	806	3.57	2252
48	23.66	48.9	190.9	18.28	6.75	19.65	779	3.16	2086
50	25.42	77.7	230.2	19.08	6.79	19.60	760	2.82	2003
55	30.18	144.7	325.9	20.90	6.87	18.48	737	2.16	2019
60	35.06	204.4	414.7	22.45	6.93	17.01	737	1.74	2211
65	39.81	257.9	496.8	23.77	7.05	15.92	745	1.46	2461
70	44.42	307.9	574.5	24.92	7.24	15.21	758	1.26	2737
75	48.88	356.1	649.4	25.95	7.50	14.81	771	1.11	3015
80	53.21	403.6	722.9	26.90	7.82	14.63	785	0.99	3292
85	57.44	451.2	795.9	27.79	8.18	14.60	798	0.90	3565
90	61.57	499.6	869.0	28.62	8.57	14.69	810	0.83	3835
95	65.63	549.0	942.8	29.42	8.98	14.85	823	0.77	4099
100	69.66	599.8	1017.8	30.19	9.40	15.05	836	0.71	4362
110	77.43	707.2	1171.8	31.66	10.27	15.58	859	0.63	4862
120	85.07	819.4	1329.9	33.03	10.97	16.05	885	0.56	5351
130	92.58	936.9	1492.4	34.33	11.53	16.45	912	0.51	5829
140	100.00	1058.2	1658.2	35.56	11.93	16.72	939	0.46	6297
150	107.34	1182.2	1826.3	36.72	12.19	16.88	968	0.43	6758
160	114.62	1307.6	1995.3	37.81	12.30	16.92	996	0.40	7212
170	121.84	1433.2	2164.3	38.84	12.32	16.87	1024	0.37	7662
180	129.03	1558.3	2332.5	39.80	12.26	16.76	1053	0.35	8107
190	136.18	1682.3	2499.4	40.70	12.15	16.61	1081	0.33	8549
200	143.30	1804.7	2664.5	41.55	12.01	16.43	1109	0.31	8988
220	157.47	2044.5	2989.3	43.09	11.69	16.05	1163	0.28	9857
240	171.56	2277.3	3306.7	44.47	11.38	15.70	1216	0.26	10719
260	185.59	2504.0	3617.6	45.72	11.12	15.40	1266	0.24	11574
280	199.57	2725.8	3923.2	46.85	10.91	15.17	1314	0.22	12424
300	213.52	2943.7	4224.8	47.89	10.76	15.00	1360	0.20	13271

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

70 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 15.968	12.41	-304.7	-217.8	5.13	4.95	6.42	1437	9.74	15926
16	12.42	-304.5	-217.6	5.14	4.96	6.43	1437	9.75	15912
17	12.51	-298.6	-210.9	5.54	5.15	6.84	1424	9.84	15284
18	12.62	-292.3	-203.9	5.94	5.32	7.23	1410	9.87	14643
19	12.73	-285.6	-196.5	6.34	5.47	7.60	1396	9.85	14029
20	12.84	-278.7	-188.7	6.74	5.60	7.95	1382	9.79	13451
21	12.97	-271.4	-180.6	7.14	5.72	8.30	1367	9.70	12876
22	13.10	-263.8	-172.1	7.53	5.82	8.62	1354	9.58	12397
23	13.23	-256.0	-163.4	7.92	5.92	8.97	1337	9.45	11795
24	13.38	-247.9	-154.2	8.31	6.00	9.30	1320	9.30	11241
25	13.53	-239.5	-144.7	8.70	6.08	9.65	1303	9.13	10685
26	13.69	-230.8	-134.9	9.08	6.15	10.00	1285	8.96	10144
27	13.86	-221.8	-124.7	9.47	6.21	10.36	1267	8.77	9619
28	14.04	-212.5	-114.2	9.85	6.27	10.73	1247	8.57	9095
29	14.23	-202.9	-103.3	10.23	6.32	11.10	1228	8.35	8585
30	14.44	-193.1	-92.0	10.62	6.36	11.47	1207	8.13	8084
31	14.65	-182.9	-80.4	11.00	6.40	11.86	1187	7.89	7605
32	14.88	-172.5	-68.3	11.38	6.44	12.24	1166	7.65	7148
33	15.13	-161.8	-55.9	11.76	6.47	12.63	1144	7.40	6709
34	15.39	-150.8	-43.0	12.15	6.50	13.03	1123	7.14	6288
35	15.67	-139.5	-29.8	12.53	6.52	13.45	1101	6.89	5886
36	15.96	-127.9	-16.1	12.92	6.54	13.86	1080	6.63	5507
37	16.28	-116.0	-2.1	13.30	6.56	14.31	1058	6.37	5135
38	16.62	-103.9	12.5	13.69	6.58	14.73	1037	6.10	4800
39	16.98	-91.5	27.4	14.08	6.59	15.14	1015	5.84	4486
40	17.37	-78.9	42.7	14.46	6.59	15.55	995	5.58	4195
42	18.23	-53.0	74.7	15.24	6.61	16.35	954	5.07	3681
44	19.21	-26.4	108.1	16.02	6.63	17.07	916	4.58	3262
46	20.30	0.2	142.3	16.78	6.70	17.71	881	4.13	2936
48	21.52	27.5	178.2	17.54	6.74	18.11	853	3.72	2706
50	22.85	54.8	214.7	18.29	6.79	18.35	829	3.36	2545
55	26.53	120.5	306.2	20.03	6.88	18.09	793	2.63	2394
60	30.48	181.3	394.7	21.57	6.96	17.12	781	2.13	2481
65	34.45	236.7	477.8	22.91	7.08	16.21	781	1.78	2667
70	38.36	288.5	557.1	24.08	7.27	15.54	788	1.53	2902
75	42.19	338.3	633.6	25.14	7.53	15.13	797	1.34	3157
80	45.92	387.2	708.7	26.11	7.84	14.93	807	1.20	3421
85	49.57	436.1	783.1	27.01	8.20	14.87	817	1.08	3687
90	53.16	485.5	857.6	27.86	8.60	14.94	828	0.99	3950
95	56.67	535.8	932.6	28.67	9.01	15.08	840	0.92	4212
100	60.14	587.4	1008.4	29.45	9.42	15.27	851	0.85	4470
110	66.90	696.5	1164.7	30.94	10.30	15.81	873	0.75	4972
120	73.51	809.9	1324.4	32.33	11.00	16.20	897	0.66	5465
130	80.00	928.3	1488.3	33.64	11.55	16.57	924	0.60	5946
140	86.41	1050.4	1655.2	34.88	11.95	16.83	951	0.55	6418
150	92.74	1175.1	1824.2	36.04	12.20	16.97	978	0.50	6883
160	99.02	1301.0	1994.1	37.14	12.32	17.00	1006	0.47	7341
170	105.25	1427.1	2163.8	38.17	12.33	16.94	1035	0.44	7794
180	111.44	1552.6	2332.7	39.13	12.27	16.83	1063	0.41	8242
190	117.60	1676.9	2500.1	40.04	12.16	16.67	1091	0.39	8686
200	123.72	1799.8	2665.8	40.89	12.02	16.48	1119	0.36	9127
220	135.91	2040.1	2991.5	42.44	11.70	16.09	1173	0.33	10001
240	148.03	2273.4	3309.6	43.82	11.39	15.73	1225	0.30	10867
260	160.09	2500.5	3621.1	45.07	11.13	15.43	1275	0.28	11725
280	172.10	2722.6	3927.3	46.21	10.92	15.20	1323	0.25	12578
300	184.08	2940.8	4229.4	47.25	10.77	15.02	1369	0.24	13427

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

80 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 16.253	12.34	-303.9	-205.1	5.14	4.99	6.53	1463	10.08	16384
17	12.41	-299.5	-200.2	5.44	5.13	6.73	1450	9.90	16011
18	12.51	-293.3	-193.2	5.84	5.30	7.11	1437	9.95	15402
19	12.62	-286.9	-185.9	6.23	5.46	7.48	1424	9.95	14782
20	12.73	-280.1	-178.3	6.62	5.59	7.83	1409	9.90	14177
21	12.84	-273.0	-170.3	7.01	5.71	8.17	1396	9.83	13628
22	12.97	-265.7	-152.0	7.40	5.82	8.49	1382	9.73	13075
23	13.09	-258.1	-153.3	7.79	5.91	8.79	1370	9.60	12613
24	13.23	-250.2	-144.3	8.17	6.00	9.12	1354	9.47	12049
25	13.37	-242.0	-135.1	8.55	6.07	9.45	1337	9.32	11499
26	13.52	-233.6	-125.4	8.92	6.15	9.78	1320	9.15	10958
27	13.67	-224.9	-115.5	9.30	6.21	10.11	1303	8.98	10436
28	13.84	-215.9	-105.2	9.67	6.27	10.45	1286	8.79	9929
29	14.01	-206.7	-94.6	10.05	6.33	10.79	1268	8.59	9424
30	14.20	-197.2	-83.7	10.42	6.37	11.13	1249	8.38	8936
31	14.39	-187.5	-72.4	10.79	6.41	11.48	1230	8.17	8454
32	14.60	-177.5	-60.7	11.16	6.45	11.83	1210	7.94	7994
33	14.81	-167.2	-48.7	11.53	6.49	12.17	1191	7.70	7556
34	15.04	-156.7	-36.4	11.89	6.51	12.52	1171	7.46	7135
35	15.29	-146.0	-23.7	12.26	6.54	12.88	1151	7.22	6735
36	15.54	-135.0	-10.7	12.63	6.56	13.24	1131	6.98	6345
37	15.82	-123.8	2.8	13.00	6.58	13.60	1112	6.73	5987
38	16.11	-112.3	16.5	13.36	6.60	13.95	1092	6.49	5645
39	16.41	-100.7	30.7	13.73	6.61	14.30	1073	6.24	5326
40	16.74	-88.8	45.1	14.10	6.62	14.64	1054	6.00	5024
42	17.45	-64.5	75.1	14.83	6.63	15.33	1017	5.52	4475
44	18.24	-39.6	106.4	15.56	6.65	15.93	982	5.05	4027
46	19.12	-14.7	138.3	16.27	6.71	16.52	947	4.61	3647
48	20.09	11.1	171.8	16.98	6.76	16.95	918	4.21	3360
50	21.14	36.9	206.0	17.68	6.80	17.29	893	3.84	3135
55	24.08	100.5	293.2	19.34	6.90	17.47	849	3.07	2847
60	27.33	161.2	379.8	20.85	6.99	16.98	828	2.51	2819
65	30.68	217.5	463.0	22.18	7.11	16.28	821	2.10	2941
70	34.03	270.6	542.9	23.36	7.30	15.71	821	1.80	3128
75	37.34	321.7	620.4	24.43	7.55	15.35	825	1.58	3349
80	40.60	371.8	696.6	25.42	7.87	15.15	831	1.41	3590
85	43.80	421.7	772.1	26.33	8.23	15.09	839	1.27	3841
90	46.95	472.0	847.6	27.19	8.62	15.14	848	1.16	4096
95	50.05	523.2	923.6	28.02	9.03	15.27	858	1.07	4349
100	53.10	575.5	1000.3	28.80	9.44	15.45	868	0.99	4605
110	59.09	685.9	1158.6	30.31	10.32	15.96	889	0.87	5108
120	64.95	800.6	1320.2	31.72	11.02	16.39	913	0.77	5605
130	70.60	919.9	1484.7	33.03	11.57	16.69	936	0.69	6073
140	76.24	1042.8	1652.7	34.28	11.97	16.93	962	0.63	6548
150	81.82	1168.1	1822.6	35.45	12.21	17.05	990	0.58	7015
160	87.34	1294.5	1993.3	36.55	12.33	17.07	1017	0.54	7476
170	92.82	1421.1	2163.7	37.59	12.35	17.01	1045	0.50	7931
180	98.26	1547.0	2333.1	38.55	12.29	16.88	1073	0.47	8381
190	103.67	1671.8	2501.1	39.46	12.19	16.72	1101	0.44	8828
200	109.06	1794.9	2667.3	40.31	12.03	16.53	1128	0.42	9271
220	119.76	2035.8	2993.9	41.87	11.71	16.13	1182	0.38	10149
240	130.39	2269.6	3312.7	43.26	11.40	15.77	1234	0.34	11017
260	140.96	2497.1	3624.8	44.51	11.14	15.46	1284	0.32	11878
280	151.50	2719.6	3931.5	45.64	10.93	15.22	1332	0.29	12734
300	162.00	2938.1	4234.0	46.69	10.77	15.04	1377	0.27	13585

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

90 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 16.532	12.28	-303.0	-192.5	5.16	5.04	6.55	1484	10.15	16922
17	12.32	-300.3	-189.4	5.35	5.12	6.71	1477	10.13	16654
18	12.41	-294.3	-182.5	5.74	5.28	7.01	1463	10.02	16123
19	12.51	-288.0	-175.4	6.13	5.44	7.37	1451	10.04	15535
20	12.62	-281.4	-167.8	6.51	5.58	7.72	1437	10.01	14931
21	12.73	-274.5	-159.9	6.90	5.70	8.05	1423	9.95	14336
22	12.84	-267.3	-151.7	7.28	5.81	8.36	1410	9.86	13812
23	12.96	-259.9	-143.2	7.56	5.91	8.67	1396	9.75	13277
24	13.09	-252.2	-134.4	8.04	5.99	8.96	1385	9.62	12825
25	13.22	-244.2	-125.2	8.41	6.07	9.27	1369	9.48	12284
26	13.36	-236.1	-115.8	8.78	6.14	9.58	1354	9.33	11752
27	13.50	-227.6	-106.1	9.14	6.21	9.90	1337	9.17	11229
28	13.66	-218.9	-96.0	9.51	6.28	10.21	1321	8.99	10721
29	13.82	-210.0	-85.7	9.87	6.33	10.53	1304	8.81	10234
30	13.98	-200.9	-75.0	10.24	6.38	10.85	1287	8.61	9745
31	14.16	-191.4	-64.0	10.60	6.42	11.16	1270	8.41	9291
32	14.35	-181.8	-52.7	10.96	6.46	11.47	1252	8.20	8839
33	14.54	-171.9	-41.0	11.31	6.50	11.79	1234	7.98	8398
34	14.75	-161.8	-29.1	11.67	6.53	12.10	1216	7.75	7976
35	14.97	-151.5	-16.8	12.03	6.56	12.42	1197	7.52	7573
36	15.20	-141.0	-4.3	12.38	6.58	12.73	1179	7.29	7186
37	15.44	-130.3	8.6	12.73	6.61	13.05	1160	7.06	6816
38	15.69	-119.4	21.8	13.09	6.62	13.37	1142	6.83	6460
39	15.96	-108.2	35.4	13.44	6.63	13.67	1124	6.59	6132
40	16.24	-96.9	49.2	13.79	6.64	13.98	1107	6.36	5822
42	16.84	-73.9	77.7	14.48	6.66	14.58	1072	5.90	5246
44	17.51	-50.2	107.4	15.17	6.68	15.10	1039	5.46	4773
46	18.25	-26.6	137.6	15.85	6.74	15.62	1006	5.03	4369
48	19.05	-2.1	169.3	16.52	6.78	16.05	977	4.63	4034
50	19.92	22.5	201.8	17.18	6.82	16.41	951	4.26	3760
55	22.34	84.0	285.1	18.77	6.93	16.82	902	3.48	3353
60	25.05	143.8	369.3	20.24	7.01	16.69	874	2.87	3212
65	27.91	200.5	451.7	21.55	7.14	16.23	861	2.42	3258
70	30.81	254.4	531.7	22.74	7.33	15.77	855	2.08	3400
75	33.71	306.3	609.7	23.82	7.58	15.46	855	1.82	3585
80	36.58	357.3	686.5	24.81	7.89	15.29	858	1.62	3799
85	39.41	408.1	762.8	25.73	8.25	15.25	863	1.46	4029
90	42.21	459.2	839.1	26.61	8.64	15.30	869	1.33	4268
95	44.97	511.1	915.8	27.44	9.04	15.42	877	1.22	4516
100	47.69	564.1	993.4	28.23	9.46	15.59	886	1.13	4761
110	53.04	675.7	1153.0	29.75	10.34	16.09	905	0.99	5258
120	58.28	791.4	1315.9	31.17	11.04	16.50	927	0.88	5750
130	63.42	911.7	1482.5	32.50	11.59	16.84	952	0.79	6233
140	68.36	1035.4	1650.7	33.75	11.99	17.06	975	0.72	6685
150	73.35	1161.3	1821.4	34.93	12.23	17.13	1001	0.66	7153
160	78.29	1288.3	1992.8	36.03	12.35	17.14	1028	0.61	7616
170	83.17	1415.3	2163.8	37.07	12.36	17.07	1056	0.57	8073
180	88.03	1541.6	2333.9	38.04	12.30	16.94	1084	0.53	8525
190	92.86	1666.7	2502.4	38.95	12.19	16.77	1111	0.50	8974
200	97.66	1790.2	2669.1	39.81	12.04	16.58	1138	0.47	9418
220	107.20	2031.6	2996.4	41.37	11.72	16.17	1192	0.43	10299
240	116.67	2265.9	3315.9	42.76	11.41	15.80	1244	0.39	11170
260	126.10	2493.8	3628.7	44.01	11.14	15.49	1293	0.36	12034
280	135.48	2716.6	3935.9	45.15	10.94	15.25	1341	0.33	12891
300	144.83	2935.4	4238.9	46.19	10.78	15.06	1386	0.31	13744

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

100 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 16.808	12.22	-302.1	-179.9	5.18	5.08	6.58	1503	10.22	17451
17	12.23	-301.0	-178.6	5.26	5.11	6.64	1501	10.21	17343
18	12.32	-295.1	-171.8	5.65	5.27	6.96	1489	10.18	16783
19	12.42	-288.9	-164.8	6.03	5.43	7.27	1476	10.12	16245
20	12.51	-282.5	-157.3	6.41	5.57	7.61	1464	10.11	15674
21	12.62	-275.7	-149.6	6.79	5.69	7.93	1450	10.06	15089
22	12.73	-268.7	-141.5	7.17	5.80	8.25	1436	9.98	14505
23	12.84	-261.5	-133.1	7.54	5.90	8.55	1424	9.88	14001
24	12.96	-254.0	-124.4	7.91	5.99	8.84	1410	9.76	13482
25	13.08	-246.2	-115.4	8.28	6.07	9.12	1399	9.63	13035
26	13.21	-238.2	-106.1	8.64	6.14	9.41	1385	9.49	12516
27	13.35	-230.0	-96.5	9.00	6.21	9.71	1370	9.34	12003
28	13.49	-221.6	-86.7	9.36	6.28	10.01	1354	9.18	11496
29	13.64	-212.9	-76.5	9.72	6.34	10.31	1338	9.00	11004
30	13.79	-204.0	-66.1	10.07	6.39	10.60	1322	8.82	10533
31	13.96	-194.9	-55.3	10.42	6.43	10.89	1307	8.63	10081
32	14.13	-185.6	-44.3	10.77	6.48	11.19	1290	8.43	9631
33	14.31	-176.0	-32.9	11.12	6.51	11.48	1273	8.22	9197
34	14.49	-166.3	-21.3	11.47	6.55	11.77	1256	8.01	8773
35	14.69	-156.3	-9.4	11.82	6.57	12.06	1239	7.79	8368
36	14.90	-146.2	2.8	12.16	6.60	12.34	1221	7.57	7979
37	15.11	-135.8	15.3	12.50	6.62	12.63	1204	7.35	7606
38	15.34	-125.3	28.0	12.84	6.64	12.91	1187	7.13	7254
39	15.57	-114.7	41.1	13.18	6.66	13.19	1170	6.91	6902
40	15.82	-103.8	54.4	13.52	6.67	13.46	1153	6.69	6589
42	16.36	-81.7	81.9	14.19	6.68	13.98	1121	6.25	6015
44	16.94	-59.1	110.3	14.85	6.70	14.48	1090	5.82	5502
46	17.57	-36.5	139.2	15.49	6.76	14.94	1059	5.41	5076
48	18.25	-13.0	169.5	16.14	6.81	15.35	1031	5.02	4710
50	18.99	10.7	200.6	16.77	6.85	15.69	1005	4.65	4406
55	21.04	70.2	280.6	18.29	6.95	16.23	953	3.85	3891
60	23.34	128.9	362.3	19.72	7.04	16.30	920	3.22	3656
65	25.81	185.3	443.4	21.01	7.17	16.09	901	2.73	3616
70	28.35	239.6	523.1	22.20	7.36	15.76	891	2.35	3703
75	30.91	292.2	601.2	23.27	7.61	15.51	886	2.06	3856
80	33.45	343.8	678.4	24.27	7.92	15.38	886	1.83	4039
85	35.98	395.3	755.1	25.20	8.27	15.35	888	1.65	4247
90	38.49	447.1	832.0	26.08	8.66	15.42	892	1.51	4468
95	40.97	499.7	909.4	26.92	9.06	15.54	898	1.38	4702
100	43.42	553.3	987.5	27.72	9.48	15.71	905	1.28	4939
110	48.25	665.8	1148.3	29.25	10.35	16.21	921	1.11	5423
120	52.98	782.5	1312.2	30.68	11.06	16.61	942	0.99	5907
130	57.63	903.6	1479.9	32.02	11.61	16.93	965	0.89	6389
140	62.21	1028.1	1650.3	33.28	12.01	17.15	990	0.81	6862
150	66.59	1154.6	1820.5	34.46	12.25	17.27	1014	0.74	7298
160	71.05	1282.2	1992.7	35.57	12.36	17.21	1039	0.68	7762
170	75.47	1409.6	2164.3	36.61	12.38	17.13	1067	0.64	8220
180	79.85	1536.4	2334.9	37.58	12.31	16.99	1094	0.59	8673
190	84.21	1661.8	2503.9	38.49	12.20	16.82	1121	0.56	9123
200	88.55	1785.6	2671.0	39.35	12.05	16.62	1148	0.53	9569
220	97.16	2027.6	2999.2	40.92	11.73	16.21	1202	0.47	10452
240	105.71	2262.2	3319.3	42.31	11.41	15.83	1253	0.43	11326
260	114.21	2490.5	3632.6	43.56	11.15	15.52	1302	0.40	12191
280	122.67	2713.6	3940.3	44.70	10.94	15.27	1349	0.37	13051
300	131.09	2932.7	4243.7	45.75	10.79	15.08	1394	0.34	13905

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

120 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 17.345	12.10	-300.1	-154.9	5.22	5.15	6.62	1542	10.36	18484
18	12.15	-296.4	-150.5	5.47	5.26	6.83	1534	10.35	18132
19	12.24	-290.4	-143.6	5.85	5.41	7.13	1523	10.33	17594
20	12.33	-284.2	-136.3	6.22	5.54	7.43	1512	10.29	17058
21	12.42	-277.8	-128.7	6.59	5.67	7.74	1501	10.27	16512
22	12.52	-271.1	-120.9	6.96	5.79	8.04	1489	10.21	15975
23	12.62	-264.1	-112.7	7.32	5.89	8.33	1477	10.13	15427
24	12.73	-256.9	-104.2	7.68	5.98	8.61	1463	10.03	14864
25	12.84	-249.5	-95.5	8.04	6.07	8.88	1451	9.92	14393
26	12.95	-241.9	-86.5	8.39	6.14	9.15	1439	9.79	13902
27	13.07	-234.1	-77.2	8.74	6.21	9.41	1427	9.65	13455
28	13.20	-226.0	-67.6	9.09	6.28	9.68	1414	9.51	12978
29	13.33	-217.8	-57.8	9.43	6.34	9.95	1400	9.35	12501
30	13.46	-209.3	-47.7	9.77	6.40	10.22	1386	9.19	12025
31	13.61	-200.7	-37.4	10.11	6.45	10.48	1371	9.02	11561
32	13.75	-191.8	-26.8	10.45	6.49	10.74	1357	8.84	11138
33	13.91	-182.8	-15.9	10.78	6.53	11.00	1343	8.66	10709
34	14.07	-173.6	-4.8	11.12	6.57	11.26	1327	8.46	10289
35	14.23	-164.2	6.6	11.45	6.60	11.50	1313	8.27	9890
36	14.40	-154.6	18.2	11.77	6.63	11.76	1297	8.07	9496
37	14.58	-144.9	30.1	12.10	6.66	11.99	1282	7.87	9135
38	14.77	-135.0	42.2	12.42	6.68	12.22	1267	7.66	8777
39	14.97	-125.0	54.6	12.74	6.70	12.45	1252	7.45	8432
40	15.17	-114.9	67.1	13.06	6.71	12.68	1237	7.25	8102
42	15.60	-94.2	92.9	13.69	6.73	13.13	1207	6.84	7471
44	16.06	-73.1	119.6	14.31	6.76	13.56	1178	6.44	6919
46	16.55	-52.1	146.6	14.91	6.82	13.97	1150	6.05	6458
48	17.09	-30.1	174.9	15.51	6.86	14.34	1124	5.68	6043
50	17.65	-7.9	203.9	16.10	6.90	14.65	1099	5.32	5691
55	19.21	48.2	278.8	17.53	7.01	15.26	1045	4.52	5016
60	20.96	104.7	356.2	18.88	7.10	15.56	1007	3.85	4623
65	22.86	160.0	434.2	20.13	7.23	15.63	979	3.31	4435
70	24.85	214.1	512.3	21.29	7.42	15.59	961	2.88	4391
75	26.89	267.3	590.3	22.36	7.67	15.49	949	2.54	4459
80	28.95	319.8	667.3	23.36	7.97	15.43	943	2.26	4593
85	31.01	372.2	744.4	24.29	8.32	15.45	940	2.04	4756
90	33.07	425.0	821.9	25.18	8.70	15.54	939	1.85	4943
95	35.11	478.6	899.9	26.02	9.10	15.69	941	1.70	5142
100	37.14	533.1	978.8	26.83	9.51	15.88	945	1.57	5352
110	41.16	647.4	1141.3	28.38	10.39	16.38	956	1.37	5801
120	45.12	765.6	1307.0	29.82	11.09	16.78	973	1.21	6261
130	49.01	888.1	1476.3	31.17	11.64	17.09	994	1.08	6732
140	52.86	1013.9	1648.2	32.45	12.04	17.30	1017	0.98	7198
150	56.65	1141.7	1821.6	33.64	12.28	17.38	1041	0.90	7664
160	60.40	1270.4	1995.2	34.76	12.40	17.37	1067	0.83	8126
170	64.12	1398.9	2168.3	35.81	12.41	17.27	1093	0.77	8582
180	67.62	1526.3	2337.7	36.78	12.34	17.13	1116	0.72	8981
190	71.27	1652.3	2507.6	37.70	12.22	16.91	1142	0.68	9432
200	74.91	1776.7	2675.5	38.56	12.09	16.70	1169	0.64	9880
220	82.12	2019.7	3005.1	40.13	11.75	16.28	1221	0.57	10766
240	89.27	2255.2	3326.5	41.53	11.43	15.89	1272	0.52	11643
260	96.38	2484.3	3640.8	42.79	11.17	15.57	1321	0.48	12512
280	103.45	2708.0	3949.4	43.93	10.96	15.31	1367	0.44	13374
300	110.50	2927.6	4253.6	44.98	10.80	15.12	1411	0.41	14230

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

140 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 17.869	11.99	-298.0	-130.2	5.26	5.21	6.67	1578	10.50	19488
18	12.00	-297.3	-129.3	5.31	5.24	6.71	1577	10.50	19420
19	12.08	-291.5	-122.5	5.68	5.39	7.00	1567	10.49	18900
20	12.16	-285.5	-115.3	6.05	5.52	7.29	1557	10.47	18381
21	12.24	-279.3	-107.9	6.41	5.65	7.57	1547	10.43	17863
22	12.33	-272.8	-100.2	6.77	5.77	7.85	1536	10.38	17347
23	12.42	-266.2	-92.2	7.12	5.87	8.14	1526	10.36	16806
24	12.52	-259.3	-84.0	7.47	5.97	8.41	1515	10.27	16299
25	12.62	-252.1	-75.4	7.82	6.06	8.67	1503	10.17	15786
26	12.73	-244.8	-66.6	8.17	6.14	8.93	1489	10.06	15246
27	12.84	-237.3	-57.6	8.51	6.21	9.18	1479	9.93	14801
28	12.95	-229.5	-48.3	8.85	6.28	9.43	1466	9.80	14334
29	13.06	-221.6	-38.7	9.18	6.35	9.67	1454	9.65	13880
30	13.19	-213.5	-28.9	9.51	6.40	9.91	1442	9.51	13441
31	13.31	-205.2	-18.9	9.84	6.46	10.16	1430	9.36	12997
32	13.44	-196.8	-8.6	10.17	6.51	10.40	1416	9.19	12549
33	13.58	-188.1	1.9	10.49	6.55	10.63	1403	9.03	12135
34	13.72	-179.3	12.7	10.81	6.59	10.87	1390	8.85	11723
35	13.86	-170.4	23.7	11.13	6.63	11.09	1377	8.67	11321
36	14.01	-161.3	34.9	11.45	6.66	11.32	1363	8.49	10926
37	14.16	-152.0	46.3	11.76	6.69	11.53	1350	8.30	10569
38	14.33	-142.6	57.9	12.07	6.71	11.74	1336	8.11	10213
39	14.49	-133.1	69.8	12.38	6.73	11.94	1323	7.92	9865
40	14.66	-123.5	81.8	12.68	6.74	12.14	1310	7.73	9530
42	15.02	-103.9	106.5	13.28	6.77	12.51	1283	7.35	8910
44	15.41	-83.8	131.9	13.88	6.80	12.89	1257	6.97	8334
46	15.82	-63.9	157.5	14.44	6.87	13.29	1229	6.60	7800
48	16.25	-43.1	184.4	15.02	6.91	13.63	1204	6.24	7352
50	16.71	-22.0	212.0	15.58	6.96	13.93	1180	5.89	6958
55	17.97	31.6	283.2	16.94	7.06	14.53	1128	5.10	6179
60	19.38	86.0	357.2	18.23	7.15	14.92	1086	4.42	5657
65	20.90	139.9	432.4	19.43	7.29	15.15	1054	3.85	5344
70	22.51	193.4	508.4	20.56	7.48	15.26	1030	3.38	5199
75	24.18	246.4	584.9	21.61	7.72	15.32	1012	2.99	5165
80	25.89	299.3	661.7	22.60	8.02	15.38	1000	2.68	5222
85	27.61	352.2	738.8	23.54	8.37	15.45	992	2.41	5335
90	29.34	405.6	816.3	24.42	8.75	15.58	988	2.20	5480
95	31.06	459.8	894.6	25.27	9.15	15.76	986	2.02	5648
100	32.78	515.0	974.0	26.08	9.55	15.96	987	1.86	5834
110	36.20	630.6	1137.4	27.64	10.43	16.49	993	1.62	6234
120	39.58	750.0	1304.2	29.09	11.12	16.90	1006	1.43	6667
130	42.93	873.7	1474.7	30.46	11.68	17.21	1024	1.28	7113
140	46.23	1000.6	1647.9	31.74	12.07	17.42	1045	1.16	7567
150	49.50	1129.4	1822.4	32.94	12.32	17.50	1068	1.06	8024
160	52.73	1259.0	1997.2	34.07	12.43	17.47	1092	0.98	8477
170	55.93	1388.3	2171.3	35.13	12.44	17.37	1117	0.91	8931
180	59.10	1516.7	2344.1	36.12	12.37	17.20	1142	0.85	9382
190	62.25	1643.5	2514.9	37.04	12.26	17.00	1167	0.80	9825
200	65.37	1768.5	2683.7	37.90	12.10	16.77	1193	0.75	10275
220	71.39	2012.2	3011.6	39.47	11.77	16.34	1241	0.67	11090
240	77.54	2248.6	3334.2	40.87	11.45	15.94	1291	0.61	11968
260	83.66	2478.2	3649.4	42.13	11.18	15.61	1339	0.56	12839
280	89.74	2702.6	3958.9	43.28	10.97	15.35	1385	0.52	13702
300	95.79	2922.7	4263.8	44.33	10.81	15.16	1429	0.48	14561

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

160 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 18.378	11.88	-295.8	-105.7	5.30	5.27	6.71	1614	10.65	20467
19	11.93	-292.3	-101.4	5.52	5.37	6.89	1608	10.65	20154
20	12.00	-286.5	-94.4	5.88	5.51	7.16	1599	10.63	19650
21	12.08	-280.4	-87.1	6.24	5.63	7.44	1590	10.61	19146
22	12.17	-274.2	-79.5	6.59	5.75	7.70	1580	10.57	18644
23	12.25	-267.7	-71.7	6.94	5.86	7.96	1570	10.51	18144
24	12.34	-261.0	-63.6	7.28	5.96	8.22	1560	10.44	17648
25	12.43	-254.2	-55.3	7.62	6.05	8.49	1550	10.41	17121
26	12.53	-247.1	-46.7	7.96	6.13	8.74	1540	10.31	16643
27	12.63	-239.8	-37.8	8.30	6.21	8.98	1528	10.20	16160
28	12.73	-232.3	-28.7	8.63	6.28	9.22	1515	10.07	15646
29	12.83	-224.7	-19.4	8.96	6.35	9.45	1505	9.94	15220
30	12.94	-216.9	-9.8	9.28	6.41	9.67	1493	9.80	14777
31	13.06	-208.9	-0.0	9.60	6.47	9.90	1481	9.65	14315
32	13.17	-200.8	10.0	9.92	6.52	10.12	1470	9.50	13908
33	13.29	-192.5	20.2	10.23	6.56	10.34	1458	9.35	13493
34	13.42	-184.0	30.7	10.55	6.61	10.56	1446	9.19	13074
35	13.55	-175.4	41.4	10.85	6.65	10.77	1434	9.03	12691
36	13.68	-166.6	52.2	11.16	6.68	10.98	1421	8.86	12300
37	13.82	-157.8	63.3	11.46	6.71	11.18	1409	8.68	11922
38	13.96	-148.7	74.6	11.77	6.74	11.37	1397	8.51	11572
39	14.10	-139.6	86.0	12.06	6.76	11.56	1385	8.33	11224
40	14.25	-130.3	97.7	12.36	6.78	11.73	1373	8.15	10892
42	14.57	-111.5	121.5	12.94	6.81	12.07	1349	7.79	10266
44	14.90	-92.4	146.0	13.51	6.84	12.41	1325	7.43	9677
46	15.25	-73.3	170.6	14.06	6.91	12.76	1300	7.07	9145
48	15.62	-53.4	196.5	14.61	6.96	13.10	1275	6.73	8634
50	16.01	-33.1	223.0	15.15	7.01	13.41	1251	6.39	8177
55	17.06	18.5	291.5	16.45	7.11	13.98	1200	5.61	7333
60	18.23	71.1	362.7	17.69	7.20	14.39	1159	4.92	6720
65	19.49	123.6	435.5	18.86	7.34	14.71	1124	4.34	6302
70	20.84	176.2	509.6	19.95	7.53	14.93	1096	3.84	6057
75	22.24	228.9	584.7	20.99	7.78	15.09	1074	3.42	5943
80	23.68	281.6	660.5	21.97	8.08	15.26	1057	3.08	5913
85	25.15	334.8	737.2	22.90	8.42	15.40	1045	2.78	5968
90	26.63	388.5	814.6	23.78	8.80	15.57	1037	2.54	6071
95	28.11	443.2	893.0	24.63	9.19	15.77	1032	2.33	6209
100	29.60	498.8	972.3	25.45	9.60	15.99	1030	2.16	6362
110	32.56	615.4	1136.3	27.01	10.46	16.55	1030	1.87	6716
120	35.50	735.8	1303.8	28.46	11.16	16.98	1040	1.65	7106
130	38.42	860.4	1475.2	29.84	11.71	17.31	1055	1.48	7529
140	41.31	988.2	1649.2	31.13	12.11	17.51	1073	1.34	7967
150	44.17	1117.9	1824.6	32.34	12.35	17.59	1094	1.23	8408
160	47.01	1248.3	2000.4	33.47	12.46	17.56	1117	1.13	8856
170	49.81	1378.4	2175.4	34.53	12.47	17.46	1141	1.05	9299
180	52.60	1507.4	2349.0	35.52	12.41	17.29	1165	0.98	9745
190	55.36	1634.9	2520.7	36.45	12.29	17.08	1190	0.92	10190
200	58.11	1760.5	2690.2	37.32	12.14	16.84	1215	0.86	10634
220	63.54	2005.5	3022.1	38.90	11.80	16.37	1264	0.77	11506
240	68.75	2242.2	3342.3	40.30	11.47	15.98	1309	0.70	12300
260	74.12	2472.5	3658.4	41.56	11.20	15.66	1357	0.64	13171
280	79.46	2697.4	3968.7	42.71	10.99	15.39	1402	0.59	14036
300	84.76	2918.0	4274.2	43.77	10.82	15.19	1446	0.55	14896

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

180 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 18.874	11.78	-293.4	-81.3	5.33	5.33	6.75	1648	10.79	21424
19	11.79	-292.7	-80.5	5.38	5.35	6.79	1647	10.79	21362
20	11.86	-287.1	-73.5	5.73	5.49	7.06	1638	10.79	20873
21	11.94	-281.2	-66.4	6.08	5.62	7.32	1630	10.77	20383
22	12.01	-275.2	-58.9	6.43	5.73	7.58	1621	10.74	19893
23	12.09	-268.9	-51.2	6.77	5.84	7.83	1612	10.70	19404
24	12.18	-262.4	-43.3	7.11	5.94	8.07	1603	10.64	18918
25	12.26	-255.7	-35.1	7.45	6.04	8.32	1593	10.57	18435
26	12.35	-248.9	-26.6	7.78	6.12	8.55	1584	10.49	17958
27	12.44	-241.8	-17.9	8.10	6.20	8.81	1574	10.43	17453
28	12.53	-234.6	-9.0	8.43	6.28	9.04	1564	10.32	17002
29	12.63	-227.2	0.1	8.75	6.35	9.26	1553	10.20	16544
30	12.73	-219.6	9.5	9.07	6.41	9.48	1541	10.07	16058
31	12.83	-211.9	19.1	9.38	6.47	9.69	1531	9.93	15652
32	12.94	-204.0	28.9	9.69	6.52	9.90	1520	9.79	15228
33	13.05	-196.0	38.9	10.00	6.57	10.10	1508	9.64	14808
34	13.16	-187.8	49.1	10.30	6.62	10.31	1497	9.50	14382
35	13.28	-179.5	59.5	10.61	6.66	10.51	1486	9.34	13993
36	13.40	-171.0	70.1	10.91	6.70	10.70	1475	9.19	13618
37	13.52	-162.4	80.9	11.20	6.73	10.89	1463	9.02	13243
38	13.65	-153.7	91.9	11.49	6.76	11.08	1452	8.86	12874
39	13.78	-144.9	103.0	11.78	6.79	11.25	1441	8.69	12534
40	13.91	-136.0	114.4	12.07	6.80	11.41	1430	8.52	12194
42	14.19	-117.8	137.5	12.64	6.84	11.74	1408	8.18	11549
44	14.48	-99.3	161.3	13.19	6.87	12.04	1386	7.84	10970
46	14.79	-81.0	185.2	13.72	6.94	12.37	1363	7.50	10428
48	15.11	-61.7	210.2	14.25	7.00	12.67	1340	7.17	9915
50	15.45	-42.2	235.9	14.77	7.05	12.95	1318	6.84	9455
55	16.36	7.8	302.2	16.04	7.16	13.55	1267	6.07	8487
60	17.36	58.9	371.3	17.24	7.26	13.97	1225	5.38	7795
65	18.43	110.2	442.1	18.37	7.39	14.32	1189	4.78	7290
70	19.58	161.9	514.4	19.45	7.53	14.61	1158	4.27	6963
75	20.78	214.0	588.0	20.46	7.83	14.86	1133	3.83	6763
80	22.02	266.5	662.9	21.43	8.12	15.08	1113	3.46	6678
85	23.29	319.6	738.8	22.35	8.47	15.30	1097	3.14	6664
90	24.58	373.5	815.9	23.23	8.84	15.52	1085	2.87	6711
95	25.87	428.4	894.1	24.08	9.24	15.75	1077	2.64	6806
100	27.17	484.3	973.4	24.89	9.64	16.00	1072	2.44	6927
110	29.77	601.6	1137.5	26.45	10.50	16.57	1069	2.12	7236
120	32.37	722.7	1305.4	27.91	11.19	17.03	1074	1.88	7588
130	34.95	848.1	1477.3	29.29	11.74	17.37	1086	1.68	7980
140	37.52	976.7	1652.0	30.58	12.14	17.58	1102	1.52	8392
150	40.06	1107.1	1828.2	31.80	12.39	17.66	1122	1.39	8818
160	42.58	1238.2	2004.7	32.94	12.49	17.64	1143	1.28	9253
170	45.08	1369.0	2180.5	34.00	12.51	17.53	1165	1.19	9690
180	47.56	1498.7	2354.8	35.00	12.44	17.36	1189	1.11	10129
190	50.02	1626.8	2527.2	35.93	12.32	17.15	1212	1.04	10565
200	52.47	1753.0	2697.4	36.80	12.17	16.91	1236	0.97	11002
220	57.31	1999.1	3030.6	38.39	11.83	16.43	1284	0.87	11875
240	62.09	2236.9	3354.5	39.80	11.50	16.00	1331	0.79	12729
260	66.71	2467.3	3668.0	41.06	11.22	15.66	1373	0.72	13509
280	71.46	2692.4	3978.7	42.21	11.00	15.43	1420	0.67	14374
300	76.19	2913.5	4284.9	43.27	10.84	15.22	1463	0.62	15234

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

200 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 19.360	11.69	-291.0	-57.2	5.37	5.38	6.79	1681	10.94	22361
20	11.73	-287.4	-52.8	5.59	5.47	6.96	1676	10.94	22056
21	11.80	-281.7	-45.7	5.94	5.60	7.22	1668	10.93	21579
22	11.88	-275.8	-38.3	6.28	5.72	7.47	1660	10.91	21101
23	11.95	-269.7	-30.7	6.62	5.83	7.71	1652	10.87	20623
24	12.03	-263.4	-22.9	6.95	5.93	7.95	1643	10.82	20146
25	12.10	-256.9	-14.8	7.28	6.02	8.18	1634	10.76	19672
26	12.19	-250.3	-6.6	7.60	6.11	8.41	1625	10.69	19201
27	12.27	-243.4	2.0	7.93	6.20	8.64	1616	10.61	18735
28	12.36	-236.4	10.7	8.24	6.28	8.86	1607	10.52	18276
29	12.45	-229.2	19.7	8.56	6.35	9.10	1597	10.44	17799
30	12.54	-221.8	28.9	8.87	6.41	9.30	1588	10.32	17371
31	12.63	-214.3	38.3	9.18	6.47	9.51	1577	10.19	16939
32	12.73	-206.7	47.9	9.49	6.53	9.71	1566	10.06	16482
33	12.83	-198.9	57.8	9.79	6.58	9.90	1556	9.92	16090
34	12.93	-190.9	67.8	10.09	6.63	10.09	1546	9.78	15687
35	13.04	-182.9	78.0	10.38	6.67	10.29	1535	9.63	15279
36	13.15	-174.6	88.3	10.67	6.71	10.48	1523	9.48	14863
37	13.26	-166.3	98.9	10.96	6.75	10.66	1513	9.33	14496
38	13.38	-157.9	109.6	11.25	6.78	10.83	1503	9.18	14147
39	13.49	-149.3	120.6	11.53	6.81	10.99	1493	9.02	13794
40	13.61	-140.6	131.6	11.81	6.83	11.15	1482	8.86	13445
42	13.86	-123.0	154.2	12.37	6.87	11.46	1462	8.53	12804
44	14.13	-105.1	177.4	12.91	6.90	11.75	1441	8.21	12211
46	14.40	-87.3	200.7	13.42	6.98	12.06	1419	7.88	11651
48	14.69	-68.6	225.1	13.94	7.03	12.34	1398	7.56	11147
50	14.99	-49.6	250.1	14.45	7.09	12.60	1378	7.24	10672
55	15.79	-1.1	314.6	15.68	7.20	13.20	1328	6.49	9632
60	16.66	48.8	382.0	16.85	7.30	13.63	1286	5.80	8864
65	17.60	99.0	451.1	17.96	7.44	13.99	1249	5.20	8299
70	18.60	149.9	521.8	19.01	7.63	14.32	1217	4.67	7894
75	19.64	201.3	594.2	20.01	7.87	14.62	1190	4.22	7626
80	20.73	253.4	668.0	20.96	8.17	14.90	1167	3.82	7462
85	21.84	306.3	743.1	21.87	8.51	15.17	1148	3.49	7399
90	22.97	360.2	819.7	22.74	8.89	15.44	1134	3.19	7397
95	24.12	415.2	897.6	23.59	9.28	15.71	1123	2.94	7445
100	25.27	471.3	976.8	24.40	9.68	15.97	1115	2.73	7533
110	27.59	589.1	1140.8	25.96	10.54	16.58	1107	2.37	7788
120	29.90	710.8	1308.8	27.42	11.23	17.04	1109	2.10	8102
130	32.21	836.8	1481.0	28.80	11.77	17.41	1118	1.88	8452
140	34.51	966.0	1656.2	30.10	12.17	17.63	1132	1.70	8843
150	36.80	1097.0	1832.9	31.32	12.41	17.72	1149	1.56	9246
160	39.06	1228.7	2010.0	32.46	12.53	17.70	1169	1.43	9670
170	41.32	1360.1	2186.4	33.53	12.54	17.59	1190	1.33	10097
180	43.55	1490.4	2361.4	34.53	12.47	17.42	1212	1.24	10522
190	45.77	1619.1	2534.4	35.47	12.35	17.21	1235	1.16	10957
200	47.97	1745.8	2705.2	36.34	12.20	16.97	1259	1.09	11391
220	52.33	1992.9	3039.6	37.94	11.86	16.49	1305	0.97	12246
240	56.65	2231.7	3364.6	39.35	11.53	16.05	1350	0.88	13106
260	60.92	2463.1	3681.4	40.62	11.25	15.67	1394	0.80	13951
280	65.15	2688.5	3991.5	41.77	11.03	15.37	1436	0.74	14794
300	69.33	2909.3	4295.9	42.82	10.85	15.22	1478	0.69	15576

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

220 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 19.835	11.60	-288.5	-33.2	5.40	5.42	6.83	1712	11.08	23280
20	11.61	-287.6	-32.1	5.46	5.45	6.87	1711	11.08	23204
21	11.68	-282.0	-25.1	5.80	5.58	7.13	1704	11.08	22739
22	11.75	-276.2	-17.8	6.14	5.70	7.37	1697	11.07	22273
23	11.82	-270.3	-10.3	6.47	5.81	7.61	1689	11.04	21806
24	11.89	-264.1	-2.6	6.80	5.92	7.84	1681	11.00	21338
25	11.96	-257.8	5.3	7.12	6.01	8.06	1673	10.94	20872
26	12.04	-251.3	13.5	7.44	6.10	8.29	1665	10.88	20408
27	12.12	-244.6	21.9	7.76	6.19	8.51	1656	10.81	19948
28	12.20	-237.8	30.5	8.08	6.27	8.73	1647	10.72	19492
29	12.28	-230.8	39.4	8.39	6.34	8.94	1638	10.63	19044
30	12.37	-223.6	48.4	8.69	6.41	9.15	1629	10.53	18603
31	12.45	-216.3	57.7	9.00	6.47	9.36	1620	10.43	18159
32	12.54	-208.8	67.1	9.30	6.53	9.55	1611	10.31	17750
33	12.64	-201.2	76.8	9.59	6.59	9.73	1601	10.18	17340
34	12.73	-193.5	86.6	9.89	6.64	9.92	1590	10.04	16913
35	12.83	-185.6	96.6	10.18	6.68	10.10	1581	9.90	16536
36	12.93	-177.6	106.8	10.46	6.72	10.27	1571	9.76	16152
37	13.03	-169.5	117.2	10.75	6.76	10.45	1560	9.61	15757
38	13.14	-161.3	127.7	11.03	6.80	10.63	1549	9.47	15352
39	13.24	-153.0	138.4	11.31	6.82	10.78	1540	9.32	15002
40	13.35	-144.5	149.3	11.58	6.85	10.93	1531	9.17	14678
42	13.58	-127.4	171.4	12.12	6.89	11.22	1512	8.86	14032
44	13.82	-109.9	194.1	12.65	6.93	11.51	1492	8.54	13407
46	14.07	-92.6	216.9	13.16	7.01	11.80	1471	8.23	12849
48	14.33	-74.4	240.8	13.66	7.07	12.07	1451	7.92	12333
50	14.60	-55.9	265.2	14.16	7.12	12.33	1432	7.61	11840
55	15.31	-8.6	328.3	15.36	7.24	12.89	1386	6.87	10786
60	16.09	40.2	394.2	16.51	7.34	13.34	1343	6.19	9928
65	16.92	89.5	461.8	17.59	7.48	13.72	1306	5.58	9300
70	17.81	139.6	531.3	18.62	7.67	14.07	1273	5.05	8832
75	18.73	190.4	602.4	19.60	7.92	14.40	1243	4.58	8499
80	19.69	242.0	675.2	20.54	8.21	14.72	1219	4.17	8292
85	20.68	294.7	749.6	21.45	8.56	15.04	1197	3.81	8157
90	21.69	348.5	825.6	22.31	8.93	15.34	1181	3.51	8111
95	22.71	403.4	903.0	23.15	9.32	15.65	1167	3.24	8117
100	23.74	459.7	982.0	23.96	9.72	15.94	1157	3.00	8164
110	25.82	577.8	1145.9	25.52	10.57	16.57	1145	2.62	8368
120	27.91	699.9	1313.9	26.98	11.26	17.05	1144	2.31	8644
130	29.99	826.4	1486.2	28.36	11.83	17.42	1150	2.08	8961
140	32.07	956.0	1661.6	29.66	12.20	17.67	1161	1.88	9310
150	34.14	1087.6	1838.7	30.89	12.44	17.77	1177	1.72	9700
160	36.20	1219.8	2016.3	32.03	12.56	17.75	1195	1.58	10100
170	38.25	1351.7	2193.2	33.10	12.57	17.65	1215	1.47	10513
180	40.28	1482.6	2368.7	34.11	12.50	17.47	1236	1.36	10937
190	42.30	1611.8	2542.3	35.04	12.38	17.26	1258	1.28	11362
200	44.30	1739.0	2713.6	35.92	12.23	17.03	1281	1.20	11785
220	48.27	1987.1	3049.1	37.52	11.89	16.54	1326	1.07	12639
240	52.20	2226.7	3375.1	38.94	11.57	16.09	1370	0.97	13485
260	56.08	2459.0	3692.9	40.21	11.29	15.72	1412	0.88	14328
280	59.93	2685.2	4003.8	41.37	11.06	15.41	1453	0.81	15157
300	63.76	2906.5	4309.1	42.42	10.88	15.16	1493	0.75	15992

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

240 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 20.300	11.52	-285.9	-9.4	5.44	5.47	6.87	1743	11.23	24184
21	11.56	-282.1	-4.5	5.67	5.56	7.04	1739	11.23	23867
22	11.63	-276.4	2.6	6.00	5.68	7.28	1732	11.22	23412
23	11.69	-270.6	10.0	6.33	5.80	7.51	1725	11.20	22956
24	11.76	-264.6	17.6	6.66	5.90	7.74	1718	11.16	22498
25	11.83	-258.4	25.5	6.98	6.00	7.96	1710	11.11	22040
26	11.90	-252.1	33.6	7.30	6.09	8.18	1702	11.06	21583
27	11.98	-245.6	41.8	7.61	6.19	8.39	1694	10.99	21129
28	12.05	-238.9	50.3	7.92	6.26	8.60	1686	10.91	20678
29	12.13	-232.0	59.0	8.22	6.34	8.81	1677	10.83	20232
30	12.21	-225.0	68.0	8.52	6.40	9.01	1669	10.74	19793
31	12.29	-217.9	77.1	8.82	6.47	9.21	1660	10.64	19361
32	12.37	-210.6	86.4	9.12	6.53	9.41	1651	10.54	18938
33	12.46	-203.2	95.9	9.41	6.59	9.59	1642	10.42	18528
34	12.55	-195.6	105.6	9.70	6.64	9.77	1633	10.29	18138
35	12.64	-187.9	115.5	9.99	6.69	9.94	1624	10.16	17748
36	12.73	-180.1	125.5	10.27	6.73	10.11	1614	10.02	17352
37	12.83	-172.2	135.7	10.55	6.77	10.27	1605	9.88	16989
38	12.92	-164.2	146.0	10.82	6.81	10.43	1596	9.74	16622
39	13.02	-156.0	156.5	11.10	6.84	10.59	1586	9.60	16242
40	13.12	-147.8	167.2	11.37	6.86	10.75	1575	9.45	15848
42	13.33	-131.1	189.0	11.90	6.91	11.02	1558	9.15	15208
44	13.55	-114.0	211.3	12.42	6.95	11.29	1540	8.85	14604
46	13.78	-97.1	233.6	12.91	7.03	11.58	1520	8.55	14026
48	14.02	-79.3	257.1	13.41	7.10	11.85	1500	8.25	13476
50	14.26	-61.3	281.0	13.90	7.15	12.10	1482	7.95	12987
55	14.91	-14.9	342.9	15.08	7.23	12.64	1438	7.23	11905
60	15.61	32.9	407.5	16.21	7.38	13.09	1398	6.56	11017
65	16.36	81.4	473.9	17.27	7.52	13.48	1359	5.94	10315
70	17.15	130.7	542.2	18.28	7.71	13.84	1325	5.40	9788
75	17.98	180.9	612.3	19.25	7.96	14.20	1295	4.92	9403
80	18.84	232.1	684.2	20.18	8.26	14.55	1268	4.50	9127
85	19.72	284.4	757.8	21.07	8.60	14.90	1246	4.13	8957
90	20.63	338.0	833.1	21.93	8.97	15.23	1227	3.81	8861
95	21.55	392.9	910.1	22.76	9.36	15.56	1211	3.52	8824
100	22.48	449.1	988.8	23.57	9.76	15.88	1199	3.27	8837
110	24.37	567.5	1152.3	25.13	10.61	16.55	1183	2.86	8973
120	26.26	690.0	1320.3	26.59	11.29	17.05	1179	2.53	9204
130	28.16	816.8	1492.6	27.97	11.84	17.43	1182	2.27	9493
140	30.05	946.8	1668.1	29.27	12.23	17.68	1191	2.06	9815
150	31.94	1078.8	1845.4	30.49	12.47	17.80	1205	1.88	10169
160	33.83	1211.5	2023.4	31.64	12.58	17.79	1221	1.73	10550
170	35.70	1343.9	2200.7	32.71	12.60	17.69	1240	1.60	10944
180	37.56	1475.2	2376.7	33.72	12.53	17.52	1260	1.49	11360
190	39.41	1604.9	2550.8	34.66	12.41	17.31	1281	1.40	11776
200	41.25	1732.6	2722.6	35.54	12.26	17.07	1303	1.31	12195
220	44.89	1981.5	3059.0	37.15	11.93	16.59	1346	1.17	13034
240	48.50	2222.0	3386.0	38.57	11.60	16.14	1389	1.06	13875
260	52.06	2455.1	3704.6	39.84	11.32	15.76	1431	0.96	14708
280	55.59	2682.1	4016.3	41.00	11.09	15.45	1471	0.88	15538
300	59.10	2904.2	4322.5	42.06	10.92	15.20	1509	0.82	16350

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

260 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 20.756	11.44	-283.2	14.2	5.47	5.51	6.91	1773	11.37	25074
21	11.45	-281.9	15.9	5.55	5.54	6.97	1772	11.37	24967
22	11.52	-276.4	23.0	5.88	5.67	7.20	1766	11.37	24523
23	11.58	-270.7	30.3	6.20	5.78	7.43	1759	11.35	24076
24	11.64	-264.8	37.8	6.52	5.89	7.65	1752	11.32	23628
25	11.71	-258.8	45.6	6.84	5.99	7.87	1745	11.28	23179
26	11.78	-252.6	53.6	7.15	6.03	8.08	1738	11.23	22729
27	11.84	-246.2	61.8	7.46	6.17	8.29	1730	11.16	22281
28	11.92	-239.7	70.1	7.77	6.25	8.49	1722	11.09	21836
29	11.99	-233.0	78.7	8.07	6.33	8.69	1714	11.02	21394
30	12.06	-226.1	87.5	8.37	6.40	8.89	1706	10.93	20956
31	12.14	-219.1	96.5	8.66	6.47	9.08	1698	10.84	20525
32	12.22	-212.0	105.7	8.95	6.53	9.27	1689	10.74	20101
33	12.30	-204.7	115.1	9.24	6.59	9.46	1681	10.64	19686
34	12.38	-197.3	124.6	9.53	6.64	9.64	1672	10.52	19281
35	12.47	-189.8	134.4	9.81	6.69	9.80	1664	10.39	18906
36	12.56	-182.2	144.3	10.09	6.74	9.96	1655	10.26	18535
37	12.64	-174.4	154.3	10.36	6.78	10.12	1647	10.13	18162
38	12.73	-166.6	164.5	10.64	6.82	10.28	1638	10.00	17796
39	12.83	-158.6	174.9	10.90	6.85	10.42	1629	9.86	17446
40	12.92	-150.6	185.3	11.17	6.87	10.56	1621	9.72	17095
42	13.11	-134.2	206.7	11.69	6.92	10.85	1601	9.43	16350
44	13.31	-117.5	228.7	12.20	6.97	11.12	1584	9.14	15741
46	13.52	-100.9	250.7	12.69	7.06	11.40	1565	8.85	15172
48	13.74	-83.5	273.7	13.18	7.12	11.65	1547	8.55	14627
50	13.97	-65.8	297.3	13.66	7.18	11.90	1529	8.26	14115
55	14.56	-20.4	358.2	14.82	7.31	12.43	1487	7.55	13000
60	15.20	26.6	421.7	15.93	7.42	12.87	1448	6.89	12078
65	15.88	74.3	487.1	16.98	7.56	13.27	1411	6.28	11338
70	16.59	122.9	554.4	17.97	7.75	13.65	1375	5.73	10742
75	17.34	172.6	623.5	18.93	8.00	14.01	1344	5.24	10314
80	18.12	223.3	694.5	19.84	8.30	14.39	1316	4.81	9977
85	18.93	275.3	767.4	20.73	8.64	14.76	1292	4.43	9760
90	19.75	328.7	842.1	21.58	9.01	15.13	1271	4.10	9622
95	20.58	383.4	918.6	22.41	9.40	15.48	1254	3.80	9549
100	21.43	439.7	996.9	23.21	9.79	15.82	1240	3.54	9523
110	23.15	558.1	1160.1	24.76	10.65	16.53	1220	3.09	9595
120	24.89	680.8	1327.9	26.22	11.33	17.05	1213	2.74	9782
130	26.62	808.0	1500.2	27.60	11.87	17.43	1215	2.46	10043
140	28.36	938.4	1675.8	28.90	12.26	17.69	1221	2.23	10329
150	30.10	1070.7	1853.2	30.13	12.50	17.82	1232	2.04	10655
160	31.83	1203.7	2031.3	31.28	12.61	17.82	1247	1.88	11018
170	33.56	1336.5	2209.0	32.36	12.62	17.73	1265	1.74	11395
180	35.27	1468.2	2385.3	33.36	12.56	17.56	1284	1.62	11796
190	36.98	1598.3	2559.8	34.31	12.44	17.35	1304	1.52	12198
200	38.68	1726.4	2732.0	35.19	12.29	17.12	1325	1.43	12610
220	42.04	1976.2	3069.3	36.80	11.96	16.63	1367	1.27	13440
240	45.37	2217.5	3397.1	38.22	11.63	16.18	1409	1.15	14266
260	48.66	2451.4	3716.6	39.50	11.35	15.80	1450	1.04	15098
280	51.92	2679.1	4029.0	40.66	11.12	15.49	1489	0.96	15920
300	55.16	2901.9	4336.1	41.72	10.95	15.24	1526	0.89	16739

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

280 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 21.205	11.36	-280.5	37.7	5.50	5.55	6.95	1802	11.51	25952
22	11.41	-276.2	43.3	5.76	5.65	7.13	1798	11.51	25607
23	11.47	-270.6	50.5	6.08	5.76	7.35	1792	11.50	25171
24	11.53	-264.9	58.0	6.40	5.87	7.57	1785	11.47	24732
25	11.59	-259.0	65.7	6.71	5.97	7.78	1779	11.43	24291
26	11.66	-252.9	73.5	7.02	6.07	7.99	1772	11.39	23849
27	11.72	-246.6	81.6	7.33	6.16	8.19	1765	11.33	23408
28	11.79	-240.2	89.9	7.63	6.24	8.39	1757	11.27	22968
29	11.86	-233.6	98.4	7.93	6.32	8.59	1749	11.19	22530
30	11.93	-226.9	107.1	8.22	6.39	8.78	1742	11.11	22096
31	12.00	-220.1	116.0	8.51	6.46	8.97	1734	11.02	21666
32	12.08	-213.1	125.0	8.80	6.53	9.15	1726	10.93	21243
33	12.15	-206.0	134.3	9.08	6.59	9.34	1718	10.83	20826
34	12.23	-198.7	143.7	9.36	6.64	9.51	1709	10.73	20418
35	12.31	-191.4	153.3	9.64	6.70	9.68	1701	10.62	20019
36	12.39	-183.9	163.1	9.92	6.75	9.85	1693	10.51	19631
37	12.47	-176.3	173.0	10.19	6.79	9.99	1685	10.36	19293
38	12.56	-168.6	183.1	10.46	6.83	10.14	1677	10.23	18937
39	12.65	-160.8	193.3	10.72	6.86	10.28	1669	10.10	18582
40	12.73	-152.9	203.7	10.99	6.89	10.42	1661	9.97	18245
42	12.91	-136.8	224.8	11.50	6.94	10.68	1645	9.69	17572
44	13.10	-120.4	246.4	12.00	6.99	10.96	1626	9.41	16858
46	13.30	-104.2	268.1	12.49	7.09	11.24	1608	9.13	16274
48	13.50	-87.1	290.8	12.97	7.14	11.49	1591	8.84	15738
50	13.71	-69.8	314.0	13.44	7.21	11.72	1574	8.56	15222
55	14.25	-25.1	374.0	14.59	7.34	12.25	1532	7.86	14060
60	14.84	21.1	436.6	15.68	7.45	12.69	1494	7.21	13110
65	15.46	68.1	501.1	16.71	7.60	13.09	1458	6.61	12345
70	16.12	116.1	567.5	17.69	7.79	13.47	1424	6.05	11722
75	16.80	165.3	635.7	18.63	8.04	13.85	1391	5.55	11231
80	17.51	215.6	706.0	19.54	8.33	14.24	1362	5.11	10849
85	18.25	267.2	778.1	20.42	8.67	14.64	1336	4.72	10577
90	19.00	320.3	852.3	21.26	9.04	15.02	1314	4.37	10396
95	19.76	374.9	928.3	22.08	9.43	15.40	1295	4.07	10285
100	20.54	431.1	1006.2	22.88	9.83	15.75	1280	3.79	10231
110	22.12	549.5	1168.9	24.43	10.68	16.50	1257	3.33	10238
120	23.71	672.4	1336.4	25.89	11.36	17.04	1248	2.95	10379
130	25.32	799.8	1508.7	27.27	11.90	17.43	1247	2.65	10608
140	26.92	930.5	1684.3	28.57	12.29	17.70	1251	2.41	10868
150	28.52	1063.1	1861.8	29.80	12.53	17.82	1261	2.20	11172
160	30.13	1196.5	2040.0	30.95	12.64	17.84	1274	2.03	11498
170	31.72	1329.6	2217.8	32.02	12.65	17.75	1290	1.88	11861
180	33.32	1461.6	2394.5	33.03	12.59	17.59	1308	1.75	12235
190	34.90	1592.1	2569.3	33.98	12.47	17.39	1327	1.64	12636
200	36.48	1720.6	2741.9	34.86	12.32	17.16	1347	1.54	13034
220	39.60	1971.1	3080.0	36.47	11.98	16.67	1388	1.37	13853
240	42.69	2213.2	3408.6	37.90	11.66	16.22	1429	1.24	14674
260	45.75	2447.8	3728.8	39.19	11.38	15.84	1468	1.13	15491
280	48.78	2676.3	4042.1	40.35	11.16	15.52	1506	1.03	16309
300	51.78	2899.8	4349.6	41.41	10.98	15.27	1543	0.96	17126

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

300 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 21.645	11.29	-277.8	61.0	5.53	5.59	6.98	1831	11.65	26818
22	11.31	-275.9	63.5	5.64	5.63	7.06	1829	11.65	26668
23	11.37	-270.4	70.6	5.96	5.75	7.28	1823	11.64	26241
24	11.43	-264.8	78.0	6.28	5.86	7.50	1817	11.62	25811
25	11.49	-258.9	85.6	6.59	5.96	7.71	1811	11.59	25379
26	11.55	-253.0	93.4	6.89	6.06	7.91	1805	11.54	24945
27	11.61	-246.8	101.5	7.20	6.15	8.11	1798	11.49	24511
28	11.67	-240.5	109.7	7.50	6.23	8.30	1791	11.43	24077
29	11.74	-234.1	118.1	7.79	6.32	8.50	1783	11.36	23644
30	11.81	-227.5	126.7	8.08	6.39	8.68	1776	11.28	23213
31	11.87	-220.8	135.4	8.37	6.46	8.87	1768	11.20	22786
32	11.94	-213.9	144.4	8.65	6.53	9.05	1761	11.11	22364
33	12.02	-207.0	153.5	8.93	6.59	9.22	1753	11.02	21947
34	12.09	-199.8	162.8	9.21	6.65	9.40	1745	10.92	21537
35	12.16	-192.6	172.3	9.49	6.70	9.57	1737	10.82	21135
36	12.24	-185.3	182.0	9.76	6.75	9.73	1729	10.71	20742
37	12.32	-177.8	191.8	10.03	6.79	9.89	1721	10.60	20359
38	12.40	-170.2	201.7	10.29	6.84	10.05	1714	10.48	19988
39	12.48	-162.5	211.9	10.56	6.87	10.16	1706	10.33	19686
40	12.56	-154.8	222.1	10.82	6.90	10.29	1699	10.20	19330
42	12.73	-139.0	242.9	11.32	6.95	10.55	1684	9.94	18697
44	12.91	-122.9	254.3	11.82	7.01	10.80	1668	9.67	18050
46	13.09	-107.0	285.6	12.29	7.10	11.10	1648	9.39	17371
48	13.28	-90.2	308.1	12.77	7.17	11.35	1631	9.11	16808
50	13.47	-73.1	331.0	13.24	7.23	11.57	1615	8.83	16302
55	13.98	-29.2	390.2	14.37	7.37	12.09	1575	8.15	15115
60	14.52	16.3	452.0	15.44	7.48	12.52	1538	7.50	14141
65	15.10	62.7	515.6	16.46	7.63	12.93	1503	6.91	13326
70	15.70	110.2	581.3	17.43	7.82	13.31	1470	6.35	12695
75	16.33	158.8	648.8	18.37	8.07	13.71	1436	5.85	12142
80	16.99	208.7	718.3	19.26	8.37	14.10	1406	5.40	11745
85	17.66	260.0	789.8	20.13	8.71	14.51	1379	5.00	11413
90	18.35	312.9	863.4	20.97	9.08	14.92	1355	4.64	11183
95	19.06	367.3	938.9	21.79	9.47	15.31	1336	4.32	11034
100	19.77	423.3	1016.5	22.58	9.86	15.69	1319	4.04	10947
110	21.23	541.7	1178.6	24.13	10.71	16.46	1294	3.55	10898
120	22.71	664.7	1345.9	25.58	11.39	17.01	1282	3.16	10998
130	24.19	792.3	1518.0	26.96	11.93	17.42	1278	2.84	11188
140	25.68	923.1	1693.6	28.26	12.31	17.69	1281	2.58	11426
150	27.17	1056.0	1871.1	29.49	12.55	17.83	1289	2.36	11703
160	28.66	1189.7	2049.4	30.64	12.66	17.84	1301	2.18	12009
170	30.14	1323.1	2227.4	31.72	12.68	17.77	1315	2.02	12337
180	31.62	1455.4	2404.2	32.73	12.61	17.62	1332	1.88	12700
190	33.10	1586.2	2579.3	33.67	12.50	17.42	1350	1.76	13071
200	34.57	1715.1	2752.3	34.56	12.35	17.19	1369	1.65	13472
220	37.49	1966.3	3091.0	36.17	12.01	16.71	1409	1.47	14271
240	40.37	2209.1	3420.3	37.61	11.69	16.26	1448	1.33	15079
260	43.23	2444.4	3741.3	38.89	11.41	15.87	1487	1.21	15888
280	46.06	2673.6	4055.2	40.06	11.19	15.56	1524	1.11	16703
300	48.86	2897.7	4363.5	41.12	11.01	15.30	1560	1.02	17509

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

320 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 22.078	11.22	-275.0	84.1	5.56	5.63	7.02	1858	11.79	27673
23	11.27	-270.0	90.7	5.85	5.73	7.22	1854	11.78	27289
24	11.33	-264.5	98.0	6.16	5.85	7.43	1848	11.77	26869
25	11.38	-258.7	105.6	6.47	5.95	7.64	1842	11.74	26445
26	11.44	-252.9	113.3	6.77	6.05	7.83	1836	11.69	26019
27	11.50	-246.8	121.2	7.07	6.14	8.03	1830	11.65	25592
28	11.56	-240.7	129.4	7.37	6.23	8.22	1823	11.59	25164
29	11.63	-234.3	137.7	7.66	6.31	8.41	1816	11.52	24736
30	11.69	-227.9	146.2	7.95	6.38	8.59	1809	11.45	24310
31	11.75	-221.3	154.9	8.23	6.46	8.77	1802	11.37	23887
32	11.82	-214.5	163.7	8.52	6.52	8.95	1794	11.29	23466
33	11.89	-207.7	172.8	8.79	6.59	9.12	1787	11.20	23050
34	11.96	-200.7	182.0	9.07	6.64	9.29	1779	11.10	22640
35	12.03	-193.6	191.4	9.34	6.70	9.45	1771	11.00	22236
36	12.10	-186.4	200.9	9.61	6.75	9.62	1764	10.90	21840
37	12.18	-179.0	210.6	9.87	6.80	9.78	1756	10.79	21452
38	12.25	-171.6	220.4	10.14	6.84	9.93	1749	10.68	21074
39	12.33	-164.0	230.4	10.40	6.87	10.07	1741	10.57	20707
40	12.41	-156.4	240.6	10.65	6.91	10.18	1734	10.42	20411
42	12.57	-140.9	261.2	11.16	6.96	10.43	1720	10.16	19739
44	12.73	-125.1	282.3	11.65	7.02	10.67	1706	9.91	19153
46	12.90	-109.4	303.4	12.12	7.11	10.95	1689	9.64	18529
48	13.08	-92.9	325.5	12.59	7.18	11.21	1671	9.37	17888
50	13.26	-76.1	348.2	13.05	7.25	11.44	1654	9.10	17341
55	13.73	-32.8	406.7	14.16	7.40	11.95	1617	8.42	16179
60	14.24	12.1	467.8	15.23	7.51	12.38	1579	7.78	15141
65	14.78	57.9	530.7	16.23	7.66	12.78	1545	7.19	14310
70	15.34	104.8	595.6	17.20	7.86	13.19	1511	6.64	13609
75	15.92	153.0	662.5	18.12	8.11	13.57	1480	6.13	13084
80	16.52	202.6	731.4	19.01	8.40	13.98	1448	5.67	12612
85	17.15	253.6	802.3	19.87	8.74	14.40	1420	5.26	12252
90	17.79	306.1	875.3	20.70	9.11	14.82	1395	4.90	11977
95	18.44	360.4	950.5	21.51	9.50	15.23	1374	4.57	11789
100	19.11	416.2	1027.6	22.31	9.90	15.62	1357	4.28	11665
110	20.46	534.5	1189.1	23.84	10.75	16.41	1330	3.77	11580
120	21.83	657.5	1356.1	25.30	11.42	16.99	1315	3.37	11626
130	23.21	785.2	1528.1	26.67	11.96	17.42	1309	3.03	11770
140	24.60	916.3	1703.6	27.97	12.34	17.69	1311	2.75	11996
150	25.99	1049.4	1881.1	29.20	12.58	17.82	1317	2.52	12249
160	27.38	1183.3	2059.4	30.35	12.69	17.85	1328	2.32	12533
170	28.77	1316.9	2237.4	31.43	12.70	17.78	1341	2.15	12843
180	30.15	1449.6	2414.5	32.44	12.64	17.64	1356	2.01	13171
190	31.53	1580.7	2589.7	33.39	12.52	17.44	1373	1.88	13535
200	32.91	1709.8	2762.9	34.28	12.37	17.22	1391	1.76	13912
220	35.64	1961.7	3102.3	35.89	12.04	16.74	1429	1.57	14691
240	38.35	2205.2	3432.3	37.33	11.72	16.29	1468	1.42	15497
260	41.02	2441.2	3754.0	38.62	11.44	15.91	1505	1.29	16301
280	43.68	2671.0	4068.6	39.78	11.22	15.59	1542	1.18	17101
300	46.30	2895.8	4377.5	40.85	11.04	15.34	1577	1.09	17903

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

340 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 22.504	11.15	-272.1	107.2	5.59	5.66	7.06	1885	11.93	28519
23	11.18	-269.5	110.7	5.74	5.72	7.16	1883	11.92	28317
24	11.24	-264.0	118.0	6.05	5.83	7.37	1878	11.91	27906
25	11.29	-258.4	125.4	6.36	5.94	7.57	1873	11.88	27491
26	11.35	-252.6	133.1	6.66	6.03	7.77	1867	11.84	27073
27	11.40	-246.7	141.0	6.96	6.13	7.96	1861	11.80	26652
28	11.46	-240.6	149.0	7.25	6.22	8.15	1854	11.74	26231
29	11.52	-234.4	157.3	7.54	6.30	8.34	1848	11.68	25809
30	11.58	-228.0	165.7	7.82	6.38	8.51	1841	11.61	25388
31	11.64	-221.6	174.3	8.11	6.45	8.69	1834	11.53	24968
32	11.71	-214.9	183.1	8.38	6.52	8.86	1827	11.45	24550
33	11.77	-208.2	192.0	8.66	6.58	9.03	1819	11.37	24136
34	11.84	-201.3	201.1	8.93	6.64	9.20	1812	11.27	23726
35	11.90	-194.3	210.4	9.20	6.70	9.36	1805	11.18	23322
36	11.97	-187.2	219.8	9.47	6.75	9.52	1797	11.08	22924
37	12.04	-180.0	229.4	9.73	6.80	9.67	1790	10.98	22533
38	12.11	-172.7	239.2	9.99	6.85	9.82	1782	10.87	22150
39	12.19	-165.3	249.1	10.25	6.88	9.96	1775	10.76	21777
40	12.26	-157.7	259.1	10.50	6.91	10.10	1768	10.65	21414
42	12.41	-142.5	279.5	11.00	6.97	10.32	1755	10.38	20803
44	12.57	-126.9	300.4	11.48	7.03	10.57	1740	10.13	20153
46	12.73	-111.5	321.3	11.95	7.13	10.83	1726	9.87	19611
48	12.89	-95.2	343.2	12.41	7.20	11.08	1710	9.61	19009
50	13.06	-78.6	365.6	12.87	7.27	11.32	1693	9.35	18408
55	13.51	-35.9	423.5	13.97	7.42	11.82	1656	8.69	17207
60	13.99	8.4	483.9	15.03	7.54	12.25	1620	8.05	16154
65	14.49	53.6	546.2	16.02	7.69	12.66	1585	7.46	15272
70	15.01	100.1	610.5	16.98	7.93	13.06	1552	6.91	14556
75	15.56	147.9	676.8	17.89	8.14	13.45	1521	6.40	14005
80	16.12	197.1	745.1	18.77	8.44	13.86	1490	5.94	13520
85	16.70	247.8	815.4	19.62	8.78	14.29	1461	5.52	13101
90	17.29	300.1	887.9	20.45	9.15	14.72	1435	5.15	12800
95	17.90	354.1	962.6	21.26	9.54	15.15	1413	4.81	12564
100	18.52	409.8	1039.4	22.05	9.93	15.55	1394	4.51	12407
110	19.78	527.9	1200.3	23.58	10.78	16.36	1364	3.99	12261
120	21.06	650.9	1367.0	25.03	11.45	16.96	1348	3.56	12263
130	22.35	778.7	1538.8	26.41	11.98	17.40	1340	3.21	12372
140	23.65	910.0	1714.2	27.70	12.37	17.69	1340	2.92	12553
150	24.95	1043.3	1891.7	28.93	12.60	17.83	1345	2.67	12796
160	26.26	1177.4	2070.0	30.08	12.72	17.85	1354	2.47	13067
170	27.55	1311.2	2248.1	31.16	12.73	17.78	1366	2.29	13358
180	28.85	1444.1	2425.1	32.17	12.66	17.65	1380	2.13	13671
190	30.15	1575.4	2600.6	33.12	12.55	17.46	1396	2.00	14002
200	31.45	1704.9	2774.0	34.01	12.40	17.24	1413	1.88	14367
220	34.02	1957.4	3113.9	35.63	12.07	16.77	1450	1.67	15134
240	36.56	2201.5	3444.6	37.07	11.74	16.32	1488	1.51	15920
260	39.08	2438.1	3766.9	38.36	11.47	15.94	1524	1.37	16716
280	41.58	2668.5	4082.2	39.53	11.25	15.62	1560	1.26	17512
300	44.05	2894.0	4391.7	40.60	11.07	15.37	1594	1.16	18301

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

360 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 22.924	11.09	-269.3	130.1	5.62	5.70	7.09	1912	12.06	29356
23	11.10	-268.9	130.6	5.64	5.70	7.11	1912	12.06	29326
24	11.15	-263.5	137.8	5.95	5.82	7.32	1907	12.05	28924
25	11.20	-258.0	145.2	6.25	5.92	7.51	1902	12.02	28517
26	11.25	-252.3	152.8	6.55	6.02	7.71	1896	11.99	28107
27	11.31	-246.4	160.6	6.84	6.12	7.90	1890	11.94	27694
28	11.36	-240.4	168.6	7.13	6.21	8.08	1884	11.89	27279
29	11.42	-234.3	176.8	7.42	6.29	8.27	1878	11.83	26863
30	11.48	-228.1	185.2	7.70	6.37	8.44	1872	11.76	26447
31	11.54	-221.7	193.7	7.98	6.45	8.61	1865	11.69	26031
32	11.60	-215.1	202.4	8.26	6.52	8.78	1858	11.61	25617
33	11.66	-208.5	211.2	8.53	6.58	8.95	1851	11.53	25206
34	11.72	-201.7	220.3	8.80	6.64	9.11	1844	11.44	24797
35	11.79	-194.8	229.5	9.07	6.70	9.27	1837	11.35	24393
36	11.85	-187.8	238.8	9.33	6.75	9.42	1829	11.25	23994
37	11.92	-180.7	248.3	9.59	6.80	9.57	1822	11.15	23601
38	11.99	-173.5	257.9	9.85	6.85	9.72	1815	11.05	23215
39	12.05	-166.2	267.7	10.10	6.89	9.86	1808	10.94	22837
40	12.12	-158.8	277.7	10.35	6.92	9.99	1801	10.83	22468
42	12.27	-143.8	297.9	10.85	6.98	10.25	1787	10.61	21760
44	12.42	-128.4	318.6	11.33	7.05	10.46	1774	10.34	21201
46	12.57	-113.2	339.3	11.79	7.14	10.73	1759	10.09	20570
48	12.73	-97.2	361.0	12.25	7.22	10.96	1746	9.84	20070
50	12.89	-80.8	383.1	12.70	7.29	11.20	1730	9.58	19488
55	13.31	-38.7	440.4	13.79	7.44	11.71	1692	8.93	18199
60	13.76	5.1	500.3	14.84	7.57	12.13	1659	8.30	17163
65	14.22	49.9	562.0	15.82	7.72	12.54	1623	7.71	16225
70	14.72	95.9	625.7	16.77	7.92	12.95	1591	7.16	15478
75	15.23	143.3	691.5	17.68	8.17	13.36	1559	6.66	14866
80	15.75	192.2	759.3	18.55	8.47	13.76	1529	6.19	14388
85	16.29	242.5	829.1	19.40	8.81	14.20	1499	5.77	13950
90	16.85	294.6	901.2	20.22	9.18	14.62	1474	5.39	13648
95	17.42	348.4	975.4	21.02	9.57	15.07	1449	5.05	13341
100	17.99	403.9	1051.7	21.81	9.96	15.48	1430	4.74	13155
110	19.18	521.8	1212.2	23.33	10.81	16.32	1398	4.20	12945
120	20.38	644.8	1378.4	24.78	11.48	16.93	1380	3.76	12911
130	21.59	772.7	1550.0	26.15	12.01	17.39	1371	3.39	12980
140	22.81	904.1	1725.3	27.45	12.40	17.68	1369	3.09	13142
150	24.04	1037.5	1902.9	28.68	12.63	17.82	1373	2.83	13355
160	25.26	1171.8	2081.2	29.83	12.74	17.85	1381	2.61	13605
170	26.48	1305.8	2259.3	30.91	12.75	17.78	1391	2.42	13883
180	27.71	1438.9	2436.4	31.92	12.68	17.65	1404	2.26	14175
190	28.93	1570.5	2611.9	32.87	12.57	17.47	1419	2.11	14496
200	30.15	1700.1	2785.5	33.76	12.42	17.26	1435	1.99	14829
220	32.57	1953.2	3125.8	35.38	12.09	16.80	1471	1.77	15569
240	34.98	2197.9	3457.1	36.82	11.77	16.35	1507	1.60	16349
260	37.36	2435.1	3779.9	38.12	11.49	15.97	1543	1.45	17132
280	39.71	2666.2	4095.8	39.29	11.27	15.65	1577	1.33	17908
300	42.05	2892.2	4406.0	40.36	11.10	15.39	1611	1.23	18711

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

380 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 23.338	11.03	-266.3	152.8	5.64	5.73	7.13	1938	12.20	30185
24	11.06	-262.8	157.6	5.85	5.80	7.26	1935	12.19	29924
25	11.11	-257.4	164.9	6.15	5.91	7.46	1930	12.17	29526
26	11.16	-251.8	172.5	6.44	6.01	7.65	1925	12.13	29124
27	11.22	-246.0	180.2	6.73	6.11	7.84	1919	12.09	28718
28	11.27	-240.1	188.2	7.02	6.20	8.02	1914	12.04	28310
29	11.33	-234.1	196.3	7.31	6.29	8.20	1907	11.98	27900
30	11.38	-227.9	204.6	7.59	6.37	8.37	1901	11.91	27489
31	11.44	-221.6	213.0	7.87	6.44	8.54	1895	11.84	27078
32	11.50	-215.2	221.7	8.14	6.51	8.71	1888	11.77	26668
33	11.55	-208.6	230.4	8.41	6.58	8.87	1881	11.69	26259
34	11.61	-202.[illegible]	239.4	8.68	6.64	9.03	1875	11.60	25853
35	11.68	-195.2	248.5	8.94	6.70	9.18	1868	11.51	25450
36	11.74	-188.3	257.8	9.20	6.76	9.34	1861	11.42	25051
37	11.80	-181.3	267.2	9.46	6.81	9.48	1853	11.32	24657
38	11.87	-174.2	276.7	9.72	6.85	9.63	1846	11.22	24269
39	11.93	-167.0	286.4	9.97	6.89	9.76	1840	11.12	23888
40	12.00	-159.7	296.3	10.22	6.93	9.89	1833	11.01	23515
42	12.14	-144.8	316.3	10.70	6.99	10.15	1819	10.79	22794
44	12.28	-129.7	336.9	11.18	7.05	10.40	1805	10.56	22114
46	12.42	-114.7	357.3	11.64	7.15	10.63	1792	10.29	21604
48	12.57	-98.8	378.8	12.10	7.23	10.88	1777	10.05	20992
50	12.72	-82.7	400.8	12.54	7.30	11.09	1766	9.80	20531
55	13.12	-41.1	457.6	13.63	7.46	11.61	1729	9.17	19225
60	13.54	2.3	516.9	14.66	7.59	12.02	1695	8.55	18145
65	13.99	46.6	578.1	15.64	7.75	12.43	1661	7.96	17204
70	14.45	92.2	641.3	16.57	7.95	12.84	1627	7.41	16394
75	14.93	139.2	706.5	17.47	8.20	13.26	1596	6.90	15751
80	15.43	187.7	773.9	18.34	8.50	13.68	1566	6.44	15233
85	15.93	237.8	843.3	19.19	8.84	14.10	1538	6.01	14833
90	16.45	289.6	914.9	20.00	9.21	14.55	1510	5.62	14438
95	16.99	343.2	988.7	20.80	9.60	14.97	1487	5.27	14175
100	17.53	398.6	1064.7	21.58	9.99	15.41	1465	4.95	13911
110	18.64	516.3	1224.5	23.10	10.84	16.27	1431	4.41	13644
120	19.77	639.2	1390.4	24.55	11.51	16.90	1411	3.95	13564
130	20.91	767.1	1561.8	25.92	12.04	17.37	1401	3.57	13601
140	22.06	898.5	1737.0	27.22	12.42	17.68	1397	3.25	13714
150	23.22	1032.1	1914.4	28.44	12.66	17.83	1399	2.98	13909
160	24.37	1166.6	2092.8	29.59	12.77	17.85	1407	2.75	14155
170	25.53	1300.8	2270.8	30.67	12.77	17.79	1416	2.55	14401
180	26.68	1434.1	2448.0	31.68	12.71	17.65	1429	2.38	14694
190	27.84	1565.8	2623.6	32.63	12.59	17.48	1443	2.23	14992
200	28.99	1695.7	2797.2	33.52	12.44	17.27	1458	2.10	15317
220	31.28	1949.2	3138.0	35.15	12.11	16.82	1491	1.87	16020
240	33.56	2194.4	3469.7	36.59	11.79	16.38	1527	1.69	16783
260	35.81	2432.3	3793.2	37.89	11.52	16.00	1561	1.54	17557
280	38.05	2663.9	4109.6	39.06	11.30	15.68	1595	1.41	18339
300	40.26	2890.5	4420.3	40.13	11.13	15.43	1627	1.30	19107

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

400 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 23.746	10.97	-263.4	175.4	5.67	5.76	7.16	1963	12.33	31006
24	10.98	-262.1	177.3	5.75	5.79	7.22	1962	12.33	30908
25	11.03	-256.7	184.6	6.05	5.90	7.41	1958	12.31	30519
26	11.08	-251.2	192.1	6.34	6.00	7.60	1953	12.27	30124
27	11.13	-245.5	199.8	6.63	6.10	7.78	1948	12.23	29726
28	11.18	-239.7	207.7	6.92	6.19	7.97	1942	12.18	29325
29	11.24	-233.7	215.7	7.20	6.28	8.14	1936	12.13	28921
30	11.29	-227.6	223.9	7.48	6.36	8.31	1930	12.06	28516
31	11.34	-221.4	232.3	7.75	6.44	8.48	1924	11.99	28110
32	11.40	-215.1	240.9	8.03	6.51	8.64	1918	11.92	27703
33	11.46	-208.6	249.6	8.29	6.58	8.80	1911	11.84	27298
34	11.51	-202.0	258.5	8.56	6.64	8.96	1904	11.76	26895
35	11.57	-195.3	267.5	8.82	6.70	9.11	1898	11.67	26493
36	11.63	-188.5	276.7	9.08	6.76	9.26	1891	11.58	26095
37	11.69	-181.6	286.0	9.34	6.81	9.40	1884	11.48	25701
38	11.75	-174.6	295.5	9.59	6.86	9.54	1877	11.38	25312
39	11.82	-167.5	305.1	9.84	6.90	9.68	1870	11.28	24929
40	11.88	-160.3	314.9	10.08	6.93	9.81	1864	11.18	24553
42	12.01	-145.7	334.7	10.57	7.00	10.06	1850	10.97	23822
44	12.14	-130.7	355.1	11.04	7.07	10.31	1837	10.75	23127
46	12.28	-115.9	375.4	11.49	7.16	10.58	1822	10.52	22474
48	12.43	-100.3	396.8	11.95	7.24	10.78	1810	10.25	22012
50	12.57	-84.3	418.5	12.39	7.32	11.01	1795	10.01	21416
55	12.95	-43.1	474.9	13.47	7.48	11.51	1763	9.40	20209
60	13.35	-0.3	533.7	14.49	7.61	11.93	1730	8.78	19094
65	13.77	43.6	594.4	15.46	7.77	12.33	1697	8.20	18164
70	14.21	88.9	657.1	16.39	7.98	12.75	1663	7.65	17310
75	14.66	135.5	721.9	17.28	8.23	13.17	1631	7.14	16628
80	15.13	183.7	788.8	18.15	8.53	13.60	1601	6.67	16076
85	15.61	233.6	857.9	18.99	8.87	14.02	1574	6.24	15683
90	16.10	285.1	929.1	19.80	9.24	14.45	1547	5.85	15301
95	16.60	338.5	1002.5	20.59	9.63	14.92	1520	5.49	14916
100	17.11	393.7	1078.1	21.37	10.02	15.35	1499	5.17	14677
110	18.15	511.2	1237.3	22.88	10.87	16.23	1463	4.61	14338
120	19.22	634.0	1402.8	24.32	11.54	16.87	1442	4.14	14218
130	20.30	761.9	1573.9	25.69	12.07	17.35	1430	3.74	14223
140	21.39	893.4	1749.0	26.99	12.45	17.66	1425	3.41	14313
150	22.48	1027.1	1926.4	28.22	12.68	17.82	1426	3.13	14481
160	23.58	1161.7	2104.7	29.37	12.79	17.85	1432	2.89	14694
170	24.67	1296.1	2282.9	30.45	12.80	17.79	1441	2.68	14948
180	25.76	1429.5	2460.0	31.46	12.73	17.66	1452	2.50	15207
190	26.86	1561.4	2635.6	32.41	12.61	17.49	1465	2.35	15490
200	27.95	1691.5	2809.3	33.30	12.47	17.28	1480	2.21	15806
220	30.12	1945.4	3150.3	34.92	12.14	16.84	1512	1.97	16473
240	32.28	2191.2	3482.5	36.37	11.82	16.41	1546	1.78	17214
260	34.43	2429.5	3806.6	37.67	11.55	16.03	1580	1.62	17984
280	36.55	2661.7	4123.6	38.84	11.33	15.71	1613	1.48	18762
300	38.65	2888.9	4434.8	39.92	11.16	15.45	1644	1.37	19533

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

450 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 24.742	10.83	-255.9	231.5	5.74	5.84	7.25	2025	12.66	33029
25	10.84	-254.6	233.4	5.81	5.87	7.30	2023	12.66	32934
26	10.89	-249.2	240.8	6.10	5.98	7.49	2019	12.62	32559
27	10.94	-243.7	248.4	6.39	6.08	7.67	2015	12.58	32180
28	10.98	-238.1	256.1	6.67	6.17	7.84	2010	12.54	31796
29	11.03	-232.3	264.0	6.95	6.26	8.01	2004	12.48	31408
30	11.08	-226.4	272.1	7.22	6.35	8.18	1999	12.42	31017
31	11.13	-220.4	280.4	7.49	6.43	8.34	1993	12.35	30624
32	11.18	-214.2	288.8	7.76	6.50	8.50	1988	12.28	30230
33	11.23	-208.0	297.4	8.02	6.57	8.65	1982	12.21	29834
34	11.28	-201.6	306.1	8.28	6.64	8.80	1975	12.13	29439
35	11.34	-195.1	315.0	8.54	6.70	8.94	1969	12.04	29044
36	11.39	-188.5	324.0	8.79	6.76	9.09	1963	11.95	28651
37	11.44	-181.8	333.1	9.05	6.81	9.23	1956	11.86	28260
38	11.50	-175.0	342.4	9.29	6.86	9.36	1950	11.77	27872
39	11.55	-168.1	351.9	9.54	6.90	9.49	1943	11.68	27487
40	11.61	-161.1	361.4	9.78	6.94	9.61	1937	11.58	27106
42	11.73	-146.9	380.9	10.26	7.02	9.85	1924	11.38	26361
44	11.85	-132.4	400.8	10.72	7.09	10.09	1911	11.17	25642
46	11.97	-118.1	420.7	11.16	7.19	10.36	1896	10.95	24954
48	12.10	-102.8	441.7	11.61	7.28	10.61	1882	10.73	24301
50	12.23	-87.3	463.2	12.05	7.35	10.84	1868	10.50	23690
55	12.57	-47.2	518.4	13.10	7.53	11.31	1839	9.90	22490
60	12.92	-5.3	576.3	14.11	7.67	11.73	1811	9.32	21434
65	13.29	37.7	635.9	15.06	7.83	12.13	1780	8.75	20458
70	13.68	82.0	697.6	15.97	8.04	12.53	1749	8.20	19628
75	14.08	127.8	761.3	16.85	8.30	12.96	1716	7.69	18872
80	14.49	175.3	827.2	17.70	8.61	13.41	1684	7.22	18200
85	14.91	224.5	895.4	18.53	8.95	13.86	1655	6.78	17674
90	15.34	275.6	965.9	19.34	9.32	14.32	1627	6.38	17230
95	15.78	328.5	1038.5	20.12	9.70	14.75	1604	6.01	16940
100	16.22	383.3	1113.4	20.89	10.10	15.18	1582	5.67	16641
110	17.13	500.1	1271.1	22.39	10.94	16.10	1542	5.08	16144
120	18.07	622.6	1435.6	23.82	11.61	16.80	1515	4.59	15873
130	19.02	750.4	1606.1	25.19	12.14	17.30	1500	4.16	15798
140	19.97	882.0	1780.7	26.48	12.52	17.63	1493	3.81	15824
150	20.93	1015.9	1957.9	27.70	12.75	17.80	1491	3.50	15924
160	21.90	1150.7	2136.1	28.85	12.85	17.85	1494	3.24	16084
170	22.86	1285.4	2314.3	29.93	12.86	17.79	1501	3.01	16289
180	23.83	1419.2	2491.4	30.95	12.79	17.66	1510	2.81	16520
190	24.79	1551.5	2667.2	31.89	12.67	17.49	1522	2.63	16785
200	25.76	1682.0	2840.9	32.79	12.52	17.30	1535	2.48	17052
220	27.68	1936.8	3182.3	34.41	12.19	16.87	1563	2.21	17656
240	29.60	2183.5	3515.4	35.86	11.87	16.46	1594	2.00	18338
260	31.50	2423.1	3840.6	37.16	11.61	16.09	1626	1.82	19074
280	33.38	2656.6	4158.9	38.34	11.39	15.77	1657	1.67	19840
300	35.25	2885.2	4471.6	39.42	11.22	15.52	1687	1.54	20592

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

500 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 25.708	10.70	-248.3	286.9	5.80	5.92	7.34	2083	12.98	35015
26	10.72	-246.8	289.0	5.88	5.95	7.39	2082	12.97	34910
27	10.76	-241.4	296.5	6.16	6.05	7.57	2078	12.93	34549
28	10.80	-236.0	304.2	6.44	6.15	7.74	2073	12.88	34183
29	10.85	-230.4	312.0	6.71	6.25	7.91	2069	12.83	33811
30	10.89	-224.6	320.0	6.99	6.33	8.07	2064	12.77	33436
31	10.94	-218.8	328.1	7.25	6.41	8.22	2059	12.70	33057
32	10.98	-212.8	336.4	7.52	6.49	8.38	2053	12.63	32675
33	11.03	-206.7	344.9	7.78	6.56	8.53	2048	12.56	32291
34	11.08	-200.4	353.5	8.03	6.63	8.67	2042	12.48	31906
35	11.13	-194.1	362.2	8.29	6.70	8.81	2036	12.40	31520
36	11.18	-187.7	371.1	8.54	6.76	8.95	2030	12.31	31134
37	11.23	-181.2	380.1	8.78	6.82	9.08	2024	12.22	30748
38	11.28	-174.5	389.3	9.03	6.87	9.21	2018	12.13	30364
39	11.33	-167.8	398.5	9.27	6.91	9.33	2012	12.04	29981
40	11.38	-161.0	407.9	9.51	6.95	9.45	2006	11.95	29601
42	11.48	-147.2	427.0	9.97	7.03	9.68	1993	11.75	28852
44	11.59	-133.1	446.6	10.43	7.11	9.91	1980	11.55	28120
46	11.71	-119.1	466.2	10.86	7.22	10.18	1966	11.35	27411
48	11.82	-104.2	486.8	11.30	7.31	10.42	1952	11.13	26730
50	11.94	-89.1	507.9	11.73	7.39	10.65	1938	10.92	26080
55	12.25	-49.9	562.4	12.77	7.57	11.17	1906	10.37	24621
60	12.56	-8.9	619.3	13.76	7.72	11.57	1880	9.80	23579
65	12.90	33.3	678.1	14.70	7.89	11.97	1854	9.25	22640
70	13.24	76.9	739.0	15.60	8.10	12.37	1824	8.71	21801
75	13.60	122.0	801.9	16.47	8.37	12.79	1794	8.20	21050
80	13.96	168.9	867.0	17.31	8.67	13.24	1763	7.72	20363
85	14.34	217.5	934.3	18.13	9.02	13.71	1732	7.28	19736
90	14.72	268.1	1004.0	18.93	9.39	14.18	1703	6.87	19223
95	15.11	320.6	1076.1	19.70	9.78	14.63	1678	6.49	18812
100	15.51	375.0	1150.4	20.47	10.17	15.06	1657	6.14	18548
110	16.31	491.2	1306.9	21.96	11.01	15.99	1615	5.53	17962
120	17.14	613.3	1470.3	23.38	11.68	16.71	1586	5.01	17593
130	17.98	740.8	1640.1	24.74	12.21	17.24	1568	4.57	17402
140	18.84	872.4	1814.2	26.03	12.58	17.60	1557	4.18	17339
150	19.70	1006.4	1991.1	27.25	12.81	17.78	1553	3.85	17387
160	20.56	1141.4	2169.2	28.40	12.91	17.84	1554	3.57	17493
170	21.42	1276.4	2347.3	29.48	12.92	17.79	1559	3.32	17643
180	22.28	1410.4	2524.5	30.49	12.85	17.67	1566	3.10	17840
190	23.14	1543.0	2700.2	31.44	12.73	17.50	1576	2.91	18065
200	24.01	1673.8	2874.2	32.33	12.58	17.30	1588	2.74	18325
220	25.73	1929.3	3215.7	33.96	12.24	16.89	1613	2.45	18867
240	27.45	2176.8	3549.2	35.41	11.93	16.49	1641	2.22	19487
260	29.16	2417.3	3875.3	36.72	11.66	16.14	1671	2.02	20173
280	30.86	2652.0	4194.8	37.90	11.45	15.84	1701	1.86	20912
300	32.54	2881.8	4508.7	38.98	11.29	15.58	1730	1.71	21669

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

550 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 26.646	10.58	-240.6	341.6	5.85	6.00	7.43	2139	13.29	36968
27	10.60	-238.7	344.2	5.95	6.04	7.49	2138	13.28	36846
28	10.64	-233.4	351.8	6.23	6.14	7.66	2134	13.23	36497
29	10.68	-227.9	359.6	6.50	6.23	7.82	2129	13.17	36142
30	10.72	-222.3	367.5	6.77	6.32	7.98	2125	13.11	35782
31	10.77	-216.6	375.5	7.03	6.40	8.13	2120	13.04	35417
32	10.81	-210.7	383.7	7.29	6.48	8.28	2115	12.97	35049
33	10.85	-204.6	392.1	7.55	6.56	8.42	2110	12.90	34677
34	10.90	-198.7	400.6	7.80	6.63	8.56	2105	12.82	34303
35	10.94	-192.5	409.2	8.05	6.70	8.70	2099	12.74	33927
36	10.99	-186.3	418.0	8.30	6.76	8.83	2094	12.65	33549
37	11.03	-179.9	426.9	8.54	6.82	8.96	2088	12.57	33171
38	11.08	-173.4	435.9	8.78	6.87	9.09	2082	12.48	32793
39	11.13	-166.9	445.0	9.02	6.92	9.20	2076	12.39	32415
40	11.17	-160.2	454.3	9.26	6.96	9.32	2071	12.29	32039
42	11.27	-146.7	473.1	9.72	7.04	9.54	2059	12.10	31291
44	11.37	-132.9	492.4	10.16	7.12	9.76	2046	11.91	30556
46	11.47	-119.2	511.7	10.59	7.24	10.02	2032	11.71	29836
48	11.58	-104.7	532.0	11.02	7.33	10.25	2018	11.50	29137
50	11.68	-89.9	552.7	11.45	7.42	10.48	2005	11.30	28463
55	11.96	-51.5	606.4	12.47	7.61	11.00	1972	10.76	26909
60	12.25	-11.2	662.8	13.45	7.76	11.44	1942	10.22	25583
65	12.56	30.2	720.7	14.38	7.94	11.83	1920	9.69	24756
70	12.87	73.1	780.9	15.27	8.16	12.24	1893	9.17	23898
75	13.19	117.7	843.2	16.13	8.43	12.65	1865	8.66	23176
80	13.52	163.9	907.6	16.96	8.74	13.11	1835	8.19	22441
85	13.86	212.1	974.3	17.77	9.08	13.57	1805	7.74	21805
90	14.20	262.2	1043.3	18.56	9.46	14.05	1775	7.33	21221
95	14.55	314.3	1114.8	19.33	9.85	14.52	1748	6.94	20739
100	14.91	368.4	1188.5	20.09	10.24	14.97	1724	6.58	20338
110	15.64	484.1	1344.2	21.57	11.08	15.88	1684	5.94	19788
120	16.38	605.6	1506.6	22.98	11.75	16.62	1653	5.40	19312
130	17.14	732.9	1675.5	24.33	12.27	17.18	1632	4.94	19017
140	17.91	864.4	1849.2	25.62	12.65	17.56	1619	4.54	18886
150	18.68	998.4	2025.8	26.84	12.87	17.76	1613	4.20	18860
160	19.46	1133.5	2203.6	27.99	12.98	17.83	1612	3.89	18909
170	20.24	1268.6	2381.7	29.07	12.98	17.78	1615	3.62	19026
180	21.02	1402.9	2558.9	30.08	12.91	17.67	1620	3.39	19183
190	21.80	1535.7	2734.6	31.03	12.78	17.50	1629	3.18	19378
200	22.58	1666.8	2908.5	31.92	12.63	17.31	1638	3.00	19598
220	24.14	1922.9	3250.3	33.55	12.30	16.89	1662	2.69	20097
240	25.69	2171.0	3584.0	35.00	11.98	16.51	1687	2.43	20650
260	27.24	2412.3	3910.5	36.31	11.71	16.18	1715	2.22	21282
280	28.78	2647.7	4230.9	37.50	11.50	15.89	1743	2.04	21977
300	30.32	2878.6	4546.0	38.58	11.34	15.64	1771	1.88	22728

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

600 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 27.559	10.47	-232.7	395.7	5.91	6.09	7.51	2193	13.60	38892
28	10.49	-230.4	399.1	6.03	6.12	7.59	2191	13.57	38745
29	10.53	-225.1	405.7	6.30	6.22	7.75	2187	13.51	38407
30	10.57	-219.6	414.6	6.56	6.31	7.90	2183	13.45	38062
31	10.61	-214.0	422.5	6.83	6.39	8.05	2179	13.38	37712
32	10.65	-208.3	430.7	7.08	6.48	8.20	2174	13.31	37358
33	10.69	-202.5	438.9	7.34	6.55	8.34	2170	13.23	36999
34	10.73	-196.5	447.3	7.59	6.63	8.47	2165	13.15	36637
35	10.77	-190.5	455.9	7.84	6.69	8.61	2159	13.07	36271
36	10.81	-184.3	464.6	8.08	6.76	8.74	2154	12.98	35903
37	10.86	-178.1	473.4	8.32	6.82	8.86	2149	12.90	35534
38	10.90	-171.7	482.3	8.56	6.88	8.98	2143	12.81	35163
39	10.94	-165.3	491.3	8.79	6.92	9.10	2138	12.72	34792
40	10.99	-158.8	500.5	9.03	6.97	9.20	2132	12.62	34421
42	11.08	-145.6	519.1	9.48	7.05	9.42	2121	12.44	33680
44	11.17	-132.0	538.1	9.92	7.14	9.64	2109	12.24	32946
46	11.26	-118.6	557.1	10.34	7.25	9.88	2095	12.05	32223
48	11.36	-104.4	577.1	10.77	7.35	10.11	2082	11.85	31514
50	11.46	-89.8	597.6	11.19	7.44	10.33	2068	11.64	30824
55	11.71	-52.2	650.5	12.20	7.64	10.84	2035	11.13	29206
60	11.98	-12.6	706.2	13.16	7.81	11.29	2004	10.60	27776
65	12.26	28.2	763.7	14.09	7.99	11.72	1974	10.07	26571
70	12.54	70.5	823.1	14.97	8.21	12.13	1954	9.58	25873
75	12.84	114.5	884.9	15.82	8.49	12.56	1927	9.09	25086
80	13.14	160.2	948.8	16.64	8.80	12.99	1901	8.62	24476
85	13.45	207.9	1014.9	17.44	9.15	13.46	1871	8.17	23786
90	13.76	257.6	1083.4	18.23	9.53	13.94	1843	7.75	23207
95	14.08	309.4	1154.3	18.99	9.92	14.42	1816	7.36	22692
100	14.41	363.2	1227.5	19.74	10.31	14.88	1790	6.99	22211
110	15.07	478.3	1382.3	21.22	11.15	15.81	1746	6.33	21499
120	15.74	599.5	1544.0	22.63	11.82	16.53	1715	5.77	21023
130	16.43	726.5	1712.1	23.97	12.34	17.11	1692	5.30	20644
140	17.12	857.7	1885.2	25.25	12.71	17.51	1677	4.89	20413
150	17.83	991.7	2061.4	26.47	12.94	17.73	1670	4.52	20339
160	18.54	1126.8	2239.1	27.62	13.04	17.81	1667	4.20	20341
170	19.25	1262.1	2417.0	28.69	13.04	17.78	1668	3.92	20410
180	19.96	1396.5	2594.1	29.71	12.97	17.67	1672	3.67	20525
190	20.67	1529.6	2769.8	30.66	12.84	17.50	1679	3.45	20687
200	21.38	1660.8	2943.8	31.55	12.69	17.31	1687	3.25	20867
220	22.81	1917.4	3285.8	33.18	12.35	16.90	1708	2.91	21324
240	24.22	2166.1	3619.6	34.63	12.03	16.52	1731	2.64	21832
260	25.64	2407.9	3946.4	35.94	11.76	16.20	1756	2.41	22400
280	27.05	2644.1	4267.3	37.13	11.55	15.92	1783	2.22	23046
300	28.46	2875.7	4583.3	38.22	11.39	15.69	1809	2.05	23751

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

650 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ $BAR\text{-}CM^3/G$
* 28.449	10.37	-224.8	449.3	5.96	6.15	7.60	2245	13.89	40792
29	10.39	-221.9	453.5	6.11	6.21	7.69	2243	13.86	40613
30	10.43	-216.6	451.3	6.37	6.30	7.84	2239	13.79	40285
31	10.47	-211.1	469.2	6.63	6.39	7.99	2235	13.72	39949
32	10.50	-205.5	477.3	6.89	6.47	8.13	2231	13.64	39609
33	10.54	-199.8	485.5	7.14	6.55	8.27	2226	13.56	39263
34	10.58	-193.9	493.8	7.39	6.62	8.40	2221	13.48	38913
35	10.62	-188.0	502.3	7.63	6.69	8.53	2217	13.40	38559
36	10.66	-182.0	510.9	7.88	6.76	8.66	2212	13.31	38201
37	10.70	-175.8	519.6	8.11	6.82	8.78	2206	13.22	37841
38	10.74	-169.6	528.4	8.35	6.88	8.90	2201	13.13	37479
39	10.78	-163.3	537.4	8.58	6.93	9.01	2196	13.04	37115
40	10.82	-156.9	546.4	8.81	6.98	9.11	2191	12.94	36750
42	10.90	-143.9	564.9	9.26	7.07	9.32	2180	12.75	36020
44	10.99	-130.6	583.7	9.70	7.15	9.53	2168	12.56	35291
46	11.08	-117.5	602.5	10.12	7.27	9.77	2155	12.37	34569
48	11.16	-103.5	622.2	10.54	7.37	9.99	2142	12.17	33856
50	11.26	-89.2	642.4	10.95	7.47	10.20	2129	11.97	33158
55	11.49	-52.1	694.7	11.95	7.68	10.71	2096	11.47	31495
60	11.74	-13.2	749.7	12.90	7.85	11.16	2064	10.96	29988
65	11.99	27.0	806.6	13.81	8.04	11.59	2033	10.44	28677
70	12.26	68.8	865.6	14.69	8.27	12.03	2003	9.92	27581
75	12.53	112.2	926.8	15.53	8.54	12.46	1984	9.48	26987
80	12.81	157.6	990.2	16.35	8.86	12.92	1956	9.01	26253
85	13.09	204.8	1055.9	17.15	9.21	13.36	1932	8.56	25729
90	13.38	254.3	1124.0	17.92	9.59	13.84	1904	8.14	25107
95	13.67	305.6	1194.4	18.69	9.98	14.33	1877	7.75	24553
100	13.97	359.1	1267.2	19.43	10.38	14.80	1853	7.38	24089
110	14.58	473.8	1421.3	20.90	11.23	15.74	1807	6.71	23296
120	15.19	594.7	1582.2	22.30	11.89	16.46	1773	6.12	22699
130	15.82	721.3	1749.7	23.64	12.41	17.04	1747	5.63	22236
140	16.46	852.3	1922.1	24.92	12.78	17.45	1732	5.20	21955
150	17.10	986.1	2097.9	26.13	13.00	17.70	1722	4.83	21782
160	17.76	1121.3	2275.4	27.28	13.10	17.79	1719	4.50	21757
170	18.41	1256.6	2453.1	28.35	13.10	17.77	1719	4.20	21786
180	19.06	1391.2	2630.4	29.37	13.02	17.66	1722	3.94	21877
190	19.72	1524.4	2805.9	30.31	12.90	17.50	1728	3.70	21999
200	20.37	1655.9	2979.9	31.21	12.75	17.32	1734	3.49	22141
220	21.68	1912.9	3322.0	32.84	12.40	16.91	1753	3.13	22548
240	22.98	2162.1	3656.0	34.29	12.08	16.52	1774	2.84	23020
260	24.29	2404.4	3983.0	35.60	11.81	16.20	1797	2.60	23534
280	25.59	2641.1	4304.1	36.79	11.60	15.95	1821	2.39	24118
300	26.88	2873.3	4620.7	37.88	11.44	15.73	1846	2.22	24776

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

700 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 29.318	10.27	-216.8	502.4	6.01	6.22	7.68	2295	14.18	42668
30	10.30	-213.2	507.7	6.19	6.29	7.78	2292	14.13	42454
31	10.33	-207.9	515.5	6.45	6.38	7.93	2289	14.05	42133
32	10.37	-202.4	523.5	6.70	6.47	8.07	2285	13.97	41807
33	10.41	-196.8	531.7	6.95	6.55	8.21	2280	13.89	41474
34	10.44	-191.0	540.0	7.20	6.62	8.34	2276	13.81	41137
35	10.48	-185.2	548.4	7.44	6.69	8.47	2271	13.72	40794
36	10.52	-179.3	556.9	7.68	6.76	8.59	2267	13.63	40448
37	10.55	-173.2	565.5	7.92	6.83	8.71	2262	13.54	40098
38	10.59	-167.1	574.3	8.15	6.89	8.82	2257	13.44	39745
39	10.63	-160.9	583.2	8.39	6.94	8.93	2252	13.35	39389
40	10.67	-154.6	592.2	8.61	6.99	9.03	2247	13.26	39032
42	10.75	-141.8	610.4	9.06	7.08	9.24	2236	13.06	38313
44	10.83	-128.7	629.1	9.49	7.17	9.44	2225	12.87	37592
46	10.91	-115.8	647.7	9.91	7.29	9.67	2212	12.67	36874
48	10.99	-102.0	667.3	10.32	7.39	9.89	2199	12.48	36162
50	11.07	-87.9	687.2	10.73	7.49	10.10	2186	12.28	35459
55	11.29	-51.4	739.0	11.72	7.71	10.59	2154	11.78	33767
60	11.52	-13.0	793.3	12.66	7.89	11.03	2122	11.28	32203
65	11.76	26.7	849.6	13.56	8.09	11.48	2091	10.78	30808
70	12.00	68.0	908.1	14.43	8.32	11.92	2059	10.28	29606
75	12.25	110.9	968.8	15.27	8.60	12.36	2028	9.78	28609
80	12.51	155.8	1031.8	16.08	8.92	12.84	2011	9.37	28107
85	12.78	202.7	1097.1	16.87	9.27	13.31	1982	8.92	27392
90	13.05	251.7	1164.8	17.64	9.65	13.77	1958	8.50	26882
95	13.32	302.7	1234.9	18.40	10.05	14.24	1934	8.11	26391
100	13.59	356.0	1307.3	19.15	10.45	14.72	1909	7.74	25859
110	14.15	470.3	1460.8	20.61	11.29	15.68	1865	7.07	25057
120	14.72	590.8	1621.1	22.00	11.96	16.41	1830	6.46	24421
130	15.30	717.3	1788.0	23.34	12.48	16.96	1802	5.94	23897
140	15.88	848.0	1959.7	24.61	12.85	17.40	1781	5.50	23431
150	16.48	981.6	2135.0	25.82	13.06	17.66	1772	5.12	23235
160	17.08	1116.7	2312.2	26.96	13.16	17.78	1766	4.78	23088
170	17.69	1252.0	2490.0	28.04	13.16	17.76	1767	4.47	23148
180	18.29	1386.7	2667.1	29.05	13.08	17.66	1770	4.20	23222
190	18.89	1520.1	2842.6	30.00	12.96	17.50	1775	3.95	23321
200	19.50	1651.7	3016.6	30.89	12.80	17.32	1780	3.73	23432
220	20.71	1909.2	3358.8	32.52	12.46	16.92	1796	3.35	23769
240	21.92	2158.8	3692.9	33.98	12.13	16.53	1816	3.04	24200
260	23.12	2401.6	4020.1	35.29	11.86	16.21	1837	2.78	24683
280	24.32	2638.7	4341.4	36.48	11.65	15.96	1858	2.56	25198
300	25.52	2871.5	4658.2	37.57	11.49	15.75	1881	2.37	25801

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

750 BAR ISOBAR

TEMPERA-TURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 30.168	10.18	-208.8	555.0	6.06	6.30	7.77	2343	14.46	44524
31	10.21	-204.4	561.5	6.27	6.37	7.89	2340	14.39	44269
32	10.25	-199.0	569.5	6.53	6.46	8.03	2336	14.31	43956
33	10.28	-193.5	577.6	6.78	6.54	8.16	2333	14.22	43637
34	10.32	-187.8	585.8	7.02	6.62	8.29	2328	14.13	43312
35	10.35	-182.1	594.1	7.26	6.69	8.41	2324	14.04	42982
36	10.39	-176.3	602.6	7.50	6.76	8.54	2319	13.95	42646
37	10.42	-170.3	611.2	7.74	6.83	8.65	2315	13.85	42307
38	10.46	-164.3	619.9	7.97	6.89	8.76	2310	13.75	41963
39	10.49	-158.2	628.7	8.20	6.94	8.87	2305	13.66	41616
40	10.53	-152.0	637.7	8.43	6.99	8.97	2300	13.56	41267
42	10.60	-139.4	655.8	8.87	7.09	9.17	2290	13.36	40562
44	10.68	-126.4	674.3	9.30	7.18	9.36	2279	13.17	39851
46	10.75	-113.7	692.7	9.71	7.31	9.59	2267	12.97	39140
48	10.83	-100.1	712.1	10.12	7.41	9.80	2254	12.77	38431
50	10.91	-86.2	731.9	10.52	7.51	10.00	2241	12.57	37727
55	11.11	-50.2	783.2	11.50	7.74	10.49	2209	12.08	36017
60	11.32	-12.2	837.0	12.44	7.92	10.92	2178	11.58	34411
65	11.54	27.0	892.7	13.33	8.13	11.36	2146	11.09	32949
70	11.77	67.8	950.6	14.19	8.38	11.82	2113	10.60	31660
75	12.01	110.4	1010.9	15.02	8.65	12.28	2081	10.11	30561
80	12.25	154.8	1073.4	15.83	8.98	12.73	2050	9.63	29652
85	12.50	201.3	1138.5	16.61	9.33	13.24	2036	9.27	29222
90	12.75	250.0	1205.9	17.38	9.72	13.72	2006	8.84	28502
95	13.00	300.8	1275.6	18.14	10.11	14.19	1984	8.44	28054
100	13.25	353.8	1347.8	18.88	10.51	14.65	1962	8.07	27636
110	13.77	467.6	1500.5	20.33	11.36	15.63	1917	7.39	26711
120	14.30	587.9	1660.5	21.73	12.03	16.36	1885	6.79	26127
130	14.84	714.2	1827.0	23.06	12.55	16.92	1856	6.25	25555
140	15.38	844.8	1998.1	24.32	12.92	17.32	1833	5.77	25082
150	15.93	978.1	2172.6	25.53	13.13	17.61	1816	5.38	24582
160	16.49	1113.1	2349.6	26.67	13.23	17.74	1812	5.04	24476
170	17.05	1248.4	2527.0	27.75	13.22	17.76	1808	4.73	24341
180	17.62	1383.1	2704.2	28.76	13.14	17.66	1814	4.45	24499
190	18.18	1516.6	2879.8	29.71	13.02	17.50	1819	4.19	24627
200	18.74	1648.4	3053.9	30.60	12.86	17.32	1824	3.96	24729
220	19.86	1906.2	3396.0	32.23	12.52	16.92	1837	3.56	24974
240	20.99	2156.3	3730.3	33.69	12.19	16.54	1855	3.23	25372
260	22.11	2399.5	4057.6	35.00	11.91	16.22	1875	2.96	25825
280	23.23	2637.1	4379.1	36.19	11.70	15.96	1895	2.73	26321
300	24.34	2870.3	4696.1	37.28	11.54	15.77	1915	2.53	26825

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

800 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 30.999	10.10	-200.7	607.2	6.11	6.37	7.85	2390	14.73	46360
31	10.10	-200.7	607.2	6.11	6.37	7.85	2390	14.73	46360
32	10.13	-195.4	615.1	6.36	6.46	7.99	2387	14.64	46062
33	10.16	-190.0	623.1	6.61	6.54	8.12	2383	14.55	45756
34	10.20	-184.4	631.3	6.85	6.62	8.25	2379	14.45	45443
35	10.23	-178.8	639.6	7.09	6.70	8.37	2375	14.36	45125
36	10.26	-173.0	648.0	7.33	6.77	8.49	2370	14.26	44801
37	10.30	-167.2	656.6	7.56	6.84	8.60	2366	14.16	44472
38	10.33	-161.2	665.3	7.80	6.90	8.71	2361	14.06	44138
39	10.36	-155.2	674.0	8.02	6.95	8.82	2357	13.96	43800
40	10.40	-149.1	682.9	8.25	7.00	8.91	2352	13.86	43459
42	10.47	-136.6	700.9	8.69	7.10	9.11	2342	13.66	42769
44	10.54	-123.8	719.3	9.12	7.19	9.30	2332	13.46	42070
46	10.61	-111.3	737.6	9.52	7.32	9.52	2319	13.25	41367
48	10.68	-97.8	756.8	9.93	7.43	9.73	2307	13.05	40663
50	10.76	-84.1	776.5	10.33	7.53	9.92	2294	12.85	39962
55	10.95	-48.5	827.3	11.30	7.76	10.39	2263	12.36	38241
60	11.14	-11.0	880.6	12.23	7.96	10.82	2231	11.87	36603
65	11.35	27.8	935.8	13.11	8.17	11.26	2199	11.38	35088
70	11.56	68.3	993.3	13.96	8.42	11.72	2166	10.90	33728
75	11.78	110.5	1053.1	14.79	8.71	12.19	2133	10.42	32542
80	12.01	154.6	1115.2	15.59	9.04	12.66	2101	9.95	31537
85	12.24	200.8	1179.7	16.37	9.40	13.13	2070	9.48	30708
90	12.48	249.0	1247.1	17.14	9.78	13.66	2058	9.17	30330
95	12.71	299.6	1316.4	17.89	10.13	14.13	2033	8.75	29772
100	12.95	352.3	1388.4	18.63	10.58	14.60	2008	8.37	29215
110	13.44	465.7	1540.7	20.08	11.43	15.58	1964	7.69	28313
120	13.93	585.7	1700.1	21.47	12.10	16.34	1932	7.10	27648
130	14.43	711.9	1866.4	22.80	12.62	16.89	1908	6.55	27217
140	14.93	842.4	2037.1	24.06	12.99	17.28	1885	6.05	26716
150	15.44	975.7	2211.0	25.26	13.21	17.53	1864	5.62	26197
160	15.96	1110.4	2387.2	26.40	13.29	17.71	1849	5.27	25677
170	16.49	1245.6	2564.6	27.48	13.29	17.72	1851	4.97	25679
180	17.01	1380.3	2741.4	28.49	13.21	17.68	1849	4.68	25529
190	17.54	1513.8	2917.2	29.44	13.08	17.51	1859	4.42	25819
200	18.07	1645.7	3091.4	30.33	12.92	17.32	1866	4.18	25996
220	19.12	1903.9	3433.6	31.96	12.58	16.93	1878	3.76	26206
240	20.17	2154.4	3768.0	33.42	12.25	16.55	1893	3.42	26521
260	21.22	2398.0	4095.6	34.73	11.97	16.23	1912	3.13	26958
280	22.26	2636.0	4417.2	35.92	11.75	15.97	1930	2.89	27422
300	23.31	2869.7	4734.3	37.01	11.59	15.77	1949	2.68	27920

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

850 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM3/G
* 31.814	10.02	-192.6	658.9	6.15	6.44	7.93	2435	14.99	48179
32	10.02	-191.6	660.3	6.20	6.46	7.95	2435	14.98	48126
33	10.05	-186.3	668.4	6.45	6.54	8.09	2431	14.88	47833
34	10.09	-180.8	676.5	6.69	6.62	8.21	2428	14.78	47533
35	10.12	-175.2	684.8	6.93	6.70	8.33	2424	14.68	47227
36	10.15	-169.5	693.2	7.17	6.77	8.45	2419	14.57	46916
37	10.18	-163.8	701.7	7.40	6.84	8.56	2415	14.47	46596
38	10.21	-157.9	710.3	7.63	6.90	8.67	2411	14.37	46272
39	10.25	-151.9	719.0	7.86	6.96	8.77	2406	14.26	45944
40	10.28	-145.9	727.9	8.08	7.01	8.87	2402	14.16	45612
42	10.35	-133.6	745.8	8.52	7.11	9.06	2392	13.95	44936
44	10.41	-121.0	764.1	8.94	7.21	9.24	2382	13.74	44250
46	10.48	-108.5	782.2	9.35	7.34	9.46	2370	13.53	43557
48	10.55	-95.3	801.4	9.75	7.45	9.66	2358	13.33	42860
50	10.62	-81.7	820.9	10.15	7.55	9.86	2345	13.12	42163
55	10.80	-46.4	871.3	11.11	7.79	10.32	2314	12.63	40438
60	10.98	-9.3	924.2	12.03	7.99	10.74	2283	12.14	38777
65	11.17	29.2	979.0	12.91	8.21	11.17	2251	11.66	37220
70	11.37	69.3	1036.0	13.75	8.47	11.63	2217	11.18	35799
75	11.58	111.2	1095.3	14.57	8.76	12.11	2184	10.71	34537
80	11.79	155.0	1157.1	15.37	9.10	12.59	2151	10.25	33448
85	12.00	200.9	1221.2	16.15	9.47	13.07	2119	9.79	32531
90	12.22	248.9	1287.8	16.91	9.85	13.54	2089	9.33	31774
95	12.45	299.0	1357.5	17.66	10.24	14.10	2079	9.07	31425
100	12.68	351.6	1429.1	18.40	10.65	14.54	2057	8.67	30983
110	13.13	464.6	1580.8	19.84	11.50	15.54	2005	7.96	29746
120	13.60	584.3	1740.1	21.23	12.16	16.31	1973	7.36	29043
130	14.07	710.2	1906.0	22.55	12.69	16.89	1951	6.83	28600
140	14.54	840.8	2076.5	23.82	13.06	17.25	1935	6.33	28346
150	15.01	974.1	2250.1	25.02	13.28	17.48	1915	5.88	27861
160	15.49	1108.7	2425.7	26.15	13.37	17.62	1894	5.49	27222
170	15.98	1243.7	2602.1	27.22	13.36	17.71	1882	5.18	26719
180	16.48	1378.3	2779.1	28.23	13.27	17.64	1888	4.89	26834
190	16.97	1511.8	2954.3	29.18	13.14	17.55	1887	4.64	26649
200	17.47	1643.8	3129.1	30.07	12.98	17.34	1902	4.40	27089
220	18.46	1902.2	3471.5	31.71	12.63	16.94	1916	3.96	27386
240	19.45	2153.1	3806.0	33.16	12.30	16.55	1931	3.60	27708
260	20.43	2397.1	4133.7	34.47	12.02	16.24	1946	3.30	28038
280	21.41	2635.6	4455.5	35.67	11.81	15.97	1964	3.04	28510
300	22.39	2869.7	4772.7	36.76	11.64	15.77	1982	2.82	28979

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

900 BAR ISOBAR

TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 32.614	9.94	-184.4	710.2	6.20	6.51	8.01	2480	15.25	49981
33	9.95	-182.4	713.3	6.29	6.54	8.06	2478	15.21	49872
34	9.98	-177.0	721.4	6.54	6.62	8.18	2475	15.10	49585
35	10.01	-171.5	729.7	6.77	6.70	8.30	2471	15.00	49291
36	10.04	-165.9	738.0	7.01	6.78	8.42	2467	14.89	48989
37	10.07	-160.2	746.5	7.24	6.85	8.53	2463	14.78	48682
38	10.11	-154.4	755.1	7.47	6.91	8.64	2459	14.67	48368
39	10.14	-148.5	763.8	7.70	6.97	8.74	2454	14.56	48050
40	10.17	-142.5	772.6	7.92	7.02	8.83	2450	14.45	47726
42	10.23	-130.3	790.4	8.35	7.12	9.01	2441	14.23	47067
44	10.29	-117.8	808.6	8.78	7.22	9.20	2430	14.02	46394
46	10.36	-105.6	826.7	9.18	7.35	9.41	2419	13.81	45712
48	10.42	-92.4	845.7	9.58	7.47	9.61	2407	13.59	45023
50	10.49	-78.9	865.1	9.98	7.57	9.80	2395	13.39	44331
55	10.66	-44.0	915.2	10.94	7.81	10.25	2364	12.88	42607
60	10.83	-7.2	967.8	11.85	8.02	10.66	2332	12.39	40930
65	11.01	30.9	1022.1	12.72	8.24	11.09	2300	11.91	39338
70	11.20	70.7	1078.7	13.56	8.51	11.55	2267	11.45	37866
75	11.39	112.3	1137.6	14.37	8.81	12.03	2233	10.98	36539
80	11.59	155.9	1199.0	15.16	9.15	12.52	2199	10.52	35374
85	11.79	201.6	1262.9	15.94	9.53	13.02	2167	10.07	34376
90	12.00	249.4	1329.1	16.70	9.92	13.50	2136	9.63	33540
95	12.20	299.3	1397.8	17.44	10.32	13.96	2108	9.19	32849
100	12.43	351.4	1470.0	18.18	10.71	14.53	2100	8.97	32494
110	12.85	464.2	1621.1	19.62	11.57	15.49	2050	8.23	31377
120	13.29	583.6	1779.9	21.00	12.24	16.24	2018	7.61	30692
130	13.73	709.3	1945.4	22.32	12.76	16.87	1989	7.08	29925
140	14.19	839.7	2116.4	23.59	13.13	17.24	1978	6.60	29816
150	14.63	973.1	2289.8	24.79	13.35	17.45	1963	6.13	29492
160	15.08	1107.8	2464.8	25.92	13.44	17.55	1945	5.72	28962
170	15.53	1242.7	2640.3	26.98	13.43	17.66	1915	5.37	27872
180	15.99	1377.1	2816.4	27.99	13.34	17.64	1913	5.08	27700
190	16.46	1510.5	2991.7	28.93	13.21	17.50	1924	4.83	27949
200	16.93	1642.5	3166.2	29.83	13.04	17.40	1921	4.59	27675
220	17.87	1901.2	3509.5	31.47	12.69	16.95	1951	4.16	28496
240	18.80	2152.4	3844.5	32.92	12.36	16.55	1968	3.78	28917
260	19.73	2396.8	4172.1	34.23	12.08	16.24	1980	3.46	29175
280	20.65	2635.7	4494.0	35.43	11.86	15.99	1995	3.20	29545
300	21.57	2870.2	4811.6	36.52	11.69	15.79	2012	2.97	29982

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

950 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 33.398	9.87	-176.3	761.1	6.24	6.58	8.09	2523	15.50	51768
34	9.88	-173.0	766.0	6.39	6.63	8.16	2520	15.43	51601
35	9.91	-167.6	774.2	6.63	6.71	8.28	2517	15.32	51319
36	9.94	-162.1	782.6	6.86	6.78	8.40	2513	15.20	51029
37	9.97	-156.4	791.0	7.09	6.85	8.51	2509	15.09	50732
38	10.00	-150.7	799.6	7.32	6.92	8.61	2505	14.97	50429
39	10.03	-144.8	808.3	7.54	6.98	8.71	2501	14.86	50120
40	10.06	-138.9	817.0	7.77	7.03	8.80	2496	14.75	49806
42	10.12	-126.9	834.8	8.20	7.14	8.98	2487	14.52	49163
44	10.18	-114.5	852.9	8.62	7.24	9.16	2477	14.29	48504
46	10.24	-102.3	870.9	9.02	7.37	9.37	2466	14.07	47833
48	10.31	-89.3	889.9	9.42	7.49	9.56	2454	13.86	47153
50	10.37	-76.0	909.2	9.82	7.59	9.75	2442	13.64	46467
55	10.53	-41.3	959.0	10.77	7.84	10.19	2411	13.13	44748
60	10.70	-4.8	1011.2	11.68	8.05	10.59	2380	12.63	43059
65	10.87	33.0	1065.2	12.54	8.23	11.02	2348	12.15	41439
70	11.04	72.5	1121.4	13.37	8.55	11.47	2314	11.69	39924
75	11.22	113.9	1180.0	14.18	8.86	11.95	2280	11.23	38539
80	11.41	157.2	1241.0	14.97	9.21	12.45	2246	10.78	37306
85	11.60	202.7	1304.5	15.74	9.58	12.96	2213	10.34	36234
90	11.79	250.3	1370.6	16.49	9.98	13.45	2182	9.90	35323
95	11.99	300.2	1439.0	17.23	10.39	13.93	2152	9.47	34562
100	12.19	352.2	1509.8	17.96	10.79	14.37	2125	9.04	33930
110	12.61	464.4	1662.0	19.41	11.64	15.40	2107	8.50	33547
120	13.01	583.5	1819.7	20.78	12.31	16.20	2055	7.84	32102
130	13.44	709.0	1985.3	22.11	12.83	16.83	2025	7.30	31255
140	13.86	839.2	2155.7	23.37	13.20	17.26	2009	6.83	30868
150	14.28	972.6	2329.5	24.57	13.42	17.45	2004	6.38	30894
160	14.71	1107.5	2504.7	25.70	13.52	17.52	1992	5.95	30604
170	15.13	1242.5	2679.8	26.76	13.51	17.53	1975	5.58	30068
180	15.55	1376.9	2854.6	27.76	13.42	17.59	1942	5.25	28769
190	15.98	1510.1	3028.4	28.70	13.28	17.51	1944	5.00	28651
200	16.44	1642.0	3203.6	29.60	13.11	17.34	1958	4.76	28988
220	17.33	1900.7	3546.9	31.24	12.75	16.99	1978	4.34	29384
240	18.22	2152.2	3883.0	32.70	12.42	16.56	2001	3.95	30026
260	19.09	2397.1	4210.9	34.01	12.14	16.25	2013	3.62	30279
280	19.96	2636.4	4532.9	35.20	11.92	16.00	2026	3.34	30574
300	20.83	2871.3	4850.5	36.30	11.75	15.80	2042	3.10	31005

* TWO PHASE BOUNDARY

TABLE VI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN

1000 BAR ISOBAR TEMPERATURE K	MOLAR VOLUME CM^3/G	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	SPECIFIC HEAT CV J/G-K	SPECIFIC HEAT CP J/G-K	VELOCITY OF SOUND M/S	$\left(\frac{\partial P}{\partial T}\right)_V$ BAR/K	$\left(\frac{\partial P}{\partial \rho}\right)_T$ BAR-CM^3/G
* 34.169	9.80	-168.0	811.7	6.28	6.65	8.16	2564	15.74	53539
35	9.82	-163.6	818.5	6.48	6.71	8.26	2561	15.64	53314
36	9.85	-158.1	826.9	6.72	6.79	8.38	2558	15.52	53035
37	9.88	-152.5	835.3	6.95	6.86	8.49	2554	15.40	52749
38	9.91	-146.8	843.8	7.17	6.93	8.59	2550	15.28	52456
39	9.94	-141.0	852.5	7.40	6.99	8.68	2546	15.16	52157
40	9.96	-135.2	861.2	7.62	7.04	8.78	2541	15.04	51852
42	10.02	-123.2	878.9	8.05	7.15	8.95	2533	14.80	51225
44	10.08	-111.0	897.0	8.47	7.25	9.13	2523	14.57	50581
46	10.14	-98.9	914.9	8.87	7.39	9.34	2511	14.34	49922
48	10.20	-86.0	933.8	9.27	7.51	9.53	2500	14.11	49251
50	10.26	-72.7	953.0	9.66	7.62	9.71	2488	13.89	48573
55	10.41	-38.4	1002.7	10.61	7.87	10.14	2457	13.36	46862
60	10.57	-2.1	1054.6	11.51	8.08	10.53	2426	12.86	45165
65	10.73	35.5	1108.3	12.37	8.31	10.95	2394	12.38	43523
70	10.89	74.7	1164.1	13.20	8.59	11.40	2360	11.92	41969
75	11.07	115.8	1222.3	14.00	8.90	11.88	2326	11.47	40534
80	11.24	158.9	1283.0	14.79	9.25	12.39	2291	11.02	39238
85	11.42	204.2	1346.2	15.55	9.64	12.90	2258	10.59	38097
90	11.60	251.7	1412.0	16.31	10.04	13.41	2226	10.16	37114
95	11.79	301.4	1480.3	17.04	10.45	13.90	2196	9.73	36284
100	11.98	353.4	1550.9	17.77	10.86	14.36	2169	9.31	35592
110	12.35	465.2	1700.3	19.19	11.72	15.23	2118	8.50	34527
120	12.76	584.0	1860.2	20.58	12.38	16.20	2088	8.07	33349
130	13.15	709.3	2024.7	21.90	12.91	16.84	2050	7.50	32233
140	13.55	839.4	2194.6	23.16	13.28	17.25	2039	7.03	31990
150	13.96	972.6	2368.5	24.36	13.50	17.50	2030	6.60	31779
160	14.37	1107.6	2544.7	25.50	13.59	17.53	2031	6.18	31975
170	14.77	1242.8	2719.9	26.56	13.58	17.50	2021	5.79	31698
180	15.17	1377.4	2894.2	27.55	13.49	17.42	2005	5.44	31147
190	15.57	1510.7	3067.3	28.49	13.35	17.47	1968	5.14	29608
200	15.98	1642.4	3239.9	29.37	13.18	17.36	1971	4.91	29505
220	16.84	1900.9	3585.1	31.02	12.82	17.09	1981	4.49	29423
240	17.68	2152.6	3920.9	32.48	12.48	16.60	2026	4.12	30868
260	18.52	2397.8	4249.6	33.80	12.20	16.26	2044	3.78	31326
280	19.34	2637.5	4571.7	34.99	11.98	16.00	2057	3.49	31690
300	20.16	2872.9	4889.2	36.09	11.81	15.80	2069	3.24	31993

* TWO PHASE BOUNDARY

NBS-114A (REV. 7-73)

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET	1. PUBLICATION OR REPORT NO. NASA SP-3088 and NBSIR 74-374	2. Gov't Accession No.	3. Recipient's Accession No.
4. TITLE AND SUBTITLE Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 300 K at Pressures to 1000 Bar			5. Publication Date March 1975
			6. Performing Organization Code
7. AUTHOR(S) L. A. Weber			8. Performing Organ. Report No.
9. PERFORMING ORGANIZATION NAME AND ADDRESS NATIONAL BUREAU OF STANDARDS DEPARTMENT OF COMMERCE WASHINGTON, D.C. 20234			10. Project/Task/Work Unit No. 2750547
			11. Contract/Grant No. C-32369-C Amend. No. 2
12. Sponsoring Organization Name and Complete Address (Street, City, State, ZIP) National Aeronautics and Space Administration Lewis Research Center, Mail Stop 301-1 Cleveland, OH 44135			13. Type of Report & Period Covered Final
			14. Sponsoring Agency Code

15. SUPPLEMENTARY NOTES

16. ABSTRACT (*A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.*)

NBS compressibility measurements and thermodynamic properties data for parahydrogen have been extended to higher temperatures and pressures. Results of an experimental program are presented in the form of new PVT data in the temperature range 23-300 K at pressures up to 800 bar. Also given are tables of thermodynamic properties on isobars to 1000 bar including density, internal energy, enthalpy, entropy, specific heats at constant volume and constant pressure, velocity of sound, and the surface derivatives $(\partial P/\partial T)_V$ and $(\partial P/\partial \rho)_T$. The accuracy of the data is discussed and comparisons are made with previous data.

17. KEY WORDS (*six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons*)

Density; enthalpy; entropy; hydrogen; properties of fluids; specific heat; velocity of sound.

18. AVAILABILITY	19. SECURITY CLASS (THIS REPORT)	21. NO. OF PAGES
[x] Unlimited	UNCLASSIFIED	
[ ] For Official Distribution. Do Not Release to NTIS		
[ ] Order From Sup. of Doc., U.S. Government Printing Office Washington, D.C. 20402, SD Cat. No. C13	20. SECURITY CLASS (THIS PAGE)	22. Price
[ ] Order From National Technical Information Service (NTIS) Springfield, Virginia 22151	UNCLASSIFIED	

USCOMM-DC 29042-P74

☆ U. S. GOVERNMENT PRINTING OFFICE 1975 · 677-239/1247