A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

NBS TECHNICAL NOTE 631

SOD [illegible] 1.25

Thermophysical Properties of Helium-4 from 2 to 1500 K with Pressures to 1000 Atmospheres

Nasa-tx-
(NBS-TN-631) THERMOPHYSICAL PROPERTIES OF HELIUM-4 FROM 2 TO 1500 K WITH PRESSURES TO 1000 ATMOSPHERES (National Bureau of Standards) 161 p MF $0.95; SOD $1.25 as C13.46:631
N73-15953
CSCL 20M G3/33 Unclas 52450

U.S. EPARTMENT OF COMMERCE
National Bureau of Standards

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards[1] was established by an act of Congress March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau consists of the Institute for Basic Standards, the Institute for Materials Research, the Institute for Applied Technology, the Center for Computer Sciences and Technology, and the Office for Information Programs.

THE INSTITUTE FOR BASIC STANDARDS provides the central basis within the United States of a complete and consistent system of physical measurement; coordinates that system with measurement systems of other nations; and furnishes essential services leading to accurate and uniform physical measurements throughout the Nation's scientific community, industry, and commerce. The Institute consists of a Center for Radiation Research, an Office of Measurement Services and the following divisions:

Applied Mathematics—Electricity—Heat—Mechanics—Optical Physics—Linac Radiation[2]—Nuclear Radiation[2]—Applied Radiation[2]—Quantum Electronics[3]—Electromagnetics[3]—Time and Frequency[3]—Laboratory Astrophysics[3]—Cryogenics[3].

THE INSTITUTE FOR MATERIALS RESEARCH conducts materials research leading to improved methods of measurement, standards, and data on the properties of well-characterized materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government agencies; and develops, produces, and distributes standard reference materials. The Institute consists of the Office of Standard Reference Materials and the following divisions:

Analytical Chemistry—Polymers—Metallurgy—Inorganic Materials—Reactor Radiation—Physical Chemistry.

THE INSTITUTE FOR APPLIED TECHNOLOGY provides technical services to promote the use of available technology and to facilitate technological innovation in industry and Government; cooperates with public and private organizations leading to the development of technological standards (including mandatory safety standards), codes and methods of test; and provides technical advice and services to Government agencies upon request. The Institute also monitors NBS engineering standards activities and provides liaison between NBS and national and international engineering standards bodies. The Institute consists of a Center for Building Technology and the following divisions and offices:

Engineering Standards Services—Weights and Measures—Invention and Innovation—Product Evaluation Technology—Electronic Technology—Technical Analysis—Measurement Engineering—Fire Technology—Housing Technology[4]—Federal Building Technology[4]—Building Standards and Codes Services[4]—Building Environment[4]—Structures, Materials and Life Safety[4]—Technical Evaluation and Application[4].

THE CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides technical services designed to aid Government agencies in improving cost effectiveness in the conduct of their programs through the selection, acquisition, and effective utilization of automatic data processing equipment; and serves as the principal focus within the executive branch for the development of Federal standards for automatic data processing equipment, techniques, and computer languages. The Center consists of the following offices and divisions:

Information Processing Standards—Computer Information—Computer Services—Systems Development—Information Processing Technology.

THE OFFICE FOR INFORMATION PROGRAMS promotes optimum dissemination and accessibility of scientific information generated within NBS and other agencies of the Federal Government; promotes the development of the National Standard Reference Data System and a system of information analysis centers dealing with the broader aspects of the National Measurement System; provides appropriate services to ensure that the NBS staff has optimum accessibility to the scientific information of the world, and directs the public information activities of the Bureau. The Office consists of the following organizational units:

Office of Standard Reference Data—Office of Technical Information and Publications—Library—Office of International Relations.

---

[1] Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.
[2] Part of the Center for Radiation Research.
[3] Located at Boulder, Colorado 80302.
[4] Part of the Center for Building Technology.

Thermophysical Properties of Helium-4 from 2 to 1500 K with Pressures to 1000 Atmospheres

R.D. McCarty
Cryogenics Division
Institute for Basic Standards
National Bureau of Standards
Boulder, Colorado 80302

NBS Technical Notes are designed to supplement the Bureau's regular publications program. They provide a means for making available scientific data that are of transient or limited interest. Technical Notes may be listed or referred to in the open literature.

U.S. DEPARTMENT OF COMMERCE, Peter G. Peterson, Secretary
NATIONAL BUREAU OF STANDARDS, Lawrence M. Kushner, Acting Director

Issued November 1972

National Bureau of Standards Technical Note 631

Nat. Bur. Stand. (U.S.), Tech. Note 631, 161 pages (November 1972)
CODEN:NBTNAE

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
(Order by SD Catalog No. C13.46:631.)

Contents

PRECEDING PAGE BLANK NOT FILMED

	Page
1. Introduction	1
2. Thermodynamic and Related Properties	1
2.1 PVT Surface	1
2.2 Derived Thermodynamic Properties	3
2.3 Related Properties	3
2.4 Heat Capacities	3
3. Transport Properties	4
3.1 Thermal Conductivity, 300 K and Below	4
3.2 Thermal Conductivity, 300 K and Above	5
3.3 Viscosity Below 100 K	9
3.4 Viscosity Between 100 and 300 K	10
3.5 Viscosity for Temperatures Above 300 K	10
4. Surface Tension	11
5. Dielectric Constant	11
6. Index of Refraction	13
7. Thermal Diffusivity	16
8. Prandtl Number	16
9. Joule-Thomson Inversion Curve	16
10. The Melting Line	19
11. The Lambda Line	20
12. Summary	20
13. Bibliography	21
Appendix A, List of Symbols and Units	23
Appendix B, Fixed Points	24
Appendix C, Conversion Factors	24
Appendix D, Saturation Properties	26
Appendix E, Isobaric Properties	30

RECEDING PAGE BLANK NOT FILMED

List of Tables

Table		Page
1.	Uncertainties in the PVT Data	1
2.	Index of Refraction of Saturated Liquid Helium at Three Wavelengths	14
3.	Joule-Thomson Inversion Curve	17
4.	Melting Line for Helium-4	19
5.	PρT of the Lambda Line	20

List of Figures

Figure		
1.	Range of PT Covered	2
2.	PVT Range of Experimental Data for Thermal Conductivity	6
3.	Deviations between Calculated Thermal Conductivity and Data by Kerrisk (1968)	7
4.	Deviations between Calculated Thermal Conductivities and Data by Golubev and Shpagina (1966)	8
5.	Deviations between Calculated and Experimental Surface Tension Data	12
6.	Index of Refraction for Saturated Liquid and Gaseous Helium. Points are from Edwards (1957, 1958)	15
7.	Joule-Thomson Inversion Curve	18

THERMOPHYSICAL PROPERTIES OF HELIUM-4 FROM 2 TO 1500 K WITH PRESSURES TO 1000 ATMOSPHERES*

Robert D. McCarty

Tables of thermophysical properties of helium 4 are presented for temperatures from 2 to 1500 K for pressures to 1000 atmospheres. The tables include, entropy, enthalpy, internal energy, density, volume, speed of sound, specific heat, thermal conductivity, viscosity, thermal diffusivity, Prandtl number and the dielectric constant for 62 isobars. Also included in the isobaric tables are quantities of special utility in heat transfer calculations: $(\partial P/\partial V)_T$, $(\partial P/\partial T)_\rho$, $V(\partial H/\partial V)_P$, $V(\partial P/\partial U)_V$, $-V(\partial P/\partial V)_T$, $1/V(\partial V/\partial T)_P$.

In addition to the isobaric tables, tables for the saturated vapor and liquid are given which include all of the above properties, plus the surface tension. Tables for the PρT of the freezing liquid, PρT of the lambda line, index of refraction and the derived Joule-Thomson inversion curve are also presented. A computer program to calculate the various properties is also available. Inquiries should be addressed to the National Bureau of Standards, Cryogenic Data Center, Boulder, Colorado 80302.

Key Words: Density; dielectric constant; enthalpy; entropy; equation of state; fixed points; heat transfer coefficients; helium 4; index of refraction; Joule-Thomson coefficient; lambda line; latent heat; melting point; Prandtl number; specific heats; speed of sound; surface tension; thermal conductivity; thermal diffusivity; vapor pressure; viscosity; volume.

* This work carried out at the National Bureau of Standards, supported by NASA-MSC Contract T-1813A, and DOC/NBS Presidential Initiative Program in Cryogenics for the Electrical Industry.

1. Introduction

The purpose of this document is to assemble data on many of the properties of helium commonly used in engineering calculations over as wide a temperature and pressure range as is practical, and present these properties in a form which is convenient to the engineer. All of these properties have been critically evaluated and represent the "best values" for that property at this time.

The properties of helium 4 have been of great interest to the scientific and engineering community for many years. Much of the interest, and consequently the work, has been in the more spectacular properties of helium II, the superfluid phase. The properties of the superfluid are not included here except for the PρT of the boundary where the transition to the superfluid begins.

2. Thermodynamic and Related Properties

2.1 PVT Surface

The PVT surface described by McCarty (1972) was used to calculate all of the thermodynamic and related properties. The tables given here are essentially the same as those found in the referenced document. Figure 1 shows the range of PT covered by these tables, and table 1 gives estimates of uncertainties in density.

Table 1. Uncertainties in the PVT Data

Temperature Range	Pressure Range	Uncertainty in Density		
		Average	Maximum	
2 - 20 K	0 - 2 atm	0.1%	0.5%	(except in critical region)
2 - 20 K	2 - 1000 atm	0.5%	1.5%	(except in critical region)
Critical region	$T_c \pm 5\%, \rho_c \pm 20\%$	3%	8%	
20 - 70 K	0 - 20 atm	0.5%	1%	
20 - 70 K	20 - 1000 atm	1%	2%	(no reliable experimental data)
70 - 150 K	0 - 100 atm	0.1%	0.5%	
70 - 150 K	100 - 1000 atm	0.5%	2%	
150 - 400 K	0 - 100 atm	0.05%	0.2%	
150 - 400 K	100 - 1000 atm	0.1%	1%	
400 - 1500 K	0 - 100 atm	0.1%	0.5%	
400 - 1500 K	100 - 1000 atm	.2%	2%	

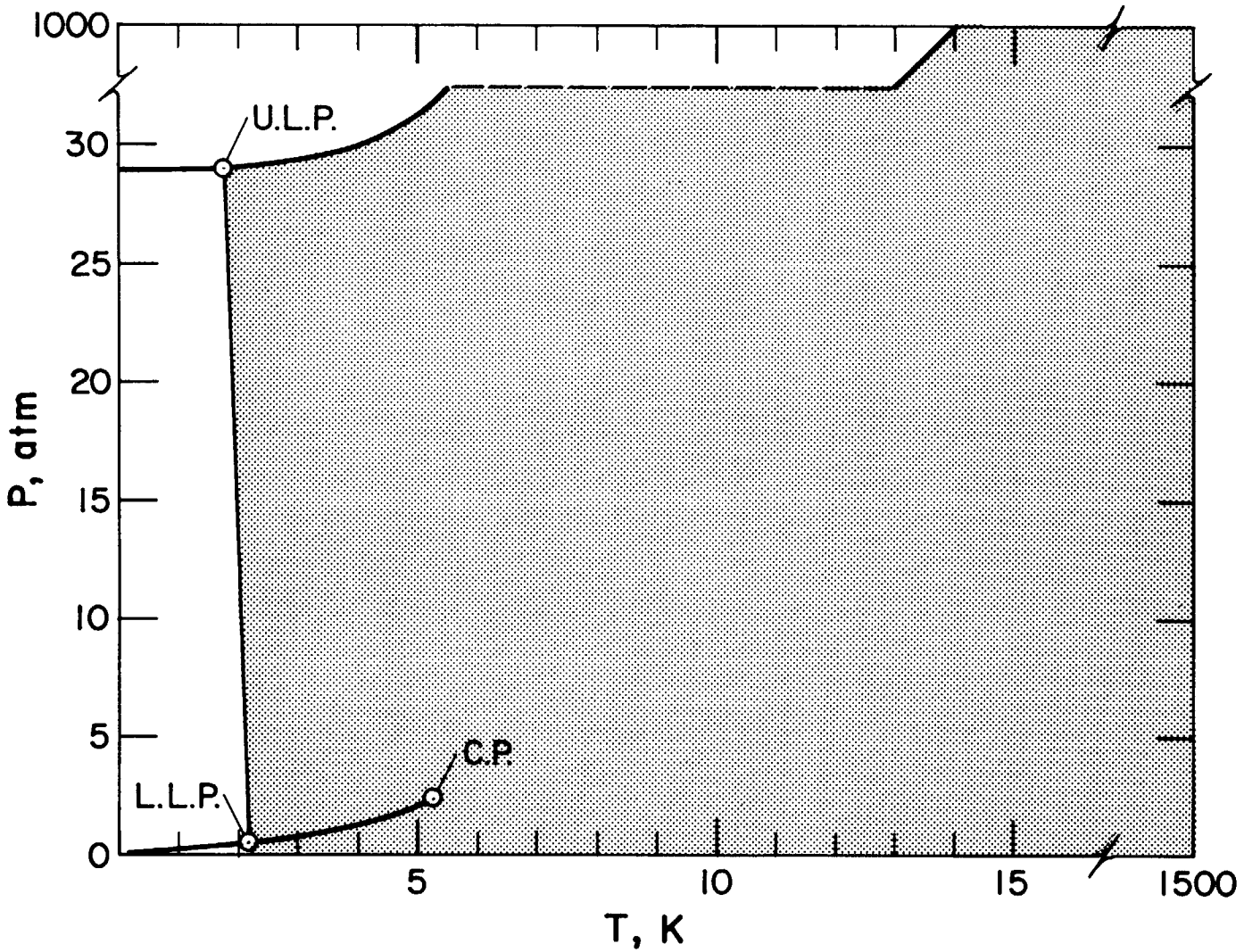

Figure 1. Range of PT Covered

2.2 Derived Thermodynamic Properties

The enthalpy, H, speed of sound, W, entropy, S, and the internal energy, U, were calculated directly from the equations taken from McCarty (1972) and should be identical to those of McCarty when the proper unit conversions are applied.

2.3 Related Properties

A number of parameters such as the specific heat input $[V(\partial H/\partial V)_P]$ are of use to the engineer. Several of the more useful quantities of this kind have been tabulated here for the convenience of the user. These quantities have been derived from the equation of state in the following manner.

Specific heat input

$$\theta = V\left(\frac{\partial H}{\partial V}\right)_P = \rho C_p \left[\left(\frac{\partial P}{\partial \rho}\right)_T / \left(\frac{\partial P}{\partial T}\right)_V\right] \tag{1}$$

Energy derivative

$$\Phi = V\left(\frac{\partial P}{\partial U}\right)_V = \frac{V}{C_v}\left(\frac{\partial P}{\partial T}\right)_V \tag{2}$$

Isothermal bulk modulus

$$\alpha = V\left(\frac{\partial P}{\partial V}\right)_T = -\rho\left(\frac{\partial P}{\partial \rho}\right)_T \tag{3}$$

Volume expansivity

$$\beta = \frac{1}{V}\left(\frac{\partial V}{\partial T}\right)_P = -\frac{1}{\rho}\left(\frac{\partial P}{\partial T}\right)_\rho / \left(\frac{\partial P}{\partial \rho}\right)_T \tag{4}$$

2.4 Heat Capacities

The heat capacities, C_V, C_P which appear in this document are taken from McCarty (1972). Except for the critical region and near the boundaries of phase changes, the uncertainty of the tabulated specific heats is estimated to be no greater than 5%.

At the critical point, and along the lambda line, the specific heats become anomalous and no realistic estimates of accuracy may be made.

3. Transport Properties

3.1 Thermal Conductivity, 300 K and Below

For temperatures below 300 K, the thermal conductivity for helium-4 has been calculated using the following equations.

$$\lambda = \lambda_o(T)\,\lambda_y(\rho, T) + \lambda_c(\rho, T) \tag{5}$$

where $\lambda_o(T)$ is the dilute gas contribution, $\lambda_y(\rho, T)$ corrects the dilute gas value for increasing densities and $\lambda_c(\rho, T)$ predicts the enhancement in thermal conductivity in the region near the critical point. The dilute gas contribution, $\lambda_o(T)$ for this temperature region has been calculated from

$$\lambda_o(T) = e^{Z(\ell n\ T)} \tag{6}$$

If $x = \ell n\ T$, then

$$Z(T) = -4.3611622157 + 1.9250159286\,x - 0.52544120165\,x^2 + 0.090045763885x^3 - 0.0054773874708x^4 \tag{7}$$

where T is in Kelvin and λ_o is in mW/cm-K.

The $\lambda_y(\rho, T)$ of equation (5) is given by

$$\lambda_y(\rho, T) = e^{(B(T)\rho + C(T)\rho^2)}\ , \tag{8}$$

if $x = \ell n\ T$, then

$$B(T) = \mathrm{EXP}(4.7470660612 - 5.3641468153x + 3.4639703698x^2 - 1.0702455443x^3 + 0.1571349306x^4 - 0.00892140047x^5) \tag{9}$$

and

$$C(T) = 2.2109006708 + 187.74174808/T - 1281.0947055/T^2 + 3645.2393216/T^3 - 3986.6937948/T^4 \tag{10}$$

where T is in Kelvin and ρ is in g/cm^3. The $\lambda_c(\rho, T)$ of equation (5) is given by

$$\lambda_c(\rho, T) = 0.000649578\ \Delta C_p(\rho, T) \tag{11}$$

where the ΔC_p is the C_p at ρ and T minus the C_p at ρ and T = 11.83 K. For T > 11.83 K, $\rho > .12$ g/cm^3 or ΔC_p negative, $\lambda_c(\rho, T)$ is taken to be zero. The units of C_p must be J/mol-K and the resulting units of thermal conductivity are mW/cm-K. There are no known thermal conductivity measurements for helium-4 in the region of the critical

point, and equation (11) is based on values scaled from hydrogen. The other term in equation (5), the λ_o (T) $\lambda_y(\rho, T)$ term relies heavily on two sources of experimental data, Golubev and Shpagina (1966) and Kerrisk (1968). These data were used by Roder (1971) and Arp (1971) to determine equations (7, 9, 10). Figure 2 shows the pressure and temperature regions covered by these two sources and figures 3 and 4 show typical differences, including the maximum differences, between the calculated and experimental conductivities.

3.2 Thermal Conductivity, 300 K and Above

When correlating thermal conductivity data it is common procedure to separate the equation into additive parts, with the $\lambda_o(T)$, or dilute gas contribution being a function of temperature only and $\lambda_E(\rho, T)$, called the excess or dense gas contribution being a function of density and temperature. For the heavier fluids, the temperature dependence of $\lambda_E(\rho, T)$ is so slight that it is usually neglected; however for helium this is not the case, and although equation (5) is multiplicative rather than additive, it does take into account the temperature dependence of the excess function. Since no experimental data above 300 K were used in obtaining the various parts of equation (5) it was not used for temperatures above 300 K. For temperatures greater than 300 K, the thermal conductivity has been calculated using the following equations

$$\lambda = \lambda_o'(T) + \lambda_E(\rho, T) \tag{12}$$

$$\lambda_o'(T) = \left(1.53220256T^{0.71938}\right)\left(e^{(12.451/T - 295.67/T^2 - 4.1249)}\right) + C \tag{13}$$

where T is in Kelvin, $\lambda_o'(T)$ is in mW/cm-K and C is a constant such that $\lambda_o'(T)$ from equation (13) = $\lambda_o(T)$ from equation (6) at T = 300 K.

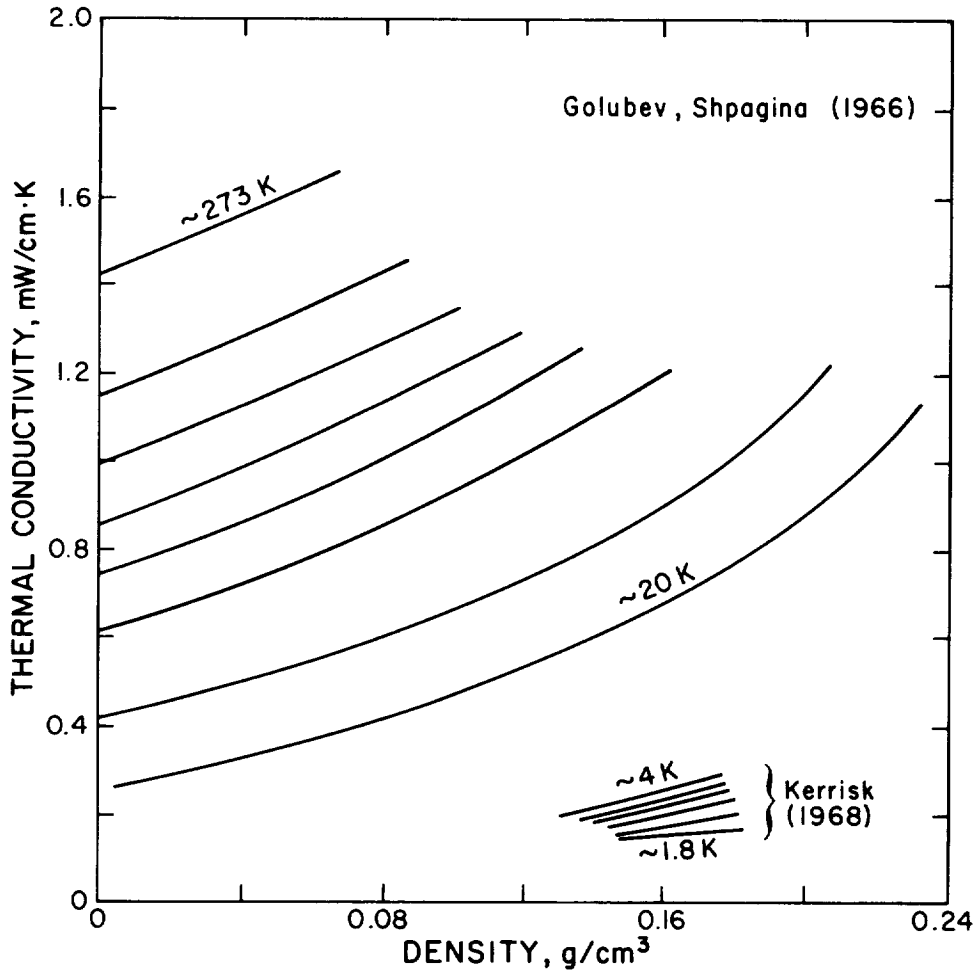

Figure 2. PVT Range of Experimental Data for Thermal Conductivity.

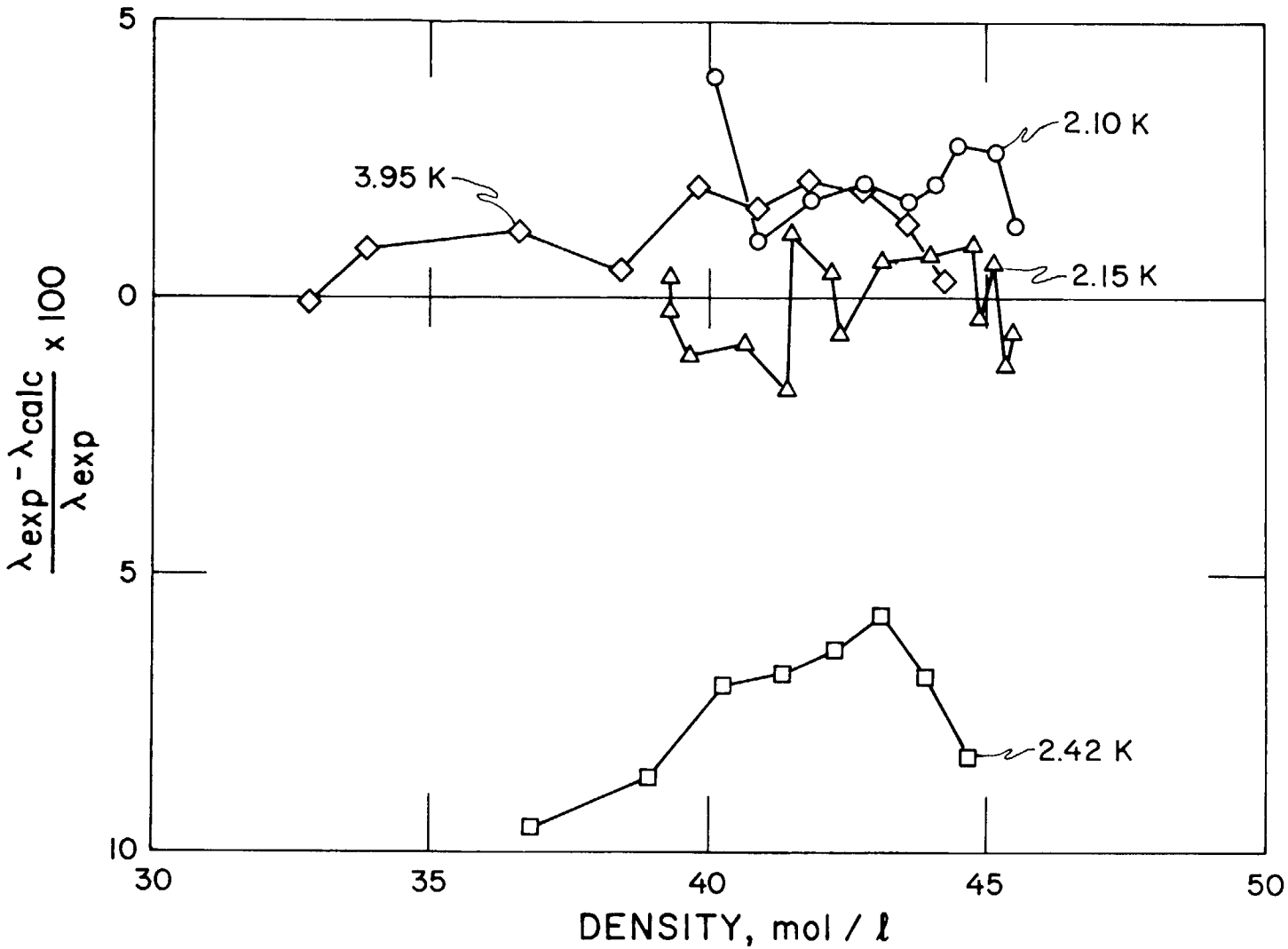

Figure 3. Deviations between Calculated Thermal Conductivities and Data by Kerrisk (1968).

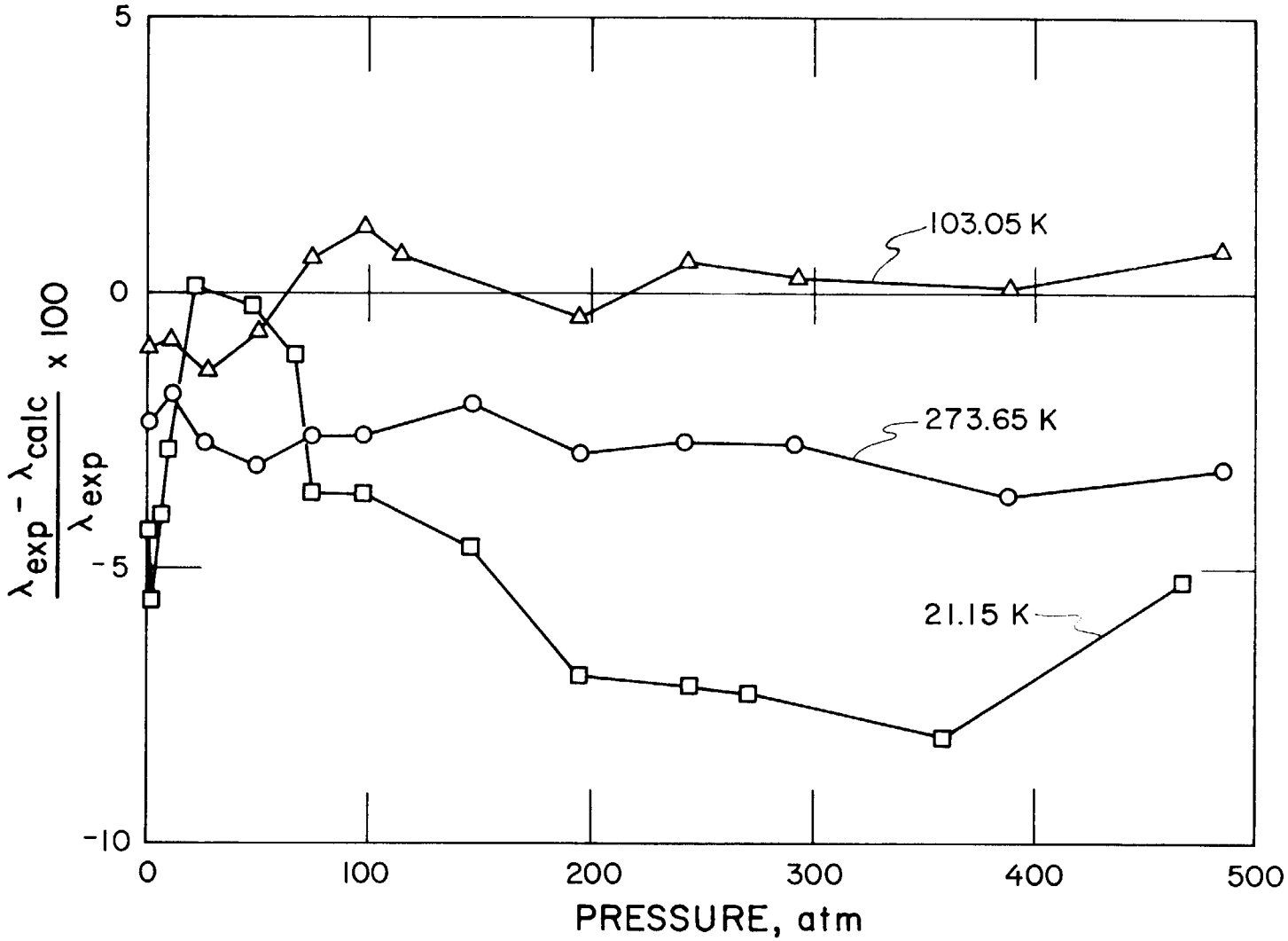

Figure 4. Deviations between Calculated Thermal Conductivities and Data by Golubev and Shpagina (1966).

In selecting a suitable representation of the dilute gas contribution for temperatures above 300 K, the correlation by Tsederberg, et al., (1969) was considered but was not used for two reasons. First, their value at 300 K was in disagreement with our best estimates by an excessive amount and, second, the λ_o at higher temperatures, (2000 °C), were not theoretically consistent with the recently measured dilute gas viscosities, Guevara, et al., (1969). The representation which was finally selected (equation 13) is from Maitland and Smith (1971), and was selected because the above two objections to the equation proposed by Tsederberg, et al., (1969) were not present. The original equation from Maitland and Smith (1971) is for the dilute gas viscosity and has been converted to thermal conductivity by a proportionality constant.

The $\lambda_E(\rho, T)$ of equation (12) is given by

$$\lambda_E(\rho, T) = \lambda_E(\rho) = \lambda_o(300)\,[\lambda_y(\rho,\ 300) - 1] \tag{14}$$

evaluated at ρ and T = 300 K. Thus equation (5) and equation (12) will give identical results for all ρ at 300 K.

3.3 Viscosity Below 100 K

For temperatures of 100 K and below the equation

$$\ell n\ \eta = \eta_o'(T) + \eta_E'(\rho, T) \tag{15}$$

was used to calculate the viscosity for helium. If $x = \ell n\ (T)$, then

$$\eta_o'(T) = -0.135311743/x + 1.00347841 + 1.20654649x - 0.149564551x^2 + 0.0125208416x^3 \tag{16}$$

and

$$\eta'_E(\rho, T) = \rho\, B(T) + \rho^2\, C(T) + \rho^3\, D(T) \tag{17}$$

where ρ is in g/cm^3, and

$$B(T) = -47.5295259/x + 87.6799309 - 42.0741589x + 8.33128289x^2 - 0.589252385x^3 \tag{18}$$

$$C(T) = 547.309267/\chi - 904.870586 + 431.404928\chi - 81.4504854\chi^2 + 5.37008433\chi^3 \quad (19)$$

$$D(T) = -1684.39324/\chi + 3331.08630 - 1632.19172\chi + 308.804413\chi^2 - 20.2936367\chi^3 \ . \quad (20)$$

The resulting viscosities are in $\mu g/cm \cdot s$. Equations (15-20) are from Steward, et al. (1971). Steward's work included new measurements from 4 to 20 K at pressures from the dilute gas region to 10 MN/m^2. Steward reports a standard deviation of .032 in the natural log of the viscosity in the units of $\mu g/cm \cdot s$. In addition, Steward proposes the possibility of an uncertainty of $\pm$ 8%.

3.4 Viscosity Between 100 and 300 K

Steward included a few points calculated from the Enskog theory (Hanley, et al., 1971) when the equations (15-20) were derived. He found this necessary to enable the use of these equations up to 300 K; however, from 100 to 300 K the dilute gas values of Steward differ by 2.5% from a recent correlation by Maitland and Smith (1971). Since Steward reports using calculated dilute gas values and the correlation of Maitland and Smith is based on experimental data, the dilute gas values of Maitland and Smith were used for all $T > 110$. Between 100 and 110 K, a linear average of the dilute gas values of Steward and Maitland and Smith was used. In the 100 to 110 K temperature range the dense gas contribution for viscosity was calculated from Steward's equations. The equations for viscosity between 100 and 300 K are:

$$\eta(\rho, T) = \eta_o(T) + \eta_E(\rho, T) \quad (21)$$

where

$$\eta_o(T) = 196 T^{.71938} e^{(12.451/T - 295.67/T^2 - 4.1249)} \quad (22)$$

and

$$\eta_E = e^{[\eta'_o(T) + \eta'_E(\rho, T)]} - e^{[\eta'_o(T) + \eta'_E(0, T)]} \quad (23)$$

where ρ is in g/cm^3, T in Kelvin, and η is in $\mu g/cm \cdot s$.

3.5 Viscosities for Temperatures Above 300 K

Since Steward's analysis did not include any dense gas data for temperatures above 300 K, either calculated or experimental, the temperature dependence of the excess function given by equation (23) was frozen at 300K. When equation (23) is fixed at 300 K, the resulting equation is a function of density alone and gives results similar to the excess

function of Tsederberg, et al., (1969). Therefore, for temperatures above 300 K, the viscosities were calculated using equations (21-23) except that equation (23) was always evaluated at ρ and T = 300 K. The uncertainty of the viscosity for $T > 100$ K is estimated to be maximum of $\pm$ 10%.

4. Surface Tension

The surface tension for helium-4 has been calculated using the equation

$$\gamma = \gamma_0 (1 - T/T_c) \tag{24}$$

where $\gamma_0 = 0.5308$ dyn/cm and $T_c = 5.2014$ K. The γ_0 is based on a least squares fit of equation (24) to the data of van Urk, et al., (1925). Since the least squares fit of equation (24) was performed two sources of experimental data have appeared. These are Dickson, et al., (1970), and Devaraj and Hollis-Hallett (1967). Figure 5 shows that γ_0 would not change appreciably if these new data were included in a refit.

5. Dielectric Constant

The dielectric constant of a fluid may be calculated from the Clausius-Mossotti equation:

$$\frac{\epsilon - 1}{\epsilon + 2} \quad \frac{1}{\rho} = p \tag{25}$$

where ϵ is the dielectric constant, ρ is the density, and p is the specific polarizability, a property of the substance having dimensions of specific volume. Recent measurements of the dielectric constant by Kerr and Sherman (1970) indicate that for helium-4 the specific polarizability is a weak function of density and that the first density correction is negative. For the calculations here, the equation:

$$p = 0.123396 - 0.0014 \rho \tag{26}$$

was used, where p is the specific polarizability in cm^3/g and ρ is the density in g/cm^3. The uncertainty of the tabulated values of dielectric constant is estimated to be 0.01%.

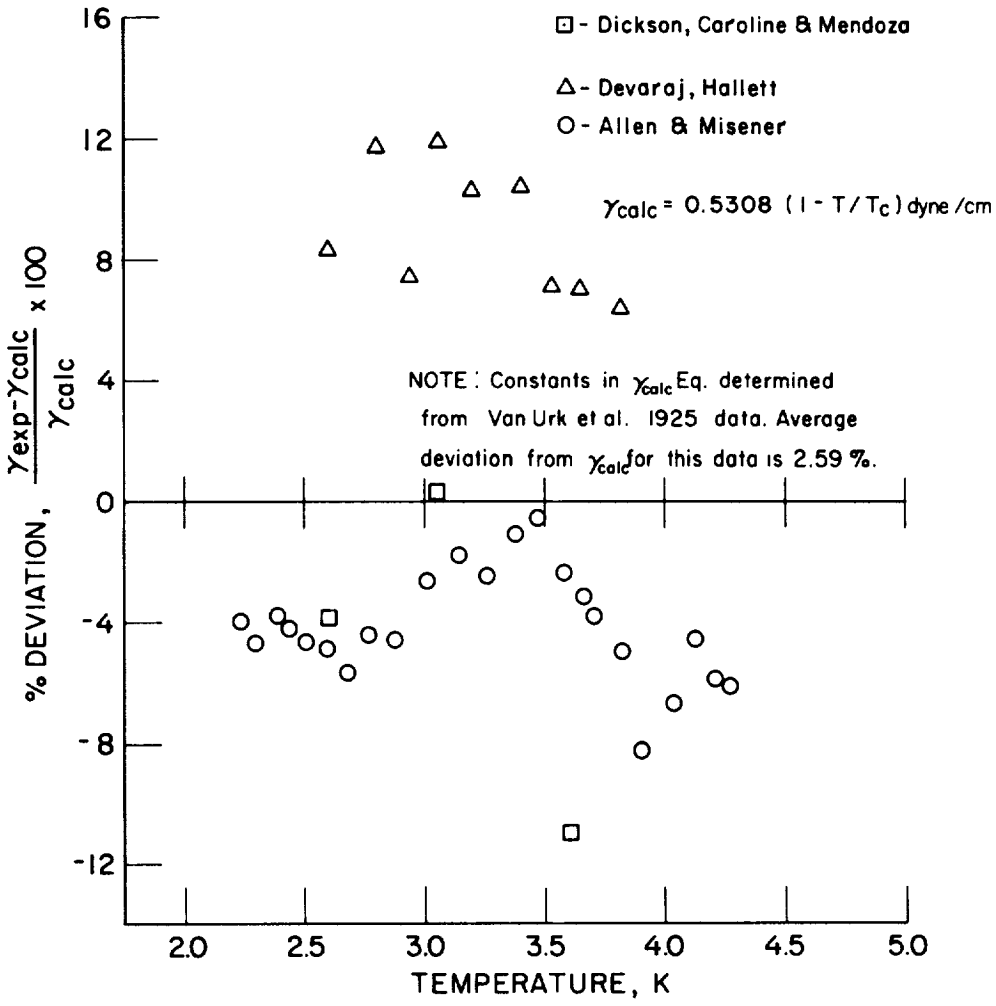

Figure 5. Deviations between Calculated and Experimental Surface Tension Data.

6. Index of Refraction

The refractive index of a non-polar fluid depends on the wavelength of the incident radiation and on the density of the fluid. However, the dependence on wavelength can be treated independently of the dependence on density. The Cauchy dispersion formula:

$$r_\Lambda = r(\rho, \Lambda) = r_\infty(\rho) + \theta_1 / \Lambda^2 + \theta_2 / \Lambda^4 \tag{27}$$

assuming the equivalence of the Maxwell's relation

$$\epsilon = n_\infty^2 \tag{28}$$

to

$$p = r_\infty \tag{29}$$

allows the calculation of r_∞ from the polarizability as a function of density and

$$r_\infty(\rho) = 0.123396 - 0.0014\,\rho \tag{30}$$

where ρ is density in g/cm^3. Equation (30) was then substituted for the first term in equation (27) and θ_1 and θ_2 were determined by least squares estimation using dispersion data from Landolt-Börnstein (1962). The resulting values were $\theta_1 = 33701.617944$ and $\theta_2 = -12325284955$. The specific refraction, r_Λ, is in cm^3/g, density, ρ, is in g/cm^3, and the wavelength, Λ, is in Å. Values of the index of refraction n in table 2 have been calculated from equations (27), (30), and (31).

$$r_\Lambda = \frac{n^2 - 1}{n^2 + 2} \cdot \frac{1}{\rho} \quad . \tag{31}$$

A comparison between experimental measurements of the index of refraction (Edwards, 1956, 1957, and 1958) and those calculated using equation (31) shows agreement to better than 0.1%, except with those values from the 1956 reference. Edwards (1956) and (1958) papers both report values of the index of refraction for the saturated liquid of helium-4. However, the values in the 1956 paper are about 4% higher than those in the 1958 paper, and the 1956 values are presumed to be in error. Figure 6 shows n as a function of density for the saturated vapor and saturated liquid conditions. The points are from Edwards (1957 and 1958).

Table 2. Index of Refraction of Saturated Liquid Helium at Three Wavelengths

Temp K	4358 Å n	5462 Å n	6939 Å n
2.2	1.02881	1.02867	1.02857
2.4	1.02864	1.02849	1.02839
2.6	1.02841	1.02827	1.02817
2.8	1.02814	1.02800	1.02790
3.0	1.02782	1.02768	1.02759
3.2	1.02745	1.02731	1.02722
3.4	1.02703	1.02690	1.02681
3.6	1.02656	1.02643	1.02634
3.8	1.02602	1.02589	1.02580
4.0	1.02541	1.02528	1.02520
4.2	1.02471	1.02459	1.02450
4.4	1.02389	1.02377	1.02369
4.6	1.02290	1.02278	1.02270
4.8	1.02163	1.02152	1.02145
5.0	1.01986	1.01976	1.01969

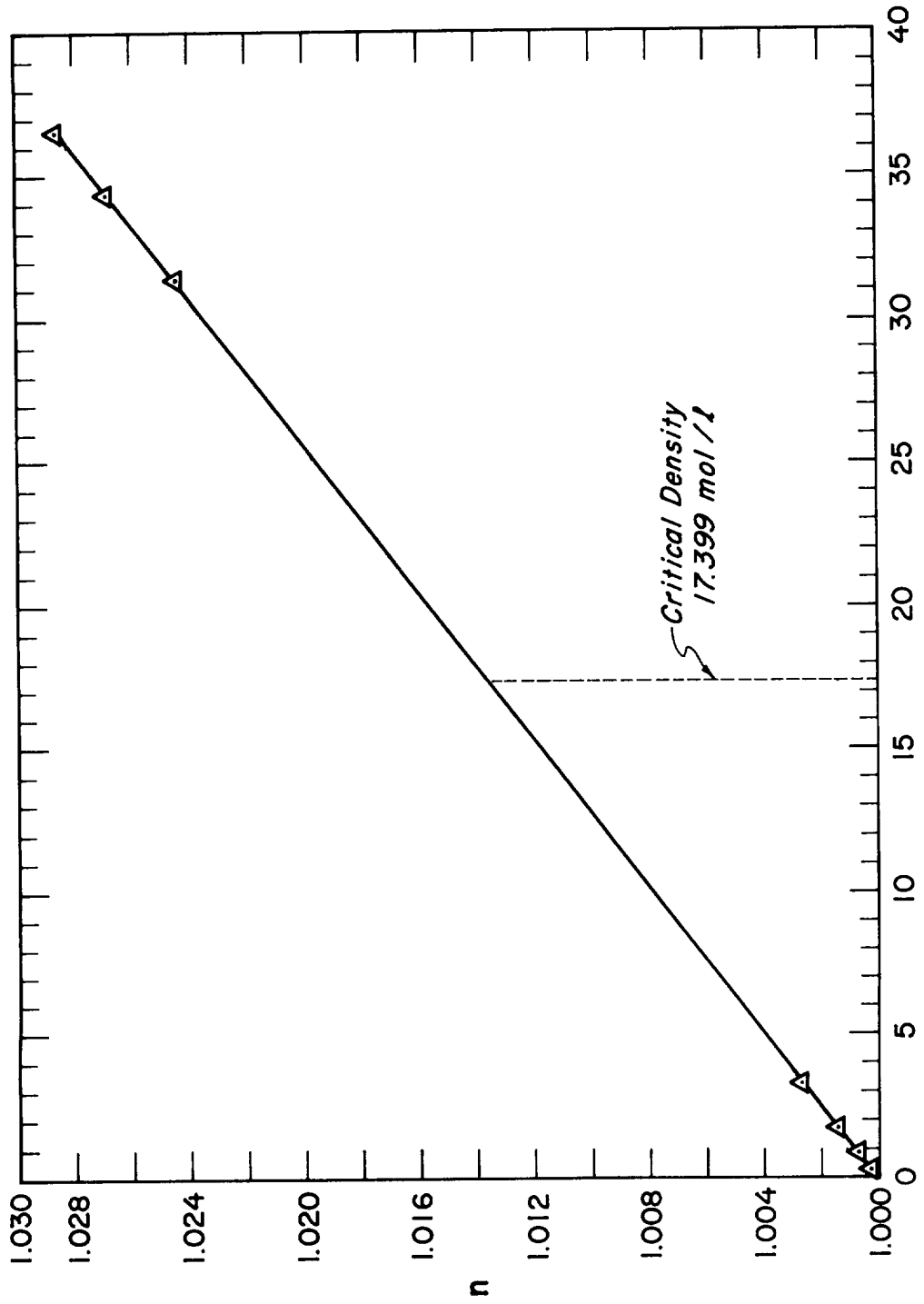

Figure 6. Index of Refraction for Saturated Liquid and Gaseous Helium. Points are from Edwards (1957, 1958).

7. Thermal Diffusivity

The thermal diffusivity of a fluid is defined as

$$\alpha = \lambda/(\rho C_p) \tag{32}$$

where α is the thermal diffusivity, λ is the thermal conductivity, and C_p is the specific heat at constant pressure. The tabulations of thermal diffusivity in appendices D and E have been calculated using the above equation, and ρ, λ, and C_p in the tables. The uncertainty of α is estimated to be 20%, except in the critical region.

8. Prandtl Number

The Prandtl number is frequently used in engineering calculations and is defined as:

$$Pr = C_p \eta / \lambda \tag{33}$$

where Pr is the Prandtl number, C_p is the specific heat at constant pressure, η is the viscosity, and λ is the thermal conductivity. The tabulations of the Prandtl number in appendices D and E have been calculated from equation (33) using values of η, λ, and C_p from adjacent entries in the tables. Since Pr is a function of both η and λ, the uncertainty in Pr could be as much as 25%.

9. Joule-Thomson Inversion Curve

The Joule-Thomson coefficient for a fluid is defined as:

$$J = (\partial T/\partial P)_H \ . \tag{34}$$

The locus of points where $J = 0$ is called the Joule-Thomson inversion curve: see figure 7. The inversion curve as given in table 3 has been calculated using the relationship:

$$T (\partial P/\partial T)_\rho = \rho (\partial P/\partial \rho)_T \tag{35}$$

and the equation of state from McCarty (1972).

Table 3. Joule-Thomson Inversion Curve

Temperature		Pressure		Density	
K	R	atm	psia	mol/ℓ	lb/ft^3
4.5	8.1	1.821	26.76	30.83	7.703
5	9.0	3.768	55.37	30.68	7.667
6	10.8	7.266	106.8	30.03	7.504
7	12.6	10.74	157.8	29.53	7.378
8	12.4	14.10	207.2	28.99	7.245
9	16.2	17.31	254.4	28.43	7.106
10	18.0	20.36	299.2	27.86	6.962
12	21.6	25.57	375.8	26.42	6.602
14	25.2	29.29	430.5	24.72	6.177
16	28.8	32.07	471.3	23.07	5.764
18	32.4	34.44	506.2	21.61	5.400
20	36.0	36.18	531.7	20.20	5.046
22	39.6	37.33	548.6	18.82	4.703
24	43.2	37.93	557.4	17.48	4.367
26	46.8	37.98	558.2	16.15	4.035
28	50.4	37.48	550.8	14.83	3.705
30	54.0	36.40	535.0	13.49	3.372
32	57.6	34.71	510.1	12.13	3.030
34	61.2	32.32	475.0	10.71	2.675
36	64.8	29.13	428.0	9.194	2.297
38	68.4	24.89	365.8	7.527	1.881
40	72.0	19.11	280.8	5.567	1.391
42	75.6	9.80	144.0	2.780	.695
43	77.4	.03	.5	.009	.002

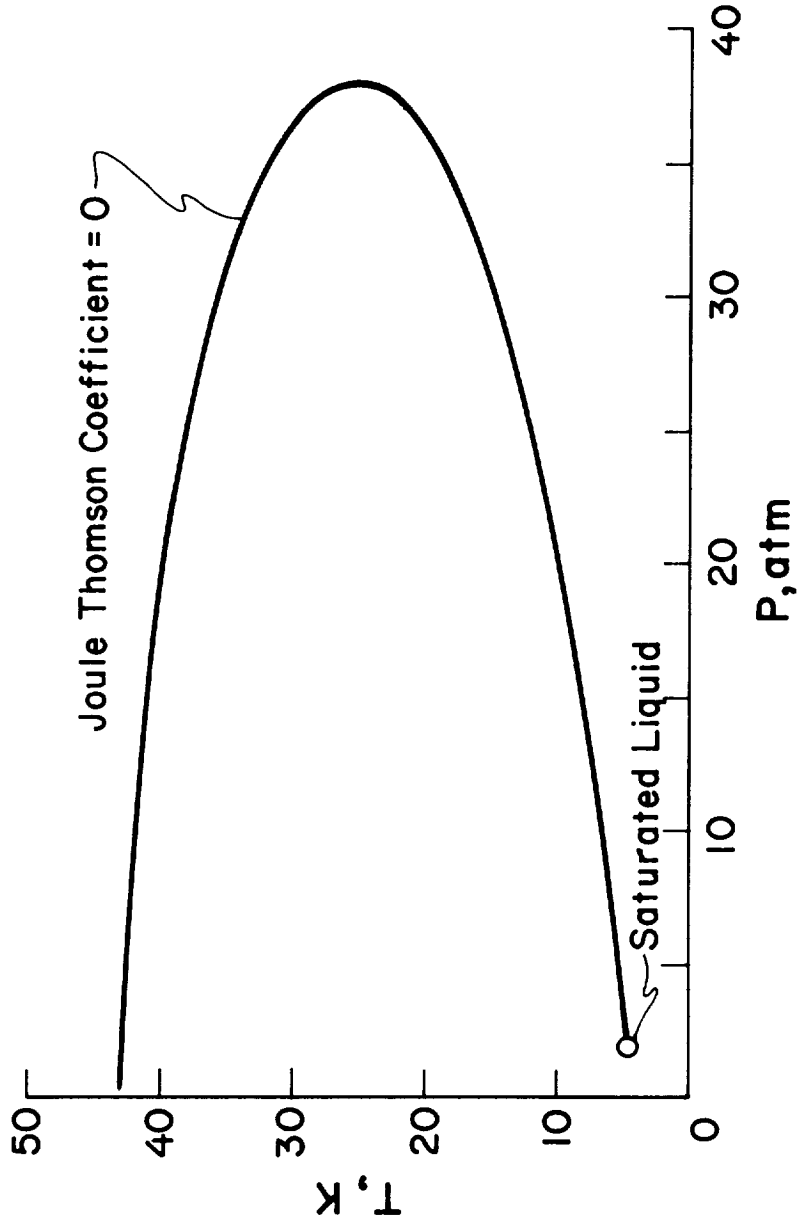

Figure 7. Joule-Thomson Inversion Curve

10. The Melting Line

The melting curve for helium may be calculated using the Simon melting equation.

$$P = -17.80 + 17.31457\ T^{1.555414} \tag{36}$$

where P is in kg/cm^2 and T is in Kelvin. The constants in equation (36) were reported by Mills and Grilly (1955), and were based on their experimental data which extended from the upper lambda point to 30.77 K where they found the melting pressure to be 3555.6 kg/cm^2. In a later paper (Grilly and Mills, 1959) a separate equation is reported for temperatures between 1.8 and 5.2 K. This equation is:

$$P = 33.28 - 44.156\ T + 31.799\ T^2 - 4.8159\ T^3 + 0.30313\ T^4 \tag{37}$$

where P is in kg/cm^2 and T is in Kelvin. The values in table 4 have been calculated using equation (37) for $T \leq 5.2$ and equation (36) for $T > 5.2$

Table 4. Melting Line for Helium-4

Temperature		Pressure		Liquid Density	
K	R	atm	psia	mol/ℓ	lb/cu-ft
2.0	3.60	37.25	547.4	46.18	11.540
2.5	4.50	56.35	828.2	48.67	12.162
3.0	5.40	78.91	1159.6	50.97	12.737
3.5	6.30	103.83	1525.9	52.94	13.229
4.0	7.20	130.49	1917.7	54.63	13.650
5.0	9.00	188.67	2772.8	57.54	14.378
6.0	10.80	254.77	3744.1	60.25	15.055
7.0	12.60	328.47	4827.1	62.85	15.704
8.0	14.40	408.27	5999.9	65.30	16.317
9.0	16.20	493.81	7257.1	67.63	16.900
10.0	18.00	584.82	8594.4	69.85	17.455
12.0	21.60	782.21	11495.4	73.91	18.468
14.0	25.20	998.83	14678.8	77.37	19.332
16.0	28.80	1233.37	18125.7	80.43	20.096
18.0	32.40	1484.81	21820.8	83.34	20.824
20.0	36.00	1752.29	25751.6	86.07	21.507
22.0	39.60	2035.05	29907.1	88.67	22.156
24.0	43.20	2332.48	34278.1	91.17	22.780
26.0	46.80	2644.01	38856.3	93.60	23.387
28.0	50.40	2969.14	43634.5	95.98	23.983
30.0	54.00	3307.44	48606.2	98.34	24.573

Table 5. PρT of the Lambda Line

Temperature		Pressure		Density	
K	R	atm	psia	g/cm^3	lb/ft^3
2.172	3.910	0.0497	.730	0.1462	9.127
2.15	3.87	2.33	34.24	0.1506	9.402
2.10	3.78	6.84	100.5	0.1576	9.839
2.05	3.69	10.91	160.3	0.1627	10.16
2.00	3.6	14.68	215.7	0.1669	10.42
1.95	3.51	18.22	267.8	0.1705	10.64
1.90	3.42	21.55	316.7	0.1736	10.84
1.85	3.33	24.70	363.0	0.1763	11.01
1.80	3.24	27.67	406.6	0.1788	11.16
1.763	3.174	29.74	437.1	0.1804	11.26

11. The Lambda Line

The boundary of the superfluid phase (helium II) of liquid helium-4 is known as the lambda line. The lambda line begins at 2.172 K on the saturated liquid line and continues through the liquid phase to intersect the melting curve at 1.763 K. Table 5 gives the PρT of the lambda line as reported by Kierstead (1967).

12. Summary

The lack of sufficiently accurate experimental data for helium between the temperatures of 2 and 70 K has hampered the efforts of correlating the PVT surface by McCarty (1972). This is especially important for the temperature range of 2 - 20 K where small amounts of accurate data do exist but these data cover very restricted ranges of temperature and pressure. A single set of self consistent data covering the entire pressure and temperature range is needed.

The purpose of the previous sections has been to describe where or how the values were obtained in assembling the various tables and graphs presented here. Most of the material has been taken from McCarty (1972) and formulas and descriptions given there have not been repeated here.

In addition, an effort has been made to assign realistic uncertainties in the data wherever possible. Uncertainty is defined here to be an estimate of accuracy at a 95% confidence level. These assignments are made in the text of the section or subsection concerned with that property. Finally, the number of digits in the tables of appendices D and E should not be taken as an indication of accuracy of the number. The tabulations are a direct copy of computer printouts where it is often necessary to present more digits for a property than its accuracy justifies.

13. Bibliography

Allen, J. F. and Miesner, A. D., The Surface Tension of Liquid Helium, Camb. Phil. Soc. 34, 299 (1938).

Arp, V., Ballinger, E. R., Giarratano, P. J., Roder, H. M., Smith, R. V., Snyder, N. S., Steward, W. G., and Wallace, G. H., Helium Heat Transfer, Unpublished Data (1971).

Devaraj, N. and Hollis-Hallet, A. G., The Surface Tension of Liquid Helium I and the Law of Corresponding States, Can. J. Phys. 45, 2113 (1967).

Dickson, D. P. E., Caroline, D., and Mendoza, E., Surface Tension of Liquid ^{4}Helium, Phys. Lett. 33A, No. 3, 139 (1970).

Edwards, M. H., The Index of Refraction of Liquid Helium, Can. J. Phys. 34, 898 (1956).

Edwards, M. H., Refractive Index of He^4: Saturated Vapor, Phys. Rev. 108, No. 5, 1243 (Dec 1957).

Edwards, M. H., Refractive Index of He^4: Liquid, Can. J. Phys. 36, 884 (1958).

Grilly, E. R. and Mills, R. L., Melting Properties of He^3 and He^4 up to 3500 kg/cm^2, Ann. Phys. 8, 1 (1959).

Golubev, I. F. and Shpagina, I. B., Thermal Conductivity of Helium at Temperatures from 273.65 to 21.15 Degrees K and Pressures From 1 to 500 Atmospheres, Gaz. Prom. 11, No. 8, 40 (Aug 1966).

Guevara, F. A., McInteer, B. B., and Wageman, W. E., High Temperature Viscosity Ratios for Hydrogen, Helium, Argon and Nitrogen, Phys. Fluids 12, No. 12, 2493 (Dec 1969).

Hanley, H. J. M., McCarty, R. D., and Cohen, E. G. D., Analysis of Transport Coefficients for Simple Dense Fluids: Application of the Modified Enskog Theory, Physica (1972).

Kerr, E. C. and Sherman, R. H., The Molar Polarizability of ^{3}He at Low Temperatures and its Density Dependence, J. Low Temp. Phys. 3, No. 5, 451 (1970).

Kerrisk, J. F., The Thermal Conductivity of Liquid Helium-4 and Liquid Helium-3, Doctoral Dissertation, University of New Mexico, Albuquerque, N.M. (Jun 1968).

Kierstead, H. A., Lambda Curve of Liquid He^4, Phys. Rev. 162, No. 1, (Oct 1967).

Landolt-Börnstein Tables, 6th Edition II, Part 8, 872 (1962).

Maitland, G. C. and Smith, E. B., The Viscosities of Eleven Common Gases: A Critical Compilation, Physical Chemistry Laboratory, South Parks Road, Oxford, England (Sep 1971).

McCarty, R. D., The Thermodynamic Functions for Helium-4 for Temperatures from 2 to 1500 K with Pressures to 100 MN/m^2, NSRD Monograph (to be published) (1972).

Mechtly, E. A., The International System of Units, Physical Constants and Conversion Factors, NASA-SP-7012 (1964).

Mills, R. L. and Grilly, E. R., Melting Curves of He^3, He^4, H_2, D_2, Ne, N_2 and O_2 up to 3500 kg/cm^2, Phys. Rev. 99, No. 2, 480 (Jul 1955).

Roder, H. M., Private Communication (1971).

Steward, W. G. and Wallace, G. H., $Helium^4$ Viscosity Measurements 4 to 20 K, 0 to 10 MN/m^2, Unpublished Data (Sep 1971).

Tsederberg, N. V., Popov, V. N., and Morozova, N. A., Thermodynamic and Thermophysical Properties of Helium, Moscow (1969), Translated by the Israel Program for Scientific Translations, Jerusalem (1971), Available from the U. S. Department of Commerce National Technical Information Service, Springfield, Va.

van Urk, A. Th., Keesom, W. H., and Onnes, H. K., Measurements of the Surface Tension of Liquid Helium, Communs. Phys. Lab. Univ. Leiden, No. 179a (1925).

Appendix A. List of Symbols and Units

The calculation of the tables and properties presented here was performed in many different systems of units, and converted to the units shown below at the very end of the calculations; therefore the reader is cautioned to pay particular attention to the units when consulting individual sections of this document. All conversion factors have been taken from the National Aeronautics and Space Administration Report Number SP-7012 (Mechtly 1964).

R = gas constant, 20.5006 cm^3-atm/g-K

P = pressure, atm

V = specific volume, cm^3/g

T = absolute temperature, K

ρ = density, g/cm^3

C_p = specific heat at constant pressure, J/g-K

C_v = specific heat at constant volume, J/g-K

S = entropy, J/g-K

H = enthalpy, J/g

U = internal energy J/g

W = speed of sound, m/s

$(\partial P/\partial T)_\rho$ = isochore derivative, atm/K

$(\partial P/\partial \rho)_T$ = isotherm derivative, cm^3-atm/g

θ = specific heat input, J/g

Φ = energy derivative, atm-cm^3/J

α = isothermal bulk modulus, atm

β = volume expansivity, 1/K

n = index of refraction, dimensionless

r = specific refraction, cm^3/g

Pr = Prandtl number, dimensionless

p = specific polarizability, cm^3/g

J = Joule-Thomson coefficient, K/atm

λ = thermal conductivity, mW/cm-K

η = viscosity, g/cm-s

ϵ = dielectric constant, dimensionless

γ = surface tension, dyn/cm

Λ = wavelength, angstrom

α = thermal diffusivity, cm^2/s

Appendix B. Fixed Points*

Critical Point

P_c = 32.99 psia (2.245 atm)

T_c = 9.3625 R (5.2014 K)

ρ_c = 4.348 lb_m/ft^3 (0.017399 mol/cm^3)

Normal Boiling Point

P = 14.696 psia (1 atm)

T = 7.604 R (4.224 K)

ρ_{gas} = 1.054 lb_m/ft^3 (0.004220 mol/cm^3)

ρ_{liquid} = 7.802 lb_m/ft^3 (0.03122 mol/cm^3)

Lower Lambda Point

P = 0.730 psia (0.0497 atm)

T = 3.919 R (2.177 K)

ρ_{liquid} = 9.127 lb_m/ft^3 (0.03653 mol/cm^3)

Upper Lambda Point

P = 437.1 psia (29.74 atm)

T = 3.174 R (1.763 K)

ρ_{liquid} = 11.26 lb_m/ft^3 (0.04507 mol/cm^3)

Appendix C. Conversion Factors

Temperature	1.8 R = 1 K
Pressure	14.695949 psia = 1 atm = 1.01325 x 10^5 N/m^2
Specific Volume	0.004002013 ft^3/lb_m = 1 cm^3/mol
Internal Energy	0.107483 BTU/lb_m = 1 J/mol
Entropy, Specific Heat	0.0597126 BTU/lb_m R = 1 J/mol-K
Thermal Conductivity	0.0578176 BTU/ft-hr-R = 1 mW/cm-K
Viscosity	0.067196897 lb_m/ft-s = 1 g/cm-s
Speed of Sound	3.2808 ft/s = 1 m/s = m/s
Molecular Weight	4.0026**
Surface Tension	0.5710147 x 10^{-5} lb_f/in = 1 dyn/cm
	(1 dyn = 10^{-5} N)

* Fixed Points from McCarty (1972)

** On the C^{12} = 12.000 scale

PRECEDING PAGE BLANK NOT FILMED

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID HELIUM

TEMP	PRESS	VOLUME CC/G	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND	SURFACE TENSION
DEG. K	ATM	** X 100	CC-ATM/G	ATM/K	J/G	J/G	J/G-K	J/G-K		M/S	DYN/CM
* 2.177	0.04969	0.06839									
* 2.177	0.04969	8.494	39.8	0.0246	21.14	25.41	11.92	3.20	5.61	84.10	
2.20	0.05256	0.06842	453.0	1.58	3.240	3.276	1.671	3.10	3.16	216.1	0.3063
2.20	0.05256	8.099	40.0	0.0258	21.19	25.51	11.85	3.20	5.63	84.45	
2.25	0.05916	0.06850	449.0	1.81	3.388	3.429	1.738	2.73	2.81	216.4	0.3012
2.25	0.05916	7.327	40.5	0.0285	21.32	25.71	11.71	3.20	5.66	85.19	
2.30	0.06629	0.06860	445.0	2.02	3.521	3.567	1.796	2.46	2.56	216.7	0.2961
2.30	0.06629	6.654	41.0	0.0315	21.44	25.91	11.57	3.21	5.69	85.91	
2.35	0.07399	0.06870	441.0	2.20	3.644	3.695	1.849	2.25	2.38	217.1	0.2910
2.35	0.07399	6.062	41.5	0.0346	21.56	26.11	11.45	3.21	5.73	86.61	
2.40	0.08228	0.06882	436.0	2.37	3.758	3.816	1.898	2.10	2.25	217.4	0.2859
2.40	0.08228	5.540	41.9	0.0379	21.68	26.30	11.32	3.22	5.77	87.29	
2.45	0.09120	0.06894	431.0	2.51	3.868	3.932	1.943	2.00	2.17	217.7	0.2808
2.45	0.09120	5.077	42.4	0.0414	21.80	26.49	11.20	3.22	5.81	87.95	
2.50	0.1008	0.06907	425.0	2.64	3.975	4.045	1.986	1.93	2.13	217.9	0.2757
2.50	0.1008	4.665	42.7	0.0451	21.91	26.68	11.09	3.22	5.85	88.59	
2.55	0.1110	0.06921	418.0	2.76	4.079	4.157	2.027	1.88	2.11	217.9	0.2706
2.55	0.1110	4.297	43.1	0.0490	22.03	26.86	10.98	3.23	5.89	89.22	
2.60	0.1219	0.06936	412.0	2.86	4.184	4.269	2.068	1.85	2.10	217.7	0.2655
2.60	0.1219	3.967	43.4	0.0532	22.14	27.04	10.87	3.23	5.93	89.82	
2.65	0.1336	0.06952	405.0	2.95	4.288	4.382	2.108	1.84	2.12	217.4	0.2604
2.65	0.1336	3.670	43.7	0.0575	22.25	27.21	10.76	3.24	5.98	90.40	
2.70	0.1460	0.06969	398.0	3.04	4.393	4.496	2.147	1.84	2.14	216.9	0.2553
2.70	0.1460	3.402	43.9	0.0621	22.35	27.38	10.66	3.24	6.02	90.97	
2.75	0.1591	0.06986	390.0	3.11	4.500	4.612	2.186	1.84	2.18	216.3	0.2502
2.75	0.1591	3.160	44.1	0.0670	22.46	27.55	10.56	3.24	6.07	91.51	
2.80	0.1730	0.07004	382.0	3.18	4.608	4.731	2.225	1.85	2.22	215.5	0.2451
2.80	0.1730	2.941	44.3	0.0721	22.56	27.71	10.47	3.25	6.13	92.04	
2.85	0.1878	0.07023	375.0	3.24	4.718	4.851	2.265	1.87	2.27	214.7	0.2400
2.85	0.1878	2.741	44.5	0.0775	22.66	27.87	10.37	3.25	6.18	92.56	
2.90	0.2033	0.07043	367.0	3.30	4.830	4.975	2.304	1.88	2.31	213.7	0.2349
2.90	0.2033	2.559	44.6	0.0831	22.76	28.03	10.28	3.26	6.24	93.05	
2.95	0.2198	0.07064	358.0	3.35	4.944	5.102	2.343	1.90	2.37	212.6	0.2298
2.95	0.2198	2.393	44.7	0.0891	22.85	28.18	10.19	3.26	6.30	93.53	
3.00	0.2371	0.07085	350.0	3.40	5.061	5.231	2.382	1.92	2.42	211.5	0.2247
3.00	0.2371	2.241	44.7	0.0953	22.94	28.33	10.11	3.26	6.36	93.99	
3.05	0.2553	0.07107	341.0	3.44	5.181	5.364	2.422	1.94	2.48	210.3	0.2195
3.05	0.2553	2.101	44.8	0.102	23.03	28.47	10.02	3.27	6.42	94.44	
3.10	0.2744	0.07130	333.0	3.48	5.302	5.501	2.462	1.96	2.54	209.1	0.2144
3.10	0.2744	1.972	44.7	0.109	23.12	28.61	9.937	3.27	6.49	94.87	
3.15	0.2945	0.07155	324.0	3.52	5.427	5.640	2.502	1.98	2.60	207.8	0.2093
3.15	0.2945	1.854	44.7	0.116	23.21	28.74	9.855	3.27	6.56	95.28	
3.20	0.3156	0.07180	316.0	3.55	5.554	5.783	2.542	2.00	2.67	206.5	0.2042
3.20	0.3156	1.745	44.6	0.123	23.29	28.87	9.774	3.28	6.64	95.68	
3.25	0.3376	0.07205	307.0	3.58	5.684	5.930	2.583	2.02	2.73	205.2	0.1991
3.25	0.3376	1.644	44.5	0.131	23.37	28.99	9.694	3.28	6.72	96.06	
3.30	0.3607	0.07232	298.0	3.61	5.816	6.081	2.624	2.04	2.80	203.8	0.1940
3.30	0.3607	1.550	44.3	0.139	23.44	29.11	9.616	3.28	6.80	96.42	
3.35	0.3848	0.07261	289.0	3.64	5.952	6.235	2.665	2.06	2.87	202.4	0.1888
3.35	0.3848	1.463	44.1	0.148	23.51	29.22	9.539	3.29	6.89	96.77	
3.40	0.4100	0.07290	281.0	3.66	6.090	6.393	2.706	2.07	2.95	201.0	0.1838
3.40	0.4100	1.382	43.9	0.157	23.58	29.32	9.463	3.29	6.98	97.10	
3.45	0.4363	0.07320	272.0	3.68	6.232	6.555	2.748	2.09	3.02	199.5	0.1787
3.45	0.4363	1.307	43.6	0.166	23.65	29.43	9.389	3.29	7.08	97.41	
3.50	0.4637	0.07352	263.0	3.69	6.376	6.722	2.790	2.11	3.10	198.0	0.1736
3.50	0.4637	1.237	43.3	0.176	23.71	29.52	9.314	3.30	7.18	97.71	
3.55	0.4923	0.07385	254.0	3.71	6.524	6.893	2.832	2.13	3.19	196.5	0.1685
3.55	0.4923	1.171	42.9	0.186	23.77	29.61	9.241	3.30	7.29	98.00	
3.60	0.5220	0.07419	245.0	3.72	6.675	7.068	2.875	2.14	3.28	194.9	0.1634
3.60	0.5220	1.110	42.5	0.197	23.82	29.69	9.169	3.30	7.40	98.27	
3.65	0.5528	0.07454	237.0	3.73	6.830	7.247	2.918	2.16	3.37	193.4	0.1583
3.65	0.5528	1.053	42.1	0.208	23.87	29.77	9.097	3.31	7.52	98.52	

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID HELIUM

TEMPERATURE DEG. K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_P$ 1/DEG. K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.177	14.62									
* 2.177	0.1177	10.7	6.53	0.0468	0.525	0.0447	5.38	0.00676	1.00044	0.675
2.20	14.61	133.0	3.48	66.1	0.0238	0.148	36.1	0.000321	1.05500	0.778
2.20	0.1235	10.8	6.53	0.0494	0.522	0.0453	5.45	0.00652	1.00046	0.677
2.25	14.60	102.0	4.54	65.6	0.0276	0.152	36.4	0.000370	1.05494	0.674
2.25	0.1365	11.0	6.53	0.0553	0.516	0.0467	5.60	0.00604	1.00051	0.688
2.30	14.58	82.2	5.64	64.9	0.0311	0.155	36.7	0.000416	1.05486	0.605
2.30	0.1503	11.2	6.52	0.0617	0.510	0.0480	5.76	0.00561	1.00056	0.683
2.35	14.56	69.2	6.72	64.2	0.0343	0.158	36.9	0.000456	1.05478	0.556
2.35	0.1649	11.4	6.52	0.0685	0.505	0.0494	5.92	0.00523	1.00061	0.686
2.40	14.53	60.3	7.74	63.4	0.0374	0.160	37.1	0.000490	1.05468	0.521
2.40	0.1805	11.5	6.52	0.0757	0.500	0.0508	6.07	0.00488	1.00067	0.690
2.45	14.51	54.0	8.66	62.5	0.0402	0.163	37.2	0.000516	1.05458	0.497
2.45	0.1970	11.7	6.52	0.0834	0.496	0.0521	6.23	0.00456	1.00073	0.694
2.50	14.48	49.5	9.47	61.5	0.0430	0.165	37.3	0.000535	1.05448	0.482
2.50	0.2144	11.9	6.52	0.0916	0.492	0.0535	6.38	0.00427	1.00079	0.698
2.55	14.45	46.2	10.1	60.5	0.0456	0.166	37.3	0.000547	1.05436	0.472
2.55	0.2327	12.0	6.52	0.100	0.489	0.0548	6.54	0.00400	1.00086	0.702
2.60	14.42	43.7	10.7	59.4	0.0482	0.168	37.3	0.000554	1.05424	0.468
2.60	0.2521	12.2	6.52	0.109	0.486	0.0562	6.69	0.00376	1.00093	0.707
2.65	14.38	41.8	11.2	58.2	0.0507	0.170	37.3	0.000556	1.05412	0.467
2.65	0.2725	12.4	6.52	0.119	0.483	0.0575	6.85	0.00353	1.00101	0.712
2.70	14.35	40.3	11.5	57.1	0.0532	0.171	37.3	0.000556	1.05399	0.468
2.70	0.2939	12.5	6.53	0.129	0.481	0.0589	7.01	0.00333	1.00109	0.717
2.75	14.31	39.1	11.8	55.9	0.0557	0.172	37.3	0.000593	1.05385	0.471
2.75	0.3164	12.7	6.53	0.140	0.480	0.0603	7.17	0.00314	1.00117	0.722
2.80	14.28	38.1	12.0	54.6	0.0582	0.174	37.2	0.000548	1.05371	0.475
2.80	0.3401	12.8	6.53	0.151	0.478	0.0616	7.32	0.00296	1.00126	0.728
2.85	14.24	37.3	12.2	53.3	0.0608	0.175	37.1	0.000542	1.05356	0.481
2.85	0.3648	12.9	6.53	0.162	0.477	0.0630	7.48	0.00279	1.00135	0.734
2.90	14.20	36.5	12.3	52.0	0.0634	0.176	37.0	0.000535	1.05341	0.487
2.90	0.3908	13.1	6.54	0.174	0.477	0.0643	7.64	0.00264	1.00145	0.741
2.95	14.16	35.9	12.4	50.7	0.0660	0.177	36.9	0.000528	1.05325	0.493
2.95	0.4179	13.2	6.54	0.187	0.477	0.0657	7.80	0.00250	1.00155	0.747
3.00	14.11	35.2	12.5	49.4	0.0688	0.178	36.8	0.000521	1.05309	0.500
3.00	0.4463	13.3	6.54	0.200	0.477	0.0671	7.96	0.00236	1.00165	0.755
3.05	14.07	34.6	12.6	48.0	0.0716	0.179	36.6	0.000513	1.05292	0.507
3.05	0.4760	13.4	6.55	0.213	0.478	0.0685	8.13	0.00224	1.00176	0.762
3.10	14.02	34.1	12.7	46.7	0.0746	0.180	36.5	0.000506	1.05274	0.514
3.10	0.5070	13.6	6.55	0.227	0.479	0.0699	8.29	0.00212	1.00188	0.770
3.15	13.98	33.5	12.7	45.3	0.0776	0.181	36.3	0.000498	1.05256	0.522
3.15	0.5394	13.7	6.56	0.241	0.480	0.0712	8.45	0.00201	1.00200	0.778
3.20	13.93	33.0	12.7	44.0	0.0808	0.182	36.2	0.000491	1.05238	0.529
3.20	0.5731	13.8	6.56	0.256	0.482	0.0726	8.62	0.00191	1.00212	0.787
3.25	13.88	32.5	12.8	42.6	0.0841	0.183	36.0	0.000483	1.05219	0.537
3.25	0.6084	13.9	6.57	0.271	0.484	0.0741	8.79	0.00181	1.00225	0.797
3.30	13.83	32.0	12.8	41.2	0.0876	0.184	35.8	0.000476	1.05199	0.545
3.30	0.6452	14.0	6.57	0.286	0.487	0.0755	8.95	0.00172	1.00239	0.807
3.35	13.77	31.5	12.8	39.9	0.0912	0.185	35.7	0.000468	1.05179	0.553
3.35	0.6835	14.0	6.58	0.302	0.490	0.0769	9.12	0.00163	1.00253	0.817
3.40	13.72	31.0	12.9	38.5	0.0958	0.186	35.5	0.000460	1.05157	0.562
3.40	0.7235	14.1	6.59	0.317	0.494	0.0784	9.30	0.00155	1.00268	0.828
3.45	13.66	30.5	12.9	37.1	0.0991	0.187	35.3	0.000453	1.05136	0.571
3.45	0.7651	14.2	6.59	0.334	0.498	0.0798	9.47	0.00147	1.00283	0.840
3.50	13.60	30.1	12.9	35.8	0.103	0.188	35.1	0.000445	1.05113	0.580
3.50	0.8085	14.3	6.60	0.350	0.503	0.0813	9.65	0.00140	1.00300	0.852
3.55	13.54	29.6	12.9	34.4	0.106	0.189	34.9	0.000437	1.05090	0.589
3.55	0.8537	14.3	6.61	0.367	0.508	0.0828	9.82	0.00133	1.00316	0.865
3.60	13.48	29.1	12.9	33.1	0.113	0.190	34.7	0.000429	1.05066	0.599
3.60	0.9008	14.4	6.62	0.383	0.514	0.0843	10.0	0.00126	1.00334	0.878
3.65	13.41	28.7	12.9	31.7	0.118	0.198	34.5	0.000421	1.05042	0.610
3.65	0.9498	14.5	6.63	0.400	0.520	0.0858	10.2	0.00120	1.00352	0.893

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID HELIUM

TEMP	PRESS	VOLUME CC/G	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND	SURFACE TENSION
DEG. K	ATM	** X 100	CC-ATM/G	ATM/K	J/G	J/G	J/G-K	J/G-K		M/S	DYN/CM
3.78	0.5849	0.07492	228.8	3.74	6.988	7.432	2.962	2.18	3.47	191.7	0.1532
3.70	0.5849	0.999	41.8	0.220	23.92	29.84	9.025	3.31	7.66	98.75	
3.75	0.6182	0.07530	219.8	3.74	7.149	7.621	3.006	2.19	3.57	190.1	0.1481
3.75	0.6182	0.9487	41.1	0.232	23.96	29.91	8.954	3.31	7.79	98.97	
3.80	0.6528	0.07571	211.0	3.74	7.315	7.816	3.050	2.21	3.68	188.4	0.1430
3.80	0.6528	0.9813	40.6	0.245	24.00	29.96	8.884	3.32	7.94	99.17	
3.85	0.6886	0.07613	202.0	3.74	7.484	8.016	3.095	2.23	3.80	186.7	0.1379
3.85	0.6886	0.8567	40.0	0.258	24.04	30.02	8.813	3.32	8.10	99.36	
3.90	0.7257	0.07657	193.0	3.74	7.658	8.221	3.141	2.25	3.92	184.9	0.1328
3.90	0.7257	0.8147	39.3	0.272	24.07	30.06	8.743	3.33	8.27	99.5	
3.95	0.7642	0.07704	185.0	3.73	7.836	8.433	3.187	2.26	4.05	183.1	0.1277
3.95	0.7642	0.7750	38.6	0.287	24.09	30.09	8.673	3.33	8.45	99.7	
4.00	0.8040	0.07752	176.0	3.72	8.019	8.650	3.234	2.28	4.19	181.2	0.1226
4.00	0.8040	0.7375	37.9	0.302	24.11	30.12	8.603	3.33	8.65	99.8	
4.05	0.8452	0.07803	168.0	3.71	8.206	8.874	3.281	2.30	4.35	179.2	0.1175
4.05	0.8452	0.7021	37.1	0.318	24.13	30.14	8.533	3.34	8.87	99.9	
4.10	0.8878	0.07856	159.0	3.69	8.398	9.105	3.330	2.32	4.51	177.2	0.1124
4.10	0.8878	0.6685	36.2	0.335	24.13	30.15	8.463	3.34	9.10	100.0	
4.15	0.9318	0.07912	151.0	3.67	8.596	9.343	3.379	2.34	4.69	175.2	0.1073
4.15	0.9318	0.6366	35.3	0.353	24.14	30.15	8.393	3.34	9.35	100.1	
4.20	0.9772	0.07971	143.0	3.65	8.799	9.586	3.429	2.36	4.88	173.0	0.1022
4.20	0.9772	0.6063	34.4	0.372	24.13	30.14	8.322	3.35	9.63	100.1	
4.224	1.000	0.08001	139.0	3.64	8.900	9.711	3.454	2.37	4.98	172.0	0.0997
4.224	1.000	0.5921	33.9	0.381	24.13	30.13	8.287	3.35	9.78	100.2	
4.25	1.024	0.08034	135.8	3.62	9.008	9.842	3.480	2.38	5.09	170.8	0.09709
4.25	1.024	0.5775	33.4	0.391	24.12	30.12	8.250	3.35	9.94	100.2	
4.30	1.073	0.08100	126.8	3.60	9.223	10.10	3.532	2.40	5.32	168.6	0.09199
4.30	1.073	0.5501	32.3	0.412	24.10	30.08	8.177	3.35	10.3	100.2	
4.35	1.123	0.08169	118.0	3.56	9.446	10.37	3.585	2.42	5.58	166.2	0.08688
4.35	1.123	0.5239	31.2	0.434	24.08	30.04	8.104	3.36	10.7	100.2	
4.40	1.174	0.08244	110.8	3.53	9.675	10.66	3.640	2.44	5.86	163.8	0.08178
4.40	1.174	0.4988	30.0	0.457	24.04	29.98	8.029	3.36	11.1	100.1	
4.45	1.227	0.08323	102.0	3.49	9.913	10.95	3.695	2.47	6.18	161.3	0.07668
4.45	1.227	0.4749	28.7	0.482	24.00	29.90	7.953	3.36	11.6	100.1	
4.50	1.282	0.08407	94.5	3.45	10.16	11.25	3.753	2.49	6.55	158.6	0.07158
4.50	1.282	0.4519	27.4	0.508	23.94	29.81	7.876	3.37	12.1	100.0	
4.55	1.339	0.08498	86.7	3.40	10.41	11.57	3.812	2.51	6.96	155.9	0.06648
4.55	1.339	0.4297	26.0	0.536	23.88	29.71	7.796	3.37	12.8	99.9	
4.60	1.397	0.08596	79.8	3.35	10.68	11.90	3.873	2.54	7.44	153.1	0.06137
4.60	1.397	0.4084	24.5	0.565	23.80	29.58	7.714	3.37	13.5	99.7	
4.65	1.457	0.08702	71.4	3.30	10.96	12.24	3.936	2.57	8.01	150.2	0.05627
4.65	1.457	0.3878	23.0	0.598	23.70	29.43	7.629	3.38	14.4	99.6	
4.70	1.519	0.08817	63.9	3.24	11.25	12.61	4.002	2.59	8.68	147.1	0.05117
4.70	1.519	0.3677	21.3	0.632	23.59	29.25	7.540	3.38	15.5	99.38	
4.75	1.582	0.08945	56.5	3.18	11.55	12.99	4.071	2.62	9.51	144.0	0.04607
4.75	1.582	0.3483	19.5	0.670	23.46	29.04	7.448	3.38	16.8	99.16	
4.80	1.648	0.09086	49.2	3.11	11.88	13.40	4.144	2.66	10.5	140.7	0.04096
4.80	1.648	0.3292	17.7	0.712	23.30	28.80	7.350	3.38	18.5	98.91	
4.85	1.715	0.09246	42.2	3.03	12.22	13.83	4.221	2.69	11.9	137.3	0.03586
4.85	1.715	0.3105	15.7	0.758	23.12	28.51	7.246	3.39	20.7	98.65	
4.90	1.784	0.09427	35.3	2.95	12.60	14.38	4.304	2.73	13.6	133.7	0.03076
4.90	1.784	0.2919	13.7	0.809	22.90	28.18	7.133	3.39	23.6	98.37	
4.95	1.856	0.09639	28.6	2.86	13.00	14.81	4.394	2.76	16.1	129.9	0.02566
4.95	1.856	0.2733	11.5	0.869	22.63	27.77	7.010	3.39	27.9	98.09	
5.00	1.929	0.09893	22.1	2.76	13.45	15.39	4.495	2.81	19.9	126.8	0.02055
5.00	1.929	0.2545	9.25	0.938	22.31	27.28	6.871	3.39	34.6	97.83	
5.05	2.004	0.1021	16.8	2.64	13.96	16.04	4.609	2.86	26.1	121.8	0.01545
5.05	2.004	0.2349	6.88	1.02	21.89	26.66	6.710	3.38	46.2	97.64	
5.10	2.082	0.1063	10.3	2.50	14.58	16.82	4.747	2.92	38.5	117.3	0.01035
5.10	2.082	0.2137	4.44	1.13	21.32	25.83	6.513	3.37	71.5	97.61	
* 5.201	2.245	0.1436	-0.0000136	1.74	18.10	21.36	5.589				0.000
* 5.201	2.245	0.1436	-0.0000136	1.74	18.18	21.36	5.589				

* LAMBDA POINT AND CRITICAL POINT
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID HELIUM

TEMPERATURE DEG. K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_P$ 1/DEG. K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
3.70	13.35	28.2	12.9	30.4	0.123	0.191	34.2	0.000413	1.05016	0.621
3.70	1.001	14.5	6.63	0.417	0.528	0.0874	10.4	0.00114	1.00371	0.908
3.75	13.28	27.8	12.8	29.1	0.129	0.192	34.0	0.000404	1.04990	0.633
3.75	1.054	14.6	6.64	0.433	0.535	0.0890	10.6	0.00108	1.00391	0.924
3.80	13.21	27.3	12.8	27.8	0.135	0.192	33.8	0.000396	1.04963	0.646
3.80	1.109	14.6	6.65	0.450	0.544	0.0906	10.7	0.00103	1.00411	0.942
3.85	13.14	26.9	12.8	26.5	0.141	0.193	33.6	0.000387	1.04935	0.660
3.85	1.167	14.6	6.66	0.466	0.554	0.0922	10.9	0.000975	1.00433	0.960
3.90	13.06	26.5	12.7	25.2	0.148	0.194	33.3	0.000378	1.04906	0.674
3.90	1.228	14.7	6.67	0.482	0.564	0.0939	11.1	0.000925	1.00455	0.980
3.95	12.98	26.1	12.7	24.0	0.156	0.194	33.1	0.000369	1.04876	0.690
3.95	1.290	14.7	6.68	0.498	0.576	0.0957	11.3	0.000877	1.00478	1.00
4.00	12.90	25.6	12.6	22.7	0.164	0.195	32.8	0.000360	1.04845	0.707
4.00	1.356	14.7	6.69	0.513	0.589	0.0974	11.5	0.000831	1.00503	1.02
4.05	12.82	25.2	12.6	21.5	0.172	0.195	32.6	0.000350	1.04813	0.726
4.05	1.424	14.7	6.70	0.528	0.603	0.0993	11.7	0.000786	1.00528	1.05
4.10	12.73	24.8	12.5	20.3	0.182	0.196	32.3	0.000341	1.04780	0.745
4.10	1.496	14.7	6.71	0.542	0.619	0.101	11.9	0.000743	1.00555	1.07
4.15	12.64	24.4	12.4	19.1	0.192	0.196	32.1	0.000331	1.04746	0.767
4.15	1.571	14.7	6.72	0.555	0.636	0.103	12.1	0.000702	1.00583	1.10
4.20	12.54	24.0	12.3	17.9	0.204	0.196	31.8	0.000321	1.04710	0.791
4.20	1.649	14.7	6.73	0.567	0.655	0.105	12.4	0.000662	1.00612	1.13
4.224	12.50	23.7	12.3	17.3	0.210	0.196	31.7	0.000315	1.04692	0.804
4.224	1.689	14.7	6.74	0.573	0.666	0.106	12.5	0.000643	1.00626	1.15
4.25	12.45	23.5	12.2	16.8	0.216	0.197	31.6	0.000318	1.04673	0.818
4.25	1.732	14.7	6.75	0.578	0.677	0.107	12.6	0.000624	1.00642	1.16
4.30	12.35	23.1	12.1	15.6	0.238	0.197	31.3	0.000299	1.04635	0.847
4.30	1.818	14.7	6.76	0.588	0.701	0.110	12.8	0.000586	1.00674	1.20
4.35	12.24	22.7	12.0	14.5	0.246	0.197	31.0	0.000288	1.04594	0.879
4.35	1.909	14.6	6.77	0.596	0.729	0.112	13.0	0.000550	1.00708	1.24
4.40	12.13	22.2	11.9	13.4	0.264	0.197	30.7	0.000277	1.04553	0.916
4.40	2.005	14.6	6.78	0.602	0.760	0.114	13.3	0.000515	1.00744	1.28
4.45	12.02	21.8	11.8	12.3	0.284	0.197	30.4	0.000265	1.04509	0.957
4.45	2.106	14.5	6.80	0.605	0.796	0.117	13.5	0.000481	1.00781	1.33
4.50	11.89	21.3	11.6	11.2	0.307	0.199	30.1	0.000255	1.04463	0.994
4.50	2.213	14.5	6.81	0.607	0.837	0.120	13.8	0.000448	1.00821	1.39
4.55	11.77	20.9	11.5	10.2	0.334	0.199	29.8	0.000243	1.04415	1.04
4.55	2.327	14.4	6.83	0.605	0.885	0.123	14.0	0.000415	1.00864	1.45
4.60	11.63	20.4	11.3	9.19	0.365	0.200	29.5	0.000231	1.04364	1.10
4.60	2.449	14.3	6.84	0.608	0.942	0.127	14.3	0.000383	1.00909	1.52
4.65	11.49	19.9	11.2	8.20	0.402	0.201	29.2	0.000218	1.04310	1.16
4.65	2.579	14.3	6.86	0.592	1.01	0.131	14.6	0.000352	1.00957	1.60
4.70	11.34	19.4	11.0	7.24	0.447	0.202	28.9	0.000205	1.04252	1.24
4.70	2.719	14.2	6.88	0.579	1.09	0.135	14.8	0.000321	1.01010	1.70
4.75	11.18	18.9	10.8	6.32	0.503	0.203	28.5	0.000191	1.04191	1.34
4.75	2.871	14.1	6.90	0.561	1.19	0.140	15.1	0.000291	1.01066	1.81
4.80	11.01	18.4	10.6	5.42	0.574	0.205	28.2	0.000176	1.04125	1.45
4.80	3.037	14.0	6.92	0.537	1.32	0.147	15.5	0.000262	1.01128	1.95
4.85	10.82	17.8	10.4	4.56	0.665	0.207	27.8	0.000161	1.04053	1.59
4.85	3.221	13.8	6.95	0.507	1.49	0.154	15.8	0.000232	1.01197	2.11
4.90	10.61	17.3	10.2	3.74	0.789	0.210	27.4	0.000145	1.03974	1.78
4.90	3.425	13.7	6.98	0.469	1.73	0.164	16.2	0.000203	1.01273	2.32
4.95	10.37	16.7	10.0	2.96	0.965	0.214	26.9	0.000128	1.03886	2.02
4.95	3.658	13.6	7.01	0.422	2.06	0.178	16.6	0.000174	1.01360	2.60
5.00	10.11	16.1	9.73	2.24	1.23	0.222	26.4	0.000110	1.03785	2.37
5.00	3.930	13.4	7.05	0.364	2.58	0.198	17.0	0.000146	1.01461	2.97
5.05	9.796	15.5	9.45	1.57	1.69	0.235	25.8	0.0000918	1.03666	2.87
5.05	4.258	13.3	7.10	0.293	3.49	0.232	17.5	0.000118	1.01564	3.50
5.10	9.489	14.9	9.13	0.968	2.59	0.263	25.1	0.0000727	1.03520	3.68
5.10	4.688	13.1	7.17	0.208	5.45	0.301	18.1	0.0000901	1.01742	4.30
* 5.201	6.964									
* 5.201	6.964									

* LAMBDA POINT AND CRITICAL POINT
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

0.1 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.177	0.06834								
*	2.496	0.06906	425.0	2.63	3.966	4.036	1.983	1.932	2.128	217.9
*	2.496	4.696	42.7	0.0448	21.90	26.66	11.10	3.224	5.843	88.55
	2.5	4.705	42.6	0.0447	21.92	26.68	11.11	3.223	5.839	88.63
	3.0	5.826	55.1	0.0357	23.61	29.52	12.14	3.164	5.548	98.90
	3.5	6.914	66.5	0.0299	25.25	32.26	12.98	3.138	5.418	107.9
	4.0	7.981	77.6	0.0259	26.86	34.95	13.70	3.126	5.349	116.0
	4.5	9.037	88.5	0.0228	28.45	37.61	14.33	3.121	5.309	123.5
	5.0	10.09	99.2	0.0204	30.04	40.26	14.89	3.118	5.283	130.5
	5.1	0.1062	10.4	2.51	16.71	16.81	4.746	2.915	38.19	117.4
	5.2	0.1306	0.552	1.94	19.97	20.10	5.346	3.152	616.3	104.6
	5.3	10.71	106.0	0.0192	30.99	41.84	15.20	3.117	5.271	134.5
	5.4	10.92	108.0	0.0188	31.30	42.37	15.29	3.116	5.268	135.8
	5.5	11.13	110.0	0.0185	31.62	42.90	15.39	3.116	5.265	137.1
	5.6	11.34	112.0	0.0182	31.93	43.42	15.49	3.116	5.262	138.4
	5.7	11.55	114.0	0.0178	32.25	43.95	15.58	3.116	5.260	139.7
	5.8	11.76	116.0	0.0175	32.56	44.47	15.67	3.116	5.257	140.9
	5.9	11.96	118.0	0.0172	32.88	45.00	15.76	3.116	5.255	142.2
	6.0	12.17	120.0	0.0169	33.19	45.52	15.85	3.115	5.252	143.4
	6.5	13.21	131.0	0.0156	34.76	48.15	16.27	3.115	5.243	149.4
	7.0	14.25	141.0	0.0144	36.33	50.77	16.66	3.115	5.236	155.2
	7.5	15.28	152.0	0.0135	37.90	53.38	17.02	3.115	5.230	160.7
	8.0	16.32	162.0	0.0126	39.47	56.00	17.36	3.115	5.226	166.1
	8.5	17.35	173.0	0.0118	41.03	58.61	17.67	3.115	5.222	171.3
	9.0	18.38	183.0	0.0112	42.60	61.22	17.97	3.115	5.219	176.3
	9.5	19.41	193.0	0.0106	44.16	63.83	18.25	3.115	5.216	181.2
	10.0	20.44	204.0	0.0101	45.72	66.44	18.52	3.115	5.214	185.9
	11.0	22.50	225.0	0.00913	48.85	71.65	19.02	3.116	5.211	195.0
	12.0	24.56	245.0	0.00836	51.97	76.86	19.47	3.116	5.208	203.8
	13.0	26.62	266.0	0.00772	55.10	82.07	19.89	3.116	5.206	212.1
	14.0	28.67	286.0	0.00716	58.22	87.27	20.27	3.116	5.204	220.2
	15.0	30.73	307.0	0.00668	61.34	92.47	20.63	3.116	5.203	227.9
	16.0	32.78	328.0	0.00626	64.46	97.68	20.97	3.116	5.202	235.4
	17.0	34.84	348.0	0.00589	67.58	102.9	21.28	3.116	5.201	242.6
	18.0	36.89	369.0	0.00556	70.70	108.1	21.58	3.116	5.200	249.7
	19.0	38.94	389.0	0.00527	73.82	113.3	21.86	3.116	5.199	256.5
	20.0	41.00	410.0	0.00501	76.94	118.5	22.13	3.116	5.199	263.2
	21.0	43.05	430.0	0.00477	80.06	123.7	22.38	3.116	5.198	269.7
	22.0	45.10	451.0	0.00455	83.17	128.9	22.62	3.116	5.198	276.1
	23.0	47.15	472.0	0.00435	86.29	134.1	22.85	3.116	5.197	282.3
	24.0	49.20	492.0	0.00417	89.41	139.3	23.08	3.116	5.197	288.3
	25.0	51.26	513.0	0.00400	92.53	144.5	23.29	3.116	5.197	294.3
	26.0	53.31	533.0	0.00385	95.64	149.7	23.49	3.116	5.196	300.1
	28.0	57.41	574.0	0.00357	101.9	160.1	23.88	3.116	5.196	311.4
	30.0	61.51	615.0	0.00334	108.1	170.4	24.24	3.116	5.196	322.4
	32.0	65.62	656.0	0.00313	114.3	180.8	24.57	3.116	5.195	332.9
	34.0	69.72	697.0	0.00294	120.6	191.2	24.89	3.116	5.195	343.2
	36.0	73.82	738.0	0.00278	126.8	201.6	25.18	3.116	5.195	353.1
	38.0	77.92	779.0	0.00263	133.0	212.0	25.46	3.116	5.195	362.8
	40.0	82.02	820.0	0.00250	139.3	222.4	25.73	3.116	5.194	372.2
	45.0	92.27	923.0	0.00222	154.9	248.4	26.34	3.116	5.194	394.8
	50.0	102.5	1030.0	0.00200	170.4	274.3	26.89	3.116	5.194	416.1
	55.0	112.8	1130.0	0.00182	186.0	300.3	27.38	3.116	5.194	436.4
	60.0	123.0	1230.0	0.00167	201.6	326.3	27.84	3.116	5.194	455.8
	65.0	133.3	1330.0	0.00154	217.2	352.2	28.25	3.116	5.194	474.5
	70.0	143.5	1440.0	0.00143	232.8	378.2	28.64	3.116	5.193	492.4
	75.0	153.8	1540.0	0.00133	248.4	404.2	28.99	3.116	5.193	509.6
	80.0	164.0	1640.0	0.00125	263.9	430.1	29.33	3.116	5.193	526.3
	90.0	184.5	1850.0	0.00111	295.1	482.1	29.94	3.116	5.193	558.3
	100.0	205.0	2050.0	0.00100	326.2	534.0	30.49	3.116	5.193	588.4
	125.0	256.3	2560.0	0.000800	404.1	663.8	31.65	3.116	5.193	657.9
	150.0	307.5	3080.0	0.000667	482.0	793.7	32.59	3.116	5.193	720.7
	175.0	358.8	3590.0	0.000571	559.9	923.5	33.39	3.116	5.193	778.4
	200.0	410.0	4100.0	0.000500	637.8	1053.0	34.09	3.116	5.193	832.1
	225.0	461.3	4610.0	0.000444	715.7	1183.0	34.70	3.116	5.193	882.6
	250.0	512.5	5130.0	0.000400	793.6	1313.0	35.25	3.116	5.193	930.3
	275.0	563.8	5640.0	0.000364	871.5	1443.0	35.74	3.116	5.193	975.7
	300.0	615.0	6150.0	0.000333	949.4	1573.0	36.19	3.116	5.193	1019.0
	350.0	717.6	7180.0	0.000286	1105.0	1832.0	36.99	3.116	5.193	1101.0
	400.0	820.1	8200.0	0.000250	1261.0	2092.0	37.69	3.116	5.193	1177.0
	450.0	922.6	9230.0	0.000222	1417.0	2352.0	38.30	3.116	5.193	1248.0
	500.0	1025.0	10300.0	0.000200	1573.0	2611.0	38.85	3.116	5.193	1316.0
	600.0	1230.0	12300.0	0.000167	1884.0	3131.0	39.79	3.116	5.193	1441.0
	700.0	1435.0	14400.0	0.000143	2196.0	3650.0	40.59	3.116	5.193	1557.0
	800.0	1640.0	16400.0	0.000125	2507.0	4169.0	41.29	3.116	5.193	1664.0
	900.0	1845.0	18500.0	0.000111	2819.0	4688.0	41.90	3.116	5.193	1765.0
	1000.0	2050.0	20500.0	0.000100	3130.0	5208.0	42.45	3.116	5.193	1861.0
	1100.0	2255.0	22600.0	0.0000909	3442.0	5727.0	42.94	3.116	5.193	1951.0
	1200.0	2460.0	24600.0	0.0000833	3754.0	6246.0	43.39	3.116	5.193	2038.0
	1300.0	2665.0	26700.0	0.0000769	4065.0	6766.0	43.81	3.116	5.193	2121.0
	1400.0	2870.0	28700.0	0.0000714	4377.0	7285.0	44.19	3.116	5.193	2201.0
	1500.0	3075.0	30800.0	0.0000667	4686.0	7804.0	44.55	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.1 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.177	14.63									
* 2.496	14.48	49.8	9.41	61.6	0.0427	0.164	37.3	0.000533	1.05449	0.483
* 2.496	0.2130	11.9	6.52	0.0909	0.492	0.0534	6.37	0.00429	1.00079	0.698
2.5	0.2126	11.9	6.52	0.0910	0.491	0.0535	6.38	0.00431	1.00079	0.697
3.0	0.1716	14.7	6.57	0.0945	0.377	0.0642	7.80	0.00674	1.00064	0.675
3.5	0.1446	17.4	6.59	0.0962	0.311	0.0745	9.11	0.00951	1.00054	0.663
4.0	0.1253	20.1	6.60	0.0973	0.266	0.0844	10.3	0.0126	1.00046	0.656
4.5	0.1107	22.8	6.60	0.0979	0.233	0.0936	11.5	0.0159	1.00041	0.653
5.0	0.09915	25.5	6.61	0.0984	0.208	0.102	12.6	0.0195	1.00037	0.651
5.1	9.414	14.9	9.13	0.977	2.56	0.263	25.2	0.0000730	1.03522	3.66
5.2	7.658	13.4	8.04	0.0423	45.9	1.75	22.3	0.0000370	1.02859	7.88
5.3	0.09334	27.0	6.61	0.0986	0.195	0.107	13.3	0.0218	1.00035	0.651
5.4	0.09156	27.6	6.61	0.0986	0.191	0.109	13.5	0.0226	1.00034	0.651
5.5	0.08984	28.1	6.61	0.0987	0.187	0.111	13.7	0.0234	1.00033	0.651
5.6	0.08819	28.6	6.61	0.0988	0.184	0.112	13.9	0.0242	1.00033	0.652
5.7	0.08660	29.2	6.60	0.0988	0.180	0.114	14.1	0.0250	1.00032	0.652
5.8	0.08507	29.7	6.60	0.0989	0.177	0.115	14.3	0.0258	1.00031	0.652
5.9	0.08359	30.2	6.60	0.0989	0.174	0.117	14.5	0.0266	1.00031	0.652
6.0	0.08216	30.7	6.60	0.0989	0.171	0.119	14.7	0.0275	1.00030	0.652
6.5	0.07570	33.4	6.60	0.0991	0.157	0.126	15.7	0.0317	1.00028	0.654
7.0	0.07019	36.0	6.60	0.0993	0.145	0.133	16.7	0.0362	1.00026	0.656
7.5	0.06544	38.6	6.60	0.0994	0.135	0.140	17.6	0.0409	1.00024	0.658
8.0	0.06129	41.3	6.60	0.0995	0.127	0.147	18.5	0.0458	1.00023	0.660
8.5	0.05764	43.9	6.60	0.100	0.119	0.153	19.4	0.0508	1.00021	0.662
9.0	0.05441	46.5	6.60	0.100	0.112	0.159	20.2	0.0560	1.00020	0.664
9.5	0.05152	49.1	6.60	0.100	0.106	0.165	21.1	0.0614	1.00019	0.666
10.0	0.04892	51.7	6.60	0.100	0.101	0.171	21.9	0.0670	1.00018	0.668
11.0	0.04444	57.0	6.59	0.100	0.0915	0.182	23.5	0.0786	1.00016	0.672
12.0	0.04072	62.2	6.59	0.100	0.0836	0.193	25.0	0.0908	1.00015	0.676
13.0	0.03757	67.4	6.59	0.100	0.0773	0.203	26.4	0.104	1.00014	0.679
14.0	0.03488	72.6	6.59	0.100	0.0717	0.212	27.9	0.117	1.00013	0.683
15.0	0.03254	77.8	6.59	0.100	0.0669	0.222	29.2	0.131	1.00012	0.685
16.0	0.03050	83.0	6.59	0.100	0.0627	0.231	30.5	0.145	1.00011	0.688
17.0	0.02871	88.2	6.59	0.100	0.0590	0.240	31.8	0.161	1.00011	0.690
18.0	0.02711	93.4	6.59	0.100	0.0557	0.248	33.1	0.176	1.00010	0.693
19.0	0.02568	98.6	6.59	0.100	0.0527	0.257	34.3	0.192	1.00010	0.695
20.0	0.02439	104.0	6.59	0.100	0.0501	0.265	35.5	0.209	1.00009	0.696
21.0	0.02323	109.0	6.59	0.100	0.0477	0.273	36.6	0.226	1.00009	0.698
22.0	0.02217	114.0	6.59	0.100	0.0455	0.281	37.7	0.243	1.00008	0.699
23.0	0.02121	119.0	6.59	0.100	0.0435	0.288	38.9	0.262	1.00008	0.701
24.0	0.02032	125.0	6.58	0.100	0.0417	0.296	39.9	0.280	1.00008	0.702
25.0	0.01951	130.0	6.58	0.100	0.0400	0.303	41.0	0.299	1.00007	0.703
26.0	0.01876	135.0	6.58	0.100	0.0385	0.311	42.1	0.319	1.00007	0.704
28.0	0.01742	145.0	6.58	0.100	0.0357	0.325	44.1	0.359	1.00006	0.705
30.0	0.01626	156.0	6.58	0.100	0.0333	0.339	46.1	0.401	1.00006	0.706
32.0	0.01524	166.0	6.58	0.100	0.0313	0.353	48.0	0.446	1.00006	0.707
34.0	0.01434	177.0	6.58	0.100	0.0294	0.366	49.9	0.491	1.00005	0.708
36.0	0.01355	187.0	6.58	0.100	0.0278	0.379	51.7	0.539	1.00005	0.708
38.0	0.01283	197.0	6.58	0.100	0.0263	0.392	53.5	0.588	1.00005	0.708
40.0	0.01219	208.0	6.58	0.100	0.0250	0.405	55.2	0.640	1.00005	0.708
45.0	0.01084	234.0	6.58	0.100	0.0222	0.436	59.4	0.775	1.00004	0.708
50.0	0.009754	260.0	6.58	0.100	0.0200	0.466	63.4	0.920	1.00004	0.707
55.0	0.008867	286.0	6.58	0.100	0.0182	0.495	67.3	1.08	1.00003	0.705
60.0	0.008128	312.0	6.58	0.100	0.0167	0.524	71.0	1.24	1.00003	0.704
65.0	0.007503	338.0	6.58	0.100	0.0154	0.552	74.6	1.42	1.00003	0.702
70.0	0.006967	364.0	6.58	0.100	0.0143	0.579	78.1	1.60	1.00003	0.700
75.0	0.006503	390.0	6.58	0.100	0.0133	0.606	81.6	1.79	1.00002	0.699
80.0	0.006096	416.0	6.58	0.100	0.0125	0.633	84.9	2.00	1.00002	0.697
90.0	0.005419	467.0	6.58	0.100	0.0111	0.684	91.4	2.43	1.00002	0.694
100.0	0.004877	519.0	6.58	0.100	0.0100	0.735	97.7	2.90	1.00002	0.691
125.0	0.003902	649.0	6.58	0.100	0.00800	0.855	111.0	4.22	1.00001	0.673
150.0	0.003252	779.0	6.58	0.100	0.00667	0.968	125.0	5.73	1.00001	0.670
175.0	0.002787	909.0	6.58	0.100	0.00571	1.08	138.0	7.43	1.00001	0.668
200.0	0.002439	1040.0	6.58	0.100	0.00500	1.18	151.0	9.31	1.00001	0.667
225.0	0.002168	1170.0	6.58	0.100	0.00444	1.28	164.0	11.3	1.00001	0.666
250.0	0.001951	1300.0	6.58	0.100	0.00400	1.37	176.0	13.5	1.00001	0.667
275.0	0.001774	1430.0	6.58	0.100	0.00364	1.46	188.0	15.9	1.00001	0.667
300.0	0.001626	1560.0	6.58	0.100	0.00333	1.55	199.0	18.3	1.00001	0.669
350.0	0.001394	1820.0	6.58	0.100	0.00286	1.72	222.0	23.8	1.00001	0.668
400.0	0.001219	2080.0	6.58	0.100	0.00250	1.89	243.0	29.8	1.00000	0.668
450.0	0.001084	2340.0	6.58	0.100	0.00222	2.05	264.0	36.4	1.00000	0.668
500.0	0.0009756	2600.0	6.58	0.100	0.00200	2.21	284.0	43.5	1.00000	0.668
600.0	0.0008130	3120.0	6.58	0.100	0.00167	2.51	322.0	59.4	1.00000	0.667
700.0	0.0006968	3640.0	6.58	0.100	0.00143	2.80	359.0	77.2	1.00000	0.667
800.0	0.0006097	4150.0	6.58	0.100	0.00125	3.07	394.0	97.0	1.00000	0.667
900.0	0.0005420	4670.0	6.58	0.100	0.00111	3.34	428.0	119.0	1.00000	0.666
1000.0	0.0004878	5190.0	6.58	0.100	0.00100	3.60	462.0	142.0	1.00000	0.666
1100.0	0.0004434	5710.0	6.58	0.100	0.000909	3.85	494.0	167.0	1.00000	0.666
1200.0	0.0004065	6230.0	6.58	0.100	0.000833	4.10	525.0	194.0	1.00000	0.666
1300.0	0.0003752	6750.0	6.58	0.100	0.000769	4.34	556.0	222.0	1.00000	0.666
1400.0	0.0003484	7270.0	6.58	0.100	0.000714	4.57	586.0	253.0	1.00000	0.666
1500.0	0.0003252	7790.0	6.58	0.100	0.000667	4.80	615.0	284.0	1.00000	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

0.2 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.176	0.06823								
	2.5	0.06896	431.0	2.64	3.964	4.103	1.981	1.921	2.116	219.2
*	2.889	0.07039	368.0	3.29	4.806	4.949	2.295	1.879	2.304	213.9
*	2.889	2.596	44.6	0.0819	22.74	28.08	10.30	3.254	6.224	92.95
	3.0	2.731	47.7	0.0775	23.14	28.68	10.53	3.231	6.084	95.43
	3.5	3.316	60.9	0.0638	24.89	31.61	11.44	3.169	5.713	105.5
	4.0	3.875	73.0	0.0536	26.57	34.42	12.19	3.141	5.538	114.2
	4.5	4.421	84.6	0.0469	28.20	37.16	12.83	3.127	5.441	122.1
	5.0	4.959	95.9	0.0417	29.82	39.87	13.40	3.120	5.382	129.4
	5.1	0.1862	10.4	2.51	16.60	16.81	4.746	2.915	38.19	117.4
	5.2	0.1306	8.552	1.94	19.83	20.10	5.346	3.152	616.3	104.6
	5.3	5.279	103.0	0.0392	30.78	41.48	13.72	3.118	5.357	133.6
	5.4	5.386	105.0	0.0384	31.10	42.01	13.82	3.118	5.350	134.9
	5.5	5.492	107.0	0.0376	31.42	42.55	13.92	3.117	5.343	136.3
	5.6	5.598	109.0	0.0369	31.74	43.08	14.01	3.117	5.337	137.6
	5.7	5.704	111.0	0.0362	32.06	43.62	14.11	3.116	5.331	138.9
	5.8	5.810	114.0	0.0356	32.38	44.15	14.20	3.116	5.326	140.2
	5.9	5.915	116.0	0.0349	32.69	44.68	14.29	3.116	5.320	141.5
	6.0	6.021	118.0	0.0343	33.01	45.21	14.38	3.115	5.316	142.7
	6.5	6.547	129.0	0.0315	34.60	47.87	14.80	3.115	5.296	148.9
	7.0	7.071	139.0	0.0292	36.18	50.51	15.20	3.114	5.280	154.7
	7.5	7.594	150.0	0.0272	37.76	53.15	15.56	3.114	5.269	160.4
	8.0	8.115	161.0	0.0254	39.33	55.78	15.90	3.114	5.259	165.8
	8.5	8.636	171.0	0.0239	40.91	58.41	16.22	3.115	5.252	171.0
	9.0	9.155	182.0	0.0225	42.48	61.03	16.52	3.115	5.245	176.1
	9.5	9.674	192.0	0.0213	44.05	63.65	16.80	3.115	5.240	181.0
	10.0	10.19	203.0	0.0202	45.62	66.27	17.07	3.115	5.236	185.8
	11.0	11.23	224.0	0.0183	48.75	71.50	17.57	3.115	5.228	195.0
	12.0	12.26	244.0	0.0168	51.88	76.73	18.02	3.116	5.223	203.7
	13.0	13.29	265.0	0.0155	55.01	81.95	18.44	3.116	5.219	212.1
	14.0	14.32	286.0	0.0144	58.14	87.16	18.83	3.116	5.215	220.2
	15.0	15.35	307.0	0.0134	61.27	92.38	19.19	3.116	5.213	227.9
	16.0	16.38	327.0	0.0126	64.39	97.59	19.52	3.116	5.210	235.4
	17.0	17.41	348.0	0.0118	67.52	102.8	19.84	3.116	5.208	242.7
	18.0	18.44	369.0	0.0111	70.64	108.0	20.14	3.116	5.207	249.8
	19.0	19.47	389.0	0.0106	73.76	113.2	20.42	3.116	5.205	256.6
	20.0	20.49	410.0	0.0100	76.88	118.4	20.69	3.116	5.204	263.3
	21.0	21.52	430.0	0.00955	80.01	123.6	20.94	3.116	5.203	269.8
	22.0	22.55	451.0	0.00911	83.13	128.8	21.18	3.116	5.202	276.2
	23.0	23.58	472.0	0.00871	86.25	134.0	21.41	3.116	5.201	282.4
	24.0	24.60	492.0	0.00835	89.37	139.2	21.63	3.116	5.201	288.5
	25.0	25.63	513.0	0.00801	92.49	144.4	21.85	3.116	5.200	294.4
	26.0	26.66	533.0	0.00770	95.61	149.6	22.05	3.116	5.200	300.2
	28.0	28.71	574.0	0.00715	101.8	160.0	22.44	3.116	5.199	311.6
	30.0	30.76	615.0	0.00667	108.1	170.4	22.79	3.116	5.198	322.5
	32.0	32.81	657.0	0.00626	114.3	180.8	23.13	3.116	5.197	333.1
	34.0	34.87	698.0	0.00589	120.6	191.2	23.44	3.116	5.197	343.3
	36.0	36.92	739.0	0.00556	126.8	201.6	23.74	3.116	5.196	353.3
	38.0	38.97	780.0	0.00527	133.0	212.0	24.02	3.116	5.196	362.9
	40.0	41.02	821.0	0.00500	139.3	222.4	24.29	3.116	5.196	372.4
	45.0	46.15	923.0	0.00445	154.8	248.4	24.90	3.116	5.195	394.9
	50.0	51.27	1030.0	0.00400	170.4	274.3	25.45	3.116	5.195	416.3
	55.0	56.40	1130.0	0.00364	186.0	300.3	25.94	3.116	5.194	436.6
	60.0	61.53	1230.0	0.00333	201.6	326.3	26.40	3.116	5.194	456.0
	65.0	66.65	1330.0	0.00308	217.2	352.3	26.81	3.116	5.194	474.6
	70.0	71.78	1440.0	0.00286	232.8	378.2	27.20	3.116	5.194	492.5
	75.0	76.91	1540.0	0.00267	248.3	404.2	27.55	3.116	5.194	509.7
	80.0	82.03	1640.0	0.00250	263.9	430.2	27.89	3.116	5.194	526.4
	90.0	92.28	1850.0	0.00222	295.1	482.1	28.50	3.116	5.194	558.3
	100.0	102.5	2050.0	0.00200	326.2	534.0	29.05	3.116	5.193	588.5
	125.0	128.2	2560.0	0.00160	404.1	663.9	30.21	3.116	5.193	658.0
	150.0	153.8	3080.0	0.00133	482.0	793.7	31.15	3.116	5.193	720.7
	175.0	179.4	3590.0	0.00114	559.9	923.5	31.95	3.116	5.193	778.4
	200.0	205.0	4100.0	0.00100	637.8	1053.0	32.65	3.116	5.193	832.2
	225.0	230.7	4610.0	0.000889	715.7	1183.0	33.26	3.116	5.193	882.6
	250.0	256.3	5130.0	0.000800	793.6	1313.0	33.81	3.116	5.193	930.4
	275.0	281.9	5640.0	0.000727	871.5	1443.0	34.30	3.116	5.193	975.8
	300.0	307.5	6150.0	0.000667	949.4	1573.0	34.75	3.116	5.193	1019.0
	350.0	358.8	7180.0	0.000571	1105.0	1832.0	35.55	3.116	5.193	1101.0
	400.0	410.0	8200.0	0.000500	1261.0	2092.0	36.25	3.116	5.193	1177.0
	450.0	461.3	9230.0	0.000444	1417.0	2352.0	36.86	3.116	5.193	1248.0
	500.0	512.5	10300.0	0.000400	1573.0	2611.0	37.41	3.116	5.193	1316.0
	600.0	615.0	12300.0	0.000333	1884.0	3131.0	38.35	3.116	5.193	1441.0
	700.0	717.5	14400.0	0.000286	2196.0	3650.0	39.15	3.116	5.193	1557.0
	800.0	820.1	16400.0	0.000250	2507.0	4169.0	39.85	3.116	5.193	1664.0
	900.0	922.6	18500.0	0.000222	2819.0	4688.0	40.46	3.116	5.193	1765.0
	1000.0	1025.0	20500.0	0.000200	3131.0	5208.0	41.01	3.116	5.193	1861.0
	1100.0	1128.0	22600.0	0.000182	3442.0	5727.0	41.50	3.116	5.193	1951.0
	1200.0	1230.0	24600.0	0.000167	3754.0	6246.0	41.95	3.116	5.193	2038.0
	1300.0	1333.9	26700.0	0.000154	4065.0	6766.0	42.37	3.116	5.193	2121.0
	1400.0	1436.0	28700.0	0.000143	4377.0	7285.0	42.75	3.116	5.193	2201.0
	1500.0	1538.0	30800.0	0.000133	4688.0	7804.0	43.11	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.2 ATMOSPHERE ISOBAR

	TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
	DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
*	2.176	14.66									
	2.5	14.50	50.0	9.48	62.4	0.0423	0.165	37.5	0.000537	1.05457	0.481
*	2.889	14.21	36.7	12.3	52.3	0.0628	0.176	37.0	0.000537	1.05344	0.486
*	2.889	0.3852	13.0	6.54	0.172	0.477	0.0641	7.61	0.00267	1.00143	0.739
	3.0	0.3661	13.7	6.55	0.175	0.443	0.0661	7.92	0.00297	1.00136	0.728
	3.5	0.3016	16.6	6.60	0.184	0.343	0.0758	9.24	0.00440	1.00112	0.696
	4.0	0.2581	19.5	6.62	0.188	0.285	0.0853	10.5	0.00597	1.00096	0.680
	4.5	0.2262	22.2	6.63	0.191	0.245	0.0944	11.6	0.00767	1.00084	0.671
	5.0	0.2017	24.9	6.63	0.193	0.216	0.103	12.7	0.00949	1.00075	0.666
	5.1	9.414	14.9	9.13	0.977	2.56	0.263	25.2	0.0000730	1.03522	3.66
	5.2	7.658	13.4	8.04	0.0423	45.9	1.75	22.3	0.0000370	1.02859	7.88
	5.3	0.1894	26.6	6.63	0.194	0.202	0.108	13.4	0.0106	1.00070	0.664
	5.4	0.1857	27.1	6.63	0.194	0.197	0.110	13.6	0.0110	1.00069	0.663
	5.5	0.1821	27.6	6.63	0.195	0.193	0.111	13.8	0.0114	1.00067	0.663
	5.6	0.1786	28.2	6.63	0.195	0.189	0.113	14.0	0.0118	1.00066	0.663
	5.7	0.1753	28.7	6.63	0.195	0.186	0.114	14.2	0.0122	1.00065	0.663
	5.8	0.1721	29.3	6.63	0.195	0.182	0.116	14.4	0.0127	1.00064	0.662
	5.9	0.1691	29.8	6.63	0.196	0.179	0.118	14.6	0.0131	1.00063	0.662
	6.0	0.1661	30.3	6.63	0.196	0.175	0.119	14.8	0.0135	1.00061	0.662
	6.5	0.1527	33.0	6.63	0.196	0.160	0.127	15.8	0.0156	1.00057	0.662
	7.0	0.1414	35.7	6.62	0.197	0.148	0.134	16.8	0.0179	1.00052	0.663
	7.5	0.1317	38.3	6.62	0.198	0.137	0.140	17.7	0.0202	1.00049	0.664
	8.0	0.1232	41.0	6.62	0.198	0.128	0.147	18.6	0.0227	1.00046	0.665
	8.5	0.1158	43.6	6.62	0.198	0.120	0.153	19.5	0.0252	1.00043	0.667
	9.0	0.1092	46.3	6.61	0.198	0.113	0.160	20.3	0.0278	1.00040	0.668
	9.5	0.1034	48.9	6.61	0.199	0.107	0.165	21.2	0.0306	1.00038	0.670
	10.0	0.09812	51.5	6.61	0.199	0.102	0.171	22.0	0.0333	1.00036	0.672
	11.0	0.08907	56.8	6.61	0.199	0.0921	0.182	23.5	0.0392	1.00033	0.675
	12.0	0.08157	62.0	6.61	0.199	0.0842	0.193	25.1	0.0453	1.00030	0.678
	13.0	0.07524	67.3	6.60	0.199	0.0776	0.203	26.5	0.0517	1.00028	0.681
	14.0	0.06982	72.5	6.60	0.200	0.0719	0.213	27.9	0.0584	1.00026	0.684
	15.0	0.06514	77.7	6.60	0.200	0.0671	0.222	29.3	0.0654	1.00024	0.687
	16.0	0.06104	82.9	6.60	0.200	0.0628	0.231	30.6	0.0727	1.00023	0.689
	17.0	0.05744	88.2	6.60	0.200	0.0591	0.240	31.9	0.0802	1.00021	0.692
	18.0	0.05423	93.4	6.60	0.200	0.0558	0.248	33.1	0.0880	1.00020	0.694
	19.0	0.05137	98.6	6.59	0.200	0.0528	0.257	34.3	0.0961	1.00019	0.695
	20.0	0.04879	104.0	6.59	0.200	0.0501	0.265	35.5	0.104	1.00018	0.697
	21.0	0.04646	109.0	6.59	0.200	0.0477	0.273	36.7	0.113	1.00017	0.699
	22.0	0.04435	114.0	6.59	0.200	0.0456	0.281	37.8	0.122	1.00016	0.700
	23.0	0.04241	119.0	6.59	0.200	0.0436	0.289	38.9	0.131	1.00016	0.701
	24.0	0.04064	125.0	6.59	0.200	0.0417	0.296	40.0	0.140	1.00015	0.702
	25.0	0.03902	130.0	6.59	0.200	0.0401	0.304	41.0	0.150	1.00014	0.703
	26.0	0.03751	135.0	6.59	0.200	0.0385	0.311	42.1	0.159	1.00014	0.704
	28.0	0.03483	145.0	6.59	0.200	0.0357	0.325	44.1	0.180	1.00013	0.705
	30.0	0.03251	156.0	6.59	0.200	0.0334	0.339	46.1	0.201	1.00012	0.706
	32.0	0.03047	166.0	6.59	0.200	0.0313	0.353	48.0	0.223	1.00011	0.707
	34.0	0.02868	177.0	6.59	0.200	0.0294	0.366	49.9	0.246	1.00011	0.708
	36.0	0.02709	187.0	6.59	0.200	0.0278	0.380	51.7	0.270	1.00010	0.708
	38.0	0.02566	197.0	6.59	0.200	0.0263	0.392	53.5	0.294	1.00009	0.708
	40.0	0.02438	208.0	6.59	0.200	0.0250	0.405	55.2	0.320	1.00009	0.708
	45.0	0.02167	234.0	6.58	0.200	0.0222	0.436	59.4	0.388	1.00008	0.708
	50.0	0.01950	260.0	6.58	0.200	0.0200	0.466	63.4	0.460	1.00007	0.707
	55.0	0.01773	286.0	6.58	0.200	0.0182	0.496	67.3	0.538	1.00007	0.705
	60.0	0.01625	312.0	6.58	0.200	0.0167	0.524	71.0	0.621	1.00006	0.704
	65.0	0.01500	338.0	6.58	0.200	0.0154	0.552	74.6	0.708	1.00006	0.702
	70.0	0.01393	364.0	6.58	0.200	0.0143	0.579	78.1	0.801	1.00005	0.701
	75.0	0.01300	390.0	6.58	0.200	0.0133	0.606	81.6	0.898	1.00005	0.699
	80.0	0.01219	416.0	6.58	0.200	0.0125	0.633	84.9	1.00	1.00005	0.697
	90.0	0.01084	468.0	6.58	0.200	0.0111	0.684	91.4	1.22	1.00004	0.694
	100.0	0.009753	519.0	6.58	0.200	0.0100	0.735	97.7	1.45	1.00004	0.691
	125.0	0.007803	649.0	6.58	0.200	0.00800	0.855	111.0	2.11	1.00003	0.673
	150.0	0.006503	779.0	6.58	0.200	0.00667	0.968	125.0	2.87	1.00002	0.670
	175.0	0.005574	909.0	6.58	0.200	0.00571	1.08	138.0	3.72	1.00002	0.668
	200.0	0.004877	1040.0	6.58	0.200	0.00500	1.18	151.0	4.65	1.00002	0.667
	225.0	0.004335	1170.0	6.58	0.200	0.00444	1.28	164.0	5.67	1.00002	0.666
	250.0	0.003902	1300.0	6.58	0.200	0.00400	1.37	176.0	6.77	1.00001	0.667
	275.0	0.003547	1430.0	6.58	0.200	0.00364	1.46	188.0	7.93	1.00001	0.667
	300.0	0.003252	1560.0	6.58	0.200	0.00333	1.55	199.0	9.16	1.00001	0.669
	350.0	0.002787	1820.0	6.58	0.200	0.00286	1.72	222.0	11.9	1.00001	0.668
	400.0	0.002439	2080.0	6.58	0.200	0.00250	1.89	243.0	14.9	1.00001	0.668
	450.0	0.002168	2340.0	6.58	0.200	0.00222	2.05	264.0	18.2	1.00001	0.668
	500.0	0.001951	2600.0	6.58	0.200	0.00200	2.21	284.0	21.8	1.00001	0.668
	600.0	0.001626	3120.0	6.58	0.200	0.00167	2.51	322.0	29.7	1.00001	0.667
	700.0	0.001394	3640.0	6.58	0.200	0.00143	2.80	359.0	38.6	1.00001	0.667
	800.0	0.001219	4150.0	6.58	0.200	0.00125	3.07	394.0	48.5	1.00000	0.667
	900.0	0.001084	4670.0	6.58	0.200	0.00111	3.34	428.0	59.3	1.00000	0.666
	1000.0	0.0009756	5190.0	6.58	0.200	0.00100	3.60	462.0	71.0	1.00000	0.666
	1100.0	0.0008869	5710.0	6.58	0.200	0.000909	3.85	494.0	83.6	1.00000	0.666
	1200.0	0.0008130	6230.0	6.58	0.200	0.000833	4.10	525.0	97.0	1.00000	0.666
	1300.0	0.0007504	6750.0	6.58	0.200	0.000769	4.34	556.0	111.0	1.00000	0.666
	1400.0	0.0006968	7270.0	6.58	0.200	0.000714	4.57	586.0	126.0	1.00000	0.666
	1500.0	0.0006504	7790.0	6.58	0.200	0.000667	4.80	615.0	142.0	1.00000	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

0.3 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
*	2.175	0.06813								
	2.5	0.06884	436.0	2.64	3.953	4.162	1.977	1.914	2.186	220.6
	3.0	0.07076	354.0	3.40	5.049	5.265	2.378	1.919	2.417	212.5
*	3.163	0.07161	322.0	3.53	5.460	5.678	2.513	1.985	2.620	207.5
*	3.163	1.824	44.7	0.118	23.23	28.77	9.833	3.274	6.581	95.39
	3.5	2.108	54.8	0.100	24.49	30.90	10.47	3.208	6.111	102.8
	4.0	2.502	68.2	0.0838	26.25	33.86	11.26	3.159	5.769	112.4
	4.5	2.880	80.6	0.0724	27.94	36.70	11.93	3.136	5.595	120.7
	5.0	3.249	92.5	0.0640	29.59	39.47	12.52	3.124	5.493	128.4
	5.1	0.1062	10.4	2.51	16.49	16.81	4.746	2.915	38.19	117.4
	5.2	0.1306	0.552	1.94	19.70	20.10	5.346	3.152	616.3	104.6
	5.3	3.467	99.4	0.0599	30.57	41.11	12.83	3.120	5.451	132.6
	5.4	3.539	102.0	0.0587	30.89	41.65	12.94	3.119	5.439	134.0
	5.5	3.611	104.0	0.0575	31.22	42.19	13.04	3.119	5.428	135.4
	5.6	3.683	106.0	0.0563	31.54	42.74	13.13	3.118	5.417	136.8
	5.7	3.755	109.0	0.0552	31.86	43.28	13.23	3.117	5.408	138.1
	5.8	3.827	111.0	0.0542	32.19	43.82	13.32	3.117	5.399	139.4
	5.9	3.898	113.0	0.0532	32.51	44.36	13.42	3.116	5.391	140.7
	6.0	3.970	115.0	0.0522	32.83	44.90	13.51	3.116	5.383	142.0
	6.5	4.326	126.0	0.0479	34.43	47.58	13.94	3.114	5.351	148.3
	7.0	4.679	137.0	0.0442	36.03	50.25	14.33	3.114	5.327	154.3
	7.5	5.031	148.0	0.0411	37.61	52.91	14.70	3.114	5.308	160.0
	8.0	5.382	159.0	0.0384	39.20	55.56	15.04	3.114	5.294	165.4
	8.5	5.731	170.0	0.0361	40.78	58.20	15.36	3.114	5.282	170.7
	9.0	6.080	180.0	0.0340	42.36	60.84	15.66	3.114	5.272	175.9
	9.5	6.428	191.0	0.0321	43.93	63.47	15.95	3.115	5.264	180.8
	10.0	6.775	202.0	0.0305	45.51	66.10	16.22	3.115	5.257	185.6
	11.0	7.468	223.0	0.0276	48.65	71.35	16.72	3.115	5.246	194.9
	12.0	8.159	244.0	0.0253	51.79	76.60	17.17	3.116	5.238	203.7
	13.0	8.850	264.0	0.0233	54.93	81.83	17.59	3.116	5.232	212.1
	14.0	9.539	285.0	0.0216	58.06	87.06	17.98	3.116	5.227	220.2
	15.0	10.23	306.0	0.0201	61.20	92.28	18.34	3.116	5.222	228.0
	16.0	10.91	327.0	0.0189	64.33	97.50	18.68	3.116	5.219	235.5
	17.0	11.60	348.0	0.0177	67.45	102.7	18.99	3.116	5.216	242.8
	18.0	12.29	368.0	0.0167	70.58	107.9	19.29	3.117	5.214	249.8
	19.0	12.98	389.0	0.0159	73.71	113.1	19.57	3.117	5.212	256.7
	20.0	13.66	410.0	0.0151	76.83	118.4	19.84	3.117	5.210	263.4
	21.0	14.35	430.0	0.0143	79.96	123.6	20.09	3.117	5.208	269.9
	22.0	15.03	451.0	0.0137	83.08	128.8	20.34	3.117	5.207	276.3
	23.0	15.72	472.0	0.0131	86.20	134.0	20.57	3.117	5.206	282.5
	24.0	16.40	492.0	0.0125	89.32	139.2	20.79	3.117	5.205	288.6
	25.0	17.09	513.0	0.0120	92.45	144.4	21.00	3.117	5.204	294.5
	26.0	17.77	533.0	0.0116	95.57	149.6	21.21	3.117	5.203	300.3
	28.0	19.14	575.0	0.0107	101.8	160.0	21.59	3.117	5.202	311.7
	30.0	20.51	616.0	0.0100	108.0	170.4	21.95	3.117	5.200	322.6
	32.0	21.88	657.0	0.00939	114.3	180.8	22.29	3.117	5.200	333.2
	34.0	23.25	698.0	0.00883	120.5	191.2	22.60	3.117	5.199	343.4
	36.0	24.62	739.0	0.00834	126.8	201.6	22.90	3.116	5.198	353.4
	38.0	25.99	780.0	0.00790	133.0	212.0	23.18	3.116	5.198	363.1
	40.0	27.35	821.0	0.00751	139.2	222.4	23.45	3.116	5.197	372.5
	45.0	30.77	924.0	0.00667	154.8	248.4	24.06	3.116	5.196	395.0
	50.0	34.19	1030.0	0.00600	170.4	274.3	24.61	3.116	5.196	416.4
	55.0	37.61	1130.0	0.00546	186.0	300.3	25.10	3.116	5.195	436.7
	60.0	41.03	1230.0	0.00500	201.6	326.3	25.55	3.116	5.195	456.1
	65.0	44.44	1330.0	0.00462	217.2	352.3	25.97	3.116	5.194	474.7
	70.0	47.86	1440.0	0.00429	232.8	378.2	26.35	3.116	5.194	492.6
	75.0	51.28	1540.0	0.00400	248.3	404.2	26.71	3.116	5.194	509.8
	80.0	54.70	1640.0	0.00375	263.9	430.2	27.05	3.116	5.194	526.5
	90.0	61.53	1850.0	0.00333	295.1	482.1	27.66	3.116	5.194	558.4
	100.0	68.37	2050.0	0.00300	326.2	534.1	28.21	3.116	5.194	588.6
	125.0	85.45	2560.0	0.00240	404.1	663.9	29.37	3.116	5.193	658.0
	150.0	102.5	3080.0	0.00200	482.0	793.7	30.31	3.116	5.193	720.8
	175.0	119.6	3590.0	0.00171	559.9	923.6	31.11	3.116	5.193	778.5
	200.0	136.7	4100.0	0.00150	637.8	1053.0	31.81	3.116	5.193	832.2
	225.0	153.8	4610.0	0.00133	715.7	1183.0	32.42	3.116	5.193	882.7
	250.0	170.9	5130.0	0.00120	793.6	1313.0	32.96	3.116	5.193	930.4
	275.0	188.0	5640.0	0.00109	871.5	1443.0	33.46	3.116	5.193	975.8
	300.0	205.0	6150.0	0.00100	949.4	1573.0	33.91	3.116	5.193	1019.0
	350.0	239.2	7180.0	0.000857	1105.0	1832.0	34.71	3.116	5.193	1101.0
	400.0	273.4	8200.0	0.000750	1261.0	2092.0	35.41	3.116	5.193	1177.0
	450.0	307.5	9230.0	0.000667	1417.0	2352.0	36.02	3.116	5.193	1248.0
	500.0	341.7	10300.0	0.000600	1573.0	2611.0	36.56	3.116	5.193	1316.0
	600.0	410.0	12300.0	0.000500	1884.0	3131.0	37.51	3.116	5.193	1441.0
	700.0	478.4	14400.0	0.000429	2196.0	3650.0	38.31	3.116	5.193	1557.0
	800.0	546.7	16400.0	0.000375	2507.0	4169.0	39.01	3.116	5.193	1664.0
	900.0	615.0	18500.0	0.000333	2819.0	4689.0	39.62	3.116	5.193	1765.0
	1000.0	683.4	20500.0	0.000300	3131.0	5208.0	40.16	3.116	5.193	1861.0
	1100.0	751.7	22600.0	0.000273	3442.0	5727.0	40.66	3.116	5.193	1951.0
	1200.0	820.0	24600.0	0.000250	3754.0	6246.0	41.11	3.116	5.193	2038.0
	1300.0	888.4	26700.0	0.000231	4065.0	6766.0	41.53	3.116	5.193	2121.0
	1400.0	956.7	28700.0	0.000214	4377.0	7285.0	41.91	3.116	5.193	2201.0
	1500.0	1025.0	30800.0	0.000200	4688.0	7804.0	42.27	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.3 ATMOSPHERE ISOBAR

	TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
	DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
*	2.175	14.68									
	2.5	14.53	50.6	9.50	63.4	0.0417	0.165	37.7	0.000540	1.05466	0.481
	3.0	14.13	35.5	12.5	50.0	0.0680	0.178	36.9	0.000522	1.05316	0.500
*	3.163	13.96	33.4	12.7	45.0	0.0784	0.182	36.3	0.000496	1.05252	0.524
*	3.163	0.5482	13.7	6.56	0.245	0.481	0.0716	8.50	0.00199	1.00203	0.761
	3.5	0.4744	15.8	6.60	0.260	0.386	0.0774	9.38	0.00267	1.00176	0.740
	4.0	0.3996	18.8	6.64	0.273	0.307	0.0864	10.6	0.00375	1.00148	0.708
	4.5	0.3472	21.6	6.65	0.280	0.259	0.0953	11.8	0.00490	1.00129	0.691
	5.0	0.3078	24.4	6.66	0.285	0.225	0.104	12.9	0.00614	1.00114	0.681
	5.1	9.414	14.9	9.13	0.977	2.56	0.263	25.2	0.0000730	1.03522	3.66
	5.2	7.658	13.4	8.04	0.0423	45.9	1.75	22.3	0.0000370	1.02859	7.88
	5.3	0.2885	26.1	6.66	0.287	0.209	0.109	13.5	0.00691	1.00107	0.678
	5.4	0.2826	26.6	6.66	0.287	0.204	0.110	13.7	0.00718	1.00105	0.676
	5.5	0.2769	27.2	6.66	0.288	0.200	0.112	13.9	0.00744	1.00103	0.676
	5.6	0.2715	27.7	6.66	0.288	0.195	0.113	14.1	0.00771	1.00101	0.675
	5.7	0.2663	28.3	6.66	0.289	0.191	0.115	14.3	0.00799	1.00099	0.674
	5.8	0.2613	28.8	6.65	0.289	0.187	0.117	14.5	0.00826	1.00097	0.673
	5.9	0.2565	29.4	6.65	0.290	0.183	0.118	14.7	0.00854	1.00095	0.673
	6.0	0.2519	29.9	6.65	0.290	0.180	0.120	14.9	0.00882	1.00093	0.672
	6.5	0.2312	32.6	6.65	0.292	0.164	0.127	15.9	0.0103	1.00086	0.671
	7.0	0.2137	35.3	6.65	0.293	0.151	0.134	16.9	0.0118	1.00079	0.670
	7.5	0.1988	38.0	6.64	0.294	0.140	0.141	17.8	0.0134	1.00074	0.670
	8.0	0.1858	40.7	6.64	0.295	0.130	0.148	18.7	0.0150	1.00069	0.671
	8.5	0.1745	43.4	6.64	0.296	0.122	0.154	19.6	0.0167	1.00065	0.672
	9.0	0.1645	46.0	6.63	0.297	0.115	0.160	20.4	0.0184	1.00061	0.673
	9.5	0.1556	48.7	6.63	0.297	0.108	0.166	21.2	0.0203	1.00058	0.674
	10.0	0.1476	51.3	6.63	0.297	0.102	0.172	22.0	0.0221	1.00055	0.675
	11.0	0.1339	56.6	6.62	0.298	0.0927	0.183	23.6	0.0260	1.00050	0.678
	12.0	0.1226	61.9	6.62	0.299	0.0847	0.193	25.1	0.0301	1.00045	0.681
	13.0	0.1130	67.1	6.61	0.299	0.0779	0.203	26.6	0.0344	1.00042	0.683
	14.0	0.1048	72.4	6.61	0.299	0.0722	0.213	28.0	0.0389	1.00039	0.686
	15.0	0.09778	77.6	6.61	0.299	0.0673	0.222	29.3	0.0436	1.00036	0.688
	16.0	0.09162	82.9	6.61	0.299	0.0630	0.231	30.6	0.0484	1.00034	0.691
	17.0	0.08619	88.1	6.60	0.300	0.0592	0.240	31.9	0.0534	1.00032	0.693
	18.0	0.08137	93.3	6.60	0.300	0.0559	0.249	33.1	0.0586	1.00030	0.695
	19.0	0.07707	98.5	6.60	0.300	0.0529	0.257	34.4	0.0640	1.00029	0.696
	20.0	0.07320	104.0	6.60	0.300	0.0502	0.265	35.5	0.0696	1.00027	0.698
	21.0	0.06970	109.0	6.60	0.300	0.0478	0.273	36.7	0.0753	1.00026	0.699
	22.0	0.06652	114.0	6.60	0.300	0.0456	0.281	37.8	0.0812	1.00025	0.701
	23.0	0.06362	119.0	6.60	0.300	0.0436	0.289	38.9	0.0872	1.00024	0.702
	24.0	0.06096	125.0	6.60	0.300	0.0418	0.296	40.0	0.0934	1.00023	0.703
	25.0	0.05852	130.0	6.60	0.300	0.0401	0.304	41.1	0.100	1.00022	0.704
	26.0	0.05626	135.0	6.59	0.300	0.0385	0.311	42.1	0.106	1.00021	0.704
	28.0	0.05224	145.0	6.59	0.300	0.0358	0.326	44.2	0.120	1.00019	0.706
	30.0	0.04875	156.0	6.59	0.300	0.0334	0.340	46.1	0.134	1.00018	0.707
	32.0	0.04570	166.0	6.59	0.300	0.0313	0.353	48.1	0.149	1.00017	0.707
	34.0	0.04301	177.0	6.59	0.300	0.0294	0.367	49.9	0.164	1.00016	0.708
	36.0	0.04062	187.0	6.59	0.300	0.0278	0.380	51.7	0.180	1.00015	0.708
	38.0	0.03848	197.0	6.59	0.300	0.0263	0.393	53.5	0.196	1.00014	0.708
	40.0	0.03656	208.0	6.59	0.300	0.0250	0.405	55.3	0.213	1.00014	0.708
	45.0	0.03250	234.0	6.59	0.300	0.0222	0.436	59.5	0.258	1.00012	0.708
	50.0	0.02925	260.0	6.59	0.300	0.0200	0.466	63.5	0.307	1.00011	0.707
	55.0	0.02659	286.0	6.59	0.300	0.0182	0.496	67.3	0.359	1.00010	0.706
	60.0	0.02437	312.0	6.58	0.300	0.0167	0.524	71.0	0.414	1.00009	0.704
	65.0	0.02250	338.0	6.58	0.300	0.0154	0.552	74.7	0.472	1.00008	0.702
	70.0	0.02089	364.0	6.58	0.300	0.0143	0.580	78.2	0.534	1.00008	0.701
	75.0	0.01950	390.0	6.58	0.300	0.0133	0.606	81.6	0.599	1.00007	0.699
	80.0	0.01828	416.0	6.58	0.300	0.0125	0.633	84.9	0.666	1.00007	0.697
	90.0	0.01625	468.0	6.58	0.300	0.0111	0.685	91.4	0.811	1.00006	0.694
	100.0	0.01463	520.0	6.58	0.300	0.0100	0.735	97.7	0.967	1.00005	0.691
	125.0	0.01170	649.0	6.58	0.300	0.00800	0.855	111.8	1.41	1.00004	0.673
	150.0	0.009753	779.0	6.58	0.300	0.00666	0.968	125.0	1.91	1.00004	0.670
	175.0	0.008360	909.0	6.58	0.300	0.00571	1.08	138.0	2.48	1.00003	0.668
	200.0	0.007315	1040.0	6.58	0.300	0.00500	1.18	151.0	3.10	1.00003	0.667
	225.0	0.006503	1170.0	6.58	0.300	0.00444	1.28	164.0	3.78	1.00002	0.666
	250.0	0.005852	1300.0	6.58	0.300	0.00400	1.37	176.0	4.51	1.00002	0.667
	275.0	0.005320	1430.0	6.58	0.300	0.00364	1.46	188.0	5.29	1.00002	0.667
	300.0	0.004877	1560.0	6.58	0.300	0.00333	1.55	199.0	6.11	1.00002	0.669
	350.0	0.004181	1820.0	6.58	0.300	0.00286	1.72	222.0	7.93	1.00002	0.668
	400.0	0.003658	2080.0	6.58	0.300	0.00250	1.89	243.0	9.94	1.00001	0.668
	450.0	0.003252	2340.0	6.58	0.300	0.00222	2.05	264.0	12.1	1.00001	0.668
	500.0	0.002927	2600.0	6.58	0.300	0.00200	2.21	284.0	14.5	1.00001	0.668
	600.0	0.002439	3120.0	6.58	0.300	0.00167	2.51	322.0	19.8	1.00001	0.667
	700.0	0.002090	3640.0	6.58	0.300	0.00143	2.80	359.0	25.7	1.00001	0.667
	800.0	0.001829	4150.0	6.58	0.300	0.00125	3.07	394.0	32.3	1.00001	0.667
	900.0	0.001626	4670.0	6.58	0.300	0.00111	3.34	428.0	39.5	1.00001	0.666
	1000.0	0.001463	5190.0	6.58	0.300	0.00100	3.60	462.0	47.3	1.00001	0.666
	1100.0	0.001330	5710.0	6.58	0.300	0.000909	3.85	494.0	55.7	1.00000	0.666
	1200.0	0.001219	6230.0	6.58	0.300	0.000833	4.10	525.0	64.7	1.00000	0.666
	1300.0	0.001126	6750.0	6.58	0.300	0.000769	4.34	556.0	74.2	1.00000	0.666
	1400.0	0.001045	7270.0	6.58	0.300	0.000714	4.57	586.0	84.2	1.00000	0.666
	1500.0	0.0009756	7790.0	6.58	0.300	0.000667	4.80	615.0	94.8	1.00000	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

0.4 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.174	0.06803								
	2.5	0.06873	442.0	2.64	3.942	4.221	1.973	1.908	2.097	221.9
	3.0	0.07061	360.0	3.41	5.031	5.317	2.372	1.918	2.408	213.9
*	3.380	0.07278	284.0	3.65	6.036	6.331	2.690	2.067	2.918	201.5
*	3.380	1.413	44.0	0.153	23.56	29.28	9.493	3.289	6.941	96.97
	3.5	1.495	48.0	0.144	24.04	30.10	9.730	3.258	6.674	99.9
	4.0	1.812	63.1	0.117	25.91	33.26	10.57	3.181	6.057	110.3
	4.5	2.108	76.5	0.100	27.66	36.21	11.27	3.146	5.773	119.3
	5.0	2.392	89.0	0.0874	29.35	39.05	11.87	3.129	5.616	127.2
	5.1	2.448	91.4	0.0853	29.69	39.61	11.98	3.127	5.593	128.7
	5.2	0.1320	0.306	1.92	19.70	20.24	5.373	3.164	1108.0	104.1
	5.3	2.561	96.2	0.0815	30.35	40.73	12.19	3.123	5.553	131.7
	5.4	2.615	98.6	0.0798	30.68	41.28	12.30	3.122	5.536	133.1
	5.5	2.670	101.0	0.0781	31.01	41.83	12.40	3.121	5.519	134.5
	5.6	2.725	103.0	0.0765	31.34	42.38	12.50	3.120	5.504	135.9
	5.7	2.780	106.0	0.0749	31.67	42.93	12.60	3.119	5.490	137.3
	5.8	2.835	108.0	0.0735	31.99	43.48	12.69	3.118	5.478	138.6
	5.9	2.890	110.0	0.0720	32.32	44.03	12.79	3.117	5.466	140.0
	6.0	2.944	113.0	0.0707	32.64	44.58	12.88	3.116	5.454	141.3
	6.5	3.215	124.0	0.0647	34.26	47.29	13.31	3.114	5.409	147.7
	7.0	3.483	135.0	0.0596	35.87	49.99	13.71	3.113	5.375	153.8
	7.5	3.750	146.0	0.0553	37.47	52.67	14.08	3.113	5.349	159.6
	8.0	4.015	157.0	0.0516	39.06	55.34	14.43	3.113	5.329	165.1
	8.5	4.279	168.0	0.0484	40.65	58.00	14.75	3.113	5.313	170.5
	9.0	4.542	179.0	0.0456	42.24	60.65	15.05	3.114	5.299	175.6
	9.5	4.805	190.0	0.0431	43.82	63.30	15.34	3.114	5.288	180.6
	10.0	5.067	200.0	0.0408	45.40	65.94	15.61	3.114	5.279	185.5
	11.0	5.589	222.0	0.0370	48.56	71.21	16.11	3.115	5.264	194.8
	12.0	6.109	243.0	0.0338	51.70	76.46	16.57	3.116	5.253	203.6
	13.0	6.629	264.0	0.0311	54.85	81.71	16.99	3.116	5.245	212.1
	14.0	7.147	285.0	0.0289	57.99	86.95	17.38	3.116	5.238	220.2
	15.0	7.665	306.0	0.0269	61.12	92.19	17.74	3.116	5.232	228.0
	16.0	8.181	327.0	0.0252	64.26	97.42	18.08	3.117	5.228	235.5
	17.0	8.698	347.0	0.0237	67.39	102.6	18.39	3.117	5.224	242.8
	18.0	9.214	368.0	0.0224	70.52	107.9	18.69	3.117	5.220	249.9
	19.0	9.729	389.0	0.0212	73.65	113.1	18.97	3.117	5.218	256.8
	20.0	10.24	410.0	0.0201	76.78	118.3	19.24	3.117	5.215	263.5
	21.0	10.76	430.0	0.0191	79.91	123.5	19.49	3.117	5.213	270.0
	22.0	11.27	451.0	0.0183	83.03	128.7	19.74	3.117	5.211	276.4
	23.0	11.79	472.0	0.0175	86.16	133.9	19.97	3.117	5.210	282.6
	24.0	12.30	492.0	0.0167	89.28	139.1	20.19	3.117	5.208	288.7
	25.0	12.82	513.0	0.0161	92.40	144.4	20.40	3.117	5.207	294.6
	26.0	13.33	534.0	0.0154	95.53	149.6	20.61	3.117	5.206	300.5
	28.0	14.36	575.0	0.0143	101.8	160.0	20.99	3.117	5.204	311.8
	30.0	15.39	616.0	0.0134	108.0	170.4	21.35	3.117	5.203	322.7
	32.0	16.41	657.0	0.0125	114.3	180.8	21.69	3.117	5.202	333.3
	34.0	17.44	698.0	0.0118	120.5	191.2	22.00	3.117	5.201	343.6
	36.0	18.47	739.0	0.0111	126.7	201.6	22.30	3.117	5.200	353.5
	38.0	19.49	780.0	0.0105	133.0	212.0	22.58	3.117	5.199	363.2
	40.0	20.52	822.0	0.0100	139.2	222.4	22.85	3.117	5.198	372.6
	45.0	23.08	924.0	0.00890	154.8	248.4	23.46	3.117	5.197	395.2
	50.0	25.65	1030.0	0.00801	170.4	274.4	24.01	3.116	5.196	416.5
	55.0	28.21	1130.0	0.00728	186.0	300.3	24.50	3.116	5.196	436.8
	60.0	30.78	1230.0	0.00667	201.6	326.3	24.96	3.116	5.195	456.2
	65.0	33.34	1330.0	0.00616	217.2	352.3	25.37	3.116	5.195	474.8
	70.0	35.90	1440.0	0.00572	232.7	378.3	25.76	3.116	5.195	492.7
	75.0	38.47	1540.0	0.00533	248.3	404.2	26.11	3.116	5.194	509.9
	80.0	41.03	1640.0	0.00500	263.9	430.2	26.45	3.116	5.194	526.6
	90.0	46.16	1850.0	0.00444	295.1	482.1	27.06	3.116	5.194	558.5
	100.0	51.28	2050.0	0.00400	326.2	534.1	27.61	3.116	5.194	588.7
	125.0	64.10	2570.0	0.00320	404.1	663.9	28.77	3.116	5.193	658.1
	150.0	76.91	3080.0	0.00267	482.0	793.8	29.71	3.116	5.193	720.9
	175.0	89.72	3590.0	0.00229	559.9	923.6	30.51	3.116	5.193	778.6
	200.0	102.5	4100.0	0.00200	637.8	1053.0	31.21	3.116	5.193	832.3
	225.0	115.3	4620.0	0.00178	715.7	1183.0	31.82	3.116	5.193	882.7
	250.0	128.2	5130.0	0.00160	793.6	1313.0	32.37	3.116	5.193	930.5
	275.0	141.0	5640.0	0.00145	871.5	1443.0	32.86	3.116	5.193	975.9
	300.0	153.8	6150.0	0.00133	949.4	1573.0	33.31	3.116	5.193	1019.0
	350.0	179.4	7180.0	0.00114	1105.0	1832.0	34.11	3.116	5.193	1101.0
	400.0	205.0	8200.0	0.00100	1261.0	2092.0	34.81	3.116	5.193	1177.0
	450.0	230.7	9230.0	0.000889	1417.0	2352.0	35.42	3.116	5.193	1248.0
	500.0	256.3	10300.0	0.000800	1573.0	2611.0	35.97	3.116	5.193	1316.0
	600.0	307.5	12300.0	0.000667	1884.0	3131.0	36.91	3.116	5.193	1441.0
	700.0	358.8	14400.0	0.000571	2196.0	3650.0	37.71	3.116	5.193	1557.0
	800.0	410.0	16400.0	0.000500	2507.0	4169.0	38.41	3.116	5.193	1664.0
	900.0	461.3	18500.0	0.000444	2819.0	4689.0	39.02	3.116	5.193	1765.0
	1000.0	512.5	20500.0	0.000400	3131.0	5208.0	39.57	3.116	5.193	1861.0
	1100.0	563.8	22600.0	0.000364	3442.0	5727.0	40.06	3.116	5.193	1951.0
	1200.0	615.0	24600.0	0.000333	3754.0	6246.0	40.51	3.116	5.193	2038.0
	1300.0	666.3	26700.0	0.000308	4065.0	6766.0	40.93	3.116	5.193	2121.0
	1400.0	717.5	28700.0	0.000286	4377.0	7285.0	41.31	3.116	5.193	2201.0
	1500.0	768.8	30800.0	0.000267	4688.0	7804.0	41.67	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.4 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.174	14.70									
2.5	14.55	51.1	9.51	64.4	0.0411	0.166	38.0	0.000543	1.05476	0.481
3.0	14.16	36.0	12.6	51.0	0.0669	0.179	37.2	0.000525	1.05327	0.500
* 3.380	13.74	31.2	12.8	39.0	0.0935	0.186	35.6	0.000463	1.05166	0.558
* 3.380	0.7076	14.1	6.58	0.311	0.492	0.0778	9.23	0.00156	1.00262	0.824
3.5	0.6589	14.9	6.60	0.321	0.448	0.0795	9.53	0.00178	1.00249	0.803
4.0	0.5519	18.1	6.65	0.348	0.335	0.0877	10.8	0.00262	1.00204	0.743
4.5	0.4745	21.0	6.67	0.363	0.274	0.0962	11.9	0.00351	1.00176	0.714
5.0	0.4160	23.9	6.68	0.372	0.235	0.105	13.0	0.00445	1.00155	0.698
5.1	0.4085	24.5	6.68	0.373	0.228	0.106	13.2	0.00465	1.00151	0.696
5.2	7.578	13.4	8.00	0.0232	82.8	3.02	22.2	0.000360	1.02829	8.13
5.3	0.3907	25.6	6.68	0.376	0.217	0.109	13.6	0.00564	1.00145	0.692
5.4	0.3824	26.2	6.68	0.377	0.211	0.111	13.8	0.00624	1.00142	0.690
5.5	0.3745	26.7	6.68	0.378	0.206	0.113	14.0	0.00685	1.00139	0.689
5.6	0.3669	27.3	6.68	0.379	0.202	0.114	14.3	0.00745	1.00136	0.688
5.7	0.3597	27.9	6.68	0.380	0.197	0.116	14.5	0.00806	1.00133	0.686
5.8	0.3527	28.4	6.68	0.381	0.193	0.117	14.7	0.00867	1.00131	0.685
5.9	0.3461	29.0	6.68	0.382	0.189	0.119	14.9	0.00928	1.00128	0.684
6.0	0.3397	29.5	6.68	0.383	0.185	0.120	15.1	0.00989	1.00126	0.683
6.5	0.3111	32.3	6.67	0.386	0.168	0.128	16.0	0.00758	1.00115	0.680
7.0	0.2871	35.0	6.67	0.388	0.154	0.135	17.0	0.00873	1.00106	0.678
7.5	0.2667	37.7	6.66	0.390	0.142	0.141	17.9	0.00992	1.00099	0.677
8.0	0.2491	40.4	6.66	0.392	0.132	0.148	18.8	0.0112	1.00092	0.676
8.5	0.2337	43.1	6.65	0.393	0.123	0.154	19.6	0.0124	1.00087	0.677
9.0	0.2202	45.8	6.65	0.394	0.116	0.160	20.5	0.0138	1.00082	0.677
9.5	0.2081	48.5	6.65	0.395	0.109	0.166	21.3	0.0151	1.00077	0.678
10.0	0.1974	51.1	6.64	0.395	0.103	0.172	22.1	0.0165	1.00073	0.679
11.0	0.1789	56.4	6.64	0.397	0.0933	0.183	23.7	0.0194	1.00066	0.681
12.0	0.1637	61.7	6.63	0.397	0.0851	0.194	25.2	0.0225	1.00061	0.683
13.0	0.1509	67.0	6.63	0.398	0.0783	0.204	26.6	0.0257	1.00056	0.686
14.0	0.1399	72.3	6.62	0.398	0.0725	0.213	28.0	0.0291	1.00052	0.688
15.0	0.1305	77.5	6.62	0.399	0.0675	0.223	29.4	0.0326	1.00048	0.690
16.0	0.1222	82.8	6.62	0.399	0.0631	0.232	30.7	0.0363	1.00045	0.692
17.0	0.1150	88.0	6.61	0.399	0.0593	0.241	32.1	0.0401	1.00043	0.694
18.0	0.1085	93.3	6.61	0.400	0.0560	0.249	33.2	0.0440	1.00040	0.696
19.0	0.1028	98.5	6.61	0.400	0.0530	0.257	34.4	0.0480	1.00038	0.697
20.0	0.09761	104.0	6.61	0.400	0.0503	0.266	35.6	0.0522	1.00036	0.699
21.0	0.09294	109.0	6.61	0.400	0.0479	0.274	36.7	0.0565	1.00034	0.700
22.0	0.08870	114.0	6.60	0.400	0.0456	0.281	37.9	0.0609	1.00033	0.701
23.0	0.08483	119.0	6.60	0.400	0.0436	0.289	39.0	0.0654	1.00031	0.702
24.0	0.08128	125.0	6.60	0.400	0.0418	0.297	40.0	0.0701	1.00030	0.703
25.0	0.07802	130.0	6.60	0.400	0.0401	0.304	41.1	0.0748	1.00029	0.704
26.0	0.07501	135.0	6.60	0.400	0.0386	0.311	42.2	0.0797	1.00028	0.705
28.0	0.06964	145.0	6.60	0.400	0.0358	0.326	44.2	0.0899	1.00026	0.706
30.0	0.06499	156.0	6.60	0.400	0.0334	0.340	46.2	0.100	1.00024	0.707
32.0	0.06092	166.0	6.59	0.400	0.0313	0.353	48.1	0.112	1.00023	0.708
34.0	0.05734	177.0	6.59	0.400	0.0294	0.367	50.0	0.123	1.00021	0.708
36.0	0.05415	187.0	6.59	0.400	0.0278	0.380	51.8	0.135	1.00020	0.708
38.0	0.05130	198.0	6.59	0.400	0.0263	0.393	53.5	0.147	1.00019	0.709
40.0	0.04873	208.0	6.59	0.400	0.0250	0.406	55.3	0.160	1.00018	0.709
45.0	0.04332	234.0	6.59	0.400	0.0222	0.437	59.5	0.194	1.00016	0.708
50.0	0.03899	260.0	6.59	0.400	0.0200	0.467	63.5	0.230	1.00014	0.707
55.0	0.03544	286.0	6.59	0.400	0.0182	0.496	67.3	0.269	1.00013	0.706
60.0	0.03249	312.0	6.59	0.400	0.0167	0.524	71.1	0.311	1.00012	0.704
65.0	0.02999	338.0	6.59	0.400	0.0154	0.552	74.7	0.354	1.00011	0.702
70.0	0.02785	364.0	6.59	0.400	0.0143	0.580	78.2	0.401	1.00010	0.701
75.0	0.02600	390.0	6.58	0.400	0.0133	0.607	81.6	0.449	1.00010	0.699
80.0	0.02437	416.0	6.58	0.400	0.0125	0.633	84.9	0.500	1.00009	0.697
90.0	0.02167	468.0	6.58	0.400	0.0111	0.685	91.4	0.608	1.00008	0.694
100.0	0.01950	520.0	6.58	0.400	0.0100	0.735	97.7	0.726	1.00007	0.691
125.0	0.01560	649.0	6.58	0.400	0.00800	0.855	111.3	1.06	1.00006	0.673
150.0	0.01300	779.0	6.58	0.400	0.00666	0.968	125.0	1.43	1.00005	0.670
175.0	0.01115	909.0	6.58	0.400	0.00571	1.08	138.0	1.86	1.00004	0.668
200.0	0.009753	1040.0	6.58	0.400	0.00500	1.18	151.0	2.33	1.00004	0.667
225.0	0.008670	1170.0	6.58	0.400	0.00444	1.28	164.0	2.84	1.00003	0.666
250.0	0.007803	1300.0	6.58	0.400	0.00400	1.37	176.0	3.38	1.00003	0.667
275.0	0.007094	1430.0	6.58	0.400	0.00364	1.46	188.0	3.97	1.00003	0.667
300.0	0.006503	1560.0	6.58	0.400	0.00333	1.55	199.0	4.58	1.00002	0.669
350.0	0.005574	1820.0	6.58	0.400	0.00286	1.72	222.0	5.95	1.00002	0.668
400.0	0.004877	2080.0	6.58	0.400	0.00250	1.89	243.0	7.45	1.00002	0.668
450.0	0.004335	2340.0	6.58	0.400	0.00222	2.05	264.0	9.10	1.00002	0.668
500.0	0.003902	2600.0	6.58	0.400	0.00200	2.21	284.0	10.9	1.00001	0.668
600.0	0.003252	3120.0	6.58	0.400	0.00167	2.51	322.0	14.8	1.00001	0.667
700.0	0.002787	3640.0	6.58	0.400	0.00143	2.80	359.0	19.3	1.00001	0.667
800.0	0.002439	4150.0	6.58	0.400	0.00125	3.07	394.0	24.3	1.00001	0.667
900.0	0.002168	4670.0	6.58	0.400	0.00111	3.34	428.0	29.7	1.00001	0.666
1000.0	0.001951	5190.0	6.58	0.400	0.00100	3.60	462.0	35.5	1.00001	0.666
1100.0	0.001774	5710.0	6.58	0.400	0.000909	3.85	494.0	41.8	1.00001	0.666
1200.0	0.001626	6230.0	6.58	0.400	0.000833	4.10	525.0	48.5	1.00001	0.666
1300.0	0.001501	6750.0	6.58	0.400	0.000769	4.34	556.0	55.6	1.00001	0.666
1400.0	0.001394	7270.0	6.58	0.400	0.000714	4.57	586.0	63.1	1.00001	0.666
1500.0	0.001301	7790.0	6.58	0.400	0.000667	4.80	615.0	71.1	1.00000	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

0.5 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.173	0.06792								
	2.5	0.06862	448.0	2.64	3.932	4.280	1.968	1.902	2.088	223.2
	3.0	0.07046	366.0	3.42	5.013	5.370	2.366	1.917	2.398	215.4
	3.5	0.07344	265.0	3.70	6.366	6.738	2.786	2.109	3.096	198.7
*	3.563	0.07393	252.0	3.71	6.564	6.938	2.843	2.131	3.212	196.1
*	3.563	1.155	42.8	0.189	23.78	29.63	9.222	3.301	7.317	98.07
	4.0	1.394	57.7	0.153	25.54	32.60	10.01	3.208	6.423	108.2
	4.5	1.642	72.2	0.129	27.37	35.69	10.74	3.159	5.983	117.7
	5.0	1.877	85.4	0.112	29.11	38.62	11.35	3.135	5.755	126.1
	5.1	1.923	88.0	0.109	29.45	39.19	11.47	3.132	5.723	127.6
	5.2	1.969	90.5	0.107	29.79	39.77	11.58	3.130	5.693	129.2
	5.3	2.015	93.0	0.104	30.13	40.33	11.69	3.127	5.666	130.7
	5.4	2.060	95.5	0.102	30.46	40.90	11.79	3.125	5.642	132.2
	5.5	2.105	97.9	0.0995	30.80	41.46	11.90	3.123	5.619	133.6
	5.6	2.150	100.0	0.0974	31.13	42.02	12.00	3.122	5.599	135.0
	5.7	2.195	103.0	0.0953	31.46	42.58	12.10	3.121	5.580	136.5
	5.8	2.239	105.0	0.0934	31.79	43.14	12.19	3.119	5.562	137.9
	5.9	2.284	108.0	0.0915	32.12	43.69	12.29	3.118	5.546	139.2
	6.0	2.328	110.0	0.0897	32.45	44.25	12.38	3.117	5.531	140.6
	6.5	2.548	122.0	0.0819	34.09	47.00	12.82	3.114	5.470	147.1
	7.0	2.765	133.0	0.0753	35.71	49.72	13.22	3.113	5.425	153.3
	7.5	2.981	144.0	0.0698	37.32	52.42	13.60	3.113	5.391	159.2
	8.0	3.195	156.0	0.0651	38.93	55.11	13.94	3.113	5.365	164.8
	8.5	3.408	167.0	0.0610	40.52	57.79	14.27	3.113	5.344	170.2
	9.0	3.620	178.0	0.0573	42.12	60.46	14.57	3.113	5.327	175.4
	9.5	3.831	188.0	0.0542	43.71	63.12	14.86	3.114	5.313	180.5
	10.0	4.042	199.0	0.0513	45.29	65.77	15.13	3.114	5.301	185.3
	11.0	4.461	221.0	0.0464	48.46	71.06	15.64	3.115	5.282	194.7
	12.0	4.879	242.0	0.0424	51.61	76.33	16.10	3.115	5.269	203.6
	13.0	5.296	263.0	0.0391	54.76	81.59	16.52	3.116	5.258	212.1
	14.0	5.712	284.0	0.0362	57.91	86.85	16.91	3.116	5.249	220.2
	15.0	6.127	305.0	0.0337	61.05	92.09	17.27	3.117	5.242	228.0
	16.0	6.541	326.0	0.0316	64.19	97.33	17.61	3.117	5.236	235.6
	17.0	6.955	347.0	0.0297	67.33	102.6	17.93	3.117	5.231	242.9
	18.0	7.369	368.0	0.0280	70.46	107.8	18.22	3.117	5.227	250.0
	19.0	7.782	389.0	0.0265	73.59	113.0	18.51	3.117	5.224	256.9
	20.0	8.195	409.0	0.0252	76.73	118.2	18.77	3.117	5.221	263.6
	21.0	8.607	430.0	0.0239	79.86	123.5	19.03	3.117	5.218	270.1
	22.0	9.019	451.0	0.0228	82.98	128.7	19.27	3.117	5.216	276.5
	23.0	9.431	472.0	0.0218	86.11	133.9	19.50	3.117	5.214	282.7
	24.0	9.843	492.0	0.0209	89.24	139.1	19.73	3.117	5.212	288.8
	25.0	10.25	513.0	0.0201	92.36	144.3	19.94	3.117	5.211	294.7
	26.0	10.67	534.0	0.0193	95.49	149.5	20.14	3.117	5.209	300.6
	28.0	11.49	575.0	0.0179	101.7	159.9	20.53	3.117	5.207	311.9
	30.0	12.31	616.0	0.0167	108.0	170.4	20.89	3.117	5.205	322.9
	32.0	13.13	657.0	0.0157	114.2	180.8	21.22	3.117	5.204	333.4
	34.0	13.96	699.0	0.0147	120.5	191.2	21.54	3.117	5.202	343.7
	36.0	14.78	740.0	0.0139	126.7	201.6	21.84	3.117	5.201	353.6
	38.0	15.60	781.0	0.0132	133.0	212.0	22.12	3.117	5.201	363.3
	40.0	16.42	822.0	0.0125	139.2	222.4	22.38	3.117	5.200	372.7
	45.0	18.47	925.0	0.0111	154.8	248.4	23.00	3.117	5.198	395.3
	50.0	20.52	1030.0	0.0100	170.4	274.4	23.54	3.117	5.197	416.6
	55.0	22.58	1130.0	0.00910	186.0	300.3	24.04	3.117	5.196	436.9
	60.0	24.63	1230.0	0.00834	201.6	326.3	24.49	3.116	5.196	456.3
	65.0	26.68	1340.0	0.00770	217.1	352.3	24.91	3.116	5.195	474.9
	70.0	28.73	1440.0	0.00715	232.7	378.3	25.29	3.116	5.195	492.8
	75.0	30.78	1540.0	0.00667	248.3	404.3	25.65	3.116	5.195	510.0
	80.0	32.83	1640.0	0.00625	263.9	430.2	25.99	3.116	5.195	526.7
	90.0	36.93	1850.0	0.00556	295.1	482.2	26.60	3.116	5.194	558.6
	100.0	41.03	2050.0	0.00500	326.2	534.1	27.15	3.116	5.194	588.8
	125.0	51.28	2570.0	0.00400	404.1	663.9	28.30	3.116	5.194	658.2
	150.0	61.53	3080.0	0.00333	482.0	793.8	29.25	3.116	5.193	720.9
	175.0	71.78	3590.0	0.00286	559.9	923.6	30.05	3.116	5.193	778.6
	200.0	82.03	4100.0	0.00250	637.8	1053.0	30.74	3.116	5.193	832.4
	225.0	92.28	4620.0	0.00222	715.7	1183.0	31.36	3.116	5.193	882.8
	250.0	102.5	5130.0	0.00200	793.6	1313.0	31.90	3.116	5.193	930.5
	275.0	112.8	5640.0	0.00182	871.5	1443.0	32.40	3.116	5.193	975.9
	300.0	123.0	6150.0	0.00167	949.4	1573.0	32.85	3.116	5.193	1019.0
	350.0	143.5	7180.0	0.00143	1105.0	1832.0	33.65	3.116	5.193	1101.0
	400.0	164.0	8200.0	0.00125	1261.0	2092.0	34.34	3.116	5.193	1177.0
	450.0	184.5	9230.0	0.00111	1417.0	2352.0	34.96	3.116	5.193	1248.0
	500.0	205.0	10300.0	0.00100	1573.0	2611.0	35.50	3.116	5.193	1316.0
	600.0	246.0	12300.0	0.000833	1884.0	3131.0	36.45	3.116	5.193	1441.0
	700.0	287.0	14400.0	0.000714	2196.0	3650.0	37.25	3.116	5.193	1557.0
	800.0	328.0	16400.0	0.000625	2507.0	4169.0	37.94	3.116	5.193	1664.0
	900.0	369.0	18500.0	0.000556	2819.0	4689.0	38.56	3.116	5.193	1765.0
	1000.0	410.0	20500.0	0.000500	3131.0	5208.0	39.10	3.116	5.193	1861.0
	1100.0	451.0	22600.0	0.000455	3442.0	5727.0	39.60	3.116	5.193	1951.0
	1200.0	492.0	24600.0	0.000417	3754.0	6246.0	40.05	3.116	5.193	2038.0
	1300.0	533.0	26700.0	0.000385	4065.0	6766.0	40.47	3.116	5.193	2121.0
	1400.0	574.0	28700.0	0.000357	4377.0	7285.0	40.85	3.116	5.193	2201.0
	1500.0	615.0	30800.0	0.000333	4688.0	7804.0	41.21	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_p$ J/G	$V(\partial P/\partial U)_v$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)_p/V$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.173	14.72									
2.5	14.57	51.6	9.53	65.3	0.0405	0.166	38.2	0.000545	1.05485	0.481
3.0	14.19	36.5	12.6	51.9	0.0658	0.179	37.4	0.000527	1.05339	0.500
3.5	13.62	30.2	12.9	36.1	0.102	0.188	35.2	0.000446	1.05119	0.579
* 3.563	13.53	29.5	12.9	34.1	0.109	0.189	34.8	0.000435	1.05084	0.592
* 3.563	0.8560	14.4	6.61	0.371	0.510	0.0832	9.87	0.00131	1.00321	0.868
4.0	0.7175	17.3	6.67	0.414	0.371	0.0892	10.9	0.00194	1.00266	0.785
4.5	0.6090	20.4	6.70	0.443	0.293	0.0973	12.1	0.00267	1.00226	0.741
5.0	0.5327	23.4	6.70	0.455	0.246	0.105	13.1	0.00344	1.00197	0.717
5.1	0.5199	24.0	6.71	0.458	0.239	0.107	13.3	0.00360	1.00193	0.714
5.2	0.5078	24.6	6.71	0.460	0.232	0.109	13.6	0.00376	1.00188	0.711
5.3	0.4964	25.1	6.71	0.462	0.225	0.110	13.8	0.00392	1.00184	0.708
5.4	0.4854	25.7	6.71	0.464	0.219	0.112	14.0	0.00408	1.00180	0.706
5.5	0.4750	26.3	6.71	0.465	0.214	0.113	14.2	0.00424	1.00176	0.703
5.6	0.4651	26.8	6.71	0.467	0.209	0.115	14.4	0.00441	1.00172	0.701
5.7	0.4556	27.4	6.70	0.468	0.204	0.116	14.6	0.00458	1.00169	0.699
5.8	0.4466	28.0	6.70	0.470	0.199	0.118	14.8	0.00475	1.00165	0.698
5.9	0.4379	28.5	6.70	0.471	0.194	0.119	15.0	0.00492	1.00162	0.696
6.0	0.4295	29.1	6.70	0.472	0.190	0.121	15.2	0.00509	1.00159	0.694
6.5	0.3925	31.9	6.70	0.477	0.171	0.128	16.1	0.00597	1.00145	0.689
7.0	0.3616	34.7	6.69	0.481	0.156	0.135	17.1	0.00689	1.00134	0.685
7.5	0.3355	37.4	6.68	0.484	0.144	0.142	18.0	0.00785	1.00124	0.683
8.0	0.3130	40.1	6.68	0.487	0.134	0.148	18.9	0.00884	1.00116	0.682
8.5	0.2935	42.9	6.67	0.489	0.125	0.155	19.7	0.00987	1.00109	0.682
9.0	0.2763	45.6	6.67	0.490	0.117	0.161	20.6	0.0109	1.00102	0.681
9.5	0.2610	48.2	6.66	0.492	0.110	0.167	21.4	0.0120	1.00097	0.682
10.0	0.2474	50.9	6.66	0.493	0.104	0.172	22.2	0.0132	1.00092	0.682
11.0	0.2242	56.3	6.65	0.495	0.0939	0.184	23.8	0.0155	1.00083	0.684
12.0	0.2049	61.6	6.64	0.496	0.0856	0.194	25.2	0.0180	1.00076	0.686
13.0	0.1888	66.9	6.64	0.497	0.0786	0.204	26.7	0.0206	1.00070	0.688
14.0	0.1751	72.2	6.63	0.498	0.0727	0.214	28.1	0.0233	1.00065	0.690
15.0	0.1632	77.4	6.63	0.498	0.0677	0.223	29.4	0.0261	1.00060	0.691
16.0	0.1529	82.7	6.62	0.499	0.0633	0.232	30.7	0.0290	1.00057	0.693
17.0	0.1438	88.0	6.62	0.499	0.0595	0.241	32.0	0.0320	1.00053	0.695
18.0	0.1357	93.2	6.62	0.499	0.0561	0.249	33.2	0.0352	1.00050	0.697
19.0	0.1285	98.5	6.62	0.499	0.0531	0.258	34.4	0.0384	1.00048	0.698
20.0	0.1220	104.0	6.61	0.500	0.0504	0.266	35.6	0.0417	1.00045	0.699
21.0	0.1162	109.0	6.61	0.500	0.0479	0.274	36.8	0.0452	1.00043	0.701
22.0	0.1109	114.0	6.61	0.500	0.0457	0.282	37.9	0.0487	1.00041	0.702
23.0	0.1060	119.0	6.61	0.500	0.0437	0.289	39.0	0.0523	1.00039	0.703
24.0	0.1016	125.0	6.61	0.500	0.0418	0.297	40.1	0.0561	1.00038	0.704
25.0	0.09751	130.0	6.61	0.500	0.0401	0.304	41.1	0.0599	1.00036	0.704
26.0	0.09375	135.0	6.60	0.500	0.0386	0.312	42.2	0.0638	1.00035	0.705
28.0	0.08704	145.0	6.60	0.500	0.0358	0.326	44.2	0.0719	1.00032	0.706
30.0	0.08122	156.0	6.60	0.500	0.0334	0.340	46.2	0.0804	1.00030	0.707
32.0	0.07614	166.0	6.60	0.501	0.0313	0.354	48.1	0.0893	1.00028	0.708
34.0	0.07166	177.0	6.60	0.501	0.0294	0.367	50.0	0.0985	1.00027	0.708
36.0	0.05767	187.0	6.60	0.501	0.0278	0.380	51.8	0.108	1.00025	0.709
38.0	0.06411	198.0	6.59	0.501	0.0263	0.393	53.6	0.118	1.00024	0.709
40.0	0.06090	208.0	6.59	0.501	0.0250	0.406	55.3	0.128	1.00023	0.709
45.0	0.05414	234.0	6.59	0.501	0.0222	0.437	59.5	0.155	1.00020	0.708
50.0	0.04872	260.0	6.59	0.501	0.0200	0.467	63.5	0.184	1.00018	0.707
55.0	0.04430	286.0	6.59	0.501	0.0182	0.496	67.4	0.216	1.00016	0.706
60.0	0.04061	312.0	6.59	0.501	0.0167	0.525	71.1	0.249	1.00015	0.704
65.0	0.03748	338.0	6.59	0.501	0.0154	0.552	74.7	0.284	1.00014	0.702
70.0	0.03481	364.0	6.59	0.501	0.0143	0.580	78.2	0.321	1.00013	0.701
75.0	0.03249	390.0	6.59	0.501	0.0133	0.607	81.6	0.359	1.00012	0.699
80.0	0.03046	416.0	6.59	0.501	0.0125	0.633	85.0	0.400	1.00011	0.697
90.0	0.02708	468.0	6.58	0.501	0.0111	0.685	91.4	0.487	1.00010	0.694
100.0	0.02437	520.0	6.58	0.501	0.0100	0.735	97.7	0.581	1.00009	0.691
125.0	0.01950	650.0	6.58	0.501	0.00800	0.855	111.0	0.844	1.00007	0.673
150.0	0.01625	779.0	6.58	0.501	0.00666	0.969	125.0	1.15	1.00006	0.670
175.0	0.01393	909.0	6.58	0.501	0.00571	1.08	138.0	1.49	1.00005	0.668
200.0	0.01219	1040.0	6.58	0.501	0.00500	1.18	151.0	1.86	1.00005	0.667
225.0	0.01084	1170.0	6.58	0.501	0.00444	1.28	164.0	2.27	1.00004	0.666
250.0	0.009753	1300.0	6.58	0.500	0.00400	1.37	176.0	2.71	1.00004	0.667
275.0	0.008867	1430.0	6.58	0.500	0.00364	1.46	188.0	3.17	1.00003	0.667
300.0	0.008128	1560.0	6.58	0.500	0.00333	1.55	199.0	3.67	1.00003	0.669
350.0	0.006967	1820.0	6.58	0.500	0.00286	1.72	222.0	4.76	1.00003	0.668
400.0	0.006096	2080.0	6.58	0.500	0.00250	1.89	243.0	5.96	1.00002	0.668
450.0	0.005419	2340.0	6.58	0.500	0.00222	2.05	264.0	7.28	1.00002	0.668
500.0	0.004877	2600.0	6.58	0.500	0.00200	2.21	284.0	8.71	1.00002	0.668
600.0	0.004064	3120.0	6.58	0.500	0.00167	2.51	322.0	11.9	1.00002	0.667
700.0	0.003484	3640.0	6.58	0.500	0.00143	2.80	359.0	15.4	1.00001	0.667
800.0	0.003048	4150.0	6.58	0.500	0.00125	3.07	394.0	19.4	1.00001	0.667
900.0	0.002710	4670.0	6.58	0.500	0.00111	3.34	428.0	23.7	1.00001	0.666
1000.0	0.002439	5190.0	6.58	0.500	0.00100	3.60	462.0	28.4	1.00001	0.666
1100.0	0.002217	5710.0	6.58	0.500	0.000909	3.85	494.0	33.4	1.00001	0.666
1200.0	0.002032	6230.0	6.58	0.500	0.000833	4.10	525.0	38.8	1.00001	0.666
1300.0	0.001876	6750.0	6.58	0.500	0.000769	4.34	556.0	44.5	1.00001	0.666
1400.0	0.001742	7270.0	6.58	0.500	0.000714	4.57	586.0	50.5	1.00001	0.666
1500.0	0.001626	7790.0	6.58	0.500	0.000667	4.80	615.0	56.9	1.00001	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

0.6 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.172	0.06783								
	2.5	0.06851	454.0	2.64	3.922	4.339	1.964	1.896	2.079	224.5
	3.0	0.07032	372.0	3.42	4.996	5.424	2.360	1.915	2.389	216.8
	3.5	0.07323	272.0	3.72	6.337	6.782	2.778	2.107	3.074	200.4
*	3.723	0.07509	224.0	3.74	7.061	7.518	2.982	2.185	3.514	191.0
*	3.723	0.9757	41.4	0.225	23.94	29.87	8.993	3.313	7.718	98.86
	4.0	1.111	51.8	0.195	25.13	31.89	9.515	3.241	6.907	105.8
	4.5	1.330	67.7	0.160	27.06	35.15	10.28	3.174	6.232	116.1
	5.0	1.533	81.8	0.138	28.85	38.17	10.92	3.142	5.912	124.9
	5.1	1.573	84.5	0.134	29.20	38.76	11.04	3.138	5.867	126.5
	5.2	1.612	87.1	0.131	29.55	39.35	11.15	3.135	5.827	128.1
	5.3	1.651	89.7	0.128	29.89	39.93	11.26	3.132	5.791	129.6
	5.4	1.689	92.3	0.125	30.24	40.51	11.37	3.129	5.758	131.2
	5.5	1.728	94.8	0.122	30.58	41.08	11.48	3.127	5.729	132.7
	5.6	1.766	97.4	0.119	30.92	41.65	11.58	3.125	5.701	134.2
	5.7	1.804	100.0	0.116	31.25	42.22	11.68	3.123	5.676	135.6
	5.8	1.842	102.0	0.114	31.59	42.79	11.78	3.121	5.653	137.1
	5.9	1.880	105.0	0.112	31.92	43.35	11.87	3.120	5.632	138.5
	6.0	1.917	107.0	0.109	32.26	43.91	11.97	3.119	5.613	139.9
	6.5	2.103	119.0	0.100	33.91	46.70	12.41	3.115	5.534	146.5
	7.0	2.286	131.0	0.0914	35.55	49.45	12.82	3.113	5.477	152.8
	7.5	2.468	143.0	0.0846	37.18	52.18	13.20	3.112	5.435	158.8
	8.0	2.648	154.0	0.0787	38.79	54.89	13.55	3.112	5.402	164.5
	8.5	2.827	165.0	0.0737	40.40	57.58	13.88	3.113	5.376	169.9
	9.0	3.005	176.0	0.0693	42.00	60.26	14.18	3.113	5.355	175.2
	9.5	3.182	187.0	0.0654	43.59	62.94	14.47	3.113	5.338	180.3
	10.0	3.358	198.0	0.0619	45.19	65.60	14.74	3.114	5.323	185.2
	11.0	3.710	220.0	0.0560	48.36	70.91	15.25	3.115	5.301	194.6
	12.0	4.059	241.0	0.0511	51.52	76.20	15.71	3.115	5.284	203.5
	13.0	4.408	262.0	0.0470	54.68	81.48	16.13	3.116	5.271	212.1
	14.0	4.755	284.0	0.0435	57.83	86.74	16.52	3.116	5.261	220.2
	15.0	5.102	305.0	0.0406	60.98	92.00	16.89	3.117	5.252	228.1
	16.0	5.448	326.0	0.0380	64.12	97.24	17.22	3.117	5.245	235.7
	17.0	5.794	347.0	0.0357	67.26	102.5	17.54	3.117	5.239	243.0
	18.0	6.139	368.0	0.0336	70.40	107.7	17.84	3.117	5.234	250.1
	19.0	6.483	389.0	0.0318	73.54	113.0	18.12	3.117	5.230	257.0
	20.0	6.828	409.0	0.0302	76.67	118.2	18.39	3.117	5.226	263.7
	21.0	7.172	430.0	0.0288	79.81	123.4	18.65	3.117	5.223	270.2
	22.0	7.516	451.0	0.0274	82.94	128.6	18.89	3.117	5.221	276.6
	23.0	7.860	472.0	0.0262	86.07	133.8	19.12	3.117	5.218	282.8
	24.0	8.203	492.0	0.0251	89.20	139.1	19.34	3.117	5.216	288.9
	25.0	8.547	513.0	0.0241	92.32	144.3	19.56	3.117	5.214	294.9
	26.0	8.890	534.0	0.0232	95.45	149.5	19.76	3.117	5.213	300.7
	28.0	9.576	575.0	0.0215	101.7	159.9	20.15	3.117	5.210	312.0
	30.0	10.26	616.0	0.0201	108.0	170.3	20.51	3.117	5.208	323.0
	32.0	10.95	658.0	0.0188	114.2	180.7	20.84	3.117	5.206	333.6
	34.0	11.63	699.0	0.0177	120.4	191.2	21.16	3.117	5.204	343.8
	36.0	12.32	740.0	0.0167	126.7	201.6	21.46	3.117	5.203	353.7
	38.0	13.00	781.0	0.0158	132.9	212.0	21.74	3.117	5.202	363.4
	40.0	13.69	822.0	0.0150	139.2	222.4	22.00	3.117	5.201	372.8
	45.0	15.40	925.0	0.0133	154.8	248.4	22.62	3.117	5.199	395.4
	50.0	17.11	1030.0	0.0120	170.4	274.4	23.17	3.117	5.198	416.7
	55.0	18.82	1130.0	0.0109	186.0	300.4	23.66	3.117	5.197	437.0
	60.0	20.53	1230.0	0.0100	201.5	326.3	24.11	3.117	5.196	456.4
	65.0	22.24	1340.0	0.00924	217.1	352.3	24.53	3.117	5.196	475.0
	70.0	23.94	1440.0	0.00857	232.7	378.3	24.91	3.116	5.195	492.9
	75.0	25.65	1540.0	0.00800	248.3	404.3	25.27	3.116	5.195	510.1
	80.0	27.36	1640.0	0.00750	263.9	430.2	25.61	3.116	5.195	526.8
	90.0	30.78	1850.0	0.00667	295.1	482.2	26.22	3.116	5.194	558.7
	100.0	34.20	2050.0	0.00600	326.2	534.1	26.77	3.116	5.194	586.9
	125.0	42.74	2570.0	0.00480	404.1	664.0	27.93	3.116	5.194	658.3
	150.0	51.28	3080.0	0.00400	482.0	793.8	28.87	3.116	5.193	721.0
	175.0	59.82	3590.0	0.00343	559.9	923.6	29.67	3.116	5.193	778.7
	200.0	68.37	4100.0	0.00300	637.8	1053.0	30.37	3.116	5.193	832.4
	225.0	76.91	4620.0	0.00267	715.7	1183.0	30.98	3.116	5.193	882.9
	250.0	85.45	5130.0	0.00240	793.6	1313.0	31.53	3.116	5.193	930.6
	275.0	93.99	5640.0	0.00218	871.5	1443.0	32.02	3.116	5.193	976.0
	300.0	102.5	6150.0	0.00200	949.4	1573.0	32.47	3.116	5.193	1019.0
	350.0	119.6	7180.0	0.00171	1105.0	1832.0	33.27	3.116	5.193	1101.0
	400.0	136.7	8200.0	0.00150	1261.0	2092.0	33.97	3.116	5.193	1177.0
	450.0	153.8	9230.0	0.00133	1417.0	2352.0	34.58	3.116	5.193	1248.0
	500.0	170.9	10300.0	0.00120	1573.0	2611.0	35.12	3.116	5.193	1316.0
	600.0	205.0	12300.0	0.00100	1884.0	3131.0	36.07	3.116	5.193	1441.0
	700.0	239.2	14400.0	0.000857	2196.0	3650.0	36.87	3.116	5.193	1557.0
	800.0	273.4	16400.0	0.000750	2507.0	4169.0	37.57	3.116	5.193	1664.0
	900.0	307.5	18500.0	0.000667	2819.0	4689.0	38.18	3.116	5.193	1765.0
	1000.0	341.7	20500.0	0.000600	3131.0	5208.0	38.72	3.116	5.193	1861.0
	1100.0	375.9	22600.0	0.000545	3442.0	5727.0	39.22	3.116	5.193	1951.0
	1200.0	410.0	24600.0	0.000500	3754.0	6247.0	39.67	3.116	5.193	2038.0
	1300.0	444.2	26700.0	0.000462	4065.0	6766.0	40.09	3.116	5.193	2121.0
	1400.0	478.4	28700.0	0.000429	4377.0	7285.0	40.47	3.116	5.193	2201.0
	1500.0	512.5	30800.0	0.000400	4688.0	7804.0	40.83	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.6 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)_P/V$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000.0	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.172	14.74									
2.5	14.60	52.1	9.54	66.2	0.0399	0.166	38.4	0.000548	1.05493	0.481
3.0	14.22	36.9	12.6	52.9	0.0647	0.180	37.6	0.000529	1.05349	0.500
3.5	13.66	30.7	12.9	37.1	0.100	0.189	35.4	0.000449	1.05133	0.577
* 3.723	13.32	28.0	12.9	29.8	0.125	0.191	34.1	0.000469	1.05054	0.627
* 3.723	1.025	14.5	6.64	0.424	0.531	0.0881	10.5	0.00111	1.00380	0.916
4.0	0.9082	16.5	6.68	0.467	0.419	0.0912	11.1	0.00147	1.00334	0.840
4.5	0.7519	19.8	6.72	0.509	0.315	0.0985	12.2	0.00210	1.00279	0.772
5.0	0.6523	22.9	6.73	0.534	0.259	0.106	13.3	0.00276	1.00242	0.738
5.1	0.6359	23.5	6.73	0.537	0.250	0.108	13.5	0.00289	1.00236	0.734
5.2	0.6204	24.1	6.73	0.540	0.242	0.109	13.7	0.00303	1.00230	0.729
5.3	0.6058	24.6	6.73	0.543	0.235	0.111	13.9	0.00316	1.00224	0.725
5.4	0.5919	25.2	6.73	0.546	0.228	0.112	14.1	0.00330	1.00219	0.722
5.5	0.5788	25.8	6.73	0.549	0.222	0.114	14.3	0.00344	1.00214	0.719
5.6	0.5662	26.4	6.73	0.551	0.216	0.116	14.5	0.00358	1.00210	0.716
5.7	0.5543	27.0	6.73	0.554	0.210	0.117	14.7	0.00372	1.00205	0.713
5.8	0.5429	27.6	6.73	0.556	0.205	0.119	14.9	0.00386	1.00201	0.711
5.9	0.5320	28.1	6.73	0.558	0.200	0.120	15.1	0.00401	1.00197	0.709
6.0	0.5216	28.7	6.73	0.560	0.196	0.122	15.3	0.00415	1.00193	0.707
6.5	0.4755	31.5	6.72	0.567	0.175	0.129	16.3	0.00489	1.00176	0.699
7.0	0.4374	34.3	6.71	0.573	0.159	0.136	17.2	0.00567	1.00162	0.693
7.5	0.4052	37.1	6.71	0.578	0.146	0.142	18.1	0.00647	1.00150	0.690
8.0	0.3777	39.9	6.70	0.581	0.135	0.149	19.0	0.00730	1.00140	0.688
8.5	0.3538	42.6	6.69	0.584	0.126	0.155	19.8	0.00816	1.00131	0.687
9.0	0.3328	45.3	6.68	0.586	0.118	0.161	20.7	0.00905	1.00123	0.686
9.5	0.3143	48.0	6.68	0.588	0.111	0.167	21.5	0.0100	1.00116	0.686
10.0	0.2978	50.7	6.67	0.590	0.105	0.173	22.3	0.0109	1.00111	0.686
11.0	0.2696	56.1	6.66	0.592	0.0945	0.184	23.8	0.0129	1.00100	0.687
12.0	0.2464	61.4	6.66	0.594	0.0860	0.194	25.3	0.0149	1.00091	0.688
13.0	0.2269	66.8	6.65	0.595	0.0790	0.204	26.7	0.0171	1.00084	0.690
14.0	0.2103	72.1	6.64	0.596	0.0730	0.214	28.1	0.0194	1.00078	0.691
15.0	0.1960	77.3	6.64	0.597	0.0679	0.223	29.5	0.0217	1.00073	0.693
16.0	0.1836	82.6	6.63	0.598	0.0635	0.232	30.8	0.0241	1.00068	0.695
17.0	0.1726	87.9	6.63	0.598	0.0596	0.241	32.0	0.0267	1.00064	0.696
18.0	0.1629	93.2	6.63	0.599	0.0562	0.250	33.3	0.0293	1.00060	0.698
19.0	0.1542	98.4	6.62	0.599	0.0531	0.258	34.5	0.0320	1.00057	0.699
20.0	0.1465	104.0	6.62	0.600	0.0504	0.266	35.7	0.0348	1.00054	0.700
21.0	0.1394	109.0	6.62	0.600	0.0480	0.274	36.8	0.0376	1.00052	0.701
22.0	0.1331	114.0	6.62	0.600	0.0457	0.282	37.9	0.0406	1.00049	0.702
23.0	0.1272	119.0	6.61	0.600	0.0437	0.290	39.0	0.0436	1.00047	0.703
24.0	0.1219	125.0	6.61	0.600	0.0419	0.297	40.1	0.0467	1.00045	0.704
25.0	0.1170	130.0	6.61	0.600	0.0402	0.305	41.2	0.0499	1.00043	0.705
26.0	0.1125	135.0	6.61	0.600	0.0386	0.312	42.2	0.0532	1.00042	0.706
28.0	0.1044	145.0	6.61	0.601	0.0358	0.326	44.3	0.0600	1.00039	0.707
30.0	0.09745	156.0	6.60	0.601	0.0334	0.340	46.2	0.0670	1.00036	0.708
32.0	0.09135	166.0	6.60	0.601	0.0313	0.354	48.1	0.0744	1.00034	0.708
34.0	0.08597	177.0	6.60	0.601	0.0294	0.367	50.0	0.0821	1.00032	0.709
36.0	0.08119	187.0	6.60	0.601	0.0278	0.380	51.8	0.0901	1.00030	0.709
38.0	0.07691	198.0	6.60	0.601	0.0263	0.393	53.6	0.0983	1.00028	0.709
40.0	0.07307	208.0	6.60	0.601	0.0250	0.406	55.3	0.107	1.00027	0.709
45.0	0.06495	234.0	6.59	0.601	0.0222	0.437	59.5	0.129	1.00024	0.708
50.0	0.05846	260.0	6.59	0.601	0.0200	0.467	63.5	0.154	1.00022	0.707
55.0	0.05314	286.0	6.59	0.601	0.0182	0.496	67.4	0.180	1.00020	0.706
60.0	0.04872	312.0	6.59	0.601	0.0167	0.525	71.1	0.207	1.00018	0.704
65.0	0.04497	338.0	6.59	0.601	0.0154	0.553	74.7	0.236	1.00017	0.702
70.0	0.04176	364.0	6.59	0.601	0.0143	0.580	78.2	0.267	1.00015	0.701
75.0	0.03898	390.0	6.59	0.601	0.0133	0.607	81.6	0.300	1.00014	0.699
80.0	0.03655	416.0	6.59	0.601	0.0125	0.633	85.0	0.334	1.00014	0.697
90.0	0.03249	468.0	6.59	0.601	0.0111	0.685	91.5	0.406	1.00012	0.694
100.0	0.02924	520.0	6.59	0.601	0.0100	0.735	97.7	0.484	1.00011	0.691
125.0	0.02340	650.0	6.58	0.600	0.00799	0.855	111.0	0.704	1.00009	0.673
150.0	0.01950	779.0	6.58	0.600	0.00666	0.969	125.0	0.956	1.00007	0.670
175.0	0.01672	909.0	6.58	0.600	0.00571	1.08	138.0	1.24	1.00006	0.668
200.0	0.01463	1040.0	6.58	0.600	0.00500	1.18	151.0	1.55	1.00005	0.667
225.0	0.01300	1170.0	6.58	0.600	0.00444	1.28	164.0	1.89	1.00005	0.666
250.0	0.01170	1300.0	6.58	0.600	0.00400	1.37	176.0	2.26	1.00004	0.667
275.0	0.01064	1430.0	6.58	0.600	0.00364	1.46	188.0	2.64	1.00004	0.667
300.0	0.009753	1560.0	6.58	0.600	0.00333	1.55	199.0	3.05	1.00004	0.669
350.0	0.008360	1820.0	6.58	0.600	0.00286	1.72	222.0	3.96	1.00003	0.668
400.0	0.007315	2080.0	6.58	0.600	0.00250	1.89	243.0	4.97	1.00003	0.668
450.0	0.006503	2340.0	6.58	0.600	0.00222	2.05	264.0	6.07	1.00002	0.668
500.0	0.005853	2600.0	6.58	0.600	0.00200	2.21	284.0	7.26	1.00002	0.668
600.0	0.004877	3120.0	6.58	0.600	0.00167	2.51	322.0	9.90	1.00002	0.667
700.0	0.004181	3640.0	6.58	0.600	0.00143	2.80	359.0	12.9	1.00002	0.667
800.0	0.003658	4150.0	6.58	0.600	0.00125	3.07	394.0	16.2	1.00001	0.667
900.0	0.003252	4670.0	6.58	0.600	0.00111	3.34	428.0	19.8	1.00001	0.666
1000.0	0.002927	5190.0	6.58	0.600	0.00100	3.60	462.0	23.7	1.00001	0.666
1100.0	0.002661	5710.0	6.58	0.600	0.000909	3.85	494.0	27.9	1.00001	0.666
1200.0	0.002439	6230.0	6.58	0.600	0.000833	4.10	525.0	32.3	1.00001	0.666
1300.0	0.002251	6750.0	6.58	0.600	0.000769	4.34	556.0	37.1	1.00001	0.666
1400.0	0.002090	7270.0	6.58	0.600	0.000714	4.57	586.0	42.1	1.00001	0.666
1500.0	0.001951	7790.0	6.58	0.600	0.000667	4.80	615.0	47.4	1.00001	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

0.7 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.171	0.06773								
	2.5	0.06840	459.0	2.64	3.913	4.398	1.960	1.891	2.070	225.8
	3.0	0.07018	378.0	3.43	4.979	5.477	2.354	1.914	2.380	218.2
	3.5	0.07303	278.0	3.73	6.308	6.826	2.769	2.105	3.054	202.2
*	3.866	0.07627	199.0	3.74	7.538	8.079	3.109	2.234	3.834	186.1
*	3.866	0.8434	39.8	0.263	24.05	30.03	8.792	3.323	8.153	99.41
	4.0	0.9042	45.4	0.243	24.67	31.08	9.060	3.281	7.580	103.1
	4.5	1.105	63.0	0.195	26.73	34.57	9.882	3.192	6.534	114.3
	5.0	1.286	78.0	0.165	28.59	37.71	10.54	3.151	6.089	123.6
	5.1	1.321	80.8	0.161	28.95	38.32	10.66	3.146	6.030	125.3
	5.2	1.356	83.6	0.156	29.30	38.92	10.78	3.141	5.977	127.0
	5.3	1.390	86.3	0.152	29.65	39.51	10.89	3.137	5.930	128.6
	5.4	1.424	89.0	0.149	30.00	40.10	11.01	3.134	5.887	130.2
	5.5	1.458	91.7	0.145	30.35	40.69	11.11	3.131	5.848	131.7
	5.6	1.491	94.3	0.142	30.70	41.27	11.22	3.128	5.813	133.3
	5.7	1.525	96.9	0.138	31.04	41.85	11.32	3.126	5.781	134.8
	5.8	1.558	99.5	0.135	31.38	42.43	11.42	3.124	5.752	136.2
	5.9	1.591	102.0	0.133	31.72	43.00	11.52	3.122	5.725	137.7
	6.0	1.623	105.0	0.130	32.06	43.57	11.61	3.121	5.700	139.1
	6.5	1.785	117.0	0.118	33.74	46.40	12.07	3.115	5.601	145.9
	7.0	1.944	129.0	0.108	35.39	49.18	12.48	3.113	5.531	152.3
	7.5	2.102	141.0	0.100	37.03	51.93	12.86	3.112	5.479	158.4
	8.0	2.257	152.0	0.0926	38.65	54.66	13.21	3.112	5.440	164.2
	8.5	2.412	164.0	0.0866	40.27	57.37	13.54	3.112	5.409	169.7
	9.0	2.565	175.0	0.0813	41.88	60.07	13.85	3.112	5.383	175.0
	9.5	2.718	186.0	0.0767	43.48	62.76	14.14	3.113	5.363	180.1
	10.0	2.870	197.0	0.0726	45.08	65.43	14.41	3.113	5.345	185.1
	11.0	3.173	219.0	0.0656	48.26	70.76	14.92	3.114	5.319	194.5
	12.0	3.473	240.0	0.0598	51.43	76.07	15.38	3.115	5.299	203.5
	13.0	3.773	262.0	0.0550	54.60	81.36	15.81	3.116	5.284	212.1
	14.0	4.072	283.0	0.0509	57.75	86.64	16.20	3.116	5.272	220.2
	15.0	4.373	304.0	0.0474	60.91	91.90	16.56	3.117	5.262	228.1
	16.0	4.667	325.0	0.0444	64.06	97.16	16.90	3.117	5.254	235.7
	17.0	4.964	346.0	0.0417	67.20	102.4	17.22	3.117	5.247	243.0
	18.0	5.260	367.0	0.0393	70.34	107.7	17.52	3.118	5.241	250.2
	19.0	5.556	388.0	0.0372	73.48	112.9	17.80	3.118	5.236	257.1
	20.0	5.852	409.0	0.0353	76.62	118.1	18.07	3.118	5.232	263.8
	21.0	6.147	430.0	0.0336	79.76	123.4	18.33	3.118	5.228	270.3
	22.0	6.442	451.0	0.0320	82.89	128.6	18.57	3.118	5.225	276.7
	23.0	6.737	472.0	0.0306	86.02	133.8	18.80	3.118	5.222	282.9
	24.0	7.032	492.0	0.0293	89.15	139.0	19.02	3.118	5.220	289.0
	25.0	7.326	513.0	0.0282	92.28	144.2	19.24	3.118	5.218	295.0
	26.0	7.621	534.0	0.0271	95.41	149.5	19.44	3.118	5.216	300.8
	28.0	8.209	575.0	0.0251	101.7	159.9	19.83	3.118	5.213	312.2
	30.0	8.797	617.0	0.0234	107.9	170.3	20.19	3.118	5.210	323.1
	32.0	9.385	658.0	0.0219	114.2	180.7	20.52	3.117	5.208	333.7
	34.0	9.97	699.0	0.0206	120.4	191.1	20.84	3.117	5.206	343.9
	36.0	10.56	740.0	0.0195	126.7	201.6	21.14	3.117	5.205	353.9
	38.0	11.15	782.0	0.0185	132.9	212.0	21.42	3.117	5.204	363.5
	40.0	11.73	823.0	0.0175	139.1	222.4	21.68	3.117	5.202	373.0
	45.0	13.20	926.0	0.0156	154.7	248.4	22.30	3.117	5.200	395.5
	50.0	14.67	1030.0	0.0140	170.3	274.4	22.84	3.117	5.199	416.8
	55.0	16.13	1130.0	0.0127	185.9	300.4	23.34	3.117	5.198	437.1
	60.0	17.60	1230.0	0.0117	201.5	326.4	23.79	3.117	5.197	456.5
	65.0	19.06	1340.0	0.0108	217.1	352.3	24.21	3.117	5.196	475.1
	70.0	20.53	1440.0	0.0100	232.7	378.3	24.59	3.117	5.196	493.0
	75.0	21.99	1540.0	0.00934	248.3	404.3	24.95	3.117	5.195	510.2
	80.0	23.46	1640.0	0.00875	263.9	430.3	25.29	3.116	5.195	526.9
	90.0	26.39	1850.0	0.00778	295.1	482.2	25.90	3.116	5.195	558.8
	100.0	29.32	2050.0	0.00700	326.2	534.2	26.45	3.116	5.194	589.0
	125.0	36.64	2570.0	0.00560	404.1	664.0	27.61	3.116	5.194	658.3
	150.0	43.96	3080.0	0.00467	482.0	793.8	28.55	3.116	5.193	721.1
	175.0	51.28	3590.0	0.00400	559.9	923.7	29.35	3.116	5.193	778.8
	200.0	58.60	4100.0	0.00350	637.8	1054.0	30.05	3.116	5.193	832.5
	225.0	65.93	4620.0	0.00311	715.7	1183.0	30.66	3.116	5.193	882.9
	250.0	73.25	5130.0	0.00280	793.6	1313.0	31.20	3.116	5.193	930.6
	275.0	80.57	5640.0	0.00255	871.5	1443.0	31.70	3.116	5.193	976.0
	300.0	87.89	6150.0	0.00233	949.4	1573.0	32.15	3.116	5.193	1019.0
	350.0	102.5	7180.0	0.00200	1105.0	1832.0	32.95	3.116	5.193	1101.0
	400.0	117.2	8200.0	0.00175	1261.0	2092.0	33.65	3.116	5.193	1177.0
	450.0	131.8	9230.0	0.00156	1417.0	2352.0	34.26	3.116	5.193	1248.0
	500.0	146.5	10300.0	0.00140	1573.0	2611.0	34.80	3.116	5.193	1316.0
	600.0	175.7	12300.0	0.00117	1884.0	3131.0	35.75	3.116	5.193	1441.0
	700.0	205.0	14400.0	0.00100	2196.0	3650.0	36.55	3.116	5.193	1557.0
	800.0	234.3	16400.0	0.000875	2507.0	4169.0	37.25	3.116	5.193	1664.0
	900.0	263.6	18500.0	0.000778	2819.0	4689.0	37.86	3.116	5.193	1765.0
	1000.0	292.9	20500.0	0.000700	3131.0	5208.0	38.40	3.116	5.193	1861.0
	1100.0	322.2	22600.0	0.000636	3442.0	5727.0	38.90	3.116	5.193	1951.0
	1200.0	351.5	24600.0	0.000583	3754.0	6247.0	39.35	3.116	5.193	2038.0
	1300.0	380.7	26700.0	0.000538	4065.0	6766.0	39.77	3.116	5.193	2121.0
	1400.0	410.0	28700.0	0.000500	4377.0	7285.0	40.15	3.116	5.193	2201.0
	1500.0	439.3	30800.0	0.000467	4688.0	7804.0	40.51	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

0.7 ATMOSPHERE ISOBAR

	TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
*	2.171	14.77									
	2.5	14.62	52.7	9.55	67.2	0.0393	0.167	38.7	0.000550	1.05502	0.481
	3.0	14.25	37.4	12.6	53.8	0.0637	0.180	37.9	0.000532	1.05360	0.500
	3.5	13.69	31.1	13.0	38.1	0.0981	0.189	35.7	0.000453	1.05148	0.575
*	3.866	13.11	26.8	12.8	26.1	0.143	0.193	33.5	0.000384	1.04926	0.664
*	3.866	1.186	14.6	6.66	0.471	0.557	0.0928	11.0	0.000960	1.00440	0.966
	4.0	1.106	15.7	6.69	0.502	0.483	0.0937	11.3	0.00112	1.00410	0.913
	4.5	0.9048	19.2	6.74	0.570	0.341	0.100	12.4	0.00169	1.00335	0.809
	5.0	0.7774	22.3	6.75	0.607	0.273	0.107	13.4	0.00227	1.00288	0.762
	5.1	0.7569	22.9	6.75	0.612	0.263	0.109	13.6	0.00238	1.00280	0.755
	5.2	0.7376	23.5	6.75	0.617	0.254	0.110	13.8	0.00250	1.00273	0.750
	5.3	0.7194	24.2	6.75	0.621	0.245	0.112	14.0	0.00262	1.00267	0.744
	5.4	0.7023	24.8	6.75	0.625	0.238	0.113	14.2	0.00274	1.00260	0.740
	5.5	0.6860	25.4	6.75	0.629	0.231	0.115	14.4	0.00286	1.00254	0.735
	5.6	0.6706	26.0	6.75	0.632	0.224	0.116	14.6	0.00298	1.00248	0.732
	5.7	0.6559	26.5	6.75	0.636	0.218	0.118	14.8	0.00311	1.00243	0.728
	5.8	0.6420	27.1	6.75	0.639	0.212	0.119	15.0	0.00323	1.00238	0.725
	5.9	0.6287	27.7	6.75	0.642	0.207	0.121	15.2	0.00336	1.00233	0.722
	6.0	0.6160	28.3	6.75	0.644	0.201	0.122	15.4	0.00348	1.00228	0.719
	6.5	0.5602	31.2	6.74	0.655	0.180	0.129	16.4	0.00412	1.00207	0.709
	7.0	0.5143	34.0	6.73	0.663	0.163	0.136	17.3	0.00479	1.00190	0.702
	7.5	0.4758	36.8	6.73	0.669	0.149	0.143	18.2	0.00548	1.00176	0.697
	8.0	0.4430	39.6	6.72	0.674	0.137	0.149	19.1	0.00620	1.00164	0.694
	8.5	0.4146	42.4	6.71	0.678	0.128	0.156	19.9	0.00694	1.00154	0.692
	9.0	0.3898	45.1	6.70	0.681	0.119	0.162	20.8	0.00771	1.00144	0.691
	9.5	0.3679	47.8	6.70	0.684	0.112	0.168	21.6	0.00850	1.00136	0.690
	10.0	0.3484	50.5	6.69	0.686	0.106	0.173	22.4	0.00931	1.00129	0.689
	11.0	0.3152	55.9	6.68	0.689	0.0951	0.184	23.9	0.0110	1.00117	0.690
	12.0	0.2879	61.3	6.67	0.692	0.0865	0.195	25.4	0.0128	1.00107	0.691
	13.0	0.2650	66.6	6.66	0.694	0.0793	0.205	26.8	0.0146	1.00098	0.692
	14.0	0.2456	72.0	6.65	0.695	0.0733	0.214	28.2	0.0166	1.00091	0.693
	15.0	0.2288	77.3	6.65	0.696	0.0681	0.224	29.5	0.0186	1.00085	0.694
	16.0	0.2143	82.6	6.64	0.697	0.0636	0.233	30.8	0.0207	1.00079	0.696
	17.0	0.2015	87.8	6.64	0.698	0.0597	0.242	32.1	0.0228	1.00075	0.697
	18.0	0.1901	93.1	6.63	0.698	0.0563	0.250	33.3	0.0251	1.00070	0.699
	19.0	0.1800	98.4	6.63	0.699	0.0532	0.258	34.5	0.0274	1.00067	0.700
	20.0	0.1709	104.0	6.63	0.699	0.0505	0.266	35.7	0.0298	1.00063	0.701
	21.0	0.1627	109.0	6.62	0.700	0.0480	0.274	36.8	0.0323	1.00060	0.702
	22.0	0.1552	114.0	6.62	0.700	0.0458	0.282	38.0	0.0348	1.00057	0.703
	23.0	0.1484	119.0	6.62	0.700	0.0438	0.290	39.1	0.0374	1.00055	0.704
	24.0	0.1422	125.0	6.62	0.700	0.0419	0.297	40.2	0.0401	1.00053	0.705
	25.0	0.1365	130.0	6.62	0.700	0.0402	0.305	41.2	0.0428	1.00051	0.705
	26.0	0.1312	135.0	6.61	0.701	0.0386	0.312	42.3	0.0456	1.00049	0.706
	28.0	0.1218	145.0	6.61	0.701	0.0358	0.326	44.3	0.0514	1.00045	0.707
	30.0	0.1137	156.0	6.61	0.701	0.0334	0.340	46.3	0.0575	1.00042	0.708
	32.0	0.1066	166.0	6.61	0.701	0.0313	0.354	48.2	0.0638	1.00039	0.708
	34.0	0.1003	177.0	6.60	0.701	0.0294	0.367	50.0	0.0704	1.00037	0.709
	36.0	0.09470	187.0	6.60	0.701	0.0278	0.381	51.8	0.0772	1.00035	0.709
	38.0	0.08971	198.0	6.60	0.701	0.0263	0.393	53.6	0.0843	1.00033	0.709
	40.0	0.08522	208.0	6.60	0.701	0.0250	0.406	55.4	0.0916	1.00032	0.709
	45.0	0.07576	234.0	6.60	0.701	0.0222	0.437	59.5	0.111	1.00028	0.708
	50.0	0.06818	260.0	6.59	0.701	0.0200	0.467	63.5	0.132	1.00025	0.707
	55.0	0.06199	286.0	6.59	0.701	0.0182	0.496	67.4	0.154	1.00023	0.706
	60.0	0.05683	312.0	6.59	0.701	0.0167	0.525	71.1	0.178	1.00021	0.704
	65.0	0.05246	338.0	6.59	0.701	0.0154	0.553	74.7	0.203	1.00019	0.702
	70.0	0.04871	364.0	6.59	0.701	0.0143	0.580	78.2	0.229	1.00018	0.701
	75.0	0.04547	390.0	6.59	0.701	0.0133	0.607	81.6	0.257	1.00017	0.699
	80.0	0.04263	416.0	6.59	0.701	0.0125	0.633	85.0	0.286	1.00016	0.697
	90.0	0.03790	468.0	6.59	0.701	0.0111	0.685	91.5	0.348	1.00014	0.694
	100.0	0.03411	520.0	6.59	0.701	0.0100	0.735	97.7	0.415	1.00013	0.691
	125.0	0.02729	650.0	6.58	0.701	0.00799	0.855	111.0	0.603	1.00010	0.673
	150.0	0.02275	780.0	6.58	0.700	0.00666	0.969	125.0	0.820	1.00008	0.670
	175.0	0.01950	909.0	6.58	0.700	0.00571	1.08	138.0	1.06	1.00007	0.668
	200.0	0.01706	1040.0	6.58	0.700	0.00500	1.18	151.0	1.33	1.00006	0.667
	225.0	0.01517	1170.0	6.58	0.700	0.00444	1.28	164.0	1.62	1.00006	0.666
	250.0	0.01365	1300.0	6.58	0.700	0.00400	1.37	176.0	1.93	1.00005	0.667
	275.0	0.01241	1430.0	6.58	0.700	0.00363	1.46	188.0	2.27	1.00005	0.667
	300.0	0.01138	1560.0	6.58	0.700	0.00333	1.55	199.0	2.62	1.00004	0.669
	350.0	0.009753	1820.0	6.58	0.700	0.00286	1.72	222.0	3.40	1.00004	0.668
	400.0	0.008534	2080.0	6.58	0.700	0.00250	1.89	243.0	4.26	1.00003	0.668
	450.0	0.007586	2340.0	6.58	0.700	0.00222	2.05	264.0	5.20	1.00003	0.668
	500.0	0.006828	2600.0	6.58	0.700	0.00200	2.21	284.0	6.22	1.00003	0.668
	600.0	0.005690	3120.0	6.58	0.700	0.00167	2.51	322.0	8.49	1.00002	0.667
	700.0	0.004877	3640.0	6.58	0.700	0.00143	2.80	359.0	11.0	1.00002	0.667
	800.0	0.004268	4160.0	6.58	0.700	0.00125	3.07	394.0	13.9	1.00002	0.667
	900.0	0.003794	4670.0	6.58	0.700	0.00111	3.34	428.0	16.9	1.00001	0.666
	1000.0	0.003414	5190.0	6.58	0.700	0.00100	3.60	462.0	20.3	1.00001	0.666
	1100.0	0.003104	5710.0	6.58	0.700	0.000909	3.85	494.0	23.9	1.00001	0.666
	1200.0	0.002845	6230.0	6.58	0.700	0.000833	4.10	525.0	27.7	1.00001	0.666
	1300.0	0.002626	6750.0	6.58	0.700	0.000769	4.34	556.0	31.8	1.00001	0.666
	1400.0	0.002439	7270.0	6.58	0.700	0.000714	4.57	586.0	36.1	1.00001	0.666
	1500.0	0.002276	7790.0	6.58	0.700	0.000667	4.80	615.0	40.6	1.00001	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

0.6 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.170	0.06763								
	2.5	0.06829	465.0	2.64	3.903	4.457	1.956	1.885	2.062	227.0
	3.0	0.07005	384.0	3.44	4.963	5.531	2.348	1.912	2.371	219.5
	3.5	0.07284	284.0	3.75	6.281	6.871	2.761	2.103	3.034	203.9
*	3.995	0.07747	177.0	3.72	8.000	8.628	3.229	2.280	4.180	181.4
*	3.995	0.7411	37.9	0.301	24.11	30.12	8.610	3.332	8.632	99.8
	4.0	0.7433	38.2	0.300	24.14	30.16	8.621	3.330	8.600	99.9
	4.5	0.9346	58.1	0.232	26.37	33.95	9.515	3.212	6.905	112.5
	5.0	1.100	74.2	0.195	28.31	37.23	10.21	3.160	6.292	122.3
	5.1	1.132	77.1	0.189	28.68	37.85	10.33	3.154	6.214	124.1
	5.2	1.163	80.0	0.183	29.04	38.47	10.45	3.148	6.145	125.8
	5.3	1.194	82.9	0.178	29.40	39.08	10.57	3.143	6.084	127.5
	5.4	1.224	85.7	0.174	29.76	39.69	10.68	3.139	6.029	129.1
	5.5	1.255	88.5	0.169	30.12	40.29	10.79	3.135	5.980	130.8
	5.6	1.285	91.2	0.165	30.47	40.88	10.90	3.132	5.935	132.3
	5.7	1.314	93.9	0.161	30.82	41.48	11.00	3.129	5.895	133.9
	5.8	1.344	96.6	0.158	31.17	42.06	11.10	3.127	5.858	135.4
	5.9	1.373	99.2	0.154	31.51	42.65	11.20	3.125	5.825	136.9
	6.0	1.403	102.0	0.151	31.86	43.23	11.30	3.123	5.794	138.3
	6.5	1.547	115.0	0.136	33.56	46.09	11.76	3.116	5.673	145.3
	7.0	1.688	127.0	0.125	35.23	48.91	12.18	3.113	5.588	151.8
	7.5	1.827	139.0	0.115	36.88	51.68	12.56	3.112	5.526	158.0
	8.0	1.964	150.0	0.107	38.51	54.43	12.92	3.112	5.479	163.8
	8.5	2.101	162.0	0.100	40.14	57.16	13.25	3.112	5.442	169.4
	9.0	2.236	173.0	0.0935	41.75	59.88	13.56	3.112	5.412	174.8
	9.5	2.370	185.0	0.0881	43.36	62.58	13.85	3.113	5.388	179.9
	10.0	2.504	196.0	0.0833	44.97	65.27	14.13	3.113	5.368	184.9
	11.0	2.770	218.0	0.0752	48.16	70.61	14.64	3.114	5.338	194.4
	12.0	3.034	239.0	0.0686	51.34	75.94	15.10	3.115	5.315	203.5
	13.0	3.297	261.0	0.0631	54.51	81.24	15.52	3.116	5.297	212.0
	14.0	3.559	282.0	0.0584	57.68	86.53	15.91	3.117	5.283	220.3
	15.0	3.821	304.0	0.0543	60.84	91.80	16.28	3.117	5.272	228.2
	16.0	4.081	325.0	0.0508	63.99	97.07	16.62	3.117	5.263	235.8
	17.0	4.341	346.0	0.0477	67.14	102.3	16.94	3.118	5.255	243.1
	18.0	4.601	367.0	0.0450	70.28	107.6	17.24	3.118	5.248	250.2
	19.0	4.861	388.0	0.0426	73.43	112.8	17.52	3.118	5.242	257.1
	20.0	5.120	409.0	0.0404	76.57	118.1	17.79	3.118	5.238	263.9
	21.0	5.378	430.0	0.0384	79.71	123.3	18.05	3.118	5.233	270.4
	22.0	5.637	451.0	0.0367	82.84	128.5	18.29	3.118	5.230	276.8
	23.0	5.895	472.0	0.0350	85.98	133.8	18.52	3.118	5.227	283.0
	24.0	6.153	492.0	0.0336	89.11	139.0	18.74	3.118	5.224	289.1
	25.0	6.411	513.0	0.0322	92.24	144.2	18.96	3.118	5.221	295.1
	26.0	6.669	534.0	0.0309	95.37	149.4	19.16	3.118	5.219	300.9
	28.0	7.184	575.0	0.0287	101.6	159.9	19.55	3.118	5.216	312.3
	30.0	7.699	617.0	0.0268	107.9	170.3	19.91	3.118	5.213	323.2
	32.0	8.213	658.0	0.0251	114.1	180.7	20.24	3.118	5.210	333.6
	34.0	8.728	699.0	0.0236	120.4	191.1	20.56	3.118	5.208	344.1
	36.0	9.242	741.0	0.0223	126.6	201.5	20.86	3.118	5.206	354.0
	38.0	9.756	782.0	0.0211	132.9	212.0	21.14	3.117	5.205	363.7
	40.0	10.27	823.0	0.0200	139.1	222.4	21.41	3.117	5.204	373.1
	45.0	11.55	926.0	0.0178	154.7	248.4	22.02	3.117	5.201	395.6
	50.0	12.84	1030.0	0.0160	170.3	274.4	22.57	3.117	5.200	417.0
	55.0	14.12	1130.0	0.0146	185.9	300.4	23.06	3.117	5.198	437.2
	60.0	15.40	1230.0	0.0133	201.5	326.4	23.51	3.117	5.197	456.6
	65.0	16.68	1340.0	0.0123	217.1	352.4	23.93	3.117	5.197	475.2
	70.0	17.97	1440.0	0.0114	232.7	378.3	24.32	3.117	5.196	493.1
	75.0	19.25	1540.0	0.0107	248.3	404.3	24.67	3.117	5.196	510.3
	80.0	20.53	1640.0	0.0100	263.9	430.3	25.01	3.117	5.195	527.0
	90.0	23.09	1850.0	0.00889	295.1	482.2	25.62	3.116	5.195	558.9
	100.0	25.66	2050.0	0.00800	326.2	534.2	26.17	3.116	5.194	589.1
	125.0	32.06	2570.0	0.00640	404.1	664.0	27.33	3.116	5.194	658.4
	150.0	38.47	3080.0	0.00533	482.0	793.9	28.27	3.116	5.194	721.1
	175.0	44.88	3590.0	0.00457	559.9	923.7	29.08	3.116	5.193	778.8
	200.0	51.28	4110.0	0.00400	637.8	1054.0	29.77	3.116	5.193	832.5
	225.0	57.69	4620.0	0.00356	715.7	1183.0	30.38	3.116	5.193	883.0
	250.0	64.09	5130.0	0.00320	793.6	1313.0	30.93	3.116	5.193	930.7
	275.0	70.50	5640.0	0.00291	871.5	1443.0	31.42	3.116	5.193	976.1
	300.0	76.91	6150.0	0.00267	949.4	1573.0	31.87	3.116	5.193	1019.0
	350.0	89.72	7180.0	0.00229	1105.0	1833.0	32.67	3.116	5.193	1101.0
	400.0	102.5	8200.0	0.00200	1261.0	2092.0	33.37	3.116	5.193	1177.0
	450.0	115.3	9230.0	0.00178	1417.0	2352.0	33.98	3.116	5.193	1248.0
	500.0	128.2	10300.0	0.00160	1573.0	2611.0	34.53	3.116	5.193	1316.0
	600.0	153.8	12300.0	0.00133	1884.0	3131.0	35.47	3.116	5.193	1441.0
	700.0	179.4	14400.0	0.00114	2196.0	3650.0	36.27	3.116	5.193	1557.0
	800.0	205.0	16400.0	0.00100	2507.0	4169.0	36.97	3.116	5.193	1664.0
	900.0	230.7	18500.0	0.000889	2819.0	4689.0	37.58	3.116	5.193	1765.0
	1000.0	256.3	20500.0	0.000800	3131.0	5208.0	38.13	3.116	5.193	1861.0
	1100.0	281.9	22600.0	0.000727	3442.0	5727.0	38.62	3.116	5.193	1951.0
	1200.0	307.5	24600.0	0.000667	3754.0	6247.0	39.07	3.116	5.193	2038.0
	1300.0	333.2	26700.0	0.000615	4065.0	6766.0	39.49	3.116	5.193	2121.0
	1400.0	358.8	28700.0	0.000571	4377.0	7285.0	39.87	3.116	5.193	2202.0
	1500.0	384.4	30800.0	0.000533	4688.0	7804.0	40.23	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.8 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.170	14.79									
2.5	14.64	53.2	9.56	68.1	0.0388	0.167	38.9	0.000553	1.05511	0.481
3.0	14.28	37.8	12.6	54.8	0.0627	0.181	38.1	0.000534	1.05371	0.500
3.5	13.73	31.6	13.0	39.6	0.0960	0.190	35.9	0.000456	1.05162	0.574
* 3.995	12.91	25.7	12.6	22.9	0.163	0.195	32.9	0.000361	1.04848	0.705
* 3.995	1.349	14.7	6.69	0.512	0.587	0.0973	11.5	0.000835	1.00500	1.02
4.0	1.345	14.7	6.69	0.514	0.584	0.0973	11.5	0.000841	1.00499	1.02
4.5	1.070	18.5	6.75	0.622	0.373	0.102	12.5	0.00137	1.00397	0.853
5.0	0.9088	21.8	6.77	0.674	0.289	0.108	13.6	0.00190	1.00337	0.788
5.1	0.8835	22.4	6.78	0.681	0.277	0.111	13.8	0.00200	1.00327	0.780
5.2	0.8598	23.1	6.78	0.688	0.267	0.111	14.0	0.00211	1.00319	0.772
5.3	0.8376	23.7	6.78	0.694	0.257	0.113	14.2	0.00221	1.00310	0.765
5.4	0.8167	24.3	6.78	0.700	0.248	0.114	14.4	0.00232	1.00303	0.759
5.5	0.7970	24.9	6.78	0.705	0.240	0.116	14.6	0.00243	1.00295	0.753
5.6	0.7784	25.5	6.78	0.710	0.233	0.117	14.8	0.00254	1.00288	0.749
5.7	0.7608	26.1	6.78	0.714	0.226	0.119	15.0	0.00264	1.00282	0.744
5.8	0.7440	26.7	6.78	0.719	0.219	0.120	15.2	0.00275	1.00276	0.740
5.9	0.7281	27.3	6.77	0.722	0.213	0.122	15.4	0.00287	1.00270	0.736
6.0	0.7129	27.9	6.77	0.726	0.208	0.123	15.5	0.00298	1.00264	0.733
6.5	0.6466	30.8	6.77	0.741	0.184	0.130	16.5	0.00355	1.00240	0.719
7.0	0.5925	33.7	6.76	0.751	0.166	0.137	17.4	0.00413	1.00219	0.710
7.5	0.5474	36.5	6.75	0.760	0.151	0.144	18.3	0.00475	1.00203	0.704
8.0	0.5091	39.3	6.74	0.766	0.139	0.150	19.2	0.00538	1.00189	0.700
8.5	0.4761	42.1	6.73	0.771	0.129	0.156	20.0	0.00603	1.00176	0.697
9.0	0.4473	44.9	6.72	0.775	0.121	0.162	20.8	0.00670	1.00166	0.695
9.5	0.4219	47.6	6.71	0.779	0.113	0.168	21.6	0.00739	1.00156	0.694
10.0	0.3994	50.3	6.70	0.782	0.107	0.174	22.4	0.00811	1.00148	0.693
11.0	0.3610	55.8	6.69	0.786	0.0957	0.185	24.0	0.00958	1.00134	0.693
12.0	0.3296	61.2	6.68	0.789	0.0863	0.195	25.4	0.0111	1.00122	0.693
13.0	0.3033	66.5	6.67	0.792	0.0796	0.205	26.9	0.0128	1.00112	0.694
14.0	0.2810	71.8	6.67	0.794	0.0735	0.215	28.2	0.0145	1.00104	0.695
15.0	0.2617	77.2	6.66	0.795	0.0683	0.224	29.6	0.0162	1.00097	0.696
16.0	0.2450	82.5	6.65	0.796	0.0638	0.233	30.9	0.0181	1.00091	0.697
17.0	0.2303	87.8	6.65	0.797	0.0599	0.242	32.1	0.0200	1.00085	0.698
18.0	0.2173	93.0	6.64	0.798	0.0564	0.250	33.4	0.0219	1.00080	0.700
19.0	0.2057	98.3	6.64	0.799	0.0533	0.259	34.6	0.0240	1.00076	0.701
20.0	0.1953	104.0	6.63	0.799	0.0506	0.267	35.7	0.0261	1.00072	0.702
21.0	0.1859	109.0	6.63	0.800	0.0481	0.275	36.9	0.0282	1.00069	0.703
22.0	0.1774	114.0	6.63	0.800	0.0458	0.283	38.0	0.0304	1.00066	0.704
23.0	0.1696	119.0	6.63	0.800	0.0438	0.290	39.1	0.0327	1.00063	0.704
24.0	0.1625	125.0	6.62	0.800	0.0419	0.298	40.2	0.0351	1.00060	0.705
25.0	0.1560	130.0	6.62	0.801	0.0402	0.305	41.2	0.0375	1.00058	0.706
26.0	0.1500	135.0	6.62	0.801	0.0386	0.312	42.3	0.0399	1.00056	0.706
28.0	0.1392	146.0	6.62	0.801	0.0358	0.327	44.3	0.0450	1.00052	0.707
30.0	0.1299	156.0	6.61	0.801	0.0334	0.341	46.3	0.0503	1.00048	0.708
32.0	0.1218	166.0	6.61	0.801	0.0313	0.354	48.2	0.0559	1.00045	0.709
34.0	0.1146	177.0	6.61	0.801	0.0295	0.368	50.1	0.0616	1.00042	0.709
36.0	0.1082	187.0	6.61	0.801	0.0278	0.381	51.9	0.0676	1.00040	0.709
38.0	0.1025	198.0	6.60	0.801	0.0263	0.394	53.6	0.0738	1.00038	0.709
40.0	0.09738	208.0	6.60	0.801	0.0250	0.406	55.4	0.0802	1.00036	0.709
45.0	0.08656	234.0	6.60	0.801	0.0222	0.437	59.6	0.0971	1.00032	0.708
50.0	0.07790	260.0	6.60	0.801	0.0200	0.467	63.6	0.115	1.00029	0.707
55.0	0.07083	286.0	6.60	0.801	0.0182	0.497	67.4	0.135	1.00026	0.706
60.0	0.06493	312.0	6.59	0.801	0.0167	0.525	71.1	0.156	1.00024	0.704
65.0	0.05994	338.0	6.59	0.801	0.0154	0.553	74.7	0.178	1.00022	0.702
70.0	0.05566	364.0	6.59	0.801	0.0143	0.580	78.2	0.201	1.00021	0.701
75.0	0.05195	390.0	6.59	0.801	0.0133	0.607	81.7	0.225	1.00019	0.699
80.0	0.04871	416.0	6.59	0.801	0.0125	0.634	85.0	0.250	1.00018	0.697
90.0	0.04330	468.0	6.59	0.801	0.0111	0.685	91.5	0.305	1.00016	0.694
100.0	0.03898	520.0	6.59	0.801	0.0100	0.735	97.8	0.363	1.00014	0.691
125.0	0.03119	650.0	6.59	0.801	0.00799	0.855	111.0	0.528	1.00012	0.673
150.0	0.02599	780.0	6.58	0.801	0.00666	0.969	125.0	0.718	1.00010	0.670
175.0	0.02228	909.0	6.58	0.801	0.00571	1.08	138.0	0.930	1.00008	0.668
200.0	0.01950	1040.0	6.58	0.800	0.00500	1.18	151.0	1.16	1.00007	0.667
225.0	0.01733	1170.0	6.58	0.800	0.00444	1.28	164.0	1.42	1.00006	0.666
250.0	0.01560	1300.0	6.58	0.800	0.00400	1.37	176.0	1.69	1.00006	0.667
275.0	0.01418	1430.0	6.58	0.800	0.00363	1.46	188.0	1.98	1.00005	0.667
300.0	0.01300	1560.0	6.58	0.800	0.00333	1.55	199.0	2.29	1.00005	0.669
350.0	0.01115	1820.0	6.58	0.800	0.00286	1.72	222.0	2.97	1.00004	0.668
400.0	0.009753	2080.0	6.58	0.800	0.00250	1.89	243.0	3.73	1.00004	0.668
450.0	0.008670	2340.0	6.58	0.800	0.00222	2.05	264.0	4.55	1.00003	0.668
500.0	0.007803	2600.0	6.58	0.800	0.00200	2.21	284.0	5.45	1.00003	0.668
600.0	0.006503	3120.0	6.58	0.800	0.00167	2.51	322.0	7.43	1.00002	0.667
700.0	0.005574	3640.0	6.58	0.800	0.00143	2.80	359.0	9.66	1.00002	0.667
800.0	0.004877	4160.0	6.58	0.800	0.00125	3.07	394.0	12.1	1.00002	0.667
900.0	0.004335	4670.0	6.58	0.800	0.00111	3.34	426.0	14.8	1.00002	0.666
1000.0	0.003902	5190.0	6.58	0.800	0.00100	3.60	462.0	17.8	1.00001	0.666
1100.0	0.003547	5710.0	6.58	0.800	0.000909	3.85	494.0	20.9	1.00001	0.666
1200.0	0.003252	6230.0	6.58	0.800	0.000833	4.10	525.0	24.3	1.00001	0.666
1300.0	0.003002	6750.0	6.58	0.800	0.000769	4.34	556.0	27.8	1.00001	0.666
1400.0	0.002787	7270.0	6.58	0.800	0.000714	4.57	586.0	31.6	1.00001	0.666
1500.0	0.002601	7790.0	6.58	0.800	0.000667	4.80	615.0	35.5	1.00001	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

0.9 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.169	0.06754								
	2.5	0.06819	471.0	2.64	3.894	4.516	1.952	1.879	2.053	228.3
	3.0	0.06991	390.0	3.44	4.947	5.584	2.343	1.911	2.363	220.9
	3.5	0.07265	291.0	3.77	6.255	6.917	2.753	2.101	3.014	205.5
	4.0	0.07720	183.0	3.75	7.971	8.675	3.221	2.278	4.133	183.4
*	4.114	0.07872	157.0	3.69	8.453	9.171	3.344	2.324	4.558	176.7
*	4.114	0.6593	36.0	0.340	24.14	30.15	8.443	3.340	9.168	100.0
	4.5	0.7998	52.6	0.274	25.98	33.28	9.171	3.235	7.377	110.5
	5.0	0.9547	70.1	0.226	28.01	36.72	9.898	3.171	6.527	120.9
	5.1	0.9838	73.3	0.219	28.40	37.37	10.03	3.163	6.425	122.8
	5.2	1.012	76.4	0.212	28.77	38.01	10.15	3.156	6.336	124.6
	5.3	1.041	79.4	0.206	29.15	38.64	10.27	3.150	6.257	126.4
	5.4	1.069	82.3	0.200	29.51	39.26	10.39	3.145	6.187	128.1
	5.5	1.096	85.2	0.195	29.88	39.87	10.50	3.141	6.125	129.7
	5.6	1.124	88.0	0.190	30.24	40.48	10.61	3.137	6.070	131.4
	5.7	1.151	90.9	0.185	30.59	41.09	10.72	3.133	6.019	133.0
	5.8	1.178	93.6	0.181	30.95	41.69	10.82	3.130	5.974	134.5
	5.9	1.204	96.3	0.177	31.30	42.28	10.92	3.127	5.933	136.1
	6.0	1.231	99.0	0.173	31.65	42.87	11.02	3.125	5.895	137.6
	6.5	1.361	112.0	0.155	33.37	45.78	11.49	3.117	5.748	144.7
	7.0	1.488	125.0	0.142	35.06	48.63	11.91	3.113	5.647	151.4
	7.5	1.613	137.0	0.131	36.72	51.43	12.30	3.112	5.574	157.6
	8.0	1.736	149.0	0.121	38.37	54.21	12.65	3.111	5.519	163.5
	8.5	1.858	160.0	0.113	40.01	56.95	12.99	3.111	5.476	169.1
	9.0	1.979	172.0	0.106	41.63	59.68	13.30	3.112	5.442	174.5
	9.5	2.100	183.0	0.100	43.25	62.40	13.59	3.112	5.414	179.7
	10.0	2.219	195.0	0.0942	44.86	65.10	13.87	3.113	5.391	184.8
	11.0	2.457	217.0	0.0850	48.06	70.47	14.38	3.114	5.356	194.4
	12.0	2.692	239.0	0.0775	51.25	75.81	14.85	3.115	5.331	203.4
	13.0	2.927	260.0	0.0712	54.43	81.12	15.27	3.116	5.311	212.0
	14.0	3.161	282.0	0.0658	57.60	86.42	15.66	3.117	5.295	220.3
	15.0	3.393	303.0	0.0613	60.76	91.71	16.03	3.117	5.282	228.2
	16.0	3.626	325.0	0.0573	63.92	96.99	16.37	3.118	5.271	235.8
	17.0	3.857	346.0	0.0538	67.08	102.3	16.69	3.118	5.263	243.2
	18.0	4.089	367.0	0.0507	70.23	107.5	16.99	3.118	5.255	250.3
	19.0	4.320	388.0	0.0480	73.37	112.8	17.27	3.118	5.249	257.2
	20.0	4.550	409.0	0.0455	76.52	118.0	17.54	3.118	5.243	264.0
	21.0	4.780	430.0	0.0433	79.66	123.2	17.80	3.118	5.239	270.5
	22.0	5.010	451.0	0.0413	82.79	128.5	18.04	3.118	5.234	276.9
	23.0	5.240	472.0	0.0395	85.93	133.7	18.27	3.118	5.231	283.1
	24.0	5.470	493.0	0.0378	89.07	138.9	18.50	3.118	5.228	289.2
	25.0	5.699	513.0	0.0363	92.20	144.2	18.71	3.118	5.225	295.2
	26.0	5.929	534.0	0.0348	95.33	149.4	18.92	3.118	5.223	301.0
	28.0	6.387	576.0	0.0323	101.6	159.8	19.30	3.118	5.218	312.4
	30.0	6.845	617.0	0.0301	107.9	170.3	19.66	3.118	5.215	323.3
	32.0	7.302	658.0	0.0282	114.1	180.7	20.00	3.118	5.212	333.9
	34.0	7.760	700.0	0.0266	120.4	191.1	20.31	3.118	5.210	344.2
	36.0	8.217	741.0	0.0251	126.6	201.5	20.61	3.118	5.208	354.1
	38.0	8.674	782.0	0.0237	132.9	212.0	20.89	3.118	5.206	363.8
	40.0	9.130	823.0	0.0226	139.1	222.4	21.16	3.118	5.205	373.2
	45.0	10.27	926.0	0.0200	154.7	248.4	21.77	3.117	5.202	395.8
	50.0	11.41	1030.0	0.0180	170.3	274.4	22.32	3.117	5.200	417.1
	55.0	12.55	1130.0	0.0164	185.9	300.4	22.82	3.117	5.199	437.4
	60.0	13.69	1230.0	0.0150	201.5	326.4	23.27	3.117	5.198	456.7
	65.0	14.83	1340.0	0.0139	217.1	352.4	23.69	3.117	5.197	475.3
	70.0	15.97	1440.0	0.0129	232.7	378.4	24.07	3.117	5.197	493.2
	75.0	17.11	1540.0	0.0120	248.3	404.3	24.43	3.117	5.196	510.4
	80.0	18.25	1650.0	0.0113	263.9	430.3	24.76	3.117	5.196	527.1
	90.0	20.53	1850.0	0.0100	295.0	482.3	25.38	3.117	5.195	559.0
	100.0	22.81	2060.0	0.00900	326.2	534.2	25.92	3.116	5.195	589.1
	125.0	28.50	2570.0	0.00720	404.1	664.1	27.08	3.116	5.194	658.5
	150.0	34.20	3080.0	0.00600	482.0	793.9	28.03	3.116	5.194	721.2
	175.0	39.89	3590.0	0.00514	559.9	923.7	28.83	3.116	5.193	778.9
	200.0	45.59	4110.0	0.00450	637.8	1054.0	29.52	3.116	5.193	832.6
	225.0	51.28	4620.0	0.00400	715.7	1183.0	30.14	3.116	5.193	883.0
	250.0	56.98	5130.0	0.00360	793.6	1313.0	30.68	3.116	5.193	930.7
	275.0	62.67	5640.0	0.00327	871.5	1443.0	31.18	3.116	5.193	976.1
	300.0	68.37	6160.0	0.00300	949.4	1573.0	31.63	3.116	5.193	1019.0
	350.0	79.75	7180.0	0.00257	1105.0	1833.0	32.43	3.116	5.193	1101.0
	400.0	91.14	8210.0	0.00225	1261.0	2092.0	33.12	3.116	5.193	1177.0
	450.0	102.5	9230.0	0.00200	1417.0	2352.0	33.74	3.116	5.193	1248.0
	500.0	113.9	10300.0	0.00180	1573.0	2611.0	34.28	3.116	5.193	1316.0
	600.0	136.7	12300.0	0.00150	1884.0	3131.0	35.23	3.116	5.193	1441.0
	700.0	159.5	14400.0	0.00129	2196.0	3650.0	36.03	3.116	5.193	1557.0
	800.0	182.3	16400.0	0.00112	2507.0	4169.0	36.72	3.116	5.193	1664.0
	900.0	205.0	18500.0	0.00100	2819.0	4689.0	37.33	3.116	5.193	1765.0
	1000.0	227.8	20500.0	0.000900	3131.0	5208.0	37.88	3.116	5.193	1861.0
	1100.0	250.6	22600.0	0.000818	3442.0	5727.0	38.38	3.116	5.193	1951.0
	1200.0	273.4	24600.0	0.000750	3754.0	6247.0	38.83	3.116	5.193	2038.0
	1300.0	296.1	26700.0	0.000692	4065.0	6766.0	39.24	3.116	5.193	2121.0
	1400.0	318.9	28700.0	0.000643	4377.0	7285.0	39.63	3.116	5.193	2202.0
	1500.0	341.7	30800.0	0.000600	4688.0	7805.0	39.99	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

0.9 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 10G	V(DH/DV)$_p$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.169	14.81									
2.5	14.66	53.7	9.57	69.0	0.0382	0.167	39.1	0.000555	1.05519	0.481
3.0	14.33	38.3	12.6	55.7	0.0618	0.181	38.3	0.000536	1.05381	0.500
3.5	13.77	32.6	13.0	46.0	0.0941	0.196	36.1	0.000459	1.05176	0.572
4.0	12.95	26.1	12.7	23.7	0.158	0.196	33.1	0.000365	1.04866	0.700
* 4.114	12.70	24.7	12.5	20.0	0.185	0.196	32.3	0.000338	1.04771	0.751
* 4.114	1.517	14.7	6.72	0.546	0.623	0.102	12.0	0.000731	1.00562	1.08
4.5	1.250	17.8	6.77	0.660	0.415	0.103	12.7	0.00112	1.00464	0.908
5.0	1.047	21.2	6.80	0.735	0.307	0.110	13.7	0.00166	1.00388	0.818
5.1	1.016	21.9	6.80	0.745	0.293	0.111	13.9	0.00178	1.00377	0.807
5.2	0.9877	22.5	6.80	0.754	0.281	0.112	14.1	0.00189	1.00366	0.797
5.3	0.9609	23.2	6.80	0.763	0.270	0.114	14.3	0.00199	1.00356	0.788
5.4	0.9358	23.8	6.80	0.770	0.260	0.115	14.5	0.00199	1.00347	0.780
5.5	0.9122	24.4	6.80	0.777	0.251	0.117	14.7	0.00209	1.00338	0.773
5.6	0.8900	25.1	6.80	0.784	0.242	0.118	14.9	0.00219	1.00330	0.767
5.7	0.8690	25.7	6.80	0.789	0.235	0.119	15.1	0.00228	1.00322	0.761
5.8	0.8492	26.3	6.80	0.795	0.227	0.121	15.3	0.00238	1.00315	0.756
5.9	0.8304	26.9	6.80	0.800	0.221	0.122	15.5	0.00248	1.00308	0.751
6.0	0.8125	27.5	6.80	0.805	0.214	0.124	15.7	0.00258	1.00301	0.747
6.5	0.7348	30.5	6.79	0.824	0.189	0.131	16.6	0.00309	1.00272	0.730
7.0	0.6720	33.4	6.78	0.838	0.169	0.137	17.5	0.00362	1.00249	0.719
7.5	0.6200	36.2	6.77	0.849	0.154	0.144	18.4	0.00417	1.00230	0.712
8.0	0.5759	39.1	6.76	0.857	0.141	0.150	19.3	0.00473	1.00213	0.706
8.5	0.5381	41.9	6.75	0.863	0.131	0.157	20.1	0.00532	1.00199	0.703
9.0	0.5052	44.6	6.74	0.869	0.122	0.163	20.9	0.00592	1.00187	0.700
9.5	0.4763	47.4	6.73	0.873	0.114	0.169	21.7	0.00654	1.00176	0.698
10.0	0.4506	50.2	6.72	0.877	0.107	0.174	22.5	0.00717	1.00167	0.697
11.0	0.4071	55.6	6.71	0.882	0.0963	0.185	24.0	0.00849	1.00151	0.696
12.0	0.3714	61.0	6.69	0.886	0.0874	0.196	25.5	0.00988	1.00138	0.695
13.0	0.3416	66.4	6.68	0.890	0.0800	0.206	26.9	0.0113	1.00127	0.696
14.0	0.3164	71.7	6.68	0.892	0.0738	0.215	28.3	0.0128	1.00117	0.697
15.0	0.2947	77.1	6.67	0.894	0.0685	0.224	29.6	0.0144	1.00109	0.698
16.0	0.2758	82.4	6.66	0.895	0.0640	0.233	30.9	0.0161	1.00102	0.698
17.0	0.2592	87.7	6.66	0.897	0.0600	0.242	32.2	0.0177	1.00096	0.700
18.0	0.2446	93.0	6.65	0.897	0.0565	0.251	33.4	0.0195	1.00091	0.701
19.0	0.2315	98.3	6.65	0.898	0.0534	0.259	34.6	0.0213	1.00086	0.702
20.0	0.2198	104.0	6.64	0.899	0.0506	0.267	35.8	0.0232	1.00081	0.702
21.0	0.2092	109.0	6.64	0.899	0.0481	0.275	36.9	0.0251	1.00077	0.703
22.0	0.1996	114.0	6.63	0.900	0.0459	0.283	38.0	0.0271	1.00074	0.704
23.0	0.1908	119.0	6.63	0.900	0.0438	0.290	39.1	0.0291	1.00071	0.705
24.0	0.1828	125.0	6.63	0.900	0.0420	0.298	40.2	0.0312	1.00068	0.706
25.0	0.1755	130.0	6.63	0.901	0.0403	0.305	41.3	0.0333	1.00065	0.706
26.0	0.1687	135.0	6.62	0.901	0.0387	0.313	42.3	0.0355	1.00062	0.707
28.0	0.1566	146.0	6.62	0.901	0.0359	0.327	44.3	0.0400	1.00058	0.708
30.0	0.1461	156.0	6.62	0.901	0.0334	0.341	46.3	0.0447	1.00054	0.708
32.0	0.1369	166.0	6.61	0.902	0.0313	0.355	48.2	0.0497	1.00051	0.709
34.0	0.1289	177.0	6.61	0.902	0.0295	0.368	50.1	0.0548	1.00048	0.709
36.0	0.1217	187.0	6.61	0.902	0.0278	0.381	51.9	0.0601	1.00045	0.709
38.0	0.1153	198.0	6.61	0.902	0.0263	0.394	53.7	0.0656	1.00043	0.709
40.0	0.1095	208.0	6.61	0.902	0.0250	0.407	55.4	0.0713	1.00041	0.709
45.0	0.09735	234.0	6.60	0.902	0.0222	0.438	59.6	0.0864	1.00036	0.708
50.0	0.08762	260.0	6.60	0.902	0.0200	0.468	63.6	0.103	1.00032	0.707
55.0	0.07966	286.0	6.60	0.902	0.0182	0.497	67.4	0.120	1.00029	0.706
60.0	0.07303	312.0	6.60	0.902	0.0167	0.525	71.1	0.138	1.00027	0.704
65.0	0.06742	338.0	6.59	0.902	0.0154	0.553	74.8	0.158	1.00025	0.702
70.0	0.06261	364.0	6.59	0.902	0.0143	0.580	78.3	0.178	1.00023	0.701
75.0	0.05844	390.0	6.59	0.901	0.0133	0.607	81.7	0.200	1.00022	0.699
80.0	0.05479	416.0	6.59	0.901	0.0125	0.634	85.0	0.223	1.00020	0.697
90.0	0.04871	468.0	6.59	0.901	0.0111	0.685	91.5	0.271	1.00018	0.694
100.0	0.04384	520.0	6.59	0.901	0.0100	0.735	97.8	0.323	1.00016	0.691
125.0	0.03508	650.0	6.59	0.901	0.00799	0.855	111.0	0.469	1.00013	0.673
150.0	0.02924	780.0	6.58	0.901	0.00666	0.969	125.0	0.638	1.00011	0.670
175.0	0.02507	910.0	6.58	0.901	0.00571	1.08	138.0	0.827	1.00009	0.668
200.0	0.02194	1040.0	6.58	0.901	0.00500	1.18	151.0	1.04	1.00008	0.667
225.0	0.01950	1170.0	6.58	0.901	0.00444	1.28	164.0	1.26	1.00007	0.666
250.0	0.01755	1300.0	6.58	0.900	0.00400	1.37	176.0	1.50	1.00006	0.667
275.0	0.01596	1430.0	6.58	0.900	0.00363	1.46	188.0	1.76	1.00006	0.667
300.0	0.01463	1560.0	6.58	0.900	0.00333	1.55	199.0	2.04	1.00005	0.669
350.0	0.01254	1820.0	6.58	0.900	0.00286	1.72	222.0	2.64	1.00005	0.668
400.0	0.01097	2080.0	6.58	0.900	0.00250	1.89	243.0	3.31	1.00004	0.668
450.0	0.009753	2340.0	6.58	0.900	0.00222	2.05	264.0	4.05	1.00004	0.668
500.0	0.008778	2600.0	6.58	0.900	0.00200	2.21	284.0	4.84	1.00003	0.668
600.0	0.007315	3120.0	6.58	0.900	0.00167	2.51	322.0	6.60	1.00003	0.667
700.0	0.006271	3640.0	6.58	0.900	0.00143	2.80	359.0	8.58	1.00002	0.667
800.0	0.005487	4160.0	6.58	0.900	0.00125	3.07	394.0	10.8	1.00002	0.667
900.0	0.004877	4670.0	6.58	0.900	0.00111	3.34	428.0	13.2	1.00002	0.666
1000.0	0.004390	5190.0	6.58	0.900	0.00100	3.60	462.0	15.8	1.00002	0.666
1100.0	0.003991	5710.0	6.58	0.900	0.000909	3.85	494.0	18.6	1.00001	0.666
1200.0	0.003658	6230.0	6.58	0.900	0.000833	4.10	525.0	21.6	1.00001	0.666
1300.0	0.003377	6750.0	6.58	0.900	0.000769	4.34	556.0	24.7	1.00001	0.666
1400.0	0.003136	7270.0	6.58	0.900	0.000714	4.57	586.0	28.1	1.00001	0.666
1500.0	0.002927	7790.0	6.58	0.900	0.000667	4.80	615.0	31.6	1.00001	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

1.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.168	0.06744								
2.5	0.06809	476.0	2.64	3.885	4.575	1.948	1.873	2.045	229.5
3.0	0.06978	395.0	3.45	4.931	5.638	2.337	1.910	2.355	222.2
3.5	0.07246	297.0	3.78	6.229	6.963	2.745	2.100	2.996	207.1
4.0	0.07589	190.0	3.78	7.924	8.703	3.209	2.275	4.074	185.6
* 4.224	0.08101	139.0	3.64	8.900	9.711	3.454	2.368	4.981	172.0
* 4.224	0.5921	33.9	0.381	24.13	30.13	8.287	3.348	9.778	100.2
4.5	0.6894	47.1	0.321	25.55	32.54	8.840	3.262	8.002	108.2
5.0	0.8372	66.0	0.259	27.71	36.19	9.610	3.183	6.801	119.5
5.1	0.8645	69.3	0.250	28.10	36.86	9.744	3.174	6.668	121.5
5.2	0.8913	72.6	0.242	28.49	37.52	9.872	3.165	6.553	123.4
5.3	0.9176	75.7	0.235	28.88	38.17	10.00	3.158	6.452	125.2
5.4	0.9435	78.8	0.228	29.25	38.81	10.12	3.152	6.364	127.0
5.5	0.9691	81.8	0.222	29.63	39.45	10.23	3.146	6.287	128.7
5.6	0.9944	84.8	0.216	30.00	40.07	10.34	3.142	6.217	130.4
5.7	1.019	87.7	0.210	30.36	40.69	10.45	3.138	6.155	132.1
5.8	1.044	90.6	0.205	30.72	41.30	10.56	3.134	6.100	133.7
5.9	1.069	93.4	0.200	31.08	41.91	10.66	3.131	6.049	135.2
6.0	1.093	96.2	0.195	31.44	42.51	10.77	3.128	6.004	136.8
6.5	1.212	110.0	0.175	33.19	45.47	11.24	3.119	5.828	144.1
7.0	1.328	123.0	0.159	34.89	48.35	11.67	3.114	5.709	150.9
7.5	1.442	135.0	0.146	36.57	51.18	12.06	3.112	5.623	157.2
8.0	1.554	147.0	0.136	38.23	53.98	12.42	3.111	5.560	163.2
8.5	1.665	159.0	0.126	39.88	56.74	12.75	3.111	5.511	168.9
9.0	1.774	171.0	0.118	41.51	59.49	13.07	3.111	5.472	174.3
9.5	1.883	182.0	0.111	43.13	62.22	13.36	3.112	5.440	179.6
10.0	1.991	193.0	0.105	44.75	64.93	13.64	3.113	5.414	184.6
11.0	2.206	216.0	0.0949	47.96	70.32	14.15	3.114	5.375	194.3
12.0	2.419	238.0	0.0864	51.16	75.67	14.62	3.115	5.346	203.4
13.0	2.631	260.0	0.0793	54.35	81.00	15.05	3.116	5.324	212.0
14.0	2.842	281.0	0.0733	57.52	86.32	15.44	3.117	5.307	220.3
15.0	3.052	303.0	0.0682	60.69	91.61	15.81	3.117	5.292	228.2
16.0	3.261	324.0	0.0638	63.85	96.90	16.15	3.118	5.280	235.9
17.0	3.470	346.0	0.0599	67.01	102.2	16.47	3.118	5.270	243.2
18.0	3.679	367.0	0.0564	70.17	107.4	16.77	3.118	5.262	250.4
19.0	3.887	388.0	0.0534	73.32	112.7	17.05	3.118	5.255	257.3
20.0	4.094	409.0	0.0506	76.46	117.9	17.32	3.118	5.249	264.1
21.0	4.302	430.0	0.0482	79.61	123.2	17.58	3.119	5.244	270.6
22.0	4.509	451.0	0.0459	82.75	128.4	17.82	3.119	5.239	277.0
23.0	4.715	472.0	0.0439	85.89	133.7	18.05	3.119	5.235	283.2
24.0	4.923	493.0	0.0420	89.02	138.9	18.28	3.119	5.232	289.3
25.0	5.131	513.0	0.0403	92.16	144.1	18.49	3.119	5.229	295.3
26.0	5.336	534.0	0.0387	95.29	149.4	18.70	3.118	5.226	301.2
28.0	5.749	576.0	0.0359	101.6	159.8	19.08	3.118	5.221	312.5
30.0	6.161	617.0	0.0335	107.8	170.2	19.44	3.118	5.217	323.5
32.0	6.573	659.0	0.0314	114.1	180.7	19.78	3.118	5.214	334.0
34.0	6.985	700.0	0.0295	120.3	191.1	20.09	3.118	5.212	344.3
36.0	7.397	741.0	0.0279	126.6	201.5	20.39	3.118	5.210	354.2
38.0	7.808	783.0	0.0264	132.8	211.9	20.67	3.118	5.208	363.9
40.0	8.219	824.0	0.0251	139.1	222.4	20.94	3.118	5.206	373.3
45.0	9.247	927.0	0.0223	154.7	248.4	21.55	3.118	5.203	395.9
50.0	10.27	1030.0	0.0200	170.3	274.4	22.10	3.117	5.201	417.2
55.0	11.30	1130.0	0.0182	185.9	300.4	22.60	3.117	5.200	437.5
60.0	12.33	1240.0	0.0167	201.5	326.4	23.05	3.117	5.199	456.8
65.0	13.35	1340.0	0.0154	217.1	352.4	23.47	3.117	5.198	475.4
70.0	14.38	1440.0	0.0143	232.7	378.4	23.85	3.117	5.197	493.3
75.0	15.40	1540.0	0.0133	248.3	404.4	24.21	3.117	5.196	510.5
80.0	16.43	1650.0	0.0125	263.9	430.3	24.55	3.117	5.196	527.2
90.0	18.48	1850.0	0.0111	295.0	482.3	25.18	3.117	5.195	559.1
100.0	20.53	2060.0	0.0100	326.2	534.2	25.71	3.117	5.195	589.2
125.0	25.66	2570.0	0.00800	404.1	664.1	26.86	3.116	5.194	658.6
150.0	30.78	3080.0	0.00667	482.0	793.9	27.81	3.116	5.194	721.3
175.0	35.91	3590.0	0.00571	559.9	923.8	28.61	3.116	5.193	779.0
200.0	41.03	4110.0	0.00500	637.8	1054.0	29.31	3.116	5.193	832.6
225.0	46.16	4620.0	0.00444	715.8	1183.0	29.92	3.116	5.193	883.1
250.0	51.28	5130.0	0.00400	793.7	1313.0	30.46	3.116	5.193	930.8
275.0	56.41	5640.0	0.00364	871.6	1443.0	30.96	3.116	5.193	976.2
300.0	61.53	6160.0	0.00333	949.5	1573.0	31.41	3.116	5.193	1020.0
350.0	71.78	7180.0	0.00286	1105.0	1833.0	32.21	3.116	5.193	1101.0
400.0	82.03	8210.0	0.00250	1261.0	2092.0	32.90	3.116	5.193	1177.0
450.0	92.28	9230.0	0.00222	1417.0	2352.0	33.52	3.116	5.193	1248.0
500.0	102.5	10300.0	0.00200	1573.0	2612.0	34.06	3.116	5.193	1316.0
600.0	123.0	12300.0	0.00167	1884.0	3131.0	35.01	3.116	5.193	1441.0
700.0	143.5	14400.0	0.00143	2196.0	3650.0	35.81	3.116	5.193	1557.0
800.0	164.0	16400.0	0.00125	2507.0	4169.0	36.50	3.116	5.193	1664.0
900.0	184.5	18500.0	0.00111	2819.0	4689.0	37.12	3.116	5.193	1765.0
1000.0	205.0	20500.0	0.00100	3131.0	5208.0	37.68	3.116	5.193	1861.0
1100.0	225.5	22600.0	0.000909	3442.0	5727.0	38.18	3.116	5.193	1951.0
1200.0	246.0	24600.0	0.000833	3754.0	6247.0	38.61	3.116	5.193	2038.0
1300.0	266.5	26700.0	0.000769	4065.0	6766.0	39.03	3.116	5.193	2121.0
1400.0	287.0	28700.0	0.000714	4377.0	7285.0	39.41	3.116	5.193	2202.0
1500.0	307.5	30800.0	0.000667	4688.0	7805.0	39.77	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

1.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_p$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.168	14.83									
2.5	14.69	54.2	9.58	69.9	0.0377	0.167	39.4	0.000558	1.05528	0.481
3.0	14.33	38.7	12.6	56.7	0.0668	0.182	38.6	0.000538	1.05392	0.500
3.5	13.85	32.5	13.0	41.0	0.0923	0.191	36.4	0.000462	1.05189	0.571
4.0	13.01	26.6	12.8	24.7	0.153	0.196	33.4	0.000371	1.04886	0.692
* 4.224	12.50	23.7	12.3	17.3	0.210	0.196	31.7	0.000315	1.04692	0.804
* 4.224	1.689	14.7	6.74	0.573	0.666	0.116	12.5	0.000643	1.00626	1.15
4.5	1.450	17.0	6.79	0.684	0.470	0.106	13.0	0.000913	1.00538	0.978
5.0	1.194	20.7	6.82	0.788	0.329	0.111	13.9	0.00137	1.00443	0.852
5.1	1.157	21.3	6.82	0.802	0.312	0.112	14.1	0.00146	1.00429	0.838
5.2	1.122	22.0	6.82	0.814	0.298	0.114	14.3	0.00154	1.00416	0.825
5.3	1.090	22.7	6.82	0.825	0.285	0.115	14.5	0.00163	1.00404	0.814
5.4	1.060	23.3	6.82	0.835	0.273	0.116	14.7	0.00172	1.00393	0.804
5.5	1.032	24.0	6.83	0.845	0.262	0.118	14.9	0.00181	1.00382	0.795
5.6	1.006	24.6	6.82	0.853	0.253	0.119	15.1	0.00190	1.00373	0.787
5.7	0.9810	25.2	6.82	0.861	0.244	0.120	15.2	0.00199	1.00364	0.780
5.8	0.9577	25.8	6.82	0.868	0.236	0.122	15.4	0.00208	1.00355	0.773
5.9	0.9358	26.5	6.82	0.874	0.229	0.123	15.6	0.00217	1.00347	0.768
6.0	0.9149	27.1	6.82	0.880	0.222	0.125	15.8	0.00227	1.00339	0.762
6.5	0.8250	30.1	6.81	0.905	0.194	0.131	16.7	0.00273	1.00306	0.742
7.0	0.7530	33.0	6.80	0.923	0.173	0.138	17.6	0.00321	1.00279	0.729
7.5	0.6936	35.9	6.79	0.936	0.156	0.145	18.5	0.00371	1.00257	0.719
8.0	0.6435	38.8	6.78	0.946	0.143	0.151	19.4	0.00422	1.00238	0.713
8.5	0.6007	41.6	6.76	0.955	0.132	0.157	20.2	0.00475	1.00223	0.708
9.0	0.5636	44.4	6.75	0.961	0.123	0.163	21.0	0.00529	1.00209	0.705
9.5	0.5310	47.2	6.74	0.967	0.115	0.169	21.8	0.00585	1.00197	0.702
10.0	0.5021	50.0	6.73	0.971	0.108	0.175	22.6	0.00642	1.00186	0.700
11.0	0.4533	55.4	6.72	0.978	0.0970	0.186	24.1	0.00761	1.00168	0.699
12.0	0.4134	60.9	6.71	0.983	0.0878	0.196	25.6	0.00886	1.00153	0.698
13.0	0.3801	66.3	6.70	0.987	0.0803	0.206	27.0	0.0102	1.00141	0.698
14.0	0.3519	71.6	6.69	0.990	0.0741	0.216	28.4	0.0115	1.00130	0.698
15.0	0.3277	77.0	6.68	0.992	0.0687	0.225	29.7	0.0130	1.00121	0.699
16.0	0.3066	82.3	6.67	0.994	0.0641	0.234	31.0	0.0144	1.00114	0.700
17.0	0.2882	87.6	6.66	1.00	0.0601	0.242	32.2	0.0160	1.00107	0.701
18.0	0.2718	92.9	6.66	1.00	0.0566	0.251	33.5	0.0175	1.00101	0.702
19.0	0.2573	98.2	6.65	1.00	0.0535	0.259	34.7	0.0192	1.00095	0.702
20.0	0.2442	104.0	6.65	1.00	0.0507	0.267	35.8	0.0209	1.00090	0.703
21.0	0.2325	109.0	6.64	1.00	0.0482	0.275	37.0	0.0226	1.00086	0.704
22.0	0.2218	114.0	6.64	1.00	0.0459	0.283	38.1	0.0244	1.00082	0.705
23.0	0.2120	119.0	6.64	1.00	0.0439	0.291	39.2	0.0262	1.00079	0.706
24.0	0.2031	125.0	6.63	1.00	0.0420	0.298	40.3	0.0281	1.00075	0.706
25.0	0.1949	130.0	6.63	1.00	0.0403	0.306	41.3	0.0300	1.00072	0.707
26.0	0.1874	135.0	6.63	1.00	0.0387	0.313	42.3	0.0320	1.00069	0.707
28.0	0.1739	146.0	6.62	1.00	0.0359	0.327	44.4	0.0360	1.00064	0.708
30.0	0.1623	156.0	6.62	1.00	0.0334	0.341	46.3	0.0403	1.00060	0.709
32.0	0.1521	166.0	6.62	1.00	0.0313	0.355	48.2	0.0447	1.00056	0.709
34.0	0.1432	177.0	6.61	1.00	0.0295	0.368	50.1	0.0493	1.00053	0.709
36.0	0.1352	187.0	6.61	1.00	0.0278	0.381	51.9	0.0541	1.00050	0.710
38.0	0.1281	198.0	6.61	1.00	0.0263	0.394	53.7	0.0591	1.00047	0.709
40.0	0.1217	208.0	6.61	1.00	0.0250	0.407	55.4	0.0642	1.00045	0.709
45.0	0.1081	234.0	6.60	1.00	0.0222	0.438	59.6	0.0778	1.00040	0.709
50.0	0.09734	260.0	6.60	1.00	0.0200	0.468	63.6	0.0924	1.00036	0.707
55.0	0.08849	286.0	6.60	1.00	0.0182	0.497	67.5	0.109	1.00033	0.706
60.0	0.08113	312.0	6.60	1.00	0.0166	0.525	71.2	0.125	1.00030	0.704
65.0	0.07489	338.0	6.60	1.00	0.0154	0.553	74.8	0.142	1.00028	0.702
70.0	0.06955	364.0	6.59	1.00	0.0143	0.581	78.3	0.161	1.00026	0.701
75.0	0.06492	390.0	6.59	1.00	0.0133	0.607	81.7	0.180	1.00024	0.699
80.0	0.06087	416.0	6.59	1.00	0.0125	0.634	85.0	0.200	1.00023	0.697
90.0	0.05411	468.0	6.59	1.00	0.0111	0.685	91.5	0.244	1.00020	0.694
100.0	0.04871	520.0	6.59	1.00	0.0100	0.736	97.8	0.291	1.00018	0.691
125.0	0.03898	650.0	6.59	1.00	0.00799	0.856	111.0	0.423	1.00014	0.673
150.0	0.03249	780.0	6.59	1.00	0.00666	0.969	125.0	0.574	1.00012	0.670
175.0	0.02785	910.0	6.58	1.00	0.00571	1.08	138.0	0.744	1.00010	0.668
200.0	0.02437	1040.0	6.58	1.00	0.00500	1.18	151.0	0.932	1.00009	0.667
225.0	0.02167	1170.0	6.58	1.00	0.00444	1.28	164.0	1.14	1.00008	0.666
250.0	0.01950	1300.0	6.58	1.00	0.00400	1.37	176.0	1.35	1.00007	0.667
275.0	0.01773	1430.0	6.58	1.00	0.00363	1.46	188.0	1.59	1.00007	0.667
300.0	0.01625	1560.0	6.58	1.00	0.00333	1.55	199.0	1.83	1.00006	0.669
350.0	0.01393	1820.0	6.58	1.00	0.00286	1.72	222.0	2.38	1.00005	0.668
400.0	0.01219	2080.0	6.58	1.00	0.00250	1.89	243.0	2.98	1.00005	0.668
450.0	0.01084	2340.0	6.58	1.00	0.00222	2.05	264.0	3.64	1.00004	0.668
500.0	0.009753	2600.0	6.58	1.00	0.00200	2.21	284.0	4.36	1.00004	0.668
600.0	0.008128	3120.0	6.58	1.00	0.00167	2.51	322.0	5.94	1.00003	0.667
700.0	0.006967	3640.0	6.58	1.00	0.00143	2.81	359.0	7.73	1.00003	0.667
800.0	0.006096	4160.0	6.58	1.00	0.00125	3.07	394.0	9.70	1.00002	0.667
900.0	0.005419	4670.0	6.58	1.00	0.00111	3.34	428.0	11.9	1.00002	0.666
1000.0	0.004877	5190.0	6.58	1.00	0.00100	3.60	462.0	14.2	1.00002	0.666
1100.0	0.004434	5710.0	6.58	1.00	0.000909	3.85	494.0	16.7	1.00002	0.666
1200.0	0.004065	6230.0	6.58	1.00	0.000833	4.10	525.0	19.4	1.00002	0.666
1300.0	0.003752	6750.0	6.58	1.00	0.000769	4.34	556.0	22.3	1.00001	0.666
1400.0	0.003484	7270.0	6.58	1.00	0.000714	4.57	586.0	25.3	1.00001	0.666
1500.0	0.003252	7790.0	6.58	1.00	0.000667	4.80	615.0	28.4	1.00001	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

1.2 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** K .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
*	2.167	0.06726								
	2.5	0.06789	487.0	2.63	3.868	4.694	1.940	1.862	2.029	231.9
	3.0	0.06953	407.0	3.46	4.902	5.747	2.326	1.907	2.339	224.8
	3.5	0.07211	309.0	3.81	6.180	7.057	2.730	2.096	2.962	210.3
	4.0	0.07629	203.0	3.83	7.835	8.762	3.185	2.268	3.970	189.9
*	4.424	0.08281	106.0	3.51	9.790	10.80	3.667	2.454	6.015	162.6
*	4.424	0.4870	29.4	0.469	24.02	29.94	7.993	3.362	11.31	100.1
	4.5	0.5142	34.0	0.441	24.50	30.76	8.174	3.331	10.23	102.8
	5.0	0.6580	57.1	0.339	27.02	35.03	9.077	3.212	7.521	116.4
	5.1	0.6830	60.9	0.321	27.46	35.77	9.223	3.198	7.288	118.6
	5.2	0.7073	64.6	0.309	27.88	36.48	9.363	3.187	7.094	120.7
	5.3	0.7310	68.1	0.299	28.30	37.19	9.496	3.177	6.930	122.7
	5.4	0.7542	71.6	0.289	28.70	37.87	9.625	3.168	6.790	124.7
	5.5	0.7769	74.9	0.280	29.10	38.54	9.748	3.160	6.669	126.5
	5.6	0.7992	78.1	0.271	29.49	39.21	9.867	3.154	6.563	128.4
	5.7	0.8212	81.3	0.263	29.87	39.86	9.98	3.148	6.470	130.1
	5.8	0.8429	84.4	0.256	30.25	40.50	10.09	3.143	6.388	131.9
	5.9	0.8644	87.5	0.249	30.62	41.13	10.20	3.138	6.315	133.5
	6.0	0.8856	90.5	0.243	31.00	41.76	10.31	3.135	6.249	135.2
	6.5	0.9886	105.0	0.216	32.80	44.82	10.80	3.122	6.002	142.8
	7.0	1.088	118.0	0.196	34.55	47.78	11.24	3.115	5.840	149.9
	7.5	1.185	131.0	0.179	36.26	50.67	11.64	3.112	5.728	156.4
	8.0	1.280	144.0	0.166	37.95	53.51	12.00	3.111	5.645	162.5
	8.5	1.374	156.0	0.154	39.61	56.32	12.34	3.110	5.583	168.3
	9.0	1.467	168.0	0.144	41.26	59.10	12.66	3.111	5.533	173.9
	9.5	1.559	180.0	0.135	42.90	61.85	12.96	3.111	5.494	179.2
	10.0	1.650	191.0	0.128	44.53	64.59	13.24	3.112	5.462	184.3
	11.0	1.830	214.0	0.115	47.77	70.02	13.76	3.113	5.414	194.1
	12.0	2.009	236.0	0.104	50.98	75.41	14.23	3.115	5.378	203.3
	13.0	2.187	258.0	0.0958	54.18	80.77	14.65	3.116	5.351	212.0
	14.0	2.363	280.0	0.0885	57.37	86.10	15.05	3.117	5.330	220.3
	15.0	2.539	302.0	0.0822	60.55	91.42	15.42	3.118	5.313	228.3
	16.0	2.715	323.0	0.0768	63.72	96.73	15.76	3.118	5.298	236.0
	17.0	2.889	345.0	0.0721	66.89	102.0	16.08	3.118	5.286	243.4
	18.0	3.064	366.0	0.0679	70.05	107.3	16.38	3.119	5.276	250.5
	19.0	3.238	388.0	0.0642	73.20	112.6	16.67	3.119	5.267	257.5
	20.0	3.411	409.0	0.0609	76.36	117.8	16.94	3.119	5.260	264.2
	21.0	3.584	430.0	0.0579	79.51	123.1	17.19	3.119	5.254	270.8
	22.0	3.758	451.0	0.0552	82.65	128.3	17.44	3.119	5.248	277.2
	23.0	3.930	472.0	0.0528	85.80	133.6	17.67	3.119	5.244	283.5
	24.0	4.103	493.0	0.0505	88.94	138.8	17.89	3.119	5.239	289.6
	25.0	4.276	514.0	0.0485	92.08	144.1	18.11	3.119	5.236	295.5
	26.0	4.448	534.0	0.0466	95.22	149.3	18.31	3.119	5.232	301.4
	28.0	4.792	576.0	0.0432	101.5	159.8	18.70	3.119	5.227	312.8
	30.0	5.136	618.0	0.0403	107.8	170.2	19.06	3.119	5.222	323.7
	32.0	5.480	659.0	0.0377	114.0	180.6	19.40	3.119	5.219	334.3
	34.0	5.823	701.0	0.0355	120.3	191.1	19.71	3.119	5.216	344.5
	36.0	6.167	742.0	0.0335	126.5	201.5	20.01	3.118	5.213	354.5
	38.0	6.510	783.0	0.0317	132.8	211.9	20.29	3.118	5.211	364.2
	40.0	6.853	825.0	0.0301	139.0	222.4	20.56	3.118	5.209	373.6
	45.0	7.709	928.0	0.0267	154.7	248.4	21.17	3.118	5.205	396.1
	50.0	8.565	1030.0	0.0240	170.3	274.4	21.72	3.118	5.203	417.4
	55.0	9.421	1130.0	0.0219	185.9	300.4	22.22	3.118	5.201	437.7
	60.0	10.28	1240.0	0.0200	201.5	326.4	22.67	3.117	5.200	457.1
	65.0	11.13	1340.0	0.0185	217.1	352.4	23.09	3.117	5.199	475.6
	70.0	11.99	1440.0	0.0172	232.7	378.4	23.47	3.117	5.198	493.5
	75.0	12.84	1540.0	0.0160	248.3	404.4	23.83	3.117	5.197	510.7
	80.0	13.70	1650.0	0.0150	263.8	430.4	24.17	3.117	5.196	527.4
	90.0	15.40	1850.0	0.0133	295.0	482.3	24.78	3.117	5.196	559.3
	100.0	17.11	2060.0	0.0120	326.2	534.3	25.33	3.117	5.195	589.4
	125.0	21.39	2570.0	0.00960	404.1	664.2	26.49	3.117	5.194	658.7
	150.0	25.66	3080.0	0.00800	482.0	794.1	27.43	3.116	5.194	721.4
	175.0	29.93	3600.0	0.00686	559.9	923.8	28.23	3.116	5.194	779.1
	200.0	34.20	4110.0	0.00600	637.9	1054.3	28.93	3.116	5.193	832.8
	225.0	38.47	4620.0	0.00533	715.8	1184.0	29.54	3.116	5.193	883.2
	250.0	42.74	5130.0	0.00480	793.7	1313.0	30.09	3.116	5.193	930.9
	275.0	47.01	5640.0	0.00436	871.6	1443.0	30.58	3.116	5.193	976.3
	300.0	51.28	6160.0	0.00400	949.5	1573.0	31.03	3.116	5.193	1020.0
	350.0	59.82	7180.0	0.00343	1105.0	1833.0	31.83	3.116	5.193	1101.0
	400.0	68.36	8210.0	0.00300	1261.0	2092.0	32.53	3.116	5.193	1177.0
	450.0	76.91	9230.0	0.00267	1417.0	2352.0	33.14	3.116	5.193	1248.0
	500.0	85.45	10300.0	0.00240	1573.0	2612.0	33.68	3.116	5.193	1316.0
	600.0	102.5	12300.0	0.00200	1884.0	3131.0	34.63	3.116	5.193	1441.0
	700.0	119.6	14400.0	0.00171	2196.0	3650.0	35.43	3.116	5.193	1557.0
	800.0	136.7	16400.0	0.00150	2507.0	4169.0	36.13	3.116	5.193	1664.0
	900.0	153.8	18500.0	0.00133	2819.0	4689.0	36.74	3.116	5.193	1765.0
	1000.0	170.9	20500.0	0.00120	3131.0	5208.0	37.28	3.116	5.193	1861.0
	1100.0	187.9	22600.0	0.00109	3442.0	5727.0	37.78	3.116	5.193	1952.0
	1200.0	205.0	24600.0	0.00100	3754.0	6247.0	38.23	3.116	5.193	2038.0
	1300.0	222.1	26700.0	0.000923	4065.0	6766.0	38.65	3.116	5.193	2121.0
	1400.0	239.2	28700.0	0.000857	4377.0	7285.0	39.03	3.116	5.193	2202.0
	1500.0	256.3	30800.0	0.000800	4689.0	7805.0	39.39	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

1.2 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_p$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.167	14.87									
2.5	14.73	55.3	9.60	71.8	0.0367	0.168	39.8	0.000563	1.05545	0.480
3.0	14.38	39.6	12.6	58.5	0.0591	0.182	39.0	0.000542	1.05412	0.500
3.5	13.87	33.3	13.1	42.8	0.0889	0.192	36.9	0.000468	1.05215	0.568
4.0	13.11	27.6	12.9	26.6	0.144	0.198	33.9	0.000380	1.04924	0.680
* 4.424	12.08	22.0	11.8	12.8	0.273	0.197	30.6	0.000271	1.04531	0.935
* 4.424	2.053	14.6	6.79	0.604	0.777	0.116	13.4	0.000498	1.00762	1.31
4.5	1.945	15.3	6.81	0.661	0.667	0.114	13.5	0.000573	1.00722	1.21
5.0	1.520	19.5	6.86	0.868	0.386	0.114	14.3	0.00100	1.00564	0.939
5.1	1.464	20.2	6.86	0.892	0.360	0.115	14.5	0.00108	1.00543	0.914
5.2	1.414	20.9	6.87	0.913	0.339	0.116	14.6	0.00116	1.00524	0.893
5.3	1.368	21.6	6.87	0.932	0.320	0.117	14.8	0.00124	1.00507	0.874
5.4	1.326	22.3	6.87	0.949	0.304	0.119	15.0	0.00132	1.00492	0.859
5.5	1.287	23.0	6.87	0.964	0.290	0.120	15.2	0.00140	1.00477	0.845
5.6	1.251	23.7	6.87	0.978	0.277	0.121	15.4	0.00147	1.00464	0.833
5.7	1.218	24.3	6.87	0.990	0.266	0.122	15.5	0.00155	1.00451	0.822
5.8	1.186	25.0	6.87	1.00	0.256	0.124	15.7	0.00163	1.00440	0.812
5.9	1.157	25.6	6.87	1.01	0.246	0.125	15.9	0.00171	1.00429	0.804
6.0	1.129	26.3	6.87	1.02	0.238	0.126	16.1	0.00179	1.00419	0.796
6.5	1.012	29.4	6.86	1.06	0.204	0.133	17.0	0.00219	1.00375	0.767
7.0	0.9191	32.4	6.84	1.09	0.180	0.139	17.9	0.00260	1.00341	0.748
7.5	0.8439	35.4	6.83	1.11	0.162	0.146	18.7	0.00302	1.00313	0.735
8.0	0.7811	38.3	6.81	1.12	0.148	0.152	19.6	0.00345	1.00289	0.726
8.5	0.7278	41.1	6.80	1.13	0.136	0.158	20.4	0.00389	1.00270	0.719
9.0	0.6818	44.0	6.79	1.14	0.126	0.164	21.2	0.00435	1.00253	0.714
9.5	0.6416	46.8	6.78	1.15	0.117	0.170	22.0	0.00482	1.00238	0.711
10.0	0.6061	49.5	6.76	1.16	0.110	0.176	22.8	0.00530	1.00225	0.708
11.0	0.5464	55.1	6.75	1.17	0.0982	0.186	24.3	0.00636	1.00202	0.705
12.0	0.4978	60.6	6.73	1.18	0.0888	0.197	25.7	0.00735	1.00184	0.703
13.0	0.4573	66.0	6.72	1.18	0.0811	0.207	27.1	0.00844	1.00169	0.702
14.0	0.4231	71.4	6.71	1.19	0.0746	0.216	28.5	0.00959	1.00157	0.702
15.0	0.3938	76.8	6.70	1.19	0.0692	0.225	29.8	0.0108	1.00146	0.702
16.0	0.3684	82.2	6.69	1.19	0.0645	0.234	31.1	0.0120	1.00136	0.702
17.0	0.3461	87.5	6.68	1.19	0.0604	0.243	32.3	0.0133	1.00128	0.703
18.0	0.3264	92.8	6.67	1.20	0.0568	0.252	33.5	0.0146	1.00121	0.704
19.0	0.3089	98.2	6.67	1.20	0.0537	0.260	34.7	0.0160	1.00114	0.704
20.0	0.2932	103.0	6.66	1.20	0.0508	0.268	35.9	0.0174	1.00109	0.705
21.0	0.2790	109.0	6.66	1.20	0.0483	0.276	37.0	0.0188	1.00103	0.705
22.0	0.2661	114.0	6.65	1.20	0.0460	0.284	38.2	0.0203	1.00099	0.706
23.0	0.2544	119.0	6.65	1.20	0.0440	0.291	39.3	0.0218	1.00094	0.707
24.0	0.2437	125.0	6.65	1.20	0.0421	0.299	40.3	0.0234	1.00090	0.707
25.0	0.2339	130.0	6.64	1.20	0.0403	0.306	41.4	0.0250	1.00087	0.708
26.0	0.2248	135.0	6.64	1.20	0.0387	0.313	42.4	0.0266	1.00083	0.708
28.0	0.2087	146.0	6.63	1.20	0.0359	0.328	44.4	0.0300	1.00077	0.709
30.0	0.1947	156.0	6.63	1.20	0.0335	0.342	46.4	0.0336	1.00072	0.709
32.0	0.1825	166.0	6.63	1.20	0.0313	0.355	48.3	0.0373	1.00068	0.710
34.0	0.1717	177.0	6.62	1.20	0.0295	0.369	50.2	0.0411	1.00064	0.710
36.0	0.1622	187.0	6.62	1.20	0.0278	0.382	52.0	0.0451	1.00060	0.710
38.0	0.1536	198.0	6.62	1.20	0.0263	0.395	53.7	0.0493	1.00057	0.710
40.0	0.1459	208.0	6.61	1.20	0.0250	0.407	55.5	0.0536	1.00054	0.710
45.0	0.1297	234.0	6.61	1.20	0.0222	0.438	59.6	0.0649	1.00048	0.709
50.0	0.1168	260.0	6.61	1.20	0.0200	0.464	63.6	0.0770	1.00043	0.708
55.0	0.1061	286.0	6.60	1.20	0.0182	0.497	67.5	0.0901	1.00039	0.706
60.0	0.09731	312.0	6.60	1.20	0.0166	0.526	71.2	0.104	1.00036	0.704
65.0	0.08984	338.0	6.60	1.20	0.0154	0.554	74.8	0.119	1.00033	0.703
70.0	0.08343	364.0	6.60	1.20	0.0143	0.581	78.3	0.134	1.00031	0.701
75.0	0.07788	390.0	6.60	1.20	0.0133	0.608	81.7	0.150	1.00029	0.699
80.0	0.07302	416.0	6.59	1.20	0.0125	0.634	85.1	0.167	1.00027	0.697
90.0	0.06491	468.0	6.59	1.20	0.0111	0.686	91.5	0.203	1.00024	0.694
100.0	0.05843	520.0	6.59	1.20	0.0100	0.736	97.8	0.242	1.00022	0.691
125.0	0.04676	650.0	6.59	1.20	0.00799	0.856	111.0	0.352	1.00017	0.673
150.0	0.03898	780.0	6.59	1.20	0.00666	0.969	125.0	0.479	1.00014	0.670
175.0	0.03341	910.0	6.59	1.20	0.00571	1.08	139.0	0.621	1.00012	0.668
200.0	0.02924	1040.0	6.58	1.20	0.00500	1.18	151.0	0.777	1.00011	0.667
225.0	0.02599	1170.0	6.58	1.20	0.00444	1.28	164.0	0.947	1.00010	0.666
250.0	0.02340	1300.0	6.58	1.20	0.00400	1.37	176.0	1.13	1.00009	0.667
275.0	0.02127	1430.0	6.58	1.20	0.00363	1.46	188.0	1.32	1.00008	0.667
300.0	0.01950	1560.0	6.58	1.20	0.00333	1.55	199.0	1.53	1.00007	0.669
350.0	0.01672	1820.0	6.58	1.20	0.00286	1.72	222.0	1.98	1.00006	0.668
400.0	0.01463	2080.0	6.58	1.20	0.00250	1.89	243.0	2.49	1.00005	0.668
450.0	0.01300	2340.0	6.58	1.20	0.00222	2.05	264.0	3.04	1.00005	0.668
500.0	0.01170	2600.0	6.58	1.20	0.00200	2.21	284.0	3.63	1.00004	0.668
600.0	0.009753	3120.0	6.58	1.20	0.00167	2.51	322.0	4.95	1.00004	0.667
700.0	0.008360	3640.0	6.58	1.20	0.00143	2.80	359.0	6.44	1.00003	0.667
800.0	0.007316	4160.0	6.58	1.20	0.00125	3.07	394.0	8.09	1.00003	0.667
900.0	0.006503	4670.0	6.58	1.20	0.00111	3.34	428.0	9.89	1.00002	0.666
1000.0	0.005853	5190.0	6.58	1.20	0.00100	3.60	462.0	11.8	1.00002	0.666
1100.0	0.005321	5710.0	6.58	1.20	0.000909	3.85	494.0	13.9	1.00002	0.666
1200.0	0.004877	6230.0	6.58	1.20	0.000833	4.10	525.0	16.2	1.00002	0.666
1300.0	0.004502	6750.0	6.58	1.20	0.000769	4.34	556.0	18.5	1.00002	0.666
1400.0	0.004181	7270.0	6.58	1.20	0.000714	4.57	586.0	21.1	1.00002	0.666
1500.0	0.003902	7790.0	6.58	1.20	0.000667	4.80	615.0	23.7	1.00001	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

1.4 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** K .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.165	0.06738								
	2.5	0.06769	498.0	2.63	3.852	4.812	1.933	1.852	2.013	234.2
	3.0	0.06928	418.0	3.47	4.873	5.856	2.316	1.934	2.324	227.3
	3.5	0.07177	321.0	4.84	6.134	7.152	2.716	2.092	2.930	213.3
	4.0	0.07575	216.0	3.88	7.752	8.827	3.162	2.261	3.879	193.9
	4.5	0.08330	104.0	3.51	10.04	11.23	3.729	2.480	6.233	162.5
*	4.602	0.08501	78.6	3.35	10.69	11.91	3.876	2.541	7.468	153.0
*	4.602	0.4274	24.4	0.567	23.79	29.57	7.710	3.374	13.55	99.7
	5.0	0.5254	47.2	0.427	26.23	33.68	8.570	3.247	8.633	112.8
	5.1	0.5496	51.7	0.406	26.73	34.52	8.736	3.228	8.194	115.3
	5.2	0.5728	56.2	0.388	27.20	35.33	8.892	3.212	7.852	117.7
	5.3	0.5951	60.0	0.372	27.65	36.10	9.039	3.198	7.576	120.0
	5.4	0.6167	63.9	0.357	28.09	36.84	9.178	3.187	7.349	122.2
	5.5	0.6377	67.6	0.345	28.52	37.57	9.311	3.176	7.159	124.2
	5.6	0.6582	71.1	0.333	28.94	38.28	9.439	3.168	6.998	126.2
	5.7	0.6783	74.6	0.322	29.35	38.97	9.561	3.160	6.859	128.1
	5.8	0.6980	78.0	0.312	29.75	39.65	9.679	3.153	6.738	129.9
	5.9	0.7174	81.3	0.303	30.14	40.32	9.794	3.148	6.632	131.7
	6.0	0.7364	84.5	0.295	30.53	40.97	9.904	3.143	6.539	133.5
	6.5	0.8284	100.6	0.260	32.40	44.15	10.41	3.125	6.198	141.5
	7.0	0.9162	114.0	0.234	34.20	47.19	10.86	3.117	5.985	148.8
	7.5	1.001	127.0	0.213	35.94	50.15	11.27	3.112	5.840	155.6
	8.0	1.085	140.0	0.197	37.66	53.04	11.65	3.110	5.736	161.9
	8.5	1.166	153.0	0.182	39.34	55.89	11.99	3.110	5.658	167.8
	9.0	1.247	165.0	0.170	41.01	58.70	12.31	3.110	5.597	173.5
	9.5	1.327	177.0	0.160	42.67	61.49	12.61	3.111	5.549	178.9
	10.0	1.409	189.0	0.150	44.31	64.25	12.90	3.112	5.510	184.1
	11.0	1.562	212.0	0.135	47.57	69.72	13.42	3.113	5.453	193.9
	12.0	1.716	235.0	0.123	50.80	75.14	13.89	3.115	5.411	203.2
	13.0	1.869	257.0	0.112	54.01	80.53	14.32	3.116	5.379	212.0
	14.0	2.022	279.0	0.104	57.21	85.89	14.72	3.117	5.354	220.4
	15.0	2.173	301.0	0.0964	60.40	91.23	15.09	3.118	5.333	228.4
	16.0	2.324	323.0	0.0900	63.58	96.55	15.43	3.118	5.316	236.1
	17.0	2.474	344.0	0.0844	66.76	101.9	15.75	3.119	5.302	243.5
	18.0	2.624	366.0	0.0795	69.93	107.2	16.06	3.119	5.290	250.7
	19.0	2.774	387.0	0.0751	73.09	112.4	16.34	3.119	5.280	257.7
	20.0	2.923	408.0	0.0712	76.25	117.7	16.61	3.119	5.271	264.4
	21.0	3.072	430.0	0.0677	79.41	123.0	16.87	3.120	5.264	271.0
	22.0	3.221	451.0	0.0646	82.56	128.2	17.11	3.120	5.258	277.4
	23.0	3.369	472.0	0.0617	85.71	133.5	17.35	3.120	5.252	283.7
	24.0	3.517	493.0	0.0590	88.85	138.7	17.57	3.120	5.247	289.8
	25.0	3.665	514.0	0.0566	92.00	144.0	17.78	3.120	5.243	295.8
	26.0	3.813	535.0	0.0544	95.14	149.2	17.99	3.120	5.239	301.6
	28.0	4.109	577.0	0.0504	101.4	159.7	18.38	3.119	5.232	313.0
	30.0	4.404	618.0	0.0470	107.7	170.2	18.74	3.119	5.227	324.0
	32.0	4.698	660.0	0.0440	114.0	180.6	19.08	3.119	5.223	334.5
	34.0	4.994	701.0	0.0414	120.2	191.1	19.39	3.119	5.219	344.8
	36.0	5.288	743.0	0.0391	126.5	201.5	19.69	3.119	5.216	354.7
	38.0	5.582	784.0	0.0370	132.7	211.9	19.97	3.119	5.214	364.4
	40.0	5.875	825.0	0.0351	139.0	222.3	20.24	3.119	5.212	373.8
	45.0	6.611	929.0	0.0312	154.6	248.4	20.85	3.118	5.208	396.4
	50.0	7.345	1030.0	0.0281	170.2	274.4	21.40	3.118	5.205	417.7
	55.0	8.079	1130.0	0.0255	185.8	300.4	21.90	3.118	5.202	437.9
	60.0	8.812	1240.0	0.0234	201.4	326.4	22.35	3.118	5.201	457.3
	65.0	9.545	1340.0	0.0216	217.0	352.4	22.77	3.117	5.199	475.8
	70.0	10.28	1440.0	0.0200	232.6	378.4	23.15	3.117	5.198	493.7
	75.0	11.01	1550.0	0.0187	248.2	404.4	23.51	3.117	5.198	510.9
	80.0	11.74	1650.0	0.0175	263.8	430.4	23.85	3.117	5.197	527.6
	90.0	13.21	1850.0	0.0156	295.0	482.4	24.46	3.117	5.196	559.5
	100.0	14.67	2060.0	0.0140	326.2	534.3	25.01	3.117	5.195	589.6
	125.0	18.33	2570.0	0.0112	404.1	664.2	26.17	3.117	5.194	658.9
	150.0	22.00	3080.0	0.00933	482.0	794.1	27.11	3.116	5.194	721.6
	175.0	25.66	3600.0	0.00800	559.9	923.9	27.91	3.116	5.194	779.2
	200.0	29.32	4110.0	0.00700	637.9	1054.0	28.61	3.116	5.193	832.9
	225.0	32.98	4620.0	0.00622	715.8	1184.0	29.22	3.116	5.193	883.3
	250.0	36.64	5130.0	0.00560	793.7	1313.0	29.77	3.116	5.193	931.0
	275.0	40.30	5650.0	0.00509	871.6	1443.0	30.26	3.116	5.193	976.3
	300.0	43.96	6160.0	0.00467	949.5	1573.0	30.71	3.116	5.193	1020.0
	350.0	51.28	7180.0	0.00400	1105.0	1833.0	31.51	3.116	5.193	1101.0
	400.0	58.60	8210.0	0.00350	1261.0	2092.0	32.21	3.116	5.193	1177.0
	450.0	65.92	9230.0	0.00311	1417.0	2352.0	32.82	3.116	5.193	1249.0
	500.0	73.24	10300.0	0.00280	1573.0	2612.0	33.36	3.116	5.193	1316.0
	600.0	87.89	12300.0	0.00233	1884.0	3131.0	34.31	3.116	5.193	1442.0
	700.0	102.5	14400.0	0.00200	2196.0	3650.0	35.11	3.116	5.193	1557.0
	800.0	117.2	16400.0	0.00175	2507.0	4170.0	35.81	3.116	5.193	1664.0
	900.0	131.8	18500.0	0.00156	2819.0	4689.0	36.42	3.116	5.193	1765.0
	1000.0	146.5	20500.0	0.00140	3131.0	5208.0	36.96	3.116	5.193	1861.0
	1100.0	161.1	22600.0	0.00127	3442.0	5727.0	37.46	3.116	5.193	1952.0
	1200.0	175.7	24600.0	0.00117	3754.0	6247.0	37.91	3.116	5.193	2038.0
	1300.0	190.4	26700.0	0.00108	4065.0	6766.0	38.33	3.116	5.193	2122.0
	1400.0	205.0	28700.0	0.00100	4377.0	7285.0	38.71	3.116	5.193	2202.0
	1500.0	219.7	30800.0	0.000933	4689.0	7805.0	39.07	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

E

THERMOPHYSICAL PROPERTIES OF HELIUM 4

1.4 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.165	14.91									
2.5	14.77	56.3	9.62	73.6	0.0358	0.169	40.3	0.000567	1.05561	0.480
3.0	14.43	40.4	12.6	60.3	0.0575	0.183	39.5	0.000546	1.05431	0.501
3.5	13.93	34.2	13.2	44.7	0.0858	0.193	37.3	0.000473	1.05240	0.566
4.0	13.20	28.6	13.0	28.6	0.136	0.199	34.4	0.000396	1.04961	0.669
4.5	12.01	22.1	11.8	12.4	0.282	0.198	30.6	0.000265	1.04505	0.961
* 4.602	11.63	20.4	11.3	9.14	0.367	0.200	29.5	0.000230	1.04361	1.10
* 4.602	2.455	14.3	6.85	0.643	0.945	0.127	14.3	0.000382	1.00911	1.52
5.0	1.903	18.2	6.90	0.899	0.474	0.119	14.7	0.000725	1.00706	1.07
5.1	1.819	19.0	6.91	0.941	0.431	0.119	14.9	0.000801	1.00675	1.02
5.2	1.746	19.8	6.91	0.977	0.397	0.120	15.0	0.000875	1.00648	0.984
5.3	1.680	20.6	6.91	1.01	0.369	0.121	15.2	0.000948	1.00623	0.954
5.4	1.621	21.3	6.92	1.04	0.345	0.122	15.4	0.00102	1.00601	0.928
5.5	1.568	22.0	6.92	1.06	0.325	0.123	15.5	0.00109	1.00581	0.907
5.6	1.519	22.7	6.92	1.08	0.308	0.124	15.7	0.00116	1.00563	0.889
5.7	1.474	23.4	6.92	1.10	0.293	0.125	15.9	0.00123	1.00547	0.873
5.8	1.433	24.1	6.92	1.12	0.280	0.126	16.0	0.00130	1.00531	0.859
5.9	1.394	24.8	6.92	1.13	0.268	0.127	16.2	0.00137	1.00517	0.846
6.0	1.358	25.4	6.91	1.15	0.257	0.128	16.4	0.00144	1.00503	0.835
6.5	1.207	28.7	6.90	1.20	0.216	0.134	17.2	0.00180	1.00448	0.795
7.0	1.031	31.8	6.89	1.24	0.188	0.141	18.1	0.00216	1.00405	0.769
7.5	0.999	34.8	6.87	1.27	0.168	0.147	18.9	0.00252	1.00370	0.752
8.0	0.9220	37.7	6.85	1.29	0.152	0.153	19.8	0.00290	1.00342	0.740
8.5	0.8574	40.7	6.84	1.31	0.139	0.159	20.6	0.00328	1.00318	0.731
9.0	0.8020	43.5	6.82	1.32	0.129	0.165	21.4	0.00368	1.00297	0.724
9.5	0.7538	46.4	6.81	1.33	0.120	0.171	22.1	0.00408	1.00279	0.719
10.0	0.7114	49.2	6.79	1.34	0.112	0.176	22.9	0.00450	1.00264	0.716
11.0	0.6403	54.8	6.78	1.36	0.100	0.187	24.4	0.00536	1.00237	0.711
12.0	0.5827	60.3	6.76	1.37	0.0897	0.197	25.8	0.00626	1.00216	0.708
13.0	0.5349	65.8	6.74	1.37	0.0818	0.207	27.2	0.00721	1.00198	0.706
14.0	0.4946	71.2	6.73	1.38	0.0752	0.217	28.6	0.00819	1.00183	0.705
15.0	0.4602	76.6	6.72	1.39	0.0696	0.226	29.9	0.00922	1.00170	0.705
16.0	0.4303	82.0	6.71	1.39	0.0648	0.235	31.2	0.0103	1.00159	0.705
17.0	0.4041	87.4	6.70	1.39	0.0607	0.244	32.4	0.0114	1.00150	0.705
18.0	0.3810	92.7	6.69	1.39	0.0570	0.252	33.6	0.0125	1.00141	0.706
19.0	0.3605	98.1	6.68	1.40	0.0538	0.260	34.8	0.0137	1.00134	0.706
20.0	0.3421	103.0	6.68	1.40	0.0510	0.269	36.0	0.0149	1.00127	0.706
21.0	0.3255	109.0	6.67	1.40	0.0484	0.276	37.1	0.0161	1.00121	0.707
22.0	0.3105	114.0	6.67	1.40	0.0461	0.284	38.2	0.0174	1.00115	0.707
23.0	0.2968	119.0	6.66	1.40	0.0440	0.292	39.3	0.0187	1.00110	0.708
24.0	0.2843	125.0	6.66	1.40	0.0421	0.299	40.4	0.0201	1.00105	0.708
25.0	0.2728	130.0	6.65	1.40	0.0404	0.307	41.4	0.0214	1.00101	0.709
26.0	0.2622	135.0	6.65	1.40	0.0388	0.314	42.5	0.0229	1.00097	0.709
28.0	0.2434	146.0	6.64	1.40	0.0359	0.328	44.5	0.0258	1.00090	0.709
30.0	0.2271	156.0	6.64	1.40	0.0335	0.342	46.5	0.0288	1.00084	0.710
32.0	0.2128	167.0	6.63	1.40	0.0314	0.356	48.4	0.0320	1.00079	0.710
34.0	0.2003	177.0	6.63	1.40	0.0295	0.369	50.2	0.0353	1.00074	0.710
36.0	0.1891	187.0	6.63	1.40	0.0278	0.382	52.0	0.0387	1.00070	0.710
38.0	0.1791	198.0	6.62	1.40	0.0263	0.395	53.8	0.0423	1.00066	0.710
40.0	0.1702	208.0	6.62	1.40	0.0250	0.408	55.5	0.0460	1.00063	0.710
45.0	0.1513	234.0	6.61	1.40	0.0222	0.438	59.7	0.0557	1.00056	0.709
50.0	0.1361	260.0	6.61	1.40	0.0200	0.468	63.7	0.0661	1.00050	0.708
55.0	0.1238	287.0	6.61	1.40	0.0182	0.498	67.5	0.0773	1.00046	0.706
60.0	0.1135	313.0	6.60	1.40	0.0166	0.526	71.2	0.0891	1.00042	0.704
65.0	0.1048	339.0	6.60	1.40	0.0154	0.554	74.8	0.102	1.00039	0.703
70.0	0.09730	365.0	6.60	1.40	0.0143	0.581	78.3	0.115	1.00036	0.701
75.0	0.09082	391.0	6.60	1.40	0.0133	0.608	81.8	0.129	1.00034	0.699
80.0	0.08515	417.0	6.60	1.40	0.0125	0.634	85.1	0.143	1.00032	0.697
90.0	0.07571	468.0	6.59	1.40	0.0111	0.686	91.6	0.174	1.00028	0.694
100.0	0.06815	520.0	6.59	1.40	0.0100	0.736	97.8	0.208	1.00025	0.691
125.0	0.05454	650.0	6.59	1.40	0.00799	0.856	111.0	0.302	1.00020	0.673
150.0	0.04546	780.0	6.59	1.40	0.00666	0.969	125.0	0.411	1.00017	0.670
175.0	0.03898	910.0	6.59	1.40	0.00571	1.08	139.0	0.532	1.00014	0.668
200.0	0.03411	1040.0	6.59	1.40	0.00499	1.18	151.0	0.666	1.00013	0.667
225.0	0.03032	1170.0	6.58	1.40	0.00444	1.28	164.0	0.811	1.00011	0.666
250.0	0.02729	1300.0	6.58	1.40	0.00400	1.37	176.0	0.968	1.00010	0.666
275.0	0.02481	1430.0	6.58	1.40	0.00363	1.46	188.0	1.13	1.00009	0.667
300.0	0.02275	1560.0	6.58	1.40	0.00333	1.55	199.0	1.31	1.00008	0.669
350.0	0.01950	1820.0	6.58	1.40	0.00286	1.72	222.0	1.70	1.00007	0.668
400.0	0.01706	2080.0	6.58	1.40	0.00250	1.89	243.0	2.13	1.00006	0.668
450.0	0.01517	2340.0	6.58	1.40	0.00222	2.05	264.0	2.60	1.00006	0.668
500.0	0.01365	2600.0	6.58	1.40	0.00200	2.21	284.0	3.11	1.00005	0.668
600.0	0.01138	3120.0	6.58	1.40	0.00167	2.51	322.0	4.24	1.00004	0.667
700.0	0.009753	3640.0	6.58	1.40	0.00143	2.80	359.0	5.52	1.00004	0.667
800.0	0.008535	4160.0	6.58	1.40	0.00125	3.07	394.0	6.93	1.00003	0.667
900.0	0.007586	4670.0	6.58	1.40	0.00111	3.34	428.0	8.47	1.00003	0.666
1000.0	0.006828	5190.0	6.58	1.40	0.00100	3.60	462.0	10.1	1.00003	0.666
1100.0	0.006207	5710.0	6.58	1.40	0.000919	3.85	494.0	11.9	1.00002	0.666
1200.0	0.005690	6230.0	6.58	1.40	0.000833	4.10	525.0	13.9	1.00002	0.666
1300.0	0.005253	6750.0	6.58	1.40	0.000769	4.34	556.0	15.9	1.00002	0.666
1400.0	0.004877	7270.0	6.58	1.40	0.000714	4.57	586.0	18.0	1.00002	0.666
1500.0	0.004552	7790.0	6.58	1.40	0.000667	4.80	615.0	20.3	1.00002	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

1.6 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
*	2.163	0.06691								
	2.5	0.06750	509.0	2.63	3.837	4.931	1.925	1.841	1.998	236.5
	3.0	0.06904	429.0	3.48	4.846	5.966	2.305	1.901	2.309	229.8
	3.5	0.07145	333.0	3.86	6.090	7.248	2.702	2.089	2.900	216.3
	4.0	0.07524	229.0	3.93	7.676	8.896	3.141	2.255	3.798	197.7
	4.5	0.08214	119.0	3.60	9.873	11.20	3.683	2.465	5.820	168.4
*	4.764	0.08382	54.5	3.16	11.64	13.10	4.091	2.633	9.763	143.1
*	4.764	0.3431	19.0	0.681	23.42	28.98	7.422	3.383	17.21	99.09
	5.0	0.4192	35.9	0.545	25.25	32.05	8.052	3.290	10.65	108.5
	5.1	0.4446	41.5	0.510	25.86	33.06	8.253	3.264	9.678	111.6
	5.2	0.4680	46.5	0.482	26.41	34.00	8.434	3.242	9.005	114.4
	5.3	0.4911	51.2	0.458	26.92	34.87	8.600	3.224	8.507	117.0
	5.4	0.5111	55.6	0.437	27.41	35.70	8.756	3.209	8.122	119.4
	5.5	0.5312	59.8	0.419	27.88	36.50	8.902	3.195	7.814	121.7
	5.6	0.5507	63.8	0.403	28.34	37.26	9.040	3.184	7.561	123.9
	5.7	0.5696	67.6	0.388	28.78	38.01	9.172	3.174	7.351	125.9
	5.8	0.5880	71.3	0.375	29.20	38.74	9.298	3.166	7.173	127.9
	5.9	0.6060	74.9	0.363	29.62	39.45	9.420	3.158	7.020	129.8
	6.0	0.6236	78.4	0.352	30.03	40.14	9.537	3.152	6.887	131.7
	6.5	0.7077	94.6	0.307	31.98	43.46	10.07	3.130	6.422	140.2
	7.0	0.7870	109.0	0.275	33.83	46.59	10.53	3.119	6.144	147.8
	7.5	0.8634	123.0	0.249	35.62	49.62	10.95	3.113	5.961	154.8
	8.0	0.9377	137.0	0.229	37.36	52.56	11.33	3.110	5.832	161.2
	8.5	1.010	150.0	0.211	39.07	55.45	11.68	3.110	5.737	167.3
	9.0	1.082	162.0	0.197	40.76	58.30	12.01	3.110	5.663	173.0
	9.5	1.153	175.0	0.185	42.43	61.12	12.31	3.110	5.606	178.5
	10.0	1.223	187.0	0.174	44.09	63.91	12.60	3.111	5.559	183.8
	11.0	1.360	210.0	0.156	47.37	69.42	13.12	3.113	5.492	193.8
	12.0	1.496	233.0	0.141	50.61	74.87	13.60	3.114	5.443	203.1
	13.0	1.631	256.0	0.129	53.84	80.29	14.03	3.116	5.406	212.0
	14.0	1.765	278.0	0.119	57.05	85.67	14.43	3.117	5.377	220.4
	15.0	1.899	300.0	0.111	60.25	91.03	14.80	3.118	5.354	228.5
	16.0	2.031	322.0	0.103	63.45	96.38	15.15	3.119	5.334	236.2
	17.0	2.163	344.0	0.0968	66.63	101.7	15.47	3.119	5.318	243.7
	18.0	2.295	365.0	0.0912	69.81	107.0	15.77	3.120	5.304	250.9
	19.0	2.426	387.0	0.0861	72.98	112.3	16.06	3.120	5.292	257.8
	20.0	2.557	408.0	0.0816	76.15	117.6	16.33	3.120	5.283	264.6
	21.0	2.688	430.0	0.0776	79.31	122.9	16.59	3.120	5.274	271.2
	22.0	2.818	451.0	0.0739	82.46	128.1	16.83	3.120	5.267	277.6
	23.0	2.948	472.0	0.0706	85.62	133.4	17.07	3.120	5.260	283.9
	24.0	3.078	493.0	0.0676	88.77	138.7	17.29	3.120	5.255	290.0
	25.0	3.208	514.0	0.0648	91.92	143.9	17.50	3.120	5.250	296.0
	26.0	3.338	535.0	0.0622	95.06	149.2	17.71	3.120	5.246	301.9
	28.0	3.597	577.0	0.0577	101.3	159.7	18.10	3.120	5.238	313.2
	30.0	3.855	619.0	0.0538	107.6	170.1	18.46	3.120	5.232	324.2
	32.0	4.113	660.0	0.0504	113.9	180.6	18.80	3.120	5.227	334.8
	34.0	4.371	702.0	0.0474	120.2	191.0	19.11	3.119	5.223	345.0
	36.0	4.629	743.0	0.0447	126.4	201.5	19.41	3.119	5.220	355.0
	38.0	4.887	785.0	0.0423	132.7	211.9	19.69	3.119	5.217	364.6
	40.0	5.144	826.0	0.0402	138.9	222.3	19.96	3.119	5.214	374.1
	45.0	5.787	929.0	0.0357	154.6	248.4	20.58	3.119	5.210	396.6
	50.0	6.430	1030.0	0.0321	170.2	274.4	21.12	3.119	5.206	417.9
	55.0	7.072	1140.0	0.0291	185.8	300.5	21.62	3.118	5.204	438.2
	60.0	7.714	1240.0	0.0267	201.4	326.5	22.07	3.118	5.202	457.5
	65.0	8.355	1340.0	0.0246	217.0	352.5	22.49	3.118	5.200	476.1
	70.0	8.997	1440.0	0.0229	232.6	378.5	22.87	3.118	5.199	493.9
	75.0	9.638	1550.0	0.0214	248.2	404.5	23.23	3.117	5.198	511.1
	80.0	10.28	1650.0	0.0200	263.8	430.5	23.57	3.117	5.198	527.8
	90.0	11.56	1850.0	0.0178	295.0	482.4	24.18	3.117	5.196	559.6
	100.0	12.84	2060.0	0.0160	326.2	534.4	24.73	3.117	5.196	589.8
	125.0	16.05	2570.0	0.0128	404.1	664.3	25.89	3.117	5.195	659.1
	150.0	19.25	3080.0	0.0107	482.0	794.1	26.83	3.117	5.194	721.7
	175.0	22.45	3600.0	0.00914	559.9	924.0	27.64	3.116	5.194	779.3
	200.0	25.66	4110.0	0.00800	637.9	1054.0	28.33	3.116	5.193	833.0
	225.0	28.86	4620.0	0.00711	715.8	1184.0	28.94	3.116	5.193	883.4
	250.0	32.06	5130.0	0.00640	793.7	1313.0	29.49	3.116	5.193	931.1
	275.0	35.27	5650.0	0.00582	871.6	1443.0	29.98	3.116	5.193	976.4
	300.0	38.47	6160.0	0.00533	949.5	1573.0	30.43	3.116	5.193	1020.0
	350.0	44.87	7180.0	0.00457	1105.0	1833.0	31.24	3.116	5.193	1101.0
	400.0	51.28	8210.0	0.00400	1261.0	2092.0	31.93	3.116	5.193	1177.0
	450.0	57.63	9230.0	0.00356	1417.0	2352.0	32.54	3.116	5.193	1249.0
	500.0	64.09	10300.0	0.00320	1573.0	2612.0	33.09	3.116	5.193	1316.0
	600.0	76.90	12300.0	0.00267	1884.0	3131.0	34.03	3.116	5.193	1442.0
	700.0	89.72	14400.0	0.00229	2196.0	3650.0	34.83	3.116	5.193	1557.0
	800.0	102.5	16400.0	0.00200	2507.0	4170.0	35.53	3.116	5.193	1664.0
	900.0	115.3	18500.0	0.00178	2819.0	4689.0	36.14	3.116	5.193	1765.0
	1000.0	128.2	20500.0	0.00160	3131.0	5208.0	36.69	3.116	5.193	1861.0
	1100.0	141.0	22600.0	0.00145	3442.0	5724.0	37.18	3.116	5.193	1952.0
	1200.0	153.8	24600.0	0.00133	3754.0	6247.0	37.63	3.116	5.193	2038.0
	1300.0	166.6	26700.0	0.00123	4065.0	6766.0	38.05	3.116	5.193	2122.0
	1400.0	179.4	28700.0	0.00114	4377.0	7285.0	38.43	3.116	5.193	2202.0
	1500.0	192.2	30800.0	0.00107	4689.0	7805.0	38.79	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

1.6 ATMOSPHERE ISOBAR

	TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
*	2.163	14.95									
	2.5	14.81	57.3	9.63	75.4	0.0349	0.169	40.7	0.000572	1.05577	0.480
	3.0	14.48	41.3	12.6	62.1	0.0559	0.184	39.9	0.000550	1.05450	0.501
	3.5	14.00	35.0	13.2	46.5	0.0829	0.194	37.8	0.000478	1.05264	0.564
	4.0	13.29	29.5	13.1	30.4	0.129	0.201	34.9	0.000398	1.04995	0.660
	4.5	12.17	23.4	12.0	14.4	0.249	0.201	31.2	0.000283	1.04569	0.905
*	4.764	11.13	18.8	10.8	6.07	0.521	0.203	28.4	0.000187	1.04174	1.36
*	4.764	2.915	14.0	6.91	0.555	1.23	0.142	15.2	0.000283	1.01083	1.84
	5.0	2.386	16.7	6.94	0.857	0.636	0.127	15.3	0.000499	1.00886	1.28
	5.1	2.249	17.7	6.95	0.933	0.547	0.125	15.4	0.000576	1.00835	1.19
	5.2	2.137	18.6	6.96	0.994	0.485	0.125	15.5	0.000649	1.00793	1.12
	5.3	2.040	19.4	6.96	1.04	0.438	0.125	15.6	0.000720	1.00757	1.06
	5.4	1.957	20.2	6.96	1.09	0.402	0.125	15.8	0.000788	1.00726	1.02
	5.5	1.882	21.0	6.97	1.13	0.372	0.126	15.9	0.000856	1.00698	0.987
	5.6	1.816	21.7	6.97	1.16	0.348	0.127	16.1	0.000922	1.00674	0.959
	5.7	1.756	22.5	6.97	1.19	0.327	0.127	16.2	0.000987	1.00651	0.935
	5.8	1.701	23.2	6.96	1.21	0.309	0.128	16.4	0.00105	1.00631	0.914
	5.9	1.650	23.9	6.96	1.24	0.294	0.129	16.5	0.00112	1.00612	0.897
	6.0	1.604	24.6	6.96	1.26	0.280	0.130	16.7	0.00118	1.00595	0.881
	6.5	1.413	27.9	6.95	1.34	0.230	0.136	17.5	0.00150	1.00524	0.826
	7.0	1.271	31.1	6.93	1.39	0.197	0.142	18.3	0.00182	1.00471	0.792
	7.5	1.158	34.2	6.91	1.43	0.174	0.148	19.2	0.00215	1.00429	0.770
	8.0	1.066	37.2	6.89	1.46	0.157	0.154	20.0	0.00248	1.00395	0.754
	8.5	0.9897	40.2	6.87	1.48	0.143	0.160	20.8	0.00282	1.00367	0.743
	9.0	0.9242	43.1	6.86	1.50	0.131	0.166	21.5	0.00317	1.00342	0.734
	9.5	0.8676	46.0	6.84	1.51	0.122	0.172	22.3	0.00353	1.00321	0.728
	10.0	0.8180	48.9	6.82	1.53	0.114	0.177	23.1	0.00390	1.00303	0.723
	11.0	0.7351	54.5	6.80	1.54	0.101	0.188	24.5	0.00466	1.00272	0.717
	12.0	0.6683	60.0	6.78	1.56	0.0907	0.198	26.0	0.00545	1.00248	0.713
	13.0	0.6130	65.5	6.77	1.57	0.0825	0.208	27.4	0.00628	1.00227	0.711
	14.0	0.5665	71.0	6.75	1.57	0.0757	0.218	28.7	0.00715	1.00210	0.709
	15.0	0.5267	76.5	6.74	1.58	0.0700	0.227	30.0	0.00804	1.00195	0.708
	16.0	0.4923	81.9	6.73	1.59	0.0651	0.236	31.3	0.00898	1.00182	0.708
	17.0	0.4623	87.3	6.72	1.59	0.0609	0.244	32.5	0.00994	1.00171	0.707
	18.0	0.4358	92.6	6.71	1.59	0.0573	0.253	33.7	0.0109	1.00161	0.707
	19.0	0.4122	98.0	6.70	1.59	0.0540	0.261	34.9	0.0120	1.00153	0.708
	20.0	0.3911	103.0	6.69	1.60	0.0511	0.269	36.1	0.0130	1.00145	0.708
	21.0	0.3721	109.0	6.68	1.60	0.0485	0.277	37.2	0.0141	1.00138	0.708
	22.0	0.3549	114.0	6.68	1.60	0.0462	0.285	38.3	0.0152	1.00131	0.708
	23.0	0.3392	119.0	6.67	1.60	0.0441	0.292	39.4	0.0164	1.00126	0.709
	24.0	0.3249	125.0	6.67	1.60	0.0422	0.300	40.5	0.0176	1.00120	0.709
	25.0	0.3117	130.0	6.66	1.60	0.0404	0.307	41.5	0.0188	1.00115	0.709
	26.0	0.2996	135.0	6.66	1.60	0.0388	0.314	42.5	0.0200	1.00111	0.710
	28.0	0.2780	146.0	6.65	1.60	0.0360	0.329	44.6	0.0226	1.00103	0.710
	30.0	0.2594	156.0	6.65	1.60	0.0335	0.343	46.5	0.0252	1.00096	0.710
	32.0	0.2431	167.0	6.64	1.61	0.0314	0.356	48.4	0.0280	1.00090	0.711
	34.0	0.2288	177.0	6.64	1.61	0.0295	0.369	50.3	0.0309	1.00085	0.711
	36.0	0.2160	188.0	6.63	1.61	0.0278	0.382	52.1	0.0339	1.00080	0.711
	38.0	0.2046	198.0	6.63	1.61	0.0263	0.395	53.8	0.0370	1.00076	0.710
	40.0	0.1944	208.0	6.63	1.61	0.0250	0.408	55.6	0.0402	1.00072	0.710
	45.0	0.1728	235.0	6.62	1.61	0.0222	0.439	59.7	0.0487	1.00064	0.709
	50.0	0.1555	261.0	6.61	1.61	0.0200	0.469	63.7	0.0579	1.00058	0.708
	55.0	0.1414	287.0	6.61	1.61	0.0182	0.498	67.6	0.0677	1.00052	0.706
	60.0	0.1296	313.0	6.61	1.61	0.0166	0.526	71.3	0.0780	1.00049	0.704
	65.0	0.1197	339.0	6.61	1.61	0.0154	0.554	74.9	0.0890	1.00044	0.703
	70.0	0.1112	365.0	6.60	1.60	0.0143	0.581	78.4	0.101	1.00041	0.701
	75.0	0.1038	391.0	6.60	1.60	0.0133	0.608	81.8	0.113	1.00038	0.699
	80.0	0.09729	417.0	6.60	1.60	0.0125	0.635	85.1	0.126	1.00036	0.697
	90.0	0.08650	469.0	6.60	1.60	0.0111	0.686	91.6	0.153	1.00032	0.694
	100.0	0.07786	521.0	6.59	1.60	0.0100	0.736	97.9	0.182	1.00029	0.691
	125.0	0.06232	650.0	6.59	1.60	0.00799	0.856	111.0	0.264	1.00023	0.673
	150.0	0.05195	780.0	6.59	1.60	0.00666	0.970	125.0	0.359	1.00019	0.670
	175.0	0.04454	910.0	6.59	1.60	0.00571	1.08	139.0	0.466	1.00016	0.668
	200.0	0.03898	1040.0	6.59	1.60	0.00499	1.18	151.0	0.583	1.00014	0.667
	225.0	0.03465	1170.0	6.58	1.60	0.00444	1.28	164.0	0.710	1.00013	0.666
	250.0	0.03119	1300.0	6.58	1.60	0.00400	1.37	176.0	0.847	1.00012	0.666
	275.0	0.02836	1430.0	6.58	1.60	0.00363	1.46	188.0	0.993	1.00010	0.667
	300.0	0.02600	1560.0	6.58	1.60	0.00333	1.55	199.0	1.15	1.00010	0.669
	350.0	0.02228	1820.0	6.58	1.60	0.00286	1.72	222.0	1.49	1.00008	0.668
	400.0	0.01950	2080.0	6.58	1.60	0.00250	1.89	243.0	1.86	1.00007	0.668
	450.0	0.01734	2340.0	6.58	1.60	0.00222	2.05	264.0	2.28	1.00006	0.668
	500.0	0.01560	2600.0	6.58	1.60	0.00200	2.21	284.0	2.72	1.00006	0.667
	600.0	0.01300	3120.0	6.58	1.60	0.00167	2.51	322.0	3.71	1.00005	0.667
	700.0	0.01115	3640.0	6.58	1.60	0.00143	2.80	359.0	4.83	1.00004	0.667
	800.0	0.009753	4160.0	6.58	1.60	0.00125	3.07	394.0	6.06	1.00004	0.667
	900.0	0.008670	4680.0	6.58	1.60	0.00111	3.34	428.0	7.42	1.00003	0.666
	1000.0	0.007803	5190.0	6.58	1.60	0.00100	3.60	462.0	8.88	1.00003	0.666
	1100.0	0.007094	5710.0	6.58	1.60	0.000909	3.85	494.0	10.4	1.00003	0.666
	1200.0	0.006503	6230.0	6.58	1.60	0.000833	4.10	525.0	12.1	1.00002	0.666
	1300.0	0.006003	6750.0	6.58	1.60	0.000769	4.34	556.0	13.9	1.00002	0.666
	1400.0	0.005574	7270.0	6.58	1.60	0.000714	4.57	586.0	15.8	1.00002	0.666
	1500.0	0.005203	7790.0	6.58	1.60	0.000667	4.80	615.0	17.8	1.00002	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

1.8 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.161	0.06674								
2.5	0.06732	519.0	2.62	3.822	5.050	1.918	1.831	1.983	238.7
3.0	0.06982	440.0	3.48	4.821	6.076	2.295	1.898	2.295	232.2
3.5	0.07114	344.0	3.88	6.048	7.346	2.686	2.085	2.872	219.1
4.0	0.07476	241.0	3.97	7.605	8.968	3.122	2.249	3.727	201.3
4.5	0.08114	133.0	3.68	9.722	11.20	3.646	2.453	5.506	173.9
* 4.911	0.09471	33.8	2.93	12.68	14.41	4.323	2.734	14.11	132.9
* 4.911	0.2878	13.2	0.822	22.84	28.09	7.107	3.387	24.45	98.31
5.0	0.3244	22.0	0.726	23.89	29.80	7.452	3.343	15.94	103.0
5.1	0.3552	29.5	0.652	24.74	31.21	7.732	3.307	12.69	107.1
5.2	0.3811	35.8	0.602	25.44	32.39	7.960	3.277	11.03	110.5
5.3	0.4044	41.5	0.564	26.06	33.44	8.160	3.253	9.99	113.6
5.4	0.4258	46.6	0.532	26.63	34.40	8.339	3.233	9.267	116.4
5.5	0.4459	51.4	0.506	27.16	35.30	8.504	3.217	8.734	118.9
5.6	0.4650	55.9	0.483	27.67	36.15	8.658	3.202	8.323	121.3
5.7	0.4834	60.2	0.463	28.15	36.97	8.802	3.190	7.994	123.6
5.8	0.5010	64.3	0.445	28.61	37.75	8.939	3.179	7.726	125.8
5.9	0.5182	68.2	0.429	29.06	38.51	9.069	3.170	7.502	127.9
6.0	0.5348	72.0	0.414	29.50	39.25	9.193	3.162	7.312	129.9
6.5	0.6133	89.3	0.358	31.55	42.73	9.751	3.135	6.676	138.9
7.0	0.6863	105.0	0.317	33.46	45.98	10.23	3.121	6.320	146.8
7.5	0.7560	120.0	0.286	35.29	49.07	10.66	3.114	6.091	153.9
8.0	0.8234	133.0	0.262	37.06	52.08	11.05	3.111	5.934	160.6
8.5	0.8892	147.0	0.242	38.80	55.01	11.40	3.109	5.819	166.7
9.0	0.9537	160.0	0.225	40.51	57.90	11.73	3.109	5.732	172.6
9.5	1.017	172.0	0.210	42.20	60.75	12.04	3.110	5.664	178.2
10.0	1.080	184.0	0.197	43.87	63.57	12.33	3.111	5.610	183.5
11.0	1.204	208.0	0.177	47.17	69.12	12.86	3.112	5.532	193.6
12.0	1.326	231.0	0.160	50.43	74.61	13.34	3.114	5.476	203.0
13.0	1.446	254.0	0.146	53.67	80.05	13.77	3.116	5.434	212.0
14.0	1.565	277.0	0.135	56.90	85.46	14.17	3.117	5.401	220.5
15.0	1.685	299.0	0.125	60.11	90.84	14.55	3.118	5.375	228.6
16.0	1.803	321.0	0.117	63.31	96.20	14.89	3.119	5.352	236.3
17.0	1.921	343.0	0.109	66.50	101.5	15.22	3.120	5.334	243.8
18.0	2.039	365.0	0.103	69.69	106.9	15.52	3.120	5.318	251.0
19.0	2.156	387.0	0.0972	72.87	112.2	15.81	3.120	5.305	258.0
20.0	2.272	408.0	0.0921	76.04	117.5	16.08	3.120	5.294	264.8
21.0	2.389	429.0	0.0875	79.21	122.8	16.34	3.121	5.284	271.4
22.0	2.505	451.0	0.0833	82.37	128.1	16.58	3.121	5.276	277.8
23.0	2.621	472.0	0.0796	85.53	133.3	16.82	3.121	5.269	284.1
24.0	2.736	493.0	0.0762	88.68	138.6	17.04	3.121	5.263	290.2
25.0	2.852	514.0	0.0730	91.83	143.8	17.26	3.121	5.257	296.2
26.0	2.967	535.0	0.0701	94.98	149.1	17.46	3.121	5.252	302.1
28.0	3.198	577.0	0.0650	101.3	159.6	17.85	3.120	5.244	313.5
30.0	3.429	619.0	0.0606	107.6	170.1	18.21	3.120	5.237	324.4
32.0	3.658	661.0	0.0567	113.8	180.5	18.55	3.120	5.231	335.0
34.0	3.887	702.0	0.0533	120.1	191.0	18.87	3.120	5.227	345.3
36.0	4.117	744.0	0.0503	126.4	201.5	19.17	3.120	5.223	355.2
38.0	4.346	785.0	0.0476	132.6	211.9	19.45	3.120	5.220	364.9
40.0	4.575	827.0	0.0452	138.9	222.3	19.72	3.119	5.217	374.3
45.0	5.147	930.0	0.0401	154.5	248.4	20.33	3.119	5.212	396.8
50.0	5.718	1030.0	0.0361	170.2	274.5	20.88	3.119	5.208	418.1
55.0	6.289	1140.0	0.0328	185.8	300.5	21.38	3.118	5.205	438.4
60.0	6.859	1240.0	0.0301	201.4	326.5	21.83	3.118	5.203	457.7
65.0	7.430	1340.0	0.0277	217.0	352.5	22.24	3.118	5.201	476.3
70.0	8.000	1440.0	0.0257	232.6	378.5	22.63	3.118	5.200	494.1
75.0	8.570	1550.0	0.0240	248.2	404.5	22.99	3.118	5.199	511.3
80.0	9.140	1650.0	0.0225	263.8	430.5	23.32	3.118	5.198	528.0
90.0	10.28	1860.0	0.0200	295.0	482.5	23.94	3.117	5.197	559.8
100.0	11.42	2060.0	0.0180	326.2	534.4	24.48	3.117	5.196	589.9
125.0	14.27	2570.0	0.0144	404.1	664.3	25.64	3.117	5.195	659.2
150.0	17.11	3090.0	0.0120	482.0	794.2	26.59	3.117	5.194	721.9
175.0	19.96	3600.0	0.0103	560.0	924.0	27.39	3.117	5.194	779.5
200.0	22.81	4110.0	0.00900	637.9	1054.0	28.08	3.116	5.194	833.1
225.0	25.66	4620.0	0.00800	715.8	1184.0	28.70	3.116	5.193	883.5
250.0	28.50	5140.0	0.00720	793.7	1314.0	29.24	3.116	5.193	931.2
275.0	31.35	5650.0	0.00654	871.6	1443.0	29.74	3.116	5.193	976.5
300.0	34.20	6160.0	0.00600	949.5	1573.0	30.19	3.116	5.193	1020.0
350.0	39.89	7190.0	0.00514	1105.0	1833.0	30.99	3.116	5.193	1101.0
400.0	45.59	8210.0	0.00450	1261.0	2092.0	31.68	3.116	5.193	1177.0
450.0	51.28	9240.0	0.00400	1417.0	2352.0	32.30	3.116	5.193	1249.0
500.0	56.97	10300.0	0.00360	1573.0	2612.0	32.84	3.116	5.193	1316.0
600.0	68.36	12300.0	0.00300	1884.0	3131.0	33.79	3.116	5.193	1442.0
700.0	79.75	14400.0	0.00257	2196.0	3650.0	34.59	3.116	5.193	1557.0
800.0	91.14	16400.0	0.00225	2507.0	4170.0	35.28	3.116	5.193	1664.0
900.0	102.5	18500.0	0.00200	2819.0	4689.0	35.89	3.116	5.193	1765.0
1000.0	113.9	20500.0	0.00180	3131.0	5208.0	36.44	3.116	5.193	1861.0
1100.0	125.3	22600.0	0.00164	3442.0	5728.0	36.94	3.116	5.193	1952.0
1200.0	136.7	24600.0	0.00150	3754.0	6247.0	37.39	3.116	5.193	2038.0
1300.0	148.1	26700.0	0.00138	4065.0	6766.0	37.80	3.116	5.193	2122.0
1400.0	159.5	28700.0	0.00129	4377.0	7285.0	38.19	3.116	5.193	2202.0
1500.0	170.9	30800.0	0.00120	4689.0	7805.0	38.55	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

1.8 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.161	14.98									
2.5	14.85	58.3	9.64	77.1	0.0340	0.170	41.2	0.000577	1.05592	0.480
3.0	14.53	42.1	12.6	63.9	0.0545	0.185	40.3	0.000554	1.05468	0.501
3.5	14.05	35.8	13.3	48.4	0.0803	0.195	38.2	0.000483	1.05287	0.562
4.0	13.38	30.3	13.2	32.3	0.123	0.202	35.4	0.000406	1.05027	0.652
4.5	12.32	24.5	12.2	16.4	0.224	0.203	31.8	0.000299	1.04626	0.862
* 4.911	10.56	17.1	10.2	3.56	0.823	0.211	27.3	0.000141	1.03955	1.83
* 4.911	3.474	13.7	6.98	0.459	1.79	0.167	16.2	0.000197	1.01291	2.38
5.0	3.083	15.0	6.99	0.677	1.06	0.144	16.0	0.000294	1.01145	1.77
5.1	2.816	16.2	7.00	0.830	0.785	0.136	16.0	0.000381	1.01046	1.49
5.2	2.624	17.2	7.00	0.940	0.641	0.133	16.0	0.000459	1.00974	1.33
5.3	2.473	18.2	7.01	1.03	0.550	0.131	16.1	0.000531	1.00918	1.23
5.4	2.348	19.1	7.01	1.10	0.486	0.130	16.2	0.000599	1.00872	1.15
5.5	2.242	19.9	7.01	1.15	0.439	0.130	16.3	0.000665	1.00832	1.10
5.6	2.150	20.7	7.02	1.20	0.402	0.130	16.5	0.000728	1.00798	1.05
5.7	2.069	21.5	7.02	1.25	0.372	0.131	16.6	0.000791	1.00768	1.01
5.8	1.996	22.3	7.01	1.28	0.347	0.131	16.7	0.000852	1.00741	0.983
5.9	1.930	23.0	7.01	1.32	0.326	0.132	16.9	0.000913	1.00716	0.958
6.0	1.870	23.7	7.01	1.35	0.308	0.133	17.0	0.000973	1.00694	0.936
6.5	1.631	27.2	6.99	1.46	0.245	0.138	17.8	0.00127	1.00605	0.863
7.0	1.457	30.5	6.97	1.53	0.207	0.144	18.6	0.00156	1.00543	0.817
7.5	1.323	33.6	6.95	1.58	0.181	0.150	19.4	0.00186	1.00496	0.788
8.0	1.214	36.7	6.93	1.62	0.162	0.156	20.2	0.00216	1.00458	0.769
8.5	1.125	39.7	6.91	1.65	0.146	0.161	21.0	0.00247	1.00427	0.755
9.0	1.049	42.7	6.89	1.67	0.134	0.167	21.7	0.00278	1.00399	0.745
9.5	0.9830	45.6	6.87	1.69	0.124	0.173	22.5	0.00314	1.00374	0.737
10.0	0.9258	48.5	6.86	1.71	0.116	0.178	23.2	0.00343	1.00353	0.731
11.0	0.8308	54.2	6.83	1.73	0.102	0.189	24.7	0.00411	1.00318	0.723
12.0	0.7544	59.8	6.81	1.75	0.0916	0.199	26.1	0.00482	1.00290	0.718
13.0	0.6914	65.3	6.79	1.76	0.0832	0.209	27.5	0.00556	1.00266	0.715
14.0	0.6386	70.8	6.77	1.77	0.0763	0.218	28.8	0.00633	1.00247	0.713
15.0	0.5935	76.3	6.76	1.78	0.0705	0.228	30.1	0.00713	1.00229	0.711
16.0	0.5545	81.7	6.74	1.78	0.0655	0.236	31.4	0.00797	1.00215	0.710
17.0	0.5205	87.2	6.73	1.79	0.0612	0.245	32.6	0.00883	1.00203	0.710
18.0	0.4905	92.5	6.72	1.79	0.0575	0.253	33.8	0.00972	1.00192	0.709
19.0	0.4639	97.9	6.71	1.79	0.0542	0.262	35.0	0.0106	1.00182	0.709
20.0	0.4401	103.0	6.70	1.80	0.0513	0.270	36.1	0.0116	1.00173	0.709
21.0	0.4187	109.0	6.70	1.80	0.0487	0.278	37.3	0.0125	1.00165	0.710
22.0	0.3992	114.0	6.69	1.80	0.0463	0.285	38.4	0.0135	1.00158	0.710
23.0	0.3816	119.0	6.68	1.80	0.0442	0.293	39.5	0.0146	1.00151	0.710
24.0	0.3654	125.0	6.68	1.80	0.0423	0.300	40.5	0.0156	1.00145	0.710
25.0	0.3506	130.0	6.67	1.80	0.0405	0.308	41.6	0.0167	1.00139	0.710
26.0	0.3370	135.0	6.67	1.80	0.0389	0.315	42.6	0.0178	1.00135	0.710
28.0	0.3127	146.0	6.66	1.81	0.0360	0.329	44.6	0.0201	1.00126	0.711
30.0	0.2917	156.0	6.65	1.81	0.0335	0.343	46.6	0.0225	1.00118	0.711
32.0	0.2734	167.0	6.65	1.81	0.0314	0.357	48.5	0.0249	1.00111	0.711
34.0	0.2572	177.0	6.64	1.81	0.0295	0.370	50.3	0.0275	1.00105	0.711
36.0	0.2429	188.0	6.64	1.81	0.0278	0.383	52.1	0.0302	1.00099	0.711
38.0	0.2301	198.0	6.64	1.81	0.0264	0.396	53.9	0.0329	1.00095	0.711
40.0	0.2186	209.0	6.63	1.81	0.0250	0.408	55.6	0.0358	1.00091	0.710
45.0	0.1943	235.0	6.62	1.81	0.0222	0.439	59.8	0.0434	1.00082	0.709
50.0	0.1749	261.0	6.62	1.81	0.0200	0.469	63.8	0.0515	1.00075	0.708
55.0	0.1590	287.0	6.61	1.81	0.0182	0.498	67.6	0.0602	1.00069	0.706
60.0	0.1458	313.0	6.61	1.81	0.0166	0.527	71.3	0.0694	1.00064	0.705
65.0	0.1346	339.0	6.61	1.81	0.0154	0.554	74.9	0.0792	1.00059	0.703
70.0	0.1250	365.0	6.61	1.81	0.0143	0.582	78.4	0.0895	1.00055	0.701
75.0	0.1167	391.0	6.60	1.81	0.0133	0.608	81.8	0.100	1.00052	0.699
80.0	0.1094	417.0	6.60	1.81	0.0125	0.635	85.2	0.112	1.00049	0.697
90.0	0.09728	469.0	6.60	1.81	0.0111	0.686	91.6	0.136	1.00044	0.694
100.0	0.08757	521.0	6.60	1.80	0.0100	0.736	97.9	0.162	1.00040	0.691
125.0	0.07009	651.0	6.59	1.80	0.00798	0.856	111.0	0.235	1.00033	0.683
150.0	0.05843	780.0	6.59	1.80	0.00665	0.970	125.0	0.321	1.00029	0.676
175.0	0.05009	910.0	6.59	1.80	0.00571	1.08	139.0	0.414	1.00026	0.668
200.0	0.04384	1040.0	6.59	1.80	0.00499	1.18	151.0	0.518	1.00023	0.667
225.0	0.03898	1170.0	6.59	1.80	0.00444	1.28	164.0	0.631	1.00021	0.666
250.0	0.03508	1300.0	6.58	1.80	0.00400	1.37	176.0	0.753	1.00019	0.666
275.0	0.03190	1430.0	6.58	1.80	0.00363	1.46	188.0	0.882	1.00017	0.667
300.0	0.02924	1560.0	6.58	1.80	0.00333	1.55	199.0	1.02	1.00016	0.669
350.0	0.02507	1820.0	6.58	1.80	0.00285	1.72	222.0	1.32	1.00013	0.668
400.0	0.02194	2080.0	6.58	1.80	0.00250	1.89	243.0	1.66	1.00011	0.668
450.0	0.01950	2340.0	6.58	1.80	0.00222	2.05	264.0	2.02	1.00009	0.668
500.0	0.01755	2600.0	6.58	1.80	0.00200	2.21	284.0	2.42	1.00008	0.667
600.0	0.01463	3120.0	6.58	1.80	0.00167	2.51	322.0	3.30	1.00006	0.667
700.0	0.01254	3640.0	6.58	1.80	0.00143	2.80	359.0	4.29	1.00005	0.667
800.0	0.01097	4160.0	6.58	1.80	0.00125	3.07	394.0	5.39	1.00004	0.667
900.0	0.009753	4680.0	6.58	1.80	0.00111	3.34	428.0	6.59	1.00003	0.666
1000.0	0.008778	5190.0	6.58	1.80	0.00100	3.60	462.0	7.89	1.00003	0.666
1100.0	0.007981	5710.0	6.58	1.80	0.000909	3.85	494.0	9.29	1.00003	0.666
1200.0	0.007316	6230.0	6.58	1.80	0.000833	4.10	525.0	10.8	1.00003	0.666
1300.0	0.006753	6750.0	6.58	1.80	0.000769	4.34	556.0	12.4	1.00002	0.666
1400.0	0.006271	7270.0	6.58	1.80	0.000714	4.57	586.0	14.0	1.00002	0.666
1500.0	0.005853	7790.0	6.58	1.80	0.000667	4.80	615.0	15.8	1.00002	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.0 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** K .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.159	0.06657								
	2.5	0.06714	530.0	2.62	3.808	5.169	1.912	1.821	1.968	240.8
	3.0	0.06859	451.0	3.49	4.796	6.186	2.286	1.895	2.282	234.5
	3.5	0.07084	355.0	3.91	6.009	7.444	2.675	2.081	2.846	221.9
	4.0	0.07431	254.0	4.01	7.538	9.044	3.103	2.243	3.663	204.8
	4.5	0.08026	147.0	3.75	9.587	11.21	3.612	2.441	5.258	178.9
	5.0	0.09689	29.4	2.85	13.20	15.16	4.436	2.783	15.93	130.6
*	5.047	0.1019	16.3	2.65	13.93	16.00	4.602	2.854	25.69	122.0
*	5.047	0.2360	7.01	1.02	21.91	26.70	6.720	3.382	45.38	97.65
	5.1	0.2663	14.1	0.892	22.96	28.36	7.048	3.356	24.07	101.1
	5.2	0.3025	23.3	0.775	24.13	30.26	7.417	3.317	15.76	105.9
	5.3	0.3300	30.5	0.704	24.98	31.67	7.685	3.286	12.78	109.7
	5.4	0.3535	36.8	0.652	25.69	32.86	7.908	3.261	11.17	113.0
	5.5	0.3746	42.4	0.611	26.33	33.92	8.103	3.240	10.14	115.9
	5.6	0.3941	47.6	0.578	26.91	34.89	8.279	3.222	9.412	118.6
	5.7	0.4125	52.4	0.550	27.45	35.81	8.440	3.207	8.873	121.2
	5.8	0.4299	56.9	0.525	27.96	36.67	8.591	3.194	8.454	123.5
	5.9	0.4466	61.2	0.503	28.45	37.50	8.732	3.183	8.118	125.8
	6.0	0.4627	65.4	0.484	28.92	38.30	8.866	3.173	7.843	127.9
	6.5	0.5372	84.0	0.412	31.09	41.98	9.456	3.140	6.974	137.5
	7.0	0.6054	100.0	0.362	33.07	45.34	9.95	3.123	6.515	145.7
	7.5	0.6698	116.0	0.325	34.95	48.52	10.39	3.115	6.232	153.1
	8.0	0.7318	130.0	0.296	36.75	51.59	10.79	3.111	6.042	159.9
	8.5	0.7921	144.0	0.273	38.52	54.57	11.15	3.109	5.905	166.2
	9.0	0.8511	157.0	0.253	40.25	57.50	11.49	3.109	5.804	172.2
	9.5	0.9090	170.0	0.236	41.96	60.38	11.80	3.109	5.725	177.8
	10.0	0.9662	182.0	0.222	43.64	63.22	12.09	3.110	5.662	183.2
	11.0	1.078	206.0	0.198	46.96	68.82	12.62	3.112	5.573	193.4
	12.0	1.188	230.0	0.179	50.25	74.34	13.10	3.114	5.510	203.0
	13.0	1.298	253.0	0.164	53.50	79.81	13.54	3.116	5.463	212.0
	14.0	1.407	276.0	0.151	56.74	85.24	13.94	3.117	5.426	220.5
	15.0	1.514	298.0	0.140	59.96	90.65	14.32	3.118	5.396	228.7
	16.0	1.621	321.0	0.130	63.17	96.03	14.66	3.119	5.371	236.5
	17.0	1.728	343.0	0.122	66.38	101.4	14.99	3.120	5.350	244.0
	18.0	1.834	364.0	0.115	69.57	106.7	15.29	3.120	5.332	251.2
	19.0	1.939	386.0	0.108	72.76	112.1	15.58	3.121	5.318	258.2
	20.0	2.044	408.0	0.103	75.93	117.4	15.86	3.121	5.305	265.0
	21.0	2.149	429.0	0.0974	79.11	122.7	16.11	3.121	5.295	271.6
	22.0	2.254	451.0	0.0928	82.27	128.0	16.36	3.121	5.285	278.1
	23.0	2.359	472.0	0.0886	85.44	133.2	16.59	3.121	5.277	284.3
	24.0	2.463	493.0	0.0848	88.60	138.5	16.82	3.121	5.270	290.5
	25.0	2.567	514.0	0.0813	91.75	143.8	17.03	3.121	5.264	296.5
	26.0	2.671	536.0	0.0780	94.90	149.0	17.24	3.121	5.259	302.3
	28.0	2.879	578.0	0.0723	101.2	159.5	17.63	3.121	5.249	313.7
	30.0	3.086	620.0	0.0674	107.5	170.0	17.99	3.121	5.242	324.7
	32.0	3.293	661.0	0.0631	113.8	180.5	18.33	3.121	5.236	335.3
	34.0	3.500	703.0	0.0593	120.1	191.0	18.65	3.120	5.231	345.5
	36.0	3.707	745.0	0.0559	126.3	201.4	18.95	3.120	5.226	355.5
	38.0	3.913	786.0	0.0530	132.6	211.9	19.23	3.120	5.223	365.1
	40.0	4.119	828.0	0.0503	138.9	222.3	19.50	3.120	5.220	374.5
	45.0	4.634	931.0	0.0446	154.5	248.4	20.11	3.119	5.214	397.1
	50.0	5.148	1030.0	0.0401	170.1	274.5	20.66	3.119	5.209	418.4
	55.0	5.662	1140.0	0.0365	185.8	300.5	21.16	3.119	5.206	438.6
	60.0	6.176	1240.0	0.0334	201.4	326.5	21.61	3.118	5.204	457.9
	65.0	6.690	1340.0	0.0308	217.0	352.5	22.03	3.118	5.202	476.5
	70.0	7.203	1450.0	0.0286	232.6	378.6	22.41	3.118	5.201	494.3
	75.0	7.716	1550.0	0.0267	248.2	404.6	22.77	3.118	5.200	511.5
	80.0	8.229	1650.0	0.0250	263.8	430.5	23.11	3.118	5.199	528.2
	90.0	9.255	1860.0	0.0222	295.0	482.5	23.72	3.117	5.197	560.0
	100.0	10.28	2060.0	0.0200	326.2	534.5	24.26	3.117	5.196	590.1
	125.0	12.84	2570.0	0.0160	404.1	664.4	25.42	3.117	5.195	659.4
	150.0	15.41	3090.0	0.0133	482.0	794.2	26.37	3.117	5.194	722.0
	175.0	17.97	3600.0	0.0114	560.0	924.1	27.17	3.117	5.194	779.6
	200.0	20.53	4110.0	0.0100	637.9	1054.0	27.87	3.117	5.194	833.2
	225.0	23.09	4620.0	0.00889	715.8	1184.0	28.48	3.116	5.193	883.6
	250.0	25.66	5140.0	0.00800	793.7	1314.0	29.02	3.116	5.193	931.3
	275.0	28.22	5650.0	0.00727	871.6	1443.0	29.52	3.116	5.193	976.6
	300.0	30.78	6160.0	0.00667	949.5	1573.0	29.97	3.116	5.193	1020.0
	350.0	35.91	7190.0	0.00571	1105.0	1833.0	30.77	3.116	5.193	1102.0
	400.0	41.03	8210.0	0.00500	1261.0	2093.0	31.47	3.116	5.193	1177.0
	450.0	46.15	9240.0	0.00444	1417.0	2352.0	32.08	3.116	5.193	1249.0
	500.0	51.28	10300.0	0.00400	1573.0	2612.0	32.62	3.116	5.193	1316.0
	600.0	61.53	12300.0	0.00333	1884.0	3131.0	33.57	3.116	5.193	1442.0
	700.0	71.78	14400.0	0.00286	2196.0	3650.0	34.37	3.116	5.193	1557.0
	800.0	82.03	16400.0	0.00250	2507.0	4170.0	35.06	3.116	5.193	1665.0
	900.0	92.28	18500.0	0.00222	2819.0	4689.0	35.68	3.116	5.193	1765.0
	1000.0	102.5	20500.0	0.00200	3131.0	5208.0	36.22	3.116	5.193	1861.0
	1100.0	112.8	22600.0	0.00182	3442.0	5728.0	36.72	3.116	5.193	1952.0
	1200.0	123.0	24600.0	0.00167	3754.0	6247.0	37.17	3.116	5.193	2038.0
	1300.0	133.3	26700.0	0.00154	4065.0	6766.0	37.59	3.116	5.193	2122.0
	1400.0	143.5	28700.0	0.00143	4377.0	7286.0	37.97	3.116	5.193	2202.0
	1500.0	153.8	30800.0	0.00133	4689.0	7805.0	38.33	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.159	15.02									
2.5	14.89	59.3	9.65	78.9	0.0332	0.171	41.6	0.000582	1.05607	0.480
3.0	14.58	43.0	12.6	65.7	0.0531	0.185	40.8	0.000558	1.05486	0.502
3.5	14.12	36.5	13.3	50.2	0.0779	0.196	38.6	0.000488	1.05310	0.561
4.0	13.46	31.2	13.3	34.1	0.118	0.204	35.8	0.000413	1.05058	0.645
4.5	12.46	25.5	12.3	18.3	0.205	0.205	32.4	0.000313	1.04678	0.829
5.0	10.32	17.0	9.93	3.04	0.939	0.214	26.9	0.000130	1.03866	2.30
* 5.047	9.814	15.5	9.46	1.60	1.65	0.234	25.9	0.0000928	1.03674	2.84
* 5.047	4.238	13.3	7.10	0.297	3.42	0.229	17.5	0.000119	1.01576	3.46
5.1	3.735	14.3	7.08	0.528	1.69	0.172	17.1	0.000190	1.01396	2.40
5.2	3.306	15.5	7.07	0.770	1.01	0.149	16.8	0.000286	1.01228	1.78
5.3	3.031	16.8	7.07	0.925	0.761	0.142	16.8	0.000366	1.01126	1.51
5.4	2.829	17.8	7.07	1.04	0.627	0.138	16.8	0.000437	1.01051	1.36
5.5	2.670	18.8	7.07	1.13	0.540	0.136	16.8	0.000504	1.00991	1.25
5.6	2.537	19.7	7.07	1.21	0.479	0.135	16.9	0.000567	1.00942	1.18
5.7	2.425	20.5	7.07	1.27	0.433	0.135	17.0	0.000628	1.00900	1.12
5.8	2.326	21.3	7.07	1.32	0.397	0.135	17.1	0.000688	1.00863	1.07
5.9	2.239	22.1	7.06	1.37	0.367	0.136	17.3	0.000746	1.00831	1.03
6.0	2.161	22.9	7.06	1.41	0.343	0.136	17.4	0.000803	1.00802	1.00
6.5	1.851	26.5	7.04	1.56	0.263	0.140	18.1	0.00108	1.00691	0.900
7.0	1.652	29.9	7.02	1.66	0.218	0.146	18.8	0.00135	1.00613	0.844
7.5	1.493	33.1	6.99	1.73	0.188	0.151	19.6	0.00163	1.00554	0.809
8.0	1.366	36.2	6.97	1.78	0.167	0.157	20.4	0.00190	1.00507	0.785
8.5	1.262	39.3	6.94	1.81	0.150	0.163	21.2	0.00218	1.00468	0.768
9.0	1.175	42.3	6.92	1.84	0.137	0.168	21.9	0.00247	1.00436	0.756
9.5	1.100	45.2	6.90	1.87	0.127	0.174	22.7	0.00276	1.00408	0.746
10.0	1.035	48.1	6.89	1.88	0.118	0.179	23.4	0.00306	1.00384	0.739
11.0	0.9273	53.9	6.86	1.91	0.103	0.190	24.8	0.00367	1.00344	0.729
12.0	0.8411	59.5	6.83	1.93	0.0926	0.200	26.2	0.00431	1.00312	0.723
13.0	0.7703	65.1	6.81	1.95	0.0839	0.210	27.6	0.00498	1.00285	0.719
14.0	0.7109	70.6	6.80	1.96	0.0768	0.219	28.9	0.00568	1.00263	0.716
15.0	0.6604	76.1	6.78	1.97	0.0709	0.228	30.2	0.00641	1.00245	0.714
16.0	0.6168	81.6	6.76	1.98	0.0658	0.237	31.5	0.00716	1.00228	0.713
17.0	0.5788	87.0	6.75	1.98	0.0615	0.246	32.7	0.00794	1.00214	0.712
18.0	0.5454	92.4	6.74	1.99	0.0577	0.254	33.9	0.00874	1.00202	0.711
19.0	0.5157	97.8	6.73	1.99	0.0544	0.262	35.1	0.00957	1.00191	0.711
20.0	0.4891	103.0	6.72	1.99	0.0514	0.270	36.2	0.0104	1.00181	0.711
21.0	0.4652	109.0	6.71	2.00	0.0488	0.278	37.3	0.0113	1.00172	0.711
22.0	0.4436	114.0	6.70	2.00	0.0464	0.286	38.5	0.0122	1.00164	0.711
23.0	0.4240	119.0	6.70	2.00	0.0443	0.293	39.5	0.0131	1.00157	0.711
24.0	0.4060	125.0	6.69	2.00	0.0423	0.301	40.6	0.0141	1.00150	0.711
25.0	0.3895	130.0	6.68	2.00	0.0406	0.308	41.6	0.0150	1.00144	0.711
26.0	0.3744	135.0	6.68	2.00	0.0389	0.315	42.7	0.0160	1.00139	0.711
28.0	0.3473	146.0	6.67	2.01	0.0360	0.330	44.7	0.0181	1.00129	0.711
30.0	0.3240	156.0	6.66	2.01	0.0336	0.343	46.6	0.0202	1.00120	0.711
32.0	0.3036	167.0	6.66	2.01	0.0314	0.357	48.5	0.0225	1.00112	0.712
34.0	0.2857	177.0	6.65	2.01	0.0295	0.370	50.4	0.0248	1.00106	0.711
36.0	0.2698	188.0	6.65	2.01	0.0278	0.383	52.2	0.0272	1.00100	0.711
38.0	0.2556	198.0	6.64	2.01	0.0264	0.396	53.9	0.0297	1.00095	0.711
40.0	0.2428	209.0	6.64	2.01	0.0250	0.409	55.6	0.0323	1.00090	0.711
45.0	0.2158	235.0	6.63	2.01	0.0222	0.440	59.8	0.0391	1.00080	0.709
50.0	0.1942	261.0	6.62	2.01	0.0200	0.469	63.8	0.0464	1.00072	0.708
55.0	0.1766	287.0	6.62	2.01	0.0181	0.498	67.6	0.0542	1.00065	0.706
60.0	0.1619	313.0	6.61	2.01	0.0166	0.527	71.3	0.0625	1.00060	0.705
65.0	0.1495	339.0	6.61	2.01	0.0153	0.555	74.9	0.0713	1.00055	0.703
70.0	0.1388	365.0	6.61	2.01	0.0142	0.582	78.4	0.0806	1.00051	0.701
75.0	0.1296	391.0	6.61	2.01	0.0133	0.609	81.8	0.0903	1.00048	0.699
80.0	0.1215	417.0	6.60	2.01	0.0125	0.635	85.2	0.101	1.00045	0.697
90.0	0.1081	469.0	6.60	2.01	0.0111	0.687	91.7	0.122	1.00040	0.694
100.0	0.09727	521.0	6.60	2.01	0.0100	0.737	97.9	0.146	1.00036	0.691
125.0	0.07786	651.0	6.59	2.00	0.00798	0.857	111.0	0.212	1.00029	0.673
150.0	0.06491	781.0	6.59	2.00	0.00665	0.970	125.0	0.288	1.00024	0.670
175.0	0.05565	911.0	6.59	2.00	0.00570	1.08	139.0	0.373	1.00021	0.668
200.0	0.04871	1040.0	6.59	2.00	0.00499	1.18	151.0	0.467	1.00018	0.667
225.0	0.04330	1170.0	6.59	2.00	0.00444	1.28	164.0	0.568	1.00016	0.666
250.0	0.03898	1300.0	6.59	2.00	0.00399	1.37	176.0	0.678	1.00014	0.666
275.0	0.03544	1430.0	6.58	2.00	0.00363	1.46	188.0	0.794	1.00013	0.667
300.0	0.03249	1560.0	6.58	2.00	0.00333	1.55	199.0	0.917	1.00012	0.669
350.0	0.02785	1820.0	6.58	2.00	0.00285	1.72	222.0	1.19	1.00010	0.668
400.0	0.02437	2080.0	6.58	2.00	0.00250	1.89	243.0	1.49	1.00009	0.668
450.0	0.02167	2340.0	6.58	2.00	0.00222	2.05	264.0	1.82	1.00008	0.668
500.0	0.01950	2600.0	6.58	2.00	0.00200	2.21	284.0	2.18	1.00007	0.667
600.0	0.01625	3120.0	6.58	2.00	0.00167	2.51	322.0	2.97	1.00006	0.667
700.0	0.01393	3640.0	6.58	2.00	0.00143	2.80	359.0	3.86	1.00005	0.667
800.0	0.01219	4160.0	6.58	2.00	0.00125	3.07	394.0	4.85	1.00005	0.667
900.0	0.01084	4680.0	6.58	2.00	0.00111	3.34	428.0	5.93	1.00004	0.666
1000.0	0.009754	5190.0	6.58	2.00	0.00100	3.60	462.0	7.10	1.00004	0.666
1100.0	0.008867	5710.0	6.58	2.00	0.000909	3.85	494.0	8.36	1.00003	0.666
1200.0	0.008128	6230.0	6.58	2.00	0.000833	4.10	525.0	9.70	1.00003	0.666
1300.0	0.007503	6750.0	6.58	2.00	0.000769	4.34	556.0	11.1	1.00003	0.666
1400.0	0.006967	7270.0	6.58	2.00	0.000714	4.57	586.0	12.6	1.00003	0.666
1500.0	0.006503	7790.0	6.58	2.00	0.000667	4.80	615.0	14.2	1.00002	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.1 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.158	0.06649								
	2.5	0.06705	535.0	2.62	3.802	5.229	1.908	1.816	1.961	241.9
	3.0	0.06849	456.0	3.49	4.784	6.242	2.281	1.894	2.275	235.7
	3.5	0.07070	361.0	3.92	5.990	7.494	2.669	2.080	2.833	223.2
	4.0	0.07410	260.0	4.03	7.506	9.083	3.094	2.240	3.633	206.5
	4.5	0.07985	153.0	3.79	9.525	11.22	3.596	2.436	5.151	181.3
	5.0	0.09469	38.9	2.96	12.92	14.94	4.371	2.756	12.99	136.2
	5.1	0.1062	10.4	2.51	14.55	16.81	4.746	2.915	38.19	117.4
*	5.112	0.1074	9.22	2.47	14.73	17.02	4.781	2.930	42.46	116.4
*	5.112	0.2383	3.86	1.16	21.16	25.59	6.488	3.368	82.18	97.65
	5.2	0.2617	15.8	0.908	23.17	28.74	7.070	3.337	22.28	103.1
	5.3	0.2945	24.4	0.797	24.29	30.56	7.416	3.303	15.43	107.5
	5.4	0.3202	31.5	0.727	25.13	31.95	7.676	3.275	12.69	111.1
	5.5	0.3425	37.6	0.674	25.85	33.13	7.894	3.252	11.16	114.3
	5.6	0.3626	43.2	0.633	26.48	34.20	8.086	3.233	10.15	117.2
	5.7	0.3812	48.3	0.599	27.06	35.17	8.259	3.216	9.445	119.9
	5.8	0.3987	53.1	0.570	27.61	36.09	8.418	3.202	8.912	122.4
	5.9	0.4154	57.7	0.545	28.12	36.96	8.567	3.189	8.495	124.7
	6.0	0.4314	62.0	0.522	28.61	37.79	8.707	3.179	8.160	127.0
	6.5	0.5044	81.3	0.440	30.85	41.58	9.314	3.143	7.140	136.8
	7.0	0.5706	98.2	0.386	32.87	45.01	9.823	3.125	6.620	145.2
	7.5	0.6329	114.0	0.345	34.77	48.24	10.27	3.115	6.307	152.7
	8.0	0.6926	128.0	0.314	36.60	51.34	10.67	3.111	6.098	159.6
	8.5	0.7505	142.0	0.288	38.38	54.35	11.03	3.109	5.950	166.0
	9.0	0.8071	155.0	0.267	40.12	57.29	11.37	3.109	5.840	172.0
	9.5	0.8626	168.0	0.249	41.84	60.19	11.68	3.109	5.755	177.7
	10.0	0.9174	181.0	0.234	43.53	63.05	11.98	3.110	5.688	183.1
	11.0	1.025	205.0	0.209	46.86	68.67	12.51	3.112	5.594	193.4
	12.0	1.130	229.0	0.189	50.15	74.21	12.99	3.114	5.527	202.9
	13.0	1.235	252.0	0.172	53.42	79.69	13.43	3.116	5.477	212.0
	14.0	1.338	275.0	0.159	56.66	85.14	13.84	3.117	5.438	220.5
	15.0	1.441	298.0	0.147	59.89	90.55	14.21	3.119	5.407	228.7
	16.0	1.543	320.0	0.137	63.11	95.94	14.56	3.120	5.380	236.5
	17.0	1.645	342.0	0.128	66.31	101.3	14.88	3.120	5.358	244.0
	18.0	1.746	364.0	0.121	69.51	106.7	15.19	3.121	5.339	251.3
	19.0	1.846	386.0	0.114	72.70	112.0	15.48	3.121	5.324	258.3
	20.0	1.947	408.0	0.108	75.88	117.3	15.75	3.121	5.311	265.1
	21.0	2.047	429.0	0.102	79.06	122.6	16.01	3.121	5.300	271.7
	22.0	2.147	451.0	0.0975	82.23	127.9	16.26	3.121	5.290	278.2
	23.0	2.246	472.0	0.0931	85.39	133.2	16.49	3.121	5.282	284.5
	24.0	2.346	493.0	0.0891	88.55	138.5	16.72	3.121	5.274	290.6
	25.0	2.445	514.0	0.0854	91.71	143.7	16.93	3.121	5.268	296.6
	26.0	2.544	536.0	0.0820	94.87	149.0	17.14	3.121	5.262	302.5
	28.0	2.742	578.0	0.0760	101.2	159.5	17.53	3.121	5.252	313.8
	30.0	2.940	620.0	0.0708	107.5	170.0	17.89	3.121	5.244	324.8
	32.0	3.137	662.0	0.0663	113.7	180.5	18.23	3.121	5.238	335.4
	34.0	3.334	703.0	0.0623	120.0	191.0	18.54	3.121	5.232	345.7
	36.0	3.531	745.0	0.0588	126.3	201.4	18.84	3.120	5.228	355.6
	38.0	3.727	787.0	0.0556	132.6	211.9	19.13	3.120	5.224	365.3
	40.0	3.924	828.0	0.0528	138.8	222.3	19.39	3.120	5.221	374.7
	45.0	4.414	932.0	0.0469	154.5	248.4	20.01	3.120	5.215	397.2
	50.0	4.904	1030.0	0.0421	170.1	274.5	20.56	3.119	5.210	418.5
	55.0	5.394	1140.0	0.0383	185.7	300.5	21.05	3.119	5.207	438.7
	60.0	5.883	1240.0	0.0351	201.4	326.5	21.51	3.119	5.205	458.1
	65.0	6.372	1340.0	0.0324	217.0	352.6	21.92	3.118	5.203	476.6
	70.0	6.861	1450.0	0.0300	232.6	378.6	22.31	3.118	5.201	494.4
	75.0	7.350	1550.0	0.0280	248.2	404.6	22.67	3.118	5.200	511.6
	80.0	7.838	1650.0	0.0263	263.8	430.6	23.00	3.118	5.199	528.3
	90.0	8.815	1860.0	0.0233	295.0	482.6	23.62	3.118	5.198	560.1
	100.0	9.792	2060.0	0.0210	326.2	534.5	24.16	3.117	5.197	590.2
	125.0	12.23	2580.0	0.0168	404.1	664.4	25.32	3.117	5.195	659.4
	150.0	14.67	3090.0	0.0140	482.0	794.3	26.27	3.117	5.194	722.1
	175.0	17.11	3600.0	0.0120	560.0	924.1	27.07	3.117	5.194	779.7
	200.0	19.56	4110.0	0.0105	637.9	1054.0	27.76	3.117	5.194	833.3
	225.0	22.00	4630.0	0.00933	715.8	1184.0	28.38	3.116	5.193	883.7
	250.0	24.44	5140.0	0.00840	793.7	1314.0	28.92	3.116	5.193	931.3
	275.0	26.88	5650.0	0.00764	871.6	1443.0	29.42	3.116	5.193	976.7
	300.0	29.32	6160.0	0.00700	949.5	1573.0	29.87	3.116	5.193	1020.0
	350.0	34.20	7190.0	0.00600	1105.0	1833.0	30.67	3.116	5.193	1102.0
	400.0	39.08	8210.0	0.00525	1261.0	2093.0	31.36	3.116	5.193	1177.0
	450.0	43.96	9240.0	0.00467	1417.0	2352.0	31.98	3.116	5.193	1249.0
	500.0	48.84	10300.0	0.00420	1573.0	2612.0	32.52	3.116	5.193	1316.0
	600.0	58.60	12300.0	0.00350	1884.0	3131.0	33.47	3.116	5.193	1442.0
	700.0	68.36	14400.0	0.00300	2196.0	3650.0	34.27	3.116	5.193	1557.0
	800.0	78.12	16400.0	0.00262	2507.0	4170.0	34.96	3.116	5.193	1665.0
	900.0	87.88	18500.0	0.00233	2819.0	4689.0	35.57	3.116	5.193	1765.0
	1000.0	97.65	20500.0	0.00210	3131.0	5208.0	36.12	3.116	5.193	1861.0
	1100.0	107.4	22600.0	0.00191	3442.0	5728.0	36.62	3.116	5.193	1952.0
	1200.0	117.2	24600.0	0.00175	3754.0	6247.0	37.07	3.116	5.193	2038.0
	1300.0	126.9	26700.0	0.00162	4065.0	6766.0	37.48	3.116	5.193	2122.0
	1400.0	136.7	28700.0	0.00150	4377.0	7286.0	37.87	3.116	5.193	2202.0
	1500.0	146.5	30800.0	0.00140	4689.0	7805.0	38.23	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.1 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_p$ J/G	$V(\partial P/\partial U)_v$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.158	15.04									
2.5	14.91	59.8	9.66	79.7	0.0328	0.171	41.8	0.000584	1.05615	0.480
3.0	14.60	43.4	12.6	66.6	0.0525	0.186	41.0	0.000559	1.05495	0.582
3.5	14.14	36.9	13.3	51.1	0.0767	0.196	38.9	0.000490	1.05320	0.560
4.0	13.50	31.6	13.3	35.0	0.115	0.204	36.1	0.000417	1.05072	0.641
4.5	12.52	26.1	12.4	19.2	0.197	0.206	32.7	0.000320	1.04702	0.815
5.0	10.56	18.0	10.2	4.10	0.721	0.210	27.5	0.000153	1.03956	1.70
5.1	9.414	14.9	9.13	0.977	2.56	0.263	25.2	0.0000730	1.03522	3.66
* 5.112	9.313	14.8	9.06	0.859	2.88	0.273	25.0	0.0000689	1.03484	3.89
* 5.112	4.801	13.1	7.19	0.185	6.28	0.330	18.3	0.0000837	1.01787	4.56
5.2	3.822	14.7	7.12	0.603	1.51	0.169	17.4	0.000199	1.01421	2.29
5.3	3.396	16.0	7.11	0.829	0.962	0.151	17.2	0.000288	1.01262	1.76
5.4	3.123	17.2	7.10	0.982	0.740	0.144	17.1	0.000363	1.01160	1.51
5.5	2.920	18.2	7.10	1.10	0.614	0.140	17.1	0.000431	1.01084	1.36
5.6	2.758	19.1	7.10	1.19	0.532	0.139	17.2	0.000495	1.01024	1.26
5.7	2.623	20.0	7.10	1.27	0.472	0.138	17.3	0.000556	1.00974	1.18
5.8	2.508	20.8	7.10	1.33	0.428	0.137	17.4	0.000615	1.00931	1.13
5.9	2.407	21.7	7.09	1.39	0.392	0.138	17.5	0.000672	1.00894	1.08
6.0	2.318	22.4	7.09	1.44	0.364	0.138	17.6	0.000729	1.00860	1.04
6.5	1.982	26.1	7.07	1.61	0.273	0.141	18.3	0.00100	1.00735	0.921
7.0	1.752	29.6	7.04	1.72	0.224	0.146	19.0	0.00126	1.00650	0.858
7.5	1.580	32.8	7.01	1.80	0.192	0.152	19.7	0.00153	1.00586	0.819
8.0	1.444	36.0	6.99	1.85	0.170	0.158	20.5	0.00179	1.00535	0.793
8.5	1.332	39.0	6.96	1.89	0.152	0.163	21.3	0.00206	1.00494	0.775
9.0	1.239	42.1	6.94	1.93	0.139	0.169	22.0	0.00233	1.00459	0.761
9.5	1.159	45.0	6.92	1.95	0.128	0.174	22.7	0.00261	1.00430	0.751
10.0	1.090	48.0	6.90	1.97	0.119	0.180	23.5	0.00290	1.00404	0.743
11.0	0.9759	53.7	6.87	2.00	0.104	0.190	24.9	0.00349	1.00362	0.732
12.0	0.8847	59.4	6.85	2.03	0.0931	0.200	26.3	0.00410	1.00328	0.726
13.0	0.8099	65.0	6.83	2.04	0.0843	0.210	27.7	0.00474	1.00300	0.721
14.0	0.7472	70.5	6.81	2.06	0.0771	0.220	29.0	0.00540	1.00277	0.718
15.0	0.6940	76.0	6.79	2.07	0.0711	0.229	30.3	0.00609	1.00257	0.716
16.0	0.6480	81.5	6.77	2.07	0.0660	0.237	31.5	0.00681	1.00240	0.714
17.0	0.6080	87.0	6.76	2.08	0.0616	0.246	32.8	0.00755	1.00225	0.713
18.0	0.5728	92.4	6.75	2.09	0.0578	0.254	34.0	0.00832	1.00212	0.712
19.0	0.5416	97.8	6.73	2.09	0.0544	0.263	35.1	0.00911	1.00201	0.712
20.0	0.5136	103.0	6.72	2.09	0.0515	0.271	36.3	0.00992	1.00190	0.712
21.0	0.4885	109.0	6.72	2.10	0.0488	0.278	37.4	0.0108	1.00181	0.712
22.0	0.4658	114.0	6.71	2.10	0.0465	0.286	38.5	0.0116	1.00173	0.712
23.0	0.4451	119.0	6.70	2.10	0.0443	0.294	39.6	0.0125	1.00165	0.712
24.0	0.4263	125.0	6.69	2.10	0.0424	0.301	40.6	0.0134	1.00158	0.712
25.0	0.4090	130.0	6.69	2.10	0.0406	0.309	41.7	0.0143	1.00151	0.712
26.0	0.3930	135.0	6.68	2.11	0.0389	0.316	42.7	0.0153	1.00146	0.712
28.0	0.3647	146.0	6.67	2.11	0.0361	0.330	44.7	0.0172	1.00135	0.712
30.0	0.3401	156.0	6.67	2.11	0.0336	0.344	46.7	0.0193	1.00126	0.712
32.0	0.3188	167.0	6.66	2.11	0.0314	0.357	48.5	0.0214	1.00118	0.712
34.0	0.2999	177.0	6.65	2.11	0.0295	0.371	50.4	0.0236	1.00111	0.712
36.0	0.2832	188.0	6.65	2.11	0.0278	0.384	52.2	0.0259	1.00105	0.711
38.0	0.2683	198.0	6.64	2.11	0.0264	0.396	53.9	0.0283	1.00099	0.711
40.0	0.2548	209.0	6.64	2.11	0.0250	0.409	55.7	0.0307	1.00094	0.711
45.0	0.2265	235.0	6.63	2.11	0.0222	0.440	59.8	0.0372	1.00084	0.710
50.0	0.2039	261.0	6.63	2.11	0.0200	0.470	63.8	0.0442	1.00075	0.708
55.0	0.1854	287.0	6.62	2.11	0.0181	0.499	67.7	0.0517	1.00069	0.706
60.0	0.1700	313.0	6.62	2.11	0.0166	0.527	71.4	0.0596	1.00063	0.705
65.0	0.1569	339.0	6.61	2.11	0.0153	0.555	75.0	0.0680	1.00058	0.703
70.0	0.1457	365.0	6.61	2.11	0.0142	0.582	78.4	0.0768	1.00054	0.701
75.0	0.1361	391.0	6.61	2.11	0.0133	0.609	81.9	0.0861	1.00050	0.699
80.0	0.1276	417.0	6.61	2.11	0.0125	0.635	85.2	0.0958	1.00047	0.697
90.0	0.1134	469.0	6.60	2.11	0.0111	0.687	91.7	0.116	1.00042	0.694
100.0	0.1021	521.0	6.60	2.11	0.0100	0.737	97.9	0.139	1.00038	0.691
125.0	0.08174	651.0	6.59	2.11	0.00798	0.857	111.0	0.202	1.00030	0.673
150.0	0.06815	781.0	6.59	2.10	0.00665	0.970	125.0	0.274	1.00025	0.670
175.0	0.05843	911.0	6.59	2.10	0.00570	1.08	139.0	0.355	1.00022	0.668
200.0	0.05114	1040.0	6.59	2.10	0.00499	1.18	152.0	0.444	1.00019	0.667
225.0	0.04546	1170.0	6.59	2.10	0.00444	1.28	164.0	0.541	1.00017	0.666
250.0	0.04092	1300.0	6.59	2.10	0.00399	1.37	176.0	0.646	1.00015	0.666
275.0	0.03721	1430.0	6.59	2.10	0.00363	1.46	188.0	0.757	1.00014	0.667
300.0	0.03411	1560.0	6.58	2.10	0.00333	1.55	199.0	0.874	1.00013	0.669
350.0	0.02924	1820.0	6.58	2.10	0.00285	1.72	222.0	1.13	1.00011	0.668
400.0	0.02559	2080.0	6.58	2.10	0.00250	1.89	243.0	1.42	1.00009	0.668
450.0	0.02275	2340.0	6.58	2.10	0.00222	2.05	264.0	1.74	1.00008	0.668
500.0	0.02048	2600.0	6.58	2.10	0.00200	2.21	284.0	2.08	1.00008	0.667
600.0	0.01706	3120.0	6.58	2.10	0.00167	2.51	322.0	2.83	1.00006	0.667
700.0	0.01463	3640.0	6.58	2.10	0.00143	2.80	359.0	3.68	1.00005	0.667
800.0	0.01280	4160.0	6.58	2.10	0.00125	3.07	394.0	4.62	1.00005	0.667
900.0	0.01138	4680.0	6.58	2.10	0.00111	3.34	428.0	5.65	1.00004	0.666
1000.0	0.01024	5190.0	6.58	2.10	0.00100	3.60	462.0	6.77	1.00004	0.666
1100.0	0.009310	5710.0	6.58	2.10	0.000909	3.85	494.0	7.96	1.00003	0.666
1200.0	0.008535	6230.0	6.58	2.10	0.000833	4.10	525.0	9.24	1.00003	0.666
1300.0	0.007878	6750.0	6.58	2.10	0.000769	4.34	556.0	10.6	1.00003	0.666
1400.0	0.007316	7270.0	6.58	2.10	0.000714	4.57	586.0	12.0	1.00003	0.666
1500.0	0.006828	7790.0	6.58	2.10	0.000667	4.80	615.0	13.5	1.00003	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.2 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.157	0.06641								
2.5	0.06696	540.0	2.61	3.795	5.288	1.905	1.811	1.954	243.0
3.0	0.06838	461.0	3.50	4.773	6.297	2.277	1.892	2.269	236.8
3.5	0.07056	367.0	3.93	5.971	7.544	2.663	2.078	2.821	224.6
4.0	0.07389	266.0	4.05	7.475	9.122	3.085	2.237	3.604	208.2
4.5	0.07947	160.0	3.82	9.465	11.24	3.581	2.431	5.055	183.6
5.0	0.09296	47.6	3.05	12.70	14.77	4.319	2.735	11.28	141.1
5.1	0.1005	23.5	2.72	13.93	16.17	4.595	2.850	19.29	126.9
* 5.174	0.1177	2.70	2.20	15.94	18.57	5.061	3.046	132.9	109.3
* 5.174	0.1734	0.865	1.42	19.79	23.66	6.045	3.323	369.6	98.71
5.2	0.2101	6.46	1.15	21.53	26.21	6.537	3.347	51.17	100.0
5.3	0.2582	17.7	0.921	23.41	29.17	7.102	3.319	20.44	105.2
5.4	0.2880	25.8	0.816	24.48	30.90	7.425	3.289	15.00	109.2
5.5	0.3120	32.6	0.747	25.31	32.26	7.675	3.264	12.54	112.7
5.6	0.3331	38.6	0.695	26.01	33.44	7.887	3.243	11.10	115.8
5.7	0.3522	44.1	0.653	26.65	34.50	8.075	3.225	10.14	118.6
5.8	0.3699	49.2	0.618	27.23	35.48	8.245	3.209	9.453	121.2
5.9	0.3866	54.0	0.589	27.78	36.39	8.402	3.196	8.931	123.7
6.0	0.4025	58.5	0.563	28.29	37.27	8.548	3.185	8.521	126.0
6.5	0.4745	78.6	0.470	30.61	41.18	9.176	3.146	7.319	136.1
7.0	0.5389	95.9	0.410	32.67	44.68	9.695	3.126	6.732	144.7
7.5	0.5992	112.0	0.366	34.60	47.95	10.15	3.116	6.385	152.3
8.0	0.6569	126.0	0.332	36.44	51.09	10.55	3.111	6.157	159.3
8.5	0.7126	141.0	0.305	38.24	54.12	10.92	3.109	5.996	165.7
9.0	0.7671	154.0	0.282	39.99	57.09	11.26	3.108	5.878	171.8
9.5	0.8204	167.0	0.263	41.72	60.00	11.57	3.109	5.787	177.5
10.0	0.8730	180.0	0.246	43.42	62.88	11.87	3.110	5.715	183.0
11.0	0.9758	204.0	0.220	46.76	68.51	12.41	3.111	5.615	193.3
12.0	1.077	228.0	0.198	50.06	74.07	12.89	3.114	5.544	202.9
13.0	1.177	252.0	0.181	53.33	79.57	13.33	3.116	5.491	212.0
14.0	1.276	275.0	0.167	56.58	85.03	13.74	3.117	5.450	220.6
15.0	1.374	297.0	0.154	59.81	90.45	14.11	3.119	5.417	228.8
16.0	1.472	320.0	0.144	63.04	95.85	14.46	3.120	5.389	236.6
17.0	1.569	342.0	0.135	66.25	101.2	14.78	3.120	5.366	244.1
18.0	1.666	364.0	0.127	69.45	106.6	15.09	3.121	5.346	251.4
19.0	1.762	386.0	0.119	72.64	111.9	15.38	3.121	5.330	258.4
20.0	1.858	408.0	0.113	75.83	117.2	15.65	3.121	5.317	265.2
21.0	1.954	429.0	0.107	79.01	122.6	15.91	3.122	5.305	271.8
22.0	2.049	451.0	0.102	82.18	127.9	16.16	3.122	5.295	278.3
23.0	2.144	472.0	0.0976	85.35	133.1	16.39	3.122	5.286	284.6
24.0	2.239	493.0	0.0934	88.51	138.4	16.62	3.122	5.278	290.7
25.0	2.334	515.0	0.0895	91.67	143.7	16.83	3.122	5.271	296.7
26.0	2.429	536.0	0.0860	94.83	149.0	17.04	3.122	5.265	302.6
28.0	2.618	578.0	0.0796	101.1	159.5	17.43	3.121	5.255	314.0
30.0	2.807	620.0	0.0742	107.4	170.0	17.79	3.121	5.247	324.9
32.0	2.995	662.0	0.0694	113.7	180.5	18.13	3.121	5.240	335.5
34.0	3.183	704.0	0.0653	120.0	191.0	18.45	3.121	5.234	345.8
36.0	3.371	745.0	0.0616	126.3	201.4	18.75	3.121	5.230	355.7
38.0	3.559	787.0	0.0583	132.5	211.9	19.03	3.120	5.226	365.4
40.0	3.746	828.0	0.0553	138.8	222.3	19.30	3.120	5.222	374.8
45.0	4.215	932.0	0.0491	154.5	248.4	19.91	3.120	5.216	397.3
50.0	4.683	1040.0	0.0442	170.1	274.5	20.46	3.119	5.211	418.6
55.0	5.150	1140.0	0.0401	185.7	300.5	20.96	3.119	5.208	438.8
60.0	5.617	1240.0	0.0367	201.3	326.6	21.41	3.119	5.205	458.2
65.0	6.084	1340.0	0.0339	217.0	352.6	21.83	3.118	5.203	476.7
70.0	6.550	1450.0	0.0315	232.6	378.6	22.21	3.118	5.202	494.5
75.0	7.017	1550.0	0.0294	248.2	404.6	22.57	3.118	5.200	511.7
80.0	7.483	1650.0	0.0275	263.8	430.6	22.91	3.118	5.199	528.4
90.0	8.416	1860.0	0.0245	295.0	482.6	23.52	3.118	5.198	560.2
100.0	9.348	2060.0	0.0220	326.2	534.5	24.07	3.117	5.197	590.3
125.0	11.68	2580.0	0.0176	404.1	664.4	25.23	3.117	5.195	659.5
150.0	14.01	3090.0	0.0147	482.0	794.3	26.17	3.117	5.194	722.1
175.0	16.34	3600.0	0.0126	560.0	924.2	26.97	3.117	5.194	779.7
200.0	18.67	4110.0	0.0110	637.9	1054.0	27.67	3.117	5.194	833.4
225.0	21.00	4630.0	0.00978	715.8	1184.0	28.28	3.117	5.193	883.7
250.0	23.33	5140.0	0.00880	793.7	1314.0	28.83	3.116	5.193	931.4
275.0	25.66	5650.0	0.00800	871.6	1443.0	29.32	3.116	5.193	976.7
300.0	27.99	6160.0	0.00733	949.5	1573.0	29.77	3.116	5.193	1020.0
350.0	32.64	7190.0	0.00628	1105.0	1833.0	30.57	3.116	5.193	1102.0
400.0	37.30	8210.0	0.00550	1261.0	2093.0	31.27	3.116	5.193	1178.0
450.0	41.96	9240.0	0.00489	1417.0	2352.0	31.88	3.116	5.193	1249.0
500.0	46.62	10300.0	0.00440	1573.0	2612.0	32.43	3.116	5.193	1316.0
600.0	55.94	12300.0	0.00367	1884.0	3131.0	33.37	3.116	5.193	1442.0
700.0	65.26	14400.0	0.00314	2196.0	3651.0	34.17	3.116	5.193	1557.0
800.0	74.57	16400.0	0.00275	2507.0	4170.0	34.87	3.116	5.193	1665.0
900.0	83.89	18500.0	0.00244	2819.0	4689.0	35.48	3.116	5.193	1765.0
1000.0	93.21	20500.0	0.00220	3131.0	5208.0	36.03	3.116	5.193	1861.0
1100.0	102.5	22600.0	0.00200	3442.0	5728.0	36.52	3.116	5.193	1952.0
1200.0	111.8	24600.0	0.00183	3754.0	6247.0	36.97	3.116	5.193	2038.0
1300.0	121.2	26700.0	0.00169	4065.0	6766.0	37.39	3.116	5.193	2122.0
1400.0	130.5	28700.0	0.00157	4377.0	7286.0	37.77	3.116	5.193	2202.0
1500.0	139.8	30800.0	0.00147	4689.0	7805.0	38.13	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.2 ATMOSPHERE ISOBAR

	TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_p$ J/S	$V(\partial P/\partial U)_v$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
*	2.157	15.06									
	2.5	14.93	60.3	9.66	80.6	0.0324	0.171	42.0	0.000586	1.05622	0.480
	3.0	14.62	43.8	12.6	67.5	0.0518	0.186	41.2	0.000561	1.05504	0.502
	3.5	14.17	37.3	13.3	52.0	0.0756	0.197	39.1	0.000493	1.05331	0.560
	4.0	13.53	32.0	13.4	35.9	0.113	0.205	36.3	0.000420	1.05087	0.638
	4.5	12.58	26.7	12.5	20.1	0.190	0.207	32.9	0.000326	1.04725	0.803
	5.0	10.76	19.0	10.4	5.13	0.595	0.209	28.1	0.000172	1.04031	1.52
	5.1	9.946	16.6	9.59	2.34	1.16	0.221	26.3	0.000115	1.03723	2.30
*	5.174	8.496	13.9	8.49	0.230	9.57	0.499	23.6	0.0000442	1.03175	6.29
*	5.174	5.768	13.0	7.40	0.0499	28.4	1.09	19.6	0.0000510	1.02149	6.68
	5.2	4.759	13.7	7.23	0.367	3.75	0.251	18.5	0.000103	1.01771	3.77
	5.3	3.873	15.2	7.16	0.686	1.34	0.167	17.7	0.000211	1.01440	2.17
	5.4	3.473	16.5	7.15	0.896	0.911	0.152	17.5	0.000292	1.01291	1.73
	5.5	3.235	17.6	7.14	1.05	0.714	0.146	17.5	0.000363	1.01191	1.50
	5.6	3.002	18.5	7.13	1.16	0.599	0.143	17.5	0.000428	1.01115	1.36
	5.7	2.840	19.5	7.13	1.25	0.521	0.141	17.5	0.000489	1.01055	1.26
	5.8	2.703	20.3	7.13	1.33	0.465	0.140	17.6	0.000548	1.01004	1.19
	5.9	2.587	21.2	7.12	1.40	0.421	0.140	17.7	0.000605	1.00960	1.13
	6.0	2.484	22.0	7.12	1.45	0.387	0.140	17.8	0.000660	1.00922	1.08
	6.5	2.108	25.8	7.09	1.66	0.284	0.143	18.4	0.000925	1.00782	0.945
	7.0	1.855	29.2	7.06	1.78	0.230	0.147	19.1	0.00118	1.00688	0.873
	7.5	1.669	32.5	7.04	1.86	0.196	0.153	19.9	0.00143	1.00619	0.830
	8.0	1.522	35.7	7.01	1.93	0.172	0.158	20.6	0.00169	1.00565	0.801
	8.5	1.403	38.8	6.98	1.97	0.154	0.164	21.4	0.00195	1.00520	0.781
	9.0	1.304	41.9	6.96	2.01	0.140	0.169	22.1	0.00221	1.00483	0.767
	9.5	1.219	44.8	6.94	2.04	0.129	0.175	22.8	0.00248	1.00452	0.755
	10.0	1.146	47.8	6.92	2.06	0.120	0.180	23.6	0.00275	1.00425	0.747
	11.0	1.025	53.6	6.89	2.09	0.105	0.191	25.0	0.00331	1.00380	0.736
	12.0	0.9284	59.2	6.86	2.12	0.0936	0.201	26.4	0.00390	1.00344	0.728
	13.0	0.8496	64.9	6.84	2.14	0.0847	0.211	27.7	0.00451	1.00315	0.723
	14.0	0.7836	70.4	6.82	2.15	0.0774	0.220	29.0	0.00515	1.00290	0.720
	15.0	0.7276	76.0	6.80	2.16	0.0713	0.229	30.3	0.00581	1.00270	0.717
	16.0	0.6793	81.5	6.78	2.17	0.0662	0.238	31.6	0.00650	1.00252	0.716
	17.0	0.6372	86.9	6.77	2.18	0.0617	0.246	32.8	0.00721	1.00236	0.714
	18.0	0.6003	92.3	6.75	2.19	0.0579	0.255	34.0	0.00794	1.00222	0.713
	19.0	0.5675	97.8	6.74	2.19	0.0545	0.263	35.2	0.00869	1.00210	0.713
	20.0	0.5382	103.0	6.73	2.19	0.0516	0.271	36.3	0.00947	1.00199	0.712
	21.0	0.5118	108.0	6.72	2.20	0.0489	0.279	37.4	0.0103	1.00190	0.712
	22.0	0.4880	114.0	6.71	2.20	0.0465	0.286	38.5	0.0111	1.00181	0.712
	23.0	0.4663	119.0	6.71	2.20	0.0444	0.294	39.6	0.0119	1.00173	0.712
	24.0	0.4465	124.0	6.70	2.20	0.0424	0.301	40.7	0.0128	1.00165	0.712
	25.0	0.4284	130.0	6.69	2.20	0.0406	0.309	41.7	0.0137	1.00159	0.712
	26.0	0.4117	135.0	6.69	2.21	0.0390	0.316	42.7	0.0146	1.00152	0.712
	28.0	0.3820	146.0	6.68	2.21	0.0361	0.330	44.7	0.0164	1.00141	0.712
	30.0	0.3563	156.0	6.67	2.21	0.0336	0.344	46.7	0.0184	1.00132	0.712
	32.0	0.3339	167.0	6.66	2.21	0.0314	0.357	48.6	0.0204	1.00124	0.712
	34.0	0.3141	177.0	6.66	2.21	0.0295	0.371	50.4	0.0225	1.00116	0.712
	36.0	0.2966	188.0	6.65	2.21	0.0279	0.384	52.2	0.0247	1.00110	0.712
	38.0	0.2810	198.0	6.65	2.21	0.0264	0.397	54.0	0.0270	1.00104	0.711
	40.0	0.2669	209.0	6.64	2.21	0.0250	0.409	55.7	0.0294	1.00099	0.711
	45.0	0.2373	235.0	6.63	2.21	0.0222	0.440	59.9	0.0355	1.00088	0.710
	50.0	0.2136	261.0	6.63	2.21	0.0200	0.470	63.8	0.0422	1.00079	0.708
	55.0	0.1942	287.0	6.62	2.21	0.0181	0.499	67.7	0.0493	1.00072	0.707
	60.0	0.1780	313.0	6.62	2.21	0.0166	0.527	71.4	0.0569	1.00066	0.705
	65.0	0.1644	339.0	6.61	2.21	0.0153	0.555	75.0	0.0649	1.00061	0.703
	70.0	0.1527	365.0	6.61	2.21	0.0142	0.582	78.5	0.0733	1.00057	0.701
	75.0	0.1425	391.0	6.61	2.21	0.0133	0.609	81.9	0.0822	1.00053	0.699
	80.0	0.1336	417.0	6.61	2.21	0.0125	0.635	85.2	0.0915	1.00049	0.697
	90.0	0.1188	469.0	6.60	2.21	0.0111	0.687	91.7	0.111	1.00044	0.694
	100.0	0.1070	521.0	6.60	2.21	0.0100	0.737	97.9	0.133	1.00040	0.691
	125.0	0.08563	651.0	6.60	2.21	0.00798	0.857	111.0	0.193	1.00032	0.673
	150.0	0.07138	781.0	6.59	2.20	0.00665	0.970	125.0	0.262	1.00026	0.670
	175.0	0.06121	911.0	6.59	2.20	0.00570	1.08	139.0	0.339	1.00023	0.668
	200.0	0.05357	1040.0	6.59	2.20	0.00499	1.18	152.0	0.424	1.00020	0.667
	225.0	0.04763	1170.0	6.59	2.20	0.00444	1.28	164.0	0.517	1.00018	0.666
	250.0	0.04287	1300.0	6.59	2.20	0.00399	1.37	176.0	0.616	1.00016	0.666
	275.0	0.03898	1430.0	6.59	2.20	0.00363	1.46	188.0	0.722	1.00014	0.667
	300.0	0.03573	1560.0	6.58	2.20	0.00333	1.55	199.0	0.834	1.00013	0.669
	350.0	0.03063	1820.0	6.58	2.20	0.00285	1.72	222.0	1.08	1.00011	0.668
	400.0	0.02681	2080.0	6.58	2.20	0.00250	1.89	243.0	1.36	1.00010	0.668
	450.0	0.02383	2340.0	6.58	2.20	0.00222	2.05	264.0	1.66	1.00009	0.668
	500.0	0.02145	2600.0	6.58	2.20	0.00200	2.21	284.0	1.98	1.00008	0.667
	600.0	0.01788	3120.0	6.58	2.20	0.00167	2.51	322.0	2.70	1.00007	0.667
	700.0	0.01532	3640.0	6.58	2.20	0.00143	2.80	359.0	3.51	1.00006	0.667
	800.0	0.01341	4160.0	6.58	2.20	0.00125	3.07	394.0	4.41	1.00005	0.667
	900.0	0.01192	4680.0	6.58	2.20	0.00111	3.34	428.0	5.39	1.00004	0.666
	1000.0	0.01073	5190.0	6.58	2.20	0.00100	3.60	462.0	6.46	1.00004	0.666
	1100.0	0.009754	5710.0	6.58	2.20	0.000909	3.85	494.0	7.60	1.00004	0.666
	1200.0	0.008941	6230.0	6.58	2.20	0.000833	4.10	525.0	8.82	1.00003	0.666
	1300.0	0.008253	6750.0	6.58	2.20	0.000769	4.34	556.0	10.1	1.00003	0.666
	1400.0	0.007664	7270.0	6.58	2.20	0.000714	4.57	586.0	11.5	1.00003	0.666
	1500.0	0.007153	7790.0	6.58	2.20	0.000667	4.80	615.0	12.9	1.00003	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.3 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.156	0.06633								
2.5	0.06688	545.0	2.61	3.789	5.348	1.902	1.806	1.948	244.0
3.0	0.06827	467.0	3.50	4.762	6.353	2.272	1.891	2.263	237.9
3.5	0.07042	372.0	3.94	5.953	7.594	2.657	2.076	2.809	225.9
4.0	0.07369	271.0	4.07	7.445	9.162	3.076	2.235	3.577	209.8
4.5	0.07910	167.0	3.85	9.409	11.25	3.567	2.426	4.966	185.9
5.0	0.09152	56.0	3.13	12.50	14.64	4.274	2.718	10.14	145.5
5.1	0.09763	33.1	2.84	13.57	15.85	4.513	2.815	14.87	133.0
5.2	0.1129	9.90	2.33	15.56	18.19	4.965	2.987	39.78	115.6
5.3	0.2173	10.3	1.11	22.13	27.19	6.683	3.327	33.76	102.9
5.4	0.2556	19.8	0.930	23.67	29.63	7.139	3.301	18.90	107.3
5.5	0.2826	27.4	0.833	24.68	31.27	7.440	3.275	14.53	111.0
5.6	0.3051	34.0	0.765	25.49	32.60	7.680	3.253	12.34	114.3
5.7	0.3249	39.9	0.713	26.19	33.77	7.886	3.234	11.01	117.3
5.8	0.3436	45.3	0.671	26.83	34.82	8.069	3.217	10.10	120.0
5.9	0.3599	50.3	0.637	27.41	35.79	8.236	3.203	9.441	122.6
6.0	0.3759	55.0	0.607	27.95	36.71	8.391	3.191	8.934	125.0
6.5	0.4470	75.8	0.501	30.35	40.77	9.041	3.149	7.514	135.4
7.0	0.5039	93.7	0.435	32.46	44.34	9.571	3.128	6.850	144.1
7.5	0.5685	110.0	0.387	34.42	47.67	10.03	3.117	6.466	151.9
8.0	0.6242	125.0	0.350	36.29	50.83	10.44	3.111	6.217	158.9
8.5	0.6791	139.0	0.321	38.09	53.90	10.81	3.109	6.043	165.5
9.0	0.7305	153.0	0.297	39.86	56.88	11.15	3.108	5.916	171.6
9.5	0.7819	166.0	0.276	41.59	59.82	11.47	3.109	5.818	177.3
10.0	0.8324	179.0	0.259	43.31	62.71	11.76	3.109	5.742	182.9
11.0	0.9313	203.0	0.230	46.66	68.36	12.30	3.111	5.636	193.2
12.0	1.029	227.0	0.208	49.97	73.94	12.79	3.113	5.561	202.9
13.0	1.124	251.0	0.190	53.25	79.45	13.23	3.116	5.505	212.0
14.0	1.219	274.0	0.175	56.50	84.92	13.64	3.117	5.462	220.6
15.0	1.314	297.0	0.162	59.74	90.35	14.01	3.119	5.428	228.8
16.0	1.407	319.0	0.151	62.97	95.77	14.36	3.120	5.398	236.6
17.0	1.500	342.0	0.141	66.19	101.2	14.69	3.121	5.374	244.2
18.0	1.593	364.0	0.132	69.39	106.5	14.99	3.121	5.354	251.4
19.0	1.685	386.0	0.125	72.59	111.9	15.28	3.121	5.337	258.5
20.0	1.777	407.0	0.118	75.78	117.2	15.56	3.122	5.322	265.3
21.0	1.869	429.0	0.112	78.96	122.5	15.82	3.122	5.310	271.9
22.0	1.960	451.0	0.107	82.13	127.8	16.06	3.122	5.299	278.4
23.0	2.051	472.0	0.102	85.30	133.1	16.30	3.122	5.290	284.7
24.0	2.142	493.0	0.0977	88.47	138.4	16.52	3.122	5.282	290.8
25.0	2.233	515.0	0.0937	91.63	143.7	16.74	3.122	5.275	296.8
26.0	2.324	536.0	0.0899	94.79	148.9	16.95	3.122	5.268	302.7
28.0	2.505	578.0	0.0833	101.1	159.5	17.34	3.122	5.258	314.1
30.0	2.685	620.0	0.0776	107.4	170.0	17.70	3.121	5.249	325.1
32.0	2.865	662.0	0.0726	113.7	180.5	18.04	3.121	5.242	335.7
34.0	3.043	704.0	0.0683	120.0	190.9	18.35	3.121	5.236	345.9
36.0	3.225	746.0	0.0644	126.2	201.4	18.65	3.121	5.231	355.8
38.0	3.405	787.0	0.0610	132.5	211.9	18.94	3.121	5.227	365.5
40.0	3.584	829.0	0.0579	138.8	222.3	19.20	3.120	5.224	374.9
45.0	4.032	932.0	0.0514	154.4	248.4	19.82	3.120	5.217	397.4
50.0	4.480	1040.0	0.0462	170.1	274.5	20.37	3.119	5.212	418.7
55.0	4.927	1140.0	0.0419	185.7	300.5	20.86	3.119	5.208	438.9
60.0	5.374	1240.0	0.0384	201.3	326.6	21.32	3.119	5.206	458.3
65.0	5.820	1340.0	0.0355	217.0	352.6	21.73	3.119	5.204	476.8
70.0	6.267	1450.0	0.0329	232.6	378.6	22.12	3.118	5.202	494.6
75.0	6.713	1550.0	0.0307	248.2	404.6	22.48	3.118	5.201	511.8
80.0	7.159	1650.0	0.0288	263.8	430.6	22.81	3.118	5.200	528.5
90.0	8.051	1860.0	0.0256	295.0	482.6	23.43	3.118	5.198	560.3
100.0	8.943	2060.0	0.0230	326.2	534.6	23.97	3.118	5.197	590.4
125.0	11.17	2580.0	0.0184	404.1	664.5	25.13	3.117	5.195	659.6
150.0	13.40	3090.0	0.0153	482.0	794.3	26.08	3.117	5.194	722.2
175.0	15.63	3600.0	0.0131	560.0	924.2	26.88	3.117	5.194	779.8
200.0	17.86	4110.0	0.0115	637.9	1054.0	27.58	3.117	5.194	833.4
225.0	20.09	4630.0	0.0102	715.8	1184.0	28.19	3.117	5.193	883.8
250.0	22.31	5140.0	0.00920	793.7	1314.0	28.73	3.116	5.193	931.5
275.0	24.54	5650.0	0.00836	871.6	1444.0	29.23	3.116	5.193	976.8
300.0	26.77	6160.0	0.00767	949.5	1573.0	29.68	3.116	5.193	1020.0
350.0	31.23	7190.0	0.00657	1105.0	1833.0	30.48	3.116	5.193	1102.0
400.0	35.68	8210.0	0.00575	1261.0	2093.0	31.17	3.116	5.193	1178.0
450.0	40.14	9240.0	0.00511	1417.0	2352.0	31.79	3.116	5.193	1249.0
500.0	44.59	10300.0	0.00460	1573.0	2612.0	32.33	3.116	5.193	1316.0
600.0	53.51	12300.0	0.00383	1884.0	3131.0	33.28	3.116	5.193	1442.0
700.0	62.42	14400.0	0.00329	2196.0	3651.0	34.08	3.116	5.193	1557.0
800.0	71.33	16400.0	0.00287	2507.0	4170.0	34.77	3.116	5.193	1665.0
900.0	80.24	18500.0	0.00256	2819.0	4689.0	35.39	3.116	5.193	1765.0
1000.0	89.16	20500.0	0.00230	3131.0	5208.0	35.93	3.116	5.193	1861.0
1100.0	98.07	22600.0	0.00209	3442.0	5728.0	36.43	3.116	5.193	1952.0
1200.0	107.0	24600.0	0.00192	3754.0	6247.0	36.88	3.116	5.193	2038.0
1300.0	115.9	26700.0	0.00177	4065.0	6766.0	37.30	3.116	5.193	2122.0
1400.0	124.8	28700.0	0.00164	4377.0	7286.0	37.68	3.116	5.193	2202.0
1500.0	133.7	30800.0	0.00153	4689.0	7805.0	38.04	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.3 ATMOSPHERE ISOBAR

	TEMPERATURE	DENSITY	V(DH/DV)$_p$	V(DP/DU)$_v$	-V(DP/DV)$_T$	(DV/DT)/V$_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
	DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
*	2.156	15.08									
	2.5	14.95	60.8	9.67	81.5	0.0320	0.171	42.2	0.000588	1.05630	0.480
	3.0	14.65	44.2	12.6	68.4	0.0512	0.187	41.4	0.000563	1.05513	0.502
	3.5	14.20	37.7	13.4	52.8	0.0745	0.197	39.3	0.000495	1.05342	0.559
	4.0	13.57	32.4	13.4	36.8	0.110	0.205	36.5	0.000423	1.05161	0.636
	4.5	12.64	27.2	12.6	21.1	0.183	0.208	33.2	0.000332	1.04747	0.791
	5.0	10.93	19.8	10.5	6.12	0.512	0.208	28.5	0.000188	1.04035	1.39
	5.1	10.24	17.7	9.87	3.39	0.840	0.213	27.0	0.000140	1.03836	1.88
	5.2	8.859	15.0	8.80	0.877	2.66	0.262	24.4	0.000744	1.03312	3.70
	5.3	4.601	14.4	7.26	0.474	2.35	0.207	18.6	0.000133	1.01712	3.04
	5.4	3.913	15.8	7.20	0.776	1.20	0.165	18.0	0.000223	1.01455	2.07
	5.5	3.539	16.9	7.18	0.970	0.858	0.153	17.9	0.000298	1.01315	1.69
	5.6	3.278	18.0	7.17	1.11	0.687	0.148	17.8	0.000365	1.01218	1.49
	5.7	3.078	18.9	7.16	1.23	0.581	0.145	17.8	0.000427	1.01143	1.36
	5.8	2.915	19.9	7.16	1.32	0.509	0.143	17.8	0.000486	1.01083	1.26
	5.9	2.778	20.7	7.15	1.40	0.455	0.142	17.9	0.000542	1.01032	1.19
	6.0	2.660	21.6	7.15	1.46	0.414	0.142	18.0	0.000597	1.00988	1.13
	6.5	2.237	25.4	7.12	1.70	0.296	0.144	18.6	0.000857	1.00830	0.969
	7.0	1.961	28.9	7.09	1.84	0.237	0.148	19.3	0.00110	1.00728	0.889
	7.5	1.759	32.3	7.06	1.93	0.200	0.154	20.0	0.00135	1.00652	0.841
	8.0	1.602	35.5	7.03	2.00	0.175	0.159	20.7	0.00160	1.00594	0.810
	8.5	1.475	38.6	7.00	2.05	0.157	0.165	21.5	0.00185	1.00547	0.788
	9.0	1.369	41.7	6.97	2.09	0.142	0.170	22.2	0.00210	1.00508	0.772
	9.5	1.279	44.7	6.95	2.12	0.130	0.175	22.9	0.00236	1.00474	0.760
	10.0	1.201	47.6	6.93	2.15	0.121	0.181	23.6	0.00262	1.00445	0.751
	11.0	1.074	53.4	6.90	2.18	0.106	0.191	25.1	0.00316	1.00398	0.739
	12.0	0.9723	59.1	6.87	2.21	0.0941	0.201	26.4	0.00372	1.00360	0.731
	13.0	0.8894	64.8	6.85	2.23	0.0850	0.211	27.8	0.00431	1.00330	0.725
	14.0	0.8201	70.3	6.83	2.25	0.0777	0.220	29.1	0.00492	1.00304	0.722
	15.0	0.7612	75.9	6.81	2.26	0.0715	0.229	30.4	0.00555	1.00282	0.719
	16.0	0.7106	81.4	6.79	2.27	0.0663	0.238	31.6	0.00621	1.00263	0.717
	17.0	0.6665	86.9	6.78	2.28	0.0619	0.247	32.8	0.00689	1.00247	0.715
	18.0	0.6277	92.3	6.76	2.28	0.0580	0.255	34.0	0.00759	1.00233	0.714
	19.0	0.5934	97.7	6.75	2.29	0.0546	0.263	35.2	0.00831	1.00220	0.714
	20.0	0.5627	103.0	6.74	2.29	0.0516	0.271	36.3	0.00906	1.00208	0.713
	21.0	0.5351	108.0	6.73	2.30	0.0490	0.279	37.5	0.00982	1.00198	0.713
	22.0	0.5102	114.0	6.72	2.30	0.0466	0.287	38.6	0.0106	1.00189	0.713
	23.0	0.4875	119.0	6.71	2.30	0.0444	0.294	39.6	0.0114	1.00181	0.713
	24.0	0.4668	124.0	6.71	2.30	0.0424	0.302	40.7	0.0122	1.00173	0.713
	25.0	0.4478	130.0	6.70	2.30	0.0406	0.309	41.7	0.0131	1.00166	0.712
	26.0	0.4304	135.0	6.69	2.31	0.0390	0.316	42.8	0.0139	1.00159	0.712
	28.0	0.3993	146.0	6.68	2.31	0.0361	0.330	44.8	0.0157	1.00148	0.712
	30.0	0.3724	156.0	6.67	2.31	0.0336	0.344	46.7	0.0176	1.00138	0.712
	32.0	0.3490	167.0	6.67	2.31	0.0314	0.358	48.6	0.0196	1.00129	0.712
	34.0	0.3284	177.0	6.66	2.31	0.0295	0.371	50.4	0.0216	1.00122	0.712
	36.0	0.3101	188.0	6.66	2.31	0.0279	0.384	52.2	0.0237	1.00115	0.712
	38.0	0.2937	198.0	6.65	2.31	0.0264	0.397	54.0	0.0258	1.00109	0.711
	40.0	0.2790	209.0	6.65	2.31	0.0250	0.409	55.7	0.0281	1.00103	0.711
	45.0	0.2480	235.0	6.64	2.31	0.0222	0.440	59.9	0.0340	1.00092	0.710
	50.0	0.2232	261.0	6.63	2.31	0.0200	0.470	63.9	0.0404	1.00083	0.708
	55.0	0.2030	287.0	6.62	2.31	0.0181	0.499	67.7	0.0472	1.00075	0.707
	60.0	0.1861	313.0	6.62	2.31	0.0166	0.527	71.4	0.0544	1.00069	0.705
	65.0	0.1718	339.0	6.62	2.31	0.0153	0.555	75.0	0.0621	1.00064	0.703
	70.0	0.1596	365.0	6.61	2.31	0.0142	0.582	78.5	0.0702	1.00059	0.701
	75.0	0.1490	391.0	6.61	2.31	0.0133	0.609	81.9	0.0786	1.00055	0.699
	80.0	0.1397	417.0	6.61	2.31	0.0125	0.636	85.2	0.0875	1.00052	0.697
	90.0	0.1242	469.0	6.60	2.31	0.0111	0.687	91.7	0.106	1.00046	0.694
	100.0	0.1118	521.0	6.60	2.31	0.0100	0.737	97.9	0.127	1.00041	0.691
	125.0	0.08951	651.0	6.60	2.31	0.00798	0.857	111.0	0.184	1.00033	0.673
	150.0	0.07462	781.0	6.59	2.31	0.00665	0.970	125.0	0.250	1.00028	0.670
	175.0	0.06398	911.0	6.59	2.30	0.00570	1.08	139.0	0.324	1.00024	0.668
	200.0	0.05600	1040.0	6.59	2.30	0.00499	1.18	152.0	0.406	1.00021	0.667
	225.0	0.04979	1170.0	6.59	2.30	0.00444	1.28	164.0	0.494	1.00018	0.666
	250.0	0.04482	1300.0	6.59	2.30	0.00399	1.37	176.0	0.590	1.00017	0.666
	275.0	0.04075	1430.0	6.59	2.30	0.00363	1.46	188.0	0.691	1.00015	0.667
	300.0	0.03736	1560.0	6.58	2.30	0.00333	1.55	199.0	0.798	1.00014	0.669
	350.0	0.03202	1820.0	6.58	2.30	0.00285	1.72	222.0	1.04	1.00012	0.668
	400.0	0.02803	2080.0	6.58	2.30	0.00250	1.89	243.0	1.30	1.00010	0.668
	450.0	0.02491	2340.0	6.58	2.30	0.00222	2.05	264.0	1.58	1.00009	0.668
	500.0	0.02242	2600.0	6.58	2.30	0.00200	2.21	284.0	1.90	1.00008	0.667
	600.0	0.01869	3120.0	6.58	2.30	0.00167	2.51	322.0	2.58	1.00007	0.667
	700.0	0.01602	3640.0	6.58	2.30	0.00143	2.80	359.0	3.36	1.00006	0.667
	800.0	0.01402	4160.0	6.58	2.30	0.00125	3.07	394.0	4.22	1.00005	0.667
	900.0	0.01246	4680.0	6.58	2.30	0.00111	3.34	428.0	5.16	1.00005	0.666
	1000.0	0.01122	5190.0	6.58	2.30	0.00100	3.60	462.0	6.18	1.00004	0.666
	1100.0	0.01020	5710.0	6.58	2.30	0.000909	3.85	494.0	7.27	1.00004	0.666
	1200.0	0.009347	6230.0	6.58	2.30	0.000833	4.10	525.0	8.44	1.00003	0.666
	1300.0	0.008629	6750.0	6.58	2.30	0.000769	4.34	556.0	9.68	1.00003	0.666
	1400.0	0.008012	7270.0	6.58	2.30	0.000714	4.57	586.0	11.0	1.00003	0.666
	1500.0	0.007478	7790.0	6.58	2.30	0.000667	4.80	615.0	12.4	1.00003	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.4 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.155	0.06625								
2.5	0.06679	550.0	2.61	3.783	5.407	1.898	1.801	1.941	245.0
3.0	0.06817	472.0	3.50	4.751	6.408	2.268	1.889	2.257	239.0
3.5	0.07028	378.0	3.95	5.935	7.644	2.651	2.074	2.798	227.2
4.0	0.07350	277.0	4.09	7.416	9.203	3.068	2.232	3.551	211.4
4.5	0.07875	173.0	3.88	9.354	11.27	3.553	2.422	4.885	188.0
5.0	0.09030	63.9	3.20	12.34	14.53	4.234	2.702	9.321	149.5
5.1	0.09546	41.9	2.95	13.30	15.62	4.449	2.789	12.55	138.2
5.2	0.1052	21.2	2.57	14.76	17.31	4.776	2.905	21.06	124.8
5.3	0.1572	3.07	1.58	19.30	23.12	5.878	3.258	111.7	103.2
5.4	0.2214	13.6	1.09	22.61	27.99	6.790	3.307	26.66	105.5
5.5	0.2535	22.1	0.938	23.95	30.11	7.180	3.285	17.57	109.4
5.6	0.2781	29.2	0.847	24.91	31.67	7.461	3.262	14.04	112.8
5.7	0.2991	35.5	0.781	25.70	32.97	7.691	3.242	12.12	116.0
5.8	0.3178	41.2	0.730	26.39	34.12	7.891	3.225	10.90	118.8
5.9	0.3350	46.6	0.689	27.01	35.16	8.069	3.210	10.04	121.5
6.0	0.3511	51.5	0.654	27.59	36.13	8.232	3.196	9.411	124.0
6.5	0.4217	73.1	0.534	30.09	40.35	8.908	3.152	7.724	134.7
7.0	0.4833	91.4	0.460	32.25	44.00	9.450	3.129	6.974	143.6
7.5	0.5402	108.0	0.408	34.24	47.37	9.916	3.117	6.550	151.5
8.0	0.5943	123.0	0.369	36.13	50.58	10.33	3.111	6.279	158.6
8.5	0.6464	137.0	0.338	37.95	53.67	10.70	3.109	6.091	165.2
9.0	0.6970	151.0	0.312	39.73	56.68	11.05	3.108	5.955	171.4
9.5	0.7466	165.0	0.290	41.47	59.63	11.37	3.108	5.851	177.2
10.0	0.7953	178.0	0.272	43.19	62.53	11.66	3.109	5.769	182.7
11.0	0.8904	202.0	0.242	46.56	68.21	12.21	3.111	5.657	193.1
12.0	0.9839	227.0	0.218	49.88	73.80	12.69	3.113	5.578	202.8
13.0	1.076	250.0	0.199	53.16	79.33	13.14	3.115	5.520	212.0
14.0	1.167	274.0	0.183	56.42	84.81	13.54	3.117	5.474	220.6
15.0	1.258	296.0	0.169	59.67	90.26	13.92	3.119	5.439	228.9
16.0	1.348	319.0	0.157	62.90	95.68	14.27	3.120	5.407	236.7
17.0	1.437	341.0	0.147	66.12	101.1	14.60	3.121	5.382	244.3
18.0	1.526	364.0	0.138	69.33	106.4	14.90	3.121	5.361	251.5
19.0	1.615	386.0	0.131	72.53	111.8	15.19	3.122	5.343	258.6
20.0	1.703	407.0	0.124	75.72	117.1	15.47	3.122	5.328	265.4
21.0	1.791	429.0	0.117	78.91	122.5	15.73	3.122	5.315	272.0
22.0	1.878	451.0	0.112	82.08	127.8	15.97	3.122	5.304	278.5
23.0	1.966	472.0	0.107	85.26	133.1	16.21	3.122	5.294	284.8
24.0	2.053	493.0	0.102	88.42	138.4	16.43	3.122	5.286	290.9
25.0	2.140	515.0	0.0978	91.59	143.6	16.65	3.122	5.278	296.9
26.0	2.227	536.0	0.0939	94.75	148.9	16.86	3.122	5.272	302.8
28.0	2.401	578.0	0.0870	101.1	159.4	17.25	3.122	5.261	314.2
30.0	2.574	620.0	0.0810	107.4	170.0	17.61	3.122	5.252	325.2
32.0	2.747	662.0	0.0758	113.7	180.4	17.95	3.121	5.244	335.8
34.0	2.919	704.0	0.0713	119.9	190.9	18.26	3.121	5.238	346.0
36.0	3.092	746.0	0.0672	126.2	201.4	18.56	3.121	5.233	356.0
38.0	3.264	788.0	0.0636	132.5	211.9	18.85	3.121	5.229	365.6
40.0	3.436	829.0	0.0604	138.8	222.3	19.12	3.121	5.225	375.0
45.0	3.865	933.0	0.0536	154.4	248.4	19.73	3.120	5.218	397.6
50.0	4.294	1040.0	0.0482	170.1	274.5	20.28	3.120	5.213	418.8
55.0	4.723	1140.0	0.0438	185.7	300.5	20.78	3.119	5.209	439.1
60.0	5.151	1240.0	0.0401	201.3	326.6	21.23	3.119	5.206	458.4
65.0	5.579	1350.0	0.0370	216.9	352.6	21.65	3.119	5.204	476.9
70.0	6.007	1450.0	0.0343	232.6	378.6	22.03	3.118	5.202	494.7
75.0	6.435	1550.0	0.0320	248.2	404.6	22.39	3.118	5.201	512.0
80.0	6.862	1650.0	0.0300	263.8	430.6	22.73	3.118	5.200	528.6
90.0	7.717	1860.0	0.0267	295.0	482.6	23.34	3.118	5.198	560.4
100.0	8.572	2060.0	0.0240	326.1	534.6	23.89	3.118	5.197	590.5
125.0	10.71	2580.0	0.0192	404.1	664.5	25.05	3.117	5.195	659.7
150.0	12.84	3090.0	0.0160	482.0	794.4	25.99	3.117	5.194	722.3
175.0	14.98	3600.0	0.0137	560.0	924.2	26.79	3.117	5.194	779.9
200.0	17.11	4110.0	0.0120	637.9	1054.0	27.49	3.117	5.194	833.5
225.0	19.25	4630.0	0.0107	715.8	1184.0	28.10	3.117	5.193	883.9
250.0	21.39	5140.0	0.00960	793.7	1314.0	28.65	3.117	5.193	931.5
275.0	23.52	5650.0	0.00873	871.6	1444.0	29.14	3.116	5.193	976.8
300.0	25.66	6160.0	0.00800	949.5	1573.0	29.59	3.116	5.193	1020.0
350.0	29.93	7190.0	0.00686	1105.0	1833.0	30.39	3.116	5.193	1102.0
400.0	34.20	8210.0	0.00600	1261.0	2093.0	31.09	3.116	5.193	1178.0
450.0	38.47	9240.0	0.00533	1417.0	2352.0	31.70	3.116	5.193	1249.0
500.0	42.74	10300.0	0.00480	1573.0	2612.0	32.25	3.116	5.193	1316.0
600.0	51.28	12300.0	0.00400	1884.0	3131.0	33.19	3.116	5.193	1442.0
700.0	59.82	14400.0	0.00343	2196.0	3651.0	33.99	3.116	5.193	1557.0
800.0	68.36	16400.0	0.00300	2507.0	4170.0	34.69	3.116	5.193	1665.0
900.0	76.90	18500.0	0.00267	2819.0	4689.0	35.30	3.116	5.193	1766.0
1000.0	85.44	20500.0	0.00240	3131.0	5208.0	35.84	3.116	5.193	1861.0
1100.0	93.98	22600.0	0.00218	3442.0	5728.0	36.34	3.116	5.193	1952.0
1200.0	102.5	24600.0	0.00200	3754.0	6247.0	36.79	3.116	5.193	2038.0
1300.0	111.1	26700.0	0.00185	4065.0	6766.0	37.21	3.116	5.193	2122.0
1400.0	119.6	28700.0	0.00171	4377.0	7286.0	37.59	3.116	5.193	2202.0
1500.0	128.1	30800.0	0.00160	4689.0	7805.0	37.95	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

F

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.4 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_p$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.155	15.09									
2.5	14.97	61.3	9.67	82.3	0.0317	0.172	42.5	0.000591	1.05637	0.480
3.0	14.67	46.6	12.6	69.2	0.0506	0.187	41.6	0.000565	1.05521	0.543
3.5	14.23	38.1	13.4	53.7	0.0735	0.198	39.5	0.000497	1.05352	0.558
4.0	13.61	32.8	13.5	37.7	0.108	0.206	36.7	0.000426	1.05115	0.633
4.5	12.70	27.6	12.6	22.0	0.177	0.219	33.4	0.000337	1.04769	0.781
5.0	11.07	20.6	10.7	7.68	0.452	0.209	29.0	0.000262	1.04151	1.29
5.1	10.48	18.7	10.1	4.39	0.671	0.211	27.6	0.000166	1.03924	1.64
5.2	9.502	16.5	9.30	2.01	1.28	0.222	25.6	0.000111	1.03555	2.43
5.3	6.363	13.8	7.64	0.195	8.11	0.424	20.8	0.000597	1.02372	5.47
5.4	4.517	15.1	7.29	0.615	1.77	0.190	18.7	0.000157	1.01681	2.64
5.5	3.944	16.3	7.24	0.871	1.08	0.164	18.3	0.000236	1.01467	1.97
5.6	3.595	17.4	7.22	1.05	0.806	0.154	18.2	0.000305	1.01336	1.66
5.7	3.343	18.4	7.21	1.19	0.658	0.149	18.1	0.000368	1.01242	1.47
5.8	3.147	19.4	7.20	1.30	0.563	0.147	18.1	0.000428	1.01169	1.35
5.9	2.985	20.3	7.19	1.39	0.496	0.145	18.2	0.000484	1.01109	1.26
6.0	2.848	21.1	7.18	1.47	0.445	0.144	18.2	0.000539	1.01058	1.19
6.5	2.371	25.1	7.15	1.73	0.308	0.145	18.7	0.000794	1.00880	1.00
7.0	2.069	28.6	7.11	1.89	0.244	0.149	19.4	0.00104	1.00768	0.906
7.5	1.851	32.0	7.08	2.00	0.205	0.154	20.1	0.00127	1.00687	0.853
8.0	1.683	35.2	7.05	2.07	0.178	0.160	20.8	0.00151	1.00624	0.819
8.5	1.547	38.4	7.02	2.13	0.159	0.165	21.6	0.00175	1.00574	0.795
9.0	1.435	41.5	6.99	2.17	0.144	0.171	22.3	0.00200	1.00532	0.778
9.5	1.339	44.5	6.97	2.21	0.132	0.176	23.0	0.00225	1.00497	0.765
10.0	1.257	47.5	6.95	2.23	0.122	0.181	23.7	0.00250	1.00466	0.755
11.0	1.123	53.3	6.91	2.27	0.106	0.192	25.1	0.00302	1.00416	0.742
12.0	1.016	59.0	6.89	2.30	0.0946	0.202	26.5	0.00356	1.00377	0.733
13.0	0.9293	64.6	6.86	2.33	0.0854	0.211	27.9	0.00412	1.00344	0.727
14.0	0.8566	70.2	6.84	2.34	0.0779	0.221	29.2	0.00471	1.00317	0.723
15.0	0.7949	75.8	6.82	2.36	0.0717	0.230	30.4	0.00531	1.00295	0.720
16.0	0.7419	81.3	6.80	2.37	0.0665	0.239	31.7	0.00595	1.00275	0.718
17.0	0.6958	86.8	6.78	2.38	0.0620	0.247	32.9	0.00660	1.00258	0.717
18.0	0.6552	92.3	6.77	2.38	0.0581	0.255	34.1	0.00727	1.00243	0.715
19.0	0.6193	97.7	6.76	2.39	0.0547	0.264	35.2	0.00796	1.00229	0.715
20.0	0.5873	103.0	6.75	2.39	0.0517	0.272	36.4	0.00868	1.00218	0.714
21.0	0.5584	108.0	6.74	2.40	0.0490	0.279	37.5	0.00941	1.00207	0.714
22.0	0.5324	114.0	6.73	2.40	0.0466	0.287	38.6	0.0102	1.00197	0.713
23.0	0.5087	119.0	6.72	2.40	0.0444	0.295	39.7	0.0109	1.00188	0.713
24.0	0.4871	124.0	6.71	2.40	0.0425	0.302	40.7	0.0117	1.00180	0.713
25.0	0.4673	130.0	6.70	2.41	0.0407	0.309	41.8	0.0125	1.00173	0.713
26.0	0.4490	135.0	6.70	2.41	0.0390	0.316	42.8	0.0134	1.00166	0.713
28.0	0.4166	146.0	6.69	2.41	0.0361	0.331	44.8	0.0151	1.00154	0.713
30.0	0.3885	156.0	6.68	2.41	0.0336	0.344	46.7	0.0169	1.00144	0.713
32.0	0.3641	167.0	6.67	2.41	0.0314	0.358	48.6	0.0187	1.00135	0.712
34.0	0.3426	177.0	6.66	2.41	0.0295	0.371	50.5	0.0207	1.00127	0.712
36.0	0.3235	188.0	6.66	2.41	0.0279	0.384	52.3	0.0227	1.00120	0.712
38.0	0.3064	198.0	6.65	2.41	0.0264	0.397	54.0	0.0248	1.00113	0.712
40.0	0.2911	209.0	6.65	2.41	0.0250	0.410	55.7	0.0269	1.00108	0.711
45.0	0.2587	235.0	6.64	2.41	0.0222	0.440	59.9	0.0326	1.00096	0.710
50.0	0.2329	261.0	6.63	2.41	0.0200	0.470	63.9	0.0387	1.00086	0.708
55.0	0.2117	287.0	6.63	2.41	0.0181	0.499	67.7	0.0453	1.00078	0.707
60.0	0.1941	313.0	6.62	2.41	0.0166	0.528	71.4	0.0522	1.00072	0.705
65.0	0.1792	339.0	6.62	2.41	0.0153	0.555	75.0	0.0595	1.00066	0.703
70.0	0.1665	365.0	6.61	2.41	0.0142	0.583	78.5	0.0673	1.00062	0.701
75.0	0.1554	391.0	6.61	2.41	0.0133	0.609	81.9	0.0754	1.00058	0.699
80.0	0.1457	417.0	6.61	2.41	0.0125	0.636	85.2	0.0839	1.00054	0.697
90.0	0.1296	469.0	6.61	2.41	0.0111	0.687	91.7	0.102	1.00048	0.694
100.0	0.1167	521.0	6.60	2.41	0.0100	0.737	98.0	0.122	1.00043	0.691
125.0	0.09339	651.0	6.60	2.41	0.00798	0.857	111.0	0.177	1.00035	0.673
150.0	0.07786	781.0	6.59	2.41	0.00665	0.970	125.0	0.240	1.00029	0.670
175.0	0.06676	911.0	6.59	2.40	0.00570	1.08	139.0	0.311	1.00025	0.668
200.0	0.05843	1040.0	6.59	2.40	0.00499	1.18	152.0	0.389	1.00022	0.667
225.0	0.05195	1170.0	6.59	2.40	0.00444	1.28	164.0	0.474	1.00019	0.666
250.0	0.04676	1300.0	6.59	2.40	0.00399	1.37	176.0	0.565	1.00017	0.666
275.0	0.04252	1430.0	6.59	2.40	0.00363	1.46	188.0	0.662	1.00016	0.667
300.0	0.03898	1560.0	6.59	2.40	0.00333	1.55	199.0	0.765	1.00014	0.669
350.0	0.03342	1820.0	6.58	2.40	0.00285	1.72	222.0	0.992	1.00012	0.668
400.0	0.02924	2080.0	6.58	2.40	0.00250	1.89	243.0	1.24	1.00011	0.668
450.0	0.02600	2340.0	6.58	2.40	0.00222	2.05	264.0	1.52	1.00010	0.668
500.0	0.02340	2600.0	6.58	2.40	0.00200	2.21	284.0	1.82	1.00009	0.667
600.0	0.01950	3120.0	6.58	2.40	0.00167	2.51	322.0	2.48	1.00007	0.667
700.0	0.01672	3640.0	6.58	2.40	0.00143	2.80	359.0	3.22	1.00006	0.667
800.0	0.01463	4160.0	6.58	2.40	0.00125	3.07	394.0	4.04	1.00005	0.667
900.0	0.01300	4680.0	6.58	2.40	0.00111	3.34	428.0	4.94	1.00005	0.666
1000.0	0.01170	5190.0	6.58	2.40	0.00100	3.60	462.0	5.92	1.00004	0.666
1100.0	0.01064	5710.0	6.58	2.40	0.000909	3.85	494.0	6.97	1.00004	0.666
1200.0	0.009754	6230.0	6.58	2.40	0.000833	4.10	525.0	8.09	1.00004	0.666
1300.0	0.009004	6750.0	6.58	2.40	0.000769	4.34	556.0	9.27	1.00003	0.666
1400.0	0.008361	7270.0	6.58	2.40	0.000714	4.57	586.0	10.5	1.00003	0.666
1500.0	0.007803	7790.0	6.58	2.40	0.000667	4.80	615.0	11.8	1.00003	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.154	0.36617								
2.5	0.06671	555.0	2.60	3.777	5.467	1.895	1.796	1.934	246.8
3.0	0.06507	477.0	3.51	4.740	6.464	2.263	1.888	2.251	240.1
3.5	0.07015	383.0	3.96	5.918	7.695	2.645	2.072	2.787	228.4
4.0	0.07330	283.0	4.11	7.387	9.244	3.059	2.229	3.526	213.0
4.5	0.07841	179.0	3.91	9.302	11.29	3.539	2.417	4.809	190.1
5.0	0.08923	71.6	3.27	12.19	14.45	4.199	2.689	8.695	153.2
5.1	0.09373	50.3	3.04	13.07	15.45	4.396	2.769	11.09	142.9
5.2	0.1012	30.9	2.72	14.29	16.86	4.668	2.859	15.81	131.5
5.3	0.1197	10.4	2.24	16.23	19.18	5.110	2.987	38.46	116.4
5.4	0.1824	7.86	1.35	20.99	25.62	6.313	3.287	45.30	104.8
5.5	0.2241	16.7	1.07	23.03	28.70	6.880	3.289	22.60	108.0
5.6	0.2519	24.4	0.944	24.23	30.61	7.224	3.269	16.43	111.5
5.7	0.2744	31.1	0.859	25.14	32.09	7.487	3.249	13.56	114.7
5.8	0.2940	37.2	0.796	25.91	33.36	7.707	3.232	11.87	117.7
5.9	0.3116	42.8	0.746	26.59	34.49	7.899	3.216	10.76	120.4
6.0	0.3280	48.0	0.704	27.21	35.52	8.073	3.202	9.97	123.0
6.5	0.3983	70.3	0.568	29.82	39.91	8.777	3.155	7.954	134.8
7.0	0.4597	89.1	0.487	32.03	43.65	9.332	3.131	7.106	143.1
7.5	0.5142	106.0	0.431	34.05	47.08	9.805	3.118	6.638	151.1
8.0	0.5667	121.0	0.388	35.96	50.32	10.22	3.112	6.343	158.3
8.5	0.6172	136.0	0.354	37.80	53.44	10.60	3.109	6.141	165.0
9.0	0.6662	150.0	0.327	39.59	56.47	10.95	3.108	5.994	171.2
9.5	0.7141	163.0	0.304	41.35	59.44	11.27	3.108	5.883	177.0
10.0	0.7611	177.0	0.284	43.08	62.36	11.57	3.109	5.797	182.6
11.0	0.8528	202.0	0.253	46.46	68.06	12.11	3.111	5.678	193.1
12.0	0.9429	226.0	0.228	49.78	73.67	12.60	3.113	5.595	202.8
13.0	1.032	250.0	0.208	53.08	79.21	13.05	3.115	5.534	212.0
14.0	1.120	273.0	0.191	56.34	84.71	13.45	3.117	5.487	220.6
15.0	1.207	296.0	0.177	59.59	90.16	13.83	3.119	5.449	228.9
16.0	1.293	319.0	0.164	62.83	95.59	14.18	3.120	5.417	236.8
17.0	1.379	341.0	0.154	66.06	101.0	14.51	3.121	5.390	244.3
18.0	1.465	363.0	0.144	69.27	106.4	14.81	3.122	5.368	251.6
19.0	1.550	385.0	0.136	72.47	111.7	15.10	3.122	5.349	258.7
20.0	1.634	407.0	0.129	75.67	117.1	15.38	3.122	5.334	265.5
21.0	1.719	429.0	0.122	78.86	122.4	15.64	3.122	5.320	272.1
22.0	1.803	451.0	0.117	82.04	127.7	15.89	3.122	5.309	278.6
23.0	1.887	472.0	0.111	85.21	133.0	16.12	3.122	5.299	284.9
24.0	1.971	494.0	0.106	88.38	138.3	16.35	3.122	5.290	291.0
25.0	2.055	515.0	0.102	91.55	143.6	16.56	3.122	5.282	297.1
26.0	2.138	536.0	0.0979	94.71	148.9	16.77	3.122	5.275	302.9
28.0	2.305	579.0	0.0907	101.0	159.4	17.16	3.122	5.263	314.3
30.0	2.471	621.0	0.0844	107.3	169.9	17.52	3.122	5.254	325.3
32.0	2.637	663.0	0.0790	113.6	180.4	17.86	3.122	5.246	335.9
34.0	2.803	705.0	0.0743	119.9	190.9	18.18	3.121	5.240	346.1
36.0	2.969	746.0	0.0700	126.2	201.4	18.48	3.121	5.235	356.1
38.0	3.134	788.0	0.0663	132.5	211.9	18.76	3.121	5.230	365.8
40.0	3.299	830.0	0.0629	138.7	222.3	19.03	3.121	5.226	375.2
45.0	3.712	933.0	0.0558	154.4	248.4	19.64	3.120	5.219	397.7
50.0	4.123	1040.0	0.0502	170.1	274.5	20.19	3.120	5.214	418.9
55.0	4.535	1140.0	0.0456	185.7	300.6	20.69	3.119	5.210	439.2
60.0	4.946	1240.0	0.0418	201.3	326.6	21.14	3.119	5.207	458.5
65.0	5.357	1350.0	0.0385	216.9	352.6	21.56	3.119	5.204	477.0
70.0	5.768	1450.0	0.0358	232.5	378.6	21.95	3.119	5.203	494.8
75.0	6.178	1550.0	0.0334	248.1	404.7	22.31	3.118	5.201	512.1
80.0	6.589	1650.0	0.0313	263.8	430.7	22.64	3.118	5.200	528.7
90.0	7.410	1860.0	0.0278	295.0	482.6	23.25	3.118	5.198	560.5
100.0	8.230	2070.0	0.0250	326.1	534.6	23.80	3.118	5.197	590.6
125.0	10.28	2580.0	0.0200	404.1	664.5	24.96	3.117	5.195	659.8
150.0	12.33	3090.0	0.0167	482.0	794.4	25.91	3.117	5.194	722.3
175.0	14.38	3600.0	0.0143	560.0	924.3	26.71	3.117	5.194	779.9
200.0	16.43	4120.0	0.0125	637.9	1054.0	27.40	3.117	5.194	833.5
225.0	18.48	4630.0	0.0111	715.8	1184.0	28.01	3.117	5.193	883.9
250.0	20.53	5140.0	0.0100	793.7	1314.0	28.56	3.117	5.193	931.6
275.0	22.58	5650.0	0.00909	871.6	1444.0	29.06	3.116	5.193	976.9
300.0	24.63	6170.0	0.00833	949.5	1573.0	29.51	3.116	5.193	1020.0
350.0	28.73	7190.0	0.00714	1105.0	1833.0	30.31	3.116	5.193	1102.0
400.0	32.83	8210.0	0.00625	1261.0	2093.0	31.00	3.116	5.193	1178.0
450.0	36.93	9240.0	0.00555	1417.0	2352.0	31.61	3.116	5.193	1249.0
500.0	41.03	10300.0	0.00500	1573.0	2612.0	32.16	3.116	5.193	1316.0
600.0	49.23	12300.0	0.00417	1884.0	3131.0	33.11	3.116	5.193	1442.0
700.0	57.43	14400.0	0.00357	2196.0	3651.0	33.91	3.116	5.193	1557.0
800.0	65.63	16400.0	0.00312	2507.0	4170.0	34.60	3.116	5.193	1665.0
900.0	73.83	18500.0	0.00278	2819.0	4689.0	35.21	3.116	5.193	1766.0
1000.0	82.03	20500.0	0.00250	3131.0	5208.0	35.76	3.116	5.193	1861.0
1100.0	90.23	22600.0	0.00227	3442.0	5728.0	36.25	3.116	5.193	1952.0
1200.0	98.43	24600.0	0.00208	3754.0	6247.0	36.71	3.116	5.193	2038.0
1300.0	106.6	26700.0	0.00192	4065.0	6766.0	37.12	3.116	5.193	2122.0
1400.0	114.8	28700.0	0.00179	4377.0	7286.0	37.51	3.116	5.193	2202.0
1500.0	123.0	30800.0	0.00167	4689.0	7805.0	37.87	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.154	15.11									
2.5	14.99	61.8	9.67	83.2	0.0313	0.172	42.7	0.000593	1.05644	0.480
3.0	14.69	45.0	12.6	70.1	0.0500	0.187	41.8	0.000566	1.05529	0.503
3.5	14.25	36.4	13.4	54.6	0.0725	0.198	39.7	0.000499	1.05363	0.558
4.0	13.64	33.2	13.5	38.6	0.106	0.207	36.9	0.000436	1.05128	0.630
4.5	12.75	28.1	12.7	22.9	0.171	0.210	33.7	0.000342	1.04790	0.771
5.0	11.21	21.4	10.8	8.03	0.407	0.209	29.4	0.000215	1.04201	1.22
5.1	10.67	19.6	10.3	5.37	0.566	0.210	28.1	0.000177	1.03997	1.48
5.2	9.882	17.7	9.63	3.05	0.892	0.214	26.5	0.000137	1.03699	1.96
5.3	8.570	15.2	8.77	0.890	2.52	0.258	24.1	0.0000782	1.03203	3.60
5.4	5.482	14.5	7.48	0.431	3.12	0.246	19.9	0.0000990	1.02042	3.67
5.5	4.463	15.7	7.32	0.747	1.44	0.181	18.9	0.000179	1.01660	2.37
5.6	3.969	16.9	7.28	0.968	0.975	0.163	18.6	0.000250	1.01476	1.88
5.7	3.644	17.9	7.25	1.13	0.757	0.155	18.5	0.000314	1.01355	1.62
5.8	3.402	18.9	7.24	1.27	0.629	0.151	18.4	0.000374	1.01264	1.45
5.9	3.209	19.8	7.22	1.37	0.543	0.148	18.4	0.000430	1.01192	1.34
6.0	3.049	20.7	7.21	1.46	0.482	0.147	18.5	0.000484	1.01133	1.25
6.5	2.511	24.7	7.17	1.77	0.322	0.147	18.9	0.000736	1.00932	1.02
7.0	2.180	28.3	7.14	1.94	0.251	0.151	19.5	0.000972	1.00809	0.923
7.5	1.945	31.7	7.10	2.06	0.209	0.155	20.2	0.00120	1.00721	0.865
8.0	1.765	35.0	7.07	2.14	0.181	0.160	20.9	0.00143	1.00654	0.828
8.5	1.620	38.2	7.04	2.20	0.161	0.166	21.7	0.00167	1.00601	0.802
9.0	1.501	41.3	7.01	2.25	0.145	0.171	22.4	0.00190	1.00557	0.784
9.5	1.400	44.3	6.98	2.29	0.133	0.177	23.1	0.00214	1.00519	0.770
10.0	1.314	47.3	6.96	2.32	0.123	0.182	23.8	0.00239	1.00487	0.759
11.0	1.173	53.1	6.93	2.36	0.107	0.192	25.2	0.00289	1.00435	0.745
12.0	1.061	58.9	6.90	2.40	0.0951	0.202	26.6	0.00341	1.00393	0.736
13.0	0.9693	64.5	6.87	2.42	0.0858	0.212	27.9	0.00395	1.00359	0.730
14.0	0.8932	70.1	6.85	2.44	0.0782	0.221	29.2	0.00451	1.00331	0.725
15.0	0.8287	75.7	6.83	2.45	0.0720	0.230	30.5	0.00510	1.00307	0.722
16.0	0.7732	81.3	6.81	2.46	0.0667	0.239	31.7	0.00570	1.00286	0.719
17.0	0.7251	86.7	6.79	2.47	0.0621	0.247	32.9	0.00633	1.00269	0.718
18.0	0.6828	92.2	6.78	2.48	0.0582	0.256	34.1	0.00698	1.00253	0.716
19.0	0.6453	97.6	6.76	2.49	0.0548	0.264	35.3	0.00764	1.00239	0.715
20.0	0.6118	103.0	6.75	2.49	0.0518	0.272	36.4	0.00833	1.00227	0.715
21.0	0.5817	108.0	6.74	2.50	0.0491	0.280	37.5	0.00904	1.00215	0.714
22.0	0.5546	114.0	6.73	2.50	0.0467	0.287	38.6	0.00976	1.00205	0.714
23.0	0.5299	119.0	6.72	2.50	0.0445	0.295	39.7	0.0105	1.00196	0.714
24.0	0.5073	124.0	6.72	2.50	0.0425	0.302	40.8	0.0113	1.00188	0.713
25.0	0.4867	130.0	6.71	2.51	0.0407	0.310	41.8	0.0120	1.00180	0.713
26.0	0.4677	135.0	6.70	2.51	0.0390	0.317	42.8	0.0128	1.00173	0.713
28.0	0.4338	146.0	6.69	2.51	0.0361	0.331	44.8	0.0145	1.00161	0.713
30.0	0.4046	156.0	6.68	2.51	0.0336	0.345	46.8	0.0162	1.00150	0.713
32.0	0.3792	167.0	6.68	2.51	0.0314	0.358	48.6	0.0180	1.00140	0.713
34.0	0.3568	177.0	6.67	2.51	0.0295	0.371	50.5	0.0199	1.00132	0.712
36.0	0.3369	188.0	6.66	2.51	0.0279	0.384	52.3	0.0218	1.00125	0.712
38.0	0.3191	198.0	6.66	2.51	0.0264	0.397	54.0	0.0238	1.00118	0.712
40.0	0.3031	209.0	6.65	2.51	0.0250	0.410	55.8	0.0259	1.00112	0.711
45.0	0.2694	235.0	6.64	2.51	0.0222	0.443	59.9	0.0313	1.00100	0.710
50.0	0.2425	261.0	6.63	2.51	0.0200	0.476	63.9	0.0372	1.00090	0.708
55.0	0.2205	287.0	6.63	2.51	0.0181	0.509	67.7	0.0435	1.00082	0.707
60.0	0.2022	313.0	6.62	2.51	0.0166	0.542	71.4	0.0501	1.00075	0.705
65.0	0.1867	339.0	6.62	2.51	0.0153	0.575	75.0	0.0572	1.00069	0.703
70.0	0.1734	365.0	6.62	2.51	0.0142	0.608	78.5	0.0646	1.00064	0.701
75.0	0.1619	391.0	6.61	2.51	0.0133	0.639	81.9	0.0724	1.00060	0.699
80.0	0.1518	417.0	6.61	2.51	0.0125	0.668	85.3	0.0806	1.00056	0.697
90.0	0.1350	469.0	6.61	2.51	0.0111	0.687	91.7	0.0980	1.00050	0.694
100.0	0.1215	521.0	6.60	2.51	0.0100	0.737	98.0	0.117	1.00045	0.691
125.0	0.09727	651.0	6.60	2.51	0.00798	0.857	111.0	0.170	1.00036	0.673
150.0	0.08109	781.0	6.59	2.51	0.00665	0.970	125.0	0.232	1.00030	0.670
175.0	0.06953	911.0	6.59	2.51	0.00570	1.08	139.0	0.298	1.00026	0.668
200.0	0.06086	1040.0	6.59	2.50	0.00499	1.18	152.0	0.374	1.00023	0.667
225.0	0.05411	1170.0	6.59	2.50	0.00444	1.28	164.0	0.455	1.00020	0.666
250.0	0.04871	1300.0	6.59	2.50	0.00399	1.37	176.0	0.543	1.00018	0.666
275.0	0.04429	1430.0	6.59	2.50	0.00363	1.46	188.0	0.636	1.00016	0.667
300.0	0.04060	1560.0	6.59	2.50	0.00333	1.55	199.0	0.734	1.00015	0.669
350.0	0.03481	1820.0	6.58	2.50	0.00285	1.72	222.0	0.953	1.00013	0.668
400.0	0.03046	2080.0	6.58	2.50	0.00250	1.89	243.0	1.19	1.00011	0.668
450.0	0.02708	2340.0	6.58	2.50	0.00222	2.05	264.0	1.45	1.00010	0.668
500.0	0.02437	2600.0	6.58	2.50	0.00200	2.21	284.0	1.74	1.00009	0.667
600.0	0.02031	3120.0	6.58	2.50	0.00167	2.51	322.0	2.38	1.00008	0.667
700.0	0.01741	3640.0	6.58	2.50	0.00143	2.80	359.0	3.09	1.00006	0.667
800.0	0.01524	4160.0	6.58	2.50	0.00125	3.07	394.0	3.88	1.00006	0.667
900.0	0.01355	4680.0	6.58	2.50	0.00111	3.34	428.0	4.75	1.00005	0.666
1000.0	0.01219	5190.0	6.58	2.50	0.00100	3.61	462.0	5.68	1.00005	0.666
1100.0	0.01108	5710.0	6.58	2.50	0.000909	3.85	494.0	6.69	1.00004	0.666
1200.0	0.01016	6230.0	6.58	2.50	0.000833	4.10	525.0	7.76	1.00004	0.666
1300.0	0.009379	6750.0	6.58	2.50	0.000769	4.34	556.0	8.90	1.00003	0.666
1400.0	0.008709	7270.0	6.58	2.50	0.000714	4.57	586.0	10.1	1.00003	0.666
1500.0	0.008128	7790.0	6.58	2.50	0.000667	4.80	615.0	11.4	1.00003	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.6 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.153	0.06610								
2.5	0.06663	560.0	2.60	3.771	5.527	1.892	1.792	1.928	247.1
3.0	0.06797	482.0	3.51	4.729	6.520	2.259	1.886	2.245	241.2
3.5	0.07002	386.0	3.97	5.901	7.746	2.639	2.071	2.776	229.7
4.0	0.07312	289.0	4.12	7.360	9.286	3.051	2.227	3.502	214.5
4.5	0.07809	186.0	3.94	9.252	11.31	3.526	2.413	4.739	192.2
5.0	0.08828	79.1	3.33	12.05	14.38	4.167	2.677	8.199	156.7
5.1	0.09228	58.3	3.11	12.88	15.31	4.351	2.751	10.08	147.1
5.2	0.09840	39.7	2.84	13.95	16.55	4.589	2.827	13.19	137.0
5.3	0.1082	20.3	2.49	15.36	18.21	4.906	2.900	22.08	125.0
5.4	0.1410	5.74	1.80	18.55	22.26	5.662	3.172	64.28	108.6
5.5	0.1934	11.9	1.26	21.83	26.92	6.518	3.278	31.23	107.3
5.6	0.2260	19.7	1.06	23.42	29.38	6.960	3.272	19.92	110.3
5.7	0.2506	26.8	0.949	24.52	31.12	7.269	3.255	15.46	113.5
5.8	0.2713	33.2	0.869	25.39	32.54	7.515	3.237	13.09	116.6
5.9	0.2895	39.0	0.809	26.14	33.77	7.726	3.221	11.62	119.4
6.0	0.3062	44.4	0.760	26.81	34.88	7.912	3.207	10.61	122.0
6.5	0.3765	67.6	0.604	29.55	39.47	8.648	3.158	8.203	133.3
7.0	0.4360	86.8	0.515	31.81	43.30	9.217	3.132	7.245	142.6
7.5	0.4932	104.0	0.453	33.87	46.78	9.698	3.119	6.729	150.7
8.0	0.5413	120.0	0.408	35.80	50.06	10.12	3.112	6.408	158.0
8.5	0.5902	134.0	0.372	37.66	53.21	10.50	3.109	6.191	164.7
9.0	0.6377	149.0	0.342	39.46	56.26	10.85	3.108	6.034	171.0
9.5	0.6841	162.0	0.318	41.23	59.25	11.17	3.108	5.917	176.9
10.0	0.7295	175.0	0.297	42.96	62.18	11.48	3.109	5.825	182.5
11.0	0.8181	201.0	0.264	46.35	67.91	12.02	3.110	5.700	193.0
12.0	0.9050	225.0	0.238	49.69	73.53	12.51	3.113	5.613	202.8
13.0	0.9907	249.0	0.216	52.99	79.09	12.96	3.115	5.548	212.0
14.0	1.075	272.0	0.199	56.27	84.60	13.37	3.117	5.499	220.7
15.0	1.159	296.0	0.184	59.52	90.06	13.74	3.119	5.460	229.0
16.0	1.243	318.0	0.171	62.76	95.51	14.09	3.120	5.426	236.8
17.0	1.326	341.0	0.160	65.99	100.9	14.42	3.121	5.398	244.4
18.0	1.408	363.0	0.150	69.21	106.3	14.73	3.122	5.375	251.7
19.0	1.490	385.0	0.142	72.42	111.7	15.02	3.122	5.356	258.8
20.0	1.571	407.0	0.134	75.62	117.0	15.29	3.122	5.339	265.6
21.0	1.653	429.0	0.128	78.81	122.3	15.55	3.123	5.325	272.2
22.0	1.734	451.0	0.121	81.99	127.7	15.80	3.123	5.313	278.7
23.0	1.815	472.0	0.116	85.17	133.0	16.04	3.123	5.303	285.0
24.0	1.895	494.0	0.111	88.34	138.3	16.26	3.123	5.294	291.2
25.0	1.976	515.0	0.106	91.51	143.6	16.48	3.123	5.285	297.2
26.0	2.056	536.0	0.102	94.67	148.8	16.69	3.123	5.278	303.0
28.0	2.217	579.0	0.0943	101.0	159.4	17.08	3.122	5.266	314.5
30.0	2.377	621.0	0.0878	107.3	169.9	17.44	3.122	5.256	325.4
32.0	2.536	663.0	0.0822	113.6	180.4	17.78	3.122	5.248	336.0
34.0	2.696	705.0	0.0773	119.9	190.9	18.10	3.122	5.242	346.3
36.0	2.855	747.0	0.0729	126.2	201.4	18.40	3.121	5.236	356.2
38.0	3.014	788.0	0.0690	132.4	211.8	18.68	3.121	5.232	365.9
40.0	3.173	830.0	0.0655	138.7	222.3	18.95	3.121	5.228	375.3
45.0	3.570	934.0	0.0581	154.4	248.4	19.56	3.120	5.220	397.8
50.0	3.966	1040.0	0.0522	170.0	274.5	20.11	3.120	5.214	419.1
55.0	4.361	1140.0	0.0474	185.7	300.6	20.61	3.120	5.210	439.3
60.0	4.757	1240.0	0.0434	201.3	326.6	21.06	3.119	5.207	458.6
65.0	5.152	1350.0	0.0401	216.9	352.6	21.48	3.119	5.205	477.1
70.0	5.547	1450.0	0.0372	232.5	378.7	21.86	3.119	5.203	495.0
75.0	5.942	1550.0	0.0347	248.1	404.7	22.22	3.118	5.202	512.2
80.0	6.337	1650.0	0.0325	263.7	430.7	22.56	3.118	5.200	528.8
90.0	7.126	1860.0	0.0289	294.9	482.7	23.17	3.118	5.199	560.6
100.0	7.915	2070.0	0.0260	326.1	534.7	23.72	3.118	5.197	590.6
125.0	9.887	2580.0	0.0208	404.1	664.6	24.88	3.117	5.195	659.8
150.0	11.86	3090.0	0.0173	482.0	794.4	25.83	3.117	5.195	722.4
175.0	13.83	3600.0	0.0149	560.0	924.3	26.63	3.117	5.194	780.0
200.0	15.80	4120.0	0.0130	637.9	1054.0	27.32	3.117	5.194	833.6
225.0	17.77	4630.0	0.0116	715.8	1184.0	27.93	3.117	5.193	884.0
250.0	19.74	5140.0	0.0104	793.7	1314.0	28.48	3.117	5.193	931.6
275.0	21.71	5650.0	0.00945	871.6	1444.0	28.97	3.117	5.193	976.9
300.0	23.68	6170.0	0.00867	949.5	1573.0	29.43	3.116	5.193	1020.0
350.0	27.63	7190.0	0.00743	1105.0	1833.0	30.23	3.116	5.193	1102.0
400.0	31.57	8220.0	0.00650	1261.0	2093.0	30.92	3.116	5.193	1178.0
450.0	35.51	9240.0	0.00578	1417.0	2352.0	31.53	3.116	5.193	1249.0
500.0	39.45	10300.0	0.00520	1573.0	2612.0	32.08	3.116	5.193	1316.0
600.0	47.34	12300.0	0.00433	1884.0	3131.0	33.03	3.116	5.193	1442.0
700.0	55.22	14400.0	0.00371	2196.0	3651.0	33.83	3.116	5.193	1557.0
800.0	63.10	16400.0	0.00325	2507.0	4170.0	34.52	3.116	5.193	1665.0
900.0	70.99	18500.0	0.00289	2819.0	4689.0	35.13	3.116	5.193	1766.0
1000.0	78.87	20500.0	0.00260	3131.0	5209.0	35.68	3.116	5.193	1861.0
1100.0	86.76	22600.0	0.00236	3442.0	5728.0	36.17	3.116	5.193	1952.0
1200.0	94.64	24600.0	0.00217	3754.0	6247.0	36.63	3.116	5.193	2038.0
1300.0	102.5	26700.0	0.00200	4065.0	6766.0	37.04	3.116	5.193	2122.0
1400.0	110.4	28700.0	0.00186	4377.0	7286.0	37.43	3.116	5.193	2202.0
1500.0	118.3	30800.0	0.00173	4689.0	7805.0	37.78	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.6 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.153	15.13									
2.5	15.01	62.3	9.68	84.0	0.0310	0.172	42.9	0.000595	1.05651	0.480
3.0	14.71	45.4	12.6	71.0	0.0494	0.188	42.1	0.000568	1.05538	0.503
3.5	14.28	38.8	13.4	55.5	0.0715	0.199	39.9	0.000501	1.05373	0.557
4.0	13.68	33.6	13.5	39.5	0.104	0.207	37.2	0.000433	1.05142	0.628
4.5	12.81	28.6	12.8	23.8	0.166	0.211	33.9	0.000347	1.04810	0.762
5.0	11.33	22.1	11.0	8.96	0.371	0.210	29.7	0.000226	1.04247	1.16
5.1	10.84	20.4	10.4	5.32	0.493	0.210	28.6	0.000192	1.04061	1.37
5.2	10.16	18.7	9.88	4.04	0.704	0.211	27.1	0.000157	1.03805	1.70
5.3	9.244	16.6	9.27	1.87	1.33	0.224	25.4	0.000110	1.03458	2.51
5.4	7.094	14.6	7.99	0.407	4.41	0.311	22.1	0.00006681	1.02647	4.56
5.5	5.172	15.2	7.46	0.617	2.05	0.269	19.8	0.000129	1.01926	2.96
5.6	4.425	16.3	7.36	0.873	1.22	0.175	19.2	0.000199	1.01646	2.18
5.7	3.990	17.4	7.31	1.07	0.888	0.162	18.9	0.000263	1.01484	1.80
5.8	3.686	18.4	7.29	1.22	0.711	0.156	18.8	0.000323	1.01370	1.58
5.9	3.454	19.4	7.27	1.35	0.610	0.152	18.7	0.000380	1.01283	1.43
6.0	3.266	20.3	7.25	1.45	0.524	0.150	18.7	0.000434	1.01213	1.32
6.5	2.656	24.4	7.20	1.79	0.337	0.149	19.1	0.000682	1.00986	1.06
7.0	2.294	28.0	7.16	1.99	0.258	0.152	19.7	0.000913	1.00851	0.941
7.5	2.040	31.5	7.12	2.12	0.214	0.156	20.4	0.00114	1.00757	0.877
8.0	1.848	34.8	7.09	2.21	0.184	0.161	21.1	0.00136	1.00685	0.837
8.5	1.694	37.9	7.06	2.28	0.163	0.166	21.8	0.00159	1.00628	0.809
9.0	1.558	41.1	7.03	2.33	0.147	0.172	22.5	0.00182	1.00582	0.790
9.5	1.462	44.1	7.00	2.37	0.134	0.177	23.2	0.00205	1.00542	0.775
10.0	1.371	47.1	6.98	2.40	0.124	0.182	23.9	0.00228	1.00508	0.763
11.0	1.222	53.0	6.94	2.45	0.108	0.193	25.3	0.00276	1.00453	0.748
12.0	1.105	58.7	6.91	2.49	0.0956	0.203	26.6	0.00327	1.00410	0.739
13.0	1.009	64.4	6.88	2.51	0.0861	0.212	28.0	0.00379	1.00374	0.732
14.0	0.9298	70.1	6.86	2.53	0.0785	0.221	29.3	0.00433	1.00345	0.727
15.0	0.8625	75.6	6.84	2.55	0.0722	0.230	30.5	0.00489	1.00320	0.724
16.0	0.8046	81.2	6.82	2.56	0.0668	0.239	31.8	0.00548	1.00298	0.721
17.0	0.7544	86.7	6.80	2.57	0.0623	0.248	33.0	0.00608	1.00280	0.719
18.0	0.7103	92.2	6.79	2.58	0.0583	0.256	34.2	0.00671	1.00263	0.717
19.0	0.6712	97.5	6.77	2.59	0.0549	0.264	35.3	0.00735	1.00249	0.716
20.0	0.6364	103.0	6.76	2.59	0.0518	0.272	36.5	0.00801	1.00236	0.715
21.0	0.6051	108.0	6.75	2.60	0.0491	0.280	37.6	0.00869	1.00224	0.715
22.0	0.5768	114.0	6.74	2.60	0.0467	0.288	38.7	0.00938	1.00214	0.714
23.0	0.5511	119.0	6.73	2.60	0.0445	0.295	39.7	0.0101	1.00204	0.714
24.0	0.5276	124.0	6.72	2.60	0.0425	0.303	40.8	0.0108	1.00195	0.714
25.0	0.5061	130.0	6.72	2.61	0.0407	0.310	41.8	0.0116	1.00187	0.714
26.0	0.4863	135.0	6.71	2.61	0.0391	0.317	42.9	0.0124	1.00180	0.714
28.0	0.4511	146.0	6.70	2.61	0.0361	0.331	44.9	0.0139	1.00167	0.713
30.0	0.4208	156.0	6.69	2.61	0.0336	0.345	46.8	0.0156	1.00156	0.713
32.0	0.3943	167.0	6.68	2.61	0.0315	0.358	48.7	0.0173	1.00146	0.713
34.0	0.3709	177.0	6.67	2.61	0.0295	0.372	50.5	0.0191	1.00137	0.713
36.0	0.3503	188.0	6.67	2.62	0.0279	0.385	52.3	0.0210	1.00130	0.712
38.0	0.3318	198.0	6.66	2.62	0.0264	0.397	54.1	0.0229	1.00123	0.712
40.0	0.3152	209.0	6.66	2.62	0.0250	0.410	55.8	0.0249	1.00117	0.711
45.0	0.2801	235.0	6.64	2.62	0.0222	0.441	59.9	0.0301	1.00104	0.710
50.0	0.2522	261.0	6.64	2.62	0.0200	0.470	63.9	0.0358	1.00093	0.708
55.0	0.2293	287.0	6.63	2.61	0.0181	0.499	67.7	0.0418	1.00085	0.707
60.0	0.2102	313.0	6.63	2.61	0.0166	0.528	71.4	0.0482	1.00078	0.705
65.0	0.1941	339.0	6.62	2.61	0.0153	0.556	75.0	0.0550	1.00072	0.703
70.0	0.1803	365.0	6.62	2.61	0.0142	0.583	78.5	0.0621	1.00067	0.701
75.0	0.1683	391.0	6.61	2.61	0.0133	0.610	81.9	0.0696	1.00062	0.699
80.0	0.1578	417.0	6.61	2.61	0.0125	0.636	85.3	0.0775	1.00058	0.697
90.0	0.1403	469.0	6.61	2.61	0.0111	0.687	91.7	0.0942	1.00052	0.694
100.0	0.1263	521.0	6.60	2.61	0.0100	0.737	98.0	0.112	1.00047	0.691
125.0	0.1011	651.0	6.60	2.61	0.00798	0.857	111.0	0.163	1.00037	0.673
150.0	0.08433	781.0	6.59	2.61	0.00665	0.970	125.0	0.222	1.00031	0.670
175.0	0.07231	911.0	6.59	2.61	0.00570	1.08	139.0	0.287	1.00027	0.668
200.0	0.06329	1040.0	6.59	2.61	0.00499	1.18	152.0	0.359	1.00023	0.667
225.0	0.05627	1170.0	6.59	2.60	0.00444	1.28	164.0	0.438	1.00021	0.666
250.0	0.05065	1300.0	6.59	2.60	0.00399	1.37	176.0	0.522	1.00019	0.666
275.0	0.04605	1430.0	6.59	2.60	0.00363	1.46	188.0	0.611	1.00017	0.667
300.0	0.04222	1560.0	6.59	2.60	0.00333	1.55	199.0	0.706	1.00016	0.669
350.0	0.03620	1820.0	6.58	2.60	0.00285	1.72	222.0	0.916	1.00013	0.668
400.0	0.03168	2080.0	6.58	2.60	0.00250	1.89	243.0	1.15	1.00012	0.668
450.0	0.02816	2340.0	6.58	2.60	0.00222	2.05	264.0	1.40	1.00010	0.668
500.0	0.02535	2600.0	6.58	2.60	0.00200	2.21	284.0	1.68	1.00009	0.667
600.0	0.02113	3120.0	6.58	2.60	0.00167	2.51	322.0	2.29	1.00008	0.667
700.0	0.01811	3640.0	6.58	2.60	0.00143	2.80	359.0	2.97	1.00007	0.667
800.0	0.01585	4160.0	6.58	2.60	0.00125	3.07	394.0	3.73	1.00006	0.667
900.0	0.01409	4680.0	6.58	2.60	0.00111	3.34	428.0	4.56	1.00005	0.666
1000.0	0.01268	5200.0	6.58	2.60	0.00100	3.60	462.0	5.46	1.00005	0.666
1100.0	0.01153	5710.0	6.58	2.60	0.000909	3.85	494.0	6.43	1.00004	0.666
1200.0	0.01057	6230.0	6.58	2.60	0.000833	4.10	525.0	7.46	1.00004	0.666
1300.0	0.009754	6750.0	6.58	2.60	0.000769	4.34	556.0	8.56	1.00004	0.666
1400.0	0.009057	7270.0	6.58	2.60	0.000714	4.57	586.0	9.72	1.00003	0.666
1500.0	0.008454	7790.0	6.58	2.60	0.000667	4.80	615.0	10.9	1.00003	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

2.8 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.150	0.06594								
2.5	0.06646	570.0	2.60	3.760	5.646	1.886	1.782	1.915	249.0
3.0	0.06777	493.0	3.51	4.709	6.632	2.250	1.883	2.233	243.3
3.5	0.06977	399.0	3.99	5.869	7.848	2.628	2.067	2.755	232.2
4.0	0.07276	300.0	4.16	7.307	9.371	3.038	2.222	3.457	217.5
4.5	0.07748	198.0	4.00	9.157	11.36	3.502	2.405	4.614	196.1
5.0	0.08665	93.4	3.43	11.82	14.27	4.111	2.657	7.458	163.0
5.1	0.08995	73.4	3.25	12.56	15.11	4.276	2.722	8.737	154.5
5.2	0.09452	56.0	3.02	13.46	16.14	4.474	2.781	10.48	146.2
5.3	0.1005	37.6	2.77	14.49	17.34	4.702	2.815	13.85	137.0
5.4	0.1109	20.0	2.42	15.94	19.09	5.028	2.916	22.54	125.2
5.5	0.1366	9.12	1.87	18.54	22.41	5.638	3.125	43.09	112.9
5.6	0.1750	12.6	1.42	21.27	26.24	6.328	3.241	30.89	110.3
5.7	0.2050	19.0	1.19	22.97	28.79	6.779	3.251	21.25	112.2
5.8	0.2287	25.5	1.05	24.16	30.65	7.103	3.242	16.54	114.9
5.9	0.2486	31.7	0.957	25.11	32.16	7.361	3.229	13.91	117.7
6.0	0.2663	37.5	0.887	25.91	33.46	7.580	3.215	12.25	120.4
6.5	0.3373	62.1	0.682	28.96	38.53	8.394	3.163	8.771	132.0
7.0	0.3952	82.3	0.572	31.36	42.57	8.993	3.135	7.547	141.6
7.5	0.4472	100.0	0.500	33.49	46.18	9.490	3.120	6.923	150.0
8.0	0.4958	116.0	0.448	35.47	49.54	9.924	3.112	6.546	157.4
8.5	0.5421	131.0	0.407	37.36	52.74	10.31	3.109	6.296	164.2
9.0	0.5869	146.0	0.374	39.19	55.84	10.67	3.107	6.117	170.6
9.5	0.6305	160.0	0.347	40.98	58.87	10.99	3.107	5.985	176.6
10.0	0.6732	173.0	0.323	42.73	61.83	11.30	3.108	5.882	182.2
11.0	0.7562	199.0	0.287	46.15	67.60	11.85	3.110	5.743	192.9
12.0	0.8375	224.0	0.258	49.50	73.26	12.34	3.113	5.648	202.7
13.0	0.9175	248.0	0.235	52.82	78.85	12.79	3.115	5.577	212.0
14.0	0.997	271.0	0.215	56.11	84.38	13.20	3.117	5.524	220.7
15.0	1.075	295.0	0.199	59.37	89.87	13.58	3.119	5.481	229.1
16.0	1.153	318.0	0.185	62.63	95.33	13.93	3.121	5.444	237.0
17.0	1.230	340.0	0.173	65.87	100.8	14.26	3.121	5.414	244.6
18.0	1.307	363.0	0.163	69.09	106.2	14.57	3.122	5.389	251.9
19.0	1.383	385.0	0.153	72.31	111.5	14.86	3.123	5.368	258.9
20.0	1.459	407.0	0.145	75.51	116.9	15.14	3.123	5.351	265.8
21.0	1.534	429.0	0.138	78.71	122.2	15.40	3.123	5.336	272.5
22.0	1.610	451.0	0.131	81.89	127.6	15.64	3.123	5.323	278.9
23.0	1.685	472.0	0.125	85.08	132.9	15.88	3.123	5.311	285.2
24.0	1.760	494.0	0.119	88.25	138.2	16.11	3.123	5.301	291.4
25.0	1.835	515.0	0.114	91.43	143.5	16.32	3.123	5.293	297.4
26.0	1.910	537.0	0.110	94.59	148.8	16.53	3.123	5.285	303.3
28.0	2.059	579.0	0.102	100.9	159.3	16.92	3.123	5.272	314.7
30.0	2.208	621.0	0.0947	107.2	169.9	17.28	3.123	5.261	325.7
32.0	2.356	663.0	0.0886	113.5	180.4	17.62	3.122	5.253	336.3
34.0	2.504	705.0	0.0833	119.8	190.9	17.94	3.122	5.246	346.5
36.0	2.652	747.0	0.0785	126.1	201.4	18.24	3.122	5.240	356.5
38.0	2.800	789.0	0.0743	132.4	211.8	18.52	3.122	5.235	366.1
40.0	2.948	831.0	0.0705	138.7	222.3	18.79	3.121	5.230	375.5
45.0	3.316	935.0	0.0626	154.3	248.4	19.41	3.121	5.222	398.0
50.0	3.684	1040.0	0.0562	170.0	274.5	19.96	3.120	5.216	419.3
55.0	4.052	1140.0	0.0511	185.6	300.6	20.45	3.120	5.212	439.5
60.0	4.419	1240.0	0.0468	201.3	326.6	20.91	3.119	5.208	458.8
65.0	4.786	1350.0	0.0432	216.9	352.7	21.33	3.119	5.206	477.3
70.0	5.153	1450.0	0.0401	232.5	378.7	21.71	3.119	5.204	495.2
75.0	5.519	1550.0	0.0374	248.1	404.7	22.07	3.119	5.202	512.4
80.0	5.886	1660.0	0.0350	263.7	430.7	22.41	3.118	5.201	529.0
90.0	6.619	1860.0	0.0311	294.9	482.7	23.02	3.118	5.199	560.8
100.0	7.352	2070.0	0.0280	326.1	534.7	23.57	3.118	5.198	590.8
125.0	9.183	2580.0	0.0224	404.1	664.6	24.73	3.117	5.196	660.0
150.0	11.01	3090.0	0.0187	482.0	794.5	25.67	3.117	5.195	722.6
175.0	12.84	3600.0	0.0160	560.0	924.3	26.47	3.117	5.194	780.1
200.0	14.67	4120.0	0.0140	637.9	1054.0	27.17	3.117	5.194	833.7
225.0	16.50	4630.0	0.0124	715.8	1184.0	27.78	3.117	5.193	884.1
250.0	18.33	5140.0	0.0112	793.7	1314.0	28.33	3.117	5.193	931.7
275.0	20.16	5650.0	0.0102	871.6	1444.0	28.82	3.117	5.193	977.0
300.0	21.99	6170.0	0.00933	949.5	1574.0	29.27	3.117	5.193	1020.0
350.0	25.66	7190.0	0.00800	1105.0	1833.0	30.07	3.116	5.193	1102.0
400.0	29.32	8220.0	0.00700	1261.0	2093.0	30.77	3.116	5.193	1178.0
450.0	32.98	9240.0	0.00622	1417.0	2352.0	31.38	3.116	5.193	1249.0
500.0	36.64	10300.0	0.00560	1573.0	2612.0	31.92	3.116	5.193	1316.0
600.0	43.96	12300.0	0.00467	1884.0	3131.0	32.87	3.116	5.193	1442.0
700.0	51.28	14400.0	0.00400	2196.0	3651.0	33.67	3.116	5.193	1557.0
800.0	58.60	16400.0	0.00350	2508.0	4170.0	34.37	3.116	5.193	1665.0
900.0	65.92	18500.0	0.00311	2819.0	4689.0	34.98	3.116	5.193	1766.0
1000.0	73.24	20500.0	0.00280	3131.0	5209.0	35.52	3.116	5.193	1861.0
1100.0	80.56	22600.0	0.00255	3442.0	5728.0	36.02	3.116	5.193	1952.0
1200.0	87.88	24600.0	0.00233	3754.0	6247.0	36.47	3.116	5.193	2039.0
1300.0	95.20	26700.0	0.00215	4065.0	6766.0	36.89	3.116	5.193	2122.0
1400.0	102.5	28700.0	0.00200	4377.0	7286.0	37.27	3.116	5.193	2202.0
1500.0	109.8	30800.0	0.00187	4689.0	7805.0	37.63	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

2.8 ATMOSPHERE ISOBAR

	TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
	DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
*	2.150	15.16									
	2.5	15.05	63.2	9.68	85.7	0.0303	0.173	43.3	0.000600	1.05665	0.480
	3.0	14.75	46.2	12.6	72.7	0.0483	0.188	42.5	0.000572	1.05554	0.504
	3.5	14.33	39.5	13.5	57.2	0.0697	0.200	40.3	0.000506	1.05393	0.557
	4.0	13.74	34.3	13.6	41.3	0.101	0.208	37.6	0.000439	1.05168	0.623
	4.5	12.91	29.5	12.9	25.5	0.156	0.213	34.4	0.000357	1.04848	0.747
	5.0	11.54	23.4	11.2	10.8	0.318	0.211	30.4	0.000246	1.04328	1.07
	5.1	11.12	21.9	10.7	8.16	0.398	0.211	29.4	0.000217	1.04167	1.22
	5.2	10.58	20.5	10.3	5.92	0.511	0.210	28.2	0.000189	1.03963	1.41
	5.3	9.95	18.7	9.88	3.75	0.739	0.212	26.9	0.000154	1.03726	1.76
	5.4	9.019	16.8	9.19	1.81	1.34	0.225	25.2	0.000110	1.03373	2.53
	5.5	7.321	15.4	8.18	0.667	2.80	0.260	22.7	0.0000825	1.02733	3.75
	5.6	5.715	15.7	7.64	0.720	1.97	0.215	20.7	0.000122	1.02129	2.98
	5.7	4.878	16.6	7.49	0.927	1.28	0.184	20.0	0.000178	1.01816	2.30
	5.8	4.373	17.5	7.41	1.12	0.941	0.170	19.6	0.000235	1.01627	1.91
	5.9	4.022	18.5	7.37	1.28	0.756	0.162	19.4	0.000290	1.01496	1.66
	6.0	3.755	19.5	7.35	1.41	0.630	0.158	19.3	0.000343	1.01396	1.50
	6.5	2.955	23.7	7.27	1.84	0.370	0.152	19.5	0.000585	1.01131	1.12
	7.0	2.530	27.4	7.22	2.08	0.275	0.154	20.0	0.000827	1.00939	0.980
	7.5	2.236	31.0	7.17	2.24	0.224	0.158	20.6	0.00102	1.00830	0.904
	8.0	2.017	34.3	7.13	2.35	0.191	0.163	21.3	0.00123	1.00748	0.856
	8.5	1.845	37.5	7.10	2.43	0.168	0.168	22.0	0.00145	1.00684	0.824
	9.0	1.704	40.7	7.06	2.49	0.150	0.173	22.7	0.00166	1.00632	0.801
	9.5	1.586	43.8	7.03	2.53	0.137	0.178	23.4	0.00188	1.00588	0.785
	10.0	1.485	46.8	7.01	2.57	0.126	0.183	24.1	0.00210	1.00551	0.772
	11.0	1.322	52.7	6.97	2.63	0.109	0.194	25.4	0.00255	1.00490	0.755
	12.0	1.194	58.5	6.94	2.67	0.0966	0.203	26.8	0.00302	1.00443	0.744
	13.0	1.090	64.2	6.91	2.70	0.0869	0.213	28.1	0.00350	1.00404	0.736
	14.0	1.003	69.9	6.88	2.72	0.0791	0.222	29.4	0.00401	1.00372	0.730
	15.0	0.9303	75.5	6.86	2.74	0.0726	0.231	30.6	0.00453	1.00345	0.727
	16.0	0.8675	81.1	6.84	2.76	0.0672	0.240	31.9	0.00508	1.00321	0.723
	17.0	0.8131	86.6	6.82	2.77	0.0625	0.248	33.1	0.00564	1.00301	0.721
	18.0	0.7654	92.1	6.80	2.78	0.0585	0.257	34.3	0.00622	1.00284	0.719
	19.0	0.7231	97.5	6.79	2.78	0.0550	0.265	35.4	0.00682	1.00268	0.718
	20.0	0.6855	103.0	6.77	2.79	0.0520	0.273	36.5	0.00744	1.00254	0.717
	21.0	0.6517	108.0	6.76	2.79	0.0492	0.281	37.7	0.00807	1.00241	0.716
	22.0	0.6211	114.0	6.75	2.80	0.0468	0.288	38.7	0.00872	1.00230	0.716
	23.0	0.5934	119.0	6.74	2.80	0.0446	0.296	39.8	0.00938	1.00220	0.715
	24.0	0.5681	124.0	6.73	2.81	0.0426	0.303	40.9	0.0101	1.00210	0.715
	25.0	0.5449	130.0	6.73	2.81	0.0408	0.310	41.9	0.0108	1.00202	0.715
	26.0	0.5236	135.0	6.72	2.81	0.0391	0.318	42.9	0.0115	1.00194	0.714
	28.0	0.4857	146.0	6.71	2.81	0.0362	0.332	44.9	0.0131	1.00180	0.714
	30.0	0.4530	156.0	6.70	2.81	0.0336	0.345	46.8	0.0145	1.00168	0.714
	32.0	0.4244	167.0	6.69	2.82	0.0315	0.359	48.7	0.0161	1.00157	0.713
	34.0	0.3993	177.0	6.68	2.82	0.0296	0.372	50.6	0.0178	1.00148	0.713
	36.0	0.3770	188.0	6.67	2.82	0.0279	0.385	52.4	0.0195	1.00140	0.713
	38.0	0.3571	198.0	6.67	2.82	0.0264	0.398	54.1	0.0213	1.00132	0.712
	40.0	0.3393	209.0	6.66	2.82	0.0250	0.410	55.8	0.0231	1.00126	0.712
	45.0	0.3016	235.0	6.65	2.82	0.0222	0.441	60.0	0.0286	1.00112	0.710
	50.0	0.2714	261.0	6.64	2.82	0.0200	0.471	64.0	0.0333	1.00101	0.709
	55.0	0.2468	287.0	6.63	2.82	0.0181	0.500	67.8	0.0389	1.00091	0.707
	60.0	0.2263	313.0	6.63	2.82	0.0166	0.528	71.5	0.0448	1.00084	0.705
	65.0	0.2089	340.0	6.62	2.82	0.0153	0.556	75.1	0.0511	1.00077	0.703
	70.0	0.1941	366.0	6.62	2.82	0.0142	0.583	78.6	0.0577	1.00072	0.701
	75.0	0.1812	392.0	6.62	2.81	0.0133	0.610	82.0	0.0647	1.00067	0.699
	80.0	0.1699	418.0	6.61	2.81	0.0125	0.636	85.3	0.0720	1.00063	0.697
	90.0	0.1511	470.0	6.61	2.81	0.0111	0.688	91.8	0.0875	1.00056	0.694
	100.0	0.1360	522.0	6.61	2.81	0.0100	0.738	98.0	0.104	1.00050	0.691
	125.0	0.1089	651.0	6.60	2.81	0.00798	0.857	111.8	0.152	1.00040	0.673
	150.0	0.09080	781.0	6.60	2.81	0.00665	0.971	125.3	0.206	1.00034	0.670
	175.0	0.07786	911.0	6.59	2.81	0.00570	1.08	139.0	0.267	1.00029	0.668
	200.0	0.06815	1040.0	6.59	2.81	0.00499	1.18	152.0	0.334	1.00025	0.667
	225.0	0.06059	1170.0	6.59	2.81	0.00444	1.28	164.0	0.406	1.00022	0.666
	250.0	0.05454	1300.0	6.59	2.80	0.00399	1.37	176.0	0.485	1.00020	0.666
	275.0	0.04959	1430.0	6.59	2.80	0.00363	1.46	188.0	0.568	1.00018	0.667
	300.0	0.04547	1560.0	6.59	2.80	0.00333	1.55	199.0	0.656	1.00017	0.669
	350.0	0.03898	1820.0	6.58	2.80	0.00285	1.72	222.0	0.851	1.00014	0.668
	400.0	0.03411	2080.0	6.58	2.80	0.00250	1.89	243.0	1.07	1.00013	0.668
	450.0	0.03033	2340.0	6.58	2.80	0.00222	2.05	264.0	1.30	1.00011	0.668
	500.0	0.02730	2600.0	6.58	2.80	0.00200	2.21	284.0	1.56	1.00010	0.667
	600.0	0.02275	3120.0	6.58	2.80	0.00167	2.51	322.0	2.12	1.00008	0.667
	700.0	0.01950	3640.0	6.58	2.80	0.00143	2.80	359.0	2.76	1.00007	0.667
	800.0	0.01707	4160.0	6.58	2.80	0.00125	3.07	394.0	3.47	1.00006	0.667
	900.0	0.01517	4680.0	6.58	2.80	0.00111	3.34	428.0	4.24	1.00006	0.666
	1000.0	0.01365	5200.0	6.58	2.80	0.00100	3.60	462.0	5.07	1.00005	0.666
	1100.0	0.01241	5710.0	6.58	2.80	0.000909	3.85	494.0	5.97	1.00005	0.666
	1200.0	0.01138	6230.0	6.58	2.80	0.000833	4.10	525.0	6.93	1.00004	0.666
	1300.0	0.01050	6750.0	6.58	2.80	0.000769	4.34	556.0	7.95	1.00004	0.666
	1400.0	0.009754	7270.0	6.58	2.80	0.000714	4.57	586.0	9.02	1.00004	0.666
	1500.0	0.009104	7790.0	6.58	2.80	0.000666	4.84	615.0	10.2	1.00003	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

3.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.148	0.06580								
2.5	0.0663D	580.0	2.59	3.750	5.765	1.880	1.773	1.902	251.0
3.0	0.06758	503.0	3.52	4.690	6.744	2.242	1.880	2.222	245.4
3.5	0.06952	410.0	4.01	5.637	7.951	2.617	2.064	2.735	234.6
4.0	0.07241	311.0	4.19	7.256	9.458	3.020	2.217	3.415	220.4
4.5	0.07692	210.0	4.05	9.069	11.41	3.478	2.397	4.503	199.9
5.0	0.08528	107.0	3.53	11.61	14.21	4.063	2.639	6.925	168.8
5.1	0.08811	87.7	3.37	12.30	14.98	4.214	2.699	7.879	161.1
5.2	0.09180	71.0	3.17	13.10	15.89	4.389	2.748	9.037	153.8
5.3	0.09619	53.3	2.96	13.95	16.88	4.577	2.765	10.93	146.1
5.4	0.1025	36.0	2.70	15.02	18.13	4.812	2.827	14.50	136.7
5.5	0.1133	20.7	2.36	16.48	19.93	5.140	2.929	22.18	126.1
5.6	0.1347	12.5	1.91	18.70	22.80	5.658	3.098	33.24	116.5
5.7	0.1638	14.6	1.53	20.98	25.96	6.218	3.204	27.96	113.8
5.8	0.1897	19.7	1.30	22.64	28.41	6.643	3.227	21.28	114.7
5.9	0.2115	25.4	1.15	23.88	30.30	6.968	3.225	17.06	116.8
6.0	0.2304	31.2	1.04	24.87	31.87	7.231	3.217	14.45	119.2
6.5	0.3029	56.7	0.768	28.33	37.54	8.141	3.168	9.441	130.9
7.0	0.3597	77.8	0.634	30.88	41.82	8.776	3.137	7.885	140.7
7.5	0.4098	96.2	0.550	33.10	45.55	9.292	3.121	7.133	149.2
8.0	0.4563	113.0	0.489	35.13	49.00	9.737	3.112	6.693	156.8
8.5	0.5004	129.0	0.443	37.06	52.27	10.13	3.108	6.405	163.8
9.0	0.5428	143.0	0.406	38.92	55.42	10.49	3.107	6.203	170.2
9.5	0.5840	157.0	0.376	40.73	58.48	10.82	3.107	6.055	176.3
10.0	0.6244	171.0	0.350	42.50	61.48	11.13	3.108	5.941	182.0
11.0	0.7025	197.0	0.310	45.94	67.30	11.69	3.109	5.787	192.8
12.0	0.7789	222.0	0.278	49.32	73.00	12.18	3.112	5.683	202.7
13.0	0.8541	246.0	0.253	52.65	78.61	12.63	3.115	5.607	212.0
14.0	0.9283	270.0	0.232	55.95	84.17	13.05	3.117	5.549	220.8
15.0	1.002	294.0	0.214	59.22	89.67	13.43	3.119	5.503	229.2
16.0	1.075	317.0	0.199	62.49	95.16	13.78	3.121	5.463	237.1
17.0	1.147	340.0	0.186	65.74	100.6	14.11	3.122	5.430	244.7
18.0	1.219	362.0	0.175	68.97	106.0	14.42	3.123	5.403	252.1
19.0	1.290	385.0	0.165	72.19	111.4	14.71	3.123	5.381	259.1
20.0	1.361	407.0	0.156	75.40	116.8	14.99	3.123	5.362	266.0
21.0	1.432	429.0	0.148	78.61	122.1	15.25	3.124	5.346	272.7
22.0	1.503	451.0	0.141	81.80	127.5	15.50	3.124	5.332	279.1
23.0	1.573	472.0	0.134	84.99	132.8	15.73	3.124	5.320	285.5
24.0	1.643	494.0	0.128	88.17	138.1	15.96	3.124	5.309	291.6
25.0	1.713	515.0	0.123	91.34	143.4	16.18	3.124	5.300	297.6
26.0	1.783	537.0	0.118	94.52	148.7	16.38	3.124	5.291	303.5
28.0	1.922	579.0	0.109	100.8	159.3	16.77	3.123	5.277	314.9
30.0	2.061	622.0	0.102	107.2	169.8	17.14	3.123	5.266	325.9
32.0	2.200	664.0	0.0950	113.5	180.3	17.48	3.123	5.257	336.5
34.0	2.338	706.0	0.0893	119.8	190.9	17.80	3.123	5.249	346.8
36.0	2.477	748.0	0.0842	126.1	201.3	18.10	3.122	5.243	356.7
38.0	2.615	790.0	0.0797	132.3	211.8	18.38	3.122	5.237	366.4
40.0	2.752	831.0	0.0756	138.6	222.3	18.65	3.122	5.233	375.8
45.0	3.097	935.0	0.0671	154.3	248.4	19.26	3.121	5.224	398.3
50.0	3.440	1040.0	0.0603	170.0	274.5	19.81	3.121	5.218	419.5
55.0	3.783	1140.0	0.0547	185.6	300.6	20.31	3.120	5.213	439.7
60.0	4.126	1250.0	0.0501	201.2	326.7	20.76	3.120	5.209	459.0
65.0	4.469	1350.0	0.0463	216.9	352.7	21.18	3.119	5.207	477.6
70.0	4.811	1450.0	0.0429	232.5	378.7	21.57	3.119	5.205	495.4
75.0	5.153	1550.0	0.0401	248.1	404.8	21.93	3.119	5.203	512.6
80.0	5.495	1660.0	0.0376	263.7	430.8	22.26	3.119	5.202	529.2
90.0	6.180	1860.0	0.0334	294.9	482.8	22.87	3.118	5.199	560.9
100.0	6.863	2070.0	0.0300	326.1	534.8	23.42	3.118	5.198	591.0
125.0	8.573	2580.0	0.0240	404.1	664.7	24.58	3.118	5.196	660.1
150.0	10.28	3090.0	0.0200	482.0	794.6	25.53	3.117	5.195	722.7
175.0	11.99	3610.0	0.0171	560.0	924.4	26.33	3.117	5.194	780.3
200.0	13.70	4120.0	0.0150	637.9	1054.0	27.02	3.117	5.194	833.8
225.0	15.41	4630.0	0.0133	715.8	1184.0	27.63	3.117	5.194	884.2
250.0	17.11	5140.0	0.0120	793.7	1314.0	28.18	3.117	5.193	931.8
275.0	18.82	5660.0	0.0109	871.6	1444.0	28.68	3.117	5.193	977.1
300.0	20.53	6170.0	0.0100	949.5	1574.0	29.13	3.117	5.193	1020.0
350.0	23.95	7190.0	0.00857	1105.0	1833.0	29.93	3.116	5.193	1102.0
400.0	27.36	8220.0	0.00750	1261.0	2093.0	30.62	3.116	5.193	1178.0
450.0	30.78	9240.0	0.00667	1417.0	2353.0	31.23	3.116	5.193	1249.0
500.0	34.20	10300.0	0.00600	1573.0	2612.0	31.78	3.116	5.193	1317.0
600.0	41.03	12300.0	0.00500	1884.0	3131.0	32.73	3.116	5.193	1442.0
700.0	47.86	14400.0	0.00429	2196.0	3651.0	33.53	3.116	5.193	1557.0
800.0	54.69	16400.0	0.00375	2508.0	4170.0	34.22	3.116	5.193	1665.0
900.0	61.53	18500.0	0.00333	2819.0	4689.0	34.83	3.116	5.193	1766.0
1000.0	68.36	20500.0	0.00300	3131.0	5209.0	35.38	3.116	5.193	1861.0
1100.0	75.19	22600.0	0.00273	3442.0	5728.0	35.88	3.116	5.193	1952.0
1200.0	82.02	24600.0	0.00250	3754.0	6247.0	36.33	3.116	5.193	2039.0
1300.0	88.86	26700.0	0.00231	4065.0	6767.0	36.74	3.116	5.193	2122.0
1400.0	95.69	28700.0	0.00214	4377.0	7286.0	37.13	3.116	5.193	2202.0
1500.0	102.5	30800.0	0.00200	4689.0	7805.0	37.49	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

3.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.148	15.20									
2.5	15.08	64.2	9.68	87.4	0.0296	0.173	43.8	0.000604	1.05679	0.480
3.0	14.89	47.0	12.6	74.4	0.0473	0.189	42.9	0.000575	1.05570	0.504
3.5	14.38	40.2	13.5	58.9	0.0680	0.200	40.7	0.000510	1.05412	0.556
4.0	13.81	35.6	13.7	43.0	0.0974	0.209	38.0	0.000444	1.05192	0.619
4.5	13.03	30.4	13.0	27.3	0.148	0.214	34.9	0.000366	1.04884	0.733
5.0	11.73	24.6	11.4	12.8	0.281	0.213	31.0	0.000262	1.04398	1.01
5.1	11.35	23.3	11.0	10.0	0.338	0.212	30.1	0.000238	1.04256	1.12
5.2	10.89	22.0	10.6	7.74	0.410	0.211	29.0	0.000214	1.04082	1.24
5.3	10.40	20.5	10.3	5.54	0.534	0.211	28.0	0.000186	1.03894	1.45
5.4	9.753	18.8	9.80	3.51	0.770	0.214	26.8	0.000151	1.03650	1.81
5.5	8.827	17.2	9.13	1.83	1.29	0.224	25.2	0.000114	1.03300	2.49
5.6	7.423	16.1	8.31	0.927	2.06	0.238	23.1	0.0001965	1.02771	3.22
5.7	6.134	16.3	7.82	0.894	1.71	0.213	21.5	0.000125	1.02275	2.82
5.8	5.272	17.0	7.62	1.04	1.25	0.190	20.7	0.000169	1.01963	2.32
5.9	4.728	17.9	7.53	1.20	0.954	0.176	20.3	0.000218	1.01759	1.96
6.0	4.340	18.8	7.47	1.36	0.769	0.168	20.0	0.000268	1.01615	1.72
6.5	3.302	23.0	7.34	1.87	0.410	0.156	19.9	0.000501	1.01227	1.20
7.0	2.780	26.9	7.27	2.16	0.293	0.157	20.3	0.000715	1.01032	1.02
7.5	2.440	30.4	7.22	2.35	0.234	0.160	20.9	0.000920	1.00906	0.931
8.0	2.192	33.8	7.18	2.47	0.198	0.164	21.5	0.00112	1.00813	0.876
8.5	1.999	37.1	7.13	2.57	0.173	0.169	22.2	0.00132	1.00741	0.840
9.0	1.842	40.3	7.10	2.64	0.154	0.174	22.9	0.00153	1.00683	0.814
9.5	1.712	43.4	7.07	2.70	0.139	0.179	23.6	0.00173	1.00635	0.795
10.0	1.602	46.5	7.04	2.74	0.128	0.184	24.2	0.00194	1.00594	0.780
11.0	1.423	52.4	7.00	2.80	0.110	0.195	25.6	0.00236	1.00528	0.761
12.0	1.284	58.2	6.96	2.85	0.0976	0.204	26.9	0.00280	1.00476	0.749
13.0	1.171	64.0	6.93	2.89	0.0876	0.214	28.2	0.00326	1.00434	0.740
14.0	1.077	69.7	6.91	2.91	0.0796	0.223	29.5	0.00373	1.00399	0.734
15.0	0.998	75.3	6.88	2.93	0.0731	0.232	30.8	0.00422	1.00370	0.730
16.0	0.9305	80.9	6.86	2.95	0.0675	0.241	32.0	0.00473	1.00345	0.726
17.0	0.8719	86.5	6.84	2.96	0.0628	0.249	33.2	0.00526	1.00323	0.723
18.0	0.8205	92.0	6.82	2.97	0.0587	0.257	34.4	0.00581	1.00304	0.721
19.0	0.7751	97.5	6.80	2.98	0.0552	0.265	35.5	0.00636	1.00287	0.720
20.0	0.7346	103.0	6.79	2.99	0.0521	0.273	36.6	0.00694	1.00272	0.718
21.0	0.6983	108.5	6.77	2.99	0.0494	0.281	37.7	0.00753	1.00259	0.718
22.0	0.6655	114.0	6.76	3.00	0.0469	0.289	38.8	0.00814	1.00247	0.717
23.0	0.6358	119.0	6.75	3.00	0.0447	0.296	39.9	0.00876	1.00236	0.716
24.0	0.6086	124.0	6.74	3.01	0.0427	0.304	40.9	0.00940	1.00225	0.716
25.0	0.5837	130.0	6.74	3.01	0.0408	0.311	42.0	0.0100	1.00216	0.715
26.0	0.5609	135.0	6.73	3.01	0.0392	0.318	43.0	0.0107	1.00208	0.715
28.0	0.5202	146.0	6.72	3.01	0.0362	0.332	45.0	0.0121	1.00193	0.715
30.0	0.4851	156.0	6.70	3.02	0.0337	0.346	46.9	0.0135	1.00180	0.714
32.0	0.4545	167.0	6.69	3.02	0.0315	0.359	48.8	0.0150	1.00168	0.714
34.0	0.4276	178.0	6.69	3.02	0.0296	0.372	50.6	0.0166	1.00158	0.713
36.0	0.4038	188.0	6.68	3.02	0.0279	0.385	52.4	0.0182	1.00150	0.713
38.0	0.3825	199.0	6.67	3.02	0.0264	0.398	54.2	0.0199	1.00142	0.712
40.0	0.3633	209.0	6.67	3.02	0.0250	0.411	55.9	0.0216	1.00135	0.712
45.0	0.3229	235.0	6.65	3.02	0.0222	0.441	60.0	0.0262	1.00120	0.710
50.0	0.2907	261.0	6.65	3.02	0.0200	0.471	64.0	0.0311	1.00108	0.709
55.0	0.2643	288.0	6.64	3.02	0.0181	0.500	67.8	0.0363	1.00098	0.707
60.0	0.2424	314.0	6.63	3.02	0.0166	0.528	71.5	0.0419	1.00090	0.705
65.0	0.2238	340.0	6.63	3.02	0.0153	0.556	75.1	0.0477	1.00083	0.703
70.0	0.2079	366.0	6.62	3.02	0.0142	0.583	78.6	0.0539	1.00077	0.701
75.0	0.1941	392.0	6.62	3.02	0.0133	0.610	82.0	0.0604	1.00072	0.699
80.0	0.1820	418.0	6.62	3.02	0.0125	0.636	85.3	0.0672	1.00067	0.697
90.0	0.1618	470.0	6.61	3.01	0.0111	0.688	91.8	0.0818	1.00060	0.694
100.0	0.1457	522.0	6.61	3.01	0.0100	0.738	98.0	0.0974	1.00054	0.691
125.0	0.1167	652.0	6.60	3.01	0.00797	0.858	111.0	0.141	1.00043	0.673
150.0	0.09726	782.0	6.60	3.01	0.00665	0.971	125.0	0.192	1.00036	0.670
175.0	0.08341	911.0	6.59	3.01	0.00570	1.08	139.0	0.249	1.00031	0.668
200.0	0.07300	1040.0	6.59	3.01	0.00499	1.18	152.0	0.311	1.00027	0.667
225.0	0.06491	1170.0	6.59	3.01	0.00444	1.28	164.0	0.379	1.00024	0.666
250.0	0.05843	1300.0	6.59	3.01	0.00399	1.37	176.0	0.452	1.00022	0.666
275.0	0.05313	1430.0	6.59	3.00	0.00363	1.46	188.0	0.530	1.00020	0.667
300.0	0.04871	1560.0	6.59	3.00	0.00333	1.55	199.0	0.612	1.00018	0.669
350.0	0.04176	1820.0	6.59	3.00	0.00285	1.72	222.0	0.794	1.00015	0.668
400.0	0.03655	2080.0	6.58	3.00	0.00250	1.89	243.0	1.00	1.00014	0.668
450.0	0.03249	2340.0	6.58	3.00	0.00222	2.05	264.0	1.22	1.00012	0.668
500.0	0.02924	2600.0	6.58	3.00	0.00200	2.21	284.0	1.45	1.00011	0.667
600.0	0.02437	3120.0	6.58	3.00	0.00167	2.51	322.0	1.98	1.00009	0.667
700.0	0.02089	3640.0	6.58	3.00	0.00143	2.80	359.0	2.58	1.00008	0.667
800.0	0.01828	4160.0	6.58	3.00	0.00125	3.07	394.0	3.24	1.00007	0.667
900.0	0.01625	4680.0	6.58	3.00	0.00111	3.34	428.0	3.96	1.00006	0.666
1000.0	0.01463	5200.0	6.58	3.00	0.00100	3.60	462.0	4.74	1.00005	0.666
1100.0	0.01330	5710.0	6.58	3.00	0.000909	3.85	494.0	5.57	1.00005	0.666
1200.0	0.01219	6230.0	6.58	3.00	0.000833	4.10	525.0	6.47	1.00005	0.666
1300.0	0.01125	6750.0	6.58	3.00	0.000769	4.34	556.0	7.42	1.00004	0.666
1400.0	0.01045	7270.0	6.58	3.00	0.000714	4.57	586.0	8.42	1.00004	0.666
1500.0	0.009754	7790.0	6.58	3.00	0.000666	4.80	615.0	9.48	1.00004	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

3.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.143	0.06544								
2.5	0.06592	604.0	2.57	3.726	6.064	1.865	1.751	1.872	255.7
3.0	0.06712	528.0	3.53	4.645	7.025	2.222	1.872	2.195	250.4
3.5	0.06894	436.0	4.85	5.765	8.210	2.591	2.055	2.688	240.3
4.0	0.07162	339.0	4.27	7.141	9.681	2.985	2.205	3.322	227.3
4.5	0.07566	239.0	4.17	8.873	11.56	3.426	2.379	4.277	208.6
5.0	0.08259	139.0	3.73	11.21	14.13	3.963	2.605	6.060	181.3
5.1	0.08469	121.0	3.60	11.80	14.80	4.093	2.656	6.631	174.9
5.2	0.08724	105.0	3.45	12.45	15.55	4.236	2.692	7.228	169.3
5.3	0.08999	88.6	3.30	13.12	16.31	4.381	2.691	8.028	163.6
5.4	0.09336	71.9	3.12	13.86	17.17	4.541	2.723	9.191	156.8
5.5	0.09771	56.0	2.92	14.70	18.17	4.725	2.765	10.88	149.4
5.6	0.1036	41.5	2.69	15.71	19.38	4.944	2.822	13.46	141.6
5.7	0.1122	29.5	2.42	16.95	20.93	5.217	2.900	17.32	133.6
5.8	0.1249	22.2	2.11	18.49	22.92	5.563	3.002	21.49	126.9
5.9	0.1418	20.9	1.82	20.18	25.20	5.955	3.108	22.23	123.0
6.0	0.1594	23.3	1.59	21.67	27.33	6.311	3.155	19.92	122.1
6.5	0.2330	45.2	1.03	26.55	34.81	7.513	3.169	11.57	129.3
7.0	0.2881	67.4	0.811	29.60	39.81	8.257	3.141	8.890	139.0
7.5	0.3348	87.1	0.686	32.06	43.94	8.826	3.123	7.730	147.8
8.0	0.3772	105.0	0.602	34.25	47.63	9.303	3.113	7.096	155.6
8.5	0.4169	121.0	0.540	36.29	51.07	9.720	3.108	6.730	162.8
9.0	0.4547	137.0	0.491	38.23	54.35	10.10	3.106	6.431	169.5
9.5	0.4912	152.0	0.452	40.10	57.52	10.44	3.106	6.238	175.7
10.0	0.5267	166.0	0.420	41.92	60.60	10.75	3.106	6.093	181.5
11.0	0.5952	193.0	0.369	45.42	66.53	11.32	3.108	5.900	192.5
12.0	0.6619	218.0	0.330	48.85	72.32	11.82	3.111	5.772	202.6
13.0	0.7273	243.0	0.299	52.22	78.01	12.28	3.114	5.680	212.1
14.0	0.7917	268.0	0.274	55.55	83.63	12.70	3.117	5.611	221.0
15.0	0.8555	292.0	0.253	58.85	89.19	13.08	3.120	5.557	229.5
16.0	0.9185	315.0	0.235	62.15	94.72	13.44	3.121	5.509	237.5
17.0	0.9810	339.0	0.219	65.42	100.2	13.77	3.123	5.471	245.1
18.0	1.043	361.0	0.205	68.67	105.7	14.08	3.123	5.439	252.5
19.0	1.105	384.0	0.192	71.91	111.1	14.38	3.124	5.413	259.6
20.0	1.166	406.0	0.183	75.14	116.5	14.65	3.124	5.390	266.5
21.0	1.227	429.0	0.173	78.36	121.9	14.92	3.125	5.371	273.2
22.0	1.288	451.0	0.165	81.56	127.2	15.17	3.125	5.355	279.7
23.0	1.348	473.0	0.157	84.76	132.6	15.40	3.125	5.341	286.0
24.0	1.409	494.0	0.150	87.95	137.9	15.63	3.125	5.328	292.2
25.0	1.469	516.0	0.144	91.14	143.2	15.85	3.125	5.317	298.2
26.0	1.529	537.0	0.138	94.32	148.6	16.06	3.125	5.308	304.1
28.0	1.649	580.0	0.128	100.7	159.1	16.45	3.125	5.291	315.5
30.0	1.768	623.0	0.119	107.0	169.7	16.81	3.124	5.278	326.5
32.0	1.888	665.0	0.111	113.3	180.3	17.15	3.124	5.267	337.1
34.0	2.006	708.0	0.104	119.6	190.8	17.47	3.124	5.259	347.4
36.0	2.125	750.0	0.0984	125.9	201.3	17.77	3.123	5.251	357.3
38.0	2.244	792.0	0.0931	132.2	211.8	18.06	3.123	5.245	367.0
40.0	2.362	833.0	0.0883	138.5	222.3	18.33	3.123	5.239	376.4
45.0	2.657	938.0	0.0783	154.2	248.4	18.94	3.122	5.229	398.9
50.0	2.952	1040.0	0.0704	169.9	274.6	19.49	3.121	5.222	420.1
55.0	3.246	1140.0	0.0639	185.5	300.7	19.99	3.121	5.216	440.3
60.0	3.540	1250.0	0.0585	201.2	326.7	20.44	3.120	5.212	459.6
65.0	3.834	1350.0	0.0540	216.8	352.8	20.86	3.120	5.209	478.1
70.0	4.128	1450.0	0.0501	232.4	378.8	21.25	3.120	5.207	495.9
75.0	4.421	1560.0	0.0468	248.1	404.9	21.61	3.119	5.205	513.1
80.0	4.715	1660.0	0.0438	263.7	430.9	21.94	3.119	5.203	529.7
90.0	5.301	1870.0	0.0389	294.9	482.9	22.55	3.119	5.200	561.4
100.0	5.887	2070.0	0.0350	326.1	534.9	23.10	3.118	5.199	591.4
125.0	7.352	2580.0	0.0280	404.1	664.8	24.26	3.118	5.196	660.5
150.0	8.817	3100.0	0.0233	482.0	794.7	25.21	3.117	5.195	723.1
175.0	10.28	3610.0	0.0200	560.0	924.6	26.01	3.117	5.194	780.6
200.0	11.75	4120.0	0.0175	637.9	1054.0	26.70	3.117	5.194	834.1
225.0	13.21	4630.0	0.0156	715.8	1184.0	27.31	3.117	5.194	884.5
250.0	14.67	5150.0	0.0140	793.7	1314.0	27.86	3.117	5.193	932.1
275.0	16.14	5660.0	0.0127	871.6	1444.0	28.36	3.117	5.193	977.4
300.0	17.60	6170.0	0.0117	949.5	1574.0	28.81	3.117	5.193	1021.0
350.0	20.53	7200.0	0.0100	1105.0	1833.0	29.61	3.117	5.193	1102.0
400.0	23.46	8220.0	0.00875	1261.0	2093.0	30.30	3.117	5.193	1178.0
450.0	26.39	9250.0	0.00778	1417.0	2353.0	30.91	3.116	5.193	1249.0
500.0	29.31	10300.0	0.00700	1573.0	2612.0	31.46	3.116	5.193	1317.0
600.0	35.17	12300.0	0.00583	1884.0	3132.0	32.41	3.116	5.193	1442.0
700.0	41.03	14400.0	0.00500	2196.0	3651.0	33.21	3.116	5.193	1557.0
800.0	46.88	16400.0	0.00437	2508.0	4170.0	33.90	3.116	5.193	1665.0
900.0	52.74	18500.0	0.00389	2819.0	4690.0	34.51	3.116	5.193	1766.0
1000.0	58.60	20500.0	0.00350	3131.0	5209.0	35.06	3.116	5.193	1861.0
1100.0	64.45	22600.0	0.00318	3442.0	5728.0	35.56	3.116	5.193	1952.0
1200.0	70.31	24600.0	0.00292	3754.0	6247.0	36.01	3.116	5.193	2039.0
1300.0	76.17	26700.0	0.00269	4066.0	6767.0	36.42	3.116	5.193	2122.0
1400.0	82.02	28700.0	0.00250	4377.0	7286.0	36.81	3.116	5.193	2202.0
1500.0	87.88	30800.0	0.00233	4689.0	7805.0	37.17	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM *

3.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.143	15.28									
2.5	15.17	66.6	9.69	91.6	0.0281	0.175	44.8	0.000615	1.05713	0.480
3.0	14.98	48.3	12.6	78.6	0.0449	0.191	43.9	0.000583	1.05609	0.506
3.5	14.50	42.0	13.6	63.2	0.0640	0.202	41.7	0.000519	1.05458	0.554
4.0	13.95	36.8	13.9	47.3	0.0902	0.212	39.0	0.000457	1.05251	0.611
4.5	13.22	32.4	13.3	31.6	0.132	0.218	35.9	0.000385	1.04966	0.706
5.0	12.11	27.4	11.8	16.9	0.221	0.216	32.4	0.000295	1.04544	0.908
5.1	11.81	26.3	11.5	14.3	0.252	0.217	31.6	0.000277	1.04429	0.967
5.2	11.46	25.3	11.2	12.1	0.286	0.216	30.7	0.000260	1.04298	1.03
5.3	11.11	24.0	11.0	9.84	0.335	0.215	29.9	0.000241	1.04166	1.12
5.4	10.71	22.7	10.7	7.70	0.406	0.215	29.1	0.000218	1.04013	1.25
5.5	10.23	21.3	10.3	5.73	0.510	0.214	28.1	0.000192	1.03833	1.43
5.6	9.651	20.0	9.88	4.00	0.672	0.215	27.1	0.000166	1.03612	1.70
5.7	8.914	18.8	9.36	2.63	0.920	0.217	25.9	0.000141	1.03333	2.06
5.8	8.005	18.0	8.80	1.78	1.19	0.219	24.5	0.000127	1.02990	2.41
5.9	7.053	18.0	8.32	1.47	1.24	0.212	23.3	0.000135	1.02632	2.44
6.0	6.274	18.3	8.03	1.46	1.09	0.200	22.5	0.000160	1.02339	2.24
6.5	4.232	21.8	7.58	1.94	0.531	0.170	21.2	0.000341	1.01597	1.44
7.0	3.472	25.6	7.44	2.34	0.347	0.165	21.2	0.000533	1.01290	1.15
7.5	2.997	29.3	7.36	2.60	0.264	0.166	21.6	0.000718	1.01109	1.01
8.0	2.651	32.8	7.29	2.78	0.216	0.169	22.2	0.000898	1.00984	0.930
8.5	2.389	36.1	7.24	2.91	0.185	0.173	22.7	0.00108	1.00890	0.880
9.0	2.199	39.4	7.19	3.01	0.163	0.178	23.4	0.00126	1.00816	0.846
9.5	2.036	42.6	7.15	3.09	0.146	0.183	24.0	0.00144	1.00755	0.821
10.0	1.899	45.7	7.12	3.15	0.133	0.187	24.7	0.00162	1.00704	0.802
11.0	1.680	51.7	7.07	3.24	0.114	0.197	26.0	0.00199	1.00623	0.778
12.0	1.511	57.7	7.03	3.30	0.100	0.207	27.3	0.00237	1.00560	0.762
13.0	1.375	63.5	6.99	3.35	0.0895	0.216	28.5	0.00277	1.00510	0.751
14.0	1.263	69.3	6.96	3.38	0.0810	0.225	29.8	0.00318	1.00468	0.743
15.0	1.169	75.0	6.93	3.41	0.0741	0.234	31.0	0.00360	1.00433	0.737
16.0	1.089	80.6	6.90	3.43	0.0683	0.242	32.2	0.00404	1.00404	0.732
17.0	1.019	86.2	6.88	3.45	0.0635	0.251	33.4	0.00450	1.00378	0.729
18.0	0.9587	91.8	6.86	3.46	0.0593	0.259	34.6	0.00497	1.00355	0.726
19.0	0.9052	97.3	6.84	3.48	0.0556	0.267	35.7	0.00545	1.00335	0.724
20.0	0.8576	103.0	6.82	3.49	0.0525	0.275	36.8	0.00595	1.00318	0.722
21.0	0.8150	108.0	6.81	3.49	0.0496	0.283	37.9	0.00646	1.00302	0.721
22.0	0.7765	114.0	6.79	3.50	0.0471	0.290	39.0	0.00698	1.00288	0.720
23.0	0.7416	119.0	6.78	3.50	0.0449	0.298	40.1	0.00752	1.00275	0.719
24.0	0.7098	124.0	6.77	3.51	0.0428	0.305	41.1	0.00806	1.00263	0.718
25.0	0.6807	130.0	6.76	3.51	0.0410	0.312	42.1	0.00863	1.00252	0.718
26.0	0.6539	135.0	6.75	3.51	0.0393	0.319	43.1	0.00920	1.00242	0.717
28.0	0.6064	146.0	6.74	3.52	0.0363	0.333	45.1	0.0104	1.00225	0.716
30.0	0.5655	157.0	6.72	3.52	0.0337	0.347	47.0	0.0116	1.00209	0.716
32.0	0.5298	167.0	6.71	3.52	0.0315	0.360	48.9	0.0129	1.00196	0.715
34.0	0.4984	178.0	6.70	3.53	0.0296	0.374	50.7	0.0143	1.00185	0.714
36.0	0.4706	188.0	6.70	3.53	0.0279	0.386	52.5	0.0156	1.00174	0.714
38.0	0.4457	199.0	6.69	3.53	0.0264	0.399	54.3	0.0171	1.00165	0.713
40.0	0.4234	209.0	6.68	3.53	0.0250	0.412	56.0	0.0186	1.00157	0.712
45.0	0.3763	236.0	6.67	3.53	0.0222	0.442	60.1	0.0225	1.00139	0.711
50.0	0.3388	262.0	6.66	3.53	0.0200	0.472	64.1	0.0267	1.00125	0.709
55.0	0.3080	288.0	6.65	3.53	0.0181	0.501	67.9	0.0312	1.00114	0.707
60.0	0.2825	314.0	6.64	3.53	0.0166	0.529	71.6	0.0359	1.00105	0.705
65.0	0.2608	340.0	6.64	3.52	0.0153	0.557	75.2	0.0410	1.00097	0.703
70.0	0.2423	366.0	6.63	3.52	0.0142	0.584	78.7	0.0463	1.00090	0.701
75.0	0.2262	392.0	6.63	3.52	0.0133	0.611	82.1	0.0519	1.00084	0.699
80.0	0.2121	418.0	6.62	3.52	0.0124	0.637	85.4	0.0577	1.00079	0.697
90.0	0.1886	470.0	6.62	3.52	0.0111	0.688	91.9	0.0702	1.00070	0.694
100.0	0.1699	522.0	6.61	3.52	0.0100	0.738	98.1	0.0836	1.00063	0.691
125.0	0.1360	652.0	6.60	3.51	0.00797	0.858	111.0	0.121	1.00050	0.673
150.0	0.1134	782.0	6.60	3.51	0.00664	0.971	125.0	0.165	1.00042	0.670
175.0	0.09726	912.0	6.60	3.51	0.00570	1.08	139.0	0.214	1.00036	0.668
200.0	0.08514	1040.0	6.59	3.51	0.00499	1.18	152.0	0.267	1.00032	0.667
225.0	0.07570	1170.0	6.59	3.51	0.00443	1.28	164.0	0.325	1.00028	0.666
250.0	0.06815	1300.0	6.59	3.51	0.00399	1.37	176.0	0.388	1.00025	0.666
275.0	0.06197	1430.0	6.59	3.51	0.00363	1.46	188.0	0.455	1.00023	0.667
300.0	0.05681	1560.0	6.59	3.51	0.00333	1.55	199.0	0.525	1.00021	0.669
350.0	0.04871	1820.0	6.59	3.50	0.00285	1.72	222.0	0.681	1.00018	0.668
400.0	0.04263	2080.0	6.58	3.50	0.00250	1.89	243.0	0.853	1.00016	0.668
450.0	0.03790	2340.0	6.58	3.50	0.00222	2.05	264.0	1.04	1.00014	0.668
500.0	0.03411	2600.0	6.58	3.50	0.00200	2.21	284.0	1.25	1.00013	0.667
600.0	0.02843	3120.0	6.58	3.50	0.00167	2.51	322.0	1.70	1.00011	0.667
700.0	0.02437	3640.0	6.58	3.50	0.00143	2.80	359.0	2.21	1.00009	0.667
800.0	0.02133	4160.0	6.58	3.50	0.00125	3.07	394.0	2.77	1.00008	0.667
900.0	0.01896	4680.0	6.58	3.50	0.00111	3.34	428.0	3.39	1.00007	0.666
1000.0	0.01707	5200.0	6.58	3.50	0.00100	3.60	462.0	4.06	1.00006	0.666
1100.0	0.01552	5710.0	6.58	3.50	0.000909	3.85	494.0	4.78	1.00006	0.666
1200.0	0.01422	6230.0	6.58	3.50	0.000833	4.10	525.0	5.55	1.00005	0.666
1300.0	0.01313	6750.0	6.58	3.50	0.000769	4.34	556.0	6.36	1.00005	0.666
1400.0	0.01219	7270.0	6.58	3.50	0.000714	4.57	586.0	7.22	1.00005	0.666
1500.0	0.01138	7790.0	6.58	3.50	0.000666	4.80	615.0	8.12	1.00004	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

4.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.138	0.06510								
2.5	0.06556	627.0	2.56	3.706	6.363	1.851	1.730	1.843	260.2
3.0	0.06669	552.0	3.54	4.605	7.308	2.203	1.864	2.170	255.2
3.5	0.06841	461.0	4.09	5.700	8.473	2.567	2.046	2.646	245.8
4.0	0.07090	365.0	4.33	7.038	9.911	2.952	2.193	3.242	233.8
4.5	0.07458	267.0	4.27	8.703	11.73	3.379	2.364	4.100	216.6
5.0	0.08053	170.0	3.90	10.88	14.15	3.884	2.578	5.528	192.0
5.1	0.08223	152.0	3.79	11.42	14.75	4.001	2.625	5.933	186.4
5.2	0.08421	137.0	3.67	12.00	15.41	4.127	2.654	6.326	181.8
5.3	0.08625	121.0	3.54	12.57	16.07	4.251	2.645	6.799	177.2
5.4	0.08862	104.0	3.40	13.19	16.78	4.384	2.666	7.434	171.6
5.5	0.09142	88.4	3.25	13.86	17.56	4.528	2.693	8.246	165.7
5.6	0.09483	73.5	3.08	14.60	18.44	4.687	2.726	9.308	159.4
5.7	0.09908	59.7	2.89	15.43	19.44	4.864	2.768	10.72	153.0
5.8	0.1045	47.5	2.69	16.38	20.62	5.068	2.819	12.57	146.5
5.9	0.1117	37.8	2.46	17.48	22.01	5.306	2.883	14.82	140.3
6.0	0.1211	31.5	2.22	18.72	23.63	5.579	2.956	16.89	135.1
6.5	0.1819	39.0	1.37	24.49	31.86	6.900	3.142	13.66	131.1
7.0	0.2344	59.2	1.02	28.17	37.67	7.762	3.137	10.05	138.6
7.5	0.2786	79.1	0.843	30.95	42.24	8.393	3.122	8.414	147.0
8.0	0.3179	97.6	0.727	33.32	46.21	8.906	3.112	7.547	154.8
8.5	0.3543	115.0	0.645	35.48	49.84	9.347	3.107	7.023	162.1
9.0	0.3887	131.0	0.583	37.51	53.26	9.738	3.105	6.677	168.9
9.5	0.4216	146.0	0.533	39.45	56.54	10.09	3.104	6.433	175.2
10.0	0.4536	161.0	0.493	41.32	59.70	10.42	3.105	6.252	181.2
11.0	0.5148	189.0	0.431	44.90	65.76	11.00	3.107	6.016	192.4
12.0	0.5742	215.0	0.384	48.37	71.65	11.51	3.110	5.863	202.6
13.0	0.6323	241.0	0.347	51.79	77.41	11.97	3.114	5.755	212.2
14.0	0.6894	265.0	0.317	55.15	83.09	12.39	3.117	5.674	221.2
15.0	0.7458	290.0	0.292	58.48	88.70	12.78	3.120	5.611	229.8
16.0	0.8015	314.0	0.271	61.80	94.29	13.14	3.122	5.556	237.9
17.0	0.8567	337.0	0.252	65.10	99.8	13.47	3.123	5.511	245.6
18.0	0.9114	360.0	0.236	68.37	105.3	13.79	3.124	5.475	253.0
19.0	0.9657	383.0	0.223	71.63	110.8	14.08	3.125	5.444	260.1
20.0	1.020	406.0	0.210	74.87	116.2	14.36	3.126	5.419	267.0
21.0	1.073	428.0	0.199	78.11	121.6	14.63	3.126	5.397	273.7
22.0	1.127	451.0	0.189	81.33	127.0	14.88	3.126	5.378	280.3
23.0	1.180	473.0	0.180	84.54	132.4	15.12	3.126	5.362	286.6
24.0	1.233	495.0	0.172	87.74	137.7	15.34	3.126	5.347	292.8
25.0	1.286	516.0	0.165	90.94	143.1	15.56	3.126	5.335	298.8
26.0	1.339	538.0	0.158	94.13	148.4	15.77	3.126	5.324	304.7
28.0	1.444	581.0	0.146	100.5	159.0	16.16	3.126	5.305	316.2
30.0	1.549	624.0	0.136	106.8	169.6	16.53	3.125	5.290	327.2
32.0	1.653	667.0	0.127	113.2	180.2	16.87	3.125	5.278	337.8
34.0	1.758	709.0	0.119	119.5	190.7	17.19	3.125	5.268	348.0
36.0	1.862	751.0	0.113	125.8	201.3	17.49	3.124	5.259	358.0
38.0	1.965	793.0	0.107	132.1	211.8	17.78	3.124	5.252	367.6
40.0	2.069	835.0	0.101	138.4	222.3	18.04	3.124	5.246	377.0
45.0	2.324	940.0	0.0896	154.1	248.5	18.66	3.123	5.234	399.5
50.0	2.586	1040.0	0.0805	169.8	274.6	19.21	3.122	5.226	420.7
55.0	2.844	1150.0	0.0731	185.5	300.7	19.71	3.122	5.220	440.9
60.0	3.101	1250.0	0.0669	201.1	326.8	20.16	3.121	5.215	460.1
65.0	3.358	1350.0	0.0617	216.8	352.9	20.58	3.121	5.211	478.6
70.0	3.615	1460.0	0.0573	232.4	378.9	20.97	3.120	5.208	496.4
75.0	3.872	1560.0	0.0534	248.0	405.0	21.33	3.120	5.206	513.6
80.0	4.129	1660.0	0.0501	263.6	431.0	21.66	3.120	5.204	530.2
90.0	4.642	1870.0	0.0445	294.9	483.0	22.28	3.119	5.202	561.9
100.0	5.155	2070.0	0.0400	326.1	535.0	22.82	3.119	5.200	591.9
125.0	6.437	2590.0	0.0320	404.1	665.0	23.98	3.118	5.197	660.9
150.0	7.719	3100.0	0.0267	482.0	794.9	24.93	3.118	5.195	723.4
175.0	9.000	3610.0	0.0229	560.0	924.7	25.73	3.117	5.194	780.9
200.0	10.28	4120.0	0.0200	637.9	1055.0	26.43	3.117	5.194	834.4
225.0	11.56	4640.0	0.0178	715.8	1184.0	27.04	3.117	5.194	884.7
250.0	12.84	5150.0	0.0160	793.7	1314.0	27.58	3.117	5.193	932.3
275.0	14.12	5660.0	0.0145	871.6	1444.0	28.08	3.117	5.193	977.6
300.0	15.41	6170.0	0.0133	949.5	1574.0	28.53	3.117	5.193	1021.0
350.0	17.97	7200.0	0.0114	1105.0	1834.0	29.33	3.117	5.193	1102.0
400.0	20.53	8220.0	0.0100	1261.0	2093.0	30.03	3.117	5.193	1176.0
450.0	23.09	9250.0	0.00889	1417.0	2353.0	30.64	3.117	5.193	1249.0
500.0	25.65	10300.0	0.00800	1573.0	2613.0	31.18	3.116	5.193	1317.0
600.0	30.78	12300.0	0.00667	1884.0	3132.0	32.13	3.116	5.193	1442.0
700.0	35.90	14400.0	0.00571	2196.0	3651.0	32.93	3.116	5.193	1558.0
800.0	41.03	16400.0	0.00500	2508.0	4170.0	33.62	3.116	5.193	1665.0
900.0	46.15	18500.0	0.00444	2819.0	4690.0	34.24	3.116	5.193	1766.0
1000.0	51.28	20500.0	0.00400	3131.0	5209.0	34.78	3.116	5.193	1861.0
1100.0	56.40	22600.0	0.00364	3442.0	5728.0	35.28	3.116	5.193	1952.0
1200.0	61.52	24600.0	0.00333	3754.0	6248.0	35.73	3.116	5.193	2039.0
1300.0	66.65	26700.0	0.00308	4066.0	6767.0	36.15	3.116	5.193	2122.0
1400.0	71.77	28700.0	0.00286	4377.0	7286.0	36.53	3.116	5.193	2202.0
1500.0	76.90	30800.0	0.00267	4689.0	7805.0	36.89	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

4.0 ATMOSPHERE ISOBAR

	TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
	DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
*	2.138	15.36									
	2.5	15.25	69.0	9.68	95.7	0.0267	0.176	45.9	0.000626	1.05745	0.481
	3.0	14.99	50.8	12.6	82.8	0.0427	0.192	44.9	0.000591	1.05646	0.507
	3.5	14.62	43.7	13.7	67.4	0.0606	0.204	42.7	0.000528	1.05502	0.553
	4.0	14.10	38.5	14.0	51.5	0.0842	0.215	40.0	0.000459	1.05335	0.604
	4.5	13.41	34.3	13.5	35.8	0.119	0.221	37.0	0.000402	1.05039	0.686
	5.0	12.42	29.8	12.2	21.1	0.185	0.222	33.6	0.000323	1.04662	0.839
	5.1	12.16	28.9	11.9	18.5	0.205	0.221	32.9	0.000306	1.04564	0.885
	5.2	11.87	28.0	11.6	16.3	0.226	0.220	32.1	0.000293	1.04455	0.922
	5.3	11.59	26.8	11.5	14.0	0.253	0.220	31.4	0.000279	1.04348	0.972
	5.4	11.28	25.7	11.3	11.8	0.289	0.219	30.7	0.000262	1.04231	1.04
	5.5	10.94	24.6	11.0	9.67	0.336	0.219	30.0	0.000242	1.04099	1.13
	5.6	10.55	23.4	10.7	7.75	0.397	0.218	29.2	0.000222	1.03956	1.25
	5.7	10.09	22.3	10.4	6.02	0.480	0.217	28.4	0.000201	1.03779	1.40
	5.8	9.556	21.3	10.0	4.54	0.591	0.217	27.4	0.000180	1.03579	1.59
	5.9	8.951	20.4	9.53	3.38	0.727	0.216	26.5	0.000163	1.03347	1.81
	6.0	8.258	19.8	9.09	2.60	0.853	0.215	25.5	0.000154	1.03085	2.00
	6.5	5.498	21.4	7.94	2.15	0.640	0.186	22.7	0.000248	1.02048	1.67
	7.0	4.266	24.8	7.66	2.52	0.406	0.174	22.2	0.000406	1.01587	1.28
	7.5	3.590	28.4	7.52	2.84	0.297	0.172	22.4	0.000571	1.01334	1.09
	8.0	3.146	31.9	7.43	3.07	0.237	0.174	22.8	0.000734	1.01169	0.988
	8.5	2.823	35.3	7.35	3.24	0.199	0.178	23.3	0.000895	1.01048	0.923
	9.0	2.573	38.6	7.29	3.37	0.173	0.182	23.9	0.00106	1.00955	0.879
	9.5	2.372	41.8	7.24	3.47	0.154	0.186	24.5	0.00122	1.00881	0.848
	10.0	2.205	45.0	7.20	3.55	0.139	0.190	25.1	0.00138	1.00818	0.824
	11.0	1.942	51.1	7.14	3.66	0.118	0.200	26.4	0.00171	1.00721	0.794
	12.0	1.742	57.1	7.09	3.74	0.103	0.209	27.6	0.00205	1.00646	0.775
	13.0	1.582	63.0	7.05	3.80	0.0913	0.218	28.9	0.00240	1.00587	0.761
	14.0	1.451	68.9	7.02	3.85	0.0824	0.227	30.1	0.00276	1.00538	0.752
	15.0	1.341	74.6	6.99	3.89	0.0752	0.236	31.3	0.00313	1.00497	0.745
	16.0	1.248	80.3	6.95	3.91	0.0692	0.244	32.5	0.00352	1.00463	0.739
	17.0	1.167	86.0	6.92	3.94	0.0641	0.253	33.7	0.00393	1.00433	0.734
	18.0	1.097	91.6	6.90	3.96	0.0598	0.261	34.8	0.00434	1.00407	0.731
	19.0	1.036	97.1	6.88	3.97	0.0561	0.269	35.9	0.00477	1.00384	0.728
	20.0	0.9807	103.0	6.86	3.98	0.0528	0.276	37.0	0.00520	1.00363	0.726
	21.0	0.9316	108.0	6.84	3.99	0.0499	0.284	38.1	0.00565	1.00345	0.724
	22.0	0.8874	114.0	6.83	4.00	0.0473	0.292	39.2	0.00611	1.00329	0.723
	23.0	0.8474	119.0	6.81	4.01	0.0450	0.299	40.2	0.00658	1.00314	0.721
	24.0	0.8109	124.0	6.80	4.01	0.0430	0.306	41.3	0.00707	1.00300	0.720
	25.0	0.7776	130.0	6.79	4.02	0.0411	0.314	42.3	0.00756	1.00288	0.720
	26.0	0.7469	135.0	6.78	4.02	0.0394	0.321	43.3	0.00806	1.00277	0.719
	28.0	0.6925	146.0	6.76	4.03	0.0364	0.335	45.3	0.00911	1.00257	0.718
	30.0	0.6456	157.0	6.75	4.03	0.0338	0.348	47.2	0.0102	1.00233	0.717
	32.0	0.6048	167.0	6.73	4.03	0.0316	0.362	49.0	0.0113	1.00224	0.716
	34.0	0.5690	178.0	6.72	4.03	0.0296	0.375	50.9	0.0125	1.00211	0.715
	36.0	0.5372	188.0	6.71	4.04	0.0279	0.388	52.7	0.0137	1.00199	0.715
	38.0	0.5088	199.0	6.70	4.04	0.0264	0.400	54.4	0.0150	1.00188	0.714
	40.0	0.4833	210.0	6.70	4.04	0.0250	0.413	56.1	0.0163	1.00179	0.713
	45.0	0.4296	236.0	6.68	4.04	0.0222	0.443	60.2	0.0197	1.00159	0.711
	50.0	0.3867	262.0	6.67	4.04	0.0199	0.473	64.2	0.0234	1.00143	0.709
	55.0	0.3517	288.0	6.66	4.04	0.0181	0.502	68.0	0.0273	1.00130	0.707
	60.0	0.3225	314.0	6.65	4.03	0.0166	0.530	71.7	0.0315	1.00119	0.705
	65.0	0.2978	340.0	6.64	4.03	0.0153	0.558	75.3	0.0359	1.00110	0.703
	70.0	0.2766	366.0	6.64	4.03	0.0142	0.585	78.8	0.0406	1.00102	0.701
	75.0	0.2583	392.0	6.63	4.03	0.0133	0.611	82.2	0.0455	1.00096	0.699
	80.0	0.2422	419.0	6.63	4.03	0.0124	0.638	85.5	0.0506	1.00090	0.698
	90.0	0.2154	471.0	6.62	4.03	0.0111	0.689	91.9	0.0615	1.00080	0.694
	100.0	0.1940	523.0	6.62	4.02	0.0100	0.739	98.2	0.0733	1.00072	0.691
	125.0	0.1553	652.0	6.61	4.02	0.00796	0.859	111.0	0.106	1.00058	0.673
	150.0	0.1296	782.0	6.60	4.02	0.00664	0.972	125.0	0.144	1.00048	0.670
	175.0	0.1111	912.0	6.60	4.01	0.00569	1.08	139.0	0.187	1.00041	0.668
	200.0	0.09727	1040.0	6.60	4.01	0.00498	1.18	152.0	0.234	1.00036	0.667
	225.0	0.08649	1170.0	6.59	4.01	0.00443	1.28	164.0	0.285	1.00032	0.666
	250.0	0.07786	1300.0	6.59	4.01	0.00399	1.37	176.0	0.340	1.00029	0.666
	275.0	0.07080	1430.0	6.59	4.01	0.00363	1.46	188.0	0.398	1.00026	0.667
	300.0	0.06491	1560.0	6.59	4.01	0.00333	1.55	199.0	0.459	1.00024	0.669
	350.0	0.05566	1820.0	6.59	4.01	0.00285	1.72	222.0	0.596	1.00021	0.668
	400.0	0.04871	2080.0	6.59	4.01	0.00250	1.89	243.0	0.747	1.00018	0.668
	450.0	0.04331	2340.0	6.58	4.00	0.00222	2.05	264.0	0.912	1.00016	0.668
	500.0	0.03898	2600.0	6.58	4.00	0.00200	2.21	284.0	1.09	1.00014	0.667
	600.0	0.03249	3120.0	6.58	4.00	0.00166	2.51	322.0	1.49	1.00012	0.667
	700.0	0.02785	3640.0	6.58	4.00	0.00143	2.80	359.0	1.93	1.00010	0.667
	800.0	0.02437	4160.0	6.58	4.00	0.00125	3.07	394.0	2.43	1.00009	0.667
	900.0	0.02167	4680.0	6.58	4.00	0.00111	3.34	429.0	2.97	1.00008	0.666
	1000.0	0.01950	5200.0	6.58	4.00	0.00100	3.60	462.0	3.55	1.00007	0.666
	1100.0	0.01773	5720.0	6.58	4.00	0.000909	3.85	494.0	4.18	1.00007	0.666
	1200.0	0.01625	6230.0	6.58	4.00	0.000833	4.10	525.0	4.85	1.00006	0.666
	1300.0	0.01500	6750.0	6.58	4.00	0.000769	4.34	556.0	5.56	1.00006	0.666
	1400.0	0.01393	7270.0	6.58	4.00	0.000714	4.57	586.0	6.32	1.00005	0.666
	1500.0	0.01300	7790.0	6.58	4.00	0.000666	4.80	615.0	7.11	1.00005	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

4.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.132	0.06477								
2.5	0.06521	650.0	2.54	3.608	6.661	1.838	1.709	1.816	264.5
3.0	0.06629	576.0	3.54	4.569	7.592	2.186	1.856	2.147	259.7
3.5	0.06791	486.0	4.12	5.642	8.738	2.544	2.037	2.608	251.0
4.0	0.07024	391.0	4.40	6.945	10.15	2.922	2.182	3.172	239.8
4.5	0.07362	294.0	4.37	8.554	11.91	3.336	2.349	3.956	223.9
5.0	0.07887	198.0	4.05	10.62	14.22	3.817	2.556	5.161	201.4
5.1	0.08031	181.0	3.95	11.12	14.78	3.925	2.600	5.476	196.5
5.2	0.08194	167.0	3.85	11.65	15.38	4.040	2.625	5.768	192.5
5.3	0.08358	150.0	3.74	12.16	15.98	4.153	2.612	6.093	188.5
5.4	0.08543	134.0	3.62	12.71	16.61	4.271	2.627	6.516	183.7
5.5	0.08753	119.0	3.49	13.29	17.28	4.395	2.647	7.025	178.7
5.6	0.08996	104.0	3.35	13.92	18.02	4.528	2.670	7.643	173.4
5.7	0.09281	89.4	3.20	14.59	18.82	4.670	2.698	8.403	168.0
5.8	0.09620	76.1	3.04	15.33	19.71	4.825	2.732	9.341	162.4
5.9	0.1003	64.1	2.87	16.14	20.71	4.996	2.772	10.49	156.8
6.0	0.1053	53.8	2.68	17.04	21.84	5.186	2.819	11.83	151.3
6.5	0.1473	39.5	1.77	22.44	29.15	6.355	3.078	14.42	137.0
7.0	0.1941	54.6	1.28	26.64	35.49	7.296	3.120	11.10	140.3
7.5	0.2354	73.1	1.02	29.76	40.50	7.988	3.116	9.121	147.3
8.0	0.2721	91.5	0.866	32.35	44.76	8.538	3.109	8.025	154.7
8.5	0.3058	109.0	0.759	34.65	48.59	9.003	3.105	7.365	161.9
9.0	0.3375	126.0	0.681	36.77	52.16	9.411	3.103	6.935	168.6
9.5	0.3677	141.0	0.619	38.78	55.55	9.778	3.102	6.636	175.0
10.0	0.3968	156.0	0.570	40.71	58.81	10.11	3.103	6.417	181.0
11.0	0.4524	185.0	0.495	44.37	65.00	10.70	3.105	6.134	192.3
12.0	0.5061	212.0	0.440	47.90	70.97	11.22	3.109	5.955	202.7
13.0	0.5584	238.0	0.397	51.35	76.81	11.69	3.113	5.829	212.4
14.0	0.6098	263.0	0.362	54.75	82.55	12.12	3.117	5.737	221.5
15.0	0.6605	288.0	0.332	58.10	88.22	12.51	3.120	5.665	230.2
16.0	0.7105	312.0	0.308	61.46	93.85	12.87	3.122	5.602	238.3
17.0	0.7600	336.0	0.286	64.78	99.43	13.21	3.124	5.552	246.0
18.0	0.8090	360.0	0.268	68.07	105.0	13.53	3.125	5.510	253.5
19.0	0.8576	383.0	0.252	71.35	110.5	13.82	3.126	5.476	260.6
20.0	0.9059	406.0	0.238	74.61	115.9	14.10	3.127	5.447	267.6
21.0	0.9539	428.0	0.225	77.86	121.3	14.37	3.127	5.422	274.3
22.0	1.002	451.0	0.214	81.09	126.8	14.62	3.127	5.401	280.8
23.0	1.049	473.0	0.204	84.31	132.2	14.86	3.127	5.383	287.2
24.0	1.097	495.0	0.195	87.53	137.5	15.09	3.127	5.367	293.4
25.0	1.144	517.0	0.186	90.73	142.9	15.31	3.127	5.352	299.4
26.0	1.191	539.0	0.179	93.93	148.2	15.52	3.127	5.340	305.3
28.0	1.285	582.0	0.165	100.3	158.9	15.91	3.127	5.319	316.8
30.0	1.378	625.0	0.154	106.7	169.5	16.28	3.127	5.302	327.8
32.0	1.471	668.0	0.143	113.0	180.1	16.62	3.126	5.288	338.4
34.0	1.564	711.0	0.135	119.4	190.7	16.94	3.126	5.277	348.6
36.0	1.657	753.0	0.127	125.7	201.2	17.24	3.125	5.267	358.6
38.0	1.749	795.0	0.120	132.0	211.7	17.53	3.125	5.259	368.2
40.0	1.841	837.0	0.114	138.3	222.2	17.80	3.125	5.253	377.6
45.0	2.071	942.0	0.101	154.0	248.5	18.42	3.124	5.239	400.1
50.0	2.301	1050.0	0.0906	169.7	274.6	18.97	3.123	5.230	421.3
55.0	2.530	1150.0	0.0823	185.4	300.8	19.46	3.122	5.223	441.4
60.0	2.759	1250.0	0.0753	201.1	326.9	19.92	3.122	5.218	460.7
65.0	2.988	1360.0	0.0695	216.7	353.0	20.34	3.121	5.214	479.2
70.0	3.217	1460.0	0.0645	232.4	379.0	20.72	3.121	5.210	496.9
75.0	3.445	1560.0	0.0601	248.0	405.1	21.08	3.120	5.208	514.1
80.0	3.673	1670.0	0.0564	263.6	431.1	21.42	3.120	5.206	530.6
90.0	4.130	1870.0	0.0501	294.8	483.1	22.03	3.120	5.203	562.3
100.0	4.586	2080.0	0.0450	326.1	535.1	22.58	3.119	5.200	592.3
125.0	5.725	2590.0	0.0360	404.1	665.1	23.74	3.118	5.197	661.3
150.0	6.864	3100.0	0.0300	482.0	795.0	24.69	3.118	5.196	723.8
175.0	8.003	3620.0	0.0257	560.0	924.9	25.49	3.118	5.195	781.2
200.0	9.142	4130.0	0.0225	637.9	1055.0	26.18	3.117	5.194	834.7
225.0	10.28	4640.0	0.0200	715.8	1185.0	26.79	3.117	5.194	885.0
250.0	11.42	5150.0	0.0180	793.7	1314.0	27.34	3.117	5.194	932.6
275.0	12.56	5660.0	0.0164	871.7	1444.0	27.83	3.117	5.193	977.8
300.0	13.70	6160.0	0.0150	949.6	1574.0	28.29	3.117	5.193	1021.0
350.0	15.97	7200.0	0.0129	1105.0	1834.0	29.09	3.117	5.193	1103.0
400.0	18.25	8230.0	0.0112	1261.0	2093.0	29.78	3.117	5.193	1178.0
450.0	20.53	9250.0	0.0100	1417.0	2353.0	30.39	3.117	5.193	1250.0
500.0	22.81	10300.0	0.00900	1573.0	2613.0	30.94	3.117	5.193	1317.0
600.0	27.36	12300.0	0.00750	1884.0	3132.0	31.89	3.116	5.193	1442.0
700.0	31.92	14400.0	0.00643	2196.0	3651.0	32.69	3.116	5.193	1558.0
800.0	36.47	16400.0	0.00562	2508.0	4171.0	33.38	3.116	5.193	1665.0
900.0	41.03	18500.0	0.00500	2819.0	4690.0	33.99	3.116	5.193	1766.0
1000.0	45.58	20500.0	0.00450	3131.0	5209.0	34.54	3.116	5.193	1861.0
1100.0	50.14	22600.0	0.00409	3442.0	5728.0	35.03	3.116	5.193	1952.0
1200.0	54.69	24600.0	0.00375	3754.0	6248.0	35.49	3.116	5.193	2039.0
1300.0	59.25	26700.0	0.00346	4066.0	6767.0	35.90	3.116	5.193	2122.0
1400.0	63.80	28700.0	0.00321	4377.0	7286.0	36.29	3.116	5.193	2202.0
1500.0	68.36	30800.0	0.00300	4689.0	7806.0	36.64	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

4.5 ATMOSPHERE ISOBAR

	TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
*	2.132	15.44									
	2.5	15.33	71.4	9.68	100.0	0.0254	0.177	46.9	0.000636	1.05776	0.481
	3.0	15.09	52.7	12.6	86.9	0.0408	0.194	45.9	0.000598	1.05681	0.549
	3.5	14.73	45.3	13.7	71.5	0.0576	0.206	43.7	0.000537	1.05543	0.552
	4.0	14.24	40.1	14.2	55.6	0.0791	0.217	40.9	0.000480	1.05356	0.599
	4.5	13.58	36.1	13.7	39.9	0.110	0.224	38.0	0.000417	1.05106	0.670
	5.0	12.68	32.1	12.5	25.1	0.161	0.226	34.7	0.000346	1.04761	0.793
	5.1	12.45	31.2	12.2	22.5	0.175	0.226	34.0	0.000331	1.04675	0.826
	5.2	12.20	30.5	12.0	20.3	0.189	0.225	33.3	0.000319	1.04580	0.856
	5.3	11.96	29.4	12.0	18.0	0.208	0.225	32.7	0.000308	1.04489	0.887
	5.4	11.71	28.3	11.8	15.7	0.230	0.224	32.1	0.000294	1.04391	0.932
	5.5	11.42	27.3	11.5	13.6	0.257	0.224	31.4	0.000279	1.04284	0.987
	5.6	11.12	26.3	11.3	11.5	0.291	0.223	30.8	0.000263	1.04167	1.05
	5.7	10.77	25.3	11.0	9.64	0.332	0.222	30.1	0.000245	1.04037	1.14
	5.8	10.39	24.3	10.7	7.91	0.384	0.221	29.4	0.000228	1.03893	1.24
	5.9	9.97	23.4	10.4	6.39	0.449	0.220	28.6	0.000211	1.03732	1.36
	6.0	9.492	22.5	10.0	5.11	0.525	0.219	27.8	0.000195	1.03552	1.50
	6.5	6.788	21.9	8.48	2.68	0.660	0.202	24.5	0.000206	1.02532	1.75
	7.0	5.151	24.5	7.94	2.81	0.454	0.185	23.4	0.000324	1.01918	1.40
	7.5	4.249	27.8	7.71	3.11	0.329	0.180	23.3	0.000465	1.01580	1.18
	8.0	3.675	31.2	7.58	3.36	0.257	0.180	23.5	0.000611	1.01366	1.05
	8.5	3.270	34.6	7.48	3.56	0.213	0.182	23.9	0.000757	1.01215	0.967
	9.0	2.963	37.9	7.40	3.72	0.183	0.186	24.4	0.000903	1.01101	0.913
	9.5	2.720	41.2	7.34	3.84	0.161	0.189	25.0	0.00105	1.01010	0.875
	10.0	2.520	44.4	7.29	3.94	0.145	0.194	25.6	0.00120	1.00935	0.847
	11.0	2.210	50.6	7.22	4.08	0.121	0.202	26.7	0.00149	1.00820	0.810
	12.0	1.976	56.5	7.16	4.18	0.105	0.211	28.0	0.00180	1.00733	0.787
	13.0	1.791	62.6	7.11	4.26	0.0931	0.220	29.2	0.00211	1.00664	0.771
	14.0	1.640	68.5	7.07	4.32	0.0838	0.229	30.4	0.00244	1.00608	0.760
	15.0	1.514	74.3	7.04	4.36	0.0762	0.238	31.6	0.00277	1.00561	0.752
	16.0	1.407	80.1	7.00	4.40	0.0700	0.246	32.7	0.00312	1.00522	0.745
	17.0	1.316	85.7	6.97	4.42	0.0647	0.254	33.9	0.00348	1.00488	0.739
	18.0	1.236	91.4	6.94	4.45	0.0603	0.262	35.0	0.00385	1.00458	0.735
	19.0	1.166	97.0	6.91	4.46	0.0565	0.270	36.1	0.00423	1.00432	0.732
	20.0	1.104	103.0	6.89	4.48	0.0531	0.278	37.2	0.00462	1.00409	0.729
	21.0	1.048	108.0	6.87	4.49	0.0502	0.286	38.3	0.00503	1.00389	0.727
	22.0	0.998	114.0	6.86	4.50	0.0476	0.293	39.4	0.00544	1.00370	0.725
	23.0	0.9531	119.0	6.84	4.51	0.0452	0.301	40.4	0.00586	1.00353	0.724
	24.0	0.9120	124.0	6.83	4.52	0.0431	0.308	41.4	0.00629	1.00338	0.723
	25.0	0.8743	130.0	6.81	4.52	0.0412	0.315	42.5	0.00673	1.00324	0.722
	26.0	0.8398	135.0	6.80	4.53	0.0395	0.322	43.5	0.00718	1.00311	0.721
	28.0	0.7784	146.0	6.78	4.53	0.0364	0.336	45.4	0.00811	1.00288	0.719
	30.0	0.7257	157.0	6.77	4.54	0.0338	0.349	47.3	0.00908	1.00269	0.718
	32.0	0.6798	167.0	6.75	4.54	0.0316	0.363	49.2	0.0101	1.00252	0.717
	34.0	0.6394	178.0	6.74	4.54	0.0296	0.376	51.0	0.0111	1.00237	0.716
	36.0	0.6037	189.0	6.73	4.55	0.0279	0.389	52.8	0.0122	1.00224	0.715
	38.0	0.5718	199.0	6.72	4.55	0.0264	0.401	54.5	0.0133	1.00212	0.714
	40.0	0.5431	210.0	6.71	4.55	0.0250	0.414	56.2	0.0145	1.00201	0.714
	45.0	0.4827	236.0	6.69	4.55	0.0222	0.444	60.3	0.0176	1.00179	0.712
	50.0	0.4346	262.0	6.68	4.55	0.0199	0.474	64.3	0.0208	1.00161	0.710
	55.0	0.3952	288.0	6.67	4.54	0.0181	0.503	68.1	0.0243	1.00146	0.708
	60.0	0.3624	315.0	6.66	4.54	0.0166	0.531	71.8	0.0281	1.00134	0.706
	65.0	0.3347	341.0	6.65	4.54	0.0153	0.558	75.3	0.0320	1.00124	0.704
	70.0	0.3109	367.0	6.65	4.54	0.0142	0.586	78.8	0.0361	1.00115	0.701
	75.0	0.2903	393.0	6.64	4.54	0.0133	0.612	82.2	0.0405	1.00107	0.700
	80.0	0.2722	419.0	6.64	4.54	0.0124	0.638	85.5	0.0450	1.00101	0.698
	90.0	0.2422	471.0	6.63	4.53	0.0110	0.690	92.0	0.0547	1.00090	0.694
	100.0	0.2181	523.0	6.62	4.53	0.00994	0.740	98.2	0.0652	1.00081	0.691
	125.0	0.1747	653.0	6.61	4.52	0.00796	0.859	111.0	0.0946	1.00065	0.673
	150.0	0.1457	783.0	6.61	4.52	0.00664	0.972	125.0	0.128	1.00054	0.670
	175.0	0.1249	913.0	6.60	4.52	0.00569	1.08	139.0	0.166	1.00046	0.668
	200.0	0.1094	1040.0	6.60	4.52	0.00498	1.18	152.0	0.208	1.00040	0.666
	225.0	0.09727	1170.0	6.59	4.51	0.00443	1.28	164.0	0.253	1.00036	0.666
	250.0	0.08757	1300.0	6.59	4.51	0.00399	1.37	176.0	0.302	1.00032	0.666
	275.0	0.07963	1430.0	6.59	4.51	0.00363	1.46	188.0	0.354	1.00029	0.667
	300.0	0.07301	1560.0	6.59	4.51	0.00333	1.55	199.0	0.409	1.00027	0.669
	350.0	0.06260	1820.0	6.59	4.51	0.00285	1.72	222.0	0.530	1.00023	0.668
	400.0	0.05479	2080.0	6.59	4.51	0.00250	1.89	243.0	0.664	1.00020	0.668
	450.0	0.04871	2340.0	6.59	4.51	0.00222	2.05	264.0	0.811	1.00018	0.668
	500.0	0.04385	2600.0	6.58	4.51	0.00200	2.21	284.0	0.970	1.00016	0.667
	600.0	0.03655	3120.0	6.58	4.50	0.00166	2.51	322.0	1.32	1.00014	0.667
	700.0	0.03133	3640.0	6.58	4.50	0.00143	2.80	359.0	1.72	1.00012	0.667
	800.0	0.02742	4160.0	6.58	4.50	0.00125	3.07	394.0	2.16	1.00010	0.667
	900.0	0.02438	4680.0	6.58	4.50	0.00111	3.34	429.0	2.64	1.00009	0.666
	1000.0	0.02194	5200.0	6.58	4.50	0.00100	3.60	462.0	3.16	1.00008	0.666
	1100.0	0.01995	5720.0	6.58	4.50	0.000909	3.85	494.0	3.72	1.00007	0.666
	1200.0	0.01828	6230.0	6.58	4.50	0.000833	4.10	525.0	4.31	1.00007	0.666
	1300.0	0.01688	6750.0	6.58	4.50	0.000769	4.34	556.0	4.95	1.00006	0.666
	1400.0	0.01567	7270.0	6.58	4.50	0.000714	4.57	586.0	5.62	1.00006	0.666
	1500.0	0.01463	7790.0	6.58	4.50	0.000666	4.80	615.0	6.32	1.00005	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

5.0 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.126	0.06446								
	2.5	0.06488	672.0	2.52	3.673	6.960	1.826	1.690	1.790	268.6
	3.0	0.06590	599.0	3.54	4.537	7.876	2.169	1.848	2.125	264.1
	3.5	0.06744	510.0	4.15	5.589	9.005	2.522	2.028	2.573	255.9
	4.0	0.06964	415.0	4.46	6.861	10.39	2.894	2.172	3.111	245.5
	4.5	0.07277	320.0	4.46	8.421	12.11	3.298	2.336	3.837	230.7
	5.0	0.07748	226.0	4.18	10.40	14.32	3.759	2.537	4.888	209.9
	5.1	0.07873	209.0	4.09	10.86	14.85	3.861	2.579	5.148	205.5
	5.2	0.08012	195.0	4.00	11.36	15.42	3.968	2.602	5.381	202.0
	5.3	0.08151	179.0	3.90	11.84	15.97	4.073	2.586	5.623	198.5
	5.4	0.08304	163.0	3.80	12.34	16.55	4.181	2.598	5.937	194.2
	5.5	0.08474	147.0	3.69	12.86	17.16	4.293	2.613	6.301	189.8
	5.6	0.08664	132.0	3.57	13.42	17.81	4.411	2.631	6.725	185.1
	5.7	0.08880	118.0	3.44	14.01	18.51	4.534	2.653	7.223	180.4
	5.8	0.09128	104.0	3.31	14.64	19.26	4.666	2.678	7.809	175.5
	5.9	0.09413	91.4	3.16	15.31	20.08	4.806	2.707	8.501	170.5
	6.0	0.09747	79.6	3.01	16.04	20.98	4.957	2.741	9.309	165.5
	6.5	0.1250	46.8	2.17	20.57	26.91	5.905	2.960	13.36	146.2
	7.0	0.1646	54.1	1.56	25.10	33.44	6.874	3.088	11.72	144.2
	7.5	0.2020	69.8	1.22	28.54	38.77	7.610	3.104	9.736	148.9
	8.0	0.2361	87.2	1.02	31.34	43.30	8.196	3.103	8.488	155.4
	8.5	0.2674	104.0	0.884	33.79	47.34	8.685	3.101	7.709	162.2
	9.0	0.2968	121.0	0.786	36.02	51.05	9.110	3.100	7.197	168.7
	9.5	0.3248	137.0	0.711	38.11	54.56	9.489	3.100	6.842	175.0
	10.0	0.3516	152.0	0.651	40.10	57.91	9.834	3.101	6.585	181.0
	11.0	0.4027	181.0	0.562	43.83	64.23	10.44	3.103	6.254	192.4
	12.0	0.4517	209.0	0.497	47.42	70.31	10.97	3.107	6.046	202.9
	13.0	0.4995	235.0	0.447	50.91	76.22	11.44	3.112	5.904	212.7
	14.0	0.5463	261.0	0.407	54.35	82.02	11.87	3.116	5.799	221.9
	15.0	0.5924	286.0	0.373	57.73	87.74	12.27	3.120	5.719	230.6
	16.0	0.6378	311.0	0.345	61.11	93.42	12.63	3.123	5.648	238.7
	17.0	0.6827	335.0	0.321	64.46	99.04	12.97	3.125	5.592	246.5
	18.0	0.7271	359.0	0.300	67.77	104.6	13.29	3.126	5.546	254.0
	19.0	0.7712	382.0	0.282	71.07	110.1	13.59	3.127	5.507	261.2
	20.0	0.8149	405.0	0.266	74.35	115.6	13.87	3.128	5.475	268.1
	21.0	0.8583	428.0	0.252	77.61	121.1	14.14	3.128	5.447	274.9
	22.0	0.9015	451.0	0.239	80.85	126.5	14.39	3.128	5.424	281.4
	23.0	0.9445	473.0	0.228	84.09	131.9	14.63	3.128	5.403	287.8
	24.0	0.9873	496.0	0.217	87.31	137.3	14.86	3.129	5.386	294.0
	25.0	1.030	518.0	0.208	90.53	142.7	15.08	3.128	5.370	300.0
	26.0	1.072	540.0	0.199	93.74	148.1	15.29	3.128	5.356	305.9
	28.0	1.157	583.0	0.184	100.1	158.8	15.69	3.128	5.333	317.4
	30.0	1.241	627.0	0.171	106.5	169.4	16.06	3.128	5.314	328.4
	32.0	1.325	670.0	0.160	112.9	180.0	16.40	3.127	5.299	339.0
	34.0	1.409	712.0	0.150	119.2	190.6	16.72	3.127	5.286	349.3
	36.0	1.493	755.0	0.141	125.5	201.2	17.02	3.126	5.276	359.2
	38.0	1.576	797.0	0.134	131.9	211.7	17.31	3.126	5.267	368.8
	40.0	1.659	839.0	0.127	138.2	222.2	17.58	3.125	5.259	378.2
	45.0	1.866	944.0	0.112	153.9	248.5	18.19	3.124	5.244	400.7
	50.0	2.073	1050.0	0.101	169.6	274.7	18.75	3.124	5.234	421.9
	55.0	2.280	1150.0	0.0915	185.3	300.8	19.24	3.123	5.226	442.0
	60.0	2.486	1260.0	0.0837	201.0	326.9	19.70	3.122	5.220	461.2
	65.0	2.692	1360.0	0.0772	216.7	353.0	20.12	3.122	5.216	479.7
	70.0	2.898	1460.0	0.0717	232.3	379.1	20.50	3.121	5.212	497.4
	75.0	3.103	1570.0	0.0668	247.9	405.2	20.86	3.121	5.209	514.6
	80.0	3.309	1670.0	0.0626	263.6	431.2	21.20	3.121	5.207	531.1
	90.0	3.720	1870.0	0.0556	294.8	483.2	21.81	3.120	5.204	562.8
	100.0	4.130	2080.0	0.0501	326.0	535.3	22.36	3.120	5.201	592.8
	125.0	5.156	2590.0	0.0400	404.0	665.3	23.52	3.119	5.198	661.7
	150.0	6.181	3110.0	0.0333	482.0	795.2	24.47	3.118	5.196	724.1
	175.0	7.205	3620.0	0.0286	560.0	925.0	25.27	3.118	5.195	781.5
	200.0	8.231	4130.0	0.0250	637.9	1055.0	25.96	3.118	5.194	835.0
	225.0	9.256	4640.0	0.0222	715.8	1185.0	26.57	3.117	5.194	885.3
	250.0	10.28	5160.0	0.0200	793.8	1315.0	27.12	3.117	5.194	932.8
	275.0	11.31	5670.0	0.0182	871.7	1444.0	27.62	3.117	5.193	978.1
	300.0	12.33	6180.0	0.0167	949.6	1574.0	28.07	3.117	5.193	1021.0
	350.0	14.38	7200.0	0.0143	1105.0	1834.0	28.87	3.117	5.193	1103.0
	400.0	16.43	8230.0	0.0125	1261.0	2094.0	29.56	3.117	5.193	1179.0
	450.0	18.48	9250.0	0.0111	1417.0	2353.0	30.17	3.117	5.193	1250.0
	500.0	20.53	10300.0	0.0100	1573.0	2613.0	30.72	3.117	5.193	1317.0
	600.0	24.63	12300.0	0.00833	1884.0	3132.0	31.67	3.117	5.193	1443.0
	700.0	28.73	14400.0	0.00714	2196.0	3651.0	32.47	3.116	5.193	1558.0
	800.0	32.83	16400.0	0.00625	2508.0	4171.0	33.16	3.116	5.193	1665.0
	900.0	36.93	18500.0	0.00555	2819.0	4690.0	33.77	3.116	5.193	1766.0
	1000.0	41.02	20500.0	0.00500	3131.0	5209.0	34.32	3.116	5.193	1861.0
	1100.0	45.12	22600.0	0.00454	3442.0	5729.0	34.82	3.116	5.193	1952.0
	1200.0	49.22	24600.0	0.00417	3754.0	6248.0	35.27	3.116	5.193	2039.0
	1300.0	53.32	26700.0	0.00385	4066.0	6767.0	35.68	3.116	5.193	2122.0
	1400.0	57.42	28700.0	0.00357	4377.0	7286.0	36.07	3.116	5.193	2202.0
	1500.0	61.52	30800.0	0.00333	4689.0	7806.0	36.43	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

5.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_p$ J/G	$V(\partial P/\partial U)_v$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.126	15.51									
2.5	15.41	73.7	9.67	104.0	0.0243	0.178	48.0	0.000646	1.05806	0.482
3.0	15.17	54.5	12.6	90.9	0.0390	0.195	46.9	0.000606	1.05715	0.511
3.5	14.83	46.8	13.8	75.6	0.0549	0.208	44.6	0.000545	1.05582	0.552
4.0	14.36	41.7	14.3	59.7	0.0747	0.219	41.9	0.000490	1.05403	0.594
4.5	13.74	37.8	13.9	44.0	0.101	0.227	38.9	0.000431	1.05166	0.657
5.0	12.91	34.1	12.8	29.1	0.143	0.230	35.8	0.000365	1.04848	0.759
5.1	12.70	33.4	12.5	26.5	0.154	0.230	35.1	0.000352	1.04770	0.786
5.2	12.48	32.7	12.3	24.3	0.165	0.229	34.4	0.000342	1.04686	0.807
5.3	12.27	31.6	12.3	21.9	0.178	0.229	33.9	0.000332	1.04605	0.831
5.4	12.04	30.7	12.1	19.6	0.194	0.228	33.3	0.000319	1.04519	0.865
5.5	11.80	29.7	12.0	17.4	0.212	0.229	32.7	0.000307	1.04427	0.901
5.6	11.54	28.8	11.7	15.3	0.233	0.228	32.1	0.000294	1.04329	0.946
5.7	11.26	27.9	11.5	13.3	0.259	0.227	31.5	0.000280	1.04222	1.00
5.8	10.96	27.0	11.3	11.4	0.289	0.227	30.8	0.000265	1.04106	1.06
5.9	10.62	26.1	11.0	9.71	0.326	0.226	30.2	0.000250	1.03980	1.14
6.0	10.26	25.3	10.7	8.17	0.368	0.224	29.5	0.000235	1.03842	1.23
6.5	7.939	23.0	9.18	3.74	0.581	0.214	26.3	0.000200	1.02988	1.64
7.0	6.077	24.7	8.31	3.29	0.474	0.197	24.6	0.000276	1.02265	1.47
7.5	4.951	27.5	7.95	3.46	0.354	0.189	24.2	0.000391	1.01843	1.25
8.0	4.236	30.7	7.75	3.69	0.276	0.187	24.3	0.000519	1.01576	1.10
8.5	3.739	34.1	7.62	3.90	0.226	0.187	24.6	0.000650	1.01390	1.01
9.0	3.369	37.4	7.52	4.08	0.193	0.190	25.0	0.000784	1.01252	0.947
9.5	3.079	40.6	7.44	4.22	0.168	0.193	25.5	0.000918	1.01144	0.902
10.0	2.844	43.8	7.38	4.33	0.150	0.197	26.0	0.00105	1.01056	0.869
11.0	2.484	50.1	7.30	4.50	0.125	0.205	27.1	0.00132	1.00922	0.827
12.0	2.214	56.2	7.23	4.62	0.108	0.214	28.3	0.00160	1.00822	0.800
13.0	2.002	62.2	7.18	4.71	0.0949	0.223	29.5	0.00189	1.00743	0.782
14.0	1.830	68.1	7.13	4.78	0.0851	0.231	30.7	0.00218	1.00679	0.769
15.0	1.688	74.0	7.09	4.83	0.0773	0.240	31.8	0.00248	1.00626	0.759
16.0	1.568	79.8	7.05	4.88	0.0708	0.248	33.0	0.00280	1.00581	0.751
17.0	1.465	85.5	7.01	4.91	0.0654	0.256	34.1	0.00313	1.00543	0.745
18.0	1.375	91.2	6.98	4.94	0.0608	0.264	35.2	0.00346	1.00510	0.740
19.0	1.297	96.8	6.95	4.96	0.0569	0.272	36.3	0.00381	1.00481	0.736
20.0	1.227	102.0	6.93	4.97	0.0535	0.280	37.4	0.00416	1.00455	0.733
21.0	1.165	108.0	6.91	4.99	0.0505	0.287	38.5	0.00453	1.00432	0.730
22.0	1.109	113.0	6.89	5.00	0.0478	0.295	39.6	0.00490	1.00411	0.728
23.0	1.059	119.0	6.87	5.01	0.0454	0.302	40.6	0.00528	1.00392	0.726
24.0	1.013	124.0	6.85	5.02	0.0433	0.309	41.6	0.00567	1.00375	0.725
25.0	0.9710	130.0	6.84	5.03	0.0413	0.316	42.6	0.00607	1.00360	0.724
26.0	0.9325	135.0	6.83	5.03	0.0396	0.323	43.6	0.00647	1.00346	0.723
28.0	0.8642	146.0	6.81	5.04	0.0365	0.337	45.6	0.00731	1.00320	0.721
30.0	0.8056	157.0	6.79	5.05	0.0339	0.351	47.5	0.00819	1.00298	0.719
32.0	0.7545	168.0	6.77	5.05	0.0316	0.364	49.3	0.00910	1.00280	0.718
34.0	0.7097	178.0	6.76	5.05	0.0297	0.377	51.1	0.0100	1.00263	0.717
36.0	0.6700	189.0	6.75	5.06	0.0279	0.390	52.9	0.0110	1.00248	0.716
38.0	0.6346	199.0	6.73	5.06	0.0264	0.402	54.6	0.0120	1.00235	0.715
40.0	0.6027	210.0	6.72	5.06	0.0250	0.415	56.3	0.0131	1.00223	0.714
45.0	0.5358	236.0	6.71	5.06	0.0222	0.445	60.4	0.0158	1.00198	0.712
50.0	0.4823	263.0	6.69	5.06	0.0199	0.475	64.4	0.0188	1.00179	0.710
55.0	0.4386	289.0	6.68	5.05	0.0181	0.503	68.2	0.0220	1.00162	0.708
60.0	0.4023	315.0	6.67	5.05	0.0166	0.532	71.9	0.0253	1.00149	0.706
65.0	0.3715	341.0	6.66	5.05	0.0153	0.559	75.4	0.0289	1.00138	0.704
70.0	0.3451	367.0	6.65	5.05	0.0142	0.586	78.9	0.0326	1.00128	0.702
75.0	0.3222	393.0	6.65	5.05	0.0132	0.613	82.3	0.0365	1.00119	0.700
80.0	0.3022	419.0	6.64	5.04	0.0124	0.639	85.6	0.0406	1.00112	0.698
90.0	0.2689	471.0	6.63	5.04	0.0110	0.690	92.1	0.0493	1.00100	0.694
100.0	0.2421	523.0	6.63	5.04	0.00994	0.740	98.3	0.0588	1.00090	0.691
125.0	0.1940	653.0	6.62	5.03	0.00796	0.860	111.0	0.0853	1.00072	0.673
150.0	0.1618	783.0	6.61	5.03	0.00663	0.973	125.0	0.116	1.00060	0.670
175.0	0.1388	913.0	6.60	5.02	0.00569	1.08	139.0	0.150	1.00051	0.668
200.0	0.1215	1040.0	6.60	5.02	0.00498	1.18	152.0	0.187	1.00045	0.666
225.0	0.1080	1170.0	6.60	5.02	0.00443	1.28	164.0	0.228	1.00040	0.666
250.0	0.09727	1300.0	6.59	5.01	0.00399	1.37	176.0	0.272	1.00036	0.666
275.0	0.08845	1430.0	6.59	5.01	0.00363	1.46	188.0	0.319	1.00033	0.667
300.0	0.08110	1560.0	6.59	5.01	0.00332	1.55	199.0	0.368	1.00030	0.668
350.0	0.06954	1820.0	6.59	5.01	0.00285	1.72	222.0	0.477	1.00026	0.668
400.0	0.06087	2080.0	6.59	5.01	0.00249	1.89	243.0	0.598	1.00023	0.668
450.0	0.05412	2340.0	6.59	5.01	0.00222	2.05	264.0	0.730	1.00020	0.668
500.0	0.04871	2600.0	6.59	5.01	0.00200	2.21	284.0	0.873	1.00018	0.667
600.0	0.04061	3120.0	6.58	5.01	0.00166	2.51	322.0	1.19	1.00015	0.667
700.0	0.03481	3640.0	6.58	5.00	0.00143	2.80	359.0	1.55	1.00013	0.667
800.0	0.03046	4160.0	6.58	5.00	0.00125	3.07	394.0	1.94	1.00011	0.667
900.0	0.02708	4680.0	6.58	5.00	0.00111	3.34	429.0	2.37	1.00010	0.666
1000.0	0.02438	5200.0	6.58	5.00	0.00100	3.60	462.0	2.84	1.00009	0.666
1100.0	0.02216	5720.0	6.58	5.00	0.000908	3.85	494.0	3.35	1.00008	0.666
1200.0	0.02032	6240.0	6.58	5.00	0.000833	4.10	525.0	3.88	1.00008	0.666
1300.0	0.01875	6760.0	6.58	5.00	0.000769	4.34	556.0	4.45	1.00007	0.666
1400.0	0.01741	7280.0	6.58	5.00	0.000714	4.57	586.0	5.05	1.00006	0.666
1500.0	0.01625	7800.0	6.58	5.00	0.000666	4.80	615.0	5.69	1.00006	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

5.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.121	0.06416								
2.5	0.06456	694.0	2.50	3.661	7.259	1.814	1.671	1.765	272.6
3.0	0.06553	622.0	3.55	4.509	8.161	2.153	1.840	2.104	268.3
3.5	0.06700	533.0	4.18	5.541	9.274	2.502	2.019	2.540	260.7
4.0	0.06908	440.0	4.51	6.785	10.63	2.867	2.161	3.055	251.0
4.5	0.07200	345.0	4.54	8.302	12.32	3.262	2.324	3.735	237.1
5.0	0.07628	252.0	4.29	10.20	14.45	3.707	2.521	4.674	217.7
5.1	0.07739	236.0	4.22	10.65	14.96	3.805	2.561	4.897	213.6
5.2	0.07861	222.0	4.13	11.12	15.50	3.906	2.582	5.092	210.5
5.3	0.07982	206.0	4.05	11.57	16.02	4.004	2.565	5.283	207.4
5.4	0.08112	190.0	3.95	12.03	16.56	4.106	2.574	5.532	203.5
5.5	0.08256	175.0	3.85	12.52	17.12	4.210	2.587	5.813	199.5
5.6	0.08414	160.0	3.75	13.03	17.72	4.318	2.602	6.132	195.4
5.7	0.08589	145.0	3.64	13.57	18.35	4.430	2.619	6.495	191.1
5.8	0.08785	131.0	3.52	14.13	19.02	4.547	2.640	6.911	186.7
5.9	0.09005	118.0	3.39	14.72	19.74	4.670	2.663	7.388	182.2
6.0	0.09254	106.0	3.26	15.36	20.51	4.799	2.689	7.932	177.7
6.5	0.1116	61.6	2.53	19.18	25.40	5.581	2.863	11.36	157.4
7.0	0.1432	57.1	1.86	23.66	31.65	6.507	3.041	11.83	150.0
7.5	0.1753	69.3	1.44	27.31	37.14	7.266	3.084	10.16	152.1
8.0	0.2075	84.8	1.19	30.31	41.88	7.878	3.094	8.887	157.1
8.5	0.2366	101.0	1.02	32.91	46.09	8.389	3.095	8.031	163.1
9.0	0.2646	118.0	0.898	35.25	49.96	8.831	3.096	7.452	169.3
9.5	0.2930	134.0	0.807	37.42	53.58	9.222	3.097	7.047	175.4
10.0	0.3149	149.0	0.736	39.47	57.02	9.576	3.099	6.752	181.4
11.0	0.3621	178.0	0.632	43.30	63.48	10.19	3.101	6.372	192.7
12.0	0.4074	206.0	0.557	46.94	69.64	10.73	3.106	6.137	203.2
13.0	0.4514	233.0	0.499	50.48	75.63	11.21	3.111	5.977	213.0
14.0	0.4944	259.0	0.453	53.94	81.50	11.65	3.116	5.861	222.3
15.0	0.5367	285.0	0.415	57.36	87.27	12.04	3.120	5.772	231.0
16.0	0.5784	310.0	0.383	60.77	93.00	12.41	3.123	5.694	239.2
17.0	0.6195	334.0	0.356	64.14	98.66	12.76	3.125	5.632	247.0
18.0	0.6602	358.0	0.333	67.47	104.3	13.08	3.127	5.581	254.5
19.0	0.7005	382.0	0.312	70.79	109.8	13.38	3.128	5.538	261.7
20.0	0.7404	405.0	0.294	74.08	115.3	13.66	3.129	5.503	268.7
21.0	0.7801	428.0	0.278	77.36	120.8	13.93	3.129	5.472	275.4
22.0	0.8196	451.0	0.264	80.62	126.3	14.18	3.129	5.447	282.0
23.0	0.8588	474.0	0.251	83.87	131.7	14.43	3.130	5.424	288.4
24.0	0.8979	496.0	0.240	87.10	137.1	14.66	3.130	5.404	294.6
25.0	0.9368	518.0	0.229	90.33	142.5	14.88	3.130	5.387	300.6
26.0	0.9756	540.0	0.220	93.55	147.9	15.09	3.130	5.372	306.6
28.0	1.053	584.0	0.203	100.0	158.6	15.48	3.129	5.346	318.0
30.0	1.130	628.0	0.189	106.4	169.3	15.85	3.129	5.326	329.0
32.0	1.206	671.0	0.176	112.7	179.9	16.20	3.128	5.309	339.6
34.0	1.282	714.0	0.165	119.1	190.5	16.52	3.128	5.295	349.9
36.0	1.358	756.0	0.156	125.4	201.1	16.82	3.127	5.284	359.8
38.0	1.434	799.0	0.147	131.7	211.7	17.10	3.127	5.274	369.5
40.0	1.510	841.0	0.140	138.1	222.2	17.38	3.126	5.266	378.8
45.0	1.699	946.0	0.124	153.8	248.5	17.99	3.125	5.249	401.3
50.0	1.887	1050.0	0.111	169.6	274.7	18.55	3.124	5.238	422.4
55.0	2.075	1150.0	0.101	185.3	300.9	19.05	3.124	5.229	442.6
60.0	2.262	1260.0	0.0922	200.9	327.0	19.50	3.123	5.223	461.8
65.0	2.450	1360.0	0.0850	216.6	353.1	19.92	3.122	5.218	480.2
70.0	2.637	1470.0	0.0789	232.3	379.2	20.30	3.122	5.214	498.0
75.0	2.824	1570.0	0.0736	247.9	405.3	20.66	3.121	5.211	515.1
80.0	3.011	1670.0	0.0689	263.5	431.3	21.00	3.121	5.209	531.6
90.0	3.384	1880.0	0.0612	294.8	483.4	21.61	3.120	5.205	563.3
100.0	3.757	2080.0	0.0551	326.0	535.4	22.16	3.120	5.202	593.2
125.0	4.690	2600.0	0.0440	404.0	665.4	23.32	3.119	5.198	662.1
150.0	5.622	3110.0	0.0367	482.0	795.3	24.27	3.118	5.196	724.5
175.0	6.554	3620.0	0.0314	560.0	925.2	25.07	3.118	5.195	781.9
200.0	7.486	4130.0	0.0275	637.9	1055.0	25.76	3.118	5.194	835.3
225.0	8.417	4650.0	0.0244	715.8	1185.0	26.38	3.118	5.194	885.6
250.0	9.349	5160.0	0.0220	793.8	1315.0	26.92	3.117	5.194	933.1
275.0	10.28	5670.0	0.0200	871.7	1445.0	27.42	3.117	5.193	978.3
300.0	11.21	6180.0	0.0183	949.6	1574.0	27.87	3.117	5.193	1022.0
350.0	13.08	7210.0	0.0157	1105.0	1834.0	28.67	3.117	5.193	1103.0
400.0	14.94	8230.0	0.0137	1261.0	2094.0	29.36	3.117	5.193	1179.0
450.0	16.80	9260.0	0.0122	1417.0	2353.0	29.98	3.117	5.193	1250.0
500.0	18.66	10300.0	0.0110	1573.0	2613.0	30.52	3.117	5.193	1317.0
600.0	22.39	12300.0	0.00916	1884.0	3132.0	31.47	3.117	5.193	1443.0
700.0	26.12	14400.0	0.00786	2196.0	3652.0	32.27	3.117	5.193	1558.0
800.0	29.84	16400.0	0.00687	2508.0	4171.0	32.96	3.116	5.193	1665.0
900.0	33.57	18500.0	0.00611	2819.0	4690.0	33.58	3.116	5.193	1766.0
1000.0	37.30	20500.0	0.00550	3131.0	5209.0	34.12	3.116	5.193	1861.0
1100.0	41.02	22600.0	0.00500	3442.0	5729.0	34.62	3.116	5.193	1952.0
1200.0	44.75	24600.0	0.00458	3754.0	6248.0	35.07	3.116	5.193	2039.0
1300.0	48.48	26700.0	0.00423	4066.0	6767.0	35.48	3.116	5.193	2122.0
1400.0	52.20	28700.0	0.00393	4377.0	7287.0	35.87	3.116	5.193	2202.0
1500.0	55.93	30800.0	0.00367	4689.0	7806.0	36.23	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

5.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.121	15.58									
2.5	15.49	76.0	9.65	108.0	0.0232	0.179	49.0	0.000656	1.05835	0.482
3.0	15.25	56.3	12.6	94.9	0.0374	0.197	47.9	0.000613	1.05747	0.512
3.5	14.93	48.4	13.9	79.6	0.0525	0.210	45.6	0.000553	1.05619	0.552
4.0	14.48	43.1	14.4	63.7	0.0708	0.221	42.8	0.000500	1.05447	0.591
4.5	13.83	39.4	14.1	47.9	0.0947	0.230	39.8	0.000443	1.05223	0.647
5.0	13.11	36.0	13.0	33.1	0.130	0.234	36.7	0.000382	1.04925	0.734
5.1	12.92	35.3	12.7	30.4	0.139	0.234	36.1	0.000370	1.04854	0.756
5.2	12.72	34.7	12.6	28.2	0.147	0.234	35.4	0.000361	1.04777	0.772
5.3	12.53	33.7	12.6	25.8	0.157	0.234	34.9	0.000353	1.04704	0.789
5.4	12.33	32.8	12.5	23.5	0.169	0.233	34.3	0.000342	1.04627	0.814
5.5	12.11	31.9	12.3	21.2	0.182	0.233	33.8	0.000331	1.04546	0.843
5.6	11.89	31.1	12.1	19.0	0.197	0.233	33.2	0.000319	1.04459	0.875
5.7	11.64	30.2	11.9	16.9	0.215	0.232	32.7	0.000307	1.04367	0.913
5.8	11.38	29.4	11.7	15.0	0.235	0.232	32.1	0.000295	1.04268	0.957
5.9	11.10	28.6	11.5	13.1	0.259	0.231	31.5	0.000282	1.04163	1.01
6.0	10.81	27.8	11.2	11.4	0.286	0.230	30.9	0.000268	1.04049	1.07
6.5	8.959	24.8	9.85	5.52	0.458	0.222	28.0	0.000218	1.03350	1.43
7.0	6.981	25.4	8.75	3.99	0.466	0.208	25.9	0.000251	1.02605	1.48
7.5	5.672	27.7	8.23	3.93	0.366	0.197	25.1	0.000343	1.02113	1.29
8.0	4.819	30.6	7.96	4.09	0.290	0.193	25.0	0.000452	1.01793	1.15
8.5	4.226	33.8	7.78	4.28	0.238	0.193	25.2	0.000569	1.01572	1.05
9.0	3.788	37.0	7.66	4.46	0.202	0.195	25.6	0.000690	1.01438	0.978
9.5	3.449	40.2	7.56	4.61	0.175	0.197	26.0	0.000812	1.01282	0.928
10.0	3.176	43.4	7.48	4.73	0.156	0.201	26.5	0.000936	1.01180	0.891
11.0	2.752	49.7	7.38	4.93	0.128	0.208	27.5	0.00118	1.01025	0.842
12.0	2.455	55.8	7.30	5.06	0.110	0.217	28.7	0.00144	1.00911	0.812
13.0	2.216	61.9	7.24	5.16	0.0966	0.225	29.8	0.00170	1.00822	0.791
14.0	2.023	67.8	7.19	5.24	0.0864	0.234	31.0	0.00197	1.00750	0.777
15.0	1.863	73.7	7.14	5.31	0.0783	0.242	32.1	0.00225	1.00691	0.766
16.0	1.729	79.6	7.10	5.36	0.0716	0.250	33.2	0.00254	1.00641	0.757
17.0	1.614	85.4	7.06	5.39	0.0660	0.258	34.4	0.00284	1.00599	0.750
18.0	1.515	91.1	7.02	5.43	0.0613	0.266	35.5	0.00315	1.00562	0.744
19.0	1.428	96.7	6.99	5.45	0.0573	0.274	36.6	0.00346	1.00529	0.740
20.0	1.351	102.0	6.96	5.47	0.0538	0.281	37.6	0.00379	1.00501	0.736
21.0	1.282	108.0	6.94	5.49	0.0507	0.289	38.7	0.00412	1.00475	0.733
22.0	1.220	113.0	6.92	5.50	0.0480	0.296	39.7	0.00446	1.00452	0.731
23.0	1.164	119.0	6.90	5.52	0.0456	0.303	40.8	0.00480	1.00432	0.729
24.0	1.114	124.0	6.88	5.52	0.0434	0.311	41.8	0.00516	1.00413	0.727
25.0	1.067	130.0	6.87	5.53	0.0415	0.318	42.8	0.00552	1.00396	0.726
26.0	1.025	135.0	6.85	5.54	0.0397	0.325	43.8	0.00590	1.00380	0.724
28.0	0.9499	146.0	6.83	5.55	0.0366	0.338	45.7	0.00666	1.00352	0.722
30.0	0.8853	157.0	6.81	5.56	0.0339	0.352	47.6	0.00746	1.00328	0.721
32.0	0.8291	168.0	6.79	5.56	0.0317	0.365	49.4	0.00829	1.00307	0.719
34.0	0.7798	178.0	6.77	5.57	0.0297	0.378	51.3	0.00915	1.00289	0.718
36.0	0.7362	189.0	6.76	5.57	0.0280	0.391	53.0	0.0100	1.00273	0.717
38.0	0.6972	200.0	6.75	5.57	0.0264	0.403	54.7	0.0111	1.00258	0.716
40.0	0.6623	210.0	6.74	5.57	0.0250	0.416	56.4	0.0119	1.00245	0.715
45.0	0.5887	237.0	6.72	5.57	0.0222	0.446	60.5	0.0144	1.00218	0.713
50.0	0.5300	263.0	6.70	5.57	0.0199	0.475	64.5	0.0171	1.00196	0.710
55.0	0.4820	289.0	6.69	5.57	0.0181	0.504	68.3	0.0200	1.00179	0.708
60.0	0.4420	315.0	6.68	5.56	0.0166	0.532	71.9	0.0231	1.00164	0.706
65.0	0.4082	341.0	6.67	5.56	0.0153	0.560	75.5	0.0263	1.00151	0.704
70.0	0.3793	368.0	6.66	5.56	0.0142	0.587	79.0	0.0297	1.00140	0.702
75.0	0.3542	394.0	6.65	5.56	0.0132	0.614	82.4	0.0332	1.00131	0.701
80.0	0.3322	420.0	6.65	5.55	0.0124	0.640	85.7	0.0368	1.00123	0.698
90.0	0.2955	472.0	6.64	5.55	0.0110	0.691	92.1	0.0449	1.00109	0.694
100.0	0.2661	524.0	6.63	5.54	0.00993	0.741	98.4	0.0535	1.00099	0.691
125.0	0.2132	654.0	6.62	5.54	0.00795	0.860	111.0	0.0776	1.00079	0.673
150.0	0.1779	784.0	6.61	5.53	0.00663	0.973	125.0	0.105	1.00066	0.670
175.0	0.1526	914.0	6.61	5.53	0.00569	1.08	139.0	0.136	1.00056	0.668
200.0	0.1336	1040.0	6.60	5.52	0.00498	1.18	152.0	0.170	1.00049	0.666
225.0	0.1188	1170.0	6.60	5.52	0.00443	1.28	164.0	0.208	1.00044	0.666
250.0	0.1070	1300.0	6.60	5.52	0.00399	1.37	176.0	0.247	1.00040	0.666
275.0	0.09727	1430.0	6.59	5.52	0.00362	1.46	188.0	0.290	1.00036	0.667
300.0	0.08919	1560.0	6.59	5.51	0.00332	1.55	199.0	0.335	1.00033	0.668
350.0	0.07648	1820.0	6.59	5.51	0.00285	1.72	222.0	0.434	1.00028	0.668
400.0	0.06694	2080.0	6.59	5.51	0.00249	1.89	243.0	0.544	1.00025	0.668
450.0	0.05952	2340.0	6.59	5.51	0.00222	2.05	264.0	0.664	1.00022	0.668
500.0	0.05358	2600.0	6.59	5.51	0.00200	2.21	284.0	0.794	1.00020	0.667
600.0	0.04466	3120.0	6.58	5.51	0.00166	2.51	322.0	1.08	1.00017	0.667
700.0	0.03829	3640.0	6.58	5.51	0.00143	2.80	359.0	1.41	1.00014	0.667
800.0	0.03351	4160.0	6.58	5.50	0.00125	3.07	394.0	1.77	1.00012	0.667
900.0	0.02979	4680.0	6.58	5.50	0.00111	3.34	429.0	2.16	1.00011	0.666
1000.0	0.02681	5200.0	6.58	5.50	0.00100	3.60	462.0	2.58	1.00010	0.666
1100.0	0.02438	5720.0	6.58	5.50	0.0009088	3.85	494.0	3.04	1.00009	0.666
1200.0	0.02235	6240.0	6.58	5.50	0.0008333	4.10	525.0	3.53	1.00008	0.666
1300.0	0.02063	6750.0	6.58	5.50	0.0007692	4.34	556.0	4.05	1.00008	0.666
1400.0	0.01916	7270.0	6.58	5.50	0.0007143	4.57	586.0	4.59	1.00007	0.666
1500.0	0.01788	7790.0	6.58	5.50	0.0006666	4.80	615.0	5.17	1.00007	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

6.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.115	0.06388								
2.5	0.06426	716.0	2.48	3.650	7.557	1.803	1.652	1.742	276.5
3.0	0.06519	644.0	3.55	4.483	8.446	2.137	1.832	2.084	272.4
3.5	0.06658	556.0	4.20	5.497	9.545	2.482	2.010	2.510	265.2
4.0	0.06855	464.0	4.56	6.716	10.88	2.842	2.151	3.005	256.2
4.5	0.07130	370.0	4.61	8.195	12.53	3.229	2.312	3.647	243.1
5.0	0.07523	278.0	4.40	10.03	14.61	3.661	2.506	4.502	224.9
5.1	0.07623	261.0	4.33	10.46	15.09	3.754	2.545	4.698	221.1
5.2	0.07732	248.0	4.26	10.90	15.61	3.851	2.565	4.866	218.3
5.3	0.07839	232.0	4.18	11.33	16.10	3.945	2.546	5.023	215.5
5.4	0.07954	217.0	4.09	11.78	16.61	4.041	2.554	5.228	211.9
5.5	0.08078	201.0	4.00	12.24	17.15	4.139	2.565	5.457	208.3
5.6	0.08214	186.0	3.91	12.71	17.71	4.240	2.578	5.711	204.5
5.7	0.08362	172.0	3.80	13.21	18.29	4.343	2.593	5.996	200.6
5.8	0.08525	158.0	3.70	13.73	18.91	4.451	2.610	6.315	196.6
5.9	0.08704	144.0	3.59	14.27	19.56	4.563	2.630	6.672	192.6
6.0	0.08904	131.0	3.47	14.84	20.25	4.679	2.652	7.072	188.4
6.5	0.1033	80.8	2.82	18.18	24.46	5.353	2.794	9.705	168.6
7.0	0.1275	63.5	2.15	22.28	30.03	6.179	2.984	11.38	157.1
7.5	0.1566	71.2	1.67	26.14	35.66	6.956	3.057	10.36	156.4
8.0	0.1848	84.5	1.36	29.30	40.53	7.586	3.080	9.181	159.8
8.5	0.2117	100.0	1.16	32.02	44.89	8.115	3.088	8.307	164.8
9.0	0.2371	115.0	1.02	34.47	48.88	8.571	3.091	7.686	170.5
9.5	0.2613	131.0	0.909	36.72	52.61	8.974	3.094	7.241	176.3
10.0	0.2845	146.0	0.825	38.84	56.14	9.336	3.096	6.913	182.0
11.0	0.3285	176.0	0.704	42.75	62.73	9.97	3.099	6.487	193.1
12.0	0.3706	204.0	0.618	46.46	68.99	10.51	3.104	6.226	203.6
13.0	0.4114	231.0	0.552	50.04	75.05	11.00	3.110	6.049	213.4
14.0	0.4512	258.0	0.500	53.54	80.97	11.44	3.115	5.921	222.7
15.0	0.4904	283.0	0.458	56.98	86.80	11.84	3.120	5.824	231.5
16.0	0.5289	309.0	0.422	60.42	92.58	12.21	3.123	5.739	239.7
17.0	0.5669	333.0	0.391	63.81	98.28	12.56	3.126	5.671	247.5
18.0	0.6044	358.0	0.365	67.18	103.9	12.88	3.128	5.615	255.1
19.0	0.6416	382.0	0.343	70.51	109.5	13.18	3.129	5.569	262.3
20.0	0.6784	405.0	0.323	73.82	115.1	13.47	3.130	5.530	269.3
21.0	0.7150	428.0	0.305	77.11	120.6	13.74	3.130	5.497	276.0
22.0	0.7513	451.0	0.290	80.38	126.1	13.99	3.131	5.469	282.6
23.0	0.7874	474.0	0.275	83.64	131.5	14.24	3.131	5.444	289.0
24.0	0.8234	497.0	0.263	86.89	136.9	14.47	3.131	5.423	295.2
25.0	0.8592	519.0	0.251	90.13	142.4	14.69	3.131	5.404	301.3
26.0	0.8949	541.0	0.241	93.35	147.8	14.90	3.131	5.388	307.2
28.0	0.9658	585.0	0.222	99.8	158.5	15.30	3.130	5.360	318.7
30.0	1.036	629.0	0.206	106.2	169.2	15.67	3.130	5.338	329.7
32.0	1.107	672.0	0.193	112.6	179.9	16.01	3.129	5.319	340.3
34.0	1.177	715.0	0.181	118.9	190.5	16.33	3.129	5.304	350.5
36.0	1.247	758.0	0.170	125.3	201.1	16.64	3.128	5.292	360.4
38.0	1.316	801.0	0.161	131.6	211.6	16.92	3.128	5.281	370.1
40.0	1.386	843.0	0.152	138.0	222.2	17.19	3.127	5.272	379.5
45.0	1.559	948.0	0.135	153.7	248.5	17.81	3.126	5.254	401.9
50.0	1.732	1050.0	0.121	169.5	274.8	18.36	3.125	5.242	423.0
55.0	1.904	1160.0	0.110	185.2	300.9	18.86	3.124	5.233	443.1
60.0	2.076	1260.0	0.101	200.9	327.1	19.32	3.124	5.226	462.3
65.0	2.248	1360.0	0.0928	216.5	353.2	19.74	3.123	5.220	480.8
70.0	2.419	1470.0	0.0861	232.2	379.3	20.12	3.122	5.216	498.5
75.0	2.591	1570.0	0.0803	247.9	405.4	20.48	3.122	5.213	515.6
80.0	2.762	1670.0	0.0752	263.5	431.4	20.82	3.121	5.210	532.1
90.0	3.104	1880.0	0.0668	294.8	483.5	21.43	3.121	5.206	563.7
100.0	3.447	2090.0	0.0601	326.0	535.5	21.98	3.120	5.203	593.6
125.0	4.302	2600.0	0.0480	404.0	665.5	23.14	3.119	5.199	662.5
150.0	5.156	3110.0	0.0400	482.0	795.5	24.09	3.119	5.196	724.8
175.0	6.010	3620.0	0.0343	560.0	925.4	24.89	3.118	5.195	782.2
200.0	6.864	4140.0	0.0300	637.9	1055.0	25.58	3.118	5.194	835.6
225.0	7.718	4650.0	0.0267	715.9	1185.0	26.20	3.118	5.194	885.8
250.0	8.572	5160.0	0.0240	793.8	1315.0	26.74	3.118	5.194	933.4
275.0	9.426	5670.0	0.0218	871.7	1445.0	27.24	3.117	5.193	978.6
300.0	10.28	6190.0	0.0200	949.6	1575.0	27.69	3.117	5.193	1022.0
350.0	11.99	7210.0	0.0171	1105.0	1834.0	28.49	3.117	5.193	1103.0
400.0	13.70	8230.0	0.0150	1261.0	2094.0	29.18	3.117	5.193	1179.0
450.0	15.40	9260.0	0.0133	1417.0	2354.0	29.80	3.117	5.193	1250.0
500.0	17.11	10300.0	0.0120	1573.0	2613.0	30.34	3.117	5.193	1317.0
600.0	20.53	12300.0	0.0100	1885.0	3132.0	31.29	3.117	5.193	1443.0
700.0	23.94	14400.0	0.00857	2196.0	3652.0	32.09	3.117	5.193	1558.0
800.0	27.36	16400.0	0.00750	2508.0	4171.0	32.78	3.117	5.193	1665.0
900.0	30.78	18500.0	0.00667	2819.0	4690.0	33.39	3.117	5.193	1766.0
1000.0	34.19	20500.0	0.00600	3131.0	5210.0	33.94	3.116	5.193	1862.0
1100.0	37.61	22600.0	0.00545	3443.0	5729.0	34.44	3.116	5.193	1952.0
1200.0	41.02	24600.0	0.00500	3754.0	6248.0	34.89	3.116	5.193	2039.0
1300.0	44.44	26700.0	0.00461	4066.0	6767.0	35.30	3.116	5.193	2122.0
1400.0	47.86	28700.0	0.00428	4377.0	7287.0	35.69	3.116	5.193	2202.0
1500.0	51.27	30800.0	0.00400	4689.0	7806.0	36.05	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

6.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.115	15.65									
2.5	15.56	78.3	9.63	111.0	0.0222	0.181	50.0	0.000666	1.05863	0.483
3.0	15.34	58.0	12.6	98.8	0.0359	0.198	48.9	0.000620	1.05778	0.514
3.5	15.02	49.9	13.9	83.5	0.0503	0.211	46.5	0.000561	1.05655	0.552
4.0	14.59	44.6	14.5	67.6	0.0674	0.223	43.7	0.000509	1.05490	0.588
4.5	14.03	41.0	14.2	51.9	0.0890	0.232	40.7	0.000454	1.05275	0.639
5.0	13.29	37.8	13.2	37.0	0.119	0.237	37.6	0.000396	1.04995	0.714
5.1	13.12	37.2	13.0	34.3	0.126	0.238	37.0	0.000385	1.04929	0.732
5.2	12.93	36.7	12.8	32.1	0.133	0.238	36.4	0.000378	1.04858	0.745
5.3	12.76	35.6	12.9	29.6	0.141	0.238	35.9	0.000371	1.04791	0.757
5.4	12.57	34.8	12.7	27.2	0.150	0.238	35.3	0.000362	1.04721	0.777
5.5	12.38	34.0	12.6	24.9	0.161	0.238	34.8	0.000352	1.04647	0.799
5.6	12.17	33.2	12.4	22.7	0.172	0.237	34.3	0.000341	1.04569	0.825
5.7	11.96	32.4	12.3	20.5	0.185	0.237	33.7	0.000330	1.04487	0.854
5.8	11.73	31.5	12.1	18.5	0.200	0.237	33.2	0.000319	1.04400	0.886
5.9	11.49	30.8	11.9	16.6	0.216	0.236	32.7	0.000308	1.04308	0.924
6.0	11.23	30.1	11.7	14.8	0.235	0.235	32.1	0.000296	1.04211	0.966
6.5	9.681	26.9	10.4	7.82	0.360	0.229	29.5	0.000244	1.03623	1.25
7.0	7.846	26.3	9.26	4.98	0.432	0.218	27.2	0.000244	1.02930	1.42
7.5	6.385	28.2	8.56	4.55	0.367	0.206	26.1	0.000312	1.02381	1.31
8.0	5.410	30.8	8.19	4.57	0.298	0.201	25.8	0.000404	1.02015	1.18
8.5	4.724	33.7	7.96	4.71	0.247	0.199	25.9	0.000567	1.01758	1.08
9.0	4.218	36.8	7.80	4.87	0.209	0.200	26.1	0.000616	1.01569	1.01
9.5	3.827	39.9	7.68	5.01	0.181	0.202	26.5	0.000728	1.01423	0.952
10.0	3.514	43.1	7.58	5.15	0.160	0.205	27.0	0.000842	1.01306	0.911
11.0	3.044	49.3	7.46	5.35	0.131	0.212	28.0	0.00107	1.01131	0.857
12.0	2.699	55.5	7.37	5.51	0.112	0.219	29.0	0.00131	1.01002	0.824
13.0	2.431	61.6	7.30	5.62	0.0982	0.228	30.1	0.00155	1.00902	0.801
14.0	2.216	67.5	7.25	5.71	0.0876	0.236	31.3	0.00180	1.00822	0.784
15.0	2.039	73.5	7.20	5.78	0.0792	0.244	32.4	0.00206	1.00757	0.773
16.0	1.891	79.4	7.15	5.84	0.0723	0.252	33.5	0.00232	1.00701	0.762
17.0	1.764	85.2	7.10	5.88	0.0666	0.260	34.6	0.00260	1.00654	0.755
18.0	1.654	90.9	7.06	5.92	0.0618	0.268	35.7	0.00288	1.00614	0.748
19.0	1.559	96.6	7.03	5.95	0.0576	0.275	36.8	0.00317	1.00578	0.743
20.0	1.474	102.0	7.00	5.97	0.0541	0.283	37.8	0.00347	1.00547	0.739
21.0	1.399	108.0	6.97	5.99	0.0510	0.290	38.9	0.00378	1.00519	0.736
22.0	1.331	113.0	6.95	6.01	0.0482	0.298	39.9	0.00409	1.00493	0.733
23.0	1.270	119.0	6.93	6.02	0.0458	0.305	40.9	0.00441	1.00471	0.731
24.0	1.214	124.0	6.91	6.03	0.0436	0.312	42.0	0.00474	1.00450	0.729
25.0	1.164	130.0	6.89	6.04	0.0416	0.319	43.0	0.00507	1.00431	0.728
26.0	1.118	135.0	6.88	6.05	0.0398	0.326	43.9	0.00541	1.00414	0.726
28.0	1.035	146.0	6.85	6.06	0.0366	0.340	45.9	0.00612	1.00384	0.724
30.0	0.9648	157.0	6.83	6.07	0.0340	0.353	47.7	0.00686	1.00358	0.722
32.0	0.9036	168.0	6.81	6.08	0.0317	0.366	49.6	0.00762	1.00335	0.720
34.0	0.8498	179.0	6.79	6.08	0.0297	0.379	51.4	0.00841	1.00315	0.719
36.0	0.8022	189.0	6.78	6.08	0.0280	0.392	53.1	0.00923	1.00297	0.718
38.0	0.7597	200.0	6.77	6.08	0.0264	0.404	54.9	0.0101	1.00281	0.717
40.0	0.7216	210.0	6.75	6.08	0.0251	0.417	56.5	0.0110	1.00267	0.715
45.0	0.6415	237.0	6.73	6.08	0.0222	0.447	60.6	0.0133	1.00238	0.713
50.0	0.5775	263.0	6.71	6.08	0.0199	0.476	64.6	0.0157	1.00214	0.711
55.0	0.5252	289.0	6.70	6.08	0.0181	0.505	68.4	0.0184	1.00195	0.708
60.0	0.4817	316.0	6.69	6.08	0.0166	0.533	72.0	0.0212	1.00178	0.706
65.0	0.4449	342.0	6.68	6.07	0.0153	0.561	75.6	0.0241	1.00165	0.704
70.0	0.4134	368.0	6.67	6.07	0.0142	0.588	79.1	0.0273	1.00153	0.702
75.0	0.3860	396.0	6.66	6.07	0.0132	0.614	82.5	0.0305	1.00143	0.700
80.0	0.3621	420.0	6.65	6.06	0.0124	0.640	85.8	0.0339	1.00134	0.698
90.0	0.3221	472.0	6.64	6.06	0.0110	0.692	92.2	0.0412	1.00119	0.694
100.0	0.2901	524.0	6.64	6.05	0.00993	0.741	98.4	0.0491	1.00107	0.691
125.0	0.2325	654.0	6.62	6.04	0.00795	0.861	111.0	0.0712	1.00086	0.673
150.0	0.1939	784.0	6.61	6.04	0.00663	0.974	126.0	0.0966	1.00072	0.670
175.0	0.1664	914.0	6.61	6.03	0.00568	1.08	139.0	0.125	1.00062	0.668
200.0	0.1457	1040.0	6.60	6.03	0.00498	1.18	152.0	0.156	1.00054	0.666
225.0	0.1296	1170.0	6.60	6.02	0.00443	1.28	164.0	0.190	1.00048	0.666
250.0	0.1167	1300.0	6.60	6.02	0.00398	1.37	176.0	0.227	1.00043	0.666
275.0	0.1061	1430.0	6.60	6.02	0.00362	1.46	188.0	0.266	1.00039	0.667
300.0	0.09727	1560.0	6.59	6.02	0.00332	1.55	199.0	0.307	1.00036	0.668
350.0	0.08342	1820.0	6.59	6.01	0.00285	1.72	222.0	0.398	1.00031	0.668
400.0	0.07301	2080.0	6.59	6.01	0.00249	1.89	243.0	0.499	1.00027	0.668
450.0	0.06492	2340.0	6.59	6.01	0.00222	2.05	264.0	0.609	1.00024	0.667
500.0	0.05844	2600.0	6.59	6.01	0.00200	2.21	284.0	0.728	1.00022	0.667
600.0	0.04872	3120.0	6.58	6.01	0.00166	2.51	322.0	0.992	1.00018	0.667
700.0	0.04177	3640.0	6.58	6.01	0.00143	2.80	359.0	1.29	1.00015	0.667
800.0	0.03655	4160.0	6.58	6.01	0.00125	3.07	394.0	1.62	1.00014	0.667
900.0	0.03249	4680.0	6.58	6.00	0.00111	3.34	429.0	1.98	1.00012	0.666
1000.0	0.02925	5200.0	6.58	6.00	0.00100	3.60	462.0	2.37	1.00011	0.666
1100.0	0.02659	5720.0	6.58	6.00	0.000908	3.85	494.0	2.79	1.00010	0.666
1200.0	0.02438	6240.0	6.58	6.00	0.000833	4.10	525.0	3.24	1.00009	0.666
1300.0	0.02250	6760.0	6.58	6.00	0.000769	4.34	556.0	3.71	1.00008	0.666
1400.0	0.02090	7280.0	6.58	6.00	0.000714	4.57	586.0	4.21	1.00008	0.666
1500.0	0.01950	7790.0	6.58	6.00	0.000666	4.80	616.0	4.74	1.00007	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

6.5 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.109	0.06360								
	2.5	0.06397	736.0	2.46	3.642	7.855	1.792	1.634	1.719	288.2
	3.0	0.06485	666.0	3.54	4.461	8.732	2.123	1.823	2.065	276.3
	3.5	0.06619	579.0	4.23	5.457	9.816	2.464	2.001	2.481	269.6
	4.0	0.06806	487.0	4.61	6.652	11.14	2.819	2.141	2.960	261.1
	4.5	0.07065	394.0	4.68	8.097	12.75	3.199	2.301	3.569	248.8
	5.0	0.07429	303.0	4.50	9.880	14.77	3.618	2.493	4.358	231.6
	5.1	0.07520	287.0	4.43	10.29	15.24	3.709	2.531	4.535	228.1
	5.2	0.07619	273.0	4.37	10.72	15.74	3.801	2.550	4.684	225.5
	5.3	0.07715	258.0	4.29	11.13	16.21	3.892	2.530	4.816	222.9
	5.4	0.07818	242.0	4.21	11.55	16.70	3.983	2.537	4.990	219.7
	5.5	0.07928	227.0	4.13	11.99	17.21	4.077	2.546	5.183	216.3
	5.6	0.08047	212.0	4.04	12.44	17.74	4.172	2.558	5.395	212.8
	5.7	0.08176	197.0	3.95	12.91	18.29	4.270	2.571	5.628	209.2
	5.8	0.08316	183.0	3.86	13.39	18.87	4.371	2.586	5.885	205.6
	5.9	0.08468	170.0	3.76	13.89	19.47	4.474	2.603	6.169	201.8
	6.0	0.08635	157.0	3.65	14.42	20.11	4.581	2.622	6.483	198.0
	6.5	0.09767	102.0	3.06	17.43	23.86	5.183	2.744	8.525	179.1
	7.0	0.1163	74.4	2.43	21.14	28.80	5.914	2.896	10.51	165.3
	7.5	0.1414	75.2	1.91	25.03	34.34	6.679	3.022	10.37	161.6
	8.0	0.1667	86.1	1.55	28.31	39.29	7.319	3.063	9.362	163.3
	8.5	0.1913	100.0	1.31	31.15	43.75	7.860	3.078	8.521	167.2
	9.0	0.2149	114.0	1.14	33.69	47.85	8.329	3.085	7.888	172.2
	9.5	0.2375	130.0	1.02	36.03	51.67	8.742	3.090	7.417	177.5
	10.0	0.2592	145.0	0.919	38.21	55.28	9.113	3.093	7.065	182.9
	11.0	0.3003	174.0	0.779	42.21	61.99	9.755	3.096	6.598	193.8
	12.0	0.3396	202.0	0.680	45.98	68.34	10.31	3.102	6.312	204.2
	13.0	0.3776	230.0	0.607	49.60	74.48	10.80	3.108	6.119	214.0
	14.0	0.4148	256.0	0.548	53.14	80.46	11.25	3.114	5.980	223.3
	15.0	0.4513	282.0	0.501	56.61	86.33	11.65	3.119	5.875	232.1
	16.0	0.4871	308.0	0.461	60.08	92.16	12.03	3.123	5.783	240.3
	17.0	0.5224	333.0	0.428	63.49	97.90	12.37	3.126	5.709	248.1
	18.0	0.5573	357.0	0.399	66.88	103.6	12.70	3.128	5.649	255.6
	19.0	0.5918	381.0	0.374	70.23	109.2	13.00	3.130	5.599	262.9
	20.0	0.6260	405.0	0.352	73.55	114.8	13.29	3.131	5.557	269.9
	21.0	0.6599	428.0	0.332	76.86	120.3	13.56	3.131	5.522	276.6
	22.0	0.6936	452.0	0.315	80.15	125.8	13.82	3.132	5.491	283.2
	23.0	0.7271	474.0	0.300	83.42	131.3	14.06	3.132	5.465	289.6
	24.0	0.7604	497.0	0.286	86.68	136.8	14.29	3.132	5.442	295.8
	25.0	0.7935	520.0	0.273	89.93	142.2	14.51	3.132	5.421	301.9
	26.0	0.8266	542.0	0.262	93.16	147.6	14.73	3.132	5.403	307.8
	28.0	0.8923	586.0	0.241	99.6	158.4	15.12	3.131	5.373	319.3
	30.0	0.9576	630.0	0.224	106.0	169.1	15.49	3.131	5.349	330.3
	32.0	1.023	674.0	0.209	112.4	179.8	15.84	3.130	5.330	340.9
	34.0	1.087	717.0	0.196	118.8	190.4	16.16	3.130	5.313	351.1
	36.0	1.152	760.0	0.185	125.2	201.0	16.47	3.129	5.300	361.1
	38.0	1.216	803.0	0.174	131.5	211.6	16.75	3.129	5.288	370.7
	40.0	1.281	845.0	0.165	137.8	222.2	17.02	3.128	5.278	380.1
	45.0	1.441	951.0	0.146	153.6	248.5	17.64	3.127	5.259	402.5
	50.0	1.600	1060.0	0.131	169.4	274.8	18.20	3.126	5.246	423.6
	55.0	1.759	1160.0	0.119	185.1	301.0	18.70	3.125	5.236	443.7
	60.0	1.918	1260.0	0.109	200.8	327.1	19.15	3.124	5.228	462.9
	65.0	2.077	1370.0	0.101	216.5	353.3	19.57	3.123	5.223	481.3
	70.0	2.235	1470.0	0.0933	232.2	379.4	19.96	3.123	5.218	499.0
	75.0	2.394	1570.0	0.0870	247.8	405.5	20.32	3.122	5.214	516.1
	80.0	2.552	1680.0	0.0815	263.5	431.5	20.65	3.122	5.211	532.6
	90.0	2.868	1880.0	0.0724	294.7	483.6	21.27	3.121	5.207	564.2
	100.0	3.184	2090.0	0.0651	326.0	535.7	21.81	3.121	5.204	594.1
	125.0	3.973	2600.0	0.0520	404.0	665.7	22.98	3.120	5.199	662.9
	150.0	4.762	3120.0	0.0433	482.0	795.6	23.92	3.119	5.197	725.2
	175.0	5.550	3630.0	0.0371	560.0	925.5	24.72	3.118	5.195	782.5
	200.0	6.339	4140.0	0.0325	637.9	1055.0	25.42	3.118	5.195	835.9
	225.0	7.127	4650.0	0.0289	715.9	1185.0	26.03	3.118	5.194	886.1
	250.0	7.915	5160.0	0.0260	793.8	1315.0	26.58	3.118	5.194	933.6
	275.0	8.703	5680.0	0.0236	871.7	1445.0	27.07	3.118	5.193	978.8
	300.0	9.492	6190.0	0.0217	949.6	1575.0	27.52	3.117	5.193	1022.0
	350.0	11.07	7210.0	0.0186	1105.0	1834.0	28.32	3.117	5.193	1103.0
	400.0	12.64	8240.0	0.0162	1261.0	2094.0	29.02	3.117	5.193	1179.0
	450.0	14.22	9260.0	0.0144	1417.0	2354.0	29.63	3.117	5.193	1250.0
	500.0	15.80	10300.0	0.0130	1573.0	2613.0	30.18	3.117	5.193	1318.0
	600.0	18.95	12300.0	0.0108	1885.0	3133.0	31.12	3.117	5.193	1443.0
	700.0	22.10	14400.0	0.00928	2196.0	3652.0	31.92	3.117	5.193	1558.0
	800.0	25.26	16400.0	0.00812	2508.0	4171.0	32.62	3.117	5.193	1666.0
	900.0	28.41	18500.0	0.00722	2819.0	4690.0	33.23	3.117	5.193	1766.0
	1000.0	31.56	20500.0	0.00650	3131.0	5210.0	33.78	3.117	5.193	1862.0
	1100.0	34.72	22600.0	0.00591	3443.0	5729.0	34.27	3.116	5.193	1952.0
	1200.0	37.87	24600.0	0.00542	3754.0	6248.0	34.72	3.116	5.193	2039.0
	1300.0	41.02	26700.0	0.00500	4066.0	6768.0	35.14	3.116	5.193	2122.0
	1400.0	44.18	28700.0	0.00464	4377.0	7287.0	35.52	3.116	5.193	2202.0
	1500.0	47.33	30800.0	0.00433	4689.0	7806.0	35.88	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

6.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DV)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.169	15.72									
2.5	15.63	80.6	9.62	115.0	0.0213	0.182	51.1	0.000676	1.05890	0.483
3.0	15.42	59.8	12.6	103.0	0.0345	0.200	49.9	0.000627	1.05808	0.516
3.5	15.11	51.3	14.0	87.4	0.0484	0.213	47.4	0.000568	1.05689	0.552
4.0	14.69	46.0	14.6	71.5	0.0644	0.225	44.5	0.000518	1.05530	0.585
4.5	14.15	42.5	14.4	55.7	0.0840	0.235	41.5	0.000465	1.05324	0.632
5.0	13.46	39.5	13.4	40.8	0.110	0.240	38.5	0.000410	1.05059	0.698
5.1	13.30	39.0	13.2	38.1	0.116	0.241	37.9	0.000400	1.04997	0.714
5.2	13.12	38.5	13.0	35.9	0.122	0.241	37.3	0.000392	1.04931	0.724
5.3	12.96	37.5	13.1	33.4	0.129	0.242	36.8	0.000387	1.04869	0.733
5.4	12.79	36.7	13.0	31.0	0.136	0.242	36.3	0.000379	1.04804	0.748
5.5	12.61	35.9	12.9	28.6	0.144	0.242	35.7	0.000370	1.04736	0.766
5.6	12.43	35.1	12.7	26.3	0.154	0.242	35.2	0.000361	1.04665	0.786
5.7	12.23	34.4	12.6	24.1	0.164	0.241	34.7	0.000351	1.04591	0.810
5.8	12.02	33.6	12.4	22.0	0.175	0.241	34.2	0.000340	1.04512	0.837
5.9	11.81	32.9	12.2	20.0	0.188	0.241	33.7	0.000330	1.04430	0.864
6.0	11.58	32.2	12.0	18.1	0.201	0.240	33.2	0.000320	1.04343	0.896
6.5	10.24	29.1	10.9	10.4	0.293	0.235	30.7	0.000270	1.03834	1.11
7.0	8.598	27.7	9.75	6.40	0.380	0.226	28.5	0.000250	1.03214	1.33
7.5	7.073	28.9	8.92	5.32	0.359	0.215	27.1	0.000293	1.02639	1.31
8.0	5.997	31.2	8.45	5.16	0.300	0.208	26.6	0.000371	1.02235	1.20
8.5	5.226	33.8	8.16	5.21	0.252	0.205	26.6	0.000461	1.01946	1.10
9.0	4.653	36.8	7.96	5.33	0.215	0.205	26.7	0.000558	1.01732	1.03
9.5	4.211	39.8	7.81	5.46	0.186	0.206	27.0	0.000660	1.01566	0.972
10.0	3.858	42.9	7.70	5.58	0.165	0.209	27.4	0.000765	1.01434	0.929
11.0	3.330	49.1	7.55	5.79	0.134	0.215	28.4	0.000978	1.01237	0.871
12.0	2.945	55.2	7.45	5.95	0.114	0.222	29.4	0.00120	1.01094	0.834
13.0	2.648	61.3	7.37	6.08	0.100	0.230	30.5	0.00142	1.00983	0.809
14.0	2.411	67.3	7.31	6.18	0.0888	0.238	31.6	0.00165	1.00895	0.792
15.0	2.216	73.3	7.25	6.26	0.0801	0.246	32.6	0.00189	1.00822	0.779
16.0	2.053	79.2	7.19	6.32	0.0730	0.254	33.7	0.00214	1.00762	0.768
17.0	1.914	85.0	7.15	6.37	0.0671	0.262	34.8	0.00240	1.00710	0.759
18.0	1.794	90.8	7.10	6.41	0.0622	0.270	35.9	0.00266	1.00666	0.753
19.0	1.690	96.5	7.07	6.44	0.0580	0.277	37.0	0.00293	1.00627	0.747
20.0	1.597	102.0	7.03	6.47	0.0544	0.285	38.0	0.00321	1.00592	0.743
21.0	1.515	108.0	7.01	6.49	0.0512	0.292	39.1	0.00349	1.00562	0.739
22.0	1.442	113.0	6.98	6.51	0.0484	0.299	40.1	0.00378	1.00535	0.736
23.0	1.375	119.0	6.96	6.53	0.0459	0.306	41.1	0.00408	1.00510	0.733
24.0	1.315	125.0	6.94	6.54	0.0437	0.313	42.1	0.00438	1.00488	0.731
25.0	1.260	130.0	6.92	6.55	0.0417	0.320	43.1	0.00469	1.00467	0.729
26.0	1.210	135.0	6.90	6.56	0.0399	0.327	44.1	0.00501	1.00448	0.728
28.0	1.121	146.0	6.87	6.57	0.0367	0.341	46.0	0.00566	1.00419	0.725
30.0	1.044	157.0	6.85	6.58	0.0340	0.354	47.9	0.00634	1.00387	0.723
32.0	0.9779	168.0	6.83	6.59	0.0317	0.367	49.7	0.00705	1.00362	0.721
34.0	0.9196	179.0	6.81	6.59	0.0297	0.380	51.5	0.00778	1.00341	0.720
36.0	0.8681	189.0	6.79	6.60	0.0280	0.393	53.3	0.00854	1.00322	0.718
38.0	0.8221	200.0	6.78	6.60	0.0264	0.405	55.0	0.00932	1.00305	0.717
40.0	0.7809	211.0	6.77	6.60	0.0251	0.418	56.7	0.0101	1.00289	0.716
45.0	0.6941	237.0	6.74	6.60	0.0222	0.448	60.7	0.0123	1.00257	0.713
50.0	0.6249	263.0	6.72	6.60	0.0199	0.477	64.7	0.0146	1.00231	0.711
55.0	0.5684	290.0	6.71	6.59	0.0181	0.506	68.5	0.0170	1.00211	0.709
60.0	0.5213	316.0	6.69	6.59	0.0165	0.534	72.1	0.0196	1.00193	0.706
65.0	0.4815	342.0	6.68	6.58	0.0153	0.561	75.7	0.0223	1.00178	0.704
70.0	0.4474	368.0	6.67	6.58	0.0142	0.588	79.1	0.0252	1.00166	0.702
75.0	0.4178	394.0	6.67	6.58	0.0132	0.615	82.5	0.0282	1.00155	0.700
80.0	0.3919	420.0	6.66	6.57	0.0124	0.641	85.8	0.0314	1.00145	0.698
90.0	0.3487	473.0	6.65	6.57	0.0110	0.692	92.3	0.0381	1.00129	0.694
100.0	0.3141	525.0	6.64	6.56	0.00992	0.742	98.5	0.0454	1.00116	0.691
125.0	0.2517	655.0	6.63	6.55	0.00794	0.861	111.0	0.0658	1.00093	0.673
150.0	0.2100	784.0	6.62	6.54	0.00662	0.974	126.0	0.0893	1.00078	0.670
175.0	0.1802	914.0	6.61	6.54	0.00568	1.08	139.0	0.116	1.00067	0.668
200.0	0.1578	1040.0	6.61	6.53	0.00497	1.18	152.0	0.144	1.00058	0.666
225.0	0.1403	1170.0	6.60	6.53	0.00442	1.28	164.0	0.176	1.00052	0.666
250.0	0.1263	1300.0	6.60	6.52	0.00398	1.37	176.0	0.210	1.00047	0.666
275.0	0.1149	1430.0	6.60	6.52	0.00362	1.46	188.0	0.245	1.00043	0.667
300.0	0.1054	1560.0	6.59	6.52	0.00332	1.55	199.0	0.283	1.00039	0.668
350.0	0.09035	1820.0	6.59	6.52	0.00285	1.72	222.0	0.367	1.00033	0.668
400.0	0.07909	2080.0	6.59	6.51	0.00249	1.89	243.0	0.460	1.00029	0.668
450.0	0.07032	2340.0	6.59	6.51	0.00222	2.05	264.0	0.562	1.00026	0.667
500.0	0.06330	2600.0	6.59	6.51	0.00200	2.21	284.0	0.672	1.00023	0.667
600.0	0.05277	3120.0	6.58	6.51	0.00166	2.51	322.0	0.916	1.00020	0.667
700.0	0.04524	3640.0	6.58	6.51	0.00143	2.80	359.0	1.19	1.00017	0.667
800.0	0.03959	4160.0	6.58	6.51	0.00125	3.07	394.0	1.49	1.00015	0.666
900.0	0.03520	4680.0	6.58	6.51	0.00111	3.34	429.0	1.83	1.00013	0.666
1000.0	0.03168	5200.0	6.58	6.50	0.00100	3.60	462.0	2.19	1.00012	0.666
1100.0	0.02881	5720.0	6.58	6.50	0.000908	3.85	494.0	2.57	1.00011	0.666
1200.0	0.02641	6240.0	6.58	6.50	0.000833	4.10	525.0	2.99	1.00010	0.666
1300.0	0.02438	6760.0	6.58	6.50	0.000769	4.34	556.0	3.43	1.00009	0.666
1400.0	0.02264	7270.0	6.58	6.50	0.000714	4.57	586.0	3.89	1.00008	0.666
1500.0	0.02113	7790.0	6.58	6.50	0.000666	4.80	616.0	4.38	1.00008	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

7.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
* 2.103	0.06333								
2.5	0.06369	757.0	2.44	3.635	8.153	1.782	1.617	1.698	283.7
3.0	0.06453	687.0	3.54	4.441	9.018	2.109	1.815	2.046	280.1
3.5	0.06581	601.0	4.25	5.421	10.09	2.446	1.992	2.454	273.8
4.0	0.06760	510.0	4.65	6.594	11.39	2.796	2.131	2.918	265.9
4.5	0.07005	417.0	4.75	8.008	12.98	3.170	2.291	3.500	254.2
5.0	0.07345	327.0	4.58	9.743	14.95	3.579	2.480	4.236	238.0
5.1	0.07429	311.0	4.53	10.14	15.41	3.667	2.518	4.398	234.6
5.2	0.07519	298.0	4.47	10.56	15.89	3.757	2.536	4.532	232.2
5.3	0.07607	282.0	4.40	10.95	16.35	3.844	2.516	4.645	229.9
5.4	0.07700	267.0	4.33	11.36	16.82	3.932	2.522	4.798	226.8
5.5	0.07799	252.0	4.25	11.78	17.31	4.022	2.530	4.964	223.7
5.6	0.07905	237.0	4.17	12.21	17.81	4.113	2.540	5.145	220.5
5.7	0.08020	222.0	4.09	12.65	18.34	4.206	2.552	5.343	217.1
5.8	0.08143	208.0	4.00	13.11	18.88	4.301	2.566	5.559	213.7
5.9	0.08275	194.0	3.91	13.58	19.45	4.399	2.582	5.794	210.2
6.0	0.08419	181.0	3.81	14.07	20.04	4.499	2.599	6.050	206.7
6.5	0.09356	124.0	3.27	16.84	23.48	5.049	2.706	7.687	188.8
7.0	0.1083	88.8	2.68	20.21	27.90	5.704	2.841	9.564	174.0
7.5	0.1292	80.9	2.14	23.93	33.09	6.422	2.970	10.15	167.4
8.0	0.1523	89.3	1.74	27.37	38.17	7.078	3.042	9.441	167.5
8.5	0.1747	101.0	1.47	30.30	42.69	7.626	3.066	8.670	170.3
9.0	0.1965	115.0	1.27	32.93	46.86	8.103	3.078	8.049	174.4
9.5	0.2175	129.0	1.13	35.33	50.76	8.525	3.085	7.569	179.2
10.0	0.2378	144.0	1.02	37.58	54.45	8.904	3.090	7.201	184.2
11.0	0.2764	173.0	0.856	41.67	61.27	9.557	3.094	6.702	194.7
12.0	0.3132	201.0	0.745	45.50	67.71	10.12	3.100	6.394	204.9
13.0	0.3489	228.0	0.662	49.17	73.91	10.62	3.107	6.186	214.6
14.0	0.3837	255.0	0.598	52.74	79.95	11.06	3.113	6.038	223.9
15.0	0.4178	281.0	0.545	56.24	85.87	11.47	3.119	5.925	232.7
16.0	0.4514	307.0	0.501	59.73	91.75	11.85	3.123	5.826	240.9
17.0	0.4844	332.0	0.464	63.18	97.53	12.20	3.127	5.747	248.7
18.0	0.5170	357.0	0.432	66.58	103.2	12.53	3.129	5.683	256.2
19.0	0.5492	381.0	0.405	69.95	108.9	12.84	3.130	5.629	263.5
20.0	0.5811	405.0	0.381	73.29	114.5	13.12	3.131	5.584	270.5
21.0	0.6127	429.0	0.360	76.61	120.1	13.39	3.132	5.546	277.3
22.0	0.6441	452.0	0.341	79.91	125.6	13.65	3.133	5.513	283.8
23.0	0.6754	475.0	0.324	83.20	131.1	13.90	3.133	5.485	290.2
24.0	0.7064	498.0	0.309	86.47	136.6	14.13	3.133	5.460	296.5
25.0	0.7373	520.0	0.295	89.72	142.0	14.35	3.133	5.438	302.5
26.0	0.7681	543.0	0.283	92.97	147.4	14.56	3.133	5.419	308.5
28.0	0.8293	588.0	0.261	99.44	158.3	14.96	3.133	5.387	319.9
30.0	0.8911	632.0	0.242	105.9	169.0	15.34	3.132	5.361	330.9
32.0	0.9506	675.0	0.226	112.3	179.7	15.68	3.131	5.340	341.5
34.0	1.011	719.0	0.211	118.7	190.4	16.00	3.131	5.322	351.8
36.0	1.071	762.0	0.199	125.0	201.0	16.31	3.130	5.308	361.7
38.0	1.131	804.0	0.188	131.4	211.6	16.59	3.130	5.295	371.3
40.0	1.191	847.0	0.178	137.7	222.2	16.87	3.129	5.285	380.7
45.0	1.339	953.0	0.158	153.5	248.5	17.49	3.128	5.264	403.1
50.0	1.488	1060.0	0.142	169.3	274.8	18.04	3.127	5.250	424.2
55.0	1.635	1160.0	0.128	185.0	301.0	18.54	3.126	5.239	444.3
60.0	1.783	1270.0	0.117	200.8	327.2	19.00	3.125	5.231	463.4
65.0	1.930	1370.0	0.108	216.4	353.4	19.41	3.124	5.225	481.8
70.0	2.078	1470.0	0.100	232.1	379.5	19.80	3.123	5.220	499.5
75.0	2.225	1580.0	0.0937	247.8	405.6	20.16	3.123	5.216	516.6
80.0	2.372	1680.0	0.0878	263.4	431.6	20.50	3.122	5.213	533.1
90.0	2.665	1890.0	0.0779	294.7	483.7	21.11	3.122	5.208	564.6
100.0	2.959	2090.0	0.0701	325.9	535.8	21.66	3.121	5.205	594.5
125.0	3.691	2610.0	0.0560	404.0	665.8	22.82	3.120	5.200	663.3
150.0	4.424	3120.0	0.0467	482.0	795.8	23.77	3.119	5.197	725.5
175.0	5.156	3630.0	0.0400	560.0	925.7	24.57	3.119	5.196	782.8
200.0	5.888	4140.0	0.0350	637.9	1056.0	25.26	3.118	5.195	836.2
225.0	6.620	4660.0	0.0311	715.9	1185.0	25.88	3.118	5.194	886.4
250.0	7.352	5170.0	0.0280	793.8	1315.0	26.42	3.118	5.194	933.9
275.0	8.084	5680.0	0.0254	871.7	1445.0	26.92	3.118	5.193	979.1
300.0	8.816	6190.0	0.0233	949.6	1575.0	27.37	3.118	5.193	1022.0
350.0	10.28	7220.0	0.0200	1105.0	1835.0	28.17	3.117	5.193	1104.0
400.0	11.74	8240.0	0.0175	1261.0	2094.0	28.86	3.117	5.193	1179.0
450.0	13.21	9260.0	0.0156	1417.0	2354.0	29.47	3.117	5.193	1250.0
500.0	14.67	10300.0	0.0140	1573.0	2614.0	30.02	3.117	5.193	1318.0
600.0	17.60	12300.0	0.0117	1885.0	3133.0	30.97	3.117	5.193	1443.0
700.0	20.53	14400.0	0.0100	2196.0	3652.0	31.77	3.117	5.193	1558.0
800.0	23.45	16400.0	0.00875	2508.0	4171.0	32.46	3.117	5.193	1666.0
900.0	26.38	18500.0	0.00778	2819.0	4691.0	33.07	3.117	5.193	1766.0
1000.0	29.31	20500.0	0.00700	3131.0	5210.0	33.62	3.117	5.193	1862.0
1100.0	32.24	22600.0	0.00636	3443.0	5729.0	34.12	3.117	5.193	1952.0
1200.0	35.17	24600.0	0.00583	3754.0	6248.0	34.57	3.117	5.193	2039.0
1300.0	38.09	26700.0	0.00538	4066.0	6768.0	34.98	3.116	5.193	2122.0
1400.0	41.02	28700.0	0.00500	4377.0	7287.0	35.37	3.116	5.193	2202.0
1500.0	43.95	30800.0	0.00467	4689.0	7806.0	35.73	3.116	5.193	2279.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

7.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.103	15.79									
2.5	15.70	82.8	9.60	119.0	0.0205	0.183	52.1	0.000686	1.05917	0.484
3.0	15.50	61.5	12.6	106.0	0.0333	0.201	50.8	0.000634	1.05838	0.518
3.5	15.19	52.7	14.0	91.3	0.0466	0.215	48.3	0.000576	1.05722	0.552
4.0	14.79	47.3	14.8	75.4	0.0617	0.227	45.4	0.000526	1.05568	0.583
4.5	14.28	43.9	14.5	59.6	0.0797	0.237	42.4	0.000474	1.05370	0.626
5.0	13.62	41.2	13.6	44.6	0.103	0.243	39.4	0.000422	1.05118	0.685
5.1	13.46	40.7	13.4	41.9	0.108	0.244	38.8	0.000412	1.05060	0.699
5.2	13.30	40.2	13.2	39.6	0.113	0.245	38.2	0.000406	1.04998	0.707
5.3	13.15	39.2	13.3	37.1	0.118	0.245	37.7	0.000401	1.04939	0.713
5.4	12.99	38.4	13.2	34.7	0.125	0.246	37.1	0.000394	1.04879	0.726
5.5	12.82	37.7	13.1	32.3	0.132	0.246	36.6	0.000386	1.04816	0.740
5.6	12.65	37.0	13.0	30.0	0.139	0.246	36.1	0.000378	1.04750	0.756
5.7	12.47	36.2	12.8	27.7	0.147	0.246	35.7	0.000369	1.04681	0.775
5.8	12.28	35.5	12.7	25.6	0.156	0.245	35.2	0.000360	1.04610	0.796
5.9	12.08	34.8	12.5	23.5	0.166	0.245	34.7	0.000350	1.04535	0.820
6.0	11.88	34.2	12.3	21.5	0.177	0.245	34.2	0.000341	1.04456	0.845
6.5	10.69	31.1	11.3	13.2	0.247	0.241	31.9	0.000293	1.04005	1.02
7.0	9.230	29.3	10.2	8.20	0.327	0.234	29.7	0.000265	1.03453	1.22
7.5	7.740	29.7	9.31	6.26	0.342	0.223	28.2	0.000284	1.02890	1.28
8.0	6.568	31.8	8.73	5.86	0.297	0.215	27.5	0.000347	1.02449	1.20
8.5	5.725	34.2	8.37	5.79	0.254	0.212	27.3	0.000426	1.02133	1.12
9.0	5.080	36.9	8.13	5.84	0.218	0.210	27.3	0.000513	1.01895	1.05
9.5	4.598	39.9	7.95	5.94	0.190	0.211	27.6	0.000606	1.01711	0.989
10.0	4.235	42.9	7.82	6.05	0.168	0.213	27.9	0.000703	1.01564	0.945
11.0	3.619	48.9	7.64	6.25	0.137	0.218	28.8	0.000900	1.01345	0.883
12.0	3.193	55.1	7.52	6.41	0.116	0.225	29.7	0.00110	1.01186	0.844
13.0	2.856	61.1	7.44	6.54	0.101	0.233	30.8	0.00131	1.01065	0.818
14.0	2.606	67.2	7.36	6.65	0.0899	0.241	31.8	0.00153	1.00968	0.799
15.0	2.393	73.1	7.31	6.73	0.0810	0.248	32.9	0.00175	1.00888	0.785
16.0	2.216	79.1	7.24	6.80	0.0737	0.256	34.0	0.00198	1.00822	0.773
17.0	2.054	84.9	7.19	6.86	0.0677	0.264	35.1	0.00222	1.00766	0.764
18.0	1.934	90.7	7.14	6.90	0.0626	0.271	36.1	0.00247	1.00718	0.757
19.0	1.821	96.5	7.10	6.94	0.0584	0.279	37.2	0.00272	1.00675	0.751
20.0	1.721	102.0	7.07	6.97	0.0547	0.286	38.2	0.00298	1.00638	0.746
21.0	1.632	108.0	7.04	6.99	0.0514	0.294	39.3	0.00324	1.00605	0.742
22.0	1.552	113.0	7.01	7.02	0.0486	0.301	40.3	0.00351	1.00576	0.739
23.0	1.481	119.0	6.99	7.03	0.0461	0.308	41.3	0.00379	1.00549	0.736
24.0	1.416	125.0	6.97	7.05	0.0438	0.315	42.3	0.00407	1.00525	0.733
25.0	1.356	130.0	6.95	7.06	0.0418	0.322	43.3	0.00436	1.00503	0.731
26.0	1.302	136.0	6.93	7.07	0.0400	0.329	44.2	0.00466	1.00483	0.729
28.0	1.206	146.0	6.90	7.08	0.0368	0.342	46.2	0.00527	1.00447	0.727
30.0	1.124	157.0	6.87	7.10	0.0341	0.355	48.0	0.00590	1.00416	0.724
32.0	1.052	168.0	6.85	7.10	0.0318	0.369	49.8	0.00656	1.00390	0.722
34.0	0.9893	179.0	6.83	7.11	0.0298	0.381	51.6	0.00724	1.00367	0.721
36.0	0.9338	190.0	6.81	7.11	0.0280	0.394	53.4	0.00795	1.00346	0.719
38.0	0.8843	200.0	6.80	7.11	0.0264	0.406	55.1	0.00868	1.00328	0.718
40.0	0.8400	211.0	6.78	7.11	0.0251	0.419	56.8	0.00943	1.00311	0.717
45.0	0.7466	237.0	6.76	7.11	0.0222	0.449	60.8	0.0114	1.00277	0.714
50.0	0.6722	264.0	6.73	7.11	0.0199	0.478	64.8	0.0135	1.00249	0.711
55.0	0.6115	290.0	6.72	7.11	0.0181	0.507	68.5	0.0158	1.00227	0.709
60.0	0.5508	316.0	6.70	7.10	0.0165	0.535	72.2	0.0182	1.00208	0.706
65.0	0.5180	342.0	6.69	7.10	0.0153	0.562	75.8	0.0208	1.00192	0.704
70.0	0.4813	369.0	6.68	7.09	0.0142	0.589	79.2	0.0234	1.00178	0.702
75.0	0.4495	395.0	6.67	7.09	0.0132	0.616	82.6	0.0263	1.00166	0.700
80.0	0.4217	421.0	6.67	7.09	0.0124	0.642	85.9	0.0292	1.00156	0.698
90.0	0.3752	473.0	6.65	7.08	0.0110	0.693	92.3	0.0355	1.00139	0.694
100.0	0.3380	525.0	6.65	7.07	0.00991	0.743	98.6	0.0422	1.00125	0.691
125.0	0.2709	655.0	6.63	7.06	0.00794	0.862	112.0	0.0612	1.00100	0.673
150.0	0.2260	785.0	6.62	7.05	0.00662	0.974	126.0	0.0830	1.00084	0.670
175.0	0.1939	915.0	6.61	7.04	0.00568	1.08	139.0	0.107	1.00072	0.668
200.0	0.1698	1040.0	6.61	7.04	0.00497	1.18	152.0	0.134	1.00063	0.666
225.0	0.1511	1170.0	6.60	7.03	0.00442	1.28	164.0	0.163	1.00056	0.666
250.0	0.1360	1300.0	6.60	7.03	0.00398	1.38	176.0	0.195	1.00050	0.666
275.0	0.1237	1430.0	6.60	7.03	0.00362	1.46	188.0	0.228	1.00046	0.667
300.0	0.1134	1560.0	6.60	7.02	0.00332	1.55	200.0	0.263	1.00042	0.668
350.0	0.09728	1820.0	6.59	7.02	0.00285	1.72	222.0	0.341	1.00036	0.668
400.0	0.08515	2080.0	6.59	7.02	0.00249	1.89	243.0	0.428	1.00032	0.668
450.0	0.07572	2340.0	6.59	7.01	0.00222	2.05	264.0	0.522	1.00028	0.667
500.0	0.06816	2600.0	6.59	7.01	0.00200	2.21	284.0	0.624	1.00025	0.667
600.0	0.05682	3120.0	6.59	7.01	0.00166	2.51	322.0	0.850	1.00021	0.667
700.0	0.04872	3640.0	6.58	7.01	0.00143	2.80	359.0	1.11	1.00018	0.667
800.0	0.04264	4160.0	6.58	7.01	0.00125	3.07	394.0	1.39	1.00016	0.666
900.0	0.03790	4680.0	6.58	7.01	0.00111	3.34	429.0	1.70	1.00014	0.666
1000.0	0.03412	5200.0	6.58	7.01	0.00100	3.60	462.0	2.03	1.00013	0.666
1100.0	0.03102	5720.0	6.58	7.00	0.000908	3.85	494.0	2.39	1.00011	0.666
1200.0	0.02844	6240.0	6.58	7.00	0.000833	4.10	525.0	2.77	1.00011	0.666
1300.0	0.02625	6760.0	6.58	7.00	0.000769	4.34	556.0	3.18	1.00010	0.666
1400.0	0.02438	7280.0	6.58	7.00	0.000714	4.57	586.0	3.61	1.00009	0.666
1500.0	0.02275	7790.0	6.58	7.00	0.000666	4.80	616.0	4.06	1.00008	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

8.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.091	0.06283								
2.5	0.06316	797.0	2.40	3.628	8.747	1.763	1.584	1.657	290.6
3.0	0.06394	729.0	3.54	4.408	9.590	2.083	1.798	2.011	287.4
3.5	0.06511	644.0	4.29	5.358	10.64	2.413	1.974	2.404	281.8
4.0	0.06676	554.0	4.73	6.492	11.90	2.755	2.112	2.842	274.8
4.5	0.06897	463.0	4.87	7.851	13.44	3.117	2.271	3.381	264.3
5.0	0.07197	374.0	4.75	9.505	15.34	3.509	2.458	4.038	249.6
5.1	0.07270	358.0	4.70	9.880	15.77	3.593	2.495	4.178	246.6
5.2	0.07347	345.0	4.65	10.27	16.23	3.677	2.512	4.292	244.5
5.3	0.07422	330.0	4.59	10.65	16.66	3.760	2.491	4.379	242.5
5.4	0.07501	315.0	4.53	11.03	17.11	3.843	2.496	4.501	239.8
5.5	0.07584	300.0	4.46	11.41	17.56	3.927	2.503	4.633	237.1
5.6	0.07672	285.0	4.39	11.81	18.03	4.012	2.511	4.774	234.2
5.7	0.07766	270.0	4.32	12.22	18.52	4.098	2.522	4.926	231.3
5.8	0.07865	256.0	4.24	12.64	19.02	4.185	2.534	5.090	228.3
5.9	0.07971	242.0	4.16	13.07	19.54	4.274	2.547	5.265	225.2
6.0	0.08084	229.0	4.08	13.52	20.07	4.364	2.562	5.452	222.1
6.5	0.08784	168.0	3.62	15.96	23.08	4.847	2.651	6.602	206.0
7.0	0.09802	124.0	3.10	18.84	26.79	5.398	2.762	8.045	191.1
7.5	0.1125	101.0	2.58	22.13	31.25	6.014	2.880	9.199	180.8
8.0	0.1305	98.9	2.13	25.54	36.12	6.644	2.979	9.326	177.1
8.5	0.1496	108.0	1.79	28.69	40.82	7.214	3.037	8.792	177.8
9.0	0.1681	119.0	1.55	31.45	45.03	7.701	3.059	8.249	180.2
9.5	0.1863	131.0	1.36	33.98	49.09	8.134	3.072	7.791	183.7
10.0	0.2041	145.0	1.22	36.34	52.88	8.524	3.081	7.419	187.9
11.0	0.2381	172.0	1.02	40.60	59.90	9.196	3.088	6.882	197.2
12.0	0.2708	200.0	0.878	44.55	66.50	9.772	3.095	6.542	206.7
13.0	0.3025	227.0	0.777	48.31	72.82	10.28	3.103	6.311	216.2
14.0	0.3334	254.0	0.699	51.94	78.97	10.74	3.111	6.145	225.3
15.0	0.3637	280.0	0.636	55.50	84.98	11.15	3.118	6.019	234.1
16.0	0.3934	306.0	0.583	59.05	90.94	11.54	3.123	5.909	242.2
17.0	0.4227	331.0	0.539	62.54	96.80	11.89	3.127	5.820	250.0
18.0	0.4515	356.0	0.501	65.99	102.6	12.22	3.130	5.748	257.5
19.0	0.4800	381.0	0.469	69.39	108.3	12.53	3.132	5.687	264.8
20.0	0.5082	405.0	0.440	72.77	114.0	12.82	3.133	5.636	271.8
21.0	0.5361	429.0	0.415	76.12	119.6	13.09	3.134	5.593	278.6
22.0	0.5638	453.0	0.393	79.45	125.2	13.35	3.135	5.556	285.1
23.0	0.5914	476.0	0.374	82.76	130.7	13.60	3.135	5.524	291.5
24.0	0.6187	499.0	0.356	86.05	136.2	13.83	3.135	5.496	297.8
25.0	0.6459	522.0	0.340	89.32	141.7	14.06	3.135	5.471	303.8
26.0	0.6730	545.0	0.325	92.59	147.1	14.27	3.135	5.450	309.8
28.0	0.7269	590.0	0.299	99.09	158.0	14.68	3.135	5.413	321.2
30.0	0.7803	634.0	0.278	105.5	168.8	15.05	3.134	5.384	332.2
32.0	0.8335	678.0	0.259	112.0	179.5	15.39	3.134	5.360	342.8
34.0	0.8864	722.0	0.243	118.4	190.2	15.72	3.133	5.340	353.1
36.0	0.9391	765.0	0.228	124.8	200.9	16.02	3.132	5.323	363.0
38.0	0.9917	808.0	0.216	131.2	211.5	16.31	3.132	5.309	372.6
40.0	1.044	851.0	0.204	137.5	222.1	16.58	3.131	5.297	381.9
45.0	1.175	957.0	0.181	153.4	248.6	17.21	3.129	5.274	404.3
50.0	1.305	1060.0	0.162	169.2	274.9	17.76	3.128	5.258	425.4
55.0	1.434	1170.0	0.147	184.9	301.2	18.26	3.127	5.246	445.4
60.0	1.563	1270.0	0.134	200.6	327.4	18.72	3.126	5.236	464.5
65.0	1.692	1380.0	0.124	216.3	353.5	19.14	3.125	5.229	482.9
70.0	1.821	1480.0	0.115	232.0	379.7	19.52	3.125	5.224	500.5
75.0	1.950	1580.0	0.107	247.7	405.8	19.88	3.124	5.219	517.6
80.0	2.079	1690.0	0.100	263.3	431.8	20.22	3.123	5.215	534.1
90.0	2.336	1890.0	0.0891	294.6	484.0	20.83	3.122	5.210	565.6
100.0	2.592	2100.0	0.0801	325.9	536.0	21.38	3.122	5.206	595.4
125.0	3.234	2610.0	0.0640	404.0	666.1	22.54	3.120	5.200	664.1
150.0	3.875	3120.0	0.0533	482.0	796.1	23.49	3.120	5.198	726.2
175.0	4.515	3640.0	0.0457	560.0	926.0	24.29	3.119	5.196	783.5
200.0	5.156	4150.0	0.0400	637.9	1056.0	24.99	3.119	5.195	836.8
225.0	5.796	4660.0	0.0355	715.9	1186.0	25.60	3.118	5.194	886.9
250.0	6.437	5170.0	0.0320	793.8	1316.0	26.15	3.118	5.194	934.4
275.0	7.077	5690.0	0.0291	871.8	1445.0	26.64	3.118	5.194	979.5
300.0	7.718	6200.0	0.0267	949.7	1575.0	27.09	3.118	5.193	1023.0
350.0	8.998	7220.0	0.0228	1106.0	1835.0	27.89	3.118	5.193	1104.0
400.0	10.28	8250.0	0.0200	1261.0	2095.0	28.59	3.117	5.193	1180.0
450.0	11.56	9270.0	0.0178	1417.0	2354.0	29.20	3.117	5.193	1251.0
500.0	12.84	10300.0	0.0160	1573.0	2614.0	29.74	3.117	5.193	1318.0
600.0	15.40	12300.0	0.0133	1885.0	3133.0	30.69	3.117	5.193	1443.0
700.0	17.96	14400.0	0.0114	2196.0	3652.0	31.49	3.117	5.193	1559.0
800.0	20.53	16400.0	0.0100	2508.0	4172.0	32.19	3.117	5.193	1666.0
900.0	23.09	18500.0	0.00889	2819.0	4691.0	32.80	3.117	5.193	1767.0
1000.0	25.65	20500.0	0.00800	3131.0	5210.0	33.34	3.117	5.193	1862.0
1100.0	28.21	22600.0	0.00727	3443.0	5729.0	33.84	3.117	5.193	1953.0
1200.0	30.77	24600.0	0.00666	3754.0	6249.0	34.29	3.117	5.193	2039.0
1300.0	33.33	26700.0	0.00615	4066.0	6768.0	34.71	3.117	5.193	2122.0
1400.0	35.90	28700.0	0.00571	4378.0	7287.0	35.09	3.117	5.193	2202.0
1500.0	38.46	30800.0	0.00533	4689.0	7807.0	35.45	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

8.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.091	15.92									
2.5	15.83	87.2	9.56	126.0	0.0190	0.185	54.1	0.000705	1.05967	0.485
3.0	15.64	64.8	12.6	114.0	0.0310	0.203	52.8	0.000647	1.05893	0.522
3.5	15.35	55.4	14.2	98.9	0.0434	0.218	50.1	0.000590	1.05785	0.553
4.0	14.98	49.9	15.0	83.0	0.0570	0.231	47.1	0.000542	1.05640	0.580
4.5	14.50	46.5	14.8	67.1	0.0725	0.241	44.0	0.000492	1.05456	0.616
5.0	13.89	44.2	13.9	52.0	0.0913	0.249	41.0	0.000444	1.05225	0.665
5.1	13.76	43.8	13.7	49.3	0.0953	0.251	40.4	0.000435	1.05172	0.676
5.2	13.61	43.4	13.6	47.0	0.0989	0.251	39.8	0.000429	1.05116	0.682
5.3	13.47	42.4	13.7	44.5	0.103	0.252	39.3	0.000426	1.05064	0.684
5.4	13.33	41.7	13.6	42.0	0.108	0.252	38.8	0.000420	1.05010	0.692
5.5	13.19	41.0	13.5	39.5	0.113	0.253	38.3	0.000414	1.04954	0.702
5.6	13.03	40.3	13.4	37.1	0.118	0.253	37.8	0.000407	1.04897	0.713
5.7	12.88	39.7	13.3	34.8	0.124	0.254	37.4	0.000400	1.04837	0.726
5.8	12.71	39.1	13.2	32.6	0.130	0.254	36.9	0.000392	1.04775	0.740
5.9	12.54	38.4	13.0	30.4	0.137	0.254	36.4	0.000384	1.04710	0.756
6.0	12.37	37.8	12.9	28.3	0.144	0.253	36.0	0.000376	1.04643	0.774
6.5	11.38	35.0	12.0	19.2	0.189	0.251	33.8	0.000334	1.04269	0.888
7.0	10.20	32.8	11.0	12.6	0.245	0.246	31.8	0.000300	1.03820	1.04
7.5	8.891	32.1	10.1	8.98	0.287	0.238	30.2	0.000291	1.03324	1.17
8.0	7.662	33.1	9.34	7.58	0.281	0.230	29.1	0.000322	1.02861	1.18
8.5	6.685	35.3	8.84	7.21	0.249	0.224	28.6	0.000382	1.02493	1.12
9.0	5.948	37.7	8.50	7.07	0.219	0.222	28.5	0.000451	1.02217	1.06
9.5	5.357	40.3	8.26	7.05	0.193	0.221	28.6	0.000528	1.01999	1.01
10.0	4.900	43.1	8.08	7.09	0.172	0.222	28.9	0.000609	1.01824	0.967
11.0	4.199	48.9	7.84	7.23	0.141	0.225	29.6	0.000780	1.01562	0.903
12.0	3.693	54.9	7.68	7.37	0.119	0.231	30.5	0.000958	1.01373	0.862
13.0	3.306	60.9	7.57	7.50	0.104	0.238	31.4	0.00114	1.01228	0.832
14.0	3.000	66.9	7.49	7.61	0.0918	0.246	32.4	0.00133	1.01114	0.811
15.0	2.750	72.9	7.42	7.70	0.0826	0.253	33.5	0.00153	1.01021	0.796
16.0	2.542	78.9	7.34	7.78	0.0749	0.260	34.5	0.00173	1.00944	0.783
17.0	2.366	84.7	7.28	7.84	0.0687	0.268	35.5	0.00194	1.00878	0.772
18.0	2.215	90.6	7.23	7.90	0.0635	0.275	36.6	0.00216	1.00822	0.764
19.0	2.083	96.4	7.18	7.94	0.0590	0.282	37.6	0.00238	1.00773	0.757
20.0	1.968	102.0	7.14	7.97	0.0552	0.290	38.6	0.00261	1.00730	0.752
21.0	1.865	108.0	7.11	8.00	0.0519	0.297	39.6	0.00284	1.00692	0.747
22.0	1.774	113.0	7.08	8.03	0.0490	0.304	40.6	0.00308	1.00658	0.743
23.0	1.691	119.0	7.05	8.05	0.0464	0.311	41.6	0.00333	1.00627	0.740
24.0	1.616	125.0	7.02	8.07	0.0441	0.318	42.6	0.00358	1.00599	0.737
25.0	1.548	130.0	7.00	8.08	0.0420	0.325	43.6	0.00383	1.00574	0.735
26.0	1.486	136.0	6.98	8.10	0.0402	0.331	44.6	0.00409	1.00551	0.733
28.0	1.376	147.0	6.94	8.11	0.0369	0.345	46.4	0.00463	1.00510	0.729
30.0	1.282	158.0	6.91	8.13	0.0342	0.358	48.3	0.00519	1.00475	0.726
32.0	1.200	168.0	6.89	8.14	0.0318	0.371	50.1	0.00577	1.00445	0.724
34.0	1.128	179.0	6.86	8.14	0.0298	0.384	51.9	0.00637	1.00418	0.722
36.0	1.065	190.0	6.84	8.15	0.0280	0.396	53.6	0.00699	1.00395	0.721
38.0	1.008	201.0	6.83	8.15	0.0265	0.408	55.3	0.00763	1.00374	0.719
40.0	0.9578	211.0	6.81	8.15	0.0251	0.421	57.0	0.00829	1.00355	0.718
45.0	0.8514	238.0	6.78	8.15	0.0222	0.451	61.1	0.0100	1.00315	0.715
50.0	0.7666	264.0	6.76	8.15	0.0199	0.480	65.0	0.0119	1.00284	0.712
55.0	0.6973	291.0	6.74	8.14	0.0180	0.508	68.7	0.0139	1.00258	0.709
60.0	0.6396	317.0	6.72	8.13	0.0165	0.536	72.4	0.0160	1.00237	0.707
65.0	0.5909	343.0	6.71	8.13	0.0152	0.564	75.9	0.0182	1.00219	0.704
70.0	0.5491	369.0	6.70	8.12	0.0141	0.590	79.4	0.0206	1.00203	0.702
75.0	0.5128	395.0	6.69	8.12	0.0132	0.617	82.8	0.0231	1.00190	0.700
80.0	0.4811	422.0	6.68	8.11	0.0124	0.643	86.1	0.0256	1.00178	0.698
90.0	0.4281	474.0	6.67	8.10	0.0110	0.694	92.5	0.0311	1.00159	0.694
100.0	0.3857	526.0	6.66	8.09	0.00990	0.744	98.7	0.0370	1.00143	0.691
125.0	0.3392	656.0	6.64	8.08	0.00793	0.863	112.0	0.0536	1.00115	0.673
150.0	0.2581	786.0	6.63	8.06	0.00661	0.975	126.0	0.0727	1.00096	0.670
175.0	0.2215	916.0	6.62	8.05	0.00567	1.08	139.0	0.0941	1.00082	0.668
200.0	0.1940	1050.0	6.61	8.05	0.00497	1.18	152.0	0.118	1.00072	0.666
225.0	0.1725	1180.0	6.61	8.04	0.00442	1.28	164.0	0.143	1.00064	0.666
250.0	0.1554	1310.0	6.60	8.04	0.00398	1.38	176.0	0.171	1.00058	0.666
275.0	0.1413	1430.0	6.60	8.03	0.00362	1.47	188.0	0.200	1.00052	0.667
300.0	0.1296	1560.0	6.60	8.03	0.00332	1.55	200.0	0.230	1.00048	0.668
350.0	0.1111	1820.0	6.59	8.03	0.00285	1.72	222.0	0.299	1.00041	0.668
400.0	0.09729	2080.0	6.59	8.02	0.00249	1.89	243.0	0.374	1.00036	0.668
450.0	0.08651	2340.0	6.59	8.02	0.00222	2.05	264.0	0.457	1.00032	0.667
500.0	0.07788	2600.0	6.59	8.02	0.00199	2.21	284.0	0.546	1.00029	0.667
600.0	0.06493	3120.0	6.59	8.01	0.00166	2.51	322.0	0.744	1.00024	0.667
700.0	0.05567	3640.0	6.58	8.01	0.00143	2.80	359.0	0.968	1.00021	0.667
800.0	0.04872	4160.0	6.58	8.01	0.00125	3.07	394.0	1.21	1.00018	0.666
900.0	0.04331	4680.0	6.58	8.01	0.00111	3.34	429.0	1.48	1.00016	0.666
1000.0	0.03899	5200.0	6.58	8.01	0.00100	3.60	462.0	1.78	1.00014	0.666
1100.0	0.03545	5720.0	6.58	8.01	0.000908	3.85	494.0	2.09	1.00013	0.666
1200.0	0.03250	6240.0	6.58	8.01	0.000833	4.10	525.0	2.43	1.00012	0.666
1300.0	0.03000	6760.0	6.58	8.01	0.000769	4.34	556.0	2.78	1.00011	0.666
1400.0	0.02786	7280.0	6.58	8.00	0.000714	4.57	586.0	3.16	1.00010	0.666
1500.0	0.02600	7800.0	6.58	8.00	0.000666	4.80	616.0	3.56	1.00010	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

9.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.079	0.06235								
2.5	0.06266	835.0	2.36	3.626	9.340	1.745	1.552	1.619	297.0
3.0	0.06338	769.0	3.53	4.383	10.16	2.058	1.781	1.979	294.2
3.5	0.06447	685.0	4.33	5.306	11.19	2.382	1.956	2.359	289.4
4.0	0.06599	597.0	4.80	6.404	12.42	2.716	2.094	2.777	283.2
4.5	0.06802	507.0	4.98	7.717	13.92	3.069	2.252	3.282	273.6
5.0	0.07071	419.0	4.89	9.305	15.75	3.448	2.438	3.882	260.1
5.1	0.07135	404.0	4.85	9.664	16.17	3.527	2.475	4.008	257.4
5.2	0.07204	391.0	4.81	10.04	16.61	3.608	2.491	4.108	255.6
5.3	0.07269	376.0	4.76	10.39	17.02	3.687	2.469	4.178	253.8
5.4	0.07337	361.0	4.70	10.75	17.44	3.766	2.474	4.281	251.4
5.5	0.07409	346.0	4.64	11.12	17.88	3.846	2.480	4.390	248.9
5.6	0.07485	331.0	4.58	11.50	18.32	3.926	2.488	4.507	246.4
5.7	0.07565	316.0	4.52	11.88	18.78	4.007	2.498	4.632	243.7
5.8	0.07649	302.0	4.45	12.27	19.25	4.089	2.508	4.764	241.0
5.9	0.07738	288.0	4.38	12.68	19.73	4.172	2.520	4.904	238.3
6.0	0.07832	274.0	4.31	13.09	20.23	4.256	2.534	5.053	235.5
6.5	0.08392	212.0	3.90	15.32	22.97	4.697	2.613	5.935	220.9
7.0	0.09160	162.0	3.44	17.89	26.24	5.182	2.709	7.039	206.7
7.5	0.1022	129.0	2.95	20.81	30.12	5.719	2.813	8.161	195.0
8.0	0.1158	116.0	2.50	23.97	34.53	6.290	2.912	8.797	188.1
8.5	0.1316	117.0	2.12	27.13	39.13	6.848	2.989	8.734	186.3
9.0	0.1478	127.0	1.83	30.08	43.56	7.355	3.037	8.313	187.4
9.5	0.1636	137.0	1.61	32.70	47.61	7.794	3.057	7.909	189.6
10.0	0.1791	149.0	1.43	35.14	51.48	8.190	3.071	7.559	192.7
11.0	0.2093	174.0	1.19	39.55	58.64	8.876	3.081	7.019	200.5
12.0	0.2385	200.0	1.02	43.61	65.36	9.463	3.090	6.664	209.2
13.0	0.2669	227.0	0.896	47.45	71.79	9.98	3.100	6.419	218.2
14.0	0.2946	253.0	0.803	51.16	78.02	10.44	3.108	6.241	227.0
15.0	0.3218	280.0	0.729	54.77	84.12	10.86	3.116	6.105	235.6
16.0	0.3486	306.0	0.667	58.37	90.16	11.25	3.123	5.986	243.7
17.0	0.3749	331.0	0.615	61.91	96.10	11.61	3.127	5.889	251.5
18.0	0.4007	357.0	0.571	65.40	101.9	11.95	3.130	5.809	258.9
19.0	0.4263	381.0	0.533	68.84	107.7	12.26	3.133	5.743	266.2
20.0	0.4516	406.0	0.501	72.25	113.4	12.55	3.134	5.687	273.1
21.0	0.4766	430.0	0.472	75.63	119.1	12.83	3.136	5.639	279.9
22.0	0.5015	454.0	0.446	78.98	124.7	13.09	3.136	5.598	286.5
23.0	0.5261	477.0	0.424	82.32	130.3	13.34	3.137	5.562	292.9
24.0	0.5506	501.0	0.403	85.63	135.8	13.57	3.137	5.531	299.1
25.0	0.5749	524.0	0.385	88.93	141.4	13.80	3.137	5.504	305.2
26.0	0.5991	547.0	0.368	92.21	146.8	14.01	3.137	5.479	311.1
28.0	0.6473	592.0	0.339	98.74	157.8	14.42	3.137	5.439	322.5
30.0	0.6950	637.0	0.314	105.2	168.6	14.79	3.136	5.406	333.5
32.0	0.7425	681.0	0.292	111.7	179.4	15.14	3.136	5.379	344.1
34.0	0.7897	725.0	0.274	118.1	190.1	15.47	3.135	5.357	354.3
36.0	0.8367	769.0	0.258	124.5	200.8	15.77	3.134	5.339	364.2
38.0	0.8835	812.0	0.243	130.9	211.5	16.06	3.133	5.323	373.8
40.0	0.9302	855.0	0.230	137.3	222.1	16.33	3.133	5.310	383.2
45.0	1.046	962.0	0.204	153.2	248.6	16.96	3.131	5.284	405.5
50.0	1.162	1070.0	0.183	169.0	275.0	17.51	3.130	5.266	426.5
55.0	1.277	1170.0	0.165	184.8	301.3	18.01	3.128	5.252	446.5
60.0	1.393	1280.0	0.151	200.5	327.5	18.47	3.127	5.242	465.6
65.0	1.507	1380.0	0.139	216.2	353.7	18.89	3.126	5.234	484.0
70.0	1.622	1490.0	0.129	231.9	379.8	19.28	3.126	5.227	501.6
75.0	1.736	1590.0	0.121	247.6	406.0	19.64	3.125	5.222	518.6
80.0	1.851	1690.0	0.113	263.3	432.1	19.97	3.124	5.218	535.0
90.0	2.079	1900.0	0.100	294.6	484.2	20.59	3.123	5.212	566.5
100.0	2.308	2100.0	0.0902	325.9	536.3	21.14	3.122	5.208	596.3
125.0	2.878	2620.0	0.0721	404.0	666.4	22.30	3.121	5.201	664.8
150.0	3.448	3130.0	0.0600	482.0	796.4	23.25	3.120	5.198	726.9
175.0	4.017	3640.0	0.0514	560.0	926.3	24.05	3.119	5.196	784.1
200.0	4.586	4160.0	0.0450	638.0	1056.0	24.74	3.119	5.195	837.4
225.0	5.156	4670.0	0.0400	715.9	1186.0	25.35	3.119	5.194	887.5
250.0	5.725	5180.0	0.0360	793.9	1316.0	25.90	3.118	5.194	934.9
275.0	6.294	5690.0	0.0327	871.8	1446.0	26.40	3.118	5.194	980.0
300.0	6.863	6200.0	0.0300	949.7	1576.0	26.85	3.118	5.193	1023.0
350.0	8.002	7230.0	0.0257	1106.0	1835.0	27.65	3.118	5.193	1104.0
400.0	9.140	8250.0	0.0225	1261.0	2095.0	28.34	3.118	5.193	1180.0
450.0	10.28	9280.0	0.0200	1417.0	2355.0	28.95	3.117	5.193	1251.0
500.0	11.42	10300.0	0.0180	1573.0	2614.0	29.50	3.117	5.193	1318.0
600.0	13.69	12300.0	0.0150	1885.0	3133.0	30.45	3.117	5.193	1444.0
700.0	15.97	14400.0	0.0129	2196.0	3653.0	31.25	3.117	5.193	1559.0
800.0	18.25	16400.0	0.0112	2508.0	4172.0	31.94	3.117	5.193	1666.0
900.0	20.52	18500.0	0.0100	2820.0	4691.0	32.55	3.117	5.193	1767.0
1000.0	22.80	20500.0	0.00900	3131.0	5211.0	33.10	3.117	5.193	1862.0
1100.0	25.08	22600.0	0.00818	3443.0	5730.0	33.59	3.117	5.193	1953.0
1200.0	27.36	24600.0	0.00750	3754.0	6249.0	34.05	3.117	5.193	2039.0
1300.0	29.63	26700.0	0.00692	4066.0	6768.0	34.46	3.117	5.193	2123.0
1400.0	31.91	28700.0	0.00643	4378.0	7288.0	34.85	3.117	5.193	2202.0
1500.0	34.19	30800.0	0.00600	4689.0	7807.0	35.20	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

9.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_p$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.079	16.04									
2.5	15.96	91.5	9.51	133.0	0.0177	0.187	56.2	0.000724	1.06016	0.486
3.0	15.78	68.0	12.6	121.0	0.0291	0.206	54.7	0.000660	1.05946	0.525
3.5	15.51	58.0	14.3	116.0	0.0407	0.221	51.9	0.000603	1.05843	0.555
4.0	15.15	52.3	15.1	90.5	0.0531	0.234	48.7	0.000556	1.05706	0.578
4.5	14.70	49.2	15.0	74.6	0.0667	0.245	45.6	0.000509	1.05533	0.610
5.0	14.14	47.1	14.2	59.3	0.0824	0.254	42.5	0.000462	1.05319	0.651
5.1	14.01	46.8	14.0	56.6	0.0857	0.255	41.9	0.000454	1.05271	0.659
5.2	13.88	46.4	13.9	54.3	0.0886	0.256	41.4	0.000449	1.05220	0.663
5.3	13.75	45.4	14.0	51.7	0.0920	0.257	40.9	0.000448	1.05172	0.663
5.4	13.63	44.7	13.9	49.1	0.0957	0.258	40.4	0.000443	1.05123	0.669
5.5	13.50	44.1	13.9	46.6	0.100	0.259	39.9	0.000437	1.05073	0.676
5.6	13.36	43.5	13.8	44.2	0.104	0.260	39.4	0.000432	1.05021	0.683
5.7	13.22	42.8	13.7	41.8	0.108	0.260	38.9	0.000425	1.04967	0.692
5.8	13.07	42.3	13.6	39.5	0.113	0.261	38.5	0.000419	1.04912	0.703
5.9	12.92	41.7	13.4	37.2	0.118	0.261	38.0	0.000412	1.04854	0.714
6.0	12.77	41.1	13.3	35.0	0.123	0.261	37.6	0.000405	1.04795	0.727
6.5	11.92	38.5	12.5	25.3	0.154	0.260	35.5	0.000368	1.04471	0.810
7.0	10.92	36.3	11.6	17.7	0.194	0.257	33.6	0.000334	1.04091	0.922
7.5	9.789	35.0	10.7	12.7	0.233	0.251	32.0	0.000314	1.03664	1.04
8.0	8.634	35.1	10.0	10.0	0.251	0.244	30.8	0.000321	1.03227	1.11
8.5	7.600	36.6	9.35	8.91	0.239	0.237	30.1	0.000357	1.02838	1.11
9.0	6.765	38.9	8.91	8.57	0.214	0.233	29.7	0.000414	1.02523	1.06
9.5	6.114	41.3	8.60	8.39	0.192	0.231	29.7	0.000478	1.02279	1.02
10.0	5.582	43.8	8.36	8.31	0.172	0.231	29.9	0.000547	1.02080	0.979
11.0	4.778	49.3	8.05	8.32	0.142	0.233	30.4	0.000695	1.01778	0.916
12.0	4.193	55.0	7.85	8.40	0.121	0.238	31.2	0.000851	1.01560	0.874
13.0	3.747	60.9	7.71	8.50	0.105	0.244	32.1	0.00101	1.01393	0.844
14.0	3.394	66.8	7.61	8.60	0.0934	0.251	33.0	0.00118	1.01261	0.822
15.0	3.107	72.8	7.53	8.69	0.0838	0.258	34.0	0.00136	1.01154	0.806
16.0	2.869	78.8	7.44	8.77	0.0760	0.265	35.0	0.00154	1.01065	0.791
17.0	2.668	84.7	7.37	8.84	0.0696	0.272	36.0	0.00173	1.00991	0.780
18.0	2.495	90.5	7.31	8.90	0.0642	0.279	37.0	0.00192	1.00926	0.771
19.0	2.346	96.3	7.26	8.95	0.0596	0.286	38.0	0.00212	1.00871	0.763
20.0	2.214	102.0	7.21	8.99	0.0557	0.293	39.0	0.00233	1.00822	0.757
21.0	2.098	108.0	7.17	9.02	0.0523	0.300	40.0	0.00254	1.00779	0.752
22.0	1.994	113.0	7.14	9.05	0.0493	0.307	41.0	0.00275	1.00740	0.748
23.0	1.901	119.0	7.11	9.08	0.0467	0.314	42.0	0.00297	1.00705	0.744
24.0	1.816	125.0	7.08	9.10	0.0443	0.321	43.0	0.00319	1.00674	0.741
25.0	1.739	130.0	7.05	9.11	0.0422	0.327	43.9	0.00342	1.00645	0.738
26.0	1.669	136.0	7.03	9.13	0.0403	0.334	44.9	0.00365	1.00619	0.736
28.0	1.545	147.0	6.99	9.15	0.0370	0.347	46.7	0.00413	1.00573	0.732
30.0	1.439	158.0	6.95	9.17	0.0342	0.360	48.6	0.00463	1.00533	0.729
32.0	1.347	169.0	6.93	9.18	0.0319	0.373	50.4	0.00515	1.00499	0.726
34.0	1.266	180.0	6.90	9.18	0.0298	0.386	52.1	0.00569	1.00469	0.724
36.0	1.195	190.0	6.88	9.19	0.0280	0.398	53.9	0.00624	1.00443	0.722
38.0	1.132	201.0	6.86	9.19	0.0265	0.411	55.5	0.00681	1.00420	0.720
40.0	1.075	212.0	6.84	9.19	0.0251	0.423	57.2	0.00741	1.00398	0.719
45.0	0.9556	238.0	6.81	9.19	0.0222	0.453	61.3	0.00896	1.00354	0.715
50.0	0.8605	265.0	6.78	9.18	0.0199	0.482	65.1	0.0106	1.00319	0.712
55.0	0.7828	291.0	6.76	9.18	0.0180	0.510	68.9	0.0124	1.00290	0.710
60.0	0.7181	318.0	6.74	9.17	0.0165	0.538	72.5	0.0143	1.00266	0.707
65.0	0.6634	344.0	6.72	9.16	0.0152	0.565	76.1	0.0163	1.00246	0.705
70.0	0.6165	370.0	6.71	9.15	0.0141	0.592	79.5	0.0184	1.00228	0.702
75.0	0.5759	396.0	6.70	9.15	0.0132	0.618	82.9	0.0206	1.00213	0.700
80.0	0.5403	422.0	6.69	9.14	0.0124	0.644	86.2	0.0229	1.00200	0.698
90.0	0.4809	474.0	6.68	9.13	0.0110	0.695	92.6	0.0277	1.00178	0.694
100.0	0.4333	527.0	6.66	9.12	0.00989	0.745	98.8	0.0330	1.00160	0.691
125.0	0.3475	657.0	6.64	9.10	0.00792	0.864	112.0	0.0478	1.00129	0.673
150.0	0.2901	787.0	6.63	9.08	0.00661	0.976	126.0	0.0648	1.00107	0.670
175.0	0.2489	916.0	6.62	9.07	0.00567	1.08	139.0	0.0838	1.00092	0.668
200.0	0.2180	1050.0	6.62	9.06	0.00497	1.19	152.0	0.105	1.00081	0.666
225.0	0.1940	1180.0	6.61	9.05	0.00442	1.28	164.0	0.127	1.00072	0.666
250.0	0.1747	1310.0	6.61	9.05	0.00398	1.38	176.0	0.152	1.00065	0.666
275.0	0.1589	1440.0	6.60	9.04	0.00362	1.47	188.0	0.178	1.00059	0.667
300.0	0.1457	1570.0	6.60	9.04	0.00332	1.55	200.0	0.205	1.00054	0.668
350.0	0.1250	1830.0	6.60	9.03	0.00285	1.72	222.0	0.266	1.00046	0.668
400.0	0.1094	2080.0	6.59	9.03	0.00249	1.89	243.0	0.333	1.00041	0.668
450.0	0.09729	2340.0	6.59	9.02	0.00222	2.05	264.0	0.406	1.00036	0.667
500.0	0.08759	2600.0	6.59	9.02	0.00199	2.21	284.0	0.486	1.00032	0.667
600.0	0.07303	3120.0	6.59	9.02	0.00166	2.51	322.0	0.662	1.00027	0.667
700.0	0.06261	3640.0	6.59	9.01	0.00143	2.80	359.0	0.865	1.00023	0.667
800.0	0.05480	4160.0	6.58	9.01	0.00125	3.07	394.0	1.08	1.00020	0.666
900.0	0.04872	4680.0	6.58	9.01	0.00111	3.34	429.0	1.32	1.00018	0.666
1000.0	0.04386	5200.0	6.58	9.01	0.00100	3.60	462.0	1.58	1.00016	0.666
1100.0	0.03987	5720.0	6.58	9.01	0.000908	3.85	494.0	1.86	1.00015	0.666
1200.0	0.03655	6240.0	6.58	9.01	0.000832	4.10	525.0	2.16	1.00014	0.666
1300.0	0.03375	6760.0	6.58	9.01	0.000768	4.34	556.0	2.47	1.00012	0.666
1400.0	0.03134	7280.0	6.58	9.01	0.000714	4.57	586.0	2.81	1.00012	0.666
1500.0	0.02925	7800.0	6.58	9.01	0.000666	4.80	616.0	3.16	1.00011	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

10.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.067	0.06190								
2.5	0.06219	872.0	2.32	3.629	9.931	1.728	1.523	1.583	303.1
3.0	0.06286	808.0	3.52	4.365	10.73	2.038	1.763	1.948	300.7
3.5	0.06388	726.0	4.36	5.263	11.74	2.354	1.939	2.317	296.5
4.0	0.06530	639.0	4.87	6.330	12.95	2.681	2.076	2.718	291.0
4.5	0.06717	550.0	5.07	7.602	14.41	3.025	2.235	3.198	282.3
5.0	0.06962	463.0	5.02	9.135	16.19	3.393	2.420	3.756	269.8
5.1	0.07019	446.0	4.99	9.480	16.59	3.469	2.457	3.871	267.3
5.2	0.07080	435.0	4.95	9.840	17.01	3.547	2.473	3.961	265.7
5.3	0.07138	420.0	4.91	10.18	17.41	3.623	2.451	4.019	264.1
5.4	0.07199	405.0	4.86	10.52	17.82	3.699	2.455	4.108	262.0
5.5	0.07263	390.0	4.81	10.87	18.23	3.776	2.461	4.203	259.7
5.6	0.07330	375.0	4.75	11.23	18.66	3.852	2.468	4.303	257.4
5.7	0.07399	360.0	4.69	11.60	19.09	3.930	2.477	4.410	255.0
5.8	0.07472	346.0	4.63	11.97	19.54	4.007	2.487	4.521	252.5
5.9	0.07549	332.0	4.57	12.35	20.00	4.086	2.499	4.639	250.0
6.0	0.07629	319.0	4.50	12.74	20.47	4.165	2.511	4.763	247.4
6.5	0.08099	255.0	4.13	14.82	23.03	4.578	2.584	5.481	234.1
7.0	0.08715	202.0	3.72	17.17	26.00	5.018	2.671	6.362	220.7
7.5	0.09531	162.0	3.27	19.81	29.47	5.499	2.765	7.327	208.7
8.0	0.1059	139.0	2.84	22.71	33.44	6.013	2.858	8.114	200.0
8.5	0.1185	132.0	2.44	25.74	37.75	6.537	2.939	8.429	195.6
9.0	0.1325	136.0	2.12	28.71	42.13	7.039	3.001	8.289	194.9
9.5	0.1466	146.0	1.86	31.50	46.36	7.497	3.041	7.945	196.4
10.0	0.1603	156.0	1.65	34.01	50.25	7.896	3.059	7.633	198.5
11.0	0.1871	179.0	1.36	38.54	57.50	8.590	3.074	7.112	204.6
12.0	0.2133	203.0	1.16	42.70	64.71	9.185	3.085	6.757	212.3
13.0	0.2388	228.0	1.02	46.62	70.82	9.708	3.095	6.508	220.6
14.0	0.2640	254.0	0.910	50.39	77.14	10.18	3.105	6.323	229.1
15.0	0.2887	280.0	0.824	54.09	83.30	10.60	3.114	6.182	237.4
16.0	0.3129	306.0	0.752	57.71	89.42	11.00	3.122	6.056	245.4
17.0	0.3368	332.0	0.693	61.29	95.42	11.36	3.127	5.953	253.0
18.0	0.3603	357.0	0.643	64.82	101.3	11.70	3.131	5.867	260.5
19.0	0.3835	382.0	0.599	68.30	107.2	12.01	3.134	5.795	267.6
20.0	0.4064	407.0	0.562	71.74	112.9	12.31	3.136	5.734	274.6
21.0	0.4291	431.0	0.529	75.15	118.6	12.59	3.137	5.682	281.3
22.0	0.4516	455.0	0.500	78.53	124.3	12.85	3.138	5.638	287.9
23.0	0.4740	479.0	0.474	81.88	129.9	13.10	3.139	5.599	294.3
24.0	0.4961	503.0	0.451	85.22	135.5	13.34	3.139	5.565	300.5
25.0	0.5182	526.0	0.430	88.53	141.0	13.56	3.139	5.535	306.5
26.0	0.5401	549.0	0.411	91.83	146.6	13.78	3.139	5.508	312.4
28.0	0.5836	595.0	0.378	98.39	157.5	14.19	3.139	5.464	323.9
30.0	0.6268	640.0	0.350	104.9	168.4	14.56	3.138	5.428	334.9
32.0	0.6697	684.0	0.326	111.4	179.2	14.91	3.137	5.399	345.4
34.0	0.7123	729.0	0.305	117.8	190.0	15.24	3.137	5.375	355.6
36.0	0.7547	772.0	0.287	124.3	200.7	15.55	3.136	5.354	365.5
38.0	0.7970	816.0	0.271	130.7	211.4	15.84	3.135	5.337	375.1
40.0	0.8391	859.0	0.257	137.1	222.1	16.11	3.134	5.322	384.4
45.0	0.9440	966.0	0.227	153.0	248.6	16.73	3.133	5.294	406.7
50.0	1.048	1070.0	0.203	168.8	275.0	17.29	3.131	5.273	427.7
55.0	1.152	1180.0	0.184	184.6	301.4	17.79	3.130	5.258	447.7
60.0	1.256	1280.0	0.168	200.4	327.6	18.25	3.129	5.247	466.7
65.0	1.359	1390.0	0.155	216.1	353.8	18.67	3.128	5.238	485.0
70.0	1.463	1490.0	0.144	231.8	380.0	19.06	3.127	5.231	502.6
75.0	1.565	1590.0	0.134	247.5	406.2	19.42	3.126	5.226	519.6
80.0	1.669	1700.0	0.126	263.2	432.3	19.75	3.125	5.221	536.0
90.0	1.874	1900.0	0.111	294.5	484.4	20.37	3.124	5.214	567.4
100.0	2.080	2110.0	0.100	325.8	536.6	20.92	3.123	5.209	597.1
125.0	2.593	2620.0	0.0801	403.9	666.7	22.08	3.122	5.202	665.6
150.0	3.106	3140.0	0.0667	482.0	796.7	23.03	3.121	5.199	727.6
175.0	3.618	3650.0	0.0571	560.0	926.6	23.83	3.120	5.197	784.8
200.0	4.131	4160.0	0.0500	638.0	1057.0	24.52	3.119	5.195	838.0
225.0	4.643	4670.0	0.0444	715.9	1186.0	25.13	3.119	5.195	888.0
250.0	5.155	5190.0	0.0400	793.9	1316.0	25.68	3.119	5.194	935.4
275.0	5.668	5700.0	0.0363	871.8	1446.0	26.18	3.118	5.194	980.5
300.0	6.180	6210.0	0.0333	949.7	1576.0	26.63	3.118	5.193	1024.0
350.0	7.204	7230.0	0.0286	1106.0	1836.0	27.43	3.118	5.193	1105.0
400.0	8.229	8260.0	0.0250	1261.0	2095.0	28.12	3.118	5.193	1180.0
450.0	9.253	9280.0	0.0222	1417.0	2355.0	28.73	3.118	5.193	1251.0
500.0	10.28	10300.0	0.0200	1573.0	2615.0	29.28	3.117	5.193	1319.0
600.0	12.33	12400.0	0.0167	1885.0	3134.0	30.23	3.117	5.193	1444.0
700.0	14.38	14400.0	0.0143	2196.0	3653.0	31.03	3.117	5.193	1559.0
800.0	16.43	16500.0	0.0125	2508.0	4172.0	31.72	3.117	5.193	1666.0
900.0	18.47	18500.0	0.0111	2820.0	4692.0	32.33	3.117	5.193	1767.0
1000.0	20.52	20500.0	0.0100	3131.0	5211.0	32.88	3.117	5.193	1862.0
1100.0	22.57	22600.0	0.00909	3443.0	5730.0	33.38	3.117	5.193	1953.0
1200.0	24.62	24600.0	0.00833	3754.0	6249.0	33.83	3.117	5.193	2040.0
1300.0	26.67	26700.0	0.00769	4066.0	6769.0	34.24	3.117	5.193	2123.0
1400.0	28.72	28700.0	0.00714	4378.0	7288.0	34.63	3.117	5.193	2203.0
1500.0	30.77	30800.0	0.00666	4689.0	7807.0	34.99	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

10.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_p$ J/S	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.057	16.16									
2.5	16.08	95.7	9.48	14.0	0.0165	0.189	58.2	0.000742	1.06062	0.488
3.0	15.91	71.1	12.6	129.0	0.0274	0.208	56.6	0.000672	1.05996	0.529
3.5	15.65	60.4	14.4	114.0	0.0343	0.223	53.6	0.000616	1.05898	0.557
4.0	15.31	54.6	15.3	97.8	0.0438	0.237	50.4	0.000570	1.05768	0.577
4.5	14.89	51.6	15.2	81.9	0.0620	0.249	47.1	0.000524	1.05605	0.604
5.0	14.36	49.8	14.4	66.5	0.0754	0.258	44.0	0.000479	1.05405	0.640
5.1	14.25	49.5	14.2	63.8	0.0782	0.260	43.4	0.000471	1.05359	0.647
5.2	14.12	49.2	14.2	61.4	0.0806	0.261	42.8	0.000467	1.05313	0.650
5.3	14.01	48.2	14.3	58.8	0.0834	0.262	42.3	0.000466	1.05268	0.648
5.4	13.89	47.5	14.2	56.2	0.0864	0.264	41.8	0.000462	1.05223	0.652
5.5	13.77	46.9	14.2	53.7	0.0896	0.265	41.4	0.000458	1.05177	0.656
5.6	13.64	46.3	14.1	51.2	0.0929	0.266	40.9	0.000453	1.05129	0.662
5.7	13.51	45.8	14.0	48.7	0.0963	0.267	40.4	0.000447	1.05080	0.668
5.8	13.38	45.2	13.9	46.3	0.100	0.267	40.0	0.000442	1.05030	0.676
5.9	13.25	44.7	13.8	44.0	0.104	0.268	39.5	0.000436	1.04978	0.684
6.0	13.11	44.2	13.7	41.7	0.108	0.268	39.1	0.000430	1.04924	0.694
6.5	12.35	41.7	13.0	31.5	0.131	0.269	37.1	0.000397	1.04635	0.757
7.0	11.47	39.6	12.1	23.2	0.161	0.266	35.3	0.000365	1.04303	0.842
7.5	10.49	38.1	11.3	17.0	0.192	0.262	33.7	0.000341	1.03930	0.941
8.0	9.447	37.6	10.5	13.1	0.216	0.256	32.4	0.000334	1.03535	1.03
8.5	8.436	38.3	9.86	11.1	0.220	0.250	31.5	0.000351	1.03153	1.06
9.0	7.550	40.1	9.35	10.3	0.207	0.244	31.0	0.000391	1.02819	1.05
9.5	6.822	42.5	8.96	9.94	0.187	0.241	30.8	0.000445	1.02545	1.01
10.0	6.240	44.8	8.67	9.72	0.170	0.240	30.8	0.000504	1.02326	0.980
11.0	5.345	49.9	8.28	9.55	0.142	0.241	31.2	0.000633	1.01991	0.923
12.0	4.689	55.4	8.03	9.52	0.122	0.244	31.9	0.000772	1.01745	0.882
13.0	4.187	61.1	7.86	9.57	0.106	0.250	32.7	0.000917	1.01557	0.852
14.0	3.799	67.0	7.74	9.63	0.0944	0.256	33.6	0.00107	1.01408	0.830
15.0	3.484	72.9	7.64	9.71	0.0849	0.263	34.5	0.00123	1.01287	0.813
16.0	3.196	78.8	7.54	9.79	0.0769	0.269	35.5	0.00139	1.01187	0.798
17.0	2.959	84.7	7.46	9.86	0.0703	0.276	36.5	0.00156	1.01103	0.787
18.0	2.775	90.6	7.39	9.92	0.0648	0.283	37.5	0.00174	1.01031	0.777
19.0	2.608	96.4	7.34	10.0	0.0601	0.290	38.4	0.00192	1.00968	0.769
20.0	2.460	102.0	7.29	10.0	0.0561	0.297	39.4	0.00210	1.00913	0.762
21.0	2.330	108.0	7.24	10.1	0.0527	0.303	40.4	0.00229	1.00865	0.756
22.0	2.214	114.0	7.20	10.1	0.0496	0.310	41.4	0.00249	1.00822	0.752
23.0	2.110	119.0	7.17	10.1	0.0469	0.317	42.3	0.00268	1.00783	0.748
24.0	2.016	125.0	7.13	10.1	0.0445	0.324	43.3	0.00289	1.00748	0.744
25.0	1.930	131.0	7.11	10.2	0.0424	0.330	44.2	0.00309	1.00716	0.741
26.0	1.852	136.0	7.08	10.2	0.0405	0.337	45.2	0.00330	1.00687	0.739
28.0	1.713	147.0	7.03	10.2	0.0371	0.350	47.0	0.00374	1.00636	0.734
30.0	1.595	158.0	7.00	10.2	0.0343	0.363	48.8	0.00419	1.00592	0.731
32.0	1.493	169.0	6.96	10.2	0.0319	0.376	50.6	0.00466	1.00554	0.728
34.0	1.404	180.0	6.94	10.2	0.0299	0.388	52.4	0.00514	1.00521	0.725
36.0	1.325	191.0	6.91	10.2	0.0281	0.400	54.1	0.00565	1.00491	0.723
38.0	1.255	202.0	6.89	10.2	0.0265	0.413	55.8	0.00616	1.00465	0.721
40.0	1.192	212.0	6.87	10.2	0.0251	0.425	57.4	0.00670	1.00442	0.720
45.0	1.059	239.0	6.83	10.2	0.0221	0.454	61.5	0.00810	1.00393	0.716
50.0	0.9539	266.0	6.80	10.2	0.0199	0.483	65.3	0.00961	1.00354	0.713
55.0	0.8679	292.0	6.78	10.2	0.0181	0.512	69.1	0.0112	1.00322	0.710
60.0	0.7963	318.0	6.76	10.2	0.0165	0.539	72.7	0.0129	1.00295	0.707
65.0	0.7357	345.0	6.74	10.2	0.0152	0.567	76.2	0.0147	1.00273	0.705
70.0	0.6838	371.0	6.73	10.2	0.0141	0.593	79.7	0.0166	1.00253	0.703
75.0	0.6387	397.0	6.71	10.2	0.0132	0.620	83.1	0.0186	1.00237	0.700
80.0	0.5993	423.0	6.70	10.2	0.0123	0.646	86.3	0.0206	1.00222	0.698
90.0	0.5335	475.0	6.69	10.2	0.0110	0.696	92.7	0.0250	1.00198	0.694
100.0	0.4808	527.0	6.67	10.1	0.00988	0.746	98.9	0.0298	1.00178	0.691
125.0	0.3856	658.0	6.65	10.1	0.00791	0.865	112.8	0.0431	1.00143	0.673
150.0	0.3220	787.0	6.64	10.1	0.00660	0.977	126.0	0.0584	1.00119	0.670
175.0	0.2764	917.0	6.63	10.1	0.00566	1.08	139.0	0.0755	1.00102	0.667
200.0	0.2421	1050.0	6.62	10.1	0.00496	1.19	152.0	0.0943	1.00090	0.666
225.0	0.2154	1180.0	6.61	10.1	0.00441	1.28	164.0	0.115	1.00080	0.666
250.0	0.1940	1310.0	6.61	10.1	0.00397	1.38	177.0	0.137	1.00072	0.666
275.0	0.1764	1440.0	6.61	10.1	0.00362	1.47	188.0	0.163	1.00065	0.667
300.0	0.1618	1570.0	6.60	10.0	0.00332	1.55	200.0	0.185	1.00060	0.668
350.0	0.1388	1830.0	6.60	10.0	0.00284	1.73	222.0	0.239	1.00051	0.668
400.0	0.1215	2090.0	6.59	10.0	0.00249	1.89	243.0	0.300	1.00045	0.667
450.0	0.1081	2350.0	6.59	10.0	0.00221	2.05	264.0	0.366	1.00040	0.667
500.0	0.09730	2600.0	6.59	10.0	0.00199	2.21	284.0	0.437	1.00036	0.667
600.0	0.08112	3120.0	6.59	10.0	0.00166	2.51	322.0	0.596	1.00030	0.667
700.0	0.06956	3640.0	6.59	10.0	0.00143	2.80	359.0	0.774	1.00026	0.667
800.0	0.06088	4160.0	6.58	10.0	0.00125	3.07	394.0	0.972	1.00023	0.666
900.0	0.05413	4680.0	6.58	10.0	0.00111	3.34	429.0	1.19	1.00020	0.666
1000.0	0.04872	5200.0	6.58	10.0	0.00100	3.60	462.0	1.42	1.00018	0.666
1100.0	0.04430	5720.0	6.58	10.0	0.000918	3.85	494.0	1.67	1.00016	0.666
1200.0	0.04061	6240.0	6.58	10.0	0.000832	4.11	525.0	1.94	1.00015	0.666
1300.0	0.03749	6760.0	6.58	10.0	0.000768	4.34	556.0	2.23	1.00014	0.666
1400.0	0.03482	7280.0	6.58	10.0	0.000714	4.57	586.0	2.53	1.00013	0.666
1500.0	0.03250	7800.0	6.58	10.0	0.000666	4.80	616.0	2.85	1.00012	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

11.0 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.054	0.06147								
	2.5	0.06175	908.0	2.29	3.638	10.52	1.713	1.494	1.550	308.9
	3.0	0.06238	846.0	3.51	4.353	11.31	2.015	1.746	1.919	306.9
	3.5	0.06333	765.0	4.39	5.228	12.29	2.327	1.921	2.278	303.2
	4.0	0.06466	679.0	4.93	6.266	13.47	2.648	2.059	2.666	298.4
	4.5	0.06640	591.0	5.16	7.502	14.90	2.984	2.218	3.124	290.5
	5.0	0.06864	505.0	5.13	8.988	16.64	3.342	2.404	3.650	278.8
	5.1	0.06917	490.0	5.11	9.321	17.03	3.417	2.441	3.757	276.4
	5.2	0.06972	478.0	5.08	9.669	17.44	3.493	2.456	3.839	275.0
	5.3	0.07025	463.0	5.04	10.00	17.83	3.566	2.434	3.889	273.7
	5.4	0.07080	448.0	5.00	10.33	18.22	3.639	2.438	3.968	271.7
	5.5	0.07137	433.0	4.95	10.67	18.62	3.713	2.444	4.052	269.6
	5.6	0.07196	418.0	4.90	11.01	19.03	3.787	2.451	4.141	267.4
	5.7	0.07258	403.0	4.85	11.36	19.45	3.861	2.459	4.234	265.2
	5.8	0.07323	389.0	4.80	11.71	19.87	3.936	2.469	4.332	263.0
	5.9	0.07391	375.0	4.74	12.07	20.31	4.011	2.480	4.434	260.6
	6.0	0.07461	361.0	4.68	12.44	20.76	4.087	2.492	4.541	258.3
	6.5	0.07867	297.0	4.34	14.41	23.19	4.475	2.562	5.150	245.9
	7.0	0.08381	241.0	3.96	16.60	25.94	4.887	2.643	5.881	233.3
	7.5	0.09042	197.0	3.55	19.04	29.12	5.327	2.729	6.700	221.5
	8.0	0.09882	167.0	3.14	21.72	32.73	5.796	2.816	7.473	212.0
	8.5	0.1091	152.0	2.74	24.57	36.73	6.281	2.896	7.982	205.8
	9.0	0.1208	149.0	2.40	27.46	40.92	6.762	2.962	8.109	203.1
	9.5	0.1332	155.0	2.11	30.28	45.13	7.218	3.013	7.944	203.2
	10.0	0.1457	165.0	1.88	32.96	49.19	7.636	3.047	7.655	204.9
	11.0	0.1696	185.0	1.54	37.59	56.49	8.335	3.066	7.168	209.4
	12.0	0.1932	208.0	1.31	41.83	63.36	8.934	3.079	6.823	215.9
	13.0	0.2164	232.0	1.14	45.82	69.93	9.462	3.091	6.576	223.5
	14.0	0.2392	257.0	1.02	49.64	76.30	9.935	3.102	6.392	231.4
	15.0	0.2618	282.0	0.921	53.35	82.52	10.36	3.112	6.248	239.5
	16.0	0.2840	308.0	0.840	57.05	88.71	10.76	3.120	6.118	247.2
	17.0	0.3058	333.0	0.772	60.68	94.77	11.13	3.127	6.011	254.8
	18.0	0.3273	359.0	0.715	64.25	100.7	11.47	3.131	5.920	262.1
	19.0	0.3486	384.0	0.667	67.76	106.6	11.79	3.134	5.844	269.2
	20.0	0.3696	408.0	0.624	71.23	112.4	12.09	3.137	5.779	276.1
	21.0	0.3904	433.0	0.588	74.67	118.2	12.37	3.138	5.724	282.8
	22.0	0.4110	457.0	0.555	78.07	123.9	12.63	3.139	5.676	289.3
	23.0	0.4314	481.0	0.526	81.45	129.5	12.89	3.140	5.634	295.7
	24.0	0.4517	505.0	0.500	84.80	135.1	13.12	3.141	5.597	301.9
	25.0	0.4718	528.0	0.477	88.14	140.7	13.35	3.141	5.565	307.9
	26.0	0.4918	551.0	0.455	91.46	146.2	13.57	3.141	5.537	313.8
	28.0	0.5316	597.0	0.418	98.05	157.3	13.98	3.141	5.488	325.2
	30.0	0.5710	643.0	0.387	104.6	168.2	14.36	3.140	5.449	336.2
	32.0	0.6101	688.0	0.360	111.1	179.1	14.71	3.139	5.418	346.7
	34.0	0.6490	732.0	0.337	117.6	189.8	15.03	3.139	5.391	356.9
	36.0	0.6877	776.0	0.317	124.0	200.7	15.34	3.138	5.369	366.8
	38.0	0.7262	820.0	0.299	130.4	211.4	15.63	3.137	5.350	376.4
	40.0	0.7646	863.0	0.283	136.8	222.1	15.91	3.136	5.334	385.7
	45.0	0.8601	971.0	0.250	152.8	248.7	16.53	3.134	5.303	407.9
	50.0	0.9551	1080.0	0.224	168.7	275.1	17.09	3.133	5.281	428.9
	55.0	1.050	1180.0	0.203	184.5	301.5	17.59	3.131	5.265	448.8
	60.0	1.144	1290.0	0.185	200.3	327.8	18.05	3.130	5.252	467.8
	65.0	1.238	1390.0	0.171	216.0	354.0	18.47	3.129	5.243	486.1
	70.0	1.332	1500.0	0.158	231.7	380.2	18.86	3.128	5.235	503.7
	75.0	1.426	1600.0	0.148	247.4	406.4	19.22	3.127	5.229	520.6
	80.0	1.520	1700.0	0.138	263.1	432.5	19.56	3.126	5.224	537.0
	90.0	1.707	1910.0	0.123	294.5	484.7	20.17	3.125	5.216	568.3
	100.0	1.894	2120.0	0.110	325.8	536.8	20.72	3.124	5.211	598.0
	125.0	2.360	2630.0	0.0881	403.9	667.0	21.88	3.122	5.203	666.4
	150.0	2.826	3140.0	0.0733	482.0	797.0	22.83	3.121	5.199	728.3
	175.0	3.292	3660.0	0.0628	560.0	927.0	23.63	3.120	5.197	785.4
	200.0	3.758	4170.0	0.0550	638.0	1057.0	24.32	3.120	5.196	839.6
	225.0	4.224	4680.0	0.0489	716.0	1187.0	24.94	3.119	5.195	888.6
	250.0	4.690	5190.0	0.0440	793.9	1317.0	25.48	3.119	5.194	935.9
	275.0	5.155	5700.0	0.0400	871.8	1446.0	25.98	3.119	5.194	981.0
	300.0	5.621	6220.0	0.0366	949.8	1576.0	26.43	3.119	5.193	1024.0
	350.0	6.552	7240.0	0.0314	1106.0	1836.0	27.23	3.118	5.193	1105.0
	400.0	7.483	8260.0	0.0275	1261.0	2096.0	27.92	3.118	5.193	1181.0
	450.0	8.415	9290.0	0.0244	1417.0	2355.0	28.54	3.118	5.193	1252.0
	500.0	9.346	10300.0	0.0220	1573.0	2615.0	29.08	3.118	5.193	1319.0
	600.0	11.21	12400.0	0.0183	1885.0	3134.0	30.03	3.117	5.193	1444.0
	700.0	13.07	14400.0	0.0157	2196.0	3653.0	30.83	3.117	5.193	1559.0
	800.0	14.93	16500.0	0.0137	2508.0	4173.0	31.52	3.117	5.193	1666.0
	900.0	16.80	18500.0	0.0122	2820.0	4692.0	32.14	3.117	5.193	1767.0
	1000.0	18.66	20600.0	0.0110	3131.0	5211.0	32.68	3.117	5.193	1862.0
	1100.0	20.52	22600.0	0.0100	3443.0	5730.0	33.18	3.117	5.193	1953.0
	1200.0	22.39	24600.0	0.00916	3755.0	6250.0	33.63	3.117	5.193	2040.0
	1300.0	24.25	26700.0	0.00846	4066.0	6769.0	34.05	3.117	5.193	2123.0
	1400.0	26.11	28700.0	0.00785	4378.0	7288.0	34.43	3.117	5.193	2203.0
	1500.0	27.98	30800.0	0.00733	4689.0	7807.0	34.79	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

11.6 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 10C	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
* 2.054	16.27									
2.5	16.19	100.0	9.44	147.0	0.0155	0.191	60.3	0.000760	1.06106	0.490
3.0	16.03	74.1	12.6	135.0	0.0259	0.211	58.5	0.000685	1.06043	0.533
3.5	15.73	62.5	14.5	121.0	0.0363	0.226	55.4	0.000628	1.05950	0.558
4.0	15.47	56.8	15.5	105.0	0.0470	0.240	52.0	0.000583	1.05826	0.577
4.5	15.05	53.9	15.5	89.0	0.0580	0.253	48.6	0.000537	1.05671	0.601
5.0	14.57	52.3	14.7	73.6	0.0697	0.263	45.5	0.000494	1.05482	0.632
5.1	14.46	52.1	14.5	70.8	0.0721	0.264	44.9	0.000487	1.05440	0.638
5.2	14.34	51.8	14.4	68.5	0.0741	0.266	44.3	0.000483	1.05396	0.640
5.3	14.24	50.8	14.5	65.9	0.0765	0.267	43.8	0.000483	1.05355	0.637
5.4	14.13	50.2	14.5	63.2	0.0790	0.269	43.3	0.000479	1.05313	0.639
5.5	14.01	49.5	14.5	60.6	0.0817	0.270	42.8	0.000476	1.05270	0.642
5.6	13.90	49.0	14.4	58.1	0.0844	0.271	42.3	0.000471	1.05225	0.646
5.7	13.78	48.5	14.3	55.6	0.0873	0.272	41.8	0.000467	1.05180	0.650
5.8	13.66	48.0	14.2	53.1	0.0903	0.273	41.4	0.000462	1.05134	0.656
5.9	13.53	47.5	14.1	50.7	0.0934	0.274	40.9	0.000457	1.05086	0.662
6.0	13.40	47.0	14.0	48.4	0.0966	0.275	40.5	0.000451	1.05037	0.670
6.5	12.71	44.8	13.3	37.7	0.115	0.276	38.5	0.000422	1.04774	0.718
7.0	11.93	42.8	12.6	28.8	0.138	0.275	36.7	0.000392	1.04477	0.786
7.5	11.05	41.2	11.8	21.8	0.163	0.272	35.2	0.000367	1.04145	0.867
8.0	10.12	40.3	11.0	16.9	0.185	0.267	33.9	0.000353	1.03789	0.948
8.5	9.158	40.4	10.3	13.9	0.197	0.261	32.9	0.000357	1.03429	1.00
9.0	8.281	41.6	9.78	12.3	0.195	0.256	32.2	0.000381	1.03094	1.02
9.5	7.508	43.6	9.34	11.6	0.182	0.252	31.9	0.000422	1.02803	1.01
10.0	6.864	46.1	8.99	11.3	0.166	0.249	31.8	0.000474	1.02561	0.975
11.0	5.895	50.9	8.51	10.9	0.141	0.249	32.0	0.000589	1.02197	0.924
12.0	5.177	56.0	8.21	10.8	0.122	0.251	32.6	0.000712	1.01927	0.886
13.0	4.622	61.5	8.01	10.7	0.107	0.256	33.4	0.000842	1.01720	0.857
14.0	4.180	67.2	7.86	10.7	0.0951	0.262	34.2	0.000979	1.01555	0.836
15.0	3.820	73.0	7.75	10.8	0.0856	0.268	35.1	0.00112	1.01420	0.819
16.0	3.521	78.9	7.64	10.8	0.0775	0.274	36.0	0.00127	1.01309	0.804
17.0	3.270	84.8	7.55	10.9	0.0709	0.280	36.9	0.00143	1.01215	0.792
18.0	3.055	90.7	7.48	11.0	0.0653	0.287	37.9	0.00159	1.01135	0.782
19.0	2.859	96.5	7.41	11.0	0.0606	0.294	38.9	0.00175	1.01065	0.774
20.0	2.706	102.0	7.36	11.1	0.0565	0.300	39.8	0.00192	1.01005	0.766
21.0	2.562	108.0	7.31	11.1	0.0530	0.307	40.8	0.00209	1.00951	0.760
22.0	2.433	114.0	7.26	11.1	0.0499	0.314	41.7	0.00227	1.00903	0.755
23.0	2.318	119.0	7.23	11.2	0.0472	0.320	42.7	0.00245	1.00860	0.751
24.0	2.214	125.0	7.19	11.2	0.0447	0.327	43.6	0.00264	1.00822	0.747
25.0	2.120	131.0	7.16	11.2	0.0426	0.333	44.6	0.00283	1.00787	0.744
26.0	2.033	136.0	7.13	11.2	0.0406	0.340	45.5	0.00302	1.00754	0.741
28.0	1.881	147.0	7.08	11.2	0.0372	0.353	47.3	0.00342	1.00698	0.736
30.0	1.751	159.0	7.04	11.3	0.0344	0.365	49.1	0.00383	1.00650	0.733
32.0	1.639	169.0	7.00	11.3	0.0320	0.378	50.9	0.00426	1.00608	0.729
34.0	1.541	180.0	6.97	11.3	0.0299	0.390	52.6	0.00470	1.00571	0.727
36.0	1.454	191.0	6.94	11.3	0.0281	0.403	54.3	0.00516	1.00539	0.724
38.0	1.377	202.0	6.92	11.3	0.0265	0.415	56.0	0.00563	1.00511	0.722
40.0	1.308	213.0	6.90	11.3	0.0251	0.427	57.7	0.00612	1.00485	0.721
45.0	1.163	240.0	6.86	11.3	0.0221	0.456	61.7	0.00740	1.00431	0.717
50.0	1.047	266.0	6.82	11.3	0.0198	0.485	65.5	0.00877	1.00388	0.713
55.0	0.9526	293.0	6.80	11.3	0.0180	0.513	69.3	0.0102	1.00353	0.710
60.0	0.8741	319.0	6.77	11.3	0.0165	0.541	72.9	0.0118	1.00324	0.708
65.0	0.8077	345.0	6.76	11.2	0.0152	0.568	76.4	0.0134	1.00299	0.705
70.0	0.7507	371.0	6.74	11.2	0.0141	0.595	79.8	0.0151	1.00278	0.703
75.0	0.7013	398.0	6.73	11.2	0.0131	0.621	83.2	0.0169	1.00260	0.701
80.0	0.6581	424.0	6.72	11.2	0.0123	0.647	86.5	0.0188	1.00244	0.698
90.0	0.5859	476.0	6.70	11.2	0.0110	0.698	92.9	0.0228	1.00217	0.694
100.0	0.5281	528.0	6.68	11.2	0.00987	0.747	99.1	0.0272	1.00196	0.691
125.0	0.4237	658.0	6.66	11.1	0.0790	0.866	112.0	0.0393	1.00157	0.673
150.0	0.3538	788.0	6.64	11.1	0.00663	0.978	126.0	0.0532	1.00131	0.670
175.0	0.3037	918.0	6.63	11.1	0.00566	1.09	139.0	0.0687	1.00112	0.667
200.0	0.2661	1050.0	6.62	11.1	0.00496	1.19	152.0	0.0859	1.00099	0.666
225.0	0.2368	1180.0	6.62	11.1	0.00441	1.28	165.0	0.104	1.00088	0.666
250.0	0.2132	1310.0	6.61	11.1	0.00397	1.38	177.0	0.124	1.00079	0.666
275.0	0.1940	1440.0	6.61	11.1	0.00361	1.47	188.0	0.146	1.00072	0.667
300.0	0.1779	1570.0	6.60	11.1	0.00331	1.55	200.0	0.169	1.00066	0.668
350.0	0.1526	1830.0	6.60	11.0	0.00284	1.73	222.0	0.218	1.00057	0.668
400.0	0.1336	2090.0	6.60	11.0	0.00249	1.89	243.0	0.273	1.00049	0.667
450.0	0.1188	2350.0	6.59	11.0	0.00221	2.05	264.0	0.333	1.00044	0.667
500.0	0.1070	2610.0	6.59	11.0	0.00199	2.21	284.0	0.398	1.00040	0.667
600.0	0.08922	3130.0	6.59	11.0	0.00166	2.51	322.0	0.542	1.00033	0.667
700.0	0.07650	3640.0	6.59	11.0	0.00143	2.80	359.0	0.704	1.00028	0.667
800.0	0.06696	4160.0	6.58	11.0	0.00125	3.07	394.0	0.884	1.00025	0.666
900.0	0.05953	4680.0	6.58	11.0	0.00111	3.34	429.0	1.08	1.00022	0.666
1000.0	0.05359	5200.0	6.58	11.0	0.00100	3.60	462.0	1.29	1.00020	0.666
1100.0	0.04872	5720.0	6.58	11.0	0.000908	3.85	494.0	1.52	1.00018	0.666
1200.0	0.04467	6240.0	6.58	11.0	0.000832	4.10	525.0	1.77	1.00017	0.666
1300.0	0.04124	6760.0	6.58	11.0	0.000769	4.34	556.0	2.03	1.00015	0.666
1400.0	0.03830	7280.0	6.58	11.0	0.000713	4.57	586.0	2.30	1.00014	0.666
1500.0	0.03575	7800.0	6.58	11.0	0.000666	4.81	616.0	2.59	1.00013	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

12.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.041	0.06107								
2.5	0.06133	943.0	2.25	3.650	11.11	1.698	1.468	1.519	314.4
3.0	0.06192	883.0	3.50	4.347	11.88	1.995	1.729	1.891	312.7
3.5	0.06282	804.0	4.41	5.200	12.84	2.302	1.903	2.242	309.7
4.0	0.06407	718.0	4.99	6.212	14.00	2.617	2.042	2.618	305.5
4.5	0.06569	632.0	5.24	7.415	15.40	2.947	2.202	3.059	298.1
5.0	0.06777	547.0	5.24	8.860	17.10	3.297	2.389	3.559	287.2
5.1	0.06825	531.0	5.22	9.183	17.48	3.369	2.425	3.660	285.8
5.2	0.06876	519.0	5.20	9.521	17.88	3.443	2.441	3.737	283.7
5.3	0.06924	504.0	5.16	9.838	18.26	3.514	2.419	3.779	282.5
5.4	0.06974	489.0	5.12	10.16	18.64	3.585	2.423	3.851	280.6
5.5	0.07026	474.0	5.08	10.48	19.03	3.657	2.428	3.927	278.7
5.6	0.07080	459.0	5.04	10.81	19.42	3.728	2.435	4.007	276.7
5.7	0.07136	445.0	4.99	11.15	19.83	3.800	2.444	4.091	274.7
5.8	0.07194	431.0	4.94	11.49	20.24	3.872	2.453	4.178	272.6
5.9	0.07255	417.0	4.89	11.84	20.66	3.944	2.464	4.269	270.4
6.0	0.07318	403.0	4.83	12.19	21.09	4.017	2.476	4.364	268.2
6.5	0.07675	338.0	4.53	14.07	23.40	4.389	2.543	4.896	256.7
7.0	0.08118	281.0	4.17	16.14	26.01	4.777	2.620	5.523	244.8
7.5	0.08672	233.0	3.79	18.42	28.97	5.187	2.702	6.226	233.4
8.0	0.09364	198.0	3.40	20.92	32.31	5.620	2.783	6.935	223.5
8.5	0.1021	176.0	3.02	23.60	36.01	6.072	2.860	7.510	216.2
9.0	0.1119	166.0	2.67	26.37	39.98	6.527	2.928	7.816	211.9
9.5	0.1226	166.0	2.36	29.15	44.06	6.969	2.983	7.838	210.4
10.0	0.1338	173.0	2.11	31.85	48.12	7.387	3.025	7.668	211.1
11.0	0.1557	193.0	1.72	36.68	55.60	8.104	3.058	7.193	214.6
12.0	0.1769	214.0	1.46	40.99	62.50	8.707	3.073	6.865	220.8
13.0	0.1980	236.0	1.27	45.04	69.12	9.238	3.086	6.626	226.7
14.0	0.2189	260.0	1.13	48.91	75.53	9.714	3.098	6.446	234.1
15.0	0.2396	284.0	1.02	52.66	81.80	10.15	3.109	6.304	241.7
16.0	0.2601	310.0	0.929	56.41	88.03	10.55	3.119	6.173	249.3
17.0	0.2802	335.0	0.853	60.08	94.15	10.92	3.126	6.062	256.6
18.0	0.3000	360.0	0.789	63.68	100.2	11.26	3.131	5.969	263.9
19.0	0.3196	386.0	0.735	67.23	106.1	11.58	3.135	5.890	270.9
20.0	0.3390	410.0	0.688	70.73	111.9	11.89	3.138	5.822	277.7
21.0	0.3581	435.0	0.647	74.19	117.7	12.17	3.140	5.763	284.4
22.0	0.3771	459.0	0.610	77.62	123.5	12.43	3.141	5.712	290.9
23.0	0.3959	483.0	0.578	81.02	129.2	12.69	3.142	5.668	297.2
24.0	0.4146	507.0	0.549	84.40	134.8	12.93	3.142	5.629	303.3
25.0	0.4332	531.0	0.523	87.75	140.4	13.16	3.143	5.594	309.4
26.0	0.4516	554.0	0.500	91.09	146.0	13.38	3.143	5.564	315.2
28.0	0.4882	600.0	0.459	97.71	157.1	13.79	3.142	5.512	326.6
30.0	0.5245	646.0	0.424	104.3	168.1	14.16	3.142	5.470	337.6
32.0	0.5605	691.0	0.395	110.8	179.0	14.52	3.141	5.436	348.1
34.0	0.5963	736.0	0.369	117.3	189.8	14.85	3.140	5.408	358.3
36.0	0.6318	780.0	0.347	123.8	200.6	15.15	3.140	5.384	368.1
38.0	0.6673	824.0	0.327	130.2	211.3	15.44	3.139	5.364	377.6
40.0	0.7025	867.0	0.309	136.6	222.1	15.72	3.138	5.346	386.9
45.0	0.7903	975.0	0.273	152.6	248.7	16.35	3.136	5.313	409.1
50.0	0.8775	1080.0	0.244	168.5	275.2	16.91	3.134	5.289	430.1
55.0	0.9643	1190.0	0.221	184.3	301.6	17.41	3.132	5.271	450.0
60.0	1.051	1290.0	0.202	200.1	327.9	17.87	3.131	5.257	468.9
65.0	1.137	1400.0	0.186	215.9	354.2	18.29	3.130	5.247	487.2
70.0	1.223	1500.0	0.173	231.6	380.4	18.68	3.129	5.239	504.7
75.0	1.309	1610.0	0.161	247.4	406.6	19.04	3.128	5.232	521.6
80.0	1.395	1710.0	0.151	263.1	432.7	19.37	3.127	5.227	538.0
90.0	1.567	1920.0	0.134	294.4	484.9	19.99	3.126	5.218	569.3
100.0	1.738	2120.0	0.120	325.7	537.1	20.54	3.125	5.213	598.9
125.0	2.166	2640.0	0.0961	403.9	667.3	21.70	3.123	5.204	667.2
150.0	2.593	3150.0	0.0800	482.0	797.3	22.65	3.122	5.200	729.0
175.0	3.021	3660.0	0.0686	560.0	927.3	23.45	3.121	5.197	786.0
200.0	3.447	4170.0	0.0600	638.0	1057.0	24.14	3.120	5.196	839.2
225.0	3.874	4690.0	0.0533	716.0	1187.0	24.76	3.120	5.195	889.1
250.0	4.301	5200.0	0.0480	793.9	1317.0	25.30	3.119	5.194	936.4
275.0	4.728	5710.0	0.0436	871.9	1447.0	25.80	3.119	5.194	981.5
300.0	5.155	6220.0	0.0400	949.8	1577.0	26.25	3.119	5.193	1025.0
350.0	6.009	7250.0	0.0343	1106.0	1836.0	27.05	3.118	5.193	1106.0
400.0	6.862	8270.0	0.0300	1262.0	2096.0	27.74	3.118	5.193	1181.0
450.0	7.716	9290.0	0.0267	1417.0	2356.0	28.36	3.118	5.193	1252.0
500.0	8.570	10300.0	0.0240	1573.0	2615.0	28.90	3.118	5.193	1319.0
600.0	10.28	12400.0	0.0200	1885.0	3134.0	29.85	3.118	5.193	1444.0
700.0	11.98	14400.0	0.0171	2196.0	3654.0	30.65	3.117	5.193	1560.0
800.0	13.69	16500.0	0.0150	2508.0	4173.0	31.34	3.117	5.193	1667.0
900.0	15.40	18500.0	0.0133	2820.0	4692.0	31.96	3.117	5.193	1767.0
1000.0	17.11	20600.0	0.0120	3131.0	5211.0	32.50	3.117	5.193	1863.0
1100.0	18.82	22600.0	0.0109	3443.0	5731.0	33.00	3.117	5.193	1953.0
1200.0	20.52	24700.0	0.0100	3755.0	6250.0	33.45	3.117	5.193	2040.0
1300.0	22.23	26700.0	0.00923	4066.0	6769.0	33.86	3.117	5.193	2123.0
1400.0	23.94	28800.0	0.00857	4378.0	7288.0	34.25	3.117	5.193	2203.0
1500.0	25.65	30800.0	0.00800	4689.0	7808.0	34.61	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

12.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_V$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.041	16.38									
2.5	16.31	104.0	9.42	154.0	0.0147	0.193	62.4	0.000778	1.06148	0.492
3.0	16.15	76.9	12.6	143.0	0.0246	0.213	60.4	0.000697	1.06089	0.536
3.5	15.92	65.0	14.6	128.0	0.0345	0.228	57.1	0.000640	1.06000	0.560
4.0	15.61	58.9	15.6	112.0	0.0445	0.243	53.6	0.000595	1.05881	0.577
4.5	15.22	56.1	15.6	96.1	0.0545	0.256	50.1	0.000559	1.05733	0.598
5.0	14.76	54.7	14.9	80.6	0.0650	0.267	46.9	0.000528	1.05554	0.625
5.1	14.65	54.5	14.7	77.8	0.0671	0.269	46.3	0.000521	1.05514	0.631
5.2	14.54	54.3	14.6	75.5	0.0688	0.270	45.7	0.000497	1.05473	0.632
5.3	14.44	53.3	14.8	72.8	0.0709	0.272	45.1	0.000498	1.05434	0.628
5.4	14.34	52.7	14.7	70.1	0.0731	0.273	44.6	0.000495	1.05395	0.629
5.5	14.23	52.1	14.7	67.5	0.0753	0.275	44.1	0.000492	1.05354	0.631
5.6	14.12	51.6	14.6	64.9	0.0776	0.276	43.6	0.000488	1.05313	0.633
5.7	14.01	51.1	14.6	62.4	0.0801	0.277	43.2	0.000484	1.05270	0.637
5.8	13.90	50.6	14.5	59.9	0.0826	0.279	42.7	0.000480	1.05227	0.641
5.9	13.78	50.1	14.4	57.4	0.0851	0.280	42.3	0.000475	1.05183	0.646
6.0	13.66	49.7	14.3	55.0	0.0878	0.280	41.8	0.000470	1.05137	0.651
6.5	13.03	47.6	13.7	44.0	0.103	0.283	39.8	0.000444	1.04894	0.689
7.0	12.32	45.7	12.9	34.6	0.121	0.283	38.1	0.000416	1.04624	0.744
7.5	11.53	44.2	12.2	26.9	0.141	0.281	36.5	0.000391	1.04325	0.811
8.0	10.68	43.1	11.4	21.1	0.161	0.277	35.2	0.000374	1.04001	0.882
8.5	9.797	42.8	10.8	17.2	0.175	0.272	34.2	0.000370	1.03667	0.944
9.0	8.939	43.5	10.2	14.8	0.180	0.267	33.4	0.000382	1.03343	0.980
9.5	8.156	45.0	9.71	13.6	0.174	0.262	33.0	0.000410	1.03047	0.985
10.0	7.474	47.2	9.32	13.0	0.163	0.259	32.7	0.000452	1.02790	0.969
11.0	6.425	51.9	8.75	12.4	0.139	0.257	32.8	0.000556	1.02396	0.920
12.0	5.651	56.8	8.40	12.1	0.121	0.258	33.3	0.000666	1.02105	0.886
13.0	5.049	62.1	8.16	11.9	0.107	0.262	34.0	0.000784	1.01883	0.859
14.0	4.568	67.6	7.99	11.9	0.0953	0.267	34.8	0.000908	1.01700	0.839
15.0	4.173	73.3	7.86	11.9	0.0860	0.273	35.6	0.00104	1.01552	0.823
16.0	3.845	79.2	7.75	11.9	0.0780	0.279	36.5	0.00117	1.01430	0.809
17.0	3.569	85.0	7.65	12.0	0.0713	0.285	37.4	0.00132	1.01327	0.797
18.0	3.333	90.9	7.56	12.0	0.0657	0.291	38.3	0.00146	1.01238	0.786
19.0	3.129	96.7	7.49	12.1	0.0609	0.297	39.3	0.00161	1.01162	0.778
20.0	2.950	102.0	7.43	12.1	0.0568	0.304	40.2	0.00177	1.01096	0.770
21.0	2.792	108.0	7.38	12.1	0.0532	0.310	41.2	0.00193	1.01037	0.764
22.0	2.652	114.0	7.33	12.2	0.0501	0.317	42.1	0.00209	1.00985	0.759
23.0	2.526	120.0	7.28	12.2	0.0474	0.323	43.0	0.00226	1.00938	0.754
24.0	2.412	125.0	7.25	12.2	0.0449	0.330	44.0	0.00243	1.00895	0.750
25.0	2.308	131.0	7.21	12.3	0.0427	0.336	44.9	0.00260	1.00857	0.747
26.0	2.214	137.0	7.18	12.3	0.0407	0.343	45.8	0.00278	1.00822	0.744
28.0	2.048	148.0	7.13	12.3	0.0373	0.355	47.6	0.00315	1.00760	0.738
30.0	1.907	159.0	7.08	12.3	0.0344	0.368	49.4	0.00353	1.00707	0.734
32.0	1.784	170.0	7.04	12.3	0.0320	0.380	51.1	0.00392	1.00662	0.731
34.0	1.677	181.0	7.01	12.3	0.0299	0.393	52.9	0.00433	1.00622	0.728
36.0	1.583	192.0	6.98	12.3	0.0281	0.405	54.6	0.00475	1.00587	0.726
38.0	1.499	203.0	6.95	12.3	0.0265	0.417	56.2	0.00519	1.00556	0.724
40.0	1.423	213.0	6.93	12.3	0.0251	0.429	57.9	0.00563	1.00528	0.722
45.0	1.265	240.0	6.88	12.3	0.0221	0.458	61.9	0.00681	1.00469	0.717
50.0	1.140	267.0	6.84	12.3	0.0198	0.487	65.7	0.00818	1.00422	0.714
55.0	1.037	293.0	6.82	12.3	0.0180	0.515	69.4	0.00962	1.00384	0.711
60.0	0.9516	320.0	6.79	12.3	0.0164	0.542	73.1	0.0110	1.00353	0.708
65.0	0.8794	346.0	6.77	12.3	0.0152	0.570	76.6	0.0123	1.00326	0.705
70.0	0.8174	372.0	6.75	12.3	0.0141	0.596	80.0	0.0139	1.00303	0.703
75.0	0.7637	398.0	6.74	12.3	0.0131	0.622	83.4	0.0156	1.00283	0.701
80.0	0.7167	425.0	6.73	12.2	0.0123	0.648	86.6	0.0173	1.00266	0.698
90.0	0.6382	477.0	6.71	12.2	0.0109	0.699	93.0	0.0210	1.00236	0.694
100.0	0.5753	529.0	6.69	12.2	0.00985	0.748	99.2	0.0250	1.00213	0.691
125.0	0.4617	659.0	6.67	12.2	0.00789	0.867	112.0	0.0361	1.00171	0.673
150.0	0.3856	789.0	6.65	12.1	0.00659	0.979	126.0	0.0488	1.00143	0.670
175.0	0.3311	919.0	6.64	12.1	0.00566	1.09	139.0	0.0631	1.00123	0.667
200.0	0.2901	1050.0	6.63	12.1	0.00495	1.19	152.0	0.0788	1.00107	0.666
225.0	0.2581	1180.0	6.62	12.1	0.00441	1.29	165.0	0.0958	1.00096	0.665
250.0	0.2325	1310.0	6.61	12.1	0.00397	1.38	177.0	0.114	1.00086	0.666
275.0	0.2115	1440.0	6.61	12.1	0.00361	1.47	188.0	0.134	1.00078	0.666
300.0	0.1940	1570.0	6.61	12.1	0.00331	1.55	200.0	0.154	1.00072	0.668
350.0	0.1664	1830.0	6.60	12.1	0.00284	1.73	222.0	0.200	1.00062	0.668
400.0	0.1457	2090.0	6.60	12.1	0.00249	1.89	243.0	0.250	1.00054	0.667
450.0	0.1296	2350.0	6.60	12.0	0.00221	2.05	264.0	0.305	1.00048	0.667
500.0	0.1167	2610.0	6.59	12.0	0.00199	2.21	284.0	0.365	1.00043	0.667
600.0	0.09730	3130.0	6.59	12.0	0.00166	2.51	322.0	0.497	1.00036	0.667
700.0	0.08344	3640.0	6.59	12.0	0.00142	2.80	359.0	0.646	1.00031	0.667
800.0	0.07303	4160.0	6.59	12.0	0.00125	3.07	394.0	0.811	1.00027	0.666
900.0	0.06494	4680.0	6.58	12.0	0.00111	3.34	429.0	0.991	1.00024	0.666
1000.0	0.05845	5200.0	6.58	12.0	0.00100	3.60	462.0	1.19	1.00022	0.666
1100.0	0.05315	5720.0	6.58	12.0	0.000908	3.85	494.0	1.40	1.00020	0.666
1200.0	0.04873	6240.0	6.58	12.0	0.000832	4.10	525.0	1.62	1.00018	0.666
1300.0	0.04498	6760.0	6.58	12.0	0.000768	4.34	556.0	1.86	1.00017	0.666
1400.0	0.04177	7280.0	6.58	12.0	0.000713	4.57	586.0	2.11	1.00015	0.666
1500.0	0.03899	7800.0	6.58	12.0	0.000666	4.80	616.0	2.37	1.00014	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

13.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
* 2.028	0.06068								
2.5	0.06093	977.0	2.23	3.666	11.69	1.685	1.442	1.490	319.7
3.0	0.06149	919.0	3.50	4.346	12.44	1.976	1.712	1.865	318.4
3.5	0.06234	841.0	4.43	5.179	13.39	2.279	1.886	2.208	315.8
4.0	0.06351	757.0	5.04	6.166	14.53	2.588	2.025	2.574	312.2
4.5	0.06504	671.0	5.32	7.340	15.91	2.912	2.187	3.001	305.4
5.0	0.06698	587.0	5.34	8.747	17.57	3.254	2.375	3.480	295.1
5.1	0.06743	571.0	5.32	9.062	17.94	3.325	2.411	3.576	293.0
5.2	0.06789	559.0	5.30	9.391	18.33	3.396	2.427	3.648	291.9
5.3	0.06834	545.0	5.27	9.699	18.70	3.466	2.405	3.686	290.8
5.4	0.06880	529.0	5.24	10.01	19.07	3.536	2.409	3.752	289.1
5.5	0.06928	515.0	5.20	10.33	19.45	3.605	2.414	3.822	287.3
5.6	0.06977	500.0	5.16	10.65	19.84	3.675	2.421	3.895	285.4
5.7	0.07028	485.0	5.12	10.97	20.23	3.745	2.430	3.971	283.5
5.8	0.07081	471.0	5.08	11.30	20.63	3.814	2.439	4.050	281.5
5.9	0.07136	457.0	5.03	11.64	21.04	3.884	2.450	4.133	279.5
6.0	0.07193	443.0	4.98	11.98	21.45	3.955	2.461	4.219	277.4
6.5	0.07514	378.0	4.69	13.78	23.68	4.312	2.527	4.694	266.6
7.0	0.07903	319.0	4.36	15.75	26.16	4.683	2.602	5.244	255.3
7.5	0.08379	269.0	4.01	17.91	28.95	5.070	2.680	5.859	244.3
8.0	0.08964	230.0	3.64	20.26	32.07	5.475	2.758	6.498	234.4
8.5	0.09671	203.0	3.27	22.79	35.53	5.897	2.832	7.073	226.4
9.0	0.1050	187.0	2.92	25.44	39.27	6.327	2.899	7.476	221.0
9.5	0.1143	182.0	2.60	28.14	43.19	6.752	2.956	7.645	218.2
10.0	0.1242	184.0	2.33	30.81	47.17	7.161	3.002	7.607	217.6
11.0	0.1443	203.0	1.90	35.83	54.83	7.896	3.051	7.195	220.1
12.0	0.1636	221.0	1.61	40.19	61.74	8.500	3.068	6.887	224.4
13.0	0.1829	242.0	1.40	44.29	68.38	9.033	3.081	6.659	230.2
14.0	0.2021	264.0	1.24	48.21	74.82	9.512	3.094	6.486	237.0
15.0	0.2211	288.0	1.12	52.00	81.12	9.946	3.106	6.348	244.2
16.0	0.2400	313.0	1.02	55.79	87.40	10.35	3.117	6.219	251.5
17.0	0.2586	338.0	0.935	59.49	93.56	10.73	3.125	6.108	258.7
18.0	0.2770	363.0	0.864	63.13	99.6	11.07	3.131	6.013	265.7
19.0	0.2952	388.0	0.804	66.71	105.6	11.39	3.135	5.931	272.7
20.0	0.3132	413.0	0.752	70.24	111.5	11.70	3.138	5.861	279.4
21.0	0.3310	437.0	0.706	73.72	117.3	11.98	3.141	5.800	286.0
22.0	0.3486	462.0	0.666	77.18	123.1	12.25	3.142	5.746	292.4
23.0	0.3660	486.0	0.631	80.60	128.8	12.50	3.143	5.700	298.7
24.0	0.3834	510.0	0.599	83.99	134.5	12.75	3.144	5.659	304.9
25.0	0.4006	533.0	0.570	87.37	140.1	12.98	3.144	5.622	310.8
26.0	0.4177	557.0	0.544	90.72	145.7	13.20	3.144	5.590	316.7
28.0	0.4516	603.0	0.499	97.37	156.9	13.61	3.144	5.535	328.0
30.0	0.4852	649.0	0.461	104.0	167.9	13.99	3.144	5.491	338.9
32.0	0.5185	695.0	0.429	110.5	178.8	14.34	3.143	5.454	349.4
34.0	0.5517	739.0	0.401	117.0	189.7	14.67	3.142	5.424	359.6
36.0	0.5846	784.0	0.377	123.5	200.5	14.98	3.141	5.398	369.4
38.0	0.6174	828.0	0.355	130.0	211.3	15.27	3.140	5.377	378.9
40.0	0.6500	872.0	0.336	136.4	222.0	15.55	3.139	5.358	388.2
45.0	0.7312	980.0	0.296	152.4	248.7	16.18	3.137	5.322	410.3
50.0	0.8118	1090.0	0.265	168.3	275.3	16.74	3.135	5.296	431.2
55.0	0.8920	1190.0	0.240	184.2	301.7	17.24	3.134	5.277	451.1
60.0	0.9720	1300.0	0.219	200.0	328.1	17.70	3.132	5.263	470.0
65.0	1.052	1400.0	0.202	215.8	354.3	18.12	3.131	5.251	488.2
70.0	1.131	1510.0	0.187	231.5	380.6	18.51	3.130	5.242	505.7
75.0	1.211	1610.0	0.175	247.3	406.8	18.87	3.129	5.235	522.6
80.0	1.290	1710.0	0.163	263.0	432.9	19.21	3.128	5.229	538.9
90.0	1.449	1920.0	0.145	294.4	485.2	19.82	3.127	5.220	570.2
100.0	1.607	2130.0	0.130	325.7	537.3	20.37	3.125	5.214	599.8
125.0	2.002	2640.0	0.104	403.9	667.6	21.53	3.123	5.205	667.9
150.0	2.396	3160.0	0.0867	482.0	797.6	22.48	3.122	5.200	729.7
175.0	2.791	3670.0	0.0743	560.0	927.6	23.28	3.121	5.198	786.7
200.0	3.185	4180.0	0.0650	638.0	1058.0	23.98	3.120	5.196	839.8
225.0	3.579	4690.0	0.0577	716.0	1187.0	24.59	3.120	5.195	889.7
250.0	3.973	5200.0	0.0520	794.0	1317.0	25.14	3.120	5.194	936.9
275.0	4.367	5720.0	0.0472	871.9	1447.0	25.63	3.119	5.194	981.9
300.0	4.761	6230.0	0.0433	949.8	1577.0	26.08	3.119	5.193	1025.0
350.0	5.549	7250.0	0.0371	1106.0	1837.0	26.88	3.119	5.193	1106.0
400.0	6.337	8270.0	0.0325	1262.0	2096.0	27.58	3.118	5.193	1182.0
450.0	7.125	9300.0	0.0289	1417.0	2356.0	28.19	3.118	5.193	1253.0
500.0	7.913	10300.0	0.0260	1573.0	2616.0	28.74	3.118	5.193	1320.0
600.0	9.489	12400.0	0.0217	1885.0	3135.0	29.68	3.118	5.193	1445.0
700.0	11.06	14400.0	0.0186	2197.0	3654.0	30.48	3.118	5.193	1560.0
800.0	12.64	16500.0	0.0162	2508.0	4173.0	31.18	3.117	5.193	1667.0
900.0	14.22	18500.0	0.0144	2820.0	4693.0	31.79	3.117	5.193	1768.0
1000.0	15.79	20600.0	0.0130	3131.0	5212.0	32.34	3.117	5.193	1863.0
1100.0	17.37	22600.0	0.0118	3443.0	5731.0	32.83	3.117	5.193	1953.0
1200.0	18.95	24700.0	0.0108	3755.0	6250.0	33.28	3.117	5.193	2040.0
1300.0	20.52	26700.0	0.0100	4066.0	6770.0	33.70	3.117	5.193	2123.0
1400.0	22.10	28800.0	0.00928	4378.0	7289.0	34.08	3.117	5.193	2203.0
1500.0	23.67	30800.0	0.00866	4690.0	7808.0	34.44	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

13.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 2.028	16.48									
2.5	16.41	107.0	9.41	160.0	0.0139	0.194	64.5	0.000795	1.06189	0.494
3.0	16.25	79.7	12.6	149.0	0.0234	0.215	62.3	0.000709	1.06132	0.540
3.5	16.04	67.2	14.7	135.0	0.0329	0.231	58.8	0.000652	1.06047	0.563
4.0	15.74	60.9	15.8	119.0	0.0423	0.246	55.1	0.000607	1.05933	0.577
4.5	15.37	58.2	15.8	103.0	0.0516	0.260	51.6	0.000563	1.05791	0.596
5.0	14.93	57.1	15.1	87.6	0.0610	0.271	48.3	0.000521	1.05621	0.620
5.1	14.83	56.9	14.9	84.8	0.0628	0.273	47.6	0.000514	1.05583	0.625
5.2	14.73	56.7	14.8	82.4	0.0644	0.274	47.0	0.000510	1.05544	0.625
5.3	14.63	55.7	15.0	79.7	0.0662	0.276	46.5	0.000512	1.05507	0.621
5.4	14.54	55.1	15.0	77.0	0.0681	0.278	46.0	0.000509	1.05470	0.621
5.5	14.44	54.6	14.9	74.3	0.0700	0.279	45.5	0.000507	1.05432	0.622
5.6	14.33	54.0	14.9	71.7	0.0721	0.281	45.0	0.000503	1.05392	0.623
5.7	14.23	53.6	14.8	69.1	0.0741	0.282	44.5	0.000500	1.05353	0.626
5.8	14.12	53.1	14.7	66.5	0.0763	0.284	44.0	0.000496	1.05312	0.629
5.9	14.01	52.7	14.6	64.1	0.0785	0.285	43.6	0.000492	1.05270	0.633
6.0	13.90	52.2	14.5	61.6	0.0808	0.286	43.1	0.000487	1.05228	0.637
6.5	13.31	50.3	13.9	50.3	0.0933	0.289	41.1	0.000463	1.05002	0.667
7.0	12.65	48.5	13.3	40.4	0.108	0.290	39.3	0.000437	1.04752	0.711
7.5	11.93	47.0	12.5	32.2	0.125	0.289	37.8	0.000413	1.04478	0.768
8.0	11.15	45.9	11.8	25.7	0.142	0.286	36.5	0.000394	1.04182	0.830
8.5	10.34	45.4	11.2	20.9	0.156	0.282	35.4	0.000385	1.03873	0.890
9.0	9.524	45.6	10.6	17.8	0.164	0.277	34.6	0.000389	1.03564	0.934
9.5	8.751	46.7	10.1	15.9	0.164	0.272	34.0	0.000407	1.03271	0.955
10.0	8.053	48.5	9.65	14.9	0.157	0.269	33.7	0.000438	1.03008	0.955
11.0	6.930	53.1	9.00	14.1	0.135	0.265	33.6	0.000531	1.02586	0.914
12.0	6.111	57.8	8.60	13.5	0.119	0.265	34.0	0.000631	1.02278	0.883
13.0	5.468	62.9	8.32	13.2	0.106	0.269	34.6	0.000738	1.02037	0.859
14.0	4.949	68.2	8.13	13.1	0.0951	0.273	35.4	0.000850	1.01842	0.840
15.0	4.523	73.8	7.98	13.0	0.0861	0.278	36.2	0.000968	1.01683	0.826
16.0	4.157	79.5	7.85	13.0	0.0782	0.283	37.0	0.00109	1.01550	0.812
17.0	3.866	85.3	7.74	13.1	0.0716	0.289	37.9	0.00122	1.01437	0.800
18.0	3.610	91.1	7.65	13.1	0.0660	0.295	38.8	0.00136	1.01342	0.790
19.0	3.387	96.9	7.57	13.1	0.0612	0.301	39.7	0.00150	1.01259	0.781
20.0	3.193	103.0	7.50	13.2	0.0571	0.308	40.6	0.00164	1.01186	0.774
21.0	3.022	108.0	7.44	13.2	0.0535	0.314	41.5	0.00179	1.01122	0.767
22.0	2.869	114.0	7.39	13.2	0.0503	0.320	42.4	0.00194	1.01065	0.762
23.0	2.732	120.0	7.34	13.3	0.0475	0.327	43.4	0.00210	1.01014	0.757
24.0	2.608	126.0	7.30	13.3	0.0450	0.333	44.3	0.00226	1.00968	0.753
25.0	2.496	131.0	7.26	13.3	0.0428	0.339	45.2	0.00242	1.00927	0.749
26.0	2.394	137.0	7.23	13.3	0.0408	0.346	46.1	0.00258	1.00889	0.746
28.0	2.214	148.0	7.17	13.4	0.0374	0.358	47.9	0.00292	1.00822	0.740
30.0	2.061	159.0	7.12	13.4	0.0345	0.370	49.7	0.00327	1.00765	0.736
32.0	1.928	170.0	7.08	13.4	0.0320	0.383	51.4	0.00364	1.00715	0.732
34.0	1.813	181.0	7.04	13.4	0.0299	0.395	53.1	0.00402	1.00672	0.729
36.0	1.711	192.0	7.01	13.4	0.0281	0.407	54.8	0.00441	1.00634	0.727
38.0	1.620	203.0	6.98	13.4	0.0265	0.419	56.5	0.00481	1.00601	0.725
40.0	1.538	214.0	6.96	13.4	0.0251	0.431	58.1	0.00523	1.00570	0.722
45.0	1.368	241.0	6.91	13.4	0.0221	0.460	62.1	0.00632	1.00507	0.718
50.0	1.232	267.0	6.87	13.4	0.0198	0.489	65.9	0.00749	1.00457	0.714
55.0	1.121	294.0	6.83	13.4	0.0180	0.517	69.6	0.00873	1.00416	0.711
60.0	1.029	320.0	6.81	13.4	0.0164	0.544	73.2	0.0100	1.00381	0.708
65.0	0.9508	347.0	6.79	13.3	0.0151	0.571	76.7	0.0114	1.00352	0.706
70.0	0.8839	373.0	6.77	13.3	0.0141	0.598	80.2	0.0129	1.00328	0.703
75.0	0.8259	399.0	6.75	13.3	0.0131	0.624	83.5	0.0144	1.00306	0.701
80.0	0.7751	425.0	6.74	13.3	0.0123	0.650	86.8	0.0160	1.00287	0.699
90.0	0.6903	478.0	6.72	13.3	0.0109	0.700	93.2	0.0194	1.00256	0.695
100.0	0.6223	530.0	6.70	13.2	0.00984	0.749	99.3	0.0231	1.00231	0.691
125.0	0.4996	660.0	6.67	13.2	0.00789	0.868	112.0	0.0334	1.00185	0.673
150.0	0.4173	790.0	6.65	13.2	0.00658	0.980	126.0	0.0452	1.00155	0.670
175.0	0.3584	920.0	6.64	13.1	0.00565	1.09	140.0	0.0583	1.00133	0.667
200.0	0.3140	1050.0	6.63	13.1	0.00495	1.19	152.0	0.0728	1.00116	0.666
225.0	0.2794	1180.0	6.62	13.1	0.00440	1.29	165.0	0.0886	1.00103	0.665
250.0	0.2517	1310.0	6.62	13.1	0.00397	1.38	177.0	0.105	1.00093	0.666
275.0	0.2290	1440.0	6.61	13.1	0.00361	1.47	188.0	0.123	1.00085	0.666
300.0	0.2101	1570.0	6.61	13.1	0.00331	1.55	200.0	0.142	1.00078	0.668
350.0	0.1802	1830.0	6.60	13.1	0.00284	1.73	222.0	0.184	1.00067	0.667
400.0	0.1578	2090.0	6.60	13.1	0.00249	1.89	243.0	0.231	1.00058	0.667
450.0	0.1404	2350.0	6.60	13.1	0.00221	2.05	264.0	0.282	1.00052	0.667
500.0	0.1264	2610.0	6.59	13.0	0.00199	2.21	284.0	0.337	1.00047	0.667
600.0	0.1054	3130.0	6.59	13.0	0.00166	2.51	322.0	0.459	1.00039	0.667
700.0	0.09038	3650.0	6.59	13.0	0.00142	2.80	359.0	0.596	1.00033	0.666
800.0	0.07911	4160.0	6.59	13.0	0.00125	3.07	394.0	0.748	1.00029	0.666
900.0	0.07034	4680.0	6.58	13.0	0.00111	3.34	429.0	0.915	1.00026	0.666
1000.0	0.06332	5200.0	6.58	13.0	0.00100	3.60	462.0	1.09	1.00023	0.666
1100.0	0.05757	5720.0	6.58	13.0	0.000908	3.85	494.0	1.29	1.00021	0.666
1200.0	0.05278	6240.0	6.58	13.0	0.000832	4.10	525.0	1.49	1.00020	0.666
1300.0	0.04873	6760.0	6.58	13.0	0.000768	4.34	556.0	1.71	1.00018	0.666
1400.0	0.04525	7280.0	6.58	13.0	0.000713	4.57	586.0	1.95	1.00017	0.666
1500.0	0.04224	7800.0	6.58	13.0	0.000666	4.80	616.0	2.19	1.00016	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

14.0 ATMOSPHERE ISOBAR

	TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
*	2.014	0.06030								
	2.5	0.06055	1010.0	2.20	3.686	12.28	1.672	1.418	1.462	324.7
	3.0	0.06108	954.0	3.49	4.348	13.01	1.959	1.695	1.839	323.8
	3.5	0.06188	877.0	4.46	5.162	13.94	2.256	1.869	2.176	321.7
	4.0	0.06300	795.0	5.09	6.127	15.06	2.561	2.009	2.533	318.6
	4.5	0.06444	709.0	5.39	7.274	16.42	2.879	2.172	2.948	312.3
	5.0	0.06626	626.0	5.43	8.648	18.05	3.214	2.361	3.410	302.6
	5.1	0.06667	611.0	5.42	8.956	18.41	3.284	2.398	3.502	300.6
	5.2	0.06711	599.0	5.40	9.277	18.80	3.354	2.414	3.571	299.5
	5.3	0.06752	584.0	5.38	9.577	19.15	3.422	2.392	3.604	298.6
	5.4	0.06795	569.0	5.35	9.879	19.52	3.490	2.396	3.666	297.0
	5.5	0.06839	554.0	5.32	10.19	19.89	3.558	2.401	3.730	295.3
	5.6	0.06884	539.0	5.28	10.50	20.26	3.626	2.409	3.798	293.6
	5.7	0.06932	525.0	5.24	10.81	20.65	3.694	2.417	3.868	291.8
	5.8	0.06980	511.0	5.20	11.13	21.04	3.762	2.426	3.942	289.9
	5.9	0.07031	497.0	5.15	11.46	21.43	3.830	2.437	4.018	288.0
	6.0	0.07083	483.0	5.11	11.79	21.84	3.898	2.448	4.096	286.1
	6.5	0.07374	417.0	4.84	13.53	23.99	4.244	2.514	4.528	275.8
	7.0	0.07721	357.0	4.54	15.42	26.37	4.600	2.587	5.021	265.1
	7.5	0.08140	306.0	4.20	17.48	29.02	4.968	2.662	5.568	254.5
	8.0	0.08645	263.0	3.85	19.71	31.98	5.352	2.737	6.143	244.7
	8.5	0.09250	231.0	3.49	22.11	35.23	5.749	2.808	6.692	236.4
	9.0	0.0996	211.0	3.15	24.65	38.77	6.156	2.874	7.135	230.1
	9.5	0.1076	200.0	2.83	27.25	42.52	6.563	2.932	7.402	226.2
	10.0	0.1164	198.0	2.55	29.88	46.38	6.961	2.980	7.488	224.5
	11.0	0.1347	211.0	2.09	34.92	54.03	7.695	3.038	7.207	225.4
	12.0	0.1526	230.0	1.76	39.43	61.08	8.311	3.062	6.893	229.0
	13.0	0.1702	249.0	1.53	43.57	67.72	8.845	3.077	6.678	234.0
	14.0	0.1878	270.0	1.36	47.53	74.17	9.324	3.090	6.514	240.1
	15.0	0.2054	292.0	1.22	51.35	80.49	9.761	3.103	6.383	246.8
	16.0	0.2230	317.0	1.11	55.18	86.81	10.17	3.115	6.257	253.8
	17.0	0.2403	341.0	1.02	58.92	93.01	10.54	3.124	6.147	260.8
	18.0	0.2575	366.0	0.940	62.59	99.11	10.89	3.131	6.052	267.7
	19.0	0.2744	391.0	0.874	66.19	105.1	11.22	3.135	5.969	274.5
	20.0	0.2912	415.0	0.817	69.75	111.1	11.52	3.139	5.897	281.2
	21.0	0.3077	440.0	0.767	73.26	116.9	11.81	3.141	5.834	287.7
	22.0	0.3242	464.0	0.723	76.74	122.7	12.08	3.143	5.778	294.1
	23.0	0.3405	489.0	0.684	80.18	128.5	12.33	3.144	5.730	300.3
	24.0	0.3566	513.0	0.649	83.60	134.2	12.58	3.145	5.687	306.4
	25.0	0.3727	536.0	0.618	86.99	139.8	12.81	3.146	5.649	312.4
	26.0	0.3886	560.0	0.589	90.36	145.5	13.03	3.146	5.615	318.2
	28.0	0.4202	607.0	0.540	97.04	156.7	13.44	3.146	5.557	329.5
	30.0	0.4515	653.0	0.499	103.7	167.7	13.83	3.145	5.510	340.3
	32.0	0.4826	698.0	0.464	110.2	178.7	14.18	3.145	5.472	350.8
	34.0	0.5135	743.0	0.433	116.8	189.6	14.51	3.144	5.440	360.9
	36.0	0.5441	788.0	0.407	123.3	200.5	14.82	3.143	5.413	370.7
	38.0	0.5746	832.0	0.383	129.7	211.3	15.11	3.142	5.390	380.2
	40.0	0.6050	876.0	0.363	136.2	222.0	15.39	3.141	5.370	389.5
	45.0	0.6805	984.0	0.320	152.2	248.8	16.02	3.139	5.331	411.6
	50.0	0.7555	1090.0	0.286	168.2	275.4	16.58	3.137	5.304	432.4
	55.0	0.8301	1200.0	0.259	184.1	301.8	17.08	3.135	5.283	452.2
	60.0	0.9044	1300.0	0.237	199.9	328.2	17.54	3.133	5.268	471.1
	65.0	0.9785	1410.0	0.218	215.7	354.5	17.96	3.132	5.256	489.3
	70.0	1.052	1510.0	0.202	231.5	380.7	18.35	3.131	5.246	506.8
	75.0	1.126	1620.0	0.188	247.2	407.0	18.71	3.130	5.238	523.6
	80.0	1.200	1720.0	0.176	262.9	433.1	19.05	3.129	5.232	539.9
	90.0	1.347	1930.0	0.156	294.3	485.4	19.67	3.127	5.223	571.1
	100.0	1.494	2130.0	0.140	325.6	537.6	20.22	3.126	5.216	600.6
	125.0	1.861	2650.0	0.112	403.9	667.8	21.38	3.124	5.206	668.7
	150.0	2.227	3160.0	0.0934	482.0	797.9	22.33	3.123	5.201	730.4
	175.0	2.593	3670.0	0.0800	560.0	927.9	23.13	3.122	5.198	787.3
	200.0	2.959	4190.0	0.0700	638.0	1058.0	23.82	3.121	5.196	840.3
	225.0	3.325	4700.0	0.0622	716.0	1188.0	24.44	3.120	5.195	890.2
	250.0	3.691	5210.0	0.0560	794.0	1318.0	24.98	3.120	5.194	937.5
	275.0	4.057	5720.0	0.0509	871.9	1447.0	25.48	3.120	5.194	982.4
	300.0	4.423	6230.0	0.0466	949.9	1577.0	25.93	3.119	5.193	1025.0
	350.0	5.154	7260.0	0.0400	1106.0	1837.0	26.73	3.119	5.193	1106.0
	400.0	5.886	8280.0	0.0350	1262.0	2097.0	27.42	3.119	5.193	1182.0
	450.0	6.618	9300.0	0.0311	1417.0	2356.0	28.04	3.118	5.193	1253.0
	500.0	7.349	10300.0	0.0280	1573.0	2616.0	28.58	3.118	5.193	1320.0
	600.0	8.813	12400.0	0.0233	1885.0	3135.0	29.53	3.118	5.193	1445.0
	700.0	10.28	14400.0	0.0200	2197.0	3654.0	30.33	3.118	5.193	1560.0
	800.0	11.74	16500.0	0.0175	2508.0	4174.0	31.02	3.118	5.193	1667.0
	900.0	13.20	18500.0	0.0155	2820.0	4693.0	31.63	3.117	5.193	1768.0
	1000.0	14.67	20600.0	0.0140	3132.0	5212.0	32.18	3.117	5.193	1863.0
	1100.0	16.13	22600.0	0.0127	3443.0	5731.0	32.68	3.117	5.193	1954.0
	1200.0	17.59	24700.0	0.0117	3755.0	6251.0	33.13	3.117	5.193	2040.0
	1300.0	19.06	26700.0	0.0108	4066.0	6770.0	33.54	3.117	5.193	2123.0
	1400.0	20.52	28800.0	0.0100	4378.0	7289.0	33.93	3.117	5.193	2203.0
	1500.0	21.99	30800.0	0.00933	4690.0	7808.0	34.29	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

14.0 ATMOSPHERE ISOBAR

	TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)_P/V$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
*	2.014	16.58									
	2.5	16.51	111.0	9.40	167.0	0.0132	0.196	66.5	0.000813	1.06229	0.496
	3.0	16.37	82.3	12.6	156.0	0.0223	0.217	64.2	0.000721	1.06174	0.544
	3.5	16.16	69.2	14.8	142.0	0.0314	0.233	60.6	0.000663	1.06092	0.565
	4.0	15.87	62.8	16.0	126.0	0.0403	0.249	56.7	0.000619	1.05982	0.578
	4.5	15.52	60.2	16.0	110.0	0.0490	0.263	53.0	0.000574	1.05846	0.595
	5.0	15.09	59.3	15.2	94.4	0.0575	0.274	49.6	0.000533	1.05683	0.617
	5.1	15.00	59.2	15.1	91.6	0.0592	0.276	49.0	0.000526	1.05647	0.621
	5.2	14.90	59.0	15.0	89.2	0.0606	0.278	48.4	0.000523	1.05610	0.621
	5.3	14.81	58.0	15.2	86.5	0.0622	0.280	47.8	0.000525	1.05575	0.615
	5.4	14.72	57.4	15.2	83.7	0.0639	0.282	47.3	0.000523	1.05539	0.615
	5.5	14.62	56.9	15.1	81.0	0.0656	0.284	46.8	0.000520	1.05503	0.615
	5.6	14.53	56.4	15.1	78.4	0.0674	0.285	46.3	0.000517	1.05466	0.616
	5.7	14.43	55.9	15.0	75.7	0.0692	0.287	45.8	0.000514	1.05428	0.617
	5.8	14.33	55.5	15.0	73.2	0.0710	0.288	45.3	0.000510	1.05390	0.619
	5.9	14.22	55.1	14.9	70.6	0.0730	0.290	44.8	0.000507	1.05350	0.622
	6.0	14.12	54.7	14.8	68.2	0.0749	0.291	44.4	0.000503	1.05310	0.625
	6.5	13.56	52.9	14.2	56.5	0.0857	0.295	42.3	0.000480	1.05098	0.650
	7.0	12.95	51.2	13.5	46.3	0.0980	0.297	40.6	0.000456	1.04865	0.686
	7.5	12.29	49.8	12.8	37.6	0.112	0.296	39.0	0.000433	1.04611	0.734
	8.0	11.57	48.6	12.2	30.5	0.126	0.294	37.7	0.000414	1.04338	0.788
	8.5	10.81	47.9	11.5	25.0	0.140	0.291	36.6	0.000402	1.04051	0.843
	9.0	10.04	47.9	10.9	21.1	0.149	0.286	35.7	0.000400	1.03759	0.890
	9.5	9.291	48.6	10.4	18.6	0.152	0.282	35.1	0.000410	1.03476	0.921
	10.0	8.594	50.0	10.0	17.0	0.150	0.278	34.7	0.000433	1.03212	0.933
	11.0	7.426	54.2	9.26	15.7	0.133	0.273	34.4	0.000510	1.02772	0.909
	12.0	6.555	58.9	8.79	15.1	0.117	0.273	34.7	0.000603	1.02444	0.878
	13.0	5.875	63.7	8.48	14.6	0.105	0.275	35.3	0.000701	1.02189	0.856
	14.0	5.324	68.9	8.26	14.4	0.0945	0.279	35.9	0.000804	1.01983	0.839
	15.0	4.867	74.3	8.09	14.2	0.0859	0.283	36.7	0.000912	1.01812	0.826
	16.0	4.484	80.0	7.95	14.2	0.0782	0.288	37.5	0.00103	1.01668	0.814
	17.0	4.161	85.7	7.83	14.2	0.0717	0.294	38.3	0.00115	1.01548	0.802
	18.0	3.884	91.5	7.73	14.2	0.0661	0.299	39.2	0.00127	1.01444	0.792
	19.0	3.644	97.3	7.65	14.2	0.0614	0.305	40.1	0.00140	1.01355	0.784
	20.0	3.435	103.0	7.57	14.3	0.0572	0.311	41.0	0.00154	1.01276	0.776
	21.0	3.250	109.0	7.51	14.3	0.0536	0.318	41.9	0.00167	1.01207	0.770
	22.0	3.085	115.0	7.45	14.3	0.0505	0.324	42.8	0.00182	1.01146	0.764
	23.0	2.937	120.0	7.40	14.3	0.0477	0.330	43.7	0.00196	1.01091	0.759
	24.0	2.804	126.0	7.36	14.4	0.0452	0.336	44.6	0.00211	1.01041	0.755
	25.0	2.683	132.0	7.32	14.4	0.0429	0.342	45.5	0.00226	1.00996	0.751
	26.0	2.573	137.0	7.28	14.4	0.0409	0.348	46.4	0.00241	1.00955	0.748
	28.0	2.380	148.0	7.22	14.4	0.0374	0.361	48.2	0.00273	1.00883	0.742
	30.0	2.215	160.0	7.16	14.5	0.0345	0.373	49.9	0.00306	1.00822	0.738
	32.0	2.072	171.0	7.12	14.5	0.0321	0.385	51.7	0.00340	1.00769	0.734
	34.0	1.948	182.0	7.08	14.5	0.0299	0.397	53.4	0.00375	1.00723	0.731
	36.0	1.838	193.0	7.04	14.5	0.0281	0.409	55.0	0.00411	1.00682	0.728
	38.0	1.740	203.0	7.01	14.5	0.0265	0.421	56.7	0.00449	1.00645	0.725
	40.0	1.653	214.0	6.99	14.5	0.0251	0.433	58.3	0.00488	1.00613	0.723
	45.0	1.470	241.0	6.93	14.5	0.0221	0.462	62.3	0.00590	1.00545	0.719
	50.0	1.324	268.0	6.89	14.4	0.0198	0.490	66.1	0.00698	1.00491	0.715
	55.0	1.205	295.0	6.85	14.4	0.0179	0.518	69.8	0.00814	1.00447	0.712
	60.0	1.106	321.0	6.83	14.4	0.0164	0.546	73.4	0.00937	1.00410	0.709
	65.0	1.022	347.0	6.80	14.4	0.0151	0.573	76.9	0.0107	1.00379	0.706
	70.0	0.9501	374.0	6.78	14.4	0.0140	0.599	80.3	0.0120	1.00352	0.703
	75.0	0.8879	400.0	6.77	14.4	0.0131	0.625	83.7	0.0134	1.00329	0.701
	80.0	0.8333	426.0	6.75	14.3	0.0123	0.651	86.9	0.0149	1.00309	0.699
	90.0	0.7423	478.0	6.73	14.3	0.0109	0.701	93.3	0.0181	1.00275	0.695
	100.0	0.6693	531.0	6.71	14.3	0.00983	0.751	99.4	0.0215	1.00248	0.691
	125.0	0.5373	661.0	6.68	14.2	0.00788	0.869	112.0	0.0311	1.00199	0.673
	150.0	0.4490	791.0	6.66	14.2	0.00658	0.981	126.0	0.0420	1.00166	0.670
	175.0	0.3856	921.0	6.65	14.2	0.00565	1.09	140.0	0.0543	1.00143	0.667
	200.0	0.3379	1050.0	6.63	14.1	0.00495	1.19	152.0	0.0677	1.00125	0.666
	225.0	0.3007	1180.0	6.63	14.1	0.00440	1.29	165.0	0.0823	1.00111	0.665
	250.0	0.2709	1310.0	6.62	14.1	0.00396	1.38	177.0	0.0980	1.00100	0.665
	275.0	0.2465	1440.0	6.62	14.1	0.00361	1.47	188.0	0.115	1.00091	0.666
	300.0	0.2261	1570.0	6.61	14.1	0.00331	1.55	200.0	0.132	1.00084	0.668
	350.0	0.1940	1830.0	6.61	14.1	0.00284	1.73	222.0	0.171	1.00072	0.667
	400.0	0.1699	2090.0	6.60	14.1	0.00249	1.89	243.0	0.215	1.00063	0.667
	450.0	0.1511	2350.0	6.60	14.1	0.00221	2.05	264.0	0.262	1.00056	0.667
	500.0	0.1361	2610.0	6.59	14.1	0.00199	2.21	284.0	0.313	1.00050	0.667
	600.0	0.1135	3130.0	6.59	14.0	0.00166	2.51	322.0	0.426	1.00042	0.667
	700.0	0.09731	3650.0	6.59	14.0	0.00142	2.80	359.0	0.554	1.00036	0.666
	800.0	0.08518	4170.0	6.59	14.0	0.00125	3.07	394.0	0.695	1.00032	0.666
	900.0	0.07574	4680.0	6.58	14.0	0.00111	3.34	429.0	0.850	1.00028	0.666
	1000.0	0.06818	5200.0	6.58	14.0	0.00100	3.60	462.0	1.02	1.00025	0.666
	1100.0	0.05199	5720.0	6.58	14.0	0.000907	3.85	494.0	1.20	1.00023	0.666
	1200.0	0.05684	6240.0	6.58	14.0	0.000832	4.10	525.0	1.39	1.00021	0.666
	1300.0	0.05247	6760.0	6.58	14.0	0.000768	4.34	556.0	1.59	1.00019	0.666
	1400.0	0.04873	7280.0	6.58	14.0	0.000713	4.57	586.0	1.81	1.00018	0.666
	1500.0	0.04549	7800.0	6.58	14.0	0.000666	4.80	616.0	2.03	1.00017	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

15.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
2.0	0.05995	1040.0	0.792	2.987	12.10	1.303	2.496	2.500	325.2
2.5	0.06019	1040.0	2.18	3.708	12.86	1.659	1.395	1.437	329.6
3.0	0.06069	988.0	3.48	4.355	13.58	1.942	1.678	1.815	329.0
3.5	0.06146	913.0	4.48	5.151	14.49	2.235	1.851	2.146	327.4
4.0	0.06252	831.0	5.13	6.094	15.60	2.535	1.993	2.495	324.7
4.5	0.06388	747.0	5.46	7.216	16.93	2.848	2.158	2.900	318.9
5.0	0.06559	664.0	5.52	8.561	18.53	3.177	2.348	3.348	309.7
5.1	0.06598	649.0	5.51	8.862	18.89	3.245	2.385	3.437	307.8
5.2	0.06639	637.0	5.50	9.176	19.27	3.314	2.401	3.502	306.8
5.3	0.06677	623.0	5.47	9.469	19.62	3.381	2.379	3.532	306.8
5.4	0.06717	608.0	5.45	9.764	19.97	3.447	2.384	3.590	304.5
5.5	0.06758	593.0	5.42	10.06	20.33	3.514	2.389	3.650	302.9
5.6	0.06801	578.0	5.39	10.37	20.70	3.580	2.397	3.714	301.3
5.7	0.06844	564.0	5.35	10.67	21.08	3.647	2.405	3.779	299.6
5.8	0.06890	549.0	5.31	10.98	21.46	3.713	2.415	3.848	297.8
5.9	0.06936	535.0	5.27	11.30	21.84	3.780	2.425	3.918	296.0
6.0	0.06985	521.0	5.23	11.62	22.24	3.846	2.437	3.991	294.2
6.5	0.07250	455.0	4.98	13.31	24.32	4.182	2.502	4.389	284.4
7.0	0.07565	395.0	4.69	15.13	26.63	4.526	2.574	4.838	274.2
7.5	0.07938	342.0	4.38	17.11	29.17	4.880	2.648	5.331	264.0
8.0	0.08382	297.0	4.04	19.24	31.98	5.245	2.720	5.852	254.4
8.5	0.08909	262.0	3.70	21.54	35.08	5.623	2.789	6.367	245.9
9.0	0.09524	236.0	3.36	23.96	38.44	6.009	2.853	6.816	239.2
9.5	0.1023	221.0	3.05	26.48	42.02	6.398	2.911	7.141	234.4
10.0	0.1100	215.0	2.76	29.03	45.75	6.783	2.960	7.307	231.8
11.0	0.1266	222.0	2.27	34.07	53.31	7.509	3.024	7.183	230.9
12.0	0.1432	240.0	1.92	38.72	60.49	8.138	3.057	6.887	233.9
13.0	0.1595	257.0	1.66	42.89	67.13	8.671	3.072	6.685	238.0
14.0	0.1758	276.0	1.47	46.88	73.59	9.151	3.086	6.531	243.4
15.0	0.1921	298.0	1.32	50.73	79.92	9.588	3.100	6.407	249.6
16.0	0.2084	321.0	1.20	54.59	86.26	10.00	3.113	6.287	256.3
17.0	0.2246	345.0	1.10	58.36	92.50	10.38	3.123	6.180	263.1
18.0	0.2406	370.0	1.02	62.06	98.63	10.73	3.130	6.086	269.8
19.0	0.2565	394.0	0.945	65.69	104.7	11.05	3.135	6.002	276.5
20.0	0.2722	419.0	0.882	69.27	110.6	11.36	3.139	5.929	283.0
21.0	0.2877	443.0	0.828	72.81	116.5	11.65	3.142	5.865	289.5
22.0	0.3031	467.0	0.780	76.30	122.4	11.92	3.144	5.808	295.8
23.0	0.3183	492.0	0.737	79.77	128.2	12.18	3.146	5.758	302.0
24.0	0.3335	516.0	0.700	83.20	133.9	12.42	3.147	5.714	308.0
25.0	0.3485	539.0	0.666	86.61	139.6	12.65	3.147	5.674	313.9
26.0	0.3635	563.0	0.635	89.99	145.2	12.87	3.148	5.639	319.7
28.0	0.3931	610.0	0.582	96.71	156.5	13.29	3.148	5.578	330.9
30.0	0.4224	656.0	0.537	103.4	167.6	13.67	3.147	5.529	341.6
32.0	0.4515	702.0	0.499	110.0	178.6	14.03	3.146	5.489	352.2
34.0	0.4803	747.0	0.466	116.5	189.5	14.36	3.146	5.455	362.3
36.0	0.5090	792.0	0.437	123.0	200.4	14.67	3.145	5.426	372.0
38.0	0.5376	836.0	0.412	129.5	211.2	14.96	3.144	5.402	381.5
40.0	0.5660	880.0	0.390	136.0	222.0	15.24	3.143	5.381	390.7
45.0	0.6366	989.0	0.343	152.1	248.8	15.87	3.140	5.340	412.8
50.0	0.7067	1100.0	0.307	168.0	275.4	16.43	3.138	5.311	433.6
55.0	0.7764	1200.0	0.278	183.9	301.9	16.94	3.136	5.289	453.4
60.0	0.8458	1310.0	0.254	199.8	328.3	17.40	3.135	5.273	472.2
65.0	0.9151	1410.0	0.233	215.6	354.7	17.82	3.133	5.260	490.4
70.0	0.9841	1520.0	0.216	231.4	380.9	18.21	3.132	5.250	507.8
75.0	1.053	1620.0	0.202	247.1	407.2	18.57	3.131	5.241	524.6
80.0	1.122	1730.0	0.189	262.8	433.3	18.91	3.130	5.235	540.9
90.0	1.259	1930.0	0.167	294.2	485.6	19.52	3.128	5.225	572.0
100.0	1.397	2140.0	0.150	325.6	537.8	20.07	3.127	5.217	601.5
125.0	1.739	2650.0	0.120	403.8	668.1	21.24	3.124	5.207	669.5
150.0	2.081	3170.0	0.100	482.0	798.2	22.19	3.123	5.201	731.1
175.0	2.423	3680.0	0.0857	560.0	928.2	22.99	3.122	5.198	788.0
200.0	2.764	4190.0	0.0750	638.0	1058.0	23.68	3.121	5.196	840.9
225.0	3.106	4700.0	0.0666	716.0	1188.0	24.29	3.121	5.195	890.8
250.0	3.447	5220.0	0.0600	794.0	1318.0	24.84	3.120	5.194	938.0
275.0	3.788	5730.0	0.0545	872.0	1448.0	25.34	3.120	5.194	982.9
300.0	4.130	6240.0	0.0500	949.9	1578.0	25.79	3.120	5.193	1026.0
350.0	4.813	7260.0	0.0428	1106.0	1837.0	26.59	3.119	5.193	1107.0
400.0	5.496	8290.0	0.0375	1262.0	2097.0	27.28	3.119	5.193	1182.0
450.0	6.178	9310.0	0.0333	1418.0	2357.0	27.89	3.118	5.193	1253.0
500.0	6.861	10300.0	0.0300	1573.0	2616.0	28.44	3.118	5.193	1320.0
600.0	8.227	12400.0	0.0250	1885.0	3135.0	29.39	3.118	5.192	1445.0
700.0	9.593	14400.0	0.0214	2197.0	3655.0	30.19	3.118	5.192	1560.0
800.0	10.96	16500.0	0.0187	2508.0	4174.0	30.88	3.118	5.192	1667.0
900.0	12.32	18500.0	0.0167	2820.0	4693.0	31.49	3.118	5.193	1768.0
1000.0	13.69	20600.0	0.0150	3132.0	5212.0	32.04	3.117	5.193	1863.0
1100.0	15.06	22600.0	0.0136	3443.0	5732.0	32.53	3.117	5.193	1954.0
1200.0	16.42	24700.0	0.0125	3755.0	6251.0	32.99	3.117	5.193	2040.0
1300.0	17.79	26700.0	0.0115	4066.0	6770.0	33.40	3.117	5.193	2123.0
1400.0	19.15	28800.0	0.0107	4378.0	7289.0	33.79	3.117	5.193	2203.0
1500.0	20.52	30800.0	0.0100	4690.0	7809.0	34.14	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

15.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
2.0	16.68	549.0	1.90	174.0	0.00455	0.141	66.5	0.000339	1.06293	1.18
2.5	16.61	114.0	9.41	173.0	0.0126	0.198	68.7	0.000829	1.06267	0.498
3.0	16.49	84.9	12.6	163.0	0.0214	0.219	66.1	0.000733	1.06215	0.547
3.5	16.27	71.2	14.9	149.0	0.0301	0.236	62.3	0.000675	1.06136	0.567
4.0	16.00	64.5	16.1	133.0	0.0386	0.251	58.3	0.000630	1.06030	0.578
4.5	15.65	62.1	16.2	117.0	0.0467	0.266	54.5	0.000585	1.05898	0.594
5.0	15.25	61.4	15.4	101.0	0.0545	0.278	51.0	0.000544	1.05742	0.614
5.1	15.15	61.4	15.2	98.4	0.0560	0.280	50.3	0.000538	1.05707	0.618
5.2	15.06	61.2	15.2	96.0	0.0573	0.282	49.7	0.000534	1.05672	0.617
5.3	14.98	60.2	15.4	93.2	0.0587	0.284	49.1	0.000537	1.05639	0.611
5.4	14.89	59.6	15.4	90.4	0.0602	0.286	48.6	0.000535	1.05605	0.610
5.5	14.80	59.1	15.3	87.7	0.0618	0.288	48.0	0.000533	1.05570	0.609
5.6	14.70	58.6	15.3	85.0	0.0634	0.290	47.5	0.000530	1.05535	0.609
5.7	14.61	58.2	15.2	82.4	0.0650	0.291	47.0	0.000527	1.05499	0.610
5.8	14.51	57.8	15.2	79.7	0.0666	0.293	46.5	0.000524	1.05462	0.612
5.9	14.42	57.4	15.1	77.2	0.0683	0.294	46.1	0.000521	1.05425	0.614
6.0	14.32	57.0	15.0	74.6	0.0700	0.295	45.6	0.000517	1.05387	0.616
6.5	13.79	55.3	14.4	62.8	0.0794	0.301	43.5	0.000496	1.05186	0.636
7.0	13.22	53.8	13.8	52.2	0.0899	0.303	41.7	0.000474	1.04967	0.666
7.5	12.60	52.4	13.1	43.0	0.102	0.303	40.2	0.000452	1.04730	0.706
8.0	11.93	51.3	12.5	35.4	0.114	0.302	38.8	0.000432	1.04476	0.754
8.5	11.22	50.5	11.8	29.4	0.126	0.299	37.7	0.000418	1.04208	0.803
9.0	10.50	50.3	11.2	24.8	0.136	0.295	36.8	0.000413	1.03933	0.850
9.5	9.780	50.7	10.7	21.6	0.141	0.291	36.1	0.000417	1.03660	0.886
10.0	9.094	51.7	10.3	19.5	0.141	0.287	35.6	0.000432	1.03401	0.907
11.0	7.900	55.3	9.51	17.5	0.130	0.281	35.2	0.000496	1.02951	0.899
12.0	6.981	60.1	8.99	16.7	0.115	0.280	35.4	0.000582	1.02605	0.871
13.0	6.271	64.7	8.64	16.1	0.103	0.282	35.9	0.000672	1.02338	0.852
14.0	5.690	69.7	8.39	15.7	0.0937	0.285	36.5	0.000766	1.02120	0.837
15.0	5.207	74.9	8.21	15.5	0.0855	0.289	37.2	0.000865	1.01939	0.826
16.0	4.798	80.5	8.05	15.4	0.0781	0.293	38.0	0.000972	1.01786	0.814
17.0	4.452	86.2	7.93	15.4	0.0717	0.298	38.8	0.00108	1.01656	0.803
18.0	4.156	91.9	7.82	15.4	0.0662	0.304	39.6	0.00120	1.01546	0.794
19.0	3.899	97.7	7.73	15.4	0.0615	0.309	40.5	0.00132	1.01450	0.786
20.0	3.674	103.0	7.65	15.4	0.0573	0.315	41.4	0.00145	1.01366	0.778
21.0	3.476	109.0	7.58	15.4	0.0537	0.321	42.3	0.00158	1.01292	0.772
22.0	3.300	115.0	7.52	15.4	0.0506	0.327	43.2	0.00171	1.01226	0.766
23.0	3.141	121.0	7.46	15.4	0.0477	0.333	44.1	0.00184	1.01167	0.761
24.0	2.999	126.0	7.41	15.5	0.0452	0.339	44.9	0.00198	1.01114	0.757
25.0	2.869	132.0	7.37	15.5	0.0430	0.345	45.8	0.00212	1.01066	0.753
26.0	2.751	138.0	7.33	15.5	0.0410	0.351	46.7	0.00226	1.01022	0.750
28.0	2.544	149.0	7.26	15.5	0.0375	0.364	48.5	0.00256	1.00944	0.744
30.0	2.367	160.0	7.21	15.5	0.0346	0.376	50.2	0.00287	1.00879	0.739
32.0	2.215	171.0	7.16	15.5	0.0321	0.388	51.9	0.00319	1.00822	0.735
34.0	2.082	182.0	7.11	15.6	0.0300	0.400	53.6	0.00352	1.00772	0.732
36.0	1.964	193.0	7.08	15.6	0.0281	0.412	55.3	0.00386	1.00729	0.729
38.0	1.860	204.0	7.04	15.6	0.0265	0.423	56.9	0.00421	1.00690	0.726
40.0	1.767	215.0	7.02	15.6	0.0251	0.435	58.5	0.00458	1.00655	0.724
45.0	1.571	242.0	6.96	15.5	0.0221	0.464	62.5	0.00553	1.00583	0.719
50.0	1.415	269.0	6.91	15.5	0.0198	0.492	66.3	0.00655	1.00525	0.715
55.0	1.288	295.0	6.87	15.5	0.0179	0.520	70.0	0.00763	1.00478	0.712
60.0	1.182	322.0	6.84	15.5	0.0164	0.547	73.6	0.00878	1.00438	0.709
65.0	1.093	348.0	6.82	15.5	0.0151	0.574	77.1	0.0100	1.00405	0.706
70.0	1.016	374.0	6.80	15.4	0.0140	0.600	80.5	0.0113	1.00377	0.703
75.0	0.9496	401.0	6.78	15.4	0.0131	0.627	83.8	0.0126	1.00352	0.701
80.0	0.8913	427.0	6.77	15.4	0.0123	0.652	87.1	0.0140	1.00330	0.699
90.0	0.7941	479.0	6.74	15.4	0.0109	0.703	93.4	0.0169	1.00294	0.695
100.0	0.7161	531.0	6.72	15.3	0.00982	0.752	100.0	0.0201	1.00265	0.691
125.0	0.5751	662.0	6.69	15.3	0.00787	0.870	112.0	0.0291	1.00213	0.673
150.0	0.4806	792.0	6.66	15.2	0.00657	0.982	126.0	0.0393	1.00178	0.670
175.0	0.4128	922.0	6.65	15.2	0.00564	1.09	140.0	0.0507	1.00153	0.667
200.0	0.3618	1050.0	6.64	15.2	0.00494	1.19	152.0	0.0633	1.00134	0.666
225.0	0.3220	1180.0	6.63	15.1	0.00440	1.29	165.0	0.0769	1.00119	0.665
250.0	0.2901	1310.0	6.62	15.1	0.00396	1.38	177.0	0.0916	1.00107	0.665
275.0	0.2640	1440.0	6.62	15.1	0.00360	1.47	188.0	0.107	1.00098	0.666
300.0	0.2421	1570.0	6.61	15.1	0.00331	1.55	200.0	0.124	1.00090	0.667
350.0	0.2078	1830.0	6.61	15.1	0.00284	1.73	222.0	0.160	1.00077	0.667
400.0	0.1820	2090.0	6.60	15.1	0.00249	1.89	243.0	0.200	1.00067	0.667
450.0	0.1619	2350.0	6.60	15.1	0.00221	2.05	264.0	0.244	1.00060	0.667
500.0	0.1457	2610.0	6.60	15.1	0.00199	2.21	284.0	0.292	1.00054	0.667
600.0	0.1216	3130.0	6.59	15.0	0.00166	2.51	322.0	0.398	1.00045	0.667
700.0	0.1042	3650.0	6.59	15.0	0.00142	2.80	359.0	0.517	1.00039	0.666
800.0	0.09125	4170.0	6.59	15.0	0.00125	3.07	394.0	0.649	1.00034	0.666
900.0	0.08114	4690.0	6.59	15.0	0.00111	3.34	429.0	0.793	1.00030	0.666
1000.0	0.07304	5200.0	6.58	15.0	0.00100	3.60	462.0	0.949	1.00027	0.666
1100.0	0.06642	5720.0	6.58	15.0	0.000907	3.85	494.0	1.12	1.00025	0.666
1200.0	0.06089	6240.0	6.58	15.0	0.000832	4.10	525.0	1.30	1.00023	0.666
1300.0	0.05622	6760.0	6.58	15.0	0.000768	4.34	556.0	1.49	1.00021	0.666
1400.0	0.05221	7280.0	6.58	15.0	0.000713	4.57	586.0	1.69	1.00019	0.666
1500.0	0.04873	7800.0	6.58	15.0	0.000666	4.80	616.0	1.90	1.00018	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

16.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
2.0	0.05960	1070.0	0.896	3.042	12.71	1.303	2.372	2.377	329.3
2.5	0.05984	1070.0	2.17	3.733	13.43	1.648	1.373	1.413	334.2
3.0	0.06031	1020.0	3.47	4.366	14.14	1.926	1.661	1.792	334.0
3.5	0.06105	948.0	4.50	5.144	15.04	2.215	1.834	2.116	332.9
4.0	0.06206	867.0	5.18	6.067	16.13	2.511	1.977	2.459	330.6
4.5	0.06336	784.0	5.52	7.166	17.44	2.818	2.144	2.856	325.2
5.0	0.06497	701.0	5.60	8.484	19.02	3.143	2.336	3.292	316.4
5.1	0.06534	687.0	5.59	8.779	19.37	3.209	2.373	3.378	314.7
5.2	0.06572	675.0	5.58	9.086	19.74	3.277	2.389	3.441	313.8
5.3	0.06608	660.0	5.56	9.373	20.09	3.342	2.368	3.468	313.0
5.4	0.06646	645.0	5.54	9.661	20.44	3.408	2.372	3.522	311.6
5.5	0.06684	631.0	5.52	9.95	20.79	3.473	2.378	3.580	310.1
5.6	0.06724	616.0	5.49	10.25	21.15	3.538	2.386	3.639	308.5
5.7	0.06765	602.0	5.45	10.55	21.52	3.603	2.394	3.701	306.9
5.8	0.06807	587.0	5.42	10.85	21.89	3.668	2.404	3.765	305.3
5.9	0.06850	573.0	5.38	11.16	22.27	3.733	2.415	3.832	303.6
6.0	0.06895	559.0	5.34	11.47	22.65	3.798	2.426	3.900	301.8
6.5	0.07141	493.0	5.11	13.11	24.69	4.126	2.491	4.270	292.5
7.0	0.07428	432.0	4.84	14.88	26.92	4.459	2.562	4.684	282.7
7.5	0.07765	377.0	4.54	16.78	29.37	4.800	2.635	5.134	272.9
8.0	0.08162	331.0	4.22	18.84	32.07	5.151	2.706	5.611	263.5
8.5	0.08627	292.0	3.89	21.04	35.02	5.512	2.773	6.090	255.1
9.0	0.09168	264.0	3.56	23.36	38.23	5.881	2.836	6.530	248.0
9.5	0.09784	244.0	3.25	25.79	41.65	6.253	2.893	6.883	242.6
10.0	0.1047	234.0	2.96	28.28	45.25	6.625	2.942	7.111	239.1
11.0	0.1197	234.0	2.45	33.29	52.70	7.340	3.012	7.124	236.6
12.0	0.1352	248.0	2.07	37.96	59.87	7.969	3.048	6.893	238.5
13.0	0.1503	266.0	1.80	42.24	66.61	8.511	3.068	6.682	242.2
14.0	0.1654	284.0	1.59	46.25	73.06	8.990	3.082	6.538	247.0
15.0	0.1805	304.0	1.43	50.13	79.39	9.427	3.096	6.423	252.6
16.0	0.1958	326.0	1.30	54.01	85.76	9.838	3.111	6.310	259.0
17.0	0.2110	350.0	1.19	57.81	92.02	10.22	3.121	6.207	265.5
18.0	0.2260	374.0	1.09	61.54	98.18	10.57	3.129	6.114	272.0
19.0	0.2409	398.0	1.02	65.20	104.2	10.90	3.135	6.032	278.5
20.0	0.2556	422.0	0.948	68.80	110.2	11.21	3.140	5.959	285.0
21.0	0.2702	447.0	0.889	72.36	116.2	11.49	3.143	5.894	291.3
22.0	0.2847	471.0	0.838	75.88	122.0	11.77	3.145	5.836	297.5
23.0	0.2990	495.0	0.792	79.36	127.8	12.03	3.147	5.785	303.7
24.0	0.3133	519.0	0.751	82.81	133.6	12.27	3.148	5.739	309.6
25.0	0.3274	543.0	0.714	86.24	139.3	12.50	3.149	5.698	315.5
26.0	0.3415	567.0	0.681	89.64	145.0	12.73	3.149	5.662	321.3
28.0	0.3693	614.0	0.623	96.38	156.3	13.14	3.149	5.599	332.4
30.0	0.3969	660.0	0.575	103.1	167.4	13.53	3.149	5.548	343.2
32.0	0.4243	706.0	0.534	109.7	178.5	13.89	3.148	5.505	353.6
34.0	0.4514	751.0	0.498	116.2	189.4	14.22	3.147	5.470	363.6
36.0	0.4784	796.0	0.468	122.8	200.3	14.53	3.146	5.440	373.4
38.0	0.5052	840.0	0.441	129.3	211.2	14.82	3.145	5.414	382.8
40.0	0.5319	885.0	0.416	135.8	222.0	15.10	3.144	5.392	392.0
45.0	0.5982	994.0	0.367	151.9	248.8	15.73	3.142	5.349	414.0
50.0	0.6640	1100.0	0.328	167.9	275.5	16.29	3.140	5.318	434.8
55.0	0.7294	1210.0	0.297	183.8	302.0	16.80	3.138	5.295	454.5
60.0	0.7946	1310.0	0.271	199.7	328.5	17.26	3.136	5.278	473.4
65.0	0.8595	1420.0	0.249	215.5	354.8	17.68	3.134	5.264	491.4
70.0	0.9243	1520.0	0.231	231.3	381.1	18.07	3.133	5.253	508.8
75.0	0.9890	1630.0	0.215	247.0	407.4	18.43	3.132	5.245	525.6
80.0	1.054	1730.0	0.201	262.8	433.6	18.77	3.131	5.237	541.9
90.0	1.182	1940.0	0.179	294.2	485.9	19.39	3.129	5.227	572.9
100.0	1.311	2150.0	0.161	325.5	538.1	19.94	3.128	5.219	602.4
125.0	1.632	2660.0	0.128	403.8	668.4	21.10	3.125	5.208	670.3
150.0	1.953	3170.0	0.107	482.0	798.5	22.05	3.123	5.202	731.8
175.0	2.273	3690.0	0.0914	560.0	928.5	22.85	3.122	5.199	788.6
200.0	2.593	4200.0	0.0800	638.1	1058.0	23.55	3.122	5.197	841.5
225.0	2.913	4710.0	0.0711	716.1	1188.0	24.16	3.121	5.195	891.3
250.0	3.234	5220.0	0.0639	794.0	1318.0	24.71	3.120	5.195	938.5
275.0	3.554	5730.0	0.0581	872.0	1448.0	25.20	3.120	5.194	983.4
300.0	3.874	6250.0	0.0533	949.9	1578.0	25.65	3.120	5.194	1026.0
350.0	4.514	7270.0	0.0457	1106.0	1838.0	26.45	3.119	5.193	1107.0
400.0	5.154	8290.0	0.0400	1262.0	2097.0	27.15	3.119	5.193	1183.0
450.0	5.794	9320.0	0.0355	1418.0	2357.0	27.76	3.119	5.193	1254.0
500.0	6.434	10300.0	0.0320	1573.0	2616.0	28.31	3.118	5.192	1321.0
600.0	7.714	12400.0	0.0266	1885.0	3136.0	29.25	3.118	5.192	1446.0
700.0	8.995	14400.0	0.0228	2197.0	3655.0	30.05	3.118	5.192	1560.0
800.0	10.28	16500.0	0.0200	2508.0	4174.0	30.75	3.118	5.192	1668.0
900.0	11.56	18500.0	0.0178	2820.0	4693.0	31.36	3.118	5.192	1768.0
1000.0	12.84	20600.0	0.0160	3132.0	5213.0	31.90	3.118	5.193	1863.0
1100.0	14.12	22600.0	0.0145	3443.0	5732.0	32.40	3.117	5.193	1954.0
1200.0	15.40	24700.0	0.0133	3755.0	6251.0	32.85	3.117	5.193	2040.0
1300.0	16.68	26700.0	0.0123	4067.0	6770.0	33.27	3.117	5.193	2123.0
1400.0	17.96	28800.0	0.0114	4378.0	7290.0	33.65	3.117	5.193	2203.0
1500.0	19.24	30800.0	0.0107	4690.0	7809.0	34.01	3.117	5.193	2280.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

16.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
2.0	16.78	475.0	2.25	179.0	0.00500	0.142	68.8	0.000356	1.06330	1.15
2.5	16.71	117.0	9.44	179.0	0.0121	0.200	70.8	0.000846	1.06304	0.521
3.0	16.58	87.3	12.6	169.0	0.0205	0.221	68.0	0.000744	1.06254	0.551
3.5	16.38	73.1	15.0	155.0	0.0290	0.238	64.0	0.000686	1.06177	0.570
4.0	16.11	66.4	16.3	140.0	0.0370	0.254	59.8	0.000641	1.06075	0.580
4.5	15.78	64.3	16.3	124.0	0.0446	0.269	55.9	0.000596	1.05948	0.594
5.0	15.39	63.5	15.6	108.0	0.0519	0.281	52.3	0.000555	1.05797	0.612
5.1	15.30	63.5	15.4	105.0	0.0532	0.283	51.6	0.000548	1.05764	0.615
5.2	15.22	63.3	15.4	103.0	0.0544	0.286	51.0	0.000545	1.05730	0.614
5.3	15.13	62.3	15.5	100.0	0.0557	0.288	50.4	0.000548	1.05698	0.607
5.4	15.05	61.7	15.5	97.1	0.0571	0.290	49.8	0.000547	1.05666	0.606
5.5	14.96	61.2	15.5	94.3	0.0585	0.292	49.3	0.000545	1.05633	0.605
5.6	14.87	60.8	15.5	91.6	0.0599	0.294	48.7	0.000542	1.05599	0.604
5.7	14.78	60.3	15.4	88.9	0.0613	0.295	48.2	0.000540	1.05564	0.605
5.8	14.69	60.0	15.3	86.3	0.0628	0.297	47.7	0.000537	1.05529	0.605
5.9	14.60	59.6	15.3	83.7	0.0643	0.298	47.3	0.000534	1.05494	0.607
6.0	14.50	59.2	15.2	81.1	0.0658	0.300	46.8	0.000530	1.05457	0.609
6.5	14.00	57.7	14.6	69.0	0.0741	0.306	44.7	0.000511	1.05267	0.624
7.0	13.46	56.3	14.0	58.1	0.0832	0.309	42.9	0.000490	1.05050	0.650
7.5	12.88	55.0	13.4	48.6	0.0934	0.310	41.3	0.000469	1.04837	0.684
8.0	12.25	53.9	12.7	40.5	0.104	0.309	39.9	0.000449	1.04599	0.725
8.5	11.59	53.1	12.1	33.9	0.115	0.307	38.8	0.000435	1.04348	0.770
9.0	10.91	52.7	11.5	28.8	0.124	0.304	37.9	0.000426	1.04088	0.814
9.5	10.22	52.8	11.0	25.0	0.130	0.300	37.1	0.000426	1.03827	0.852
10.0	9.553	53.6	10.5	22.3	0.133	0.296	36.6	0.000436	1.03575	0.879
11.0	8.351	56.7	9.75	19.5	0.126	0.290	36.0	0.000487	1.03121	0.886
12.0	7.399	61.1	9.19	18.4	0.113	0.287	36.1	0.000563	1.02762	0.867
13.0	6.653	65.8	8.80	17.7	0.102	0.288	36.5	0.000648	1.02481	0.846
14.0	6.047	70.6	8.53	17.2	0.0926	0.291	37.1	0.000735	1.02254	0.834
15.0	5.539	75.6	8.33	16.8	0.0849	0.294	37.7	0.000827	1.02063	0.824
16.0	5.107	81.1	8.16	16.7	0.0778	0.298	38.5	0.000926	1.01901	0.814
17.0	4.740	86.7	8.02	16.6	0.0716	0.303	39.2	0.00103	1.01764	0.804
18.0	4.425	92.4	7.90	16.5	0.0662	0.308	40.1	0.00114	1.01646	0.795
19.0	4.152	98.1	7.81	16.5	0.0615	0.314	40.9	0.00125	1.01544	0.787
20.0	3.912	104.0	7.72	16.5	0.0574	0.319	41.8	0.00137	1.01455	0.780
21.0	3.701	110.0	7.65	16.5	0.0538	0.325	42.6	0.00149	1.01376	0.774
22.0	3.513	115.0	7.58	16.5	0.0506	0.331	43.5	0.00161	1.01305	0.768
23.0	3.344	121.0	7.52	16.6	0.0478	0.336	44.4	0.00174	1.01243	0.763
24.0	3.192	127.0	7.47	16.6	0.0453	0.342	45.3	0.00187	1.01186	0.759
25.0	3.054	132.0	7.42	16.6	0.0431	0.348	46.1	0.00200	1.01134	0.755
26.0	2.928	138.0	7.38	16.6	0.0410	0.354	47.0	0.00214	1.01088	0.751
28.0	2.708	149.0	7.31	16.6	0.0375	0.366	48.8	0.00242	1.01005	0.745
30.0	2.519	160.0	7.25	16.6	0.0346	0.378	50.5	0.00271	1.00935	0.740
32.0	2.357	172.0	7.19	16.6	0.0321	0.390	52.2	0.00301	1.00875	0.736
34.0	2.215	183.0	7.15	16.6	0.0300	0.402	53.9	0.00332	1.00822	0.733
36.0	2.090	194.0	7.11	16.6	0.0281	0.414	55.5	0.00364	1.00776	0.730
38.0	1.979	204.0	7.08	16.6	0.0265	0.425	57.1	0.00397	1.00734	0.727
40.0	1.880	215.0	7.04	16.6	0.0250	0.437	58.8	0.00431	1.00697	0.725
45.0	1.672	242.0	6.98	16.6	0.0221	0.466	62.7	0.00521	1.00620	0.720
50.0	1.506	269.0	6.93	16.6	0.0198	0.494	66.5	0.00617	1.00558	0.716
55.0	1.371	296.0	6.89	16.6	0.0179	0.521	70.2	0.00718	1.00508	0.712
60.0	1.259	322.0	6.86	16.5	0.0164	0.549	73.7	0.00826	1.00467	0.709
65.0	1.163	349.0	6.84	16.5	0.0151	0.575	77.2	0.00940	1.00431	0.706
70.0	1.082	375.0	6.81	16.5	0.0140	0.602	80.6	0.0106	1.00401	0.704
75.0	1.011	401.0	6.79	16.5	0.0131	0.628	83.9	0.0118	1.00375	0.701
80.0	0.9492	428.0	6.78	16.4	0.0122	0.654	87.2	0.0131	1.00352	0.699
90.0	0.8457	480.0	6.75	16.4	0.0109	0.704	93.6	0.0159	1.00313	0.695
100.0	0.7527	532.0	6.73	16.4	0.00981	0.753	100.0	0.0189	1.00283	0.691
125.0	0.6127	663.0	6.69	16.3	0.00786	0.871	113.0	0.0273	1.00227	0.673
150.0	0.5121	793.0	6.67	16.3	0.00656	0.983	126.0	0.0369	1.00190	0.670
175.0	0.4399	922.0	6.65	16.2	0.00564	1.09	140.0	0.0476	1.00163	0.667
200.0	0.3856	1050.0	6.64	16.2	0.00494	1.19	153.0	0.0594	1.00143	0.666
225.0	0.3432	1180.0	6.63	16.2	0.00439	1.29	165.0	0.0722	1.00127	0.665
250.0	0.3093	1310.0	6.63	16.2	0.00396	1.38	177.0	0.0860	1.00115	0.665
275.0	0.2814	1440.0	6.62	16.1	0.00360	1.47	188.0	0.101	1.00104	0.666
300.0	0.2582	1570.0	6.62	16.1	0.00330	1.55	200.0	0.116	1.00096	0.667
350.0	0.2215	1830.0	6.61	16.1	0.00284	1.73	222.0	0.150	1.00082	0.667
400.0	0.1940	2090.0	6.60	16.1	0.00248	1.89	243.0	0.188	1.00072	0.667
450.0	0.1726	2350.0	6.60	16.1	0.00221	2.05	264.0	0.229	1.00064	0.667
500.0	0.1554	2610.0	6.60	16.1	0.00199	2.21	284.0	0.274	1.00058	0.667
600.0	0.1296	3130.0	6.59	16.1	0.00166	2.51	322.0	0.373	1.00048	0.667
700.0	0.1112	3650.0	6.59	16.0	0.00142	2.80	359.0	0.485	1.00041	0.666
800.0	0.09732	4170.0	6.59	16.0	0.00125	3.07	395.0	0.608	1.00036	0.666
900.0	0.08654	4690.0	6.59	16.0	0.00111	3.34	429.0	0.744	1.00032	0.666
1000.0	0.07790	5200.0	6.58	16.0	0.00100	3.60	462.0	0.890	1.00029	0.666
1100.0	0.07084	5720.0	6.58	16.0	0.000907	3.85	494.0	1.05	1.00026	0.666
1200.0	0.06495	6240.0	6.58	16.0	0.000832	4.10	525.0	1.21	1.00024	0.666
1300.0	0.05996	6760.0	6.58	16.0	0.000768	4.34	556.0	1.39	1.00022	0.666
1400.0	0.05568	7280.0	6.58	16.0	0.000713	4.57	586.0	1.58	1.00021	0.666
1500.0	0.05198	7800.0	6.58	16.0	0.000666	4.80	616.0	1.78	1.00019	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

18.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
2.0	0.05895	1120.0	1.15	3.155	13.91	1.304	2.147	2.156	337.0
2.5	0.05919	1130.0	2.15	3.791	14.59	1.626	1.333	1.369	343.0
3.0	0.05962	1090.0	3.47	4.396	15.27	1.896	1.628	1.748	343.6
3.5	0.06029	1020.0	4.54	5.142	16.14	2.177	1.801	2.062	343.3
4.0	0.06122	937.0	5.26	6.028	17.19	2.465	1.946	2.394	341.8
4.5	0.06240	855.0	5.64	7.086	18.47	2.764	2.117	2.777	337.1
5.0	0.06386	774.0	5.75	8.355	20.00	3.078	2.313	3.194	329.1
5.1	0.06419	760.0	5.75	8.639	20.35	3.143	2.351	3.276	327.5
5.2	0.06453	748.0	5.74	8.936	20.70	3.208	2.367	3.335	326.7
5.3	0.06485	734.0	5.73	9.211	21.04	3.272	2.346	3.357	326.1
5.4	0.06519	719.0	5.71	9.488	21.38	3.335	2.351	3.407	324.8
5.5	0.06553	704.0	5.69	9.768	21.72	3.398	2.358	3.459	323.5
5.6	0.06588	690.0	5.67	10.05	22.07	3.461	2.365	3.513	322.1
5.7	0.06624	675.0	5.64	10.34	22.42	3.524	2.374	3.569	320.6
5.8	0.06662	661.0	5.61	10.63	22.78	3.586	2.384	3.627	319.1
5.9	0.06700	647.0	5.58	10.92	23.14	3.649	2.395	3.687	317.6
6.0	0.06739	633.0	5.54	11.22	23.51	3.712	2.407	3.748	316.0
6.5	0.06953	566.0	5.34	12.78	25.46	4.025	2.472	4.077	307.4
7.0	0.07198	504.0	5.10	14.45	27.58	4.342	2.543	4.438	298.4
7.5	0.07481	447.0	4.82	16.25	29.89	4.664	2.615	4.826	289.2
8.0	0.07807	398.0	4.53	18.17	32.41	4.992	2.684	5.234	280.3
8.5	0.08184	355.0	4.23	20.22	35.15	5.326	2.749	5.650	272.0
9.0	0.08615	321.0	3.92	22.39	38.19	5.667	2.809	6.054	264.7
9.5	0.09105	295.0	3.62	24.66	41.27	6.012	2.864	6.415	258.6
10.0	0.09653	277.0	3.33	27.01	44.61	6.357	2.913	6.704	253.9
11.0	0.1090	263.0	2.80	31.89	51.76	7.045	2.989	6.931	248.5
12.0	0.1222	270.0	2.38	36.58	58.86	7.668	3.032	6.845	248.3
13.0	0.1354	284.0	2.06	40.98	65.68	8.217	3.058	6.671	250.7
14.0	0.1485	301.0	1.82	45.08	72.18	8.700	3.075	6.531	254.4
15.0	0.1617	318.0	1.64	48.99	78.49	9.136	3.090	6.434	258.9
16.0	0.1752	339.0	1.48	52.92	84.87	9.549	3.106	6.337	264.6
17.0	0.1886	361.0	1.36	56.77	91.16	9.930	3.118	6.244	270.6
18.0	0.2019	384.0	1.25	60.54	97.36	10.28	3.128	6.158	276.7
19.0	0.2151	407.0	1.16	64.24	103.5	10.62	3.135	6.079	282.9
20.0	0.2283	431.0	1.08	67.89	109.5	10.93	3.140	6.007	289.1
21.0	0.2413	455.0	1.01	71.49	115.5	11.22	3.144	5.943	295.2
22.0	0.2542	479.0	0.954	75.05	121.4	11.49	3.147	5.884	301.2
23.0	0.2670	503.0	0.901	78.57	127.3	11.75	3.149	5.832	307.2
24.0	0.2798	527.0	0.854	82.05	133.1	12.00	3.150	5.784	313.1
25.0	0.2924	551.0	0.812	85.51	138.8	12.23	3.151	5.742	318.8
26.0	0.3050	574.0	0.773	88.94	144.6	12.46	3.152	5.703	324.5
28.0	0.3299	621.0	0.707	95.73	155.9	12.88	3.152	5.637	335.5
30.0	0.3545	668.0	0.652	102.5	167.1	13.27	3.152	5.582	346.2
32.0	0.3790	714.0	0.605	109.1	178.2	13.62	3.151	5.537	356.4
34.0	0.4032	759.0	0.564	115.7	189.3	13.96	3.150	5.498	366.4
36.0	0.4273	804.0	0.529	122.3	200.2	14.27	3.149	5.466	376.1
38.0	0.4512	849.0	0.498	128.8	211.1	14.57	3.148	5.438	385.5
40.0	0.4750	894.0	0.471	135.3	222.0	14.85	3.147	5.414	394.6
45.0	0.5342	1006.0	0.414	151.5	248.9	15.48	3.145	5.367	416.5
50.0	0.5928	1116.0	0.370	167.6	275.7	16.04	3.142	5.333	437.2
55.0	0.6511	1220.0	0.334	183.5	302.3	16.55	3.140	5.307	456.8
60.0	0.7092	1320.0	0.305	199.4	328.8	17.01	3.138	5.288	475.6
65.0	0.7670	1416.0	0.281	215.3	355.2	17.43	3.136	5.273	493.6
70.0	0.8247	1540.0	0.260	231.1	381.5	17.82	3.135	5.260	510.9
75.0	0.8822	1640.0	0.242	246.9	407.8	18.19	3.134	5.251	527.6
80.0	0.9397	1746.0	0.227	262.6	434.0	18.53	3.133	5.243	543.8
90.0	1.054	1950.0	0.201	294.1	486.4	19.14	3.131	5.231	574.8
100.0	1.169	2160.0	0.181	325.5	538.6	19.69	3.129	5.222	604.1
125.0	1.454	2670.0	0.144	403.8	669.0	20.86	3.126	5.210	671.8
150.0	1.733	3190.0	0.120	481.9	799.1	21.81	3.124	5.203	733.2
175.0	2.024	3700.0	0.103	560.0	929.2	22.61	3.123	5.199	789.9
200.0	2.333	4210.0	0.0899	638.1	1059.0	23.30	3.122	5.197	842.7
225.0	2.653	4720.0	0.0799	716.1	1189.0	23.91	3.122	5.196	892.4
250.0	2.978	5230.0	0.0719	794.1	1319.0	24.46	3.121	5.195	939.5
275.0	3.302	5750.0	0.0654	872.1	1449.0	24.96	3.121	5.194	984.3
300.0	3.447	6260.0	0.0599	950.0	1579.0	25.41	3.120	5.194	1027.0
350.0	4.315	7280.0	0.0514	1106.0	1838.0	26.21	3.120	5.193	1108.0
400.0	4.594	8300.0	0.0450	1262.0	2098.0	26.90	3.119	5.193	1183.0
450.0	5.153	9330.0	0.0400	1418.0	2358.0	27.51	3.119	5.193	1254.0
500.0	5.722	10360.0	0.0360	1574.0	2617.0	28.06	3.119	5.192	1321.0
600.0	6.860	12400.0	0.0300	1885.0	3136.0	29.01	3.118	5.192	1446.0
700.0	7.998	14400.0	0.0257	2197.0	3656.0	29.81	3.118	5.192	1561.0
800.0	9.136	16500.0	0.0225	2509.0	4175.0	30.50	3.118	5.192	1668.0
900.0	10.27	18500.0	0.0200	2820.0	4694.0	31.11	3.118	5.192	1769.0
1000.0	11.41	20600.0	0.0180	3132.0	5213.0	31.66	3.118	5.192	1864.0
1100.0	12.55	22600.0	0.0164	3443.0	5733.0	32.16	3.118	5.192	1954.0
1200.0	13.69	24700.0	0.0150	3755.0	6252.0	32.61	3.118	5.192	2041.0
1300.0	14.83	26700.0	0.0138	4067.0	6771.0	33.02	3.118	5.193	2124.0
1400.0	15.97	28800.0	0.0129	4378.0	7290.0	33.41	3.117	5.193	2204.0
1500.0	17.10	30800.0	0.0120	4690.0	7810.0	33.77	3.117	5.193	2281.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

18.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 10C	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
2.0	16.96	356.0	3.15	189.0	0.00605	0.143	73.5	0.000392	1.06401	1.16
2.5	16.90	122.6	9.54	191.6	0.0112	0.203	75.1	0.000877	1.06375	0.567
3.0	16.77	91.8	12.7	182.0	0.0190	0.225	71.9	0.001768	1.06328	0.559
3.5	16.59	76.6	15.2	168.0	0.0269	0.242	67.5	0.002708	1.06256	0.575
4.0	16.33	69.7	16.5	153.6	0.0343	0.259	62.9	0.003662	1.06160	0.582
4.5	16.03	67.5	16.6	137.0	0.0411	0.274	58.7	0.004616	1.06041	0.595
5.0	15.65	67.4	15.9	121.0	0.0474	0.288	54.9	0.005575	1.05900	0.610
5.1	15.58	67.5	15.7	118.0	0.0485	0.290	54.2	0.005768	1.05870	0.612
5.2	15.50	67.3	15.7	116.0	0.0495	0.292	53.5	0.005566	1.05838	0.610
5.3	15.42	66.3	15.8	113.0	0.0507	0.295	52.9	0.005569	1.05808	0.603
5.4	15.34	65.8	15.8	110.0	0.0518	0.297	52.3	0.005568	1.05778	0.600
5.5	15.26	65.3	15.8	107.0	0.0530	0.299	51.7	0.005566	1.05747	0.598
5.6	15.18	64.3	15.8	105.0	0.0542	0.301	51.2	0.005565	1.05716	0.597
5.7	15.10	64.5	15.7	102.0	0.0554	0.303	50.6	0.005562	1.05684	0.596
5.8	15.01	64.1	15.7	99.2	0.0566	0.305	50.1	0.005560	1.05652	0.596
5.9	14.93	63.8	15.6	96.5	0.0578	0.307	49.6	0.005557	1.05619	0.597
6.0	14.84	63.5	15.5	93.9	0.0590	0.308	49.1	0.005554	1.05586	0.597
6.5	14.38	62.1	15.0	81.4	0.0656	0.315	46.9	0.005537	1.05412	0.607
7.0	13.89	60.9	14.4	70.0	0.0728	0.320	45.0	0.005518	1.05224	0.625
7.5	13.37	59.9	13.8	59.8	0.0806	0.322	43.4	0.005499	1.05024	0.651
8.0	12.81	58.8	13.2	50.9	0.0890	0.322	42.0	0.005481	1.04811	0.682
8.5	12.22	58.0	12.6	43.4	0.0974	0.321	40.8	0.005465	1.04586	0.719
9.0	11.61	57.5	12.0	37.2	0.105	0.319	39.8	0.005454	1.04353	0.756
9.5	10.99	57.3	11.5	32.4	0.112	0.316	39.0	0.005448	1.04116	0.793
10.0	10.36	57.6	11.0	28.7	0.116	0.313	38.4	0.005450	1.03880	0.824
11.0	9.178	59.8	10.2	24.1	0.116	0.316	37.6	0.005481	1.03433	0.853
12.0	8.186	63.5	9.59	22.1	0.108	0.302	37.5	0.005539	1.03059	0.850
13.0	7.385	67.9	9.13	21.0	0.0982	0.301	37.7	0.005612	1.02757	0.835
14.0	6.732	72.6	8.80	20.2	0.0900	0.303	38.2	0.005688	1.02511	0.824
15.0	6.184	77.3	8.56	19.7	0.0832	0.305	38.8	0.005767	1.02305	0.817
16.0	5.709	82.6	8.37	19.3	0.0767	0.309	39.4	0.005853	1.02127	0.810
17.0	5.303	88.1	8.21	19.1	0.0709	0.313	40.2	0.005944	1.01975	0.802
18.0	4.953	93.6	8.08	19.0	0.0658	0.317	40.9	0.00604	1.01844	0.795
19.0	4.648	99.2	7.96	18.9	0.0613	0.322	41.7	0.00614	1.01730	0.788
20.0	4.381	105.0	7.87	18.9	0.0573	0.327	42.5	0.00624	1.01630	0.782
21.0	4.145	111.0	7.78	18.9	0.0538	0.332	43.4	0.00635	1.01541	0.776
22.0	3.934	116.0	7.71	18.8	0.0506	0.338	44.2	0.00646	1.01463	0.770
23.0	3.745	122.0	7.64	18.8	0.0478	0.343	45.1	0.00657	1.01392	0.766
24.0	3.575	128.0	7.58	18.8	0.0453	0.349	45.9	0.00669	1.01329	0.761
25.0	3.420	133.0	7.53	18.8	0.0431	0.355	46.8	0.00681	1.01271	0.757
26.0	3.279	139.0	7.48	18.8	0.0411	0.360	47.6	0.00693	1.01218	0.754
28.0	3.031	150.0	7.40	18.8	0.0375	0.372	49.3	0.00718	1.01126	0.748
30.0	2.821	161.0	7.33	18.8	0.0346	0.383	51.0	0.00744	1.01047	0.743
32.0	2.639	172.0	7.27	18.8	0.0321	0.395	52.7	0.00770	1.00980	0.738
34.0	2.480	184.0	7.22	18.8	0.0300	0.407	54.3	0.00798	1.00921	0.735
36.0	2.340	195.0	7.18	18.8	0.0281	0.418	56.0	0.00827	1.00869	0.732
38.0	2.216	206.0	7.14	18.8	0.0265	0.430	57.6	0.00857	1.00822	0.729
40.0	2.105	216.0	7.10	18.8	0.0250	0.441	59.2	0.00887	1.00781	0.726
45.0	1.872	244.0	7.03	18.8	0.0220	0.470	63.1	0.00967	1.00694	0.721
50.0	1.687	270.0	6.98	18.7	0.0197	0.497	66.8	0.01053	1.00626	0.717
55.0	1.536	297.0	6.93	18.7	0.0179	0.525	70.5	0.01144	1.00570	0.713
60.0	1.410	324.0	6.90	18.7	0.0163	0.552	74.1	0.01240	1.00523	0.710
65.0	1.304	350.0	6.87	18.6	0.0151	0.578	77.5	0.01342	1.00483	0.707
70.0	1.213	377.0	6.84	18.6	0.0140	0.605	80.9	0.01448	1.00450	0.704
75.0	1.134	403.0	6.82	18.6	0.0130	0.631	84.2	0.01561	1.00420	0.701
80.0	1.064	429.0	6.80	18.6	0.0122	0.656	87.5	0.01680	1.00394	0.699
90.0	0.9485	482.0	6.77	18.5	0.0109	0.706	93.8	0.01942	1.00351	0.695
100.0	0.8556	534.0	6.75	18.5	0.00978	0.755	100.0	0.02229	1.00317	0.691
125.0	0.6877	664.0	6.71	18.4	0.00784	0.873	113.0	0.03044	1.00255	0.673
150.0	0.5750	794.0	6.68	18.3	0.00655	0.985	127.0	0.03929	1.00213	0.669
175.0	0.4941	924.0	6.66	18.3	0.00563	1.09	140.0	0.04875	1.00183	0.667
200.0	0.4332	1050.0	6.65	18.2	0.00493	1.19	153.0	0.05880	1.00160	0.666
225.0	0.3856	1180.0	6.64	18.2	0.00439	1.29	165.0	0.06943	1.00143	0.665
250.0	0.3475	1310.0	6.63	18.2	0.00395	1.38	177.0	0.08066	1.00129	0.665
275.0	0.3162	1440.0	6.63	18.2	0.00360	1.47	189.0	0.09245	1.00117	0.666
300.0	0.2901	1570.0	6.62	18.2	0.00330	1.56	200.0	0.10300	1.00107	0.667
350.0	0.2490	1830.0	6.61	18.1	0.00283	1.73	222.0	0.13400	1.00092	0.667
400.0	0.2181	2090.0	6.61	18.1	0.00248	1.89	243.0	0.16700	1.00081	0.667
450.0	0.1941	2350.0	6.60	18.1	0.00221	2.06	264.0	0.20400	1.00072	0.667
500.0	0.1748	2610.0	6.60	18.1	0.00199	2.21	284.0	0.24400	1.00065	0.667
600.0	0.1458	3130.0	6.59	18.1	0.00166	2.51	322.0	0.33200	1.00054	0.667
700.0	0.1250	3650.0	6.59	18.1	0.00142	2.80	359.0	0.43100	1.00046	0.666
800.0	0.1095	4170.0	6.59	18.0	0.00125	3.07	395.0	0.54100	1.00041	0.666
900.0	0.09733	4690.0	6.59	18.0	0.00111	3.34	429.0	0.66100	1.00036	0.666
1000.0	0.08762	5210.0	6.58	18.0	0.00100	3.60	462.0	0.79100	1.00032	0.666
1100.0	0.07968	5730.0	6.58	18.0	0.000907	3.85	494.0	0.93100	1.00029	0.666
1200.0	0.07305	6240.0	6.58	18.0	0.000832	4.10	525.0	1.08	1.00027	0.666
1300.0	0.06744	6760.0	6.58	18.0	0.000768	4.34	556.0	1.24	1.00025	0.666
1400.0	0.06263	7280.0	6.58	18.0	0.000713	4.57	586.0	1.41	1.00023	0.666
1500.0	0.05847	7800.0	6.58	18.0	0.000666	4.80	616.0	1.58	1.00022	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

20.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
2.0	0.05334	1160.0	1.45	3.269	15.09	1.302	1.953	1.966	344.1
2.5	0.05858	1190.0	2.15	3.857	15.73	1.605	1.297	1.331	351.3
3.0	0.05898	1150.0	3.47	4.436	16.39	1.868	1.596	1.707	352.5
3.5	0.05960	1080.0	4.57	5.153	17.23	2.142	1.768	2.012	353.0
4.0	0.06046	1000.0	5.33	6.006	18.26	2.422	1.917	2.336	352.2
4.5	0.06155	924.0	5.74	7.026	19.50	2.714	2.092	2.708	348.2
5.0	0.06288	845.0	5.88	8.254	21.00	3.020	2.291	3.111	340.8
5.1	0.06318	830.0	5.88	8.529	21.33	3.083	2.330	3.190	339.4
5.2	0.06348	819.0	5.89	8.816	21.68	3.147	2.347	3.246	338.7
5.3	0.06378	804.0	5.88	9.082	22.01	3.209	2.327	3.265	338.2
5.4	0.06408	790.0	5.87	9.349	22.33	3.270	2.332	3.311	337.0
5.5	0.06439	775.0	5.85	9.620	22.67	3.331	2.339	3.359	335.8
5.6	0.06470	761.0	5.83	9.893	23.01	3.392	2.347	3.409	334.5
5.7	0.06503	746.0	5.81	10.17	23.35	3.453	2.357	3.461	333.2
5.8	0.06536	732.0	5.78	10.45	23.70	3.514	2.367	3.514	331.8
5.9	0.06571	718.0	5.76	10.73	24.05	3.574	2.378	3.569	330.4
6.0	0.06606	704.0	5.73	11.02	24.41	3.635	2.390	3.626	328.9
6.5	0.06795	636.0	5.54	12.51	26.28	3.938	2.457	3.925	321.0
7.0	0.07010	574.0	5.32	14.11	28.32	4.242	2.528	4.250	312.6
7.5	0.07254	516.0	5.07	15.82	30.52	4.549	2.599	4.594	304.0
8.0	0.07531	464.0	4.80	17.64	32.90	4.859	2.667	4.954	295.5
8.5	0.07847	418.0	4.52	19.58	35.48	5.174	2.730	5.321	287.5
9.0	0.08205	380.0	4.23	21.62	38.25	5.494	2.789	5.685	280.1
9.5	0.08608	349.0	3.95	23.76	41.21	5.816	2.843	6.028	273.7
10.0	0.09057	325.0	3.67	25.99	44.34	6.141	2.891	6.330	268.4
11.0	0.1009	298.0	3.12	30.72	51.17	6.798	2.971	6.687	260.8
12.0	0.1123	296.0	2.68	35.37	58.12	7.409	3.018	6.734	258.5
13.0	0.1239	305.0	2.33	39.80	64.91	7.956	3.048	6.632	259.4
14.0	0.1355	320.0	2.05	43.98	71.45	8.443	3.068	6.510	262.1
15.0	0.1471	335.0	1.84	47.95	77.76	8.880	3.083	6.420	265.7
16.0	0.1591	354.0	1.67	51.91	84.14	9.292	3.101	6.342	270.7
17.0	0.1710	374.0	1.53	55.79	90.44	9.674	3.115	6.263	276.1
18.0	0.1829	396.0	1.41	59.59	96.67	10.03	3.126	6.185	281.8
19.0	0.1948	419.0	1.31	63.34	102.8	10.36	3.134	6.112	287.6
20.0	0.2066	442.0	1.22	67.02	108.9	10.67	3.140	6.044	293.4
21.0	0.2184	465.0	1.14	70.65	114.9	10.97	3.144	5.981	299.3
22.0	0.2300	488.0	1.07	74.24	120.9	11.24	3.148	5.924	305.1
23.0	0.2416	512.0	1.01	77.79	126.8	11.51	3.150	5.871	310.9
24.0	0.2531	536.0	0.958	81.31	132.6	11.75	3.152	5.823	316.6
25.0	0.2645	559.0	0.910	84.80	138.4	11.99	3.153	5.780	322.3
26.0	0.2759	583.0	0.867	88.26	144.2	12.22	3.154	5.740	327.8
28.0	0.2984	630.0	0.792	95.10	155.6	12.64	3.155	5.672	338.7
30.0	0.3207	676.0	0.729	101.9	166.9	13.03	3.155	5.614	349.2
32.0	0.3428	722.0	0.676	108.6	178.0	13.39	3.154	5.566	359.4
34.0	0.3647	768.0	0.631	115.2	189.1	13.73	3.153	5.525	369.2
36.0	0.3865	813.0	0.591	121.8	200.1	14.04	3.152	5.490	378.8
38.0	0.4081	858.0	0.556	128.4	211.1	14.34	3.151	5.461	388.2
40.0	0.4296	903.0	0.525	134.9	222.0	14.62	3.150	5.435	397.3
45.0	0.4830	1010.0	0.462	151.1	249.0	15.25	3.147	5.384	419.0
50.0	0.5359	1120.0	0.412	167.2	275.8	15.82	3.145	5.347	439.6
55.0	0.5885	1230.0	0.372	183.2	302.5	16.33	3.143	5.319	459.1
60.0	0.6408	1340.0	0.340	199.2	329.0	16.79	3.140	5.298	477.8
65.0	0.6930	1440.0	0.312	215.1	355.5	17.21	3.139	5.281	495.7
70.0	0.7449	1550.0	0.289	230.9	381.9	17.60	3.137	5.268	513.0
75.0	0.7968	1650.0	0.269	246.7	408.2	17.97	3.136	5.257	529.6
80.0	0.8485	1760.0	0.252	262.5	434.4	18.31	3.134	5.248	545.8
90.0	0.9518	1960.0	0.224	294.0	486.8	18.92	3.132	5.235	576.6
100.0	1.055	2170.0	0.201	325.4	539.1	19.47	3.130	5.225	605.9
125.0	1.312	2690.0	0.160	403.7	669.6	20.64	3.127	5.211	673.4
150.0	1.568	3200.0	0.133	481.9	799.8	21.59	3.125	5.204	734.6
175.0	1.825	3710.0	0.114	560.1	929.8	22.39	3.124	5.200	791.1
200.0	2.081	4220.0	0.100	638.1	1060.0	23.08	3.123	5.198	843.9
225.0	2.337	4740.0	0.0888	716.1	1190.0	23.70	3.122	5.196	893.5
250.0	2.593	5250.0	0.0799	794.1	1320.0	24.24	3.122	5.195	940.5
275.0	2.849	5760.0	0.0727	872.1	1449.0	24.74	3.121	5.194	985.3
300.0	3.105	6270.0	0.0666	950.1	1579.0	25.19	3.121	5.194	1028.0
350.0	3.617	7290.0	0.0571	1106.0	1839.0	25.99	3.120	5.193	1109.0
400.0	4.129	8320.0	0.0499	1262.0	2099.0	26.68	3.120	5.193	1184.0
450.0	4.641	9340.0	0.0444	1418.0	2358.0	27.30	3.119	5.192	1255.0
500.0	5.153	10400.0	0.0400	1574.0	2618.0	27.84	3.119	5.192	1322.8
600.0	6.177	12400.0	0.0333	1885.0	3137.0	28.79	3.119	5.192	1447.0
700.0	7.201	14500.0	0.0285	2197.0	3656.0	29.59	3.118	5.192	1561.0
800.0	8.225	16500.0	0.0250	2509.0	4175.0	30.28	3.118	5.192	1668.0
900.0	9.249	18500.0	0.0222	2820.0	4695.0	30.89	3.118	5.192	1769.0
1000.0	10.27	20600.0	0.0200	3132.0	5214.0	31.44	3.118	5.192	1864.0
1100.0	11.30	22600.0	0.0182	3444.0	5733.0	31.94	3.118	5.192	1954.0
1200.0	12.32	24700.0	0.0167	3755.0	6252.0	32.39	3.118	5.192	2041.0
1300.0	13.35	26700.0	0.0154	4067.0	6772.0	32.80	3.118	5.192	2124.0
1400.0	14.37	28800.0	0.0143	4379.0	7291.0	33.19	3.118	5.192	2204.0
1500.0	15.40	30800.0	0.0133	4690.0	7810.0	33.55	3.118	5.193	2281.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

20.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
2.0	17.14	269.0	4.34	199.0	0.00730	0.145	78.3	0.000429	1.06469	1.06
2.5	17.07	125.0	9.71	203.0	0.0106	0.206	79.6	0.000907	1.06443	0.514
3.0	16.96	95.8	12.8	194.0	0.0178	0.229	75.9	0.000791	1.06398	0.566
3.5	16.78	79.8	15.4	181.0	0.0252	0.246	71.0	0.000730	1.06330	0.580
4.0	16.54	72.8	16.8	166.0	0.0321	0.263	66.1	0.000682	1.06239	0.586
4.5	16.25	70.8	16.9	150.0	0.0382	0.279	61.5	0.000635	1.06126	0.596
5.0	15.90	71.1	16.1	134.0	0.0438	0.294	57.5	0.000594	1.05994	0.609
5.1	15.83	71.2	16.0	131.0	0.0448	0.296	56.7	0.000587	1.05965	0.611
5.2	15.75	71.1	15.9	129.0	0.0456	0.299	56.0	0.000584	1.05936	0.609
5.3	15.68	70.1	16.1	126.0	0.0466	0.301	55.4	0.000588	1.05908	0.600
5.4	15.61	69.5	16.1	123.0	0.0476	0.304	54.7	0.000587	1.05880	0.597
5.5	15.53	69.1	16.1	120.0	0.0486	0.306	54.1	0.000586	1.05851	0.594
5.6	15.45	68.7	16.1	118.0	0.0496	0.308	53.5	0.000585	1.05822	0.593
5.7	15.38	68.4	16.0	115.0	0.0506	0.310	53.0	0.000583	1.05792	0.591
5.8	15.30	68.0	16.0	112.0	0.0516	0.312	52.4	0.000581	1.05762	0.590
5.9	15.22	67.8	15.9	109.0	0.0527	0.314	51.9	0.000578	1.05732	0.590
6.0	15.14	67.5	15.8	107.0	0.0537	0.316	51.4	0.000576	1.05701	0.590
6.5	14.72	66.3	15.3	93.7	0.0592	0.324	49.1	0.000561	1.05539	0.595
7.0	14.27	65.3	14.8	81.8	0.0651	0.329	47.1	0.000543	1.05367	0.608
7.5	13.79	64.4	14.2	71.1	0.0713	0.333	45.4	0.000525	1.05183	0.627
8.0	13.28	63.5	13.6	61.6	0.0780	0.334	44.0	0.000508	1.04989	0.652
8.5	12.74	62.8	13.0	53.3	0.0848	0.334	42.7	0.000493	1.04786	0.681
9.0	12.19	62.2	12.5	46.3	0.0914	0.333	41.7	0.000480	1.04574	0.713
9.5	11.62	61.9	11.9	40.5	0.0974	0.330	40.8	0.000472	1.04357	0.745
10.0	11.04	61.9	11.5	35.9	0.102	0.328	40.1	0.000469	1.04138	0.776
11.0	9.907	63.3	10.6	29.6	0.106	0.321	39.2	0.000485	1.03709	0.816
12.0	8.907	66.2	10.0	26.3	0.102	0.316	38.8	0.000527	1.03331	0.827
13.0	8.071	70.2	9.46	24.6	0.0944	0.314	38.9	0.000587	1.03015	0.821
14.0	7.379	74.7	9.08	23.6	0.0871	0.315	39.3	0.000655	1.02754	0.812
15.0	6.797	79.3	8.79	22.7	0.0810	0.317	39.8	0.000725	1.02536	0.807
16.0	6.297	84.4	8.57	22.2	0.0752	0.319	40.4	0.000800	1.02344	0.803
17.0	5.847	89.5	8.40	21.9	0.0699	0.322	41.0	0.000880	1.02179	0.798
18.0	5.466	95.0	8.25	21.6	0.0651	0.326	41.8	0.000964	1.02036	0.792
19.0	5.133	101.0	8.12	21.5	0.0608	0.330	42.5	0.00105	1.01911	0.787
20.0	4.840	106.0	8.01	21.4	0.0570	0.335	43.3	0.00115	1.01801	0.781
21.0	4.579	112.0	7.92	21.3	0.0536	0.340	44.1	0.00124	1.01704	0.776
22.0	4.347	117.0	7.83	21.2	0.0505	0.345	44.9	0.00134	1.01617	0.771
23.0	4.139	123.0	7.76	21.2	0.0478	0.350	45.7	0.00144	1.01539	0.767
24.0	3.951	129.0	7.70	21.2	0.0453	0.355	46.6	0.00154	1.01469	0.763
25.0	3.780	134.0	7.64	21.1	0.0431	0.361	47.4	0.00165	1.01405	0.759
26.0	3.625	140.0	7.58	21.1	0.0410	0.366	48.2	0.00176	1.01347	0.756
28.0	3.351	151.0	7.49	21.1	0.0375	0.378	49.9	0.00199	1.01245	0.750
30.0	3.118	162.0	7.41	21.1	0.0346	0.389	51.6	0.00222	1.01158	0.744
32.0	2.917	173.0	7.35	21.1	0.0321	0.400	53.2	0.00246	1.01084	0.740
34.0	2.742	185.0	7.29	21.1	0.0299	0.411	54.8	0.00272	1.01018	0.736
36.0	2.588	196.0	7.24	21.0	0.0281	0.423	56.4	0.00298	1.00961	0.733
38.0	2.450	207.0	7.20	21.0	0.0264	0.434	58.0	0.00324	1.00910	0.730
40.0	2.328	218.0	7.16	21.0	0.0250	0.445	59.6	0.00352	1.00864	0.727
45.0	2.070	245.0	7.08	21.0	0.0220	0.473	63.5	0.00425	1.00768	0.722
50.0	1.856	272.0	7.02	20.9	0.0197	0.501	67.2	0.00502	1.00692	0.717
55.0	1.679	298.0	6.97	20.9	0.0178	0.524	70.9	0.00584	1.00630	0.714
60.0	1.550	325.0	6.93	20.8	0.0163	0.555	74.4	0.00671	1.00579	0.710
65.0	1.443	352.0	6.90	20.8	0.0150	0.581	77.9	0.00763	1.00535	0.707
70.0	1.342	378.0	6.87	20.8	0.0139	0.608	81.2	0.00859	1.00498	0.704
75.0	1.255	404.0	6.85	20.7	0.0130	0.633	84.5	0.00960	1.00465	0.702
80.0	1.179	431.0	6.83	20.7	0.0122	0.659	87.8	0.0107	1.00437	0.699
90.0	1.051	483.0	6.79	20.6	0.0108	0.709	94.1	0.0129	1.00389	0.695
100.0	0.9480	535.0	6.77	20.6	0.00976	0.758	100.0	0.0153	1.00351	0.691
125.0	0.7623	666.0	6.72	20.5	0.00783	0.875	113.0	0.0220	1.00282	0.673
150.0	0.6376	796.0	6.69	20.4	0.00654	0.986	127.0	0.0297	1.00236	0.669
175.0	0.5481	926.0	6.67	20.3	0.00562	1.09	140.0	0.0383	1.00203	0.667
200.0	0.4806	1066.0	6.66	20.3	0.00492	1.19	153.0	0.0478	1.00178	0.665
225.0	0.4279	1190.0	6.65	20.3	0.00438	1.29	165.0	0.0580	1.00158	0.665
250.0	0.3857	1320.0	6.64	20.2	0.00395	1.38	177.0	0.0690	1.00143	0.665
275.0	0.3510	1450.0	6.63	20.2	0.00359	1.47	189.0	0.0807	1.00130	0.666
300.0	0.3221	1570.0	6.63	20.2	0.00330	1.56	200.0	0.0931	1.00119	0.667
350.0	0.2765	1830.0	6.62	20.2	0.00283	1.73	222.0	0.120	1.00102	0.667
400.0	0.2422	2090.0	6.61	20.1	0.00248	1.90	243.0	0.151	1.00090	0.667
450.0	0.2155	2350.0	6.61	20.1	0.00221	2.06	264.0	0.184	1.00080	0.667
500.0	0.1941	2610.0	6.60	20.1	0.00199	2.21	284.0	0.220	1.00072	0.667
600.0	0.1619	3130.0	6.60	20.1	0.00166	2.51	322.0	0.299	1.00060	0.666
700.0	0.1389	3650.0	6.59	20.1	0.00142	2.80	359.0	0.388	1.00051	0.666
800.0	0.1216	4170.0	6.59	20.1	0.00125	3.08	395.0	0.487	1.00045	0.666
900.0	0.1081	4690.0	6.59	20.1	0.00111	3.34	429.0	0.595	1.00040	0.666
1000.0	0.09734	5210.0	6.59	20.0	0.00100	3.60	462.0	0.712	1.00036	0.666
1100.0	0.08851	5730.0	6.58	20.0	0.000907	3.85	494.0	0.838	1.00033	0.666
1200.0	0.08115	6250.0	6.58	20.0	0.000831	4.10	525.0	0.972	1.00030	0.666
1300.0	0.07492	6770.0	6.58	20.0	0.000768	4.34	556.0	1.11	1.00028	0.666
1400.0	0.06958	7280.0	6.58	20.0	0.000713	4.57	586.0	1.27	1.00026	0.666
1500.0	0.06495	7800.0	6.58	20.0	0.000665	4.80	616.0	1.42	1.00024	0.666

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

25.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
2.0	0.05696	1260.0	2.50	3.559	17.99	1.289	1.587	1.619	360.2
2.5	0.05721	1310.0	2.25	4.051	18.54	1.559	1.226	1.258	369.7
3.0	0.05756	1290.0	3.50	4.575	19.16	1.807	1.521	1.617	372.8
3.5	0.05809	1230.0	4.68	5.227	19.94	2.065	1.690	1.902	375.1
4.0	0.05882	1160.0	5.51	6.007	20.91	2.330	1.847	2.212	375.9
4.5	0.05973	1090.0	5.98	6.949	22.08	2.605	2.034	2.568	373.1
5.0	0.06083	1010.0	6.16	8.093	23.50	2.895	2.243	2.948	366.9
5.1	0.06107	1000.0	6.18	8.350	23.82	2.955	2.283	3.021	365.6
5.2	0.06132	986.0	6.19	8.619	24.15	3.015	2.302	3.073	365.2
5.3	0.06156	972.0	6.19	8.866	24.46	3.073	2.283	3.087	364.9
5.4	0.06181	958.0	6.19	9.115	24.77	3.131	2.290	3.127	364.0
5.5	0.06206	943.0	6.18	9.365	25.09	3.189	2.299	3.169	363.0
5.6	0.06231	929.0	6.17	9.619	25.40	3.246	2.308	3.212	361.9
5.7	0.06257	915.0	6.16	9.875	25.73	3.304	2.319	3.257	360.8
5.8	0.06284	901.0	6.15	10.13	26.05	3.361	2.330	3.303	359.6
5.9	0.06311	887.0	6.13	10.40	26.38	3.418	2.342	3.351	358.4
6.0	0.06339	873.0	6.11	10.66	26.72	3.475	2.355	3.399	357.2
6.5	0.06488	805.0	5.97	12.04	28.47	3.757	2.425	3.653	350.4
7.0	0.06652	740.0	5.79	13.50	30.35	4.039	2.498	3.921	343.1
7.5	0.06835	680.0	5.59	15.05	32.37	4.320	2.570	4.200	335.6
8.0	0.07038	625.0	5.36	16.70	34.53	4.602	2.637	4.485	328.1
8.5	0.07264	574.0	5.12	18.44	36.84	4.885	2.700	4.775	320.8
9.0	0.07513	529.0	4.87	20.26	39.30	5.170	2.757	5.065	313.8
9.5	0.07789	490.0	4.62	22.18	41.91	5.455	2.809	5.350	307.4
10.0	0.08092	456.0	4.36	24.17	44.66	5.741	2.856	5.623	301.6
11.0	0.08795	405.0	3.84	28.52	50.80	6.332	2.939	6.074	291.1
12.0	0.09591	379.0	3.36	32.97	57.27	6.901	2.992	6.329	284.9
13.0	0.1045	372.0	2.96	37.37	63.83	7.431	3.027	6.405	282.3
14.0	0.1132	376.0	2.62	41.62	70.30	7.915	3.052	6.379	282.3
15.0	0.1221	386.0	2.35	45.69	76.62	8.353	3.070	6.323	283.8
16.0	0.1312	400.0	2.14	49.68	82.93	8.760	3.091	6.291	287.1
17.0	0.1405	416.0	1.96	53.60	89.20	9.148	3.107	6.247	291.1
18.0	0.1498	434.0	1.81	57.46	95.42	9.496	3.120	6.197	295.5
19.0	0.1592	454.0	1.67	61.27	101.6	9.829	3.130	6.143	300.3
20.0	0.1685	474.0	1.56	65.02	107.7	10.14	3.138	6.090	305.3
21.0	0.1779	496.0	1.46	68.72	113.8	10.44	3.144	6.037	310.5
22.0	0.1872	518.0	1.37	72.37	119.8	10.72	3.149	5.987	315.7
23.0	0.1964	540.0	1.29	75.99	125.7	10.98	3.153	5.939	321.0
24.0	0.2056	562.0	1.22	79.57	131.7	11.24	3.155	5.894	326.3
25.0	0.2148	585.0	1.16	83.12	137.5	11.48	3.157	5.852	331.5
26.0	0.2240	608.0	1.11	86.63	143.4	11.70	3.159	5.812	336.7
28.0	0.2421	654.0	1.01	93.59	154.9	12.13	3.161	5.742	347.0
30.0	0.2601	700.0	0.927	100.5	166.3	12.53	3.161	5.681	357.1
32.0	0.2779	746.0	0.858	107.3	177.6	12.89	3.161	5.629	367.0
34.0	0.2956	792.0	0.799	114.0	188.9	13.23	3.160	5.584	376.6
36.0	0.3131	838.0	0.747	120.7	200.0	13.55	3.159	5.545	385.9
38.0	0.3306	883.0	0.703	127.3	211.0	13.85	3.158	5.512	395.0
40.0	0.3479	928.0	0.663	133.9	222.0	14.13	3.157	5.482	403.9
45.0	0.3909	1040.0	0.581	150.3	249.3	14.77	3.154	5.423	425.3
50.0	0.4335	1150.0	0.518	166.5	276.3	15.34	3.151	5.380	445.6
55.0	0.4758	1260.0	0.468	182.6	303.1	15.85	3.149	5.347	464.9
60.0	0.5179	1360.0	0.426	198.6	329.8	16.32	3.146	5.321	483.3
65.0	0.5597	1470.0	0.392	214.5	356.3	16.74	3.144	5.301	501.1
70.0	0.6014	1580.0	0.363	230.4	382.8	17.13	3.142	5.285	518.1
75.0	0.6430	1680.0	0.338	246.3	409.2	17.50	3.140	5.272	534.6
80.0	0.6845	1790.0	0.316	262.1	435.5	17.84	3.139	5.261	550.6
90.0	0.7673	1990.0	0.280	293.7	488.0	18.46	3.136	5.245	581.2
100.0	0.8498	2200.0	0.251	325.2	540.4	19.01	3.134	5.233	610.2
125.0	1.056	2720.0	0.200	403.6	671.0	20.17	3.130	5.216	677.2
150.0	1.261	3230.0	0.167	481.9	801.3	21.12	3.128	5.207	738.1
175.0	1.466	3740.0	0.143	560.1	931.4	21.93	3.126	5.202	794.3
200.0	1.671	4250.0	0.125	638.2	1061.0	22.62	3.125	5.199	846.8
225.0	1.876	4770.0	0.111	716.2	1191.0	23.23	3.124	5.197	896.2
250.0	2.080	5280.0	0.100	794.3	1321.0	23.78	3.123	5.195	943.1
275.0	2.285	5790.0	0.0908	872.3	1451.0	24.28	3.122	5.194	987.7
300.0	2.490	6300.0	0.0832	950.3	1581.0	24.73	3.122	5.194	1030.0
350.0	2.899	7320.0	0.0713	1106.0	1841.0	25.53	3.121	5.193	1111.0
400.0	3.309	8340.0	0.0624	1262.0	2100.0	26.22	3.121	5.193	1186.0
450.0	3.718	9370.0	0.0555	1418.0	2360.0	26.83	3.120	5.192	1257.0
500.0	4.128	10400.0	0.0499	1574.0	2619.0	27.38	3.120	5.192	1323.0
600.0	4.947	12400.0	0.0416	1886.0	3139.0	28.33	3.119	5.192	1448.0
700.0	5.766	14500.0	0.0357	2197.0	3658.0	29.13	3.119	5.192	1563.0
800.0	6.585	16500.0	0.0312	2509.0	4177.0	29.82	3.119	5.192	1669.0
900.0	7.404	18600.0	0.0278	2821.0	4696.0	30.43	3.119	5.192	1770.0
1000.0	8.224	20600.0	0.0250	3132.0	5215.0	30.98	3.119	5.192	1865.0
1100.0	9.043	22700.0	0.0227	3444.0	5735.0	31.47	3.118	5.192	1955.0
1200.0	9.862	24700.0	0.0208	3756.0	6254.0	31.93	3.118	5.192	2042.0
1300.0	10.68	26800.0	0.0192	4067.0	6773.0	32.34	3.118	5.192	2125.0
1400.0	11.50	28800.0	0.0178	4379.0	7292.0	32.73	3.118	5.192	2204.0
1500.0	12.32	30900.0	0.0167	4691.0	7812.0	33.08	3.118	5.192	2281.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

25.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_p$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)$_p$/V 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
2.0	17.56	143.0	8.97	220.0	0.0113	0.147	91.2	0.000518	1.06630	1.00
2.5	17.48	128.0	10.5	230.0	0.00981	0.214	91.2	0.000971	1.06599	0.537
3.0	17.37	103.0	13.3	224.0	0.0156	0.238	86.1	0.000846	1.06559	0.586
3.5	17.21	86.4	16.1	212.0	0.0220	0.256	79.9	0.000782	1.06498	0.594
4.0	17.00	79.5	17.5	198.0	0.0278	0.274	73.9	0.000729	1.06416	0.597
4.5	16.74	78.3	17.5	182.0	0.0328	0.292	68.6	0.000678	1.06316	0.604
5.0	16.44	79.5	16.7	166.0	0.0371	0.307	63.9	0.000634	1.06200	0.613
5.1	16.37	79.8	16.5	163.0	0.0378	0.310	63.0	0.000627	1.06175	0.614
5.2	16.31	79.8	16.5	161.0	0.0385	0.313	62.2	0.000625	1.06149	0.610
5.3	16.24	78.7	16.7	158.0	0.0392	0.316	61.4	0.000630	1.06125	0.600
5.4	16.18	78.3	16.7	155.0	0.0400	0.319	60.7	0.000636	1.06100	0.596
5.5	16.11	77.9	16.7	152.0	0.0407	0.321	60.0	0.000629	1.06075	0.592
5.6	16.05	77.6	16.7	149.0	0.0414	0.324	59.3	0.000628	1.06050	0.589
5.7	15.98	77.3	16.6	146.0	0.0421	0.326	58.7	0.000627	1.06024	0.586
5.8	15.91	77.0	16.6	143.0	0.0429	0.329	58.1	0.000625	1.05998	0.583
5.9	15.84	76.8	16.5	140.0	0.0436	0.331	57.5	0.000624	1.05972	0.582
6.0	15.78	76.5	16.4	138.0	0.0444	0.333	56.9	0.000622	1.05945	0.580
6.5	15.41	75.9	16.0	124.0	0.0481	0.343	54.2	0.000609	1.05806	0.578
7.0	15.03	75.3	15.4	111.0	0.0520	0.351	52.0	0.000595	1.05660	0.582
7.5	14.63	74.8	14.9	100.0	0.0561	0.356	50.1	0.000579	1.05506	0.591
8.0	14.21	74.3	14.3	88.8	0.0604	0.360	48.5	0.000564	1.05345	0.605
8.5	13.77	73.7	13.8	79.1	0.0648	0.362	47.1	0.000550	1.05176	0.622
9.0	13.31	73.2	13.3	70.4	0.0692	0.362	46.0	0.000537	1.05002	0.643
9.5	12.84	72.9	12.8	62.9	0.0734	0.362	45.0	0.000527	1.04822	0.665
10.0	12.36	72.7	12.4	56.3	0.0774	0.360	44.2	0.000518	1.04639	0.689
11.0	11.37	72.9	11.5	46.0	0.0834	0.355	42.9	0.000515	1.04264	0.733
12.0	10.43	74.4	10.8	39.5	0.0851	0.350	42.2	0.000531	1.03905	0.762
13.0	9.574	77.1	10.2	35.6	0.0830	0.347	41.9	0.000565	1.03582	0.774
14.0	8.831	80.8	9.74	33.2	0.0789	0.345	42.0	0.000612	1.03302	0.777
15.0	8.191	84.9	9.36	31.6	0.0744	0.345	42.3	0.000665	1.03060	0.776
16.0	7.619	89.5	9.09	30.5	0.0703	0.345	42.7	0.000720	1.02845	0.778
17.0	7.117	94.4	8.86	29.6	0.0662	0.347	43.2	0.000780	1.02656	0.779
18.0	6.674	99.4	8.67	29.0	0.0623	0.349	43.8	0.000844	1.02489	0.778
19.0	6.282	105.0	8.51	28.5	0.0587	0.352	44.5	0.000912	1.02342	0.776
20.0	5.934	110.0	8.37	28.1	0.0554	0.355	45.2	0.000983	1.02211	0.774
21.0	5.623	115.0	8.26	27.9	0.0524	0.359	45.9	0.00106	1.02095	0.771
22.0	5.343	121.0	8.15	27.7	0.0496	0.363	46.6	0.00114	1.01990	0.768
23.0	5.091	126.0	8.06	27.5	0.0471	0.368	47.4	0.00122	1.01895	0.765
24.0	4.863	132.0	7.98	27.4	0.0447	0.372	48.1	0.00130	1.01810	0.762
25.0	4.655	137.0	7.90	27.2	0.0426	0.377	48.9	0.00138	1.01732	0.759
26.0	4.465	143.0	7.84	27.2	0.0407	0.382	49.7	0.00147	1.01661	0.757
28.0	4.131	154.0	7.72	27.0	0.0373	0.392	51.3	0.00165	1.01536	0.751
30.0	3.845	165.0	7.62	26.9	0.0344	0.402	52.9	0.00184	1.01430	0.747
32.0	3.599	176.0	7.54	26.9	0.0319	0.413	54.5	0.00204	1.01338	0.743
34.0	3.383	187.0	7.47	26.8	0.0298	0.424	56.0	0.00224	1.01257	0.739
36.0	3.194	198.0	7.41	26.7	0.0279	0.434	57.6	0.00245	1.01186	0.735
38.0	3.025	209.0	7.35	26.7	0.0263	0.445	59.1	0.00267	1.01124	0.732
40.0	2.874	220.0	7.31	26.7	0.0249	0.456	60.7	0.00289	1.01067	0.730
45.0	2.558	248.0	7.21	26.6	0.0219	0.483	64.5	0.00348	1.00950	0.724
50.0	2.307	275.0	7.13	26.5	0.0196	0.510	68.1	0.00411	1.00856	0.719
55.0	2.102	302.0	7.07	26.4	0.0177	0.536	71.7	0.00477	1.00780	0.715
60.0	1.931	328.0	7.02	26.3	0.0162	0.563	75.2	0.00548	1.00716	0.711
65.0	1.787	355.0	6.98	26.3	0.0149	0.589	78.6	0.00622	1.00663	0.708
70.0	1.663	382.0	6.94	26.2	0.0138	0.615	82.0	0.00700	1.00617	0.705
75.0	1.555	408.0	6.91	26.1	0.0129	0.640	85.3	0.00781	1.00577	0.702
80.0	1.461	434.0	6.89	26.1	0.0121	0.665	88.5	0.00866	1.00542	0.700
90.0	1.303	487.0	6.85	26.0	0.0108	0.715	94.7	0.0105	1.00483	0.695
100.0	1.177	539.0	6.81	25.9	0.00973	0.763	101.0	0.0124	1.00436	0.691
125.0	0.9474	670.0	6.76	25.7	0.00779	0.880	114.0	0.0178	1.00351	0.673
150.0	0.7932	800.0	6.72	25.6	0.00651	0.991	127.0	0.0240	1.00294	0.669
175.0	0.6822	930.0	6.70	25.5	0.00559	1.10	141.0	0.0309	1.00253	0.667
200.0	0.5986	1060.0	6.68	25.5	0.00490	1.20	153.0	0.0385	1.00222	0.665
225.0	0.5332	1190.0	6.66	25.4	0.00437	1.29	165.0	0.0467	1.00197	0.664
250.0	0.4807	1320.0	6.65	25.4	0.00394	1.39	177.0	0.0555	1.00178	0.664
275.0	0.4376	1450.0	6.64	25.3	0.00358	1.47	189.0	0.0649	1.00162	0.665
300.0	0.4016	1580.0	6.64	25.3	0.00329	1.56	200.0	0.0748	1.00149	0.667
350.0	0.3449	1840.0	6.63	25.3	0.00282	1.73	222.0	0.0967	1.00128	0.667
400.0	0.3022	2100.0	6.62	25.2	0.00248	1.90	244.0	0.121	1.00112	0.666
450.0	0.2689	2360.0	6.61	25.2	0.00220	2.06	264.0	0.147	1.00100	0.666
500.0	0.2423	2620.0	6.61	25.2	0.00198	2.21	284.0	0.176	1.00090	0.666
600.0	0.2022	3140.0	6.60	25.1	0.00166	2.51	323.0	0.240	1.00075	0.666
700.0	0.1734	3650.0	6.59	25.1	0.00142	2.80	359.0	0.311	1.00064	0.666
800.0	0.1519	4170.0	6.59	25.1	0.00124	3.08	395.0	0.390	1.00056	0.666
900.0	0.1351	4690.0	6.59	25.1	0.00111	3.34	429.0	0.477	1.00050	0.666
1000.0	0.1216	5210.0	6.59	25.1	0.00100	3.60	462.0	0.570	1.00045	0.666
1100.0	0.1106	5730.0	6.59	25.1	0.000906	3.85	494.0	0.671	1.00041	0.666
1200.0	0.1014	6250.0	6.58	25.1	0.000831	4.10	525.0	0.778	1.00038	0.666
1300.0	0.09362	6770.0	6.58	25.1	0.000767	4.34	556.0	0.892	1.00035	0.666
1400.0	0.08695	7290.0	6.58	25.0	0.000712	4.57	586.0	1.01	1.00032	0.666
1500.0	0.08116	7810.0	6.58	25.0	0.000665	4.80	616.0	1.14	1.00030	0.666

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

30.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
2.0	0.05572	1320.0	4.01	3.849	20.79	1.262	1.373	1.450	376.3
2.5	0.05603	1430.0	2.52	4.276	21.31	1.516	1.181	1.216	385.8
3.0	0.05635	1420.0	3.61	4.753	21.88	1.754	1.454	1.542	390.9
3.5	0.05682	1380.0	4.80	5.348	22.62	1.999	1.618	1.810	394.9
4.0	0.05745	1310.0	5.67	6.067	23.53	2.250	1.784	2.112	396.8
4.5	0.05825	1240.0	6.18	6.947	24.65	2.513	1.982	2.458	394.9
5.0	0.05919	1170.0	6.40	8.026	26.02	2.791	2.201	2.825	389.5
5.1	0.05939	1150.0	6.43	8.269	26.32	2.847	2.243	2.896	388.5
5.2	0.05961	1140.0	6.45	8.524	26.64	2.905	2.264	2.945	388.1
5.3	0.05981	1130.0	6.46	8.757	26.94	2.961	2.246	2.955	388.0
5.4	0.06002	1120.0	6.46	8.991	27.23	3.016	2.255	2.992	387.2
5.5	0.06023	1100.0	6.46	9.228	27.54	3.071	2.264	3.030	386.4
5.6	0.06044	1090.0	6.46	9.466	27.84	3.126	2.275	3.070	385.5
5.7	0.06066	1070.0	6.45	9.708	28.15	3.181	2.287	3.111	384.5
5.8	0.06088	1060.0	6.44	9.95	28.46	3.236	2.299	3.153	383.5
5.9	0.06111	1040.0	6.43	10.20	28.77	3.290	2.313	3.196	382.4
6.0	0.06134	1030.0	6.41	10.45	29.09	3.344	2.327	3.239	381.3
6.5	0.06257	963.0	6.31	11.74	30.76	3.613	2.400	3.467	375.4
7.0	0.06392	898.0	6.17	13.11	32.54	3.879	2.476	3.704	368.9
7.5	0.06539	836.0	6.00	14.56	34.43	4.144	2.549	3.946	362.1
8.0	0.06700	779.0	5.80	16.09	36.45	4.408	2.618	4.191	355.4
8.5	0.06875	725.0	5.59	17.70	38.60	4.672	2.680	4.438	348.7
9.0	0.07067	676.0	5.37	19.38	40.87	4.934	2.738	4.683	342.2
9.5	0.07275	631.0	5.14	21.15	43.26	5.197	2.789	4.925	336.1
10.0	0.07502	592.0	4.91	22.98	45.78	5.459	2.836	5.161	330.4
11.0	0.08021	525.0	4.42	27.04	51.42	6.003	2.920	5.592	319.1
12.0	0.08612	480.0	3.95	31.27	57.45	6.534	2.977	5.913	310.8
13.0	0.09261	456.0	3.53	35.54	63.69	7.038	3.015	6.100	305.7
14.0	0.09945	448.0	3.16	39.76	69.99	7.510	3.042	6.172	303.3
15.0	0.1065	449.0	2.85	43.88	76.24	7.944	3.062	6.173	302.9
16.0	0.1137	456.0	2.60	47.85	82.42	8.342	3.083	6.186	304.5
17.0	0.1212	467.0	2.38	51.77	88.61	8.717	3.101	6.177	307.1
18.0	0.1287	481.0	2.20	55.65	94.77	9.070	3.115	6.155	310.3
19.0	0.1363	497.0	2.04	59.48	100.9	9.402	3.127	6.123	314.1
20.0	0.1440	515.0	1.90	63.26	107.0	9.715	3.136	6.088	318.2
21.0	0.1516	534.0	1.78	67.00	113.1	10.01	3.144	6.049	322.6
22.0	0.1593	554.0	1.67	70.70	119.1	10.29	3.149	6.009	327.2
23.0	0.1670	574.0	1.58	74.36	125.1	10.56	3.154	5.970	331.9
24.0	0.1746	596.0	1.49	77.98	131.1	10.81	3.158	5.931	336.6
25.0	0.1822	617.0	1.42	81.57	137.0	11.05	3.160	5.894	341.5
26.0	0.1898	639.0	1.35	85.14	142.8	11.28	3.162	5.858	346.3
28.0	0.2050	684.0	1.23	92.18	154.5	11.71	3.165	5.791	355.9
30.0	0.2200	729.0	1.13	99.13	166.0	12.11	3.166	5.731	365.5
32.0	0.2349	774.0	1.04	106.0	177.4	12.48	3.167	5.678	374.9
34.0	0.2497	819.0	0.969	112.8	188.7	12.82	3.166	5.632	384.2
36.0	0.2645	864.0	0.906	119.6	199.9	13.14	3.166	5.591	393.3
38.0	0.2791	909.0	0.851	126.3	211.1	13.44	3.165	5.555	402.1
40.0	0.2936	954.0	0.803	132.9	222.2	13.73	3.164	5.523	410.8
45.0	0.3297	1070.0	0.703	149.4	249.6	14.38	3.160	5.458	431.8
50.0	0.3654	1180.0	0.626	165.7	276.8	14.95	3.157	5.410	451.7
55.0	0.4008	1280.0	0.564	181.9	303.7	15.46	3.154	5.372	470.7
60.0	0.4359	1390.0	0.514	198.0	330.5	15.93	3.152	5.343	488.9
65.0	0.4709	1500.0	0.472	214.0	357.2	16.35	3.149	5.320	506.4
70.0	0.5058	1600.0	0.437	230.0	383.7	16.75	3.147	5.301	523.3
75.0	0.5405	1710.0	0.406	245.9	410.2	17.11	3.145	5.286	539.7
80.0	0.5752	1820.0	0.380	261.8	436.6	17.45	3.143	5.274	555.5
90.0	0.6442	2020.0	0.336	293.4	489.2	18.07	3.140	5.255	585.8
100.0	0.7131	2230.0	0.302	324.9	541.7	18.63	3.138	5.241	614.6
125.0	0.8847	2750.0	0.241	403.5	672.4	19.79	3.133	5.221	681.1
150.0	1.056	3260.0	0.200	481.9	802.8	20.74	3.130	5.210	741.6
175.0	1.227	3770.0	0.171	560.1	933.0	21.55	3.128	5.204	797.5
200.0	1.397	4290.0	0.150	638.3	1063.0	22.24	3.127	5.200	849.7
225.0	1.568	4800.0	0.133	716.3	1193.0	22.85	3.125	5.197	898.9
250.0	1.739	5310.0	0.120	794.4	1323.0	23.40	3.125	5.196	945.6
275.0	1.909	5820.0	0.109	872.4	1453.0	23.90	3.124	5.195	990.1
300.0	2.080	6330.0	0.100	950.4	1583.0	24.35	3.123	5.194	1033.0
350.0	2.421	7350.0	0.0856	1106.0	1842.0	25.15	3.122	5.193	1113.0
400.0	2.762	8370.0	0.0749	1262.0	2102.0	25.84	3.122	5.192	1188.0
450.0	3.103	9390.0	0.0666	1418.0	2362.0	26.45	3.121	5.192	1258.0
500.0	3.444	10400.0	0.0599	1574.0	2621.0	27.00	3.121	5.192	1325.0
600.0	4.127	12500.0	0.0499	1886.0	3140.0	27.95	3.120	5.192	1449.0
700.0	4.809	14500.0	0.0428	2198.0	3659.0	28.75	3.120	5.192	1564.0
800.0	5.492	16500.0	0.0375	2509.0	4179.0	29.44	3.120	5.192	1670.0
900.0	6.174	18600.0	0.0333	2821.0	4698.0	30.05	3.119	5.192	1771.0
1000.0	6.857	20600.0	0.0300	3133.0	5217.0	30.60	3.119	5.192	1866.0
1100.0	7.540	22700.0	0.0272	3444.0	5736.0	31.09	3.119	5.192	1956.0
1200.0	8.222	24700.0	0.0250	3756.0	6255.0	31.55	3.119	5.192	2042.0
1300.0	8.905	26800.0	0.0231	4068.0	6775.0	31.96	3.119	5.192	2125.0
1400.0	9.588	28800.0	0.0214	4379.0	7294.0	32.35	3.119	5.192	2205.0
1500.0	10.27	30900.0	0.0200	4691.0	7813.0	32.71	3.118	5.192	2282.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

30.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_p$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
2.0	17.95	85.9	16.3	238.0	0.0169	0.150	105.0	0.000576	1.06780	1.02
2.5	17.85	123.0	11.9	255.0	0.00988	0.221	104.0	0.00102	1.06742	0.571
3.0	17.75	108.0	14.0	252.0	0.0143	0.246	96.8	0.000898	1.06703	0.667
3.5	17.60	91.3	16.9	242.0	0.0198	0.265	89.2	0.000832	1.06646	0.609
4.0	17.40	85.1	18.3	228.0	0.0248	0.284	82.0	0.000773	1.06571	0.610
4.5	17.17	84.7	18.2	213.0	0.0290	0.303	75.7	0.000717	1.06480	0.615
5.0	16.90	87.0	17.2	197.0	0.0325	0.320	70.3	0.000670	1.06375	0.621
5.1	16.84	87.5	17.0	194.0	0.0331	0.323	69.3	0.000662	1.06353	0.621
5.2	16.78	87.6	17.0	192.0	0.0336	0.326	68.3	0.000660	1.06330	0.617
5.3	16.72	86.4	17.2	189.0	0.0342	0.329	67.5	0.000666	1.06308	0.606
5.4	16.66	86.1	17.2	186.0	0.0348	0.332	66.6	0.000665	1.06286	0.600
5.5	16.60	85.8	17.2	183.0	0.0353	0.335	65.8	0.000666	1.06263	0.596
5.6	16.54	85.5	17.2	180.0	0.0359	0.338	65.1	0.000665	1.06240	0.591
5.7	16.49	85.3	17.1	177.0	0.0365	0.341	64.3	0.000664	1.06217	0.587
5.8	16.42	85.1	17.1	174.0	0.0370	0.343	63.6	0.000663	1.06194	0.584
5.9	16.36	85.0	17.0	171.0	0.0376	0.346	62.9	0.000662	1.06171	0.581
6.0	16.30	84.9	16.9	168.0	0.0382	0.348	62.3	0.000660	1.06147	0.579
6.5	15.98	84.5	16.5	154.0	0.0410	0.360	59.3	0.000649	1.06024	0.571
7.0	15.65	84.4	15.9	140.0	0.0439	0.369	56.7	0.000637	1.05895	0.570
7.5	15.29	84.2	15.4	128.0	0.0469	0.376	54.6	0.000623	1.05760	0.573
8.0	14.93	83.9	14.9	116.0	0.0499	0.381	52.8	0.000609	1.05620	0.580
8.5	14.55	83.7	14.3	105.0	0.0530	0.385	51.2	0.000596	1.05474	0.591
9.0	14.15	83.4	13.9	95.6	0.0562	0.387	49.9	0.000584	1.05323	0.604
9.5	13.74	83.1	13.4	86.8	0.0593	0.388	48.8	0.000573	1.05168	0.620
10.0	13.33	82.9	13.0	78.9	0.0623	0.388	47.8	0.000564	1.05009	0.637
11.0	12.47	82.7	12.1	65.4	0.0676	0.385	46.3	0.000552	1.04681	0.673
12.0	11.61	83.4	11.4	55.7	0.0709	0.381	45.3	0.000554	1.04355	0.704
13.0	10.81	85.1	10.8	49.2	0.0717	0.377	44.8	0.000572	1.04046	0.726
14.0	10.05	87.9	10.3	45.0	0.0702	0.373	44.6	0.000602	1.03765	0.737
15.0	9.333	91.4	9.90	42.2	0.0675	0.372	44.7	0.000641	1.03514	0.742
16.0	8.732	95.5	9.58	40.1	0.0648	0.371	45.0	0.000682	1.03287	0.750
17.0	8.252	100.0	9.32	38.6	0.0618	0.371	45.3	0.000728	1.03083	0.755
18.0	7.769	105.0	9.09	37.4	0.0588	0.372	45.8	0.000778	1.02901	0.758
19.0	7.336	109.0	8.90	36.5	0.0559	0.374	46.4	0.000832	1.02738	0.760
20.0	6.946	114.0	8.73	35.8	0.0532	0.376	47.0	0.000889	1.02592	0.760
21.0	6.595	120.0	8.59	35.2	0.0506	0.379	47.6	0.000950	1.02460	0.760
22.0	6.278	125.0	8.46	34.8	0.0481	0.382	48.3	0.00101	1.02343	0.760
23.0	5.990	130.0	8.35	34.4	0.0459	0.386	49.0	0.00108	1.02232	0.758
24.0	5.727	136.0	8.25	34.1	0.0438	0.389	49.7	0.00115	1.02134	0.757
25.0	5.488	141.0	8.17	33.9	0.0418	0.393	50.4	0.00122	1.02044	0.755
26.0	5.268	146.0	8.09	33.7	0.0400	0.398	51.2	0.00129	1.01962	0.754
28.0	4.879	157.0	7.95	33.3	0.0368	0.407	52.7	0.00144	1.01816	0.750
30.0	4.545	168.0	7.83	33.1	0.0340	0.416	54.2	0.00160	1.01691	0.746
32.0	4.257	179.0	7.73	32.9	0.0316	0.426	55.7	0.00176	1.01583	0.743
34.0	4.004	191.0	7.65	32.8	0.0296	0.436	57.2	0.00193	1.01489	0.739
36.0	3.781	202.0	7.57	32.7	0.0277	0.446	58.7	0.00211	1.01406	0.736
38.0	3.583	213.0	7.51	32.6	0.0261	0.456	60.2	0.00229	1.01332	0.734
40.0	3.406	224.0	7.45	32.5	0.0247	0.467	61.7	0.00248	1.01266	0.731
45.0	3.033	251.0	7.33	32.3	0.0217	0.493	65.4	0.00298	1.01127	0.725
50.0	2.737	278.0	7.24	32.2	0.0194	0.519	69.1	0.00350	1.01016	0.720
55.0	2.495	305.0	7.17	32.0	0.0176	0.545	72.6	0.00406	1.00926	0.716
60.0	2.294	332.0	7.11	31.9	0.0161	0.571	76.0	0.00466	1.00851	0.712
65.0	2.124	359.0	7.06	31.8	0.0148	0.596	79.4	0.00528	1.00788	0.708
70.0	1.977	385.0	7.02	31.7	0.0138	0.622	82.7	0.00593	1.00734	0.705
75.0	1.850	412.0	6.98	31.6	0.0128	0.647	86.0	0.00662	1.00686	0.702
80.0	1.739	438.0	6.95	31.6	0.0120	0.672	89.2	0.00733	1.00645	0.700
90.0	1.552	491.0	6.90	31.4	0.0107	0.721	95.4	0.00884	1.00576	0.695
100.0	1.402	543.0	6.86	31.3	0.00964	0.769	101.0	0.0105	1.00520	0.691
125.0	1.130	674.0	6.79	31.1	0.00774	0.885	114.0	0.0150	1.00419	0.673
150.0	0.9472	804.0	6.75	30.9	0.00648	1.00	128.0	0.0202	1.00351	0.669
175.0	0.8153	934.0	6.72	30.8	0.00557	1.13	141.0	0.0259	1.00302	0.666
200.0	0.7157	1060.0	6.70	30.7	0.00489	1.26	154.0	0.0323	1.00265	0.665
225.0	0.6378	1190.0	6.68	30.6	0.00435	1.38	166.0	0.0391	1.00236	0.664
250.0	0.5752	1320.0	6.67	30.5	0.00392	1.49	178.0	0.0465	1.00213	0.664
275.0	0.5238	1450.0	6.66	30.5	0.00357	1.48	189.0	0.0543	1.00194	0.665
300.0	0.4808	1580.0	6.65	30.4	0.00328	1.56	200.0	0.0625	1.00178	0.666
350.0	0.4131	1840.0	6.63	30.4	0.00282	1.73	222.0	0.0808	1.00153	0.666
400.0	0.3621	2100.0	6.63	30.3	0.00247	1.90	244.0	0.101	1.00134	0.666
450.0	0.3222	2360.0	6.62	30.3	0.00220	2.06	264.0	0.123	1.00119	0.666
500.0	0.2903	2620.0	6.61	30.2	0.00198	2.22	284.0	0.147	1.00108	0.666
600.0	0.2423	3140.0	6.60	30.2	0.00165	2.52	323.0	0.200	1.00093	0.666
700.0	0.2079	3660.0	6.60	30.2	0.00142	2.80	359.0	0.260	1.00077	0.666
800.0	0.1821	4180.0	6.59	30.1	0.00124	3.08	395.0	0.325	1.00067	0.666
900.0	0.1620	4700.0	6.59	30.1	0.00111	3.34	429.0	0.398	1.00060	0.666
1000.0	0.1458	5220.0	6.59	30.1	0.00100	3.60	462.0	0.476	1.00054	0.666
1100.0	0.1326	5730.0	6.59	30.1	0.000905	3.85	494.0	0.560	1.00049	0.666
1200.0	0.1216	6250.0	6.58	30.1	0.000830	4.10	525.0	0.649	1.00045	0.666
1300.0	0.1123	6770.0	6.58	30.1	0.000767	4.34	556.0	0.744	1.00042	0.666
1400.0	0.1043	7290.0	6.58	30.1	0.000712	4.57	586.0	0.845	1.00039	0.666
1500.0	0.09737	7810.0	6.58	30.1	0.000665	4.80	616.0	0.950	1.00036	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

35.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
2.5	0.05497	1520.0	2.95	4.520	24.01	1.475	1.163	1.207	408.3
3.0	0.05528	1540.0	3.80	4.959	24.56	1.706	1.396	1.483	407.3
3.5	0.05571	1510.0	4.96	5.504	25.26	1.940	1.553	1.733	412.8
4.0	0.05629	1450.0	5.84	6.171	26.13	2.180	1.726	2.028	415.7
4.5	0.05699	1390.0	6.37	6.998	27.21	2.433	1.935	2.369	414.5
5.0	0.05782	1310.0	6.62	8.023	28.53	2.700	2.164	2.728	409.7
5.1	0.05800	1300.0	6.64	8.256	28.82	2.755	2.207	2.797	408.7
5.2	0.05818	1290.0	6.67	8.500	29.13	2.810	2.230	2.844	408.5
5.3	0.05836	1280.0	6.68	8.722	29.42	2.864	2.214	2.853	408.5
5.4	0.05854	1260.0	6.69	8.945	29.70	2.918	2.223	2.887	407.8
5.5	0.05872	1250.0	6.69	9.170	29.99	2.971	2.234	2.923	407.1
5.6	0.05891	1240.0	6.70	9.397	30.29	3.024	2.247	2.961	406.3
5.7	0.05910	1220.0	6.69	9.626	30.58	3.077	2.259	2.999	405.4
5.8	0.05929	1210.0	6.69	9.858	30.88	3.129	2.273	3.038	404.5
5.9	0.05949	1190.0	6.68	10.09	31.19	3.182	2.287	3.078	403.6
6.0	0.05969	1180.0	6.67	10.33	31.50	3.234	2.302	3.119	402.6
6.5	0.06074	1110.0	6.60	11.56	33.10	3.492	2.380	3.330	397.2
7.0	0.06188	1050.0	6.48	12.85	34.80	3.747	2.458	3.547	391.3
7.5	0.06311	985.0	6.33	14.23	36.61	4.001	2.533	3.766	385.2
8.0	0.06445	926.0	6.17	15.67	38.53	4.252	2.603	3.986	379.0
8.5	0.06589	870.0	5.98	17.19	40.56	4.502	2.666	4.205	372.8
9.0	0.06745	818.0	5.79	18.78	42.70	4.750	2.724	4.421	366.9
9.5	0.06913	771.0	5.58	20.43	44.95	4.997	2.776	4.635	361.1
10.0	0.07094	727.0	5.37	22.15	47.31	5.242	2.822	4.844	355.6
11.0	0.07502	650.0	4.91	26.00	52.60	5.754	2.909	5.237	344.2
12.0	0.07963	591.0	4.46	30.03	58.27	6.253	2.967	5.564	335.1
13.0	0.08474	552.0	4.04	34.16	64.21	6.734	3.008	5.801	328.5
14.0	0.09021	530.0	3.65	38.31	70.30	7.190	3.036	5.941	324.3
15.0	0.09591	522.0	3.31	42.42	76.43	7.615	3.058	6.001	322.1
16.0	0.1019	521.0	3.04	46.34	82.46	8.004	3.079	6.055	322.3
17.0	0.1080	527.0	2.80	50.23	88.53	8.372	3.097	6.079	323.6
18.0	0.1142	536.0	2.59	54.10	94.61	8.720	3.112	6.083	325.7
19.0	0.1206	548.0	2.40	57.93	100.7	9.049	3.124	6.073	328.5
20.0	0.1270	562.0	2.24	61.73	106.8	9.360	3.134	6.055	331.8
21.0	0.1334	579.0	2.10	65.48	112.8	9.655	3.143	6.031	335.4
22.0	0.1399	596.0	1.97	69.20	118.8	9.935	3.149	6.003	339.3
23.0	0.1464	615.0	1.86	72.89	124.8	10.20	3.155	5.973	343.4
24.0	0.1529	634.0	1.76	76.55	130.8	10.45	3.159	5.943	347.6
25.0	0.1594	654.0	1.67	80.17	136.7	10.70	3.162	5.912	352.0
26.0	0.1659	675.0	1.59	83.77	142.6	10.93	3.165	5.881	356.4
28.0	0.1788	717.0	1.45	90.88	154.3	11.36	3.169	5.821	365.3
30.0	0.1917	761.0	1.33	97.90	165.9	11.76	3.171	5.766	374.3
32.0	0.2045	805.0	1.23	104.8	177.3	12.13	3.172	5.715	383.3
34.0	0.2172	849.0	1.14	111.7	188.7	12.48	3.172	5.669	392.1
36.0	0.2299	894.0	1.07	118.5	200.0	12.80	3.171	5.628	400.9
38.0	0.2425	938.0	1.00	125.3	211.2	13.10	3.170	5.591	409.4
40.0	0.2550	983.0	0.944	132.0	222.4	13.39	3.169	5.558	417.9
45.0	0.2860	1090.0	0.825	148.6	250.0	14.04	3.166	5.489	438.3
50.0	0.3167	1200.0	0.734	165.0	277.3	14.61	3.163	5.437	457.9
55.0	0.3472	1310.0	0.661	181.3	304.4	15.13	3.160	5.396	476.6
60.0	0.3774	1420.0	0.602	197.4	331.3	15.60	3.157	5.364	494.5
65.0	0.4075	1530.0	0.552	213.5	358.0	16.03	3.154	5.338	511.8
70.0	0.4375	1630.0	0.511	229.5	384.7	16.42	3.152	5.317	528.5
75.0	0.4673	1740.0	0.475	245.5	411.2	16.79	3.150	5.300	544.7
80.0	0.4971	1850.0	0.444	261.4	437.7	17.13	3.148	5.286	560.3
90.0	0.5564	2050.0	0.393	293.1	490.4	17.75	3.144	5.264	590.4
100.0	0.6154	2260.0	0.352	324.7	543.0	18.30	3.141	5.249	618.9
125.0	0.7626	2780.0	0.281	403.4	673.9	19.47	3.136	5.225	684.9
150.0	0.9093	3290.0	0.233	481.9	804.3	20.42	3.133	5.213	745.0
175.0	1.056	3800.0	0.200	560.1	934.5	21.23	3.130	5.205	800.6
200.0	1.202	4320.0	0.175	638.3	1065.0	21.92	3.128	5.201	852.6
225.0	1.348	4830.0	0.155	716.4	1195.0	22.53	3.127	5.198	901.6
250.0	1.495	5340.0	0.140	794.5	1325.0	23.08	3.126	5.196	948.1
275.0	1.641	5850.0	0.127	872.6	1454.0	23.58	3.125	5.195	992.4
300.0	1.787	6360.0	0.116	950.6	1584.0	24.03	3.125	5.194	1035.0
350.0	2.079	7380.0	0.100	1107.0	1844.0	24.83	3.123	5.193	1115.0
400.0	2.372	8400.0	0.0873	1263.0	2104.0	25.52	3.123	5.192	1190.0
450.0	2.664	9420.0	0.0776	1418.0	2363.0	26.13	3.122	5.192	1260.0
500.0	2.956	10400.0	0.0699	1574.0	2623.0	26.68	3.122	5.192	1327.0
600.0	3.541	12500.0	0.0582	1886.0	3142.0	27.63	3.121	5.192	1451.0
700.0	4.126	14500.0	0.0499	2198.0	3661.0	28.43	3.120	5.192	1565.0
800.0	4.711	16600.0	0.0437	2510.0	4180.0	29.12	3.120	5.192	1672.0
900.0	5.296	18600.0	0.0388	2821.0	4699.0	29.73	3.120	5.192	1772.0
1000.0	5.881	20700.0	0.0350	3133.0	5219.0	30.28	3.120	5.192	1867.0
1100.0	6.466	22700.0	0.0318	3445.0	5738.0	30.78	3.119	5.192	1957.0
1200.0	7.051	24800.0	0.0291	3756.0	6257.0	31.23	3.119	5.192	2043.0
1300.0	7.636	26800.0	0.0269	4068.0	6776.0	31.64	3.119	5.192	2126.0
1400.0	8.221	28800.0	0.0250	4380.0	7295.0	32.03	3.119	5.192	2206.0
1500.0	8.806	30900.0	0.0233	4692.0	7815.0	32.39	3.119	5.192	2283.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

35.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)$_P$	V(DP/DU)$_V$	-V(DP/DV)$_T$	(DV/DT)/V$_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
2.5	18.19	113.0	14.0	277.0	0.0107	0.227	117.0	0.00104	1.06875	0.622
3.0	18.09	109.0	15.0	279.0	0.0136	0.254	108.0	0.000946	1.06835	0.633
3.5	17.95	94.6	17.8	271.0	0.0183	0.274	98.9	0.000880	1.06781	0.627
4.0	17.77	89.6	19.0	258.0	0.0226	0.293	90.4	0.000814	1.06710	0.625
4.5	17.55	90.4	18.8	243.0	0.0262	0.313	83.0	0.000753	1.06626	0.628
5.0	17.30	93.7	17.7	227.0	0.0291	0.331	76.8	0.000702	1.06529	0.633
5.1	17.24	94.5	17.5	224.0	0.0296	0.334	75.7	0.000694	1.06509	0.633
5.2	17.19	94.6	17.4	222.0	0.0300	0.338	74.6	0.000691	1.06488	0.628
5.3	17.14	93.5	17.6	219.0	0.0305	0.341	73.6	0.000698	1.06468	0.615
5.4	17.08	93.2	17.6	216.0	0.0310	0.344	72.6	0.000698	1.06447	0.609
5.5	17.03	93.0	17.6	213.0	0.0314	0.348	71.7	0.000698	1.06427	0.603
5.6	16.98	92.8	17.6	210.0	0.0319	0.351	70.8	0.000698	1.06406	0.598
5.7	16.92	92.7	17.5	207.0	0.0324	0.354	70.0	0.000697	1.06385	0.593
5.8	16.87	92.6	17.4	204.0	0.0328	0.357	69.2	0.000696	1.06364	0.589
5.9	16.81	92.5	17.4	201.0	0.0333	0.360	68.4	0.000695	1.06343	0.585
6.0	16.75	92.5	17.3	198.0	0.0337	0.362	67.6	0.000693	1.06321	0.582
6.5	16.46	92.5	16.8	183.0	0.0360	0.375	64.2	0.000684	1.06210	0.570
7.0	16.16	92.7	16.3	169.0	0.0383	0.385	61.4	0.000672	1.06093	0.565
7.5	15.85	92.8	15.8	156.0	0.0406	0.394	58.9	0.000660	1.05972	0.564
8.0	15.52	92.8	15.3	144.0	0.0429	0.400	56.9	0.000647	1.05846	0.567
8.5	15.18	92.8	14.8	132.0	0.0453	0.405	55.2	0.000635	1.05715	0.573
9.0	14.83	92.7	14.3	121.0	0.0477	0.409	53.7	0.000623	1.05581	0.581
9.5	14.47	92.6	13.9	111.0	0.0501	0.411	52.4	0.000612	1.05443	0.592
10.0	14.10	92.5	13.5	103.0	0.0524	0.412	51.3	0.000603	1.05302	0.604
11.0	13.33	92.4	12.7	86.6	0.0567	0.411	49.6	0.000588	1.05010	0.632
12.0	12.56	92.6	12.0	74.2	0.0601	0.408	48.4	0.000584	1.04715	0.660
13.0	11.80	93.6	11.4	65.2	0.0620	0.404	47.6	0.000590	1.04427	0.684
14.0	11.09	95.6	10.9	58.8	0.0621	0.400	47.2	0.000608	1.04155	0.700
15.0	10.43	98.5	10.4	54.4	0.0609	0.398	47.1	0.000636	1.03905	0.710
16.0	9.818	102.0	10.0	51.2	0.0593	0.396	47.2	0.000666	1.03675	0.721
17.0	9.261	106.0	9.75	48.8	0.0573	0.395	47.4	0.000702	1.03464	0.730
18.0	8.754	110.0	9.49	46.9	0.0551	0.395	47.8	0.000742	1.03273	0.736
19.0	8.294	115.0	9.27	45.4	0.0529	0.396	48.2	0.000785	1.03099	0.741
20.0	7.876	120.0	9.08	44.3	0.0506	0.397	48.8	0.000832	1.02942	0.744
21.0	7.495	125.0	8.92	43.4	0.0484	0.399	49.3	0.000882	1.02798	0.746
22.0	7.149	130.0	8.77	42.6	0.0463	0.401	49.9	0.000934	1.02668	0.748
23.0	6.832	135.0	8.64	42.0	0.0444	0.404	50.6	0.000989	1.02549	0.748
24.0	6.541	140.0	8.53	41.5	0.0425	0.407	51.2	0.00105	1.02439	0.748
25.0	6.275	145.0	8.43	41.0	0.0407	0.410	51.9	0.00111	1.02339	0.748
26.0	6.029	150.0	8.33	40.7	0.0391	0.414	52.6	0.00117	1.02247	0.748
28.0	5.593	161.0	8.17	40.1	0.0361	0.421	54.0	0.00129	1.02084	0.746
30.0	5.217	172.0	8.04	39.7	0.0335	0.430	55.5	0.00143	1.01943	0.744
32.0	4.890	183.0	7.92	39.3	0.0312	0.439	56.9	0.00157	1.01820	0.741
34.0	4.604	194.0	7.82	39.1	0.0292	0.448	58.4	0.00172	1.01713	0.739
36.0	4.350	205.0	7.74	38.9	0.0275	0.458	59.9	0.00187	1.01618	0.736
38.0	4.125	216.0	7.66	38.7	0.0259	0.467	61.3	0.00203	1.01534	0.733
40.0	3.922	227.0	7.59	38.6	0.0245	0.477	62.8	0.00219	1.01459	0.731
45.0	3.496	254.0	7.46	38.2	0.0216	0.502	66.4	0.00262	1.01299	0.725
50.0	3.157	282.0	7.35	38.0	0.0193	0.528	70.0	0.00307	1.01173	0.721
55.0	2.880	309.0	7.26	37.8	0.0175	0.553	73.4	0.00356	1.01070	0.716
60.0	2.650	336.0	7.19	37.6	0.0160	0.579	76.9	0.00407	1.00984	0.712
65.0	2.454	362.0	7.14	37.5	0.0147	0.604	80.2	0.00461	1.00911	0.709
70.0	2.286	389.0	7.09	37.4	0.0137	0.629	83.5	0.00518	1.00848	0.706
75.0	2.140	416.0	7.05	37.2	0.0128	0.654	86.7	0.00577	1.00794	0.703
80.0	2.012	442.0	7.01	37.1	0.0120	0.679	89.9	0.00638	1.00746	0.700
90.0	1.797	495.0	6.95	36.9	0.0106	0.727	96.0	0.00769	1.00667	0.695
100.0	1.625	547.0	6.91	36.8	0.00959	0.775	102.0	0.00909	1.00603	0.691
125.0	1.311	678.0	6.83	36.4	0.00770	0.890	115.0	0.0130	1.00486	0.673
150.0	1.100	809.0	6.78	36.2	0.00645	1.00	128.0	0.0174	1.00408	0.669
175.0	0.9472	939.0	6.74	36.0	0.00555	1.10	141.0	0.0224	1.00351	0.666
200.0	0.8319	1070.0	6.72	35.9	0.00487	1.21	154.0	0.0278	1.00308	0.664
225.0	0.7417	1200.0	6.70	35.8	0.00434	1.30	166.0	0.0337	1.00275	0.664
250.0	0.6691	1330.0	6.68	35.7	0.00391	1.39	178.0	0.0400	1.00248	0.664
275.0	0.6095	1460.0	6.67	35.6	0.00356	1.48	189.0	0.0468	1.00226	0.664
300.0	0.5596	1590.0	6.66	35.6	0.00327	1.56	200.0	0.0538	1.00207	0.666
350.0	0.4810	1850.0	6.64	35.5	0.00281	1.74	223.0	0.0695	1.00178	0.666
400.0	0.4217	2110.0	6.63	35.4	0.00247	1.90	244.0	0.0868	1.00156	0.666
450.0	0.3754	2370.0	6.62	35.4	0.00219	2.06	264.0	0.106	1.00139	0.666
500.0	0.3383	2620.0	6.62	35.3	0.00198	2.22	284.0	0.126	1.00125	0.666
600.0	0.2824	3140.0	6.61	35.3	0.00165	2.52	323.0	0.172	1.00105	0.666
700.0	0.2424	3660.0	6.60	35.2	0.00142	2.80	359.0	0.223	1.00090	0.666
800.0	0.2123	4180.0	6.60	35.2	0.00124	3.08	395.0	0.279	1.00079	0.666
900.0	0.1888	4700.0	6.59	35.2	0.00110	3.34	429.0	0.341	1.00070	0.666
1000.0	0.1700	5220.0	6.59	35.1	0.000995	3.60	462.0	0.408	1.00063	0.666
1100.0	0.1547	5740.0	6.59	35.1	0.000905	3.85	494.0	0.480	1.00057	0.666
1200.0	0.1418	6260.0	6.59	35.1	0.000830	4.10	526.0	0.557	1.00053	0.666
1300.0	0.1310	6780.0	6.58	35.1	0.000766	4.34	556.0	0.638	1.00048	0.666
1400.0	0.1216	7290.0	6.58	35.1	0.000712	4.57	586.0	0.724	1.00045	0.665
1500.0	0.1136	7810.0	6.58	35.1	0.000664	4.80	616.0	0.815	1.00042	0.665

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

40.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
2.5	0.05401	1610.0	3.59	4.777	26.67	1.432	1.174	1.234	413.8
3.0	0.05433	1650.0	4.07	5.184	27.20	1.661	1.350	1.440	422.4
3.5	0.05474	1630.0	5.15	5.685	27.87	1.885	1.495	1.668	429.4
4.0	0.05526	1580.0	6.02	6.306	28.70	2.116	1.674	1.957	433.1
4.5	0.05590	1520.0	6.55	7.088	29.74	2.361	1.893	2.295	432.3
5.0	0.05664	1450.0	6.81	8.069	31.02	2.620	2.131	2.649	428.0
5.1	0.05680	1440.0	6.84	8.293	31.31	2.673	2.176	2.717	427.1
5.2	0.05696	1430.0	6.87	8.528	31.62	2.726	2.199	2.762	426.9
5.3	0.05712	1420.0	6.88	8.740	31.89	2.779	2.185	2.770	427.0
5.4	0.05728	1410.0	6.89	8.954	32.17	2.831	2.196	2.803	426.4
5.5	0.05744	1390.0	6.90	9.169	32.45	2.883	2.208	2.838	425.7
5.6	0.05761	1380.0	6.91	9.387	32.74	2.934	2.221	2.873	425.0
5.7	0.05778	1360.0	6.91	9.607	33.02	2.985	2.235	2.910	424.3
5.8	0.05795	1350.0	6.91	9.829	33.31	3.036	2.250	2.947	423.4
5.9	0.05812	1340.0	6.90	10.05	33.61	3.087	2.265	2.985	422.6
6.0	0.05830	1320.0	6.90	10.28	33.91	3.138	2.281	3.024	421.7
6.5	0.05922	1260.0	6.84	11.46	35.46	3.388	2.362	3.222	416.7
7.0	0.06021	1190.0	6.74	12.70	37.10	3.635	2.443	3.425	411.3
7.5	0.06127	1130.0	6.62	14.01	38.84	3.879	2.520	3.629	405.6
8.0	0.06242	1070.0	6.48	15.39	40.69	4.120	2.590	3.831	399.9
8.5	0.06365	1010.0	6.31	16.84	42.63	4.360	2.655	4.031	394.2
9.0	0.06496	957.0	6.14	18.35	44.68	4.597	2.713	4.229	388.6
9.5	0.06637	907.0	5.95	19.92	46.82	4.833	2.766	4.422	383.2
10.0	0.06787	860.0	5.76	21.56	49.07	5.067	2.813	4.612	378.0
11.0	0.07123	775.0	5.33	25.24	54.11	5.554	2.901	4.971	366.9
12.0	0.07499	707.0	4.90	29.11	59.51	6.030	2.961	5.285	357.5
13.0	0.07914	656.0	4.49	33.11	65.19	6.490	3.003	5.538	350.0
14.0	0.08363	622.0	4.10	37.17	71.06	6.930	3.034	5.716	344.6
15.0	0.08836	603.0	3.75	41.23	77.04	7.346	3.056	5.822	341.2
16.0	0.09332	594.0	3.45	45.09	82.91	7.724	3.077	5.911	340.1
17.0	0.09846	593.0	3.19	48.94	88.85	8.084	3.095	5.965	340.2
18.0	0.1037	597.0	2.96	52.78	94.93	8.426	3.110	5.993	341.3
19.0	0.1091	605.0	2.76	56.60	100.8	8.751	3.123	6.005	343.2
20.0	0.1146	615.0	2.58	60.39	106.8	9.059	3.133	6.003	345.6
21.0	0.1201	628.0	2.42	64.15	112.8	9.351	3.142	5.994	348.5
22.0	0.1257	643.0	2.27	67.88	118.8	9.630	3.149	5.978	351.7
23.0	0.1313	660.0	2.15	71.58	124.8	9.895	3.155	5.958	355.2
24.0	0.1369	677.0	2.03	75.25	130.7	10.15	3.160	5.936	358.9
25.0	0.1425	695.0	1.93	78.90	136.7	10.39	3.164	5.912	362.8
26.0	0.1482	714.0	1.83	82.51	142.6	10.62	3.167	5.887	366.8
28.0	0.1594	754.0	1.67	89.67	154.3	11.06	3.172	5.837	375.0
30.0	0.1706	796.0	1.53	96.74	165.9	11.46	3.174	5.787	383.4
32.0	0.1818	838.0	1.42	103.7	177.4	11.83	3.176	5.740	391.8
34.0	0.1930	882.0	1.32	110.7	188.9	12.18	3.176	5.697	400.3
36.0	0.2041	926.0	1.23	117.5	200.2	12.50	3.176	5.657	408.7
38.0	0.2151	970.0	1.15	124.3	211.5	12.80	3.176	5.620	416.9
40.0	0.2261	1010.0	1.09	131.1	222.7	13.09	3.175	5.587	425.1
45.0	0.2533	1120.0	0.949	147.8	250.5	13.75	3.172	5.516	445.0
50.0	0.2803	1230.0	0.843	164.3	277.9	14.32	3.169	5.461	464.1
55.0	0.3070	1340.0	0.759	180.6	305.1	14.84	3.165	5.418	482.5
60.0	0.3336	1450.0	0.690	196.9	332.1	15.31	3.162	5.383	500.2
65.0	0.3600	1560.0	0.633	213.0	358.9	15.74	3.159	5.355	517.2
70.0	0.3862	1660.0	0.585	229.1	385.6	16.14	3.157	5.332	533.7
75.0	0.4124	1770.0	0.544	245.1	412.3	16.51	3.154	5.313	549.7
80.0	0.4385	1880.0	0.508	261.1	438.8	16.85	3.152	5.298	565.2
90.0	0.4905	2090.0	0.450	292.9	491.6	17.47	3.148	5.274	594.9
100.0	0.5422	2290.0	0.403	324.5	544.3	18.03	3.145	5.256	623.2
125.0	0.6710	2810.0	0.321	403.3	675.3	19.19	3.139	5.230	688.7
150.0	0.7994	3320.0	0.267	481.8	805.9	20.15	3.135	5.215	748.5
175.0	0.9276	3840.0	0.228	560.2	936.1	20.95	3.132	5.207	803.8
200.0	1.056	4350.0	0.200	638.4	1066.0	21.65	3.130	5.202	855.5
225.0	1.184	4860.0	0.177	716.6	1196.0	22.26	3.129	5.199	904.3
250.0	1.311	5370.0	0.160	794.7	1326.0	22.81	3.128	5.197	950.6
275.0	1.439	5880.0	0.145	872.7	1456.0	23.30	3.127	5.195	994.8
300.0	1.567	6390.0	0.133	950.8	1586.0	23.75	3.126	5.194	1037.0
350.0	1.823	7410.0	0.114	1107.0	1846.0	24.55	3.125	5.193	1117.0
400.0	2.079	8430.0	0.100	1263.0	2105.0	25.25	3.124	5.192	1191.0
450.0	2.334	9450.0	0.0887	1419.0	2365.0	25.86	3.123	5.192	1262.0
500.0	2.590	10500.0	0.0798	1575.0	2624.0	26.40	3.122	5.192	1328.0
600.0	3.102	12500.0	0.0665	1886.0	3144.0	27.35	3.122	5.191	1452.0
700.0	3.613	14600.0	0.0570	2198.0	3663.0	28.15	3.121	5.191	1566.0
800.0	4.123	16600.0	0.0499	2510.0	4182.0	28.84	3.121	5.191	1673.0
900.0	4.637	18600.0	0.0444	2822.0	4701.0	29.46	3.120	5.192	1773.0
1000.0	5.149	20700.0	0.0399	3133.0	5220.0	30.00	3.120	5.192	1867.0
1100.0	5.660	22700.0	0.0363	3445.0	5739.0	30.50	3.120	5.192	1958.0
1200.0	6.172	24800.0	0.0333	3757.0	6258.0	30.95	3.120	5.192	2044.0
1300.0	6.684	26800.0	0.0307	4069.0	6778.0	31.37	3.120	5.192	2127.0
1400.0	7.196	28900.0	0.0285	4380.0	7297.0	31.75	3.119	5.192	2206.0
1500.0	7.708	30900.0	0.0266	4692.0	7816.0	32.11	3.119	5.192	2283.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

40.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
2.5	18.52	102.0	16.5	298.0	0.0121	0.234	132.0	0.001C2	1.06999	0.696
3.0	18.41	108.0	16.4	304.0	0.0134	0.261	121.0	0.001986	1.06957	0.664
3.5	18.27	96.5	16.9	298.0	0.0173	0.282	109.0	0.001924	1.06904	0.646
4.0	18.13	93.2	19.9	287.0	0.0210	0.302	99.1	0.000853	1.06837	0.642
4.5	17.89	95.4	19.3	272.0	0.0241	0.323	90.6	0.000786	1.06758	0.644
5.0	17.65	100.0	18.1	257.0	0.0265	0.342	83.4	0.000731	1.06668	0.647
5.1	17.61	101.0	17.9	254.0	0.0269	0.345	82.1	0.000722	1.06649	0.646
5.2	17.55	101.0	17.8	251.0	0.0273	0.349	80.9	0.000719	1.06629	0.641
5.3	17.51	100.0	18.0	248.0	0.0277	0.352	79.8	0.000727	1.06610	0.627
5.4	17.46	100.0	18.0	245.0	0.0281	0.356	78.7	0.000727	1.06592	0.620
5.5	17.41	100.0	18.0	242.0	0.0285	0.359	77.6	0.000727	1.06573	0.613
5.6	17.35	100.0	17.9	239.0	0.0289	0.363	76.6	0.000727	1.06553	0.607
5.7	17.31	99.5	17.9	236.0	0.0292	0.366	75.7	0.000727	1.06534	0.602
5.8	17.25	99.5	17.8	233.0	0.0296	0.369	74.8	0.000726	1.06514	0.597
5.9	17.21	100.0	17.7	230.0	0.0300	0.372	73.9	0.000725	1.06495	0.592
6.0	17.15	100.0	17.6	227.0	0.0304	0.375	73.0	0.000723	1.06475	0.588
6.5	16.89	100.0	17.1	212.0	0.0322	0.389	69.2	0.000715	1.06372	0.573
7.0	16.61	100.0	16.6	198.0	0.0341	0.400	65.9	0.000704	1.06265	0.564
7.5	16.32	101.0	16.1	184.0	0.0360	0.410	63.2	0.000692	1.06154	0.560
8.0	16.02	101.0	15.6	171.0	0.0379	0.418	61.0	0.000680	1.06039	0.559
8.5	15.71	101.0	15.1	159.0	0.0398	0.423	59.0	0.000669	1.05921	0.562
9.0	15.39	101.0	14.7	147.0	0.0417	0.428	57.3	0.000657	1.05799	0.567
9.5	15.07	102.0	14.3	137.0	0.0436	0.431	55.9	0.000647	1.05673	0.574
10.0	14.73	102.0	13.9	127.0	0.0454	0.433	54.7	0.000637	1.05546	0.583
11.0	14.04	102.0	13.1	109.0	0.0489	0.434	52.7	0.000621	1.05280	0.604
12.0	13.34	102.0	12.4	94.2	0.0520	0.432	51.3	0.000613	1.05012	0.627
13.0	12.64	102.0	11.8	82.9	0.0542	0.429	50.3	0.000613	1.04745	0.650
14.0	11.96	104.0	11.3	74.4	0.0551	0.426	49.7	0.000623	1.04487	0.668
15.0	11.32	106.0	10.8	68.3	0.0549	0.423	49.4	0.000641	1.04244	0.681
16.0	10.72	109.0	10.5	63.7	0.0542	0.420	49.4	0.000663	1.04015	0.695
17.0	10.16	113.0	10.2	60.2	0.0530	0.418	49.5	0.000690	1.03803	0.706
18.0	9.639	116.0	9.88	57.5	0.0515	0.417	49.7	0.000722	1.03607	0.714
19.0	9.163	121.0	9.63	55.4	0.0498	0.417	50.1	0.000758	1.03427	0.721
20.0	8.726	125.0	9.42	53.7	0.0480	0.417	50.5	0.000796	1.03262	0.727
21.0	8.325	130.0	9.24	52.3	0.0462	0.418	51.0	0.000838	1.03111	0.731
22.0	7.956	135.0	9.07	51.2	0.0444	0.420	51.5	0.000882	1.02972	0.734
23.0	7.617	140.0	8.93	50.2	0.0427	0.422	52.1	0.000929	1.02844	0.736
24.0	7.305	145.0	8.80	49.5	0.0411	0.424	52.7	0.000978	1.02726	0.738
25.0	7.017	150.0	8.68	48.8	0.0395	0.427	53.3	0.00103	1.02618	0.739
26.0	6.750	155.0	8.58	48.2	0.0380	0.430	54.0	0.00108	1.02518	0.740
28.0	6.273	165.0	8.39	47.3	0.0353	0.436	55.3	0.00119	1.02339	0.740
30.0	5.860	176.0	8.24	46.6	0.0329	0.444	56.7	0.00131	1.02184	0.739
32.0	5.499	187.0	8.11	46.1	0.0307	0.452	58.1	0.00143	1.02048	0.738
34.0	5.182	198.0	8.00	45.7	0.0288	0.461	59.5	0.00156	1.01929	0.736
36.0	4.900	209.0	7.90	45.4	0.0271	0.470	61.0	0.00169	1.01824	0.734
38.0	4.649	220.0	7.81	45.1	0.0256	0.479	62.4	0.00183	1.01730	0.732
40.0	4.423	231.0	7.74	44.8	0.0242	0.488	63.8	0.00198	1.01645	0.730
45.0	3.947	258.0	7.58	44.4	0.0214	0.512	67.4	0.00235	1.01468	0.725
50.0	3.558	285.0	7.46	44.0	0.0192	0.537	70.8	0.00276	1.01326	0.721
55.0	3.257	312.0	7.36	43.7	0.0174	0.562	74.3	0.00318	1.01210	0.716
60.0	2.998	339.0	7.28	43.5	0.0159	0.587	77.7	0.00364	1.01114	0.713
65.0	2.778	366.0	7.21	43.3	0.0146	0.611	81.0	0.00411	1.01032	0.709
70.0	2.589	393.0	7.16	43.1	0.0136	0.636	84.2	0.00461	1.00961	0.706
75.0	2.425	419.0	7.11	42.9	0.0127	0.661	87.4	0.00513	1.00900	0.703
80.0	2.281	446.0	7.07	42.8	0.0119	0.685	90.5	0.00567	1.00846	0.700
90.0	2.039	499.0	7.00	42.5	0.0106	0.733	96.7	0.00682	1.00757	0.695
100.0	1.844	551.0	6.95	42.3	0.00953	0.781	103.0	0.00805	1.00684	0.691
125.0	1.490	682.0	6.86	41.9	0.00766	0.895	115.0	0.0115	1.00553	0.672
150.0	1.251	813.0	6.80	41.6	0.00642	1.00	129.0	0.0154	1.00464	0.668
175.0	1.078	943.0	6.76	41.4	0.00552	1.11	142.0	0.0198	1.00400	0.666
200.0	0.9473	1070.0	6.73	41.2	0.00485	1.21	154.0	0.0245	1.00351	0.664
225.0	0.8449	1200.0	6.71	41.0	0.00432	1.30	166.0	0.0297	1.00313	0.663
250.0	0.7625	1330.0	6.70	40.9	0.00390	1.40	178.0	0.0352	1.00283	0.663
275.0	0.6948	1460.0	6.68	40.8	0.00355	1.48	190.0	0.0411	1.00257	0.664
300.0	0.6381	1590.0	6.67	40.8	0.00326	1.57	201.0	0.0473	1.00236	0.665
350.0	0.5486	1850.0	6.65	40.6	0.00281	1.74	223.0	0.0610	1.00203	0.665
400.0	0.4811	2110.0	6.64	40.6	0.00246	1.90	244.0	0.0762	1.00178	0.666
450.0	0.4284	2370.0	6.63	40.5	0.00219	2.06	264.0	0.0928	1.00159	0.666
500.0	0.3861	2630.0	6.62	40.4	0.00197	2.22	284.0	0.111	1.00143	0.666
600.0	0.3224	3150.0	6.61	40.3	0.00165	2.52	323.0	0.150	1.00119	0.666
700.0	0.2768	3670.0	6.60	40.3	0.00142	2.80	360.0	0.195	1.00102	0.666
800.0	0.2424	4180.0	6.60	40.2	0.00124	3.08	395.0	0.245	1.00090	0.666
900.0	0.2157	4700.0	6.59	40.2	0.00110	3.35	429.0	0.299	1.00080	0.666
1000.0	0.1942	5220.0	6.59	40.2	0.000994	3.60	462.0	0.357	1.00072	0.666
1100.0	0.1767	5740.0	6.59	40.2	0.000904	3.86	494.0	0.420	1.00065	0.666
1200.0	0.1620	6260.0	6.59	40.1	0.000829	4.10	526.0	0.487	1.00060	0.666
1300.0	0.1496	6780.0	6.58	40.1	0.000766	4.34	556.0	0.559	1.00055	0.665
1400.0	0.1390	7300.0	6.58	40.1	0.000711	4.57	586.0	0.634	1.00051	0.665
1500.0	0.1297	7820.0	6.58	40.1	0.000664	4.80	616.0	0.713	1.00048	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

45.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
2.5	0.05313	1680.0	4.45	5.042	29.26	1.366	1.216	1.300	426.7
3.0	0.05347	1750.0	4.43	5.424	29.80	1.617	1.315	1.412	436.7
3.5	0.05386	1750.0	5.39	5.886	30.44	1.835	1.444	1.615	445.0
4.0	0.05435	1710.0	6.21	6.466	31.25	2.058	1.628	1.899	449.3
4.5	0.05493	1650.0	6.73	7.209	32.26	2.296	1.856	2.233	448.9
5.0	0.05561	1590.0	6.99	8.151	33.51	2.548	2.101	2.583	444.8
5.1	0.05575	1580.0	7.02	8.367	33.79	2.600	2.148	2.650	444.0
5.2	0.05590	1570.0	7.05	8.595	34.08	2.652	2.173	2.695	443.8
5.3	0.05604	1550.0	7.07	8.800	34.35	2.703	2.160	2.702	443.9
5.4	0.05619	1540.0	7.08	9.006	34.63	2.754	2.172	2.734	443.4
5.5	0.05633	1530.0	7.09	9.213	34.90	2.804	2.185	2.767	442.8
5.6	0.05648	1520.0	7.10	9.423	35.18	2.854	2.199	2.801	442.2
5.7	0.05663	1500.0	7.10	9.635	35.46	2.904	2.214	2.837	441.5
5.8	0.05679	1490.0	7.10	9.849	35.74	2.954	2.230	2.872	440.7
5.9	0.05694	1470.0	7.10	10.07	36.03	3.003	2.246	2.909	439.9
6.0	0.05710	1460.0	7.10	10.28	36.32	3.053	2.262	2.946	439.1
6.5	0.05792	1390.0	7.06	11.42	37.83	3.296	2.347	3.135	434.4
7.0	0.05880	1330.0	6.98	12.61	39.42	3.536	2.430	3.328	429.4
7.5	0.05974	1260.0	6.87	13.88	41.12	3.773	2.508	3.520	424.1
8.0	0.06074	1200.0	6.74	15.20	42.90	4.007	2.580	3.710	418.8
8.5	0.06181	1150.0	6.60	16.59	44.78	4.239	2.645	3.896	413.5
9.0	0.06295	1090.0	6.44	18.05	46.75	4.468	2.704	4.079	408.3
9.5	0.06417	1040.0	6.27	19.56	48.81	4.695	2.757	4.259	403.2
10.0	0.06545	990.0	6.10	21.12	50.97	4.919	2.805	4.434	398.2
11.0	0.06830	900.0	5.69	24.68	55.82	5.389	2.894	4.765	387.5
12.0	0.07146	824.0	5.29	28.42	61.00	5.846	2.956	5.062	378.1
13.0	0.07493	764.0	4.89	32.30	66.47	6.289	3.000	5.315	370.2
14.0	0.07870	720.0	4.51	36.26	72.15	6.714	3.032	5.513	364.1
15.0	0.08270	691.0	4.15	40.27	77.97	7.119	3.056	5.649	359.7
16.0	0.08691	674.0	3.85	44.06	83.68	7.488	3.077	5.764	357.6
17.0	0.09130	665.0	3.57	47.86	89.49	7.840	3.095	5.843	356.7
18.0	0.09584	663.0	3.32	51.66	95.36	8.175	3.110	5.894	356.9
19.0	0.1005	666.0	3.10	55.45	101.3	8.495	3.122	5.925	357.9
20.0	0.1052	673.0	2.90	59.23	107.2	8.799	3.133	5.940	359.6
21.0	0.1100	683.0	2.73	62.98	113.1	9.089	3.142	5.944	361.8
22.0	0.1149	695.0	2.57	66.71	119.1	9.366	3.150	5.940	364.4
23.0	0.1198	709.0	2.42	70.41	125.0	9.629	3.156	5.930	367.3
24.0	0.1247	724.0	2.30	74.09	130.9	9.882	3.161	5.917	370.5
25.0	0.1296	740.0	2.18	77.75	136.9	10.12	3.165	5.900	373.9
26.0	0.1346	758.0	2.08	81.38	142.7	10.35	3.169	5.881	377.5
28.0	0.1445	795.0	1.89	88.57	154.5	10.79	3.174	5.841	385.0
30.0	0.1545	834.0	1.74	95.68	166.1	11.19	3.177	5.798	392.7
32.0	0.1644	875.0	1.60	102.7	177.7	11.56	3.179	5.756	400.7
34.0	0.1743	917.0	1.49	109.7	189.1	11.91	3.180	5.716	408.6
36.0	0.1841	960.0	1.39	116.6	200.5	12.24	3.181	5.678	416.6
38.0	0.1940	1000.0	1.31	123.4	211.8	12.54	3.180	5.643	424.6
40.0	0.2037	1050.0	1.23	130.2	223.1	12.83	3.180	5.610	432.5
45.0	0.2280	1160.0	1.07	147.0	251.0	13.49	3.177	5.540	451.8
50.0	0.2520	1260.0	0.953	163.6	278.5	14.07	3.174	5.483	470.5
55.0	0.2758	1370.0	0.857	180.0	305.8	14.59	3.170	5.438	488.5
60.0	0.2995	1480.0	0.779	196.3	332.9	15.06	3.167	5.401	505.9
65.0	0.3230	1590.0	0.714	212.6	359.8	15.49	3.164	5.371	522.7
70.0	0.3464	1700.0	0.660	228.7	386.6	15.89	3.161	5.346	539.0
75.0	0.3697	1800.0	0.613	244.7	413.3	16.26	3.159	5.326	554.7
80.0	0.3929	1910.0	0.573	260.7	439.9	16.60	3.156	5.309	570.1
90.0	0.4392	2120.0	0.506	292.6	492.8	17.22	3.152	5.283	599.5
100.0	0.4852	2330.0	0.454	324.3	545.6	17.78	3.148	5.264	627.5
125.0	0.5998	2840.0	0.361	403.2	676.7	18.95	3.142	5.234	692.6
150.0	0.7140	3360.0	0.300	481.8	807.4	19.90	3.138	5.218	751.9
175.0	0.8279	3870.0	0.257	560.2	937.7	20.71	3.134	5.209	806.9
200.0	0.9417	4380.0	0.225	638.5	1068.0	21.40	3.132	5.203	858.4
225.0	1.055	4890.0	0.200	716.7	1198.0	22.01	3.130	5.200	907.0
250.0	1.169	5400.0	0.180	794.8	1328.0	22.56	3.129	5.197	953.1
275.0	1.283	5910.0	0.163	872.9	1458.0	23.06	3.128	5.196	997.0
300.0	1.396	6420.0	0.150	950.9	1588.0	23.51	3.127	5.194	1039.0
350.0	1.624	7440.0	0.128	1107.0	1847.0	24.31	3.126	5.193	1119.0
400.0	1.851	8460.0	0.112	1263.0	2107.0	25.00	3.125	5.192	1193.0
450.0	2.078	9480.0	0.100	1419.0	2366.0	25.61	3.124	5.192	1263.0
500.0	2.305	10500.0	0.0898	1575.0	2626.0	26.16	3.123	5.191	1330.0
600.0	2.760	12500.0	0.0748	1887.0	3145.0	27.11	3.122	5.191	1453.0
700.0	3.215	14600.0	0.0642	2199.0	3664.0	27.91	3.122	5.191	1567.0
800.0	3.669	16600.0	0.0561	2510.0	4183.0	28.60	3.121	5.191	1674.0
900.0	4.124	18700.0	0.0499	2822.0	4703.0	29.21	3.121	5.191	1774.0
1000.0	4.579	20700.0	0.0449	3134.0	5222.0	29.76	3.121	5.191	1868.0
1100.0	5.034	22800.0	0.0408	3446.0	5741.0	30.25	3.120	5.192	1958.0
1200.0	5.489	24800.0	0.0374	3757.0	6260.0	30.71	3.120	5.192	2045.0
1300.0	5.944	26800.0	0.0346	4069.0	6779.0	31.12	3.120	5.192	2127.0
1400.0	6.399	28900.0	0.0321	4381.0	7298.0	31.51	3.120	5.192	2207.0
1500.0	6.854	30900.0	0.0300	4692.0	7817.0	31.86	3.120	5.192	2284.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

45.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
2.5	18.82	92.5	19.4	316.0	0.0141	0.241	148.0	0.000983	1.07118	0.801
3.0	18.70	104.0	18.0	328.0	0.0135	0.269	134.0	0.00102	1.07072	0.703
3.5	18.57	97.2	20.1	324.0	0.0166	0.289	120.0	0.000965	1.07019	0.670
4.0	18.40	96.0	20.7	314.0	0.0198	0.311	108.0	0.000889	1.06954	0.661
4.5	18.20	100.0	19.9	301.0	0.0224	0.332	98.4	0.000816	1.06879	0.662
5.0	17.99	106.0	18.5	286.0	0.0245	0.352	90.2	0.000757	1.06794	0.663
5.1	17.94	107.0	18.2	283.0	0.0248	0.356	88.8	0.000748	1.06776	0.662
5.2	17.89	107.0	18.1	280.0	0.0251	0.359	87.4	0.000745	1.06757	0.655
5.3	17.84	106.0	18.3	277.0	0.0255	0.363	86.1	0.000753	1.06740	0.641
5.4	17.80	106.0	18.3	274.0	0.0258	0.367	84.9	0.000754	1.06722	0.633
5.5	17.75	106.0	18.3	271.0	0.0261	0.370	83.7	0.000754	1.06705	0.625
5.6	17.70	106.0	18.2	268.0	0.0265	0.374	82.6	0.000754	1.06687	0.619
5.7	17.66	106.0	18.2	265.0	0.0268	0.377	81.5	0.000753	1.06668	0.612
5.8	17.61	106.0	18.1	262.0	0.0271	0.381	80.4	0.000753	1.06650	0.607
5.9	17.56	106.0	18.0	259.0	0.0274	0.384	79.4	0.000752	1.06632	0.602
6.0	17.51	106.0	17.9	256.0	0.0277	0.387	78.5	0.000751	1.06613	0.597
6.5	17.27	107.0	17.4	241.0	0.0293	0.402	74.2	0.000742	1.06517	0.579
7.0	17.01	108.0	16.9	226.0	0.0309	0.414	70.6	0.000732	1.06418	0.567
7.5	16.74	108.0	16.4	212.0	0.0324	0.425	67.5	0.000721	1.06315	0.559
8.0	16.46	109.0	15.9	198.0	0.0340	0.434	65.0	0.000710	1.06209	0.556
8.5	16.19	109.0	15.4	185.0	0.0356	0.440	62.8	0.000699	1.06099	0.556
9.0	15.88	110.0	15.0	173.0	0.0372	0.446	60.9	0.000688	1.05987	0.558
9.5	15.58	110.0	14.6	162.0	0.0387	0.450	59.3	0.000677	1.05872	0.562
10.0	15.28	110.0	14.2	151.0	0.0403	0.452	58.0	0.000668	1.05754	0.568
11.0	14.64	110.0	13.4	132.0	0.0432	0.455	55.7	0.000652	1.05511	0.584
12.0	13.99	110.0	12.8	115.0	0.0458	0.454	54.1	0.000641	1.05263	0.603
13.0	13.34	111.0	12.2	102.0	0.0480	0.452	53.0	0.000637	1.05015	0.623
14.0	12.71	112.0	11.7	91.5	0.0493	0.449	52.2	0.000641	1.04772	0.641
15.0	12.09	114.0	11.2	83.5	0.0497	0.446	51.7	0.000653	1.04538	0.656
16.0	11.51	116.0	10.9	77.5	0.0496	0.443	51.5	0.000668	1.04315	0.671
17.0	10.95	119.0	10.5	72.9	0.0490	0.441	51.5	0.000689	1.04105	0.683
18.0	10.43	123.0	10.2	69.2	0.0480	0.439	51.6	0.000714	1.03908	0.694
19.0	9.95	127.0	10.0	66.3	0.0467	0.438	51.9	0.000743	1.03725	0.702
20.0	9.503	131.0	9.75	64.0	0.0454	0.437	52.2	0.000775	1.03556	0.709
21.0	9.089	135.0	9.54	62.1	0.0439	0.438	52.6	0.000810	1.03399	0.715
22.0	8.704	140.0	9.36	60.5	0.0424	0.438	53.1	0.000848	1.03254	0.720
23.0	8.349	145.0	9.20	59.2	0.0410	0.440	53.6	0.000888	1.03120	0.724
24.0	8.019	150.0	9.06	58.1	0.0396	0.441	54.2	0.000930	1.02996	0.727
25.0	7.714	155.0	8.93	57.1	0.0382	0.443	54.8	0.000974	1.02880	0.729
26.0	7.430	160.0	8.81	56.3	0.0369	0.446	55.4	0.00102	1.02773	0.731
28.0	6.919	170.0	8.61	55.0	0.0344	0.451	56.6	0.00112	1.02581	0.733
30.0	6.474	180.0	8.44	54.0	0.0321	0.458	57.9	0.00122	1.02414	0.734
32.0	6.083	191.0	8.29	53.2	0.0301	0.465	59.3	0.00133	1.02267	0.734
34.0	5.738	202.0	8.17	52.6	0.0283	0.473	60.7	0.00144	1.02138	0.733
36.0	5.431	213.0	8.06	52.1	0.0267	0.481	62.1	0.00156	1.02023	0.732
38.0	5.156	223.0	7.96	51.7	0.0253	0.490	63.4	0.00168	1.01920	0.730
40.0	4.909	234.0	7.88	51.4	0.0239	0.499	64.8	0.00181	1.01827	0.729
45.0	4.386	262.0	7.70	50.7	0.0212	0.522	68.3	0.00215	1.01632	0.725
50.0	3.958	289.0	7.56	50.2	0.0190	0.546	71.7	0.00251	1.01475	0.720
55.0	3.625	316.0	7.46	49.8	0.0172	0.570	75.1	0.00289	1.01348	0.716
60.0	3.339	343.0	7.37	49.5	0.0157	0.595	78.4	0.00330	1.01241	0.713
65.0	3.096	370.0	7.29	49.2	0.0145	0.619	81.7	0.00372	1.01150	0.709
70.0	2.887	397.0	7.23	48.9	0.0135	0.643	84.9	0.00417	1.01072	0.706
75.0	2.705	423.0	7.18	48.7	0.0126	0.668	88.1	0.00463	1.01004	0.703
80.0	2.545	450.0	7.13	48.5	0.0118	0.692	91.2	0.00512	1.00945	0.700
90.0	2.277	503.0	7.06	48.2	0.0105	0.739	97.3	0.00615	1.00845	0.695
100.0	2.061	556.0	7.00	47.9	0.00947	0.786	103.0	0.00725	1.00765	0.691
125.0	1.657	687.0	6.90	47.4	0.00762	0.900	116.0	0.0103	1.00618	0.672
150.0	1.401	817.0	6.83	47.0	0.00639	1.01	129.0	0.0138	1.00519	0.668
175.0	1.208	947.0	6.79	46.7	0.00550	1.11	142.0	0.0177	1.00448	0.665
200.0	1.062	1080.0	6.75	46.5	0.00483	1.21	155.0	0.0219	1.00394	0.664
225.0	0.9475	1210.0	6.73	46.3	0.00431	1.31	167.0	0.0265	1.00351	0.663
250.0	0.8554	1340.0	6.71	46.2	0.00389	1.40	178.0	0.0315	1.00317	0.663
275.0	0.7796	1470.0	6.69	46.1	0.00354	1.49	190.0	0.0367	1.00289	0.663
300.0	0.7162	1600.0	6.68	46.0	0.00326	1.57	201.0	0.0422	1.00265	0.665
350.0	0.6159	1860.0	6.66	45.8	0.00280	1.74	223.0	0.0544	1.00228	0.665
400.0	0.5403	2110.0	6.65	45.7	0.00246	1.91	244.0	0.0679	1.00200	0.665
450.0	0.4812	2370.0	6.64	45.6	0.00219	2.06	265.0	0.0826	1.00178	0.665
500.0	0.4338	2630.0	6.63	45.5	0.00197	2.22	285.0	0.0986	1.00161	0.665
600.0	0.3623	3150.0	6.62	45.4	0.00165	2.52	323.0	0.134	1.00134	0.666
700.0	0.3111	3670.0	6.61	45.4	0.00141	2.80	360.0	0.174	1.00115	0.666
800.0	0.2725	4190.0	6.60	45.3	0.00124	3.08	395.0	0.218	1.00101	0.666
900.0	0.2425	4710.0	6.60	45.3	0.00110	3.35	429.0	0.266	1.00090	0.666
1000.0	0.2184	5230.0	6.59	45.2	0.000993	3.60	462.0	0.318	1.00081	0.666
1100.0	0.1987	5750.0	6.59	45.2	0.000904	3.86	494.0	0.374	1.00074	0.665
1200.0	0.1822	6260.0	6.59	45.2	0.000829	4.10	526.0	0.434	1.00067	0.665
1300.0	0.1682	6780.0	6.59	45.2	0.000765	4.34	556.0	0.497	1.00062	0.665
1400.0	0.1563	7300.0	6.58	45.1	0.000711	4.57	586.0	0.564	1.00058	0.665
1500.0	0.1459	7820.0	6.58	45.1	0.000664	4.81	616.0	0.634	1.00054	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

50.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
2.5	0.05230	1740.0	5.55	5.309	31.81	1.335	1.291	1.414	439.4
3.0	0.05268	1850.0	4.90	5.674	32.36	1.573	1.292	1.402	458.4
3.5	0.05306	1860.0	5.67	6.101	32.98	1.787	1.401	1.574	459.8
4.0	0.05353	1830.0	6.43	6.645	33.76	2.004	1.587	1.850	464.5
4.5	0.05407	1780.0	6.92	7.353	34.75	2.236	1.822	2.182	464.3
5.0	0.05469	1720.0	7.17	8.263	35.97	2.482	2.075	2.529	460.4
5.1	0.05483	1710.0	7.20	8.473	36.25	2.533	2.123	2.595	459.6
5.2	0.05496	1700.0	7.23	8.694	36.54	2.583	2.169	2.639	459.5
5.3	0.05509	1690.0	7.24	8.892	36.80	2.634	2.137	2.644	459.6
5.4	0.05522	1670.0	7.26	9.091	37.07	2.683	2.150	2.676	459.1
5.5	0.05536	1660.0	7.27	9.292	37.34	2.733	2.165	2.708	458.6
5.6	0.05549	1650.0	7.27	9.494	37.61	2.782	2.180	2.741	458.0
5.7	0.05563	1630.0	7.28	9.699	37.88	2.831	2.196	2.775	457.3
5.8	0.05577	1620.0	7.28	9.907	38.16	2.879	2.212	2.810	456.6
5.9	0.05591	1610.0	7.28	10.12	38.44	2.928	2.229	2.845	455.9
6.0	0.05605	1590.0	7.28	10.33	38.72	2.976	2.246	2.881	455.1
6.5	0.05679	1530.0	7.25	11.42	40.20	3.214	2.333	3.063	450.7
7.0	0.05758	1460.0	7.18	12.58	41.76	3.448	2.418	3.248	446.0
7.5	0.05842	1400.0	7.09	13.80	43.40	3.679	2.497	3.430	441.0
8.0	0.05932	1340.0	6.98	15.09	45.14	3.907	2.570	3.610	436.0
8.5	0.06027	1280.0	6.85	16.43	46.97	4.132	2.636	3.787	431.1
9.0	0.06128	1220.0	6.71	17.83	48.88	4.355	2.696	3.959	426.2
9.5	0.06234	1170.0	6.56	19.29	50.87	4.574	2.750	4.128	421.4
10.0	0.06347	1120.0	6.39	20.80	52.96	4.792	2.798	4.292	416.7
11.0	0.06594	1020.0	6.01	24.25	57.66	5.247	2.889	4.600	406.3
12.0	0.06866	942.0	5.63	27.88	62.67	5.689	2.952	4.881	397.1
13.0	0.07164	874.0	5.25	31.66	67.96	6.118	2.998	5.128	389.2
14.0	0.07486	821.0	4.88	35.54	73.47	6.531	3.032	5.332	382.6
15.0	0.07829	783.0	4.52	39.49	79.15	6.926	3.056	5.488	377.5
16.0	0.08193	759.0	4.21	43.20	84.71	7.285	3.078	5.621	374.6
17.0	0.08574	743.0	3.92	46.95	90.38	7.629	3.096	5.720	373.0
18.0	0.08968	735.0	3.66	50.70	96.14	7.958	3.111	5.791	372.3
19.0	0.09375	733.0	3.43	54.46	102.0	8.272	3.123	5.839	372.6
20.0	0.09790	735.0	3.22	58.21	107.8	8.573	3.134	5.869	373.5
21.0	0.1021	741.0	3.03	61.95	113.7	8.859	3.143	5.886	375.1
22.0	0.1064	750.0	2.86	65.67	119.6	9.133	3.150	5.893	377.1
23.0	0.1107	761.0	2.70	69.37	125.5	9.395	3.157	5.893	379.5
24.0	0.1151	774.0	2.56	73.05	131.4	9.646	3.162	5.888	382.2
25.0	0.1195	789.0	2.43	76.70	137.2	9.886	3.167	5.879	385.1
26.0	0.1239	804.0	2.32	80.34	143.1	10.12	3.170	5.866	388.3
28.0	0.1328	838.0	2.11	87.56	154.8	10.55	3.176	5.836	395.1
30.0	0.1417	875.0	1.94	94.69	166.5	10.95	3.180	5.801	402.2
32.0	0.1506	914.0	1.79	101.8	178.0	11.32	3.183	5.764	409.6
34.0	0.1594	955.0	1.67	108.7	189.5	11.67	3.184	5.728	417.2
36.0	0.1683	1000.0	1.56	115.7	200.9	12.00	3.185	5.693	424.8
38.0	0.1771	1040.0	1.46	122.6	212.3	12.31	3.185	5.660	432.4
40.0	0.1859	1080.0	1.37	129.4	223.6	12.60	3.184	5.628	440.0
45.0	0.2078	1190.0	1.20	146.3	251.5	13.25	3.182	5.559	458.7
50.0	0.2294	1300.0	1.06	163.0	279.2	13.84	3.179	5.502	476.9
55.0	0.2509	1410.0	0.955	179.5	306.6	14.36	3.175	5.455	494.5
60.0	0.2723	1510.0	0.868	195.8	333.8	14.83	3.172	5.417	511.6
65.0	0.2935	1620.0	0.796	212.1	360.8	15.27	3.169	5.386	528.2
70.0	0.3146	1730.0	0.735	228.3	387.6	15.66	3.166	5.360	544.2
75.0	0.3356	1830.0	0.683	244.4	414.4	16.03	3.163	5.338	559.8
80.0	0.3565	1940.0	0.637	260.4	441.0	16.38	3.160	5.320	575.0
90.0	0.3982	2150.0	0.563	292.3	494.1	17.00	3.156	5.291	604.1
100.0	0.4397	2360.0	0.505	324.1	546.9	17.56	3.152	5.271	631.9
125.0	0.5429	2870.0	0.401	403.1	678.2	18.73	3.145	5.238	696.4
150.0	0.6456	3390.0	0.334	481.8	808.9	19.68	3.140	5.221	755.4
175.0	0.7481	3900.0	0.285	560.2	939.3	20.49	3.137	5.211	810.0
200.0	0.8505	4410.0	0.250	638.6	1069.0	21.18	3.134	5.204	861.3
225.0	0.9528	4920.0	0.222	716.8	1200.0	21.79	3.132	5.200	909.7
250.0	1.055	5430.0	0.199	794.9	1329.0	22.34	3.131	5.198	955.6
275.0	1.157	5940.0	0.181	873.0	1459.0	22.84	3.129	5.196	999.0
300.0	1.260	6450.0	0.166	951.1	1589.0	23.29	3.128	5.194	1042.0
350.0	1.464	7470.0	0.142	1107.0	1849.0	24.09	3.127	5.193	1121.0
400.0	1.669	8490.0	0.125	1263.0	2109.0	24.78	3.126	5.192	1195.0
450.0	1.873	9510.0	0.111	1419.0	2368.0	25.40	3.125	5.191	1265.0
500.0	2.078	10500.0	0.100	1575.0	2628.0	25.94	3.124	5.191	1331.0
600.0	2.487	12600.0	0.0831	1887.0	3147.0	26.89	3.123	5.191	1455.0
700.0	2.896	14600.0	0.0713	2199.0	3666.0	27.69	3.122	5.191	1568.0
800.0	3.305	16600.0	0.0624	2511.0	4185.0	28.38	3.122	5.191	1675.0
900.0	3.714	18700.0	0.0555	2822.0	4704.0	28.99	3.122	5.191	1775.0
1000.0	4.123	20700.0	0.0499	3134.0	5223.0	29.54	3.121	5.191	1869.0
1100.0	4.533	22800.0	0.0454	3446.0	5742.0	30.04	3.121	5.191	1959.0
1200.0	4.942	24800.0	0.0416	3758.0	6261.0	30.49	3.121	5.191	2045.0
1300.0	5.351	26900.0	0.0384	4069.0	6781.0	30.90	3.121	5.191	2128.0
1400.0	5.761	28900.0	0.0357	4381.0	7300.0	31.29	3.120	5.192	2207.0
1500.0	6.170	31000.0	0.0333	4693.0	7819.0	31.65	3.120	5.192	2284.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

50.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
2.5	19.12	84.8	22.5	333.0	0.0167	0.247	166.0	0.000914	1.07233	0.952
3.0	18.98	100.0	20.0	350.0	0.0140	0.276	148.0	0.00104	1.07180	0.751
3.5	18.85	97.1	21.5	350.0	0.0162	0.297	131.0	0.00100	1.07127	0.697
4.0	18.68	98.2	21.7	341.0	0.0188	0.319	118.0	0.000922	1.07064	0.684
4.5	18.49	104.0	20.5	329.0	0.0211	0.341	106.0	0.000844	1.06991	0.682
5.0	18.28	111.0	18.9	314.0	0.0228	0.361	97.3	0.000782	1.06910	0.680
5.1	18.24	112.0	18.6	311.0	0.0231	0.365	95.6	0.000772	1.06893	0.679
5.2	18.19	113.0	18.5	309.0	0.0234	0.369	94.1	0.000769	1.06876	0.672
5.3	18.15	112.0	18.7	306.0	0.0237	0.373	92.6	0.000778	1.06859	0.656
5.4	18.11	112.0	18.6	303.0	0.0240	0.377	91.2	0.000778	1.06842	0.647
5.5	18.06	112.0	18.6	300.0	0.0242	0.381	89.9	0.000779	1.06826	0.639
5.6	18.02	112.0	18.5	297.0	0.0245	0.385	88.6	0.000779	1.06809	0.632
5.7	17.98	112.0	18.4	294.0	0.0248	0.388	87.4	0.000778	1.06791	0.625
5.8	17.93	112.0	18.4	290.0	0.0251	0.392	86.3	0.000778	1.06774	0.619
5.9	17.89	112.0	18.3	287.0	0.0253	0.395	85.1	0.000777	1.06757	0.613
6.0	17.84	113.0	18.2	284.0	0.0256	0.399	84.0	0.000776	1.06739	0.607
6.5	17.61	114.0	17.6	269.0	0.0270	0.414	79.2	0.000768	1.06649	0.586
7.0	17.37	115.0	17.1	254.0	0.0283	0.428	75.2	0.000758	1.06556	0.571
7.5	17.12	116.0	16.6	239.0	0.0296	0.439	71.8	0.000748	1.06460	0.561
8.0	16.86	116.0	16.1	225.0	0.0310	0.448	69.0	0.000737	1.06361	0.555
8.5	16.59	117.0	15.7	212.0	0.0323	0.456	66.6	0.000726	1.06259	0.553
9.0	16.32	118.0	15.3	199.0	0.0337	0.462	64.5	0.000715	1.06154	0.553
9.5	16.04	118.0	14.9	187.0	0.0350	0.467	62.7	0.000705	1.06047	0.555
10.0	15.76	118.0	14.5	176.0	0.0363	0.470	61.2	0.000696	1.05937	0.558
11.0	15.17	119.0	13.7	155.0	0.0387	0.474	58.7	0.000679	1.05711	0.570
12.0	14.56	119.0	13.1	137.0	0.0410	0.475	56.9	0.000668	1.05481	0.585
13.0	13.96	119.0	12.5	122.0	0.0430	0.473	55.5	0.000661	1.05249	0.602
14.0	13.36	120.0	12.0	110.0	0.0444	0.471	54.6	0.000661	1.05020	0.619
15.0	12.77	121.0	11.6	100.0	0.0452	0.468	54.0	0.000667	1.04797	0.634
16.0	12.21	124.0	11.2	92.6	0.0455	0.465	53.7	0.000677	1.04581	0.649
17.0	11.66	126.0	10.9	86.7	0.0453	0.462	53.5	0.000693	1.04375	0.663
18.0	11.15	130.0	10.6	82.0	0.0447	0.460	53.5	0.000712	1.04180	0.674
19.0	10.67	133.0	10.3	78.2	0.0439	0.458	53.7	0.000736	1.03997	0.684
20.0	10.21	137.0	10.1	75.1	0.0428	0.457	53.9	0.000762	1.03825	0.693
21.0	9.791	141.0	9.84	72.6	0.0417	0.457	54.3	0.000792	1.03665	0.700
22.0	9.397	146.0	9.65	70.5	0.0405	0.457	54.7	0.000825	1.03516	0.706
23.0	9.030	150.0	9.47	68.7	0.0393	0.457	55.1	0.000859	1.03377	0.711
24.0	8.687	155.0	9.32	67.3	0.0380	0.458	55.6	0.000896	1.03248	0.715
25.0	8.368	160.0	9.18	66.0	0.0368	0.460	56.2	0.000935	1.03127	0.718
26.0	8.070	164.0	9.05	64.9	0.0357	0.462	56.7	0.000975	1.03015	0.721
28.0	7.531	175.0	8.83	63.1	0.0334	0.466	57.9	0.00106	1.02812	0.725
30.0	7.059	185.0	8.64	61.8	0.0314	0.472	59.2	0.00115	1.02634	0.727
32.0	6.642	195.0	8.48	60.7	0.0295	0.478	60.5	0.00125	1.02477	0.728
34.0	6.272	206.0	8.34	59.9	0.0278	0.486	61.8	0.00135	1.02338	0.729
36.0	5.942	217.0	8.22	59.2	0.0263	0.493	63.1	0.00146	1.02214	0.728
38.0	5.646	227.0	8.11	58.6	0.0249	0.501	64.5	0.00157	1.02103	0.728
40.0	5.379	238.0	8.02	58.1	0.0236	0.510	65.8	0.00168	1.02003	0.727
45.0	4.813	265.0	7.82	57.2	0.0209	0.532	69.2	0.00199	1.01791	0.723
50.0	4.358	293.0	7.67	56.5	0.0188	0.555	72.6	0.00231	1.01621	0.720
55.0	3.985	320.0	7.55	56.0	0.0171	0.579	75.9	0.00266	1.01482	0.716
60.0	3.673	347.0	7.45	55.6	0.0156	0.603	79.2	0.00303	1.01365	0.712
65.0	3.407	374.0	7.37	55.2	0.0144	0.627	82.5	0.00341	1.01266	0.709
70.0	3.179	400.0	7.30	54.9	0.0134	0.651	85.7	0.00382	1.01181	0.706
75.0	2.980	427.0	7.24	54.6	0.0125	0.674	88.8	0.00424	1.01107	0.703
80.0	2.805	454.0	7.19	54.4	0.0117	0.698	91.9	0.00468	1.01042	0.700
90.0	2.511	507.0	7.11	54.0	0.0104	0.746	97.9	0.00561	1.00932	0.695
100.0	2.274	560.0	7.04	53.6	0.00942	0.792	104.0	0.00661	1.00844	0.691
125.0	1.842	691.0	6.93	52.9	0.00758	0.905	116.0	0.00938	1.00683	0.672
150.0	1.549	821.0	6.86	52.5	0.00636	1.01	130.0	0.0125	1.00574	0.668
175.0	1.337	951.0	6.81	52.1	0.00548	1.12	143.0	0.0160	1.00496	0.665
200.0	1.176	1080.0	6.77	51.8	0.00481	1.22	155.0	0.0199	1.00436	0.663
225.0	1.049	1210.0	6.74	51.6	0.00429	1.31	167.0	0.0240	1.00389	0.662
250.0	0.9478	1340.0	6.72	51.5	0.00388	1.40	179.0	0.0285	1.00351	0.662
275.0	0.8640	1470.0	6.71	51.3	0.00353	1.49	190.0	0.0332	1.00320	0.663
300.0	0.7939	1600.0	6.69	51.2	0.00325	1.57	201.0	0.0381	1.00294	0.664
350.0	0.6830	1860.0	6.67	51.0	0.00279	1.74	223.0	0.0491	1.00253	0.665
400.0	0.5993	2120.0	6.65	50.9	0.00245	1.91	244.0	0.0613	1.00222	0.665
450.0	0.5339	2380.0	6.64	50.8	0.00218	2.07	265.0	0.0746	1.00198	0.665
500.0	0.4813	2640.0	6.63	50.7	0.00197	2.22	285.0	0.0889	1.00178	0.665
600.0	0.4022	3160.0	6.62	50.5	0.00165	2.52	323.0	0.121	1.00149	0.665
700.0	0.3453	3670.0	6.61	50.4	0.00141	2.81	360.0	0.157	1.00128	0.665
800.0	0.3026	4190.0	6.60	50.4	0.00124	3.08	395.0	0.196	1.00112	0.665
900.0	0.2692	4710.0	6.60	50.3	0.00110	3.35	429.0	0.239	1.00100	0.665
1000.0	0.2425	5230.0	6.59	50.3	0.000993	3.61	462.0	0.286	1.00090	0.665
1100.0	0.2206	5750.0	6.59	50.2	0.000903	3.86	494.0	0.337	1.00082	0.665
1200.0	0.2023	6270.0	6.59	50.2	0.000828	4.10	526.0	0.390	1.00075	0.665
1300.0	0.1869	6790.0	6.59	50.2	0.000765	4.34	556.0	0.447	1.00069	0.665
1400.0	0.1736	7310.0	6.58	50.2	0.000711	4.58	586.0	0.508	1.00064	0.665
1500.0	0.1621	7820.0	6.58	50.2	0.000664	4.81	616.0	0.571	1.00060	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

60.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
3.0	0.05126	2010.0	6.16	6.192	37.36	1.484	1.289	1.440	476.8
3.5	0.05166	2060.0	6.40	6.563	37.97	1.695	1.339	1.527	487.6
4.0	0.05209	2050.0	6.93	7.045	38.71	1.905	1.523	1.781	492.8
4.5	0.05258	2010.0	7.31	7.696	39.66	2.127	1.769	2.104	492.5
5.0	0.05312	1960.0	7.51	8.552	40.85	2.365	2.033	2.444	488.7
5.1	0.05323	1950.0	7.54	8.751	41.11	2.414	2.083	2.509	487.9
5.2	0.05335	1940.0	7.56	8.962	41.40	2.463	2.111	2.552	487.9
5.3	0.05346	1930.0	7.57	9.149	41.65	2.511	2.100	2.556	488.0
5.4	0.05357	1920.0	7.58	9.337	41.91	2.559	2.115	2.586	487.6
5.5	0.05369	1910.0	7.59	9.527	42.17	2.607	2.131	2.616	487.1
5.6	0.05380	1900.0	7.60	9.719	42.43	2.654	2.148	2.648	486.6
5.7	0.05392	1880.0	7.60	9.913	42.69	2.702	2.165	2.680	486.0
5.8	0.05404	1870.0	7.60	10.11	42.96	2.749	2.182	2.713	485.3
5.9	0.05416	1860.0	7.60	10.31	43.23	2.795	2.200	2.746	484.7
6.0	0.05428	1840.0	7.60	10.51	43.51	2.842	2.218	2.780	483.9
6.5	0.05490	1780.0	7.58	11.55	44.92	3.071	2.310	2.950	480.0
7.0	0.05556	1720.0	7.53	12.64	46.42	3.297	2.397	3.122	475.7
7.5	0.05626	1650.0	7.47	13.80	48.00	3.518	2.479	3.290	471.3
8.0	0.05700	1590.0	7.38	15.01	49.66	3.736	2.553	3.456	466.8
8.5	0.05777	1530.0	7.28	16.28	51.41	3.952	2.620	3.617	462.4
9.0	0.05859	1470.0	7.17	17.60	53.23	4.164	2.681	3.775	458.0
9.5	0.05945	1420.0	7.04	18.98	55.12	4.373	2.736	3.928	453.8
10.0	0.06036	1360.0	6.90	20.40	57.10	4.579	2.786	4.077	449.6
11.0	0.06232	1260.0	6.56	23.69	61.58	5.013	2.878	4.352	440.0
12.0	0.06445	1170.0	6.21	27.16	66.34	5.434	2.945	4.605	431.4
13.0	0.06675	1100.0	5.86	30.77	71.35	5.841	2.994	4.835	423.5
14.0	0.06923	1030.0	5.52	34.50	76.59	6.234	3.031	5.038	416.6
15.0	0.07187	978.0	5.18	38.32	82.02	6.612	3.058	5.208	410.8
16.0	0.07469	940.0	4.87	41.90	87.30	6.953	3.080	5.362	407.0
17.0	0.07765	911.0	4.58	45.53	92.73	7.282	3.099	5.486	404.2
18.0	0.08074	891.0	4.30	49.18	98.27	7.598	3.114	5.584	402.3
19.0	0.08394	878.0	4.05	52.86	103.9	7.902	3.126	5.660	401.3
20.0	0.08723	871.0	3.82	56.55	109.6	8.194	3.137	5.716	401.1
21.0	0.09060	869.0	3.60	60.24	115.3	8.474	3.145	5.757	401.5
22.0	0.09403	871.0	3.41	63.92	121.1	8.742	3.153	5.785	402.4
23.0	0.09752	876.0	3.23	67.60	126.9	9.000	3.159	5.803	403.8
24.0	0.1010	884.0	3.07	71.26	132.7	9.247	3.165	5.813	405.6
25.0	0.1046	894.0	2.92	74.91	138.5	9.485	3.170	5.818	407.7
26.0	0.1082	906.0	2.79	78.55	144.3	9.713	3.174	5.818	410.1
28.0	0.1154	933.0	2.55	85.77	156.0	10.14	3.180	5.807	415.5
30.0	0.1227	965.0	2.34	92.93	167.5	10.54	3.185	5.788	421.4
32.0	0.1301	1000.0	2.17	100.0	179.1	10.92	3.188	5.764	427.8
34.0	0.1374	1040.0	2.01	107.1	190.6	11.27	3.190	5.737	434.5
36.0	0.1447	1070.0	1.88	114.1	202.0	11.59	3.192	5.709	441.3
38.0	0.1521	1110.0	1.76	121.0	213.4	11.90	3.192	5.681	448.2
40.0	0.1594	1150.0	1.66	127.9	224.8	12.19	3.192	5.653	455.2
45.0	0.1776	1260.0	1.45	144.9	252.9	12.85	3.191	5.589	472.6
50.0	0.1957	1360.0	1.28	161.7	280.7	13.44	3.188	5.533	489.8
55.0	0.2136	1470.0	1.15	178.3	308.2	13.96	3.185	5.485	506.7
60.0	0.2315	1580.0	1.05	194.8	335.5	14.44	3.181	5.446	523.2
65.0	0.2492	1680.0	0.959	211.2	362.7	14.87	3.178	5.412	539.2
70.0	0.2668	1790.0	0.885	227.4	389.7	15.27	3.175	5.384	554.8
75.0	0.2844	1900.0	0.822	243.6	416.5	15.64	3.171	5.360	569.9
80.0	0.3019	2000.0	0.767	259.7	443.3	15.99	3.169	5.340	584.7
90.0	0.3367	2210.0	0.677	291.8	496.5	16.62	3.163	5.308	613.2
100.0	0.3713	2420.0	0.607	323.7	549.5	17.17	3.159	5.284	640.5
125.0	0.4574	2940.0	0.482	403.0	681.9	18.35	3.151	5.247	704.0
150.0	0.5431	3450.0	0.400	481.8	811.9	19.30	3.145	5.226	762.2
175.0	0.6285	3960.0	0.342	560.3	942.4	20.11	3.141	5.214	816.3
200.0	0.7138	4470.0	0.299	638.7	1073.0	20.80	3.138	5.207	867.0
225.0	0.7990	4980.0	0.266	717.0	1203.0	21.42	3.135	5.202	915.0
250.0	0.8842	5490.0	0.239	795.2	1333.0	21.96	3.134	5.199	960.6
275.0	0.9694	6000.0	0.217	873.3	1463.0	22.46	3.132	5.196	1004.0
300.0	1.055	6510.0	0.199	951.5	1593.0	22.91	3.131	5.195	1046.0
350.0	1.225	7530.0	0.171	1108.0	1852.0	23.71	3.129	5.193	1125.0
400.0	1.395	8540.0	0.150	1264.0	2112.0	24.41	3.128	5.192	1199.0
450.0	1.565	9560.0	0.133	1420.0	2371.0	25.02	3.127	5.191	1268.0
500.0	1.735	10600.0	0.120	1576.0	2631.0	25.56	3.126	5.191	1334.0
600.0	2.077	12600.0	0.100	1888.0	3150.0	26.51	3.125	5.191	1457.0
700.0	2.417	14700.0	0.0855	2199.0	3669.0	27.31	3.124	5.191	1571.0
800.0	2.758	16700.0	0.0748	2511.0	4188.0	28.00	3.123	5.191	1677.0
900.0	3.099	18700.0	0.0665	2823.0	4707.0	28.62	3.123	5.191	1776.0
1000.0	3.440	20800.0	0.0599	3135.0	5226.0	29.16	3.122	5.191	1871.0
1100.0	3.781	22800.0	0.0544	3447.0	5745.0	29.66	3.122	5.191	1961.0
1200.0	4.122	24900.0	0.0499	3758.0	6264.0	30.11	3.122	5.191	2047.0
1300.0	4.463	26900.0	0.0461	4070.0	6784.0	30.52	3.122	5.191	2129.0
1400.0	4.804	28900.0	0.0428	4382.0	7303.0	30.91	3.121	5.191	2209.0
1500.0	5.145	31000.0	0.0399	4694.0	7822.0	31.27	3.121	5.191	2285.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

60.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)$_P$	V(DP/DU)$_V$	-V(DP/DV)$_T$	(DV/DT)/V$_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
3.0	19.51	91.6	24.5	392.0	0.0157	0.290	180.0	0.00163	1.07383	0.893
3.5	19.36	95.1	24.7	398.0	0.0161	0.311	167.0	0.00165	1.07325	0.768
4.0	19.20	101.0	23.7	394.0	0.0176	0.334	138.0	0.000977	1.07263	0.737
4.5	19.02	110.0	21.7	383.0	0.0191	0.357	124.0	0.000843	1.07194	0.729
5.0	18.83	120.0	19.6	369.0	0.0204	0.380	112.0	0.000825	1.07119	0.722
5.1	18.79	122.0	19.3	366.0	0.0206	0.384	110.0	0.000819	1.07104	0.719
5.2	18.74	123.0	19.1	364.0	0.0208	0.388	108.0	0.000812	1.07088	0.710
5.3	18.70	122.0	19.3	361.0	0.0210	0.392	106.0	0.000821	1.07073	0.692
5.4	18.67	122.0	19.2	358.0	0.0212	0.397	105.0	0.000822	1.07057	0.681
5.5	18.63	122.0	19.1	355.0	0.0214	0.401	103.0	0.000822	1.07042	0.672
5.6	18.59	123.0	19.0	352.0	0.0216	0.405	101.0	0.000822	1.07027	0.663
5.7	18.55	123.0	18.9	349.0	0.0218	0.409	100.0	0.000822	1.07011	0.654
5.8	18.51	124.0	18.8	346.0	0.0220	0.413	98.3	0.000822	1.06995	0.647
5.9	18.46	124.0	18.7	343.0	0.0222	0.416	96.9	0.000821	1.06980	0.639
6.0	18.42	124.0	18.6	340.0	0.0224	0.420	95.6	0.000822	1.06964	0.633
6.5	18.21	126.0	18.0	324.0	0.0234	0.437	89.6	0.000814	1.06883	0.605
7.0	18.00	128.0	17.5	309.0	0.0244	0.452	84.7	0.000805	1.06800	0.585
7.5	17.77	129.0	16.9	294.0	0.0254	0.465	80.6	0.000795	1.06713	0.570
8.0	17.54	131.0	16.5	279.0	0.0265	0.476	77.1	0.000785	1.06625	0.560
8.5	17.31	131.0	16.1	265.0	0.0275	0.485	74.2	0.000775	1.06534	0.553
9.0	17.07	132.0	15.7	251.0	0.0285	0.493	71.7	0.000765	1.06441	0.549
9.5	16.82	133.0	15.3	238.0	0.0296	0.499	69.5	0.000755	1.06346	0.547
10.0	16.57	133.0	15.0	226.0	0.0306	0.503	67.6	0.000745	1.06249	0.548
11.0	16.05	135.0	14.2	203.0	0.0324	0.509	64.5	0.000729	1.06049	0.552
12.0	15.52	135.0	13.6	182.0	0.0341	0.512	62.3	0.000716	1.05846	0.560
13.0	14.98	135.0	13.1	164.0	0.0357	0.512	60.6	0.000707	1.05641	0.572
14.0	14.44	136.0	12.6	149.0	0.0370	0.511	59.3	0.000702	1.05435	0.586
15.0	13.91	137.0	12.2	136.0	0.0381	0.508	58.5	0.000701	1.05232	0.599
16.0	13.39	139.0	11.8	126.0	0.0387	0.505	57.8	0.000704	1.05032	0.614
17.0	12.88	141.0	11.5	117.0	0.0390	0.502	57.5	0.000711	1.04837	0.628
18.0	12.39	143.0	11.2	110.0	0.0390	0.499	57.3	0.000722	1.04650	0.640
19.0	11.91	146.0	10.9	105.0	0.0387	0.497	57.2	0.000737	1.04470	0.652
20.0	11.46	150.0	10.6	100.0	0.0382	0.495	57.3	0.000755	1.04299	0.662
21.0	11.04	153.0	10.4	95.9	0.0376	0.493	57.5	0.000777	1.04137	0.671
22.0	10.63	157.0	10.2	92.6	0.0368	0.492	57.8	0.000803	1.03984	0.679
23.0	10.25	161.0	10.0	89.9	0.0360	0.492	58.1	0.000827	1.03840	0.685
24.0	9.896	166.0	9.80	87.5	0.0351	0.492	58.5	0.000855	1.03705	0.691
25.0	9.559	170.0	9.64	85.5	0.0342	0.492	58.9	0.000885	1.03577	0.696
26.0	9.242	175.0	9.50	83.7	0.0333	0.493	59.4	0.000917	1.03457	0.701
28.0	8.662	184.0	9.24	80.8	0.0315	0.496	60.4	0.000986	1.03238	0.708
30.0	8.148	194.0	9.02	78.6	0.0298	0.500	61.6	0.00106	1.03044	0.713
32.0	7.689	204.0	8.84	76.8	0.0282	0.505	62.8	0.00114	1.02871	0.716
34.0	7.278	215.0	8.67	75.4	0.0267	0.511	64.0	0.00122	1.02716	0.719
36.0	6.909	225.0	8.53	74.2	0.0253	0.517	65.2	0.00131	1.02578	0.720
38.0	6.576	236.0	8.41	73.3	0.0241	0.524	66.5	0.00140	1.02452	0.721
40.0	6.274	247.0	8.29	72.5	0.0229	0.532	67.8	0.00150	1.02339	0.721
45.0	5.631	273.0	8.06	70.9	0.0204	0.552	71.1	0.00175	1.02098	0.720
50.0	5.110	300.0	7.88	69.7	0.0184	0.573	74.3	0.00203	1.01903	0.717
55.0	4.681	327.0	7.74	68.9	0.0168	0.596	77.6	0.00232	1.01742	0.714
60.0	4.320	354.0	7.62	68.2	0.0154	0.618	80.8	0.00263	1.01607	0.711
65.0	4.013	381.0	7.52	67.6	0.0142	0.642	83.9	0.00295	1.01492	0.708
70.0	3.748	408.0	7.44	67.1	0.0132	0.665	87.1	0.00330	1.01393	0.705
75.0	3.516	435.0	7.37	66.7	0.0123	0.688	90.2	0.00365	1.01307	0.702
80.0	3.313	462.0	7.31	66.3	0.0116	0.711	93.2	0.00402	1.01231	0.700
90.0	2.970	515.0	7.21	65.7	0.0103	0.758	99.2	0.00481	1.01103	0.695
100.0	2.693	568.0	7.13	65.2	0.00931	0.804	105.0	0.00565	1.01000	0.690
125.0	2.186	699.0	7.00	64.2	0.00751	0.915	117.0	0.00798	1.00811	0.671
150.0	1.841	830.0	6.91	63.5	0.00630	1.02	131.0	0.0106	1.00683	0.667
175.0	1.591	960.0	6.85	63.0	0.00543	1.13	143.0	0.0136	1.00590	0.664
200.0	1.401	1090.0	6.81	62.6	0.00478	1.22	156.0	0.0168	1.00519	0.662
225.0	1.251	1220.0	6.78	62.3	0.00427	1.32	168.0	0.0202	1.00464	0.661
250.0	1.131	1350.0	6.75	62.1	0.00385	1.41	179.0	0.0239	1.00419	0.661
275.0	1.032	1480.0	6.73	61.9	0.00351	1.49	190.0	0.0279	1.00382	0.662
300.0	0.9483	1610.0	6.71	61.7	0.00323	1.58	201.0	0.0320	1.00351	0.663
350.0	0.8164	1870.0	6.69	61.4	0.00278	1.75	223.0	0.0412	1.00303	0.664
400.0	0.7168	2130.0	6.67	61.2	0.00244	1.91	244.0	0.0513	1.00266	0.664
450.0	0.6388	2390.0	6.65	61.1	0.00218	2.07	265.0	0.0624	1.00237	0.664
500.0	0.5761	2640.0	6.64	61.0	0.00196	2.22	285.0	0.0744	1.00213	0.665
600.0	0.4816	3160.0	6.63	60.8	0.00164	2.52	323.0	0.101	1.00178	0.665
700.0	0.4137	3680.0	6.62	60.6	0.00141	2.81	360.0	0.131	1.00153	0.665
800.0	0.3626	4200.0	6.61	60.5	0.00124	3.08	395.0	0.164	1.00134	0.665
900.0	0.3227	4720.0	6.60	60.5	0.00110	3.35	429.0	0.200	1.00119	0.665
1000.0	0.2907	5240.0	6.60	60.4	0.000991	3.61	462.0	0.239	1.00108	0.665
1100.0	0.2645	5760.0	6.59	60.4	0.000902	3.86	494.0	0.281	1.00098	0.665
1200.0	0.2426	6270.0	6.59	60.3	0.000827	4.10	526.0	0.326	1.00090	0.665
1300.0	0.2241	6790.0	6.59	60.3	0.000764	4.34	556.0	0.373	1.00083	0.665
1400.0	0.2082	7310.0	6.58	60.3	0.000710	4.58	586.0	0.424	1.00077	0.665
1500.0	0.1944	7830.0	6.58	60.2	0.000663	4.81	616.0	0.476	1.00072	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

70.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
3.0	0.05002	2150.0	7.91	6.718	42.19	1.386	1.348	1.570	503.1
3.5	0.05044	2240.0	7.34	7.051	42.83	1.606	1.311	1.528	514.2
4.0	0.05086	2250.0	7.54	7.486	43.56	1.812	1.481	1.746	518.8
4.5	0.05131	2230.0	7.75	8.092	44.48	2.030	1.732	2.055	518.0
5.0	0.05180	2190.0	7.86	8.906	45.64	2.262	2.002	2.386	514.0
5.1	0.05190	2180.0	7.88	9.097	45.91	2.309	2.053	2.449	513.3
5.2	0.05200	2170.0	7.89	9.299	46.18	2.357	2.083	2.491	513.2
5.3	0.05210	2160.0	7.89	9.478	46.43	2.405	2.073	2.493	513.4
5.4	0.05220	2150.0	7.90	9.658	46.68	2.452	2.089	2.521	513.0
5.5	0.05230	2140.0	7.90	9.839	46.93	2.498	2.106	2.550	512.5
5.6	0.05240	2130.0	7.90	10.02	47.19	2.544	2.124	2.580	512.0
5.7	0.05250	2120.0	7.90	10.21	47.45	2.590	2.142	2.611	511.4
5.8	0.05261	2110.0	7.90	10.40	47.71	2.636	2.160	2.642	510.8
5.9	0.05271	2090.0	7.89	10.59	47.97	2.681	2.179	2.673	510.2
6.0	0.05282	2080.0	7.89	10.78	48.24	2.727	2.198	2.705	509.5
6.5	0.05336	2020.0	7.87	11.77	49.62	2.950	2.291	2.866	505.9
7.0	0.05393	1960.0	7.83	12.82	51.07	3.168	2.380	3.027	501.9
7.5	0.05453	1890.0	7.78	13.93	52.60	3.383	2.462	3.185	497.9
8.0	0.05515	1830.0	7.71	15.09	54.20	3.594	2.537	3.339	493.8
8.5	0.05581	1770.0	7.64	16.30	55.88	3.802	2.605	3.490	489.9
9.0	0.05650	1710.0	7.55	17.56	57.63	4.006	2.667	3.637	486.0
9.5	0.05722	1650.0	7.44	18.87	59.46	4.207	2.723	3.780	482.1
10.0	0.05798	1600.0	7.33	20.23	61.35	4.406	2.774	3.919	478.3
11.0	0.05961	1500.0	7.02	23.39	65.68	4.825	2.867	4.172	469.6
12.0	0.06136	1400.0	6.70	26.74	70.26	5.230	2.937	4.405	461.5
13.0	0.06323	1320.0	6.38	30.22	75.07	5.621	2.990	4.619	454.0
14.0	0.06524	1240.0	6.06	33.84	80.11	5.999	3.029	4.813	447.2
15.0	0.06737	1180.0	5.74	37.55	85.33	6.363	3.058	4.983	441.2
16.0	0.06964	1130.0	5.44	41.00	90.40	6.690	3.083	5.143	436.9
17.0	0.07204	1090.0	5.15	44.51	95.61	7.006	3.102	5.279	433.5
18.0	0.07454	1060.0	4.88	48.07	100.9	7.311	3.118	5.393	430.8
19.0	0.07715	1040.0	4.61	51.67	106.4	7.605	3.131	5.486	428.9
20.0	0.07984	1020.0	4.37	55.28	111.9	7.888	3.141	5.561	427.7
21.0	0.08261	1010.0	4.14	58.91	117.5	8.161	3.150	5.620	427.2
22.0	0.08544	1000.0	3.93	62.55	123.1	8.424	3.157	5.666	427.2
23.0	0.08833	1000.0	3.74	66.18	128.8	8.676	3.163	5.700	427.8
24.0	0.09126	1000.0	3.56	69.82	134.5	8.919	3.169	5.725	428.8
25.0	0.09423	1010.0	3.40	73.44	140.3	9.154	3.173	5.742	430.1
26.0	0.09723	1020.0	3.24	77.06	146.0	9.379	3.178	5.754	431.8
28.0	0.1033	1040.0	2.97	84.27	157.5	9.806	3.184	5.763	435.9
30.0	0.1095	1060.0	2.74	91.43	169.1	10.20	3.189	5.759	440.8
32.0	0.1157	1090.0	2.54	98.54	180.6	10.57	3.193	5.747	446.1
34.0	0.1219	1120.0	2.36	105.6	192.1	10.92	3.196	5.730	451.9
36.0	0.1281	1160.0	2.21	112.6	203.5	11.25	3.198	5.709	458.0
38.0	0.1344	1200.0	2.07	119.6	214.9	11.56	3.199	5.687	464.2
40.0	0.1406	1230.0	1.95	126.5	226.2	11.85	3.199	5.664	470.6
45.0	0.1562	1330.0	1.70	143.6	254.4	12.51	3.199	5.608	486.7
50.0	0.1717	1440.0	1.51	160.6	282.3	13.10	3.196	5.555	503.0
55.0	0.1871	1540.0	1.35	177.3	310.0	13.63	3.193	5.509	519.0
60.0	0.2024	1650.0	1.23	193.9	337.4	14.11	3.190	5.469	534.8
65.0	0.2176	1750.0	1.12	210.3	364.7	14.54	3.186	5.435	550.2
70.0	0.2328	1860.0	1.04	226.7	391.8	14.94	3.183	5.405	565.3
75.0	0.2479	1960.0	0.962	242.9	418.7	15.32	3.180	5.380	580.1
80.0	0.2629	2070.0	0.897	259.1	445.6	15.66	3.177	5.358	594.5
90.0	0.2928	2280.0	0.792	291.3	499.0	16.29	3.171	5.323	622.4
100.0	0.3225	2490.0	0.709	323.3	552.1	16.85	3.166	5.297	649.1
125.0	0.3964	3000.0	0.563	402.8	683.9	18.03	3.157	5.255	711.5
150.0	0.4698	3510.0	0.467	481.7	815.0	18.98	3.150	5.231	769.0
175.0	0.5430	4020.0	0.399	560.4	945.5	19.79	3.145	5.218	822.5
200.0	0.6161	4530.0	0.349	638.9	1076.0	20.48	3.142	5.209	872.7
225.0	0.6892	5040.0	0.310	717.2	1206.0	21.10	3.139	5.203	920.3
250.0	0.7622	5550.0	0.279	795.5	1336.0	21.65	3.137	5.200	965.5
275.0	0.8351	6060.0	0.254	873.7	1466.0	22.14	3.135	5.197	1009.0
300.0	0.9081	6570.0	0.232	951.8	1596.0	22.59	3.134	5.195	1050.0
350.0	1.054	7580.0	0.199	1108.0	1856.0	23.39	3.131	5.193	1129.0
400.0	1.200	8600.0	0.174	1264.0	2115.0	24.09	3.130	5.192	1202.0
450.0	1.346	9620.0	0.155	1420.0	2375.0	24.70	3.129	5.191	1271.0
500.0	1.492	10600.0	0.139	1576.0	2634.0	25.25	3.128	5.190	1337.0
600.0	1.784	12700.0	0.116	1888.0	3153.0	26.19	3.126	5.190	1460.0
700.0	2.076	14700.0	0.100	2200.0	3672.0	26.99	3.125	5.190	1573.0
800.0	2.368	16700.0	0.0873	2512.0	4191.0	27.68	3.124	5.190	1679.0
900.0	2.660	18800.0	0.0776	2824.0	4710.0	28.30	3.124	5.190	1778.0
1000.0	2.952	20800.0	0.0698	3136.0	5229.0	28.84	3.123	5.190	1872.0
1100.0	3.244	22900.0	0.0635	3447.0	5748.0	29.34	3.123	5.191	1962.0
1200.0	3.536	24900.0	0.0582	3759.0	6267.0	29.79	3.123	5.191	2048.0
1300.0	3.829	26900.0	0.0537	4071.0	6787.0	30.20	3.122	5.191	2130.0
1400.0	4.121	29000.0	0.0499	4383.0	7306.0	30.59	3.122	5.191	2210.0
1500.0	4.413	31000.0	0.0466	4695.0	7825.0	30.95	3.122	5.191	2286.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

70.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
3.0	19.93	85.1	29.4	429.0	0.0184	0.303	217.0	0.000966	1.07571	1.12
3.5	19.83	92.4	28.2	444.0	0.0165	0.325	185.0	0.00107	1.07506	0.870
4.0	19.66	103.0	25.9	443.0	0.0170	0.349	161.0	0.00102	1.07442	0.807
4.5	19.49	115.0	23.0	435.0	0.0178	0.373	143.0	0.000931	1.07376	0.785
5.0	19.31	128.0	20.3	423.0	0.0186	0.397	128.0	0.000861	1.07305	0.770
5.1	19.27	131.0	19.9	420.0	0.0188	0.401	125.0	0.000850	1.07290	0.766
5.2	19.23	132.0	19.7	418.0	0.0189	0.406	123.0	0.000847	1.07275	0.755
5.3	19.19	131.0	19.8	415.0	0.0190	0.410	121.0	0.000858	1.07261	0.734
5.4	19.16	132.0	19.7	412.0	0.0191	0.415	119.0	0.000859	1.07247	0.722
5.5	19.12	132.0	19.6	409.0	0.0193	0.419	117.0	0.000860	1.07233	0.710
5.6	19.08	133.0	19.5	406.0	0.0194	0.424	115.0	0.000860	1.07219	0.699
5.7	19.05	133.0	19.4	403.0	0.0196	0.428	113.0	0.000860	1.07204	0.689
5.8	19.01	134.0	19.2	400.0	0.0197	0.432	111.0	0.000860	1.07190	0.680
5.9	18.97	135.0	19.1	397.0	0.0199	0.436	109.0	0.000860	1.07175	0.671
6.0	18.93	135.0	19.0	394.0	0.0200	0.440	108.0	0.000859	1.07161	0.662
6.5	18.74	138.0	18.3	378.0	0.0208	0.459	101.0	0.000854	1.07086	0.628
7.0	18.54	140.0	17.7	363.0	0.0216	0.475	94.6	0.000846	1.07010	0.603
7.5	18.34	142.0	17.2	347.0	0.0224	0.489	89.6	0.000838	1.06932	0.583
8.0	18.13	144.0	16.8	332.0	0.0233	0.502	85.5	0.000828	1.06851	0.569
8.5	17.92	145.0	16.4	317.0	0.0241	0.512	81.9	0.000819	1.06769	0.558
9.0	17.70	146.0	16.0	303.0	0.0249	0.521	78.9	0.000809	1.06684	0.551
9.5	17.48	147.0	15.6	289.0	0.0258	0.528	76.3	0.000799	1.06598	0.547
10.0	17.25	147.0	15.3	276.0	0.0266	0.533	74.0	0.000789	1.06510	0.544
11.0	16.78	149.0	14.6	251.0	0.0280	0.541	70.3	0.000773	1.06329	0.543
12.0	16.30	150.0	14.0	228.0	0.0293	0.545	67.6	0.000759	1.06145	0.546
13.0	15.81	151.0	13.5	208.0	0.0306	0.547	65.5	0.000748	1.05960	0.554
14.0	15.33	151.0	13.0	190.0	0.0318	0.546	64.0	0.000741	1.05774	0.563
15.0	14.84	152.0	12.6	175.0	0.0328	0.545	62.8	0.000736	1.05588	0.574
16.0	14.36	153.0	12.3	162.0	0.0335	0.542	61.9	0.000734	1.05402	0.587
17.0	13.88	155.0	12.0	151.0	0.0340	0.539	61.3	0.000736	1.05220	0.600
18.0	13.41	157.0	11.7	142.0	0.0343	0.536	60.9	0.000741	1.05042	0.613
19.0	12.96	160.0	11.4	134.0	0.0344	0.533	60.7	0.000750	1.04869	0.624
20.0	12.52	163.0	11.1	128.0	0.0342	0.531	60.6	0.000762	1.04702	0.635
21.0	12.11	166.0	10.9	122.0	0.0339	0.528	60.7	0.000777	1.04543	0.645
22.0	11.70	169.0	10.6	117.0	0.0335	0.527	60.8	0.000794	1.04390	0.654
23.0	11.32	173.0	10.4	113.0	0.0330	0.525	61.0	0.000814	1.04245	0.662
24.0	10.95	177.0	10.3	110.0	0.0323	0.524	61.3	0.000836	1.04107	0.669
25.0	10.61	181.0	10.1	107.0	0.0317	0.524	61.6	0.000860	1.03976	0.676
26.0	10.28	186.0	9.92	105.0	0.0310	0.524	62.0	0.000885	1.03852	0.681
28.0	9.680	195.0	9.64	100.0	0.0296	0.525	62.9	0.000941	1.03623	0.691
30.0	9.136	204.0	9.39	97.0	0.0282	0.527	63.9	0.00100	1.03417	0.698
32.0	8.646	214.0	9.18	94.4	0.0269	0.531	65.0	0.00107	1.03232	0.703
34.0	8.205	224.0	9.00	92.3	0.0256	0.536	66.1	0.00114	1.03065	0.708
36.0	7.805	234.0	8.84	90.5	0.0244	0.541	67.3	0.00121	1.02915	0.711
38.0	7.442	245.0	8.69	89.0	0.0232	0.547	68.5	0.00129	1.02778	0.713
40.0	7.112	255.0	8.57	87.8	0.0222	0.553	69.7	0.00137	1.02654	0.714
45.0	6.403	282.0	8.30	85.4	0.0199	0.572	72.9	0.00159	1.02387	0.715
50.0	5.825	309.0	8.09	83.7	0.0180	0.591	76.0	0.00183	1.02170	0.714
55.0	5.345	336.0	7.93	82.4	0.0164	0.613	79.2	0.00208	1.01991	0.712
60.0	4.941	362.0	7.79	81.4	0.0151	0.634	82.3	0.00235	1.01839	0.710
65.0	4.595	389.0	7.68	80.5	0.0140	0.657	85.4	0.00263	1.01710	0.707
70.0	4.296	416.0	7.58	79.8	0.0130	0.679	88.5	0.00293	1.01598	0.704
75.0	4.034	443.0	7.50	79.2	0.0121	0.702	91.5	0.00323	1.01500	0.701
80.0	3.804	470.0	7.43	78.7	0.0114	0.725	94.5	0.00356	1.01414	0.699
90.0	3.416	523.0	7.31	77.8	0.0102	0.770	100.0	0.00424	1.01269	0.694
100.0	3.101	576.0	7.22	77.1	0.00920	0.815	106.0	0.00496	1.01152	0.690
125.0	2.523	707.0	7.06	75.7	0.00743	0.926	118.0	0.00698	1.00937	0.671
150.0	2.129	838.0	6.96	74.8	0.00624	1.03	131.0	0.00927	1.00790	0.666
175.0	1.842	968.0	6.90	74.1	0.00539	1.13	144.0	0.0118	1.00683	0.663
200.0	1.623	1100.0	6.85	73.6	0.00474	1.23	156.0	0.0146	1.00602	0.662
225.0	1.451	1230.0	6.81	73.2	0.00424	1.32	168.0	0.0175	1.00538	0.661
250.0	1.312	1360.0	6.78	72.8	0.00383	1.41	180.0	0.0207	1.00486	0.660
275.0	1.197	1490.0	6.75	72.6	0.00349	1.50	191.0	0.0241	1.00444	0.661
300.0	1.101	1620.0	6.74	72.3	0.00321	1.58	202.0	0.0277	1.00408	0.662
350.0	0.9488	1880.0	6.71	72.0	0.00277	1.75	224.0	0.0355	1.00352	0.663
400.0	0.8334	2130.0	6.68	71.7	0.00243	1.91	245.0	0.0442	1.00309	0.664
450.0	0.7431	2390.0	6.67	71.5	0.00217	2.07	265.0	0.0537	1.00275	0.664
500.0	0.6704	2650.0	6.65	71.3	0.00196	2.23	285.0	0.0640	1.00248	0.664
600.0	0.5606	3170.0	6.63	71.0	0.00164	2.53	323.0	0.0868	1.00208	0.665
700.0	0.4818	3690.0	6.62	70.9	0.00141	2.81	360.0	0.112	1.00178	0.665
800.0	0.4224	4210.0	6.61	70.7	0.00123	3.08	395.0	0.141	1.00156	0.665
900.0	0.3760	4730.0	6.60	70.6	0.00110	3.35	429.0	0.172	1.00139	0.665
1000.0	0.3388	5240.0	6.60	70.5	0.000993	3.61	462.0	0.205	1.00125	0.665
1100.0	0.3083	5760.0	6.59	70.5	0.000901	3.86	494.0	0.241	1.00114	0.665
1200.0	0.2828	6280.0	6.59	70.4	0.000826	4.10	526.0	0.280	1.00105	0.665
1300.0	0.2612	6800.0	6.59	70.4	0.000763	4.34	557.0	0.320	1.00097	0.665
1400.0	0.2427	7320.0	6.59	70.3	0.000709	4.58	587.0	0.363	1.00090	0.665
1500.0	0.2266	7840.0	6.58	70.3	0.000662	4.81	616.0	0.409	1.00084	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

80.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
3.5	0.04936	2400.0	8.53	7.550	47.56	1.515	1.319	1.581	539.9
4.0	0.04978	2440.0	8.26	7.951	48.31	1.725	1.463	1.744	543.2
4.5	0.05021	2440.0	8.25	8.523	49.22	1.940	1.710	2.031	541.5
5.0	0.05066	2400.0	8.23	9.305	50.37	2.169	1.983	2.350	537.1
5.1	0.05075	2400.0	8.23	9.490	50.63	2.216	2.035	2.411	536.3
5.2	0.05084	2390.0	8.23	9.687	50.90	2.263	2.065	2.450	536.2
5.3	0.05093	2380.0	8.22	9.859	51.15	2.309	2.056	2.451	536.4
5.4	0.05102	2370.0	8.21	10.03	51.39	2.355	2.072	2.477	536.0
5.5	0.05111	2360.0	8.20	10.21	51.64	2.401	2.090	2.504	535.6
5.6	0.05120	2350.0	8.19	10.38	51.89	2.446	2.108	2.532	535.0
5.7	0.05130	2340.0	8.19	10.56	52.14	2.492	2.126	2.561	534.5
5.8	0.05139	2330.0	8.18	10.74	52.40	2.536	2.145	2.590	533.9
5.9	0.05148	2320.0	8.17	10.93	52.66	2.581	2.164	2.620	533.3
6.0	0.05157	2310.0	8.16	11.11	52.92	2.625	2.183	2.650	532.6
6.5	0.05206	2250.0	8.13	12.07	54.27	2.844	2.277	2.802	529.2
7.0	0.05256	2180.0	8.09	13.08	55.68	3.057	2.366	2.953	525.5
7.5	0.05308	2120.0	8.05	14.15	57.17	3.266	2.448	3.102	521.8
8.0	0.05363	2060.0	8.00	15.26	58.73	3.471	2.523	3.248	518.1
8.5	0.05420	2000.0	7.94	16.43	60.36	3.673	2.591	3.390	514.5
9.0	0.05480	1940.0	7.87	17.64	62.06	3.871	2.654	3.529	510.9
9.5	0.05542	1880.0	7.79	18.90	63.82	4.067	2.710	3.664	507.5
10.0	0.05607	1830.0	7.69	20.20	65.66	4.259	2.762	3.795	504.1
11.0	0.05747	1720.0	7.41	23.28	69.86	4.667	2.856	4.032	496.0
12.0	0.05896	1620.0	7.13	26.52	74.31	5.060	2.928	4.251	488.6
13.0	0.06054	1530.0	6.83	29.91	78.98	5.440	2.984	4.452	481.5
14.0	0.06222	1450.0	6.53	33.42	83.85	5.806	3.026	4.636	474.9
15.0	0.06400	1380.0	6.22	37.04	88.92	6.159	3.057	4.802	469.0
16.0	0.06589	1320.0	5.94	40.39	93.80	6.474	3.084	4.961	464.5
17.0	0.06789	1280.0	5.66	43.80	98.83	6.779	3.105	5.102	460.7
18.0	0.06998	1230.0	5.39	47.27	104.0	7.074	3.122	5.223	457.5
19.0	0.07216	1200.0	5.13	50.78	109.3	7.359	3.135	5.327	455.0
20.0	0.07442	1180.0	4.88	54.32	114.6	7.635	3.145	5.414	453.2
21.0	0.07675	1160.0	4.64	57.88	120.1	7.901	3.154	5.486	452.0
22.0	0.07914	1150.0	4.42	61.46	125.6	8.157	3.161	5.545	451.3
23.0	0.08158	1140.0	4.22	65.05	131.2	8.405	3.167	5.593	451.2
24.0	0.08407	1130.0	4.03	68.65	136.8	8.644	3.173	5.630	451.5
25.0	0.08660	1130.0	3.85	72.24	142.4	8.874	3.178	5.659	452.2
26.0	0.08916	1140.0	3.68	75.83	148.1	9.097	3.182	5.681	453.2
28.0	0.09437	1150.0	3.38	83.01	159.5	9.519	3.188	5.709	456.1
30.0	0.0997	1170.0	3.12	90.15	170.9	9.913	3.194	5.720	459.9
32.0	0.1050	1190.0	2.90	97.26	182.4	10.28	3.198	5.720	464.4
34.0	0.1104	1220.0	2.70	104.3	193.8	10.63	3.201	5.712	469.4
36.0	0.1158	1250.0	2.53	111.4	205.2	10.96	3.203	5.700	474.7
38.0	0.1212	1280.0	2.37	118.3	216.6	11.26	3.205	5.684	480.3
40.0	0.1267	1320.0	2.23	125.3	228.0	11.55	3.206	5.667	486.0
45.0	0.1402	1410.0	1.95	142.5	256.7	12.22	3.206	5.619	501.0
50.0	0.1538	1510.0	1.73	159.5	284.1	12.81	3.204	5.571	516.2
55.0	0.1673	1610.0	1.55	176.3	311.9	13.34	3.202	5.527	531.4
60.0	0.1807	1720.0	1.41	193.0	339.4	13.82	3.198	5.488	546.5
65.0	0.1940	1820.0	1.29	209.5	366.8	14.25	3.195	5.453	561.4
70.0	0.2073	1930.0	1.19	225.9	394.0	14.66	3.191	5.423	576.0
75.0	0.2206	2030.0	1.10	242.3	421.0	15.03	3.188	5.397	590.3
80.0	0.2337	2140.0	1.03	258.5	447.9	15.38	3.184	5.374	604.3
90.0	0.2599	2340.0	0.907	290.8	501.5	16.01	3.178	5.337	631.5
100.0	0.2859	2550.0	0.811	323.0	554.7	16.57	3.173	5.309	657.7
125.0	0.3506	3070.0	0.643	402.6	686.8	17.75	3.162	5.262	719.1
150.0	0.4148	3580.0	0.534	481.7	818.0	18.71	3.155	5.236	775.7
175.0	0.4789	4090.0	0.456	560.5	948.7	19.51	3.149	5.221	828.6
200.0	0.5429	4600.0	0.399	639.0	1079.0	20.21	3.145	5.211	878.4
225.0	0.6068	5100.0	0.354	717.4	1209.0	20.82	3.142	5.205	925.5
250.0	0.6706	5610.0	0.319	795.7	1339.0	21.37	3.140	5.200	970.4
275.0	0.7344	6120.0	0.290	874.0	1469.0	21.86	3.138	5.197	1013.0
300.0	0.7982	6630.0	0.265	952.2	1599.0	22.32	3.136	5.195	1055.0
350.0	0.9258	7640.0	0.228	1108.0	1859.0	23.12	3.134	5.193	1133.0
400.0	1.053	8660.0	0.199	1265.0	2118.0	23.81	3.132	5.191	1206.0
450.0	1.181	9670.0	0.177	1421.0	2378.0	24.42	3.130	5.191	1275.0
500.0	1.309	10700.0	0.159	1577.0	2638.0	24.97	3.129	5.190	1340.0
600.0	1.564	12700.0	0.133	1889.0	3157.0	25.92	3.128	5.190	1463.0
700.0	1.819	14800.0	0.114	2201.0	3675.0	26.72	3.127	5.190	1575.0
800.0	2.075	16800.0	0.100	2513.0	4194.0	27.41	3.126	5.190	1681.0
900.0	2.330	18860.0	0.0886	2825.0	4713.0	28.02	3.125	5.190	1780.0
1000.0	2.586	20900.0	0.0798	3136.0	5232.0	28.57	3.125	5.190	1874.0
1100.0	2.841	22900.0	0.0725	3448.0	5751.0	29.06	3.124	5.190	1964.0
1200.0	3.097	24900.0	0.0665	3760.0	6270.0	29.51	3.124	5.190	2049.0
1300.0	3.353	27000.0	0.0614	4072.0	6790.0	29.93	3.123	5.191	2132.0
1400.0	3.608	29000.0	0.0570	4384.0	7309.0	30.31	3.123	5.191	2211.0
1500.0	3.864	31100.0	0.0532	4696.0	7828.0	30.67	3.123	5.191	2287.0

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

80.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_p$ J/G	$V(\partial P/\partial U)_v$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
3.5	20.26	90.2	31.9	486.0	0.0175	0.339	218.0	0.000106	1.07674	1.02
4.0	20.09	104.0	28.1	491.0	0.0168	0.363	187.0	0.000104	1.07607	0.896
4.5	19.92	119.0	24.2	485.0	0.0170	0.388	163.0	0.000960	1.07541	0.854
5.0	19.74	135.0	21.0	474.0	0.0174	0.413	145.0	0.000890	1.07473	0.827
5.1	19.70	138.0	20.5	472.0	0.0174	0.418	142.0	0.000880	1.07459	0.820
5.2	19.67	140.0	20.3	470.0	0.0175	0.423	139.0	0.000877	1.07445	0.807
5.3	19.63	139.0	20.4	468.0	0.0176	0.427	137.0	0.000888	1.07432	0.783
5.4	19.60	140.0	20.2	465.0	0.0177	0.432	134.0	0.000890	1.07418	0.768
5.5	19.56	141.0	20.1	462.0	0.0177	0.437	131.0	0.000892	1.07405	0.754
5.6	19.53	142.0	19.9	459.0	0.0178	0.441	129.0	0.000893	1.07391	0.741
5.7	19.49	143.0	19.7	456.0	0.0179	0.446	127.0	0.000893	1.07378	0.729
5.8	19.46	144.0	19.6	453.0	0.0180	0.450	125.0	0.000893	1.07364	0.717
5.9	19.42	144.0	19.4	450.0	0.0181	0.455	123.0	0.000893	1.07351	0.707
6.0	19.39	145.0	19.3	447.0	0.0182	0.459	121.0	0.000893	1.07337	0.697
6.5	19.21	149.0	18.6	432.0	0.0188	0.479	112.0	0.000890	1.07268	0.655
7.0	19.03	152.0	18.0	416.0	0.0195	0.497	105.0	0.000884	1.07197	0.624
7.5	18.84	154.0	17.4	400.0	0.0201	0.512	99.0	0.000876	1.07125	0.600
8.0	18.65	156.0	17.0	384.0	0.0208	0.525	94.1	0.000868	1.07050	0.581
8.5	18.45	157.0	16.6	369.0	0.0215	0.537	89.9	0.000858	1.06974	0.567
9.0	18.25	159.0	16.2	354.0	0.0223	0.547	86.3	0.000849	1.06897	0.557
9.5	18.04	160.0	15.9	339.0	0.0231	0.554	83.2	0.000839	1.06817	0.550
10.0	17.83	161.0	15.6	326.0	0.0236	0.561	80.5	0.000829	1.06736	0.545
11.0	17.40	163.0	14.9	299.0	0.0248	0.570	76.2	0.000813	1.06569	0.539
12.0	16.96	164.0	14.3	275.0	0.0259	0.576	72.9	0.000799	1.06401	0.538
13.0	16.52	165.0	13.9	253.0	0.0270	0.578	70.4	0.000787	1.06230	0.542
14.0	16.07	166.0	13.4	234.0	0.0279	0.579	68.5	0.000777	1.06059	0.548
15.0	15.63	167.0	13.0	216.0	0.0288	0.578	67.1	0.000771	1.05888	0.557
16.0	15.18	168.0	12.7	201.0	0.0296	0.576	65.9	0.000765	1.05715	0.568
17.0	14.73	169.0	12.4	188.0	0.0301	0.573	65.1	0.000763	1.05544	0.579
18.0	14.29	171.0	12.1	176.0	0.0305	0.570	64.5	0.000764	1.05376	0.591
19.0	13.86	173.0	11.8	167.0	0.0308	0.567	64.1	0.000769	1.05211	0.602
20.0	13.44	176.0	11.5	158.0	0.0308	0.564	63.9	0.000776	1.05050	0.613
21.0	13.03	178.0	11.3	151.0	0.0307	0.562	63.8	0.000786	1.04895	0.623
22.0	12.64	182.0	11.1	145.0	0.0305	0.559	63.8	0.000798	1.04745	0.632
23.0	12.25	185.0	10.9	139.0	0.0302	0.557	63.9	0.000813	1.04601	0.641
24.0	11.89	189.0	10.7	135.0	0.0299	0.556	64.1	0.000830	1.04463	0.649
25.0	11.55	192.0	10.5	131.0	0.0294	0.555	64.3	0.000849	1.04331	0.656
26.0	11.22	197.0	10.3	127.0	0.0289	0.554	64.6	0.000869	1.04205	0.663
28.0	10.60	205.0	10.0	122.0	0.0278	0.553	65.4	0.000915	1.03970	0.674
30.0	10.03	214.0	9.75	117.0	0.0267	0.554	66.2	0.000966	1.03757	0.683
32.0	9.524	224.0	9.51	113.0	0.0256	0.557	67.2	0.00102	1.03564	0.690
34.0	9.059	234.0	9.31	110.0	0.0245	0.560	68.2	0.00108	1.03388	0.696
36.0	8.636	244.0	9.13	108.0	0.0234	0.564	69.3	0.00115	1.03228	0.700
38.0	8.249	254.0	8.97	106.0	0.0224	0.569	70.5	0.00121	1.03082	0.704
40.0	7.896	264.0	8.83	104.0	0.0215	0.575	71.6	0.00129	1.02949	0.706
45.0	7.131	290.0	8.53	101.0	0.0193	0.591	74.6	0.00148	1.02661	0.709
50.0	6.503	317.0	8.30	98.4	0.0176	0.610	77.7	0.00168	1.02425	0.710
55.0	5.979	344.0	8.11	96.5	0.0161	0.629	80.7	0.00190	1.02228	0.709
60.0	5.535	371.0	7.95	95.1	0.0148	0.650	83.8	0.00214	1.02062	0.707
65.0	5.154	398.0	7.82	93.9	0.0137	0.672	86.8	0.00239	1.01919	0.705
70.0	4.824	424.0	7.72	93.0	0.0128	0.693	89.8	0.00265	1.01796	0.703
75.0	4.535	451.0	7.62	92.1	0.0120	0.715	92.8	0.00292	1.01687	0.700
80.0	4.280	478.0	7.54	91.4	0.0112	0.738	95.8	0.00321	1.01592	0.698
90.0	3.848	531.0	7.41	90.2	0.0100	0.782	102.0	0.00381	1.01431	0.693
100.0	3.498	584.0	7.31	89.3	0.00909	0.827	107.0	0.00445	1.01300	0.689
125.0	2.853	716.0	7.13	87.5	0.00735	0.936	119.0	0.00623	1.01059	0.670
150.0	2.411	846.0	7.02	86.3	0.00619	1.04	132.0	0.00824	1.00895	0.666
175.0	2.088	977.0	6.94	85.4	0.00535	1.14	145.0	0.0105	1.00775	0.663
200.0	1.842	1110.0	6.88	84.7	0.00471	1.24	157.0	0.0129	1.00683	0.661
225.0	1.648	1240.0	6.84	84.1	0.00421	1.33	169.0	0.0155	1.00611	0.660
250.0	1.491	1370.0	6.81	83.7	0.00381	1.42	180.0	0.0183	1.00553	0.660
275.0	1.362	1500.0	6.78	83.3	0.00348	1.51	191.0	0.0213	1.00505	0.660
300.0	1.253	1620.0	6.76	83.0	0.00320	1.59	202.0	0.0244	1.00464	0.661
350.0	1.080	1880.0	6.72	82.5	0.00276	1.76	224.0	0.0313	1.00400	0.662
400.0	0.9493	2140.0	6.70	82.2	0.00242	1.92	245.0	0.0389	1.00352	0.663
450.0	0.8467	2400.0	6.68	81.9	0.00216	2.08	265.0	0.0472	1.00314	0.663
500.0	0.7641	2660.0	6.66	81.7	0.00195	2.23	285.0	0.0562	1.00283	0.664
600.0	0.6394	3180.0	6.64	81.4	0.00163	2.53	324.0	0.0762	1.00237	0.664
700.0	0.5497	3700.0	6.63	81.1	0.00140	2.81	360.0	0.0986	1.00204	0.665
800.0	0.4820	4210.0	6.62	81.0	0.00123	3.09	395.0	0.123	1.00179	0.665
900.0	0.4291	4730.0	6.61	80.8	0.00110	3.35	429.0	0.151	1.00159	0.665
1000.0	0.3867	5250.0	6.60	80.7	0.000988	3.61	462.0	0.180	1.00143	0.665
1100.0	0.3519	5770.0	6.60	80.6	0.000900	3.86	495.0	0.211	1.00130	0.665
1200.0	0.3229	6290.0	6.59	80.6	0.000825	4.11	526.0	0.245	1.00120	0.665
1300.0	0.2983	6810.0	6.59	80.5	0.000763	4.34	557.0	0.281	1.00110	0.665
1400.0	0.2771	7330.0	6.59	80.5	0.000709	4.58	587.0	0.318	1.00103	0.665
1500.0	0.2588	7840.0	6.58	80.4	0.000662	4.81	616.0	0.358	1.00096	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

90.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
3.5	0.04839	2550.0	10.0	8.053	52.18	1.421	1.365	1.690	565.1
4.0	0.04882	2620.0	9.12	8.433	52.96	1.639	1.467	1.774	566.5
4.5	0.04924	2630.0	8.81	8.980	53.88	1.856	1.704	2.031	563.4
5.0	0.04966	2610.0	8.63	9.739	55.02	2.083	1.975	2.332	558.5
5.1	0.04974	2600.0	8.61	9.919	55.28	2.130	2.027	2.391	557.6
5.2	0.04983	2600.0	8.59	10.11	55.55	2.176	2.056	2.427	557.4
5.3	0.04991	2590.0	8.56	10.28	55.79	2.222	2.047	2.426	557.6
5.4	0.04999	2580.0	8.53	10.45	56.04	2.268	2.064	2.450	557.2
5.5	0.05008	2570.0	8.51	10.62	56.28	2.313	2.081	2.475	556.7
5.6	0.05016	2560.0	8.49	10.79	56.53	2.358	2.099	2.500	556.2
5.7	0.05024	2550.0	8.47	10.96	56.78	2.402	2.117	2.527	555.7
5.8	0.05033	2540.0	8.45	11.14	57.03	2.447	2.136	2.554	555.1
5.9	0.05041	2530.0	8.44	11.31	57.28	2.491	2.155	2.582	554.5
6.0	0.05050	2520.0	8.42	11.49	57.54	2.534	2.174	2.610	553.8
6.5	0.05093	2460.0	8.36	12.42	58.87	2.749	2.267	2.752	550.5
7.0	0.05138	2400.0	8.32	13.40	60.26	2.958	2.355	2.894	547.0
7.5	0.05184	2340.0	8.28	14.44	61.71	3.163	2.436	3.035	543.5
8.0	0.05233	2280.0	8.25	15.52	63.24	3.364	2.510	3.173	540.1
8.5	0.05284	2220.0	8.20	16.64	64.83	3.561	2.578	3.308	536.9
9.0	0.05336	2160.0	8.15	17.82	66.48	3.754	2.640	3.440	533.7
9.5	0.05392	2100.0	8.09	19.03	68.20	3.944	2.697	3.569	530.5
10.0	0.05449	2040.0	8.01	20.29	69.98	4.131	2.750	3.695	527.4
11.0	0.05571	1940.0	7.76	23.29	74.09	4.530	2.844	3.920	520.1
12.0	0.05701	1840.0	7.50	26.45	78.43	4.915	2.919	4.127	513.2
13.0	0.05838	1750.0	7.22	29.75	82.99	5.285	2.977	4.319	506.5
14.0	0.05982	1660.0	6.94	33.18	87.74	5.642	3.022	4.494	500.3
15.0	0.06135	1580.0	6.65	36.73	92.67	5.986	3.055	4.653	494.5
16.0	0.06297	1520.0	6.39	39.98	97.40	6.291	3.084	4.811	490.0
17.0	0.06468	1460.0	6.12	43.30	102.3	6.587	3.107	4.951	486.0
18.0	0.06647	1420.0	5.85	46.69	107.3	6.874	3.125	5.076	482.6
19.0	0.06833	1380.0	5.59	50.12	112.4	7.151	3.139	5.185	479.7
20.0	0.07026	1340.0	5.35	53.59	117.7	7.420	3.150	5.279	477.4
21.0	0.07226	1320.0	5.11	57.09	123.0	7.679	3.158	5.360	475.7
22.0	0.07431	1300.0	4.88	60.61	128.4	7.930	3.166	5.429	474.5
23.0	0.07642	1280.0	4.67	64.15	133.8	8.173	3.172	5.486	473.8
24.0	0.07857	1270.0	4.47	67.70	139.3	8.407	3.177	5.534	473.5
25.0	0.08076	1260.0	4.28	71.26	144.9	8.634	3.182	5.573	473.6
26.0	0.08298	1260.0	4.10	74.82	150.5	8.853	3.186	5.604	474.1
28.0	0.08751	1260.0	3.78	81.94	161.7	9.270	3.193	5.648	476.0
30.0	0.09213	1280.0	3.50	89.06	173.1	9.661	3.198	5.674	478.9
32.0	0.09681	1290.0	3.25	96.15	184.4	10.03	3.203	5.685	482.5
34.0	0.1015	1320.0	3.03	103.2	195.8	10.37	3.206	5.688	486.7
36.0	0.1063	1350.0	2.84	110.2	207.2	10.70	3.209	5.683	491.3
38.0	0.1111	1380.0	2.67	117.2	218.5	11.00	3.210	5.674	496.3
40.0	0.1159	1410.0	2.52	124.2	229.9	11.30	3.212	5.662	501.5
45.0	0.1279	1500.0	2.20	141.4	258.1	11.96	3.213	5.623	515.2
50.0	0.1399	1590.0	1.95	158.5	286.1	12.55	3.212	5.582	529.4
55.0	0.1519	1690.0	1.75	175.4	313.9	13.08	3.209	5.541	543.8
60.0	0.1638	1790.0	1.59	192.1	341.5	13.56	3.206	5.503	558.2
65.0	0.1757	1890.0	1.45	208.7	368.9	14.00	3.203	5.469	572.5
70.0	0.1875	2000.0	1.34	225.2	396.2	14.40	3.199	5.439	586.6
75.0	0.1992	2100.0	1.24	241.6	423.3	14.78	3.196	5.412	600.5
80.0	0.2109	2210.0	1.16	258.0	450.3	15.13	3.192	5.388	614.1
90.0	0.2343	2410.0	1.02	290.4	504.0	15.76	3.186	5.350	640.6
100.0	0.2574	2620.0	0.914	322.6	557.4	16.32	3.180	5.320	666.2
125.0	0.3149	3130.0	0.724	402.4	689.7	17.50	3.168	5.270	726.6
150.0	0.3721	3640.0	0.600	481.7	821.0	18.46	3.160	5.241	782.5
175.0	0.4290	4150.0	0.513	560.6	951.8	19.27	3.154	5.224	834.8
200.0	0.4859	4660.0	0.448	639.2	1082.0	19.96	3.149	5.213	884.0
225.0	0.5426	5170.0	0.398	717.7	1213.0	20.58	3.146	5.206	930.8
250.0	0.5994	5670.0	0.358	796.0	1343.0	21.13	3.143	5.201	975.3
275.0	0.6561	6180.0	0.326	874.3	1473.0	21.62	3.141	5.198	1018.0
300.0	0.7127	6690.0	0.298	952.5	1603.0	22.07	3.139	5.196	1059.0
350.0	0.8261	7700.0	0.256	1109.0	1862.0	22.87	3.136	5.193	1137.0
400.0	0.9395	8710.0	0.224	1265.0	2122.0	23.57	3.134	5.191	1209.0
450.0	1.053	9730.0	0.199	1421.0	2381.0	24.18	3.132	5.190	1278.0
500.0	1.166	10700.0	0.179	1577.0	2641.0	24.73	3.131	5.190	1343.0
600.0	1.393	12800.0	0.149	1889.0	3160.0	25.67	3.129	5.189	1465.0
700.0	1.620	14800.0	0.128	2201.0	3679.0	26.47	3.128	5.189	1578.0
800.0	1.847	16800.0	0.112	2513.0	4198.0	27.16	3.127	5.189	1683.0
900.0	2.074	18900.0	0.100	2825.0	4717.0	27.78	3.126	5.190	1782.0
1000.0	2.301	20900.0	0.0897	3137.0	5236.0	28.32	3.126	5.190	1876.0
1100.0	2.528	23000.0	0.0816	3449.0	5754.0	28.82	3.125	5.190	1965.0
1200.0	2.755	25000.0	0.0748	3761.0	6273.0	29.27	3.125	5.190	2051.0
1300.0	2.982	27000.0	0.0690	4073.0	6792.0	29.68	3.124	5.190	2133.0
1400.0	3.210	29100.0	0.0641	4385.0	7312.0	30.07	3.124	5.190	2212.0
1500.0	3.437	31100.0	0.0598	4696.0	7831.0	30.43	3.124	5.190	2288.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

90.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_p$ J/G	$V(\partial P/\partial U)_v$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)_P/V$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
3.5	20.65	89.1	35.4	526.0	0.0190	0.352	255.0	0.00101	1.07831	1.22
4.0	20.48	104.0	30.3	537.0	0.0176	0.377	215.0	0.00104	1.07760	1.01
4.5	20.31	123.0	25.4	534.0	0.0165	0.403	186.0	0.000977	1.07694	0.937
5.0	20.14	142.0	21.7	525.0	0.0164	0.429	164.0	0.000913	1.07627	0.892
5.1	20.10	145.0	21.1	523.0	0.0165	0.434	160.0	0.000903	1.07614	0.883
5.2	20.07	147.0	20.8	521.0	0.0165	0.439	157.0	0.000901	1.07600	0.867
5.3	20.04	147.0	20.9	519.0	0.0165	0.444	153.0	0.000913	1.07587	0.839
5.4	20.03	148.0	20.7	516.0	0.0165	0.449	150.0	0.000916	1.07575	0.820
5.5	19.97	149.0	20.5	514.0	0.0166	0.454	147.0	0.000918	1.07562	0.804
5.6	19.94	151.0	20.3	511.0	0.0166	0.459	145.0	0.000920	1.07549	0.788
5.7	19.90	152.0	20.1	508.0	0.0167	0.463	142.0	0.000921	1.07536	0.774
5.8	19.87	153.0	19.9	505.0	0.0167	0.468	139.0	0.000922	1.07523	0.760
5.9	19.84	154.0	19.7	502.0	0.0168	0.473	137.0	0.000923	1.07510	0.748
6.0	19.80	155.0	19.6	499.0	0.0169	0.477	134.0	0.000923	1.07497	0.736
6.5	19.64	159.0	18.8	484.0	0.0173	0.498	124.0	0.000922	1.07432	0.686
7.0	19.46	163.0	18.2	468.0	0.0178	0.517	116.0	0.000918	1.07366	0.648
7.5	19.23	165.0	17.6	451.0	0.0183	0.534	109.0	0.000912	1.07298	0.619
8.0	19.11	168.0	17.2	435.0	0.0189	0.548	103.0	0.000904	1.07229	0.596
8.5	18.93	169.0	16.8	420.0	0.0195	0.560	98.1	0.000895	1.07158	0.579
9.0	18.74	171.0	16.5	404.0	0.0202	0.571	93.9	0.000886	1.07086	0.566
9.5	18.55	172.0	16.2	389.0	0.0208	0.580	90.3	0.000876	1.07012	0.556
10.0	18.35	173.0	15.9	375.0	0.0214	0.587	87.2	0.000866	1.06937	0.549
11.0	17.95	176.0	15.2	348.0	0.0223	0.598	82.1	0.000850	1.06781	0.538
12.0	17.54	177.0	14.6	322.0	0.0233	0.604	78.2	0.000835	1.06624	0.534
13.0	17.13	179.0	14.2	299.0	0.0241	0.608	75.3	0.000822	1.06465	0.535
14.0	16.72	180.0	13.7	278.0	0.0250	0.610	73.0	0.000811	1.06306	0.538
15.0	16.30	181.0	13.4	258.0	0.0258	0.609	71.3	0.000803	1.06147	0.544
16.0	15.88	182.0	13.0	241.0	0.0265	0.608	69.9	0.000796	1.05985	0.553
17.0	15.46	183.0	12.7	226.0	0.0271	0.605	68.9	0.000791	1.05824	0.563
18.0	15.04	185.0	12.5	213.0	0.0275	0.602	68.1	0.000789	1.05665	0.573
19.0	14.63	186.0	12.2	201.0	0.0278	0.599	67.5	0.000790	1.05508	0.584
20.0	14.23	189.0	11.9	191.0	0.0280	0.596	67.1	0.000794	1.05354	0.594
21.0	13.84	191.0	11.7	182.0	0.0280	0.593	66.9	0.000800	1.05204	0.604
22.0	13.46	194.0	11.5	174.0	0.0280	0.590	66.7	0.000808	1.05058	0.614
23.0	13.09	197.0	11.2	168.0	0.0278	0.588	66.7	0.000819	1.04916	0.623
24.0	12.73	200.0	11.0	162.0	0.0276	0.586	66.8	0.000832	1.04780	0.631
25.0	12.38	204.0	10.9	157.0	0.0273	0.584	66.9	0.000846	1.04648	0.639
26.0	12.05	208.0	10.7	152.0	0.0270	0.583	67.2	0.000863	1.04522	0.646
28.0	11.43	216.0	10.4	144.0	0.0262	0.581	67.8	0.000900	1.04285	0.659
30.0	10.85	225.0	10.1	139.0	0.0253	0.581	68.5	0.000943	1.04068	0.669
32.0	10.33	234.0	9.83	134.0	0.0243	0.582	69.4	0.000991	1.03869	0.678
34.0	9.848	243.0	9.61	130.0	0.0234	0.584	70.3	0.00104	1.03686	0.684
36.0	9.407	253.0	9.42	127.0	0.0225	0.588	71.3	0.00110	1.03519	0.690
38.0	9.002	263.0	9.24	124.0	0.0216	0.592	72.4	0.00116	1.03366	0.694
40.0	8.629	273.0	9.08	122.0	0.0207	0.596	73.5	0.00122	1.03226	0.698
45.0	7.818	299.0	8.76	117.0	0.0188	0.611	76.4	0.00139	1.02920	0.703
50.0	7.147	326.0	8.50	114.0	0.0171	0.628	79.3	0.00157	1.02667	0.705
55.0	6.584	352.0	8.29	111.0	0.0157	0.646	82.3	0.00177	1.02455	0.705
60.0	6.105	379.0	8.12	109.0	0.0145	0.666	85.2	0.00198	1.02276	0.704
65.0	5.693	406.0	7.97	108.0	0.0135	0.687	88.2	0.00221	1.02121	0.703
70.0	5.334	433.0	7.85	107.0	0.0126	0.708	91.2	0.00244	1.01986	0.701
75.0	5.019	459.0	7.75	105.0	0.0118	0.729	94.1	0.00268	1.01869	0.699
80.0	4.741	486.0	7.66	105.0	0.0111	0.751	97.0	0.00294	1.01764	0.696
90.0	4.269	539.0	7.51	103.0	0.00992	0.794	103.0	0.00348	1.01588	0.692
100.0	3.885	592.0	7.40	102.0	0.00898	0.838	108.0	0.00406	1.01444	0.688
125.0	3.175	724.0	7.20	99.5	0.00728	0.946	120.0	0.00565	1.01180	0.669
150.0	2.687	855.0	7.07	97.9	0.00613	1.05	133.0	0.00745	1.00998	0.665
175.0	2.331	985.0	6.98	96.8	0.00530	1.15	146.0	0.00944	1.00865	0.662
200.0	2.058	1120.0	6.92	95.9	0.00468	1.25	158.0	0.0116	1.00764	0.660
225.0	1.843	1240.0	6.87	95.2	0.00418	1.34	169.0	0.0139	1.00684	0.659
250.0	1.668	1370.0	6.83	94.7	0.00378	1.43	181.0	0.0164	1.00619	0.659
275.0	1.524	1500.0	6.80	94.2	0.00346	1.51	192.0	0.0191	1.00565	0.659
300.0	1.403	1630.0	6.78	93.8	0.00318	1.59	202.0	0.0218	1.00520	0.660
350.0	1.210	1890.0	6.74	93.2	0.00274	1.76	224.0	0.0280	1.00449	0.661
400.0	1.064	2150.0	6.71	92.8	0.00241	1.92	245.0	0.0348	1.00395	0.662
450.0	0.9498	2410.0	6.69	92.4	0.00215	2.08	266.0	0.0422	1.00352	0.663
500.0	0.8575	2670.0	6.67	92.1	0.00194	2.23	285.0	0.0502	1.00318	0.663
600.0	0.7178	3190.0	6.65	91.7	0.00163	2.53	324.0	0.0679	1.00266	0.664
700.0	0.6173	3700.0	6.63	91.4	0.00140	2.81	360.0	0.0879	1.00229	0.664
800.0	0.5414	4220.0	6.62	91.2	0.00123	3.09	395.0	0.110	1.00201	0.664
900.0	0.4822	4740.0	6.61	91.0	0.00109	3.35	430.0	0.134	1.00179	0.665
1000.0	0.4346	5260.0	6.60	90.9	0.000987	3.61	463.0	0.160	1.00161	0.665
1100.0	0.3955	5780.0	6.60	90.8	0.000898	3.86	495.0	0.188	1.00146	0.665
1200.0	0.3629	6300.0	6.59	90.7	0.000824	4.11	526.0	0.218	1.00134	0.665
1300.0	0.3353	6810.0	6.59	90.6	0.000762	4.35	557.0	0.250	1.00124	0.665
1400.0	0.3116	7330.0	6.59	90.6	0.000708	4.58	587.0	0.283	1.00115	0.665
1500.0	0.2910	7850.0	6.58	90.5	0.000661	4.81	616.0	0.318	1.00108	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

100.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
3.5	0.04751	2680.0	11.7	8.551	56.69	1.320	1.452	1.861	589.8
4.0	0.04796	2780.0	10.1	8.923	57.52	1.553	1.496	1.838	586.7
4.5	0.04836	2810.0	9.44	9.455	58.46	1.775	1.714	2.052	584.0
5.0	0.04876	2800.0	9.06	10.20	59.61	2.003	1.978	2.331	578.3
5.1	0.04884	2800.0	9.01	10.37	59.86	2.050	2.028	2.386	577.4
5.2	0.04892	2800.0	8.96	10.56	60.13	2.096	2.057	2.419	577.2
5.3	0.04900	2790.0	8.92	10.73	60.38	2.142	2.048	2.415	577.3
5.4	0.04908	2780.0	8.87	10.89	60.62	2.187	2.063	2.436	576.9
5.5	0.04915	2770.0	8.83	11.06	60.86	2.232	2.080	2.459	576.4
5.6	0.04923	2770.0	8.80	11.22	61.11	2.277	2.097	2.482	575.8
5.7	0.04931	2760.0	8.76	11.39	61.36	2.321	2.115	2.506	575.3
5.8	0.04939	2750.0	8.73	11.56	61.61	2.365	2.133	2.531	574.7
5.9	0.04946	2740.0	8.71	11.74	61.86	2.408	2.151	2.556	574.1
6.0	0.04954	2730.0	8.68	11.91	62.11	2.451	2.170	2.582	573.4
6.5	0.04994	2670.0	8.59	12.82	63.42	2.663	2.260	2.714	570.2
7.0	0.05034	2610.0	8.53	13.78	64.79	2.870	2.346	2.847	566.8
7.5	0.05077	2550.0	8.50	14.78	66.22	3.071	2.426	2.980	563.6
8.0	0.05120	2490.0	8.47	15.83	67.71	3.268	2.498	3.110	560.5
8.5	0.05166	2430.0	8.44	16.92	69.27	3.460	2.565	3.238	557.5
9.0	0.05213	2370.0	8.40	18.06	70.88	3.650	2.627	3.365	554.6
9.5	0.05262	2310.0	8.35	19.24	72.56	3.835	2.684	3.488	551.7
10.0	0.05314	2260.0	8.30	20.46	74.30	4.018	2.737	3.610	548.9
11.0	0.05423	2150.0	8.07	23.39	78.34	4.410	2.831	3.825	542.2
12.0	0.05538	2050.0	7.83	26.48	82.59	4.787	2.908	4.025	535.8
13.0	0.05659	1950.0	7.57	29.72	87.05	5.150	2.970	4.209	529.6
14.0	0.05786	1870.0	7.31	33.08	91.70	5.500	3.017	4.377	523.6
15.0	0.05919	1790.0	7.04	36.55	96.53	5.836	3.052	4.530	518.1
16.0	0.06061	1710.0	6.79	39.73	101.1	6.134	3.083	4.684	513.7
17.0	0.06210	1650.0	6.53	42.97	105.9	6.422	3.108	4.823	509.7
18.0	0.06366	1600.0	6.27	46.28	110.8	6.701	3.127	4.948	506.1
19.0	0.06528	1550.0	6.02	49.64	115.8	6.972	3.142	5.059	503.0
20.0	0.06696	1510.0	5.77	53.04	120.9	7.234	3.153	5.158	500.4
21.0	0.06870	1480.0	5.54	56.48	126.1	7.488	3.162	5.244	498.4
22.0	0.07050	1450.0	5.31	59.95	131.4	7.733	3.170	5.320	496.7
23.0	0.07234	1430.0	5.09	63.44	136.7	7.971	3.176	5.384	495.6
24.0	0.07422	1410.0	4.88	66.94	142.1	8.202	3.182	5.440	494.8
25.0	0.07614	1400.0	4.69	70.46	147.6	8.425	3.186	5.487	494.5
26.0	0.07809	1390.0	4.50	73.99	153.1	8.641	3.190	5.526	494.5
28.0	0.08209	1390.0	4.16	81.05	164.2	9.052	3.197	5.585	495.5
30.0	0.08617	1390.0	3.86	88.13	175.4	9.439	3.203	5.623	497.5
32.0	0.09033	1400.0	3.60	95.19	186.7	9.803	3.207	5.646	500.4
34.0	0.09453	1420.0	3.36	102.2	198.0	10.15	3.211	5.658	503.8
36.0	0.09877	1440.0	3.15	109.3	209.3	10.47	3.213	5.661	507.8
38.0	0.1030	1470.0	2.97	116.2	220.7	10.78	3.216	5.658	512.2
40.0	0.1073	1500.0	2.80	123.2	232.0	11.07	3.217	5.652	516.8
45.0	0.1181	1580.0	2.45	140.5	260.2	11.73	3.219	5.623	529.3
50.0	0.1289	1670.0	2.17	157.6	288.2	12.32	3.219	5.588	542.6
55.0	0.1396	1770.0	1.95	174.6	316.0	12.85	3.217	5.551	556.2
60.0	0.1503	1870.0	1.77	191.4	343.7	13.33	3.214	5.515	569.9
65.0	0.1610	1970.0	1.62	208.0	371.2	13.77	3.210	5.482	583.6
70.0	0.1717	2070.0	1.49	224.6	398.5	14.18	3.207	5.452	597.2
75.0	0.1822	2170.0	1.38	241.1	425.7	14.55	3.203	5.425	610.6
80.0	0.1928	2280.0	1.29	257.4	452.8	14.90	3.200	5.401	623.9
90.0	0.2138	2480.0	1.14	290.0	506.6	15.54	3.193	5.361	649.7
100.0	0.2347	2690.0	1.02	322.3	560.0	16.10	3.187	5.330	674.8
125.0	0.2865	3200.0	0.805	402.3	692.5	17.28	3.174	5.277	734.1
150.0	0.3379	3710.0	0.667	481.7	824.0	18.24	3.165	5.246	789.2
175.0	0.3891	4220.0	0.570	560.6	954.9	19.05	3.158	5.227	840.8
200.0	0.4403	4720.0	0.498	639.4	1085.0	19.75	3.153	5.215	889.6
225.0	0.4913	5230.0	0.442	717.9	1216.0	20.36	3.149	5.208	936.0
250.0	0.5424	5730.0	0.398	796.3	1346.0	20.91	3.146	5.202	980.2
275.0	0.5934	6240.0	0.362	874.6	1476.0	21.40	3.143	5.199	1023.0
300.0	0.6444	6750.0	0.331	952.9	1606.0	21.86	3.141	5.196	1063.0
350.0	0.7463	7760.0	0.284	1109.0	1866.0	22.66	3.138	5.193	1140.0
400.0	0.8483	8770.0	0.249	1266.0	2125.0	23.35	3.136	5.191	1213.0
450.0	0.9503	9780.0	0.221	1422.0	2385.0	23.96	3.134	5.190	1281.0
500.0	1.052	10800.0	0.199	1578.0	2644.0	24.51	3.133	5.189	1346.0
600.0	1.256	12800.0	0.166	1890.0	3163.0	25.45	3.131	5.189	1468.0
700.0	1.460	14900.0	0.142	2202.0	3682.0	26.25	3.129	5.189	1580.0
800.0	1.665	16900.0	0.124	2514.0	4201.0	26.95	3.128	5.189	1685.0
900.0	1.869	18900.0	0.111	2826.0	4720.0	27.56	3.127	5.189	1784.0
1000.0	2.073	21000.0	0.100	3138.0	5239.0	28.10	3.127	5.189	1877.0
1100.0	2.278	23000.0	0.0906	3450.0	5758.0	28.60	3.126	5.190	1967.0
1200.0	2.482	25000.0	0.0831	3762.0	6276.0	29.05	3.126	5.190	2052.0
1300.0	2.686	27100.0	0.0767	4074.0	6795.0	29.47	3.125	5.190	2134.0
1400.0	2.891	29100.0	0.0712	4385.0	7314.0	29.85	3.125	5.190	2213.0
1500.0	3.095	31100.0	0.0665	4697.0	7833.0	30.21	3.125	5.190	2289.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

100.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
3.5	21.05	89.6	38.3	564.0	0.0238	0.366	299.0	0.000934	1.07980	1.52
4.0	20.85	106.0	32.4	581.0	0.0174	0.390	247.0	0.00102	1.07904	1.16
4.5	20.68	126.0	26.6	582.0	0.0162	0.417	211.0	0.00983	1.07836	1.04
5.0	20.51	148.0	22.3	574.0	0.0158	0.444	184.0	0.000929	1.07779	0.968
5.1	20.47	152.0	21.7	573.0	0.0157	0.449	180.0	0.000920	1.07767	0.955
5.2	20.44	154.0	21.3	571.0	0.0157	0.455	176.0	0.000919	1.07744	0.935
5.3	20.41	154.0	21.3	569.0	0.0157	0.460	172.0	0.000933	1.07731	0.902
5.4	20.38	156.0	21.1	567.0	0.0157	0.465	168.0	0.000937	1.07719	0.880
5.5	20.34	157.0	20.9	564.0	0.0156	0.470	164.0	0.000940	1.07707	0.860
5.6	20.31	159.0	20.6	562.0	0.0157	0.475	161.0	0.000942	1.07694	0.842
5.7	20.28	160.0	20.4	559.0	0.0157	0.480	158.0	0.000945	1.07682	0.824
5.8	20.25	161.0	20.2	556.0	0.0157	0.485	155.0	0.000946	1.07670	0.808
5.9	20.22	162.0	20.0	553.0	0.0157	0.490	152.0	0.000948	1.07657	0.793
6.0	20.18	164.0	19.8	551.0	0.0158	0.494	149.0	0.000949	1.07645	0.779
6.5	20.03	169.0	19.0	535.0	0.0161	0.517	137.0	0.000951	1.07583	0.720
7.0	19.86	173.0	18.3	519.0	0.0164	0.537	127.0	0.000949	1.07520	0.675
7.5	19.70	176.0	17.8	503.0	0.0169	0.554	119.0	0.000944	1.07457	0.640
8.0	19.53	179.0	17.4	486.0	0.0174	0.570	112.0	0.000938	1.07391	0.613
8.5	19.36	181.0	17.0	470.0	0.0179	0.583	107.0	0.000930	1.07325	0.592
9.0	19.18	182.0	16.7	455.0	0.0185	0.594	102.0	0.000921	1.07257	0.576
9.5	19.00	183.0	16.4	439.0	0.0190	0.604	97.6	0.000911	1.07187	0.564
10.0	18.82	185.0	16.1	424.0	0.0195	0.612	94.0	0.000901	1.07117	0.555
11.0	18.44	188.0	15.5	396.0	0.0204	0.624	88.1	0.000884	1.06970	0.540
12.0	18.06	190.0	14.9	370.0	0.0212	0.631	83.6	0.000869	1.06823	0.533
13.0	17.67	192.0	14.4	345.0	0.0219	0.636	80.2	0.000855	1.06674	0.531
14.0	17.28	193.0	14.0	322.0	0.0227	0.638	77.6	0.000844	1.06525	0.532
15.0	16.90	194.0	13.7	302.0	0.0233	0.639	75.5	0.000835	1.06375	0.536
16.0	16.50	195.0	13.3	283.0	0.0240	0.638	73.9	0.000825	1.06223	0.543
17.0	16.10	196.0	13.1	266.0	0.0246	0.635	72.6	0.000818	1.06071	0.551
18.0	15.71	198.0	12.8	251.0	0.0250	0.633	71.6	0.000814	1.05920	0.560
19.0	15.32	200.0	12.5	238.0	0.0253	0.630	70.8	0.000812	1.05770	0.569
20.0	14.93	202.0	12.3	226.0	0.0256	0.626	70.3	0.000813	1.05622	0.579
21.0	14.55	204.0	12.0	215.0	0.0257	0.623	69.9	0.000816	1.05478	0.588
22.0	14.19	206.0	11.8	206.0	0.0258	0.620	69.7	0.000822	1.05336	0.598
23.0	13.82	209.0	11.6	198.0	0.0257	0.617	69.5	0.000829	1.05198	0.606
24.0	13.47	212.0	11.4	190.0	0.0256	0.615	69.5	0.000839	1.05064	0.615
25.0	13.13	216.0	11.2	184.0	0.0255	0.613	69.6	0.000850	1.04935	0.623
26.0	12.81	219.0	11.0	178.0	0.0252	0.611	69.7	0.000863	1.04809	0.631
28.0	12.18	227.0	10.7	169.0	0.0246	0.608	70.1	0.000894	1.04572	0.644
30.0	11.60	235.0	10.4	161.0	0.0239	0.607	70.7	0.000930	1.04353	0.656
32.0	11.07	244.0	10.1	155.0	0.0231	0.607	71.5	0.000971	1.04153	0.665
34.0	10.58	253.0	9.90	150.0	0.0224	0.608	72.4	0.00102	1.03963	0.673
36.0	10.12	263.0	9.69	146.0	0.0215	0.610	73.3	0.00107	1.03791	0.680
38.0	9.705	273.0	9.50	143.0	0.0208	0.614	74.3	0.00112	1.03632	0.685
40.0	9.317	283.0	9.33	140.0	0.0200	0.618	75.3	0.00117	1.03485	0.689
45.0	8.468	308.0	8.98	134.0	0.0182	0.630	78.1	0.00132	1.03165	0.697
50.0	7.750	336.0	8.69	130.0	0.0167	0.646	80.9	0.00149	1.02898	0.700
55.0	7.152	361.0	8.46	127.0	0.0154	0.663	83.8	0.00167	1.02673	0.701
60.0	6.652	387.0	8.27	124.0	0.0142	0.682	86.7	0.00186	1.02481	0.701
65.0	6.210	414.0	8.12	122.0	0.0132	0.701	89.6	0.00206	1.02315	0.700
70.0	5.826	441.0	7.98	121.0	0.0124	0.722	92.5	0.00227	1.02171	0.699
75.0	5.487	468.0	7.87	119.0	0.0116	0.743	95.4	0.00249	1.02044	0.697
80.0	5.187	494.0	7.77	118.0	0.0109	0.764	98.2	0.00273	1.01931	0.695
90.0	4.678	548.0	7.61	116.0	0.00979	0.806	104.0	0.00322	1.01741	0.691
100.0	4.262	601.0	7.48	115.0	0.00887	0.849	109.0	0.00374	1.01585	0.687
125.0	3.491	733.0	7.26	112.0	0.00720	0.956	121.0	0.00519	1.01297	0.668
150.0	2.959	863.0	7.12	110.0	0.00608	1.06	134.0	0.00682	1.01099	0.664
175.0	2.570	994.0	7.02	108.0	0.00526	1.16	146.0	0.00862	1.00954	0.661
200.0	2.271	1120.0	6.95	107.0	0.00464	1.25	158.0	0.0106	1.00843	0.659
225.0	2.035	1250.0	6.90	106.0	0.00416	1.34	170.0	0.0127	1.00755	0.658
250.0	1.844	1380.0	6.86	106.0	0.00376	1.43	181.0	0.0149	1.00684	0.658
275.0	1.685	1510.0	6.82	105.0	0.00344	1.52	192.0	0.0173	1.00625	0.658
300.0	1.552	1640.0	6.80	105.0	0.00317	1.60	203.0	0.0198	1.00575	0.659
350.0	1.340	1900.0	6.76	104.0	0.00273	1.76	224.0	0.0254	1.00497	0.661
400.0	1.179	2160.0	6.72	103.0	0.00240	1.93	245.0	0.0315	1.00437	0.662
450.0	1.052	2420.0	6.70	103.0	0.00215	2.08	266.0	0.0381	1.00390	0.662
500.0	0.9503	2680.0	6.68	103.0	0.00194	2.24	286.0	0.0454	1.00352	0.663
600.0	0.7959	3190.0	6.66	102.0	0.00162	2.53	324.0	0.0613	1.00295	0.663
700.0	0.6847	3710.0	6.64	102.0	0.00140	2.82	360.0	0.0793	1.00254	0.664
800.0	0.6007	4230.0	6.62	101.0	0.00123	3.09	396.0	0.0991	1.00223	0.664
900.0	0.5351	4750.0	6.61	101.0	0.00109	3.36	430.0	0.121	1.00198	0.664
1000.0	0.4823	5270.0	6.61	101.0	0.000985	3.61	463.0	0.144	1.00179	0.665
1100.0	0.4391	5780.0	6.60	101.0	0.000897	3.86	495.0	0.170	1.00163	0.665
1200.0	0.4029	6300.0	6.60	101.0	0.000823	4.11	526.0	0.196	1.00149	0.665
1300.0	0.3723	6820.0	6.59	101.0	0.000761	4.35	557.0	0.225	1.00138	0.665
1400.0	0.3459	7340.0	6.59	101.0	0.000707	4.58	587.0	0.255	1.00128	0.665
1500.0	0.3231	7860.0	6.58	101.0	0.000661	4.81	616.0	0.287	1.00120	0.665

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

150.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
4.5	0.04498	3610.0	13.7	11.94	80.30	1.387	1.992	2.474	673.6
5.0	0.04534	3660.0	11.8	12.69	81.61	1.647	2.144	2.542	663.1
5.1	0.04541	3670.0	11.6	12.86	81.89	1.698	2.179	2.567	661.6
5.2	0.04548	3680.0	11.3	13.05	82.17	1.747	2.193	2.573	660.9
5.3	0.04554	3680.0	11.1	13.21	82.43	1.796	2.171	2.544	660.7
5.4	0.04560	3680.0	10.9	13.37	82.68	1.843	2.175	2.542	659.9
5.5	0.04567	3680.0	10.7	13.53	82.94	1.890	2.180	2.544	659.2
5.6	0.04573	3670.0	10.6	13.69	83.19	1.936	2.187	2.548	658.4
5.7	0.04579	3670.0	10.4	13.85	83.44	1.981	2.195	2.554	657.7
5.8	0.04584	3670.0	10.3	14.02	83.70	2.026	2.204	2.561	656.9
5.9	0.04590	3660.0	10.2	14.18	83.95	2.069	2.214	2.570	656.2
6.0	0.04596	3660.0	10.1	14.35	84.21	2.113	2.224	2.581	655.5
6.5	0.04625	3620.0	9.69	15.20	85.49	2.322	2.281	2.646	652.1
7.0	0.04654	3570.0	9.48	16.08	86.81	2.521	2.339	2.726	649.2
7.5	0.04683	3520.0	9.38	17.00	88.17	2.712	2.397	2.814	646.7
8.0	0.04712	3460.0	9.34	17.95	89.57	2.897	2.453	2.908	644.5
8.5	0.04743	3400.0	9.34	18.93	91.01	3.076	2.509	3.005	642.5
9.0	0.04774	3340.0	9.35	19.94	92.50	3.251	2.562	3.107	640.8
9.5	0.04807	3280.0	9.37	20.99	94.04	3.422	2.615	3.210	639.1
10.0	0.04840	3230.0	9.39	22.07	95.63	3.590	2.667	3.315	637.5
11.0	0.04912	3120.0	9.28	24.76	99.42	3.958	2.761	3.504	633.2
12.0	0.04987	3020.0	9.14	27.61	103.4	4.311	2.847	3.685	628.9
13.0	0.05064	2920.0	8.96	30.60	107.6	4.651	2.922	3.851	624.4
14.0	0.05144	2830.0	8.76	33.73	111.9	4.978	2.982	4.000	620.0
15.0	0.05227	2740.0	8.54	36.97	116.4	5.293	3.024	4.131	615.7
16.0	0.05314	2660.0	8.36	39.85	120.6	5.564	3.066	4.272	612.2
17.0	0.05405	2580.0	8.16	42.80	124.9	5.827	3.099	4.400	608.7
18.0	0.05499	2500.0	7.95	45.83	129.4	6.082	3.125	4.516	605.4
19.0	0.05597	2440.0	7.73	48.92	134.0	6.329	3.146	4.624	602.3
20.0	0.05697	2370.0	7.51	52.06	138.7	6.568	3.161	4.722	599.5
21.0	0.05802	2320.0	7.28	55.24	143.4	6.801	3.174	4.813	596.8
22.0	0.05909	2270.0	7.06	58.47	148.3	7.027	3.184	4.897	594.4
23.0	0.06019	2220.0	6.85	61.73	153.2	7.246	3.192	4.974	592.3
24.0	0.06132	2180.0	6.64	65.02	158.2	7.459	3.198	5.045	590.4
25.0	0.06248	2150.0	6.43	68.34	163.3	7.667	3.204	5.110	588.8
26.0	0.06366	2110.0	6.23	71.68	168.4	7.868	3.209	5.169	587.5
28.0	0.06610	2060.0	5.85	78.43	178.9	8.255	3.216	5.272	585.5
30.0	0.06861	2030.0	5.50	85.23	189.5	8.622	3.223	5.355	584.6
32.0	0.07119	2010.0	5.18	92.09	200.3	8.970	3.228	5.421	584.5
34.0	0.07383	2000.0	4.88	98.97	211.2	9.300	3.232	5.471	585.1
36.0	0.07652	1990.0	4.61	105.9	222.2	9.614	3.236	5.510	586.4
38.0	0.07924	2000.0	4.36	112.8	233.2	9.912	3.240	5.538	588.3
40.0	0.08199	2010.0	4.13	119.7	244.3	10.20	3.242	5.557	590.6
45.0	0.08897	2050.0	3.64	137.0	272.2	10.85	3.247	5.579	598.0
50.0	0.09601	2120.0	3.25	154.1	300.1	11.44	3.249	5.577	607.0
55.0	0.1031	2190.0	2.93	171.2	327.9	11.97	3.249	5.563	616.9
60.0	0.1102	2280.0	2.66	188.2	355.7	12.46	3.248	5.542	627.5
65.0	0.1173	2370.0	2.44	205.1	383.3	12.90	3.245	5.518	638.4
70.0	0.1243	2460.0	2.25	221.9	410.9	13.31	3.242	5.493	649.6
75.0	0.1314	2550.0	2.08	238.5	438.3	13.68	3.239	5.469	660.8
80.0	0.1384	2650.0	1.94	255.1	465.6	14.04	3.235	5.446	672.2
90.0	0.1524	2840.0	1.71	288.1	519.8	14.68	3.227	5.405	694.7
100.0	0.1664	3040.0	1.53	320.8	573.7	15.24	3.220	5.371	717.0
125.0	0.2009	3540.0	1.21	401.7	707.1	16.43	3.203	5.307	771.0
150.0	0.2352	4040.0	1.00	481.7	839.2	17.40	3.190	5.268	822.2
175.0	0.2694	4540.0	0.853	561.2	970.6	18.21	3.180	5.242	870.9
200.0	0.3034	5040.0	0.745	640.3	1101.0	18.91	3.173	5.226	917.2
225.0	0.3374	5540.0	0.661	719.1	1232.0	19.52	3.167	5.214	961.5
250.0	0.3713	6040.0	0.595	797.8	1362.0	20.07	3.162	5.207	1004.0
275.0	0.4052	6540.0	0.541	876.3	1492.0	20.57	3.158	5.201	1045.0
300.0	0.4392	7050.0	0.495	954.8	1622.0	21.02	3.155	5.197	1084.0
350.0	0.5070	8050.0	0.425	1111.0	1882.0	21.82	3.150	5.192	1159.0
400.0	0.5748	9050.0	0.372	1268.0	2141.0	22.51	3.146	5.190	1230.0
450.0	0.6426	10100.0	0.331	1424.0	2401.0	23.12	3.144	5.188	1297.0
500.0	0.7104	11100.0	0.298	1581.0	2660.0	23.67	3.141	5.187	1361.0
600.0	0.8462	13100.0	0.248	1893.0	3179.0	24.62	3.138	5.187	1480.0
700.0	0.9820	15100.0	0.213	2205.0	3698.0	25.42	3.136	5.187	1591.0
800.0	1.118	17100.0	0.186	2517.0	4216.0	26.11	3.134	5.187	1695.0
900.0	1.254	19200.0	0.166	2830.0	4735.0	26.72	3.133	5.187	1793.0
1000.0	1.390	21200.0	0.149	3142.0	5254.0	27.27	3.132	5.188	1886.0
1100.0	1.526	23200.0	0.136	3454.0	5773.0	27.76	3.131	5.188	1974.0
1200.0	1.662	25200.0	0.124	3766.0	6291.0	28.21	3.131	5.188	2059.0
1300.0	1.798	27300.0	0.115	4078.0	6810.0	28.63	3.130	5.188	2140.0
1400.0	1.934	29300.0	0.107	4390.0	7329.0	29.01	3.130	5.189	2219.0
1500.0	2.070	31300.0	0.100	4702.0	7848.0	29.37	3.129	5.189	2295.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

150.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_p$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
4.5	22.23	145.0	31.0	802.0	0.0171	0.485	381.0	0.000882	1.09446	1.94
5.0	22.05	174.0	25.0	808.0	0.0146	0.516	317.0	0.000920	1.08371	1.56
5.1	22.02	179.0	24.1	808.0	0.0143	0.522	307.0	0.000923	1.08358	1.51
5.2	21.99	184.0	23.5	808.0	0.0140	0.528	298.0	0.000933	1.08345	1.45
5.3	21.96	185.0	23.3	807.0	0.0137	0.534	289.0	0.000956	1.08333	1.38
5.4	21.93	188.0	22.9	806.0	0.0135	0.540	280.0	0.000969	1.08322	1.32
5.5	21.90	191.0	22.5	805.0	0.0133	0.546	273.0	0.000981	1.08310	1.27
5.6	21.87	194.0	22.1	803.0	0.0131	0.552	265.0	0.000991	1.08299	1.22
5.7	21.84	196.0	21.7	802.0	0.0130	0.558	258.0	0.00100	1.08288	1.18
5.8	21.81	199.0	21.4	800.0	0.0129	0.564	252.0	0.00101	1.08277	1.14
5.9	21.78	201.0	21.1	798.0	0.0128	0.570	246.0	0.00102	1.08266	1.11
6.0	21.75	204.0	20.8	795.0	0.0127	0.575	240.0	0.00102	1.08255	1.08
6.5	21.62	214.0	19.7	782.0	0.0124	0.603	215.0	0.00105	1.08203	0.944
7.0	21.49	221.0	18.9	767.0	0.0124	0.627	195.0	0.00107	1.08151	0.848
7.5	21.36	225.0	18.3	751.0	0.0125	0.649	179.0	0.00108	1.08099	0.777
8.0	21.22	229.0	17.9	734.0	0.0127	0.669	166.0	0.00108	1.08047	0.723
8.5	21.08	231.0	17.7	717.0	0.0130	0.686	155.0	0.00108	1.07994	0.681
9.0	20.95	233.0	17.4	700.0	0.0134	0.701	146.0	0.00108	1.07940	0.648
9.5	20.80	234.0	17.2	683.0	0.0137	0.713	138.0	0.00107	1.07885	0.623
10.0	20.66	236.0	17.0	667.0	0.0141	0.724	132.0	0.00106	1.07829	0.603
11.0	20.36	240.0	16.5	635.0	0.0146	0.741	121.0	0.00104	1.07712	0.571
12.0	20.05	244.0	16.0	605.0	0.0151	0.752	112.0	0.00102	1.07594	0.550
13.0	19.75	248.0	15.5	577.0	0.0155	0.760	106.0	0.00100	1.07475	0.537
14.0	19.44	251.0	15.1	550.0	0.0159	0.765	101.0	0.000983	1.07356	0.528
15.0	19.13	253.0	14.8	524.0	0.0163	0.767	97.0	0.000971	1.07238	0.522
16.0	18.82	255.0	14.5	500.0	0.0167	0.768	93.8	0.000955	1.07116	0.522
17.0	18.50	257.0	14.2	477.0	0.0171	0.767	91.2	0.000942	1.06994	0.523
18.0	18.19	259.0	14.0	455.0	0.0175	0.765	89.1	0.000931	1.06872	0.526
19.0	17.87	260.0	13.7	435.0	0.0178	0.762	87.4	0.000922	1.06750	0.530
20.0	17.55	262.0	13.5	417.0	0.0180	0.759	86.0	0.000915	1.06628	0.535
21.0	17.24	264.0	13.3	400.0	0.0182	0.755	84.8	0.000910	1.06506	0.541
22.0	16.92	266.0	13.1	384.0	0.0184	0.752	83.9	0.000907	1.06386	0.547
23.0	16.61	268.0	12.9	369.0	0.0186	0.748	83.2	0.000905	1.06267	0.554
24.0	16.31	270.0	12.7	356.0	0.0187	0.744	82.7	0.000905	1.06149	0.560
25.0	16.01	273.0	12.5	343.0	0.0187	0.741	82.3	0.000906	1.06033	0.567
26.0	15.71	276.0	12.4	332.0	0.0188	0.737	82.0	0.000908	1.05919	0.575
28.0	15.13	281.0	12.0	312.0	0.0187	0.731	81.6	0.000917	1.05697	0.588
30.0	14.57	288.0	11.7	296.0	0.0186	0.727	81.6	0.000931	1.05485	0.602
32.0	14.05	295.0	11.4	282.0	0.0184	0.723	81.8	0.000949	1.05283	0.614
34.0	13.54	303.0	11.1	270.0	0.0180	0.720	82.2	0.000972	1.05091	0.625
36.0	13.07	312.0	10.9	261.0	0.0177	0.719	82.8	0.00100	1.04910	0.634
38.0	12.62	320.0	10.7	252.0	0.0173	0.718	83.4	0.00103	1.04739	0.643
40.0	12.20	330.0	10.4	245.0	0.0169	0.719	84.1	0.00106	1.04577	0.650
45.0	11.24	354.0	10.0	231.0	0.0158	0.724	86.2	0.00115	1.04214	0.664
50.0	10.42	379.0	9.60	221.0	0.0147	0.733	88.5	0.00126	1.03901	0.674
55.0	9.700	404.0	9.29	213.0	0.0138	0.745	91.0	0.00138	1.03633	0.680
60.0	9.075	431.0	9.03	207.0	0.0129	0.759	93.6	0.00151	1.03394	0.683
65.0	8.527	457.0	8.80	202.0	0.0121	0.774	96.2	0.00165	1.03187	0.685
70.0	8.042	483.0	8.61	198.0	0.0114	0.791	98.8	0.00179	1.03004	0.686
75.0	7.610	510.0	8.45	194.0	0.0107	0.809	101.0	0.00194	1.02841	0.686
80.0	7.224	537.0	8.31	191.0	0.0101	0.828	104.0	0.00210	1.02696	0.685
90.0	6.550	590.0	8.08	187.0	0.00916	0.866	109.0	0.00244	1.02446	0.683
100.0	6.010	643.0	7.89	183.0	0.00835	0.905	115.0	0.00280	1.02240	0.680
125.0	4.976	775.0	7.57	176.0	0.00685	1.00	126.0	0.00380	1.01853	0.663
150.0	4.251	906.0	7.37	172.0	0.00582	1.10	138.0	0.00492	1.01581	0.659
175.0	3.712	1040.0	7.23	169.0	0.00506	1.20	150.0	0.00616	1.01383	0.656
200.0	3.296	1170.0	7.12	166.0	0.00448	1.29	161.0	0.00749	1.01225	0.654
225.0	2.964	1300.0	7.05	164.0	0.00403	1.38	173.0	0.00891	1.01101	0.653
250.0	2.693	1420.0	6.98	163.0	0.00365	1.46	183.0	0.0104	1.01000	0.653
275.0	2.468	1550.0	6.94	161.0	0.00335	1.54	194.0	0.0120	1.00916	0.653
300.0	2.277	1680.0	6.90	160.0	0.00309	1.62	204.0	0.0137	1.00845	0.654
350.0	1.973	1940.0	6.83	159.0	0.00267	1.79	226.0	0.0174	1.00732	0.656
400.0	1.740	2200.0	6.79	158.0	0.00236	1.94	247.0	0.0215	1.00645	0.658
450.0	1.556	2460.0	6.76	157.0	0.00211	2.10	267.0	0.0260	1.00577	0.659
500.0	1.408	2720.0	6.73	156.0	0.00191	2.25	287.0	0.0308	1.00522	0.660
600.0	1.182	3230.0	6.69	155.0	0.00160	2.55	325.0	0.0415	1.00438	0.662
700.0	1.018	3750.0	6.66	154.0	0.00138	2.83	361.0	0.0535	1.00377	0.662
800.0	0.8946	4270.0	6.65	153.0	0.00122	3.10	396.0	0.0668	1.00332	0.663
900.0	0.7976	4780.0	6.63	153.0	0.00110	3.36	430.0	0.0813	1.00296	0.663
1000.0	0.7196	5300.0	6.62	152.0	0.000979	3.62	463.0	0.0971	1.00267	0.664
1100.0	0.6554	5820.0	6.61	152.0	0.000891	3.87	495.0	0.114	1.00243	0.664
1200.0	0.6018	6340.0	6.60	152.0	0.000819	4.11	527.0	0.132	1.00223	0.664
1300.0	0.5563	6860.0	6.60	152.0	0.000757	4.35	557.0	0.151	1.00206	0.664
1400.0	0.5171	7370.0	6.59	152.0	0.000704	4.59	587.0	0.171	1.00192	0.664
1500.0	0.4831	7890.0	6.59	151.0	0.000658	4.82	617.0	0.192	1.00179	0.664

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

200.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
5.2	0.04306	4430.0	14.5	15.68	102.9	1.434	2.539	3.004	729.0
5.3	0.04312	4440.0	14.0	15.86	103.2	1.491	2.488	2.931	728.3
5.4	0.04318	4450.0	13.6	16.03	103.5	1.545	2.466	2.890	727.1
5.5	0.04324	4460.0	13.2	16.20	103.8	1.598	2.447	2.855	726.0
5.6	0.04329	4460.0	12.9	16.37	104.1	1.649	2.432	2.826	724.9
5.7	0.04334	4470.0	12.5	16.54	104.4	1.699	2.419	2.801	723.9
5.8	0.04340	4470.0	12.3	16.72	104.7	1.747	2.409	2.781	722.9
5.9	0.04345	4470.0	12.0	16.89	104.9	1.795	2.401	2.764	721.9
6.0	0.04350	4470.0	11.8	17.06	105.2	1.841	2.395	2.751	721.1
6.5	0.04374	4450.0	10.9	17.92	106.6	2.060	2.382	2.718	717.3
7.0	0.04397	4420.0	10.4	18.79	107.9	2.261	2.389	2.725	714.4
7.5	0.04420	4370.0	10.2	19.67	109.2	2.451	2.407	2.758	712.2
8.0	0.04442	4320.0	10.0	20.56	110.6	2.630	2.434	2.808	710.5
8.5	0.04466	4270.0	10.0	21.47	112.0	2.803	2.467	2.872	709.2
9.0	0.04489	4210.0	10.1	22.41	113.4	2.969	2.506	2.948	708.3
9.5	0.04514	4150.0	10.1	23.37	114.8	3.131	2.549	3.032	707.6
10.0	0.04539	4100.0	10.2	24.35	116.3	3.289	2.595	3.123	706.9
11.0	0.04593	3990.0	10.2	26.88	120.0	3.641	2.685	3.297	704.4
12.0	0.04649	3890.0	10.1	29.56	123.8	3.980	2.779	3.475	701.7
13.0	0.04707	3790.0	10.0	32.39	127.8	4.307	2.867	3.641	698.6
14.0	0.04767	3700.0	9.87	35.37	132.0	4.622	2.938	3.786	695.2
15.0	0.04828	3610.0	9.68	38.46	136.3	4.925	2.988	3.906	691.9
16.0	0.04891	3530.0	9.54	41.14	140.3	5.182	3.039	4.041	689.3
17.0	0.04957	3440.0	9.38	43.91	144.4	5.430	3.080	4.162	686.7
18.0	0.05025	3370.0	9.20	46.75	148.6	5.671	3.112	4.272	684.1
19.0	0.05095	3290.0	9.02	49.65	152.9	5.905	3.137	4.372	681.5
20.0	0.05168	3220.0	8.82	52.61	157.3	6.132	3.157	4.465	679.0
21.0	0.05242	3150.0	8.62	55.61	161.8	6.352	3.174	4.552	676.6
22.0	0.05318	3090.0	8.41	58.66	166.4	6.565	3.187	4.632	674.3
23.0	0.05396	3030.0	8.21	61.75	171.1	6.773	3.197	4.708	672.2
24.0	0.05476	2970.0	8.01	64.88	175.8	6.975	3.206	4.779	670.1
25.0	0.05557	2920.0	7.81	68.04	180.7	7.171	3.213	4.845	668.2
26.0	0.05641	2880.0	7.61	71.22	185.5	7.362	3.219	4.908	666.5
28.0	0.05812	2800.0	7.23	77.68	195.5	7.730	3.230	5.022	663.5
30.0	0.05990	2730.0	6.86	84.22	205.6	8.080	3.238	5.121	661.2
32.0	0.06173	2680.0	6.52	90.84	215.9	8.414	3.245	5.206	659.5
34.0	0.06361	2640.0	6.19	97.52	226.4	8.731	3.251	5.279	658.5
36.0	0.06553	2610.0	5.89	104.2	237.0	9.035	3.256	5.340	658.0
38.0	0.06749	2590.0	5.60	111.0	247.8	9.325	3.260	5.390	658.2
40.0	0.06948	2570.0	5.34	117.8	258.6	9.603	3.264	5.431	658.8
45.0	0.07455	2570.0	4.76	134.9	285.9	10.25	3.272	5.498	662.1
50.0	0.07973	2610.0	4.27	152.0	313.5	10.83	3.276	5.531	667.5
55.0	0.08496	2660.0	3.87	169.0	341.2	11.36	3.278	5.541	674.4
60.0	0.09023	2720.0	3.52	186.1	368.9	11.84	3.278	5.537	682.3
65.0	0.09550	2790.0	3.23	203.0	396.6	12.28	3.277	5.525	690.8
70.0	0.1008	2870.0	2.99	219.9	424.2	12.69	3.275	5.509	699.9
75.0	0.1061	2960.0	2.77	236.7	451.7	13.07	3.271	5.490	709.2
80.0	0.1113	3050.0	2.58	253.5	479.1	13.42	3.268	5.471	718.8
90.0	0.1218	3230.0	2.28	286.7	533.6	14.06	3.260	5.433	738.3
100.0	0.1323	3420.0	2.03	319.7	587.7	14.64	3.251	5.399	758.0
125.0	0.1582	3900.0	1.61	401.3	721.8	15.83	3.231	5.331	806.9
150.0	0.1839	4380.0	1.33	481.9	854.5	16.80	3.215	5.286	854.4
175.0	0.2094	4870.0	1.13	561.8	986.2	17.61	3.203	5.255	900.1
200.0	0.2349	5370.0	0.990	641.3	1117.0	18.31	3.193	5.235	944.1
225.0	0.2603	5860.0	0.879	720.4	1246.0	18.93	3.185	5.220	986.4
250.0	0.2857	6350.0	0.790	799.3	1378.0	19.48	3.178	5.210	1027.0
275.0	0.3111	6850.0	0.718	878.1	1509.0	19.97	3.173	5.203	1067.0
300.0	0.3365	7340.0	0.658	956.7	1639.0	20.43	3.169	5.198	1105.0
350.0	0.3872	8340.0	0.564	1114.0	1898.0	21.23	3.162	5.192	1178.0
400.0	0.4379	9340.0	0.494	1270.0	2158.0	21.92	3.157	5.188	1247.0
450.0	0.4886	10300.0	0.439	1427.0	2417.0	22.53	3.153	5.186	1312.0
500.0	0.5394	11300.0	0.396	1583.0	2676.0	23.08	3.150	5.185	1375.0
600.0	0.6410	13300.0	0.330	1896.0	3195.0	24.02	3.146	5.185	1493.0
700.0	0.7426	15400.0	0.283	2209.0	3713.0	24.82	3.143	5.185	1602.0
800.0	0.8443	17400.0	0.248	2521.0	4232.0	25.51	3.141	5.185	1704.0
900.0	0.9460	19400.0	0.220	2833.0	4750.0	26.13	3.139	5.185	1801.0
1000.0	1.048	21400.0	0.199	3145.0	5269.0	26.67	3.138	5.186	1893.0
1100.0	1.150	23400.0	0.181	3458.0	5787.0	27.17	3.137	5.186	1981.0
1200.0	1.252	25500.0	0.166	3770.0	6306.0	27.62	3.136	5.186	2065.0
1300.0	1.353	27500.0	0.153	4082.0	6825.0	28.03	3.135	5.187	2146.0
1400.0	1.455	29500.0	0.142	4394.0	7343.0	28.42	3.134	5.187	2224.0
1500.0	1.557	31500.0	0.133	4706.0	7862.0	28.77	3.134	5.187	2300.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

200.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)_p/V$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
5.2	23.22	213.0	24.7	1030.0	0.0141	0.597	482.0	0.000856	1.08826	2.42
5.3	23.19	215.0	24.3	1030.0	0.0136	0.604	464.0	0.000889	1.08814	2.25
5.4	23.16	219.0	23.8	1030.0	0.0132	0.611	447.0	0.000913	1.08802	2.12
5.5	23.13	223.0	23.3	1030.0	0.0128	0.618	432.0	0.000935	1.08790	2.00
5.6	23.10	227.0	22.9	1030.0	0.0125	0.624	418.0	0.000957	1.08779	1.89
5.7	23.07	230.0	22.5	1030.0	0.0122	0.631	404.0	0.000977	1.08767	1.79
5.8	23.04	234.0	22.1	1030.0	0.0119	0.638	392.0	0.00100	1.08757	1.71
5.9	23.02	237.0	21.7	1030.0	0.0117	0.644	380.0	0.00101	1.08746	1.63
6.0	22.99	240.0	21.4	1030.0	0.0114	0.651	369.0	0.00103	1.08736	1.56
6.5	22.86	254.0	20.0	1020.0	0.0107	0.682	322.0	0.00110	1.08686	1.28
7.0	22.74	263.0	19.2	1010.0	0.0104	0.710	286.0	0.00115	1.08649	1.10
7.5	22.63	269.0	18.6	989.0	0.0103	0.736	258.0	0.00118	1.08594	0.967
8.0	22.51	272.0	18.3	972.0	0.0103	0.759	235.0	0.00120	1.08549	0.871
8.5	22.39	274.0	18.1	955.0	0.0105	0.779	217.0	0.00121	1.08503	0.799
9.0	22.27	275.0	18.0	938.0	0.0107	0.797	201.0	0.00121	1.08457	0.745
9.5	22.15	276.0	17.9	920.0	0.0110	0.812	188.0	0.00121	1.08410	0.702
10.0	22.03	277.0	17.8	903.0	0.0113	0.825	177.0	0.00120	1.08362	0.670
11.0	21.77	281.0	17.4	868.0	0.0117	0.845	159.0	0.00118	1.08261	0.620
12.0	21.51	287.0	17.0	836.0	0.0121	0.859	145.0	0.00115	1.08159	0.587
13.0	21.24	293.0	16.5	806.0	0.0124	0.869	135.0	0.00112	1.08056	0.564
14.0	20.98	298.0	16.0	777.0	0.0127	0.875	127.0	0.00110	1.07953	0.547
15.0	20.71	302.0	15.6	749.0	0.0129	0.879	120.0	0.00109	1.07850	0.534
16.0	20.44	305.0	15.4	721.0	0.0132	0.880	115.0	0.00107	1.07746	0.528
17.0	20.17	308.0	15.1	695.0	0.0135	0.879	111.0	0.00105	1.07640	0.523
18.0	19.90	311.0	14.9	670.0	0.0137	0.878	107.0	0.00103	1.07534	0.521
19.0	19.63	313.0	14.6	646.0	0.0140	0.875	104.0	0.00102	1.07428	0.521
20.0	19.35	315.0	14.4	623.0	0.0142	0.872	102.0	0.00101	1.07322	0.521
21.0	19.08	317.0	14.2	601.0	0.0143	0.868	100.0	0.00100	1.07217	0.523
22.0	18.80	320.0	14.0	581.0	0.0145	0.864	98.1	0.000992	1.07111	0.526
23.0	18.53	322.0	13.9	561.0	0.0146	0.860	96.7	0.000985	1.07006	0.530
24.0	18.26	324.0	13.7	543.0	0.0147	0.856	95.6	0.000980	1.06902	0.534
25.0	17.99	326.0	13.5	526.0	0.0148	0.851	94.7	0.000977	1.06798	0.539
26.0	17.73	329.0	13.3	510.0	0.0149	0.847	93.9	0.000974	1.06696	0.544
28.0	17.20	334.0	13.0	481.0	0.0150	0.840	92.8	0.000972	1.06494	0.555
30.0	16.69	340.0	12.7	456.0	0.0151	0.833	92.1	0.000974	1.06298	0.566
32.0	16.20	346.0	12.4	433.0	0.0150	0.827	91.8	0.000980	1.06108	0.578
34.0	15.72	353.0	12.1	414.0	0.0149	0.822	91.7	0.000990	1.05924	0.589
36.0	15.26	361.0	11.9	398.0	0.0148	0.818	91.8	0.00100	1.05747	0.599
38.0	14.82	369.0	11.6	383.0	0.0146	0.815	92.1	0.00102	1.05578	0.609
40.0	14.39	377.0	11.4	371.0	0.0144	0.813	92.5	0.00104	1.05415	0.618
45.0	13.41	399.0	10.8	345.0	0.0138	0.812	93.9	0.00110	1.05041	0.636
50.0	12.54	423.0	10.4	327.0	0.0131	0.816	95.7	0.00118	1.04719	0.649
55.0	11.77	448.0	10.0	313.0	0.0124	0.823	97.8	0.00126	1.04445	0.658
60.0	11.08	474.0	9.70	302.0	0.0117	0.833	100.0	0.00136	1.04154	0.665
65.0	10.47	500.0	9.42	293.0	0.0111	0.845	102.0	0.00146	1.03922	0.669
70.0	9.923	526.0	9.19	285.0	0.0105	0.859	105.0	0.00157	1.03715	0.672
75.0	9.429	553.0	8.98	279.0	0.00994	0.874	107.0	0.00169	1.03528	0.673
80.0	8.983	579.0	8.81	274.0	0.00945	0.890	110.0	0.00181	1.03359	0.674
90.0	8.210	632.0	8.51	265.0	0.00859	0.924	114.0	0.00207	1.03067	0.673
100.0	7.561	685.0	8.28	258.0	0.00788	0.960	119.0	0.00235	1.02823	0.671
125.0	6.323	817.0	7.86	246.0	0.00652	1.05	130.0	0.00312	1.02357	0.657
150.0	5.439	948.0	7.60	238.0	0.00557	1.15	142.0	0.00399	1.02026	0.653
175.0	4.775	1080.0	7.42	233.0	0.00487	1.24	153.0	0.00493	1.01777	0.650
200.0	4.257	1210.0	7.28	228.0	0.00433	1.33	164.0	0.00595	1.01583	0.649
225.0	3.841	1340.0	7.18	225.0	0.00390	1.41	175.0	0.00703	1.01428	0.648
250.0	3.500	1470.0	7.10	222.0	0.00355	1.49	185.0	0.00818	1.01301	0.648
275.0	3.214	1600.0	7.04	220.0	0.00326	1.57	196.0	0.00939	1.01194	0.648
300.0	2.972	1720.0	6.99	218.0	0.00301	1.65	206.0	0.0107	1.01104	0.649
350.0	2.583	1980.0	6.91	215.0	0.00262	1.81	227.0	0.0135	1.00959	0.652
400.0	2.284	2240.0	6.85	213.0	0.00232	1.96	248.0	0.0166	1.00848	0.655
450.0	2.047	2500.0	6.81	212.0	0.00208	2.12	268.0	0.0199	1.00759	0.657
500.0	1.854	2750.0	6.77	210.0	0.00188	2.27	288.0	0.0236	1.00688	0.658
600.0	1.560	3270.0	6.72	208.0	0.00159	2.56	325.0	0.0316	1.00579	0.660
700.0	1.347	3790.0	6.69	207.0	0.00137	2.84	362.0	0.0407	1.00499	0.661
800.0	1.184	4300.0	6.66	206.0	0.00120	3.11	397.0	0.0506	1.00439	0.662
900.0	1.057	4820.0	6.64	205.0	0.00108	3.37	431.0	0.0615	1.00392	0.662
1000.0	0.9563	5340.0	6.63	204.0	0.000972	3.63	464.0	0.0733	1.00354	0.663
1100.0	0.8698	5850.0	6.62	204.0	0.000886	3.88	496.0	0.0860	1.00322	0.663
1200.0	0.7990	6370.0	6.61	203.0	0.000814	4.12	527.0	0.0994	1.00296	0.663
1300.0	0.7389	6890.0	6.60	203.0	0.000753	4.36	558.0	0.114	1.00274	0.663
1400.0	0.6871	7410.0	6.59	203.0	0.000700	4.59	587.0	0.129	1.00255	0.664
1500.0	0.6422	7920.0	6.59	202.0	0.000655	4.82	617.0	0.145	1.00238	0.664

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

300.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
7.0	0.04050	5910.0	12.5	24.63	147.7	1.861	2.640	2.947	817.8
7.5	0.04067	5880.0	11.7	25.52	149.2	2.060	2.535	2.829	815.6
8.0	0.04084	5840.0	11.3	26.39	150.5	2.241	2.470	2.767	814.4
8.5	0.04100	5800.0	11.2	27.24	151.9	2.408	2.435	2.747	814.0
9.0	0.04116	5750.0	11.2	28.08	153.2	2.565	2.424	2.760	814.2
9.5	0.04133	5700.0	11.3	28.91	154.5	2.715	2.432	2.798	814.8
10.0	0.04150	5640.0	11.4	29.76	155.9	2.861	2.455	2.857	815.6
11.0	0.04187	5530.0	11.6	32.03	159.3	3.189	2.531	3.010	816.5
12.0	0.04225	5440.0	11.8	34.45	162.9	3.508	2.640	3.195	816.4
13.0	0.04265	5350.0	11.8	37.04	166.7	3.818	2.752	3.376	815.2
14.0	0.04306	5260.0	11.7	39.80	170.7	4.120	2.847	3.531	813.2
15.0	0.04347	5180.0	11.5	42.69	174.8	4.412	2.913	3.650	811.1
16.0	0.04390	5100.0	11.4	45.11	178.6	4.651	2.978	3.781	809.9
17.0	0.04434	5020.0	11.3	47.62	182.4	4.884	3.031	3.897	808.7
18.0	0.04479	4940.0	11.2	50.21	186.3	5.110	3.073	4.001	807.3
19.0	0.04525	4860.0	11.0	52.86	190.4	5.329	3.108	4.095	805.8
20.0	0.04572	4790.0	10.9	55.57	194.5	5.541	3.135	4.181	804.3
21.0	0.04620	4710.0	10.7	58.33	198.8	5.747	3.158	4.261	802.8
22.0	0.04668	4640.0	10.5	61.15	203.1	5.947	3.176	4.335	801.2
23.0	0.04718	4570.0	10.3	64.00	207.4	6.141	3.192	4.404	799.6
24.0	0.04769	4510.0	10.2	66.89	211.9	6.330	3.205	4.469	798.0
25.0	0.04821	4440.0	10.0	69.82	216.4	6.514	3.216	4.531	796.4
26.0	0.04873	4380.0	9.78	72.79	220.9	6.693	3.226	4.590	794.9
28.0	0.04981	4270.0	9.41	78.81	230.2	7.037	3.242	4.701	791.8
30.0	0.05092	4160.0	9.04	84.94	239.7	7.365	3.255	4.802	788.9
32.0	0.05206	4070.0	8.69	91.17	249.4	7.678	3.266	4.895	786.3
34.0	0.05323	3990.0	8.35	97.48	259.3	7.977	3.276	4.980	783.9
36.0	0.05443	3920.0	8.02	103.9	269.3	8.264	3.285	5.056	781.9
38.0	0.05565	3860.0	7.70	110.3	279.5	8.539	3.292	5.125	780.2
40.0	0.05690	3810.0	7.40	116.9	289.8	8.804	3.299	5.187	778.9
45.0	0.06011	3720.0	6.71	133.4	316.1	9.422	3.313	5.311	777.1
50.0	0.06342	3670.0	6.11	150.1	342.9	9.99	3.323	5.396	777.3
55.0	0.06680	3660.0	5.59	167.0	370.0	10.50	3.329	5.451	779.3
60.0	0.07022	3680.0	5.13	183.9	397.3	10.98	3.332	5.483	782.7
65.0	0.07368	3710.0	4.74	200.8	424.8	11.42	3.334	5.498	787.3
70.0	0.07715	3760.0	4.39	217.8	452.3	11.83	3.333	5.502	792.8
75.0	0.08064	3820.0	4.09	234.7	479.8	12.21	3.331	5.499	798.9
80.0	0.08412	3880.0	3.83	251.6	507.3	12.56	3.328	5.490	805.6
90.0	0.09109	4030.0	3.38	285.2	562.1	13.21	3.320	5.465	819.9
100.0	0.09803	4190.0	3.03	318.6	616.6	13.78	3.311	5.436	835.2
125.0	0.1153	4630.0	2.39	401.2	751.6	14.99	3.287	5.367	875.3
150.0	0.1324	5090.0	1.98	482.7	885.1	15.96	3.266	5.315	915.9
175.0	0.1493	5560.0	1.69	563.4	1017.0	16.78	3.248	5.277	956.2
200.0	0.1663	6030.0	1.47	643.6	1149.0	17.48	3.234	5.250	996.0
225.0	0.1831	6500.0	1.31	723.3	1280.0	18.10	3.222	5.231	1034.0
250.0	0.2000	6980.0	1.18	802.7	1411.0	18.65	3.212	5.217	1072.0
275.0	0.2168	7460.0	1.07	881.9	1541.0	19.14	3.204	5.207	1109.0
300.0	0.2336	7950.0	0.980	960.8	1671.0	19.60	3.198	5.200	1144.0
350.0	0.2672	8920.0	0.840	1118.0	1931.0	20.40	3.187	5.191	1213.0
400.0	0.3009	9900.0	0.736	1276.0	2190.0	21.09	3.179	5.186	1279.0
450.0	0.3345	10900.0	0.655	1432.0	2449.0	21.70	3.173	5.183	1342.0
500.0	0.3682	11900.0	0.590	1589.0	2708.0	22.25	3.169	5.181	1402.0
600.0	0.4356	13800.0	0.492	1902.0	3226.0	23.19	3.162	5.180	1516.0
700.0	0.5031	15800.0	0.423	2215.0	3744.0	23.99	3.157	5.180	1623.0
800.0	0.5706	17800.0	0.370	2528.0	4263.0	24.68	3.154	5.181	1723.0
900.0	0.6382	19800.0	0.329	2841.0	4781.0	25.29	3.151	5.181	1818.0
1000.0	0.7058	21800.0	0.297	3153.0	5299.0	25.84	3.149	5.182	1908.0
1100.0	0.7735	23900.0	0.270	3466.0	5817.0	26.33	3.147	5.183	1995.0
1200.0	0.8412	25900.0	0.247	3778.0	6335.0	26.78	3.146	5.183	2078.0
1300.0	0.9089	27900.0	0.229	4091.0	6854.0	27.20	3.145	5.184	2158.0
1400.0	0.9767	29900.0	0.212	4403.0	7372.0	27.58	3.143	5.184	2235.0
1500.0	1.044	31900.0	0.198	4716.0	7891.0	27.94	3.143	5.185	2309.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

300.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_p$ J/G	$V(\partial P/\partial U)_v$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)/V_p$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
7.0	24.63	344.0	19.2	1460.0	0.00856	0.868	573.0	0.00119	1.09399	1.95
7.5	24.59	349.0	18.8	1450.0	0.00811	0.900	498.0	0.00129	1.09359	1.57
8.0	24.49	349.0	18.7	1430.0	0.00792	0.929	440.0	0.00137	1.09321	1.31
8.5	24.39	348.0	18.8	1410.0	0.00790	0.954	394.0	0.00142	1.09283	1.13
9.0	24.29	345.0	19.0	1400.0	0.00800	0.977	357.0	0.00146	1.09245	1.01
9.5	24.20	342.0	19.1	1380.0	0.00817	1.00	326.0	0.00147	1.09207	0.915
10.0	24.10	341.0	19.3	1360.0	0.00838	1.01	300.0	0.00147	1.09168	0.845
11.0	23.89	341.0	19.3	1320.0	0.00882	1.04	259.0	0.00144	1.09085	0.750
12.0	23.67	349.0	18.9	1290.0	0.00917	1.06	228.0	0.00140	1.09000	0.691
13.0	23.45	359.0	18.3	1250.0	0.00941	1.07	205.0	0.00135	1.08913	0.650
14.0	23.22	369.0	17.7	1220.0	0.00957	1.07	188.0	0.00131	1.08827	0.617
15.0	23.00	377.0	17.2	1190.0	0.00968	1.08	174.0	0.00128	1.08741	0.589
16.0	22.78	384.0	16.9	1160.0	0.00985	1.08	163.0	0.00125	1.08653	0.571
17.0	22.55	389.0	16.6	1130.0	0.0100	1.08	154.0	0.00123	1.08566	0.556
18.0	22.33	394.0	16.3	1100.0	0.0101	1.08	147.0	0.00121	1.08478	0.545
19.0	22.10	399.0	16.1	1070.0	0.0103	1.07	141.0	0.00119	1.08389	0.536
20.0	21.87	403.0	15.9	1050.0	0.0104	1.07	135.0	0.00117	1.08301	0.530
21.0	21.65	406.0	15.7	1020.0	0.0105	1.06	131.0	0.00115	1.08213	0.525
22.0	21.42	410.0	15.5	995.0	0.0106	1.06	128.0	0.00114	1.08124	0.522
23.0	21.19	413.0	15.3	969.0	0.0107	1.05	125.0	0.00113	1.08037	0.520
24.0	20.97	416.0	15.1	945.0	0.0107	1.05	122.0	0.00112	1.07949	0.520
25.0	20.74	419.0	14.9	922.0	0.0108	1.04	120.0	0.00111	1.07862	0.520
26.0	20.52	422.0	14.8	899.0	0.0109	1.04	118.0	0.00110	1.07775	0.521
28.0	20.08	428.0	14.5	857.0	0.0110	1.03	115.0	0.00109	1.07603	0.525
30.0	19.64	434.0	14.1	818.0	0.0111	1.02	113.0	0.00108	1.07434	0.531
32.0	19.21	441.0	13.8	782.0	0.0111	1.01	111.0	0.00107	1.07267	0.539
34.0	18.79	447.0	13.6	750.0	0.0111	1.00	110.0	0.00107	1.07104	0.547
36.0	18.37	454.0	13.3	720.0	0.0111	0.993	109.0	0.00107	1.06944	0.555
38.0	17.97	461.0	13.0	693.0	0.0111	0.987	109.0	0.00107	1.06788	0.564
40.0	17.57	469.0	12.8	669.0	0.0111	0.982	108.0	0.00108	1.06636	0.572
45.0	16.64	489.0	12.2	619.0	0.0109	0.973	108.0	0.00110	1.06276	0.592
50.0	15.77	511.0	11.7	579.0	0.0106	0.968	109.0	0.00114	1.05942	0.609
55.0	14.97	535.0	11.2	548.0	0.0102	0.968	110.0	0.00119	1.05637	0.622
60.0	14.24	559.0	10.8	523.0	0.00981	0.972	112.0	0.00124	1.05357	0.632
65.0	13.57	584.0	10.5	504.0	0.00941	0.978	114.0	0.00131	1.05102	0.639
70.0	12.96	610.0	10.2	487.0	0.00902	0.987	116.0	0.00138	1.04869	0.645
75.0	12.40	636.0	9.90	473.0	0.00864	1.00	118.0	0.00146	1.04656	0.649
80.0	11.89	662.0	9.67	462.0	0.00829	1.01	120.0	0.00155	1.04460	0.651
90.0	10.98	715.0	9.27	443.0	0.00764	1.04	124.0	0.00173	1.04115	0.654
100.0	10.20	769.0	8.96	428.0	0.00707	1.07	128.0	0.00192	1.03820	0.654
125.0	8.675	901.0	8.39	402.0	0.00595	1.15	137.0	0.00246	1.03243	0.644
150.0	7.555	1030.0	8.02	384.0	0.00515	1.23	148.0	0.00307	1.02821	0.641
175.0	6.696	1160.0	7.76	372.0	0.00454	1.31	159.0	0.00372	1.02497	0.639
200.0	6.015	1290.0	7.57	363.0	0.00406	1.40	170.0	0.00442	1.02242	0.638
225.0	5.461	1420.0	7.43	355.0	0.00368	1.47	180.0	0.00516	1.02034	0.637
250.0	5.031	1550.0	7.32	349.0	0.00337	1.55	189.0	0.00594	1.01862	0.637
275.0	4.613	1680.0	7.23	344.0	0.00310	1.62	199.0	0.00676	1.01716	0.638
300.0	4.281	1810.0	7.16	340.0	0.00288	1.70	208.0	0.00762	1.01592	0.639
350.0	3.742	2060.0	7.04	334.0	0.00252	1.85	229.0	0.00952	1.01391	0.644
400.0	3.324	2320.0	6.96	329.0	0.00224	2.00	250.0	0.0116	1.01235	0.648
450.0	2.989	2580.0	6.90	325.0	0.00201	2.15	270.0	0.0139	1.01110	0.651
500.0	2.716	2830.0	6.85	322.0	0.00183	2.30	289.0	0.0163	1.01008	0.653
600.0	2.296	3350.0	6.78	318.0	0.00155	2.58	327.0	0.0217	1.00852	0.656
700.0	1.988	3860.0	6.73	315.0	0.00134	2.86	363.0	0.0278	1.00737	0.658
800.0	1.752	4380.0	6.70	313.0	0.00118	3.13	398.0	0.0345	1.00650	0.659
900.0	1.567	4890.0	6.67	311.0	0.00106	3.39	432.0	0.0417	1.00581	0.660
1000.0	1.417	5410.0	6.65	309.0	0.000958	3.64	465.0	0.0496	1.00525	0.661
1100.0	1.293	5920.0	6.63	308.0	0.000875	3.89	497.0	0.0581	1.00479	0.661
1200.0	1.189	6440.0	6.62	307.0	0.000805	4.13	528.0	0.0671	1.00441	0.662
1300.0	1.100	6960.0	6.61	307.0	0.000745	4.37	558.0	0.0766	1.00408	0.662
1400.0	1.024	7470.0	6.60	306.0	0.000694	4.60	588.0	0.0867	1.00379	0.662
1500.0	0.9574	7990.0	6.59	305.0	0.000649	4.83	618.0	0.0973	1.00355	0.663

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

400.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
8.0	0.03843	7210.0	12.5	32.53	188.3	1.948	2.593	2.854	896.8
8.5	0.03855	7170.0	12.2	33.37	189.6	2.117	2.463	2.727	896.7
9.0	0.03868	7120.0	12.1	34.16	190.9	2.271	2.382	2.661	897.6
9.5	0.03881	7070.0	12.1	34.92	192.2	2.414	2.340	2.643	899.2
10.0	0.03894	7020.0	12.3	35.66	193.5	2.550	2.329	2.662	901.3
11.0	0.03922	6900.0	12.9	37.71	196.7	2.859	2.382	2.793	905.9
12.0	0.03952	6810.0	13.2	39.90	200.1	3.160	2.534	2.992	908.0
13.0	0.03983	6730.0	13.4	42.28	203.7	3.458	2.642	3.198	908.5
14.0	0.04015	6660.0	13.3	44.87	207.6	3.752	2.764	3.374	907.5
15.0	0.04047	6590.0	13.2	47.62	211.7	4.037	2.847	3.503	906.1
16.0	0.04081	6510.0	13.1	49.85	215.2	4.268	2.922	3.634	905.9
17.0	0.04114	6440.0	13.0	52.17	218.9	4.492	2.984	3.750	905.5
18.0	0.04149	6370.0	12.9	54.57	222.7	4.709	3.034	3.853	905.0
19.0	0.04184	6290.0	12.7	57.05	226.6	4.920	3.075	3.945	904.4
20.0	0.04220	6220.0	12.6	59.59	230.6	5.124	3.109	4.029	903.7
21.0	0.04256	6150.0	12.4	62.18	234.7	5.323	3.137	4.105	902.9
22.0	0.04293	6080.0	12.3	64.83	238.8	5.515	3.160	4.175	902.0
23.0	0.04330	6010.0	12.1	67.52	243.0	5.702	3.179	4.241	901.0
24.0	0.04368	5940.0	11.9	70.25	247.3	5.884	3.196	4.302	900.0
25.0	0.04407	5870.0	11.7	73.02	251.6	6.061	3.211	4.360	898.9
26.0	0.04446	5810.0	11.5	75.83	256.0	6.233	3.223	4.416	897.8
28.0	0.04525	5680.0	11.2	81.55	265.0	6.564	3.245	4.520	895.4
30.0	0.04607	5560.0	10.8	87.38	274.1	6.879	3.267	4.616	893.9
32.0	0.04690	5450.0	10.4	93.33	283.4	7.180	3.279	4.705	890.4
34.0	0.04775	5350.0	10.1	99.37	292.9	7.468	3.292	4.788	887.9
36.0	0.04862	5260.0	9.75	105.5	302.6	7.744	3.304	4.866	885.5
38.0	0.04951	5170.0	9.43	111.7	312.4	8.009	3.316	4.938	883.2
40.0	0.05041	5090.0	9.11	118.0	322.3	8.264	3.326	5.004	881.1
45.0	0.05273	4930.0	8.37	134.0	347.7	8.862	3.346	5.144	876.7
50.0	0.05512	4820.0	7.71	150.3	373.7	9.410	3.362	5.259	873.9
55.0	0.05758	4740.0	7.11	166.9	400.3	9.916	3.373	5.343	872.5
60.0	0.06009	4700.0	6.58	183.6	427.1	10.38	3.380	5.402	872.7
65.0	0.06263	4690.0	6.11	200.4	454.2	10.82	3.384	5.442	874.1
70.0	0.06520	4700.0	5.69	217.3	481.5	11.22	3.386	5.466	876.6
75.0	0.06778	4720.0	5.32	234.2	508.9	11.60	3.386	5.479	880.0
80.0	0.07037	4760.0	4.99	251.1	536.3	11.95	3.384	5.484	884.2
90.0	0.07556	4870.0	4.43	284.8	591.1	12.60	3.377	5.476	894.2
100.0	0.08076	5000.0	3.97	318.5	645.8	13.17	3.368	5.457	905.8
125.0	0.09367	5380.0	3.15	401.8	781.4	14.39	3.341	5.395	938.4
150.0	0.1065	5810.0	2.61	484.1	915.6	15.38	3.316	5.339	973.3
175.0	0.1192	6250.0	2.23	565.5	1048.0	16.18	3.294	5.296	1009.0
200.0	0.1318	6700.0	1.95	646.3	1180.0	16.89	3.275	5.264	1044.0
225.0	0.1444	7160.0	1.73	726.5	1312.0	17.51	3.260	5.241	1080.0
250.0	0.1570	7620.0	1.55	806.4	1443.0	18.08	3.247	5.223	1114.0
275.0	0.1695	8090.0	1.41	885.9	1573.0	18.56	3.236	5.211	1148.0
300.0	0.1820	8560.0	1.29	965.2	1703.0	19.01	3.227	5.201	1182.0
350.0	0.2071	9500.0	1.11	1123.0	1963.0	19.81	3.213	5.189	1247.0
400.0	0.2322	10500.0	0.974	1281.0	2222.0	20.50	3.202	5.183	1310.0
450.0	0.2573	11400.0	0.867	1438.0	2481.0	21.11	3.194	5.179	1370.0
500.0	0.2824	12400.0	0.781	1595.0	2740.0	21.66	3.187	5.177	1428.0
600.0	0.3328	14300.0	0.652	1909.0	3258.0	22.60	3.178	5.176	1539.0
700.0	0.3832	16300.0	0.560	2222.0	3775.0	23.40	3.171	5.176	1642.0
800.0	0.4336	18300.0	0.491	2535.0	4293.0	24.09	3.167	5.177	1740.0
900.0	0.4841	20300.0	0.437	2848.0	4811.0	24.70	3.163	5.179	1834.0
1000.0	0.5347	22300.0	0.394	3161.0	5328.0	25.25	3.160	5.178	1923.0
1100.0	0.5853	24300.0	0.358	3474.0	5846.0	25.74	3.158	5.179	2008.0
1200.0	0.6359	26300.0	0.329	3787.0	6364.0	26.19	3.156	5.180	2089.0
1300.0	0.6866	28300.0	0.304	4100.0	6882.0	26.60	3.154	5.181	2168.0
1400.0	0.7372	30300.0	0.282	4412.0	7400.0	26.99	3.153	5.181	2244.0
1500.0	0.7879	32300.0	0.263	4725.0	7918.0	27.35	3.152	5.182	2318.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

400.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	V(DH/DV)$_P$ J/G	V(DP/DU)$_v$ ATM-CC/J	-V(DP/DV)$_T$ ATM	(DV/DT)/V$_P$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
8.0	26.02	428.0	18.6	1880.0	0.00667	1.09	779.0	0.00147	1.09923	2.03
8.5	25.96	417.0	19.0	1860.0	0.00654	1.12	679.0	0.00159	1.09889	1.65
9.0	25.85	406.0	19.6	1840.0	0.00655	1.15	599.0	0.00167	1.09856	1.39
9.5	25.77	396.0	20.1	1820.0	0.00667	1.17	535.0	0.00172	1.09823	1.21
10.0	25.68	389.0	20.6	1800.0	0.00684	1.19	483.0	0.00174	1.09789	1.08
11.0	25.50	382.0	21.2	1760.0	0.00731	1.22	401.0	0.00172	1.09717	0.917
12.0	25.31	390.0	20.9	1720.0	0.00768	1.24	343.0	0.00164	1.09641	0.826
13.0	25.11	404.0	20.2	1690.0	0.00792	1.26	300.0	0.00156	1.09563	0.763
14.0	24.91	420.0	19.4	1660.0	0.00804	1.26	267.0	0.00150	1.09485	0.714
15.0	24.71	433.0	18.7	1630.0	0.00810	1.27	242.0	0.00146	1.09407	0.669
16.0	24.51	443.0	18.3	1600.0	0.00821	1.27	222.0	0.00142	1.09328	0.637
17.0	24.31	451.0	17.9	1570.0	0.00831	1.26	206.0	0.00139	1.09249	0.612
18.0	24.10	459.0	17.6	1530.0	0.00840	1.26	193.0	0.00136	1.09170	0.591
19.0	23.90	466.0	17.3	1500.0	0.00847	1.25	182.0	0.00133	1.09091	0.574
20.0	23.70	472.0	17.1	1470.0	0.00854	1.25	174.0	0.00131	1.09012	0.560
21.0	23.50	477.0	16.9	1440.0	0.00860	1.24	166.0	0.00129	1.08933	0.549
22.0	23.29	482.0	16.7	1420.0	0.00866	1.23	160.0	0.00127	1.08854	0.541
23.0	23.09	487.0	16.5	1390.0	0.00871	1.23	155.0	0.00125	1.08775	0.534
24.0	22.89	492.0	16.3	1360.0	0.00875	1.22	150.0	0.00124	1.08697	0.529
25.0	22.69	496.0	16.1	1330.0	0.00879	1.21	146.0	0.00123	1.08619	0.525
26.0	22.49	500.0	15.9	1310.0	0.00883	1.21	143.0	0.00121	1.08542	0.523
28.0	22.10	508.0	15.6	1260.0	0.00889	1.19	137.0	0.00119	1.08388	0.520
30.0	21.71	516.0	15.2	1210.0	0.00894	1.18	133.0	0.00118	1.08236	0.521
32.0	21.32	524.0	14.9	1160.0	0.00898	1.17	130.0	0.00116	1.08086	0.524
34.0	20.94	532.0	14.6	1120.0	0.00901	1.16	128.0	0.00115	1.07938	0.528
36.0	20.57	539.0	14.4	1080.0	0.00902	1.15	126.0	0.00115	1.07793	0.534
38.0	20.20	547.0	14.1	1040.0	0.00903	1.14	125.0	0.00114	1.07650	0.540
40.0	19.84	555.0	13.8	1010.0	0.00902	1.13	124.0	0.00114	1.07511	0.547
45.0	18.97	575.0	13.2	935.0	0.00895	1.12	122.0	0.00114	1.07173	0.563
50.0	18.14	597.0	12.6	874.0	0.00882	1.11	122.0	0.00116	1.06855	0.579
55.0	17.37	619.0	12.1	824.0	0.00863	1.10	122.0	0.00119	1.06557	0.593
60.0	16.64	643.0	11.7	783.0	0.00841	1.10	123.0	0.00122	1.06278	0.605
65.0	15.97	667.0	11.3	749.0	0.00816	1.10	124.0	0.00127	1.06018	0.614
70.0	15.34	692.0	11.0	721.0	0.00790	1.11	126.0	0.00132	1.05777	0.622
75.0	14.75	718.0	10.7	697.0	0.00764	1.11	127.0	0.00138	1.05554	0.627
80.0	14.21	744.0	10.4	677.0	0.00738	1.12	129.0	0.00144	1.05346	0.631
90.0	13.23	796.0	9.91	644.0	0.00688	1.14	133.0	0.00158	1.04973	0.636
100.0	12.38	850.0	9.53	619.0	0.00642	1.17	136.0	0.00173	1.04648	0.639
125.0	10.68	983.0	8.84	575.0	0.00549	1.24	145.0	0.00215	1.04000	0.631
150.0	9.393	1120.0	8.39	546.0	0.00479	1.31	155.0	0.00262	1.03514	0.629
175.0	8.392	1250.0	8.07	524.0	0.00425	1.39	165.0	0.00313	1.03136	0.628
200.0	7.588	1380.0	7.83	508.0	0.00383	1.46	174.0	0.00367	1.02833	0.627
225.0	6.926	1500.0	7.65	496.0	0.00348	1.54	184.0	0.00424	1.02584	0.626
250.0	6.371	1630.0	7.51	485.0	0.00320	1.61	193.0	0.00483	1.02376	0.627
275.0	5.900	1760.0	7.40	477.0	0.00296	1.68	202.0	0.00545	1.02198	0.628
300.0	5.493	1890.0	7.30	470.0	0.00276	1.74	211.0	0.00610	1.02046	0.629
350.0	4.828	2140.0	7.16	459.0	0.00242	1.89	232.0	0.00755	1.01797	0.636
400.0	4.306	2400.0	7.06	450.0	0.00216	2.04	252.0	0.00913	1.01602	0.641
450.0	3.886	2650.0	6.98	444.0	0.00195	2.18	272.0	0.0108	1.01445	0.645
500.0	3.540	2910.0	6.92	439.0	0.00178	2.33	291.0	0.0127	1.01316	0.648
600.0	3.005	3420.0	6.83	431.0	0.00151	2.61	329.0	0.0168	1.01116	0.652
700.0	2.610	3930.0	6.77	426.0	0.00132	2.88	364.0	0.0213	1.00969	0.655
800.0	2.306	4450.0	6.73	422.0	0.00116	3.15	399.0	0.0264	1.00856	0.657
900.0	2.065	4960.0	6.69	419.0	0.00104	3.41	433.0	0.0319	1.00766	0.658
1000.0	1.870	5470.0	6.66	416.0	0.000946	3.66	466.0	0.0378	1.00694	0.659
1100.0	1.709	5990.0	6.64	414.0	0.000865	3.91	497.0	0.0441	1.00634	0.660
1200.0	1.573	6510.0	6.62	413.0	0.000796	4.15	529.0	0.0509	1.00583	0.660
1300.0	1.457	7020.0	6.61	412.0	0.000738	4.38	559.0	0.0581	1.00540	0.661
1400.0	1.356	7540.0	6.60	410.0	0.000687	4.61	589.0	0.0656	1.00503	0.661
1500.0	1.269	8050.0	6.59	409.0	0.000643	4.84	618.0	0.0736	1.00470	0.662

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

500.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
9.5	0.03694	8330.0	12.7	41.13	228.3	2.177	2.269	2.525	969.3
10.0	0.03705	8270.0	13.0	41.80	229.5	2.306	2.214	2.497	972.4
11.0	0.03727	8160.0	13.9	43.62	232.5	2.594	2.238	2.603	980.5
12.0	0.03752	8070.0	14.5	45.57	235.7	2.878	2.371	2.818	985.9
13.0	0.03778	8010.0	14.8	47.75	239.2	3.165	2.538	3.055	988.1
14.0	0.03805	7950.0	14.9	50.18	243.0	3.452	2.688	3.260	988.1
15.0	0.03833	7890.0	14.7	52.82	247.0	3.735	2.792	3.405	987.3
16.0	0.03860	7820.0	14.7	54.89	250.5	3.959	2.874	3.538	987.6
17.0	0.03889	7750.0	14.6	57.06	254.1	4.177	2.943	3.655	987.7
18.0	0.03917	7680.0	14.4	59.32	257.8	4.389	2.999	3.759	987.8
19.0	0.03946	7620.0	14.3	61.65	261.6	4.595	3.046	3.851	987.7
20.0	0.03976	7550.0	14.2	64.05	265.5	4.794	3.084	3.934	987.6
21.0	0.04005	7480.0	14.0	66.52	269.4	4.988	3.117	4.010	987.4
22.0	0.04036	7410.0	13.8	69.03	273.5	5.176	3.144	4.078	987.0
23.0	0.04066	7350.0	13.6	71.60	277.6	5.359	3.167	4.142	986.6
24.0	0.04097	7280.0	13.5	74.21	281.8	5.536	3.187	4.202	986.1
25.0	0.04128	7210.0	13.3	76.86	286.0	5.709	3.204	4.258	985.4
26.0	0.04160	7150.0	13.1	79.54	290.3	5.877	3.219	4.311	984.7
28.0	0.04224	7020.0	12.7	85.03	299.0	6.200	3.246	4.410	983.0
30.0	0.04289	6900.0	12.3	90.63	307.9	6.508	3.268	4.501	981.1
32.0	0.04355	6780.0	12.0	96.36	317.0	6.801	3.287	4.586	979.0
34.0	0.04423	6670.0	11.6	102.2	326.3	7.081	3.305	4.666	976.7
36.0	0.04491	6560.0	11.3	108.1	335.7	7.350	3.320	4.741	974.4
38.0	0.04561	6460.0	10.9	114.1	345.2	7.608	3.334	4.812	972.0
40.0	0.04632	6370.0	10.6	120.2	354.9	7.857	3.347	4.878	969.6
45.0	0.04813	6160.0	9.81	135.8	379.7	8.440	3.375	5.025	964.2
50.0	0.05000	6000.0	9.10	151.8	405.1	8.976	3.396	5.146	959.6
55.0	0.05193	5870.0	8.46	168.0	431.1	9.471	3.412	5.243	956.1
60.0	0.05389	5780.0	7.88	184.5	457.5	9.931	3.423	5.319	953.9
65.0	0.05588	5720.0	7.36	201.2	484.3	10.36	3.431	5.376	952.9
70.0	0.05790	5690.0	6.88	217.9	511.2	10.76	3.435	5.416	953.1
75.0	0.05994	5670.0	6.46	234.7	538.4	11.13	3.436	5.444	954.2
80.0	0.06199	5680.0	6.08	251.6	565.7	11.49	3.436	5.461	956.2
90.0	0.06611	5730.0	5.42	285.4	620.3	12.13	3.431	5.473	962.3
100.0	0.07025	5820.0	4.88	319.2	675.1	12.71	3.422	5.466	970.6
125.0	0.08056	6140.0	3.89	403.0	811.1	13.92	3.394	5.416	997.0
150.0	0.09078	6530.0	3.23	485.9	945.8	14.90	3.365	5.360	1027.0
175.0	0.1009	6940.0	2.76	568.0	1079.0	15.73	3.339	5.314	1058.0
200.0	0.1110	7370.0	2.41	649.3	1212.0	16.43	3.316	5.277	1090.0
225.0	0.1210	7810.0	2.14	730.0	1343.0	17.05	3.298	5.250	1122.0
250.0	0.1310	8260.0	1.92	810.3	1474.0	17.61	3.282	5.230	1155.0
275.0	0.1410	8710.0	1.75	890.2	1605.0	18.10	3.269	5.214	1186.0
300.0	0.1510	9160.0	1.60	969.9	1735.0	18.56	3.257	5.203	1218.0
350.0	0.1710	10100.0	1.38	1129.0	1995.0	19.36	3.239	5.188	1279.0
400.0	0.1909	11000.0	1.21	1287.0	2254.0	20.05	3.225	5.180	1339.0
450.0	0.2109	12000.0	1.08	1444.0	2513.0	20.66	3.215	5.175	1397.0
500.0	0.2309	12900.0	0.969	1602.0	2771.0	21.20	3.207	5.172	1453.0
600.0	0.2710	14800.0	0.810	1916.0	3288.0	22.15	3.194	5.171	1560.0
700.0	0.3111	16800.0	0.697	2229.0	3806.0	22.94	3.186	5.171	1661.0
800.0	0.3513	18700.0	0.611	2543.0	4323.0	23.63	3.180	5.172	1757.0
900.0	0.3916	20700.0	0.544	2856.0	4840.0	24.24	3.175	5.174	1848.0
1000.0	0.4319	22700.0	0.490	3169.0	5357.0	24.79	3.171	5.175	1936.0
1100.0	0.4723	24700.0	0.446	3482.0	5875.0	25.28	3.168	5.176	2020.0
1200.0	0.5126	26600.0	0.409	3795.0	6393.0	25.73	3.166	5.177	2101.0
1300.0	0.5531	28600.0	0.378	4108.0	6910.0	26.15	3.164	5.178	2178.0
1400.0	0.5935	30600.0	0.351	4421.0	7428.0	26.53	3.162	5.179	2254.0
1500.0	0.6339	32600.0	0.328	4734.0	7946.0	26.89	3.161	5.179	2327.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

500.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG.K	DENSITY G/CC ** X 100	$V(\partial H/\partial V)_P$ J/G	$V(\partial P/\partial U)_V$ ATM-CC/J	$-V(\partial P/\partial V)_T$ ATM	$(\partial V/\partial T)_P/V$ 1/DEG.K	THERMAL CONDUCTIVITY MW/CM-K	VISCOSITY G/CM-S ** X 1000000	THERMAL DIFFUSIVITY SQ-CM/S	DIELECTRIC CONSTANT	PRANDTL NUMBER
9.5	27.07	447.0	20.8	2260.0	0.00565	1.35	853.0	0.00197	1.10334	1.60
10.0	26.99	430.0	21.7	2230.0	0.00581	1.37	754.0	0.00263	1.10304	1.37
11.0	26.83	411.0	23.1	2190.0	0.00633	1.41	606.0	0.00261	1.10239	1.12
12.0	26.65	418.0	23.0	2150.0	0.00674	1.43	501.0	0.00190	1.10170	0.990
13.0	26.47	436.0	22.1	2120.0	0.00700	1.44	426.0	0.00178	1.10097	0.904
14.0	26.28	458.0	21.1	2090.0	0.00712	1.45	370.0	0.00169	1.10023	0.834
15.0	26.09	476.0	20.2	2060.0	0.00715	1.45	328.0	0.00163	1.09950	0.771
16.0	25.90	489.0	19.7	2030.0	0.00723	1.44	295.0	0.00158	1.09876	0.722
17.0	25.72	500.0	19.2	1990.0	0.00730	1.44	269.0	0.00153	1.09802	0.683
18.0	25.53	511.0	18.9	1960.0	0.00736	1.43	248.0	0.00149	1.09729	0.651
19.0	25.34	520.0	18.5	1930.0	0.00741	1.43	231.0	0.00146	1.09655	0.625
20.0	25.15	528.0	18.2	1900.0	0.00745	1.42	217.0	0.00143	1.09581	0.603
21.0	24.97	535.0	18.0	1870.0	0.00749	1.41	206.0	0.00141	1.09508	0.586
22.0	24.78	542.0	17.7	1840.0	0.00752	1.40	196.0	0.00138	1.09435	0.571
23.0	24.59	549.0	17.5	1810.0	0.00755	1.39	188.0	0.00136	1.09362	0.559
24.0	24.41	555.0	17.3	1780.0	0.00757	1.38	181.0	0.00135	1.09290	0.550
25.0	24.22	561.0	17.1	1750.0	0.00759	1.37	175.0	0.00133	1.09217	0.542
26.0	24.04	566.0	16.9	1720.0	0.00761	1.36	169.0	0.00131	1.09146	0.536
28.0	23.68	577.0	16.5	1660.0	0.00764	1.35	161.0	0.00129	1.09003	0.528
30.0	23.32	587.0	16.2	1610.0	0.00767	1.33	155.0	0.00127	1.08863	0.523
32.0	22.96	597.0	15.9	1560.0	0.00769	1.31	150.0	0.00125	1.08724	0.522
34.0	22.61	606.0	15.5	1510.0	0.00770	1.30	146.0	0.00123	1.08588	0.523
36.0	22.27	615.0	15.2	1460.0	0.00770	1.29	143.0	0.00122	1.08453	0.525
38.0	21.92	624.0	14.9	1420.0	0.00771	1.28	140.0	0.00121	1.08321	0.529
40.0	21.59	633.0	14.7	1370.0	0.00770	1.27	139.0	0.00120	1.08190	0.533
45.0	20.78	656.0	14.0	1280.0	0.00766	1.25	136.0	0.00120	1.07874	0.546
50.0	20.00	678.0	13.4	1200.0	0.00759	1.23	134.0	0.00120	1.07573	0.559
55.0	19.26	701.0	12.9	1130.0	0.00748	1.23	134.0	0.00121	1.07286	0.572
60.0	18.56	724.0	12.4	1070.0	0.00734	1.22	134.0	0.00124	1.07016	0.584
65.0	17.90	748.0	12.0	1020.0	0.00718	1.22	135.0	0.00127	1.06760	0.594
70.0	17.27	773.0	11.6	982.0	0.00701	1.22	136.0	0.00130	1.06520	0.602
75.0	16.68	798.0	11.3	947.0	0.00682	1.22	137.0	0.00135	1.06294	0.609
80.0	16.13	823.0	11.0	916.0	0.00663	1.23	138.0	0.00139	1.06082	0.614
90.0	15.13	875.0	10.4	867.0	0.00625	1.24	141.0	0.00150	1.05696	0.621
100.0	14.24	929.0	10.0	829.0	0.00589	1.26	144.0	0.00162	1.05355	0.624
125.0	12.41	1060.0	9.23	763.0	0.00510	1.32	151.0	0.00197	1.04660	0.619
150.0	11.02	1200.0	8.70	719.0	0.00448	1.39	160.0	0.00236	1.04129	0.618
175.0	9.909	1330.0	8.33	688.0	0.00400	1.46	170.0	0.00278	1.03709	0.617
200.0	9.010	1460.0	8.05	664.0	0.00362	1.53	179.0	0.00322	1.03369	0.616
225.0	8.263	1590.0	7.84	645.0	0.00331	1.60	188.0	0.00369	1.03087	0.616
250.0	7.632	1710.0	7.68	630.0	0.00305	1.66	196.0	0.00417	1.02850	0.617
275.0	7.091	1840.0	7.54	617.0	0.00283	1.73	205.0	0.00467	1.02646	0.618
300.0	6.622	1970.0	7.44	607.0	0.00264	1.79	213.0	0.00520	1.02470	0.619
350.0	5.849	2220.0	7.27	590.0	0.00233	1.93	234.0	0.00637	1.02180	0.628
400.0	5.238	2480.0	7.15	577.0	0.00209	2.07	254.0	0.00764	1.01950	0.634
450.0	4.742	2730.0	7.05	567.0	0.00190	2.22	274.0	0.00903	1.01765	0.639
500.0	4.331	2980.0	6.98	559.0	0.00173	2.36	293.0	0.0105	1.01611	0.642
600.0	3.690	3490.0	6.87	548.0	0.00148	2.63	330.0	0.0138	1.01372	0.648
700.0	3.214	4000.0	6.80	539.0	0.00129	2.90	366.0	0.0175	1.01194	0.651
800.0	2.846	4520.0	6.75	533.0	0.00115	3.17	400.0	0.0215	1.01057	0.654
900.0	2.554	5030.0	6.71	529.0	0.00103	3.42	434.0	0.0259	1.00948	0.656
1000.0	2.315	5540.0	6.68	525.0	0.000934	3.67	467.0	0.0307	1.00859	0.657
1100.0	2.117	6060.0	6.65	522.0	0.000855	3.92	498.0	0.0358	1.00786	0.658
1200.0	1.951	6570.0	6.63	520.0	0.000788	4.16	529.0	0.0412	1.00724	0.659
1300.0	1.808	7080.0	6.61	518.0	0.000731	4.39	560.0	0.0469	1.00671	0.660
1400.0	1.685	7600.0	6.60	516.0	0.000681	4.62	590.0	0.0530	1.00625	0.660
1500.0	1.577	8120.0	6.58	514.0	0.000638	4.85	619.0	0.0594	1.00585	0.661

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

600.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
11.0	0.03575	9340.0	14.6	49.66	267.0	2.373	2.095	2.420	1045.0
12.0	0.03596	9260.0	15.6	51.37	270.0	2.640	2.240	2.653	1054.0
13.0	0.03619	9210.0	16.2	53.34	273.4	2.915	2.437	2.926	1058.0
14.0	0.03643	9170.0	16.3	55.60	277.1	3.196	2.618	3.164	1060.0
15.0	0.03667	9130.0	16.2	58.12	281.1	3.476	2.746	3.331	1059.0
16.0	0.03691	9060.0	16.1	60.86	284.5	3.696	2.834	3.467	1060.0
17.0	0.03716	9000.0	16.0	62.11	288.0	3.910	2.908	3.587	1060.0
18.0	0.03741	8930.0	15.9	64.24	291.6	4.118	2.969	3.693	1061.0
19.0	0.03766	8860.0	15.8	66.46	295.4	4.320	3.021	3.787	1061.0
20.0	0.03791	8800.0	15.6	68.75	299.2	4.516	3.063	3.871	1061.0
21.0	0.03817	8730.0	15.4	71.10	303.1	4.707	3.099	3.946	1061.0
22.0	0.03842	8670.0	15.3	73.50	307.1	4.892	3.130	4.015	1061.0
23.0	0.03869	8600.0	15.1	75.96	311.2	5.072	3.156	4.078	1061.0
24.0	0.03895	8540.0	14.9	78.47	315.3	5.247	3.178	4.137	1061.0
25.0	0.03922	8480.0	14.7	81.02	319.4	5.417	3.198	4.192	1061.0
26.0	0.03948	8410.0	14.5	83.61	323.6	5.582	3.216	4.243	1061.0
28.0	0.04002	8290.0	14.1	88.90	332.2	5.900	3.247	4.339	1060.0
30.0	0.04057	8170.0	13.7	94.33	341.0	6.203	3.273	4.428	1058.0
32.0	0.04113	8050.0	13.3	99.9	349.9	6.491	3.295	4.510	1056.0
34.0	0.04170	7930.0	13.0	105.5	359.0	6.767	3.316	4.587	1054.0
36.0	0.04227	7820.0	12.6	111.3	368.3	7.031	3.334	4.659	1052.0
38.0	0.04285	7720.0	12.3	117.2	377.7	7.285	3.351	4.727	1050.0
40.0	0.04343	7610.0	11.9	123.1	387.2	7.529	3.367	4.792	1048.0
45.0	0.04493	7380.0	11.1	138.3	411.5	8.102	3.400	4.936	1042.0
50.0	0.04647	7180.0	10.4	154.0	436.5	8.629	3.427	5.060	1036.0
55.0	0.04804	7020.0	9.67	170.0	462.1	9.116	3.447	5.162	1032.0
60.0	0.04965	6880.0	9.05	186.3	488.1	9.569	3.462	5.246	1028.0
65.0	0.05128	6780.0	8.49	202.7	514.5	9.99	3.473	5.312	1025.0
70.0	0.05294	6710.0	7.97	219.4	541.2	10.39	3.480	5.364	1023.0
75.0	0.05461	6660.0	7.51	236.1	568.1	10.76	3.484	5.402	1023.0
80.0	0.05630	6630.0	7.08	252.9	595.2	11.11	3.485	5.430	1023.0
90.0	0.05971	6620.0	6.35	286.7	649.7	11.75	3.482	5.459	1025.0
100.0	0.06313	6660.0	5.73	320.5	704.3	12.33	3.474	5.466	1031.0
125.0	0.07169	6910.0	4.59	404.7	840.6	13.54	3.444	5.432	1051.0
150.0	0.08020	7250.0	3.82	488.2	975.8	14.53	3.412	5.379	1076.0
175.0	0.08864	7640.0	3.27	570.8	1110.0	15.35	3.383	5.331	1104.0
200.0	0.09701	8040.0	2.86	652.6	1242.0	16.06	3.358	5.291	1133.0
225.0	0.1053	8460.0	2.54	733.8	1374.0	16.68	3.336	5.260	1163.0
250.0	0.1137	8890.0	2.28	814.5	1505.0	17.24	3.317	5.237	1192.0
275.0	0.1219	9330.0	2.08	894.8	1636.0	17.73	3.301	5.219	1222.0
300.0	0.1302	9770.0	1.91	974.8	1766.0	18.19	3.288	5.205	1252.0
350.0	0.1468	10700.0	1.64	1134.0	2026.0	18.99	3.266	5.187	1310.0
400.0	0.1633	11600.0	1.44	1292.0	2285.0	19.68	3.249	5.177	1367.0
450.0	0.1799	12500.0	1.28	1450.0	2544.0	20.29	3.236	5.171	1422.0
500.0	0.1965	13400.0	1.15	1608.0	2802.0	20.83	3.226	5.168	1476.0
600.0	0.2297	15300.0	0.966	1923.0	3319.0	21.78	3.211	5.166	1580.0
700.0	0.2630	17200.0	0.831	2237.0	3836.0	22.57	3.201	5.167	1679.0
800.0	0.2964	19200.0	0.729	2550.0	4352.0	23.26	3.193	5.168	1773.0
900.0	0.3298	21100.0	0.649	2864.0	4869.0	23.87	3.187	5.169	1863.0
1000.0	0.3633	23100.0	0.586	3178.0	5386.0	24.42	3.183	5.171	1949.0
1100.0	0.3968	25000.0	0.533	3491.0	5903.0	24.91	3.179	5.172	2031.0
1200.0	0.4304	27000.0	0.489	3804.0	6421.0	25.36	3.176	5.174	2111.0
1300.0	0.4640	29000.0	0.452	4117.0	6938.0	25.77	3.174	5.175	2188.0
1400.0	0.4976	31000.0	0.420	4431.0	7456.0	26.16	3.172	5.176	2262.0
1500.0	0.5312	32900.0	0.393	4744.0	7973.0	26.51	3.170	5.177	2335.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

600.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)$_P$	V(DP/DV)$_V$	-V(DP/DV)$_T$	(DV/DT)/V$_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
11.0	27.97	433.0	24.9	2610.0	0.00558	1.59	896.0	0.00235	1.10690	1.36
12.0	27.81	438.0	25.0	2580.0	0.00605	1.61	719.0	0.00219	1.10625	1.18
13.0	27.63	461.0	24.8	2540.0	0.00635	1.62	594.0	0.00201	1.10555	1.07
14.0	27.45	488.0	22.7	2520.0	0.00648	1.63	503.0	0.00187	1.10483	0.979
15.0	27.27	513.0	21.6	2490.0	0.00650	1.63	436.0	0.00179	1.10412	0.894
16.0	27.09	528.0	21.0	2460.0	0.00657	1.62	385.0	0.00173	1.10342	0.824
17.0	26.91	542.0	20.5	2420.0	0.00662	1.61	346.0	0.00167	1.10272	0.768
18.0	26.73	554.0	20.0	2390.0	0.00667	1.60	314.0	0.00163	1.10202	0.723
19.0	26.56	565.0	19.7	2350.0	0.00670	1.59	289.0	0.00159	1.10132	0.686
20.0	26.38	575.0	19.3	2320.0	0.00673	1.58	268.0	0.00155	1.10062	0.656
21.0	26.20	585.0	19.0	2290.0	0.00675	1.57	251.0	0.00152	1.09993	0.631
22.0	26.02	593.0	18.7	2260.0	0.00677	1.56	237.0	0.00149	1.09923	0.610
23.0	25.85	601.0	18.5	2220.0	0.00678	1.55	225.0	0.00147	1.09854	0.593
24.0	25.67	609.0	18.3	2190.0	0.00679	1.54	215.0	0.00145	1.09786	0.578
25.0	25.50	616.0	18.0	2160.0	0.00680	1.52	206.0	0.00143	1.09717	0.566
26.0	25.33	623.0	17.8	2130.0	0.00681	1.51	198.0	0.00141	1.09650	0.557
28.0	24.98	637.0	17.4	2070.0	0.00682	1.49	186.0	0.00138	1.09515	0.542
30.0	24.65	649.0	17.0	2010.0	0.00682	1.47	177.0	0.00135	1.09383	0.533
32.0	24.31	661.0	16.7	1960.0	0.00682	1.45	170.0	0.00132	1.09252	0.527
34.0	23.98	673.0	16.3	1900.0	0.00682	1.44	164.0	0.00131	1.09123	0.524
36.0	23.65	684.0	16.0	1850.0	0.00681	1.42	160.0	0.00129	1.08996	0.524
38.0	23.34	695.0	15.7	1800.0	0.00681	1.41	156.0	0.00128	1.08871	0.525
40.0	23.02	705.0	15.4	1750.0	0.00679	1.40	153.0	0.00127	1.08748	0.527
45.0	22.26	731.0	14.7	1640.0	0.00676	1.37	149.0	0.00125	1.08450	0.535
50.0	21.52	755.0	14.0	1550.0	0.00670	1.35	146.0	0.00124	1.08163	0.546
55.0	20.81	779.0	13.5	1460.0	0.00662	1.34	145.0	0.00125	1.07889	0.558
60.0	20.14	804.0	13.0	1390.0	0.00653	1.33	144.0	0.00126	1.07628	0.568
65.0	19.50	828.0	12.5	1320.0	0.00642	1.33	144.0	0.00128	1.07380	0.578
70.0	18.89	852.0	12.1	1270.0	0.00629	1.33	145.0	0.00131	1.07144	0.586
75.0	18.31	877.0	11.8	1220.0	0.00616	1.33	146.0	0.00134	1.06920	0.593
80.0	17.75	902.0	11.4	1180.0	0.00602	1.33	147.0	0.00138	1.06709	0.599
90.0	16.75	954.0	10.9	1110.0	0.00572	1.34	149.0	0.00147	1.06319	0.607
100.0	15.84	1010.0	10.4	1060.0	0.00543	1.36	152.0	0.00157	1.05970	0.611
125.0	13.95	1140.0	9.56	964.0	0.00477	1.41	158.0	0.00186	1.05245	0.608
150.0	12.47	1270.0	8.98	904.0	0.00422	1.47	166.0	0.00219	1.04681	0.608
175.0	11.28	1410.0	8.56	862.0	0.00379	1.53	174.0	0.00255	1.04230	0.607
200.0	10.31	1540.0	8.25	829.0	0.00344	1.60	183.0	0.00293	1.03860	0.606
225.0	9.492	1670.0	8.01	803.0	0.00316	1.66	191.0	0.00332	1.03552	0.606
250.0	8.799	1790.0	7.83	782.0	0.00292	1.72	199.0	0.00373	1.03290	0.607
275.0	8.201	1920.0	7.67	765.0	0.00272	1.78	207.0	0.00416	1.03064	0.608
300.0	7.679	2050.0	7.55	750.0	0.00254	1.84	215.0	0.00459	1.02867	0.610
350.0	6.814	2300.0	7.36	726.0	0.00225	1.97	236.0	0.00558	1.02542	0.620
400.0	6.123	2550.0	7.22	709.0	0.00203	2.11	256.0	0.00666	1.02282	0.627
450.0	5.560	2810.0	7.11	695.0	0.00184	2.25	275.0	0.00782	1.02071	0.633
500.0	5.090	3060.0	7.03	684.0	0.00169	2.39	294.0	0.00907	1.01895	0.637
600.0	4.354	3570.0	6.91	667.0	0.00145	2.66	331.0	0.0118	1.01620	0.644
700.0	3.802	4070.0	6.83	655.0	0.00127	2.93	367.0	0.0149	1.01414	0.648
800.0	3.374	4580.0	6.77	647.0	0.00113	3.19	401.0	0.0183	1.01254	0.651
900.0	3.032	5100.0	6.72	640.0	0.00101	3.44	435.0	0.0220	1.01126	0.653
1000.0	2.753	5610.0	6.68	635.0	0.000922	3.69	467.0	0.0259	1.01022	0.655
1100.0	2.520	6120.0	6.65	631.0	0.000845	3.93	499.0	0.0302	1.00936	0.656
1200.0	2.324	6630.0	6.63	627.0	0.000780	4.17	530.0	0.0347	1.00862	0.657
1300.0	2.155	7150.0	6.61	625.0	0.000724	4.41	561.0	0.0395	1.00800	0.658
1400.0	2.010	7660.0	6.59	622.0	0.000676	4.64	590.0	0.0446	1.00746	0.659
1500.0	1.883	8180.0	6.58	620.0	0.000633	4.86	619.0	0.0499	1.00698	0.660

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

700.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP J/G-K	VELOCITY OF SOUND M/S
12.0	0.03469	10400.0	16.4	57.23	303.3	2.433	2.106	2.486	1115.0
13.0	0.03490	10400.0	17.3	58.97	306.5	2.695	2.336	2.798	1122.0
14.0	0.03512	10300.0	17.6	61.06	310.2	2.970	2.552	3.075	1124.0
15.0	0.03534	10300.0	17.5	63.47	314.1	3.249	2.705	3.269	1125.0
16.0	0.03555	10300.0	17.5	65.30	317.5	3.464	2.799	3.409	1125.0
17.0	0.03577	10200.0	17.4	67.23	320.9	3.675	2.877	3.532	1126.0
18.0	0.03599	10100.0	17.3	69.26	324.5	3.880	2.943	3.641	1126.0
19.0	0.03621	10100.0	17.2	71.37	328.2	4.079	2.999	3.738	1127.0
20.0	0.03644	10000.0	17.0	73.55	332.0	4.273	3.045	3.823	1127.0
21.0	0.03666	9930.0	16.8	75.81	335.9	4.462	3.084	3.900	1128.0
22.0	0.03689	9860.0	16.6	78.12	339.8	4.645	3.118	3.970	1128.0
23.0	0.03712	9800.0	16.5	80.49	343.8	4.823	3.147	4.034	1128.0
24.0	0.03736	9740.0	16.3	82.91	347.9	4.996	3.172	4.093	1128.0
25.0	0.03759	9680.0	16.1	85.37	352.0	5.164	3.194	4.147	1128.0
26.0	0.03782	9620.0	15.9	87.87	356.2	5.328	3.214	4.199	1128.0
28.0	0.03830	9500.0	15.4	93.00	364.7	5.642	3.248	4.293	1128.0
30.0	0.03878	9380.0	15.0	98.28	373.3	5.941	3.278	4.380	1127.0
32.0	0.03926	9260.0	14.6	103.7	382.2	6.227	3.304	4.460	1125.0
34.0	0.03975	9150.0	14.2	109.2	391.2	6.499	3.327	4.534	1124.0
36.0	0.04025	9040.0	13.9	114.8	400.3	6.760	3.348	4.604	1122.0
38.0	0.04075	8930.0	13.5	120.6	409.6	7.011	3.367	4.670	1120.0
40.0	0.04125	8820.0	13.1	126.4	419.0	7.252	3.385	4.733	1118.0
45.0	0.04253	8570.0	12.3	141.3	443.0	7.818	3.424	4.874	1112.0
50.0	0.04384	8350.0	11.5	156.7	467.7	8.338	3.456	4.996	1106.0
55.0	0.04518	8160.0	10.8	172.5	492.9	8.819	3.480	5.100	1100.0
60.0	0.04654	7990.0	10.1	188.6	518.7	9.267	3.499	5.186	1095.0
65.0	0.04792	7860.0	9.52	204.9	544.8	9.685	3.513	5.258	1091.0
70.0	0.04932	7750.0	8.97	221.4	571.2	10.08	3.527	5.315	1088.0
75.0	0.05074	7660.0	8.47	238.0	597.9	10.45	3.538	5.361	1086.0
80.0	0.05216	7600.0	8.01	254.8	624.8	10.79	3.531	5.396	1085.0
90.0	0.05505	7530.0	7.21	288.5	679.0	11.43	3.530	5.439	1084.0
100.0	0.05796	7530.0	6.54	322.4	733.5	12.00	3.523	5.458	1087.0
125.0	0.06527	7680.0	5.27	406.9	869.9	13.22	3.494	5.443	1101.0
150.0	0.07255	7970.0	4.39	490.8	1005.0	14.21	3.459	5.396	1122.0
175.0	0.07977	8320.0	3.76	573.8	1140.0	15.04	3.427	5.347	1147.0
200.0	0.08694	8710.0	3.29	656.1	1273.0	15.75	3.398	5.305	1173.0
225.0	0.09406	9110.0	2.93	737.8	1405.0	16.37	3.374	5.271	1201.0
250.0	0.1012	9520.0	2.64	818.9	1536.0	16.93	3.352	5.244	1228.0
275.0	0.1082	9940.0	2.40	899.5	1667.0	17.42	3.334	5.224	1256.0
300.0	0.1153	10400.0	2.20	979.8	1798.0	17.88	3.318	5.208	1284.0
350.0	0.1294	11200.0	1.89	1140.0	2057.0	18.68	3.293	5.187	1339.0
400.0	0.1435	12100.0	1.66	1298.0	2316.0	19.37	3.273	5.174	1393.0
450.0	0.1576	13000.0	1.48	1457.0	2575.0	19.98	3.258	5.167	1446.0
500.0	0.1718	13900.0	1.34	1615.0	2833.0	20.52	3.246	5.163	1499.0
600.0	0.2001	15800.0	1.12	1930.0	3349.0	21.47	3.228	5.161	1599.0
700.0	0.2286	17700.0	0.964	2244.0	3865.0	22.26	3.216	5.162	1696.0
800.0	0.2571	19600.0	0.846	2558.0	4382.0	22.95	3.207	5.163	1788.0
900.0	0.2856	21500.0	0.754	2872.0	4898.0	23.56	3.200	5.165	1876.0
1000.0	0.3142	23500.0	0.680	3186.0	5415.0	24.10	3.195	5.167	1961.0
1100.0	0.3429	25400.0	0.619	3500.0	5932.0	24.60	3.190	5.169	2042.0
1200.0	0.3716	27400.0	0.569	3813.0	6448.0	25.05	3.187	5.170	2121.0
1300.0	0.4003	29300.0	0.526	4127.0	6966.0	25.46	3.184	5.172	2197.0
1400.0	0.4290	31300.0	0.489	4440.0	7483.0	25.84	3.181	5.173	2270.0
1500.0	0.4577	33300.0	0.456	4754.0	8000.0	26.20	3.179	5.174	2342.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

700.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 10.0000	SQ-CM/S		
12.0	28.83	454.0	27.1	3060.0	0.00548	1.80	1020.0	0.00251	1.11627	1.41
13.0	28.65	481.0	25.8	2970.0	0.00582	1.81	817.0	0.00226	1.11958	1.26
14.0	28.47	515.0	24.2	2950.0	0.00597	1.81	676.0	0.00207	1.12288	1.15
15.0	28.38	546.0	22.9	2920.0	0.00599	1.80	573.0	0.00195	1.12618	1.04
16.0	28.13	563.0	22.2	2890.0	0.00606	1.80	497.0	0.00187	1.12751	0.943
17.0	27.95	578.0	21.6	2850.0	0.00611	1.79	439.0	0.00181	1.12684	0.867
18.0	27.79	592.0	21.1	2810.0	0.00615	1.77	393.0	0.00175	1.12616	0.817
19.0	27.61	605.0	20.7	2780.0	0.00618	1.76	357.0	0.00171	1.12549	0.757
20.0	27.44	617.0	20.3	2740.0	0.00620	1.75	327.0	0.00166	1.12482	0.717
21.0	27.27	628.0	20.0	2710.0	0.00622	1.73	303.0	0.00163	1.12415	0.683
22.0	27.10	638.0	19.7	2670.0	0.00623	1.72	283.0	0.00160	1.12348	0.655
23.0	26.94	647.0	19.4	2640.0	0.00623	1.70	267.0	0.00157	1.12282	0.632
24.0	26.77	656.0	19.1	2610.0	0.00623	1.69	252.0	0.00154	1.12216	0.612
25.0	26.60	665.0	18.9	2570.0	0.00624	1.67	240.0	0.00152	1.12151	0.596
26.0	26.44	674.0	18.7	2540.0	0.00623	1.66	230.0	0.00149	1.12086	0.582
28.0	26.11	689.0	18.2	2480.0	0.00623	1.63	213.0	0.00146	1.09957	0.561
30.0	25.79	704.0	17.8	2420.0	0.00622	1.61	201.0	0.00142	1.09830	0.547
32.0	25.47	719.0	17.4	2360.0	0.00620	1.59	191.0	0.00140	1.09705	0.537
34.0	25.16	733.0	17.0	2300.0	0.00619	1.57	183.0	0.00137	1.09582	0.531
36.0	24.85	746.0	16.7	2240.0	0.00617	1.55	177.0	0.00135	1.09461	0.528
38.0	24.54	759.0	16.3	2190.0	0.00616	1.53	173.0	0.00134	1.09342	0.526
40.0	24.24	771.0	16.0	2140.0	0.00614	1.52	169.0	0.00132	1.09224	0.526
45.0	23.51	800.0	15.2	2020.0	0.00609	1.49	162.0	0.00130	1.08939	0.530
50.0	22.81	828.0	14.6	1900.0	0.00603	1.47	158.0	0.00129	1.08665	0.538
55.0	22.14	854.0	14.0	1810.0	0.00597	1.45	156.0	0.00128	1.08402	0.547
60.0	21.49	880.0	13.5	1720.0	0.00589	1.44	154.0	0.00129	1.08151	0.557
65.0	20.87	905.0	13.0	1640.0	0.00581	1.43	154.0	0.00130	1.07910	0.565
70.0	20.28	930.0	12.6	1570.0	0.00571	1.43	154.0	0.00132	1.07680	0.573
75.0	19.71	955.0	12.2	1510.0	0.00561	1.43	154.0	0.00135	1.07461	0.580
80.0	19.17	981.0	11.8	1460.0	0.00550	1.43	155.0	0.00138	1.07252	0.586
90.0	18.15	1030.0	11.2	1370.0	0.00527	1.43	157.0	0.00145	1.06854	0.594
100.0	17.25	1080.0	10.8	1300.0	0.00504	1.45	159.0	0.00154	1.06512	0.600
125.0	15.32	1220.0	9.84	1180.0	0.00448	1.49	164.0	0.00179	1.05770	0.598
150.0	13.78	1350.0	9.21	1160.0	0.00403	1.54	171.0	0.00208	1.05182	0.599
175.0	12.54	1480.0	8.76	1040.0	0.00361	1.60	179.0	0.00239	1.04707	0.598
200.0	11.53	1610.0	8.42	1000.0	0.00329	1.66	187.0	0.00272	1.04314	0.597
225.0	10.63	1740.0	8.16	968.0	0.00302	1.72	195.0	0.00307	1.03983	0.597
250.0	9.885	1870.0	7.95	941.0	0.00280	1.77	202.0	0.00342	1.03700	0.598
275.0	9.239	2000.0	7.79	918.0	0.00261	1.83	210.0	0.00379	1.03456	0.599
300.0	8.673	2130.0	7.65	899.0	0.00245	1.88	217.0	0.00417	1.03242	0.601
350.0	7.727	2380.0	7.44	868.0	0.00218	2.01	238.0	0.00502	1.02886	0.612
400.0	6.968	2630.0	7.28	845.0	0.00197	2.15	257.0	0.00595	1.02600	0.621
450.0	6.343	2880.0	7.17	826.0	0.00179	2.28	277.0	0.00696	1.02365	0.627
500.0	5.821	3130.0	7.07	811.0	0.00165	2.42	296.0	0.00804	1.02169	0.632
600.0	4.937	3640.0	6.94	789.0	0.00142	2.68	333.0	0.0104	1.01860	0.640
700.0	4.275	4140.0	6.85	774.0	0.00125	2.95	368.0	0.0131	1.01628	0.645
800.0	3.890	4650.0	6.78	762.0	0.00111	3.21	402.0	0.0160	1.01446	0.648
900.0	3.501	5160.0	6.73	753.0	0.00100	3.46	436.0	0.0191	1.01301	0.651
1000.0	3.182	5670.0	6.69	747.0	0.000911	3.70	468.0	0.0225	1.01182	0.653
1100.0	2.916	6180.0	6.66	741.0	0.000836	3.95	500.0	0.0262	1.01083	0.655
1200.0	2.691	6700.0	6.63	736.0	0.000772	4.18	531.0	0.0301	1.00999	0.656
1300.0	2.498	7210.0	6.61	733.0	0.000717	4.42	561.0	0.0342	1.00927	0.657
1400.0	2.331	7720.0	6.59	729.0	0.000670	4.65	591.0	0.0385	1.00865	0.658
1500.0	2.185	8240.0	6.57	727.0	0.000628	4.87	620.0	0.0431	1.00811	0.659

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

E

THERMODYNAMIC PROPERTIES OF HELIUM 4

600.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
13.0	0.03382	11500.0	18.2	64.64	338.8	2.501	2.231	2.664	1179.0
14.0	0.03403	11500.0	18.7	66.54	342.4	2.769	2.485	2.985	1183.0
15.0	0.03423	11500.0	18.7	68.82	346.3	3.045	2.668	3.209	1185.0
16.0	0.03442	11400.0	18.7	70.55	349.6	3.257	2.766	3.355	1185.0
17.0	0.03462	11400.0	18.7	72.38	353.0	3.465	2.849	3.483	1186.0
18.0	0.03482	11300.0	18.6	74.31	356.6	3.667	2.920	3.596	1186.0
19.0	0.03502	11200.0	18.4	76.33	360.2	3.864	2.979	3.696	1187.0
20.0	0.03522	11100.0	18.3	78.43	363.9	4.056	3.029	3.785	1187.0
21.0	0.03543	11100.0	18.1	80.60	367.8	4.243	3.072	3.864	1188.0
22.0	0.03563	11000.0	17.9	82.83	371.7	4.424	3.108	3.936	1188.0
23.0	0.03584	10900.0	17.7	85.11	375.6	4.601	3.139	4.001	1189.0
24.0	0.03605	10900.0	17.5	87.45	379.7	4.772	3.167	4.061	1189.0
25.0	0.03626	10800.0	17.3	89.84	383.8	4.939	3.191	4.116	1189.0
26.0	0.03647	10800.0	17.1	92.27	387.9	5.101	3.213	4.168	1189.0
28.0	0.03690	10600.0	16.7	97.25	396.3	5.414	3.251	4.262	1189.0
30.0	0.03732	10500.0	16.3	102.4	404.9	5.711	3.284	4.348	1189.0
32.0	0.03776	10400.0	15.8	107.7	413.7	5.994	3.312	4.427	1188.0
34.0	0.03819	10300.0	15.4	113.1	422.6	6.265	3.338	4.500	1187.0
36.0	0.03863	10200.0	15.0	118.6	431.7	6.524	3.362	4.568	1185.0
38.0	0.03907	10100.0	14.6	124.2	440.9	6.773	3.384	4.633	1183.0
40.0	0.03952	10000.0	14.3	129.9	450.2	7.012	3.404	4.694	1181.0
45.0	0.04064	9730.0	13.4	144.6	474.1	7.573	3.447	4.831	1175.0
50.0	0.04179	9490.0	12.5	159.8	498.5	8.088	3.483	4.951	1169.0
55.0	0.04295	9280.0	11.8	175.4	523.5	8.565	3.512	5.053	1163.0
60.0	0.04413	9090.0	11.1	191.3	549.0	9.008	3.534	5.140	1158.0
65.0	0.04533	8930.0	10.5	207.5	574.9	9.423	3.550	5.213	1153.0
70.0	0.04654	8790.0	9.90	223.9	601.1	9.811	3.562	5.274	1148.0
75.0	0.04776	8680.0	9.37	240.5	627.6	10.18	3.570	5.323	1145.0
80.0	0.04900	8590.0	8.88	257.1	654.4	10.52	3.575	5.363	1142.0
90.0	0.05150	8460.0	8.02	290.8	708.3	11.16	3.576	5.417	1140.0
100.0	0.05403	8400.0	7.30	324.7	762.6	11.73	3.571	5.445	1139.0
125.0	0.06039	8460.0	5.91	409.4	898.9	12.95	3.542	5.448	1149.0
150.0	0.06674	8690.0	4.94	493.7	1035.0	13.94	3.506	5.409	1166.0
175.0	0.07305	9010.0	4.24	577.2	1169.0	14.77	3.471	5.361	1187.0
200.0	0.07931	9360.0	3.72	659.9	1303.0	15.48	3.439	5.318	1211.0
225.0	0.08553	9740.0	3.31	741.9	1435.0	16.10	3.411	5.282	1236.0
250.0	0.09172	10100.0	2.98	823.4	1567.0	16.66	3.388	5.253	1262.0
275.0	0.09789	10500.0	2.71	904.4	1698.0	17.16	3.367	5.230	1288.0
300.0	0.1040	11000.0	2.49	985.0	1828.0	17.61	3.349	5.212	1314.0
350.0	0.1163	11800.0	2.14	1145.0	2088.0	18.41	3.320	5.187	1367.0
400.0	0.1286	12700.0	1.88	1305.0	2347.0	19.10	3.298	5.172	1418.0
450.0	0.1409	13500.0	1.68	1463.0	2606.0	19.71	3.280	5.164	1470.0
500.0	0.1532	14400.0	1.52	1622.0	2864.0	20.26	3.266	5.159	1520.0
600.0	0.1779	16300.0	1.27	1937.0	3379.0	21.20	3.248	5.156	1618.0
700.0	0.2027	18100.0	1.09	2252.0	3895.0	21.99	3.231	5.157	1712.0
800.0	0.2275	20000.0	0.961	2566.0	4411.0	22.68	3.221	5.159	1802.0
900.0	0.2524	21900.0	0.857	2881.0	4927.0	23.29	3.213	5.161	1889.0
1000.0	0.2774	23800.0	0.774	3195.0	5443.0	23.83	3.206	5.163	1972.0
1100.0	0.3024	25800.0	0.705	3508.0	5959.0	24.32	3.201	5.165	2052.0
1200.0	0.3274	27700.0	0.647	3822.0	6476.0	24.77	3.197	5.167	2130.0
1300.0	0.3524	29700.0	0.598	4136.0	6993.0	25.19	3.194	5.169	2205.0
1400.0	0.3775	31600.0	0.556	4450.0	7510.0	25.57	3.191	5.170	2278.0
1500.0	0.4026	33600.0	0.520	4763.0	8027.0	25.93	3.188	5.171	2349.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

800.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
13.0	29.57	498.0	27.6	3400.0	0.00535	2.00	1110.0	0.00253	1.11321	1.48
14.0	29.39	539.0	25.6	3380.0	0.00553	1.99	896.0	0.00227	1.11250	1.34
15.0	29.21	577.0	24.0	3370.0	0.00556	1.98	744.0	0.00212	1.11180	1.20
16.0	29.05	595.0	23.3	3320.0	0.00564	1.97	634.0	0.00203	1.11115	1.08
17.0	28.89	612.0	22.7	3280.0	0.00569	1.96	551.0	0.00195	1.11053	0.980
18.0	28.72	627.0	22.2	3240.0	0.00574	1.94	487.0	0.00188	1.10985	0.901
19.0	28.56	641.0	21.7	3200.0	0.00577	1.93	436.0	0.00183	1.10920	0.837
20.0	28.39	654.0	21.3	3160.0	0.00579	1.91	396.0	0.00178	1.10855	0.785
21.0	28.23	666.0	20.9	3130.0	0.00580	1.89	363.0	0.00173	1.10791	0.742
22.0	28.06	678.0	20.6	3090.0	0.00581	1.87	336.0	0.00169	1.10726	0.706
23.0	27.90	689.0	20.3	3050.0	0.00581	1.85	313.0	0.00166	1.10662	0.676
24.0	27.74	699.0	20.0	3020.0	0.00581	1.84	294.0	0.00163	1.10598	0.651
25.0	27.58	709.0	19.7	2990.0	0.00581	1.82	278.0	0.00160	1.10535	0.630
26.0	27.42	718.0	19.4	2950.0	0.00580	1.80	265.0	0.00158	1.10472	0.612
28.0	27.10	737.0	18.9	2890.0	0.00578	1.77	243.0	0.00153	1.10348	0.585
30.0	26.79	754.0	18.5	2820.0	0.00576	1.74	226.0	0.00150	1.10225	0.565
32.0	26.49	771.0	18.1	2760.0	0.00574	1.72	214.0	0.00146	1.10104	0.551
34.0	26.18	787.0	17.7	2700.0	0.00572	1.69	204.0	0.00144	1.09986	0.541
36.0	25.89	802.0	17.3	2640.0	0.00569	1.67	196.0	0.00141	1.09869	0.535
38.0	25.59	817.0	16.9	2580.0	0.00567	1.65	189.0	0.00139	1.09754	0.531
40.0	25.31	831.0	16.6	2530.0	0.00565	1.64	184.0	0.00138	1.09641	0.529
45.0	24.61	865.0	15.8	2390.0	0.00559	1.60	175.0	0.00135	1.09367	0.529
50.0	23.93	896.0	15.1	2270.0	0.00552	1.57	170.0	0.00133	1.09103	0.534
55.0	23.28	926.0	14.4	2160.0	0.00546	1.55	166.0	0.00132	1.08850	0.540
60.0	22.65	954.0	13.9	2060.0	0.00539	1.54	164.0	0.00132	1.08607	0.548
65.0	22.06	980.0	13.4	1970.0	0.00532	1.53	163.0	0.00133	1.08374	0.556
70.0	21.49	1010.0	12.9	1890.0	0.00524	1.53	163.0	0.00135	1.08150	0.563
75.0	20.94	1030.0	12.5	1820.0	0.00516	1.52	163.0	0.00137	1.07936	0.569
80.0	20.41	1060.0	12.2	1750.0	0.00507	1.52	163.0	0.00139	1.07731	0.575
90.0	19.42	1110.0	11.6	1640.0	0.00488	1.52	164.0	0.00145	1.07348	0.584
100.0	18.51	1160.0	11.0	1560.0	0.00469	1.53	166.0	0.00152	1.06997	0.590
125.0	16.56	1290.0	10.1	1400.0	0.00422	1.57	170.0	0.00174	1.06246	0.589
150.0	14.98	1430.0	9.41	1300.0	0.00379	1.62	177.0	0.00200	1.05642	0.590
175.0	13.69	1560.0	8.93	1230.0	0.00344	1.67	184.0	0.00228	1.05147	0.589
200.0	12.61	1690.0	8.57	1180.0	0.00315	1.72	191.0	0.00257	1.04735	0.589
225.0	11.69	1820.0	8.29	1140.0	0.00290	1.78	198.0	0.00288	1.04386	0.589
250.0	10.90	1950.0	8.06	1110.0	0.00269	1.83	205.0	0.00319	1.04086	0.590
275.0	10.22	2080.0	7.88	1080.0	0.00252	1.88	212.0	0.00352	1.03826	0.591
300.0	9.611	2200.0	7.74	1050.0	0.00236	1.93	219.0	0.00385	1.03597	0.593
350.0	8.596	2460.0	7.51	1010.0	0.00211	2.05	239.0	0.00463	1.03213	0.605
400.0	7.775	2710.0	7.34	985.0	0.00191	2.18	259.0	0.00543	1.02903	0.614
450.0	7.096	2960.0	7.21	961.0	0.00175	2.31	278.0	0.00631	1.02648	0.621
500.0	6.526	3210.0	7.11	942.0	0.00161	2.45	297.0	0.00726	1.02434	0.627
600.0	5.620	3710.0	6.97	914.0	0.00139	2.71	334.0	0.00935	1.02094	0.636
700.0	4.934	4210.0	6.86	894.0	0.00122	2.97	369.0	0.0117	1.01837	0.641
800.0	4.395	4720.0	6.79	879.0	0.00109	3.22	404.0	0.0142	1.01635	0.646
900.0	3.951	5230.0	6.74	868.0	0.000987	3.47	437.0	0.0170	1.01473	0.649
1000.0	3.605	5740.0	6.69	859.0	0.000900	3.72	469.0	0.0200	1.01340	0.651
1100.0	3.307	6250.0	6.66	852.0	0.000827	3.96	501.0	0.0232	1.01229	0.653
1200.0	3.055	6760.0	6.63	846.0	0.000765	4.20	532.0	0.0266	1.01135	0.654
1300.0	2.837	7270.0	6.60	842.0	0.000711	4.43	562.0	0.0302	1.01054	0.656
1400.0	2.649	7780.0	6.58	837.0	0.000664	4.66	592.0	0.0340	1.00984	0.657
1500.0	2.484	8290.0	6.57	834.0	0.000623	4.88	621.0	0.0380	1.00922	0.657

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMODYNAMIC PROPERTIES OF HELIUM 4

900.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
14.0	0.03309	12600.0	19.6	72.03	373.8	2.587	2.415	2.887	1238.0
15.0	0.03329	12700.0	19.7	74.17	377.8	2.662	2.630	3.147	1241.0
16.0	0.03346	12600.0	19.8	75.80	381.0	3.070	2.734	3.299	1241.0
17.0	0.03364	12500.0	19.8	77.55	384.3	3.274	2.822	3.434	1241.0
18.0	0.03382	12400.0	19.7	79.39	387.8	3.474	2.897	3.553	1242.0
19.0	0.03401	12300.0	19.6	81.33	391.4	3.669	2.960	3.657	1242.0
20.0	0.03419	12300.0	19.5	83.35	395.1	3.859	3.014	3.750	1243.0
21.0	0.03438	12200.0	19.3	85.43	398.9	4.044	3.060	3.833	1243.0
22.0	0.03457	12100.0	19.2	87.59	402.8	4.224	3.099	3.907	1244.0
23.0	0.03476	12100.0	19.0	89.80	406.8	4.399	3.133	3.974	1244.0
24.0	0.03495	12000.0	18.8	92.06	410.8	4.569	3.163	4.036	1245.0
25.0	0.03514	11900.0	18.6	94.38	414.8	4.735	3.190	4.093	1245.0
26.0	0.03533	11900.0	18.3	96.74	418.9	4.897	3.214	4.145	1245.0
28.0	0.03572	11800.0	17.9	101.6	427.3	5.208	3.255	4.241	1246.0
30.0	0.03611	11600.0	17.4	106.6	435.9	5.503	3.291	4.327	1245.0
32.0	0.03650	11500.0	17.0	111.8	444.6	5.785	3.322	4.405	1245.0
34.0	0.03689	11400.0	16.6	117.1	453.5	6.054	3.350	4.478	1244.0
36.0	0.03729	11300.0	16.2	122.5	462.5	6.312	3.376	4.545	1242.0
38.0	0.03769	11200.0	15.7	128.0	471.7	6.560	3.400	4.609	1241.0
40.0	0.03809	11100.0	15.3	133.6	481.0	6.798	3.422	4.668	1239.0
45.0	0.03910	10800.0	14.4	148.1	504.7	7.355	3.470	4.803	1233.0
50.0	0.04012	10600.0	13.5	163.1	529.0	7.868	3.510	4.919	1227.0
55.0	0.04115	10400.0	12.8	178.6	553.8	8.341	3.542	5.019	1221.0
60.0	0.04220	10200.0	12.0	194.3	579.1	8.782	3.567	5.106	1215.0
65.0	0.04325	10000.0	11.4	210.4	604.9	9.193	3.586	5.179	1209.0
70.0	0.04432	9840.0	10.8	226.7	630.9	9.580	3.600	5.241	1204.0
75.0	0.04540	9700.0	10.2	243.2	657.2	9.943	3.610	5.292	1200.0
80.0	0.04649	9580.0	9.69	259.8	683.8	10.29	3.617	5.334	1196.0
90.0	0.04869	9400.0	8.78	293.4	737.5	10.92	3.621	5.395	1191.0
100.0	0.05092	9300.0	8.01	327.3	791.6	11.49	3.617	5.430	1189.0
125.0	0.05653	9260.0	6.52	412.2	927.8	12.70	3.588	5.449	1193.0
150.0	0.06216	9420.0	5.47	496.8	1064.0	13.69	3.551	5.418	1207.0
175.0	0.06775	9690.0	4.71	580.7	1199.0	14.53	3.513	5.374	1225.0
200.0	0.07330	10000.0	4.13	663.9	1332.0	15.24	3.479	5.330	1247.0
225.0	0.07882	10400.0	3.67	746.3	1465.0	15.87	3.449	5.292	1270.0
250.0	0.08431	10700.0	3.31	828.2	1597.0	16.42	3.423	5.261	1294.0
275.0	0.08978	11100.0	3.02	909.5	1728.0	16.92	3.400	5.236	1318.0
300.0	0.09523	11500.0	2.77	990.4	1859.0	17.38	3.380	5.216	1343.0
350.0	0.1061	12400.0	2.39	1151.0	2119.0	18.18	3.348	5.188	1393.0
400.0	0.1170	13200.0	2.10	1311.0	2378.0	18.87	3.322	5.171	1442.0
450.0	0.1279	14100.0	1.87	1470.0	2636.0	19.48	3.303	5.161	1492.0
500.0	0.1388	14900.0	1.69	1629.0	2894.0	20.02	3.287	5.155	1540.0
600.0	0.1606	16700.0	1.42	1945.0	3409.0	20.96	3.263	5.151	1636.0
700.0	0.1825	18600.0	1.22	2260.0	3924.0	21.76	3.247	5.152	1727.0
800.0	0.2045	20400.0	1.08	2575.0	4440.0	22.44	3.234	5.154	1816.0
900.0	0.2266	22300.0	0.959	2889.0	4955.0	23.05	3.225	5.157	1901.0
1000.0	0.2487	24200.0	0.866	3203.0	5471.0	23.59	3.218	5.159	1983.0
1100.0	0.2708	26100.0	0.789	3517.0	5987.0	24.09	3.212	5.162	2062.0
1200.0	0.2930	28000.0	0.725	3831.0	6503.0	24.54	3.207	5.164	2139.0
1300.0	0.3152	30000.0	0.671	4145.0	7020.0	24.95	3.204	5.166	2213.0
1400.0	0.3374	31900.0	0.624	4459.0	7536.0	25.33	3.200	5.167	2285.0
1500.0	0.3597	33900.0	0.583	4773.0	8053.0	25.69	3.197	5.169	2355.0

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

THERMOPHYSICAL PROPERTIES OF HELIUM 4

900.0 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)$_P$	V(DP/DU)$_v$	-V(DP/DV)$_T$	(DV/DT)/V$_P$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
14.0	30.22	563.0	26.9	3820.0	0.00513	2.18	1180.0	0.00250	1.11578	1.56
15.0	30.04	588.0	25.0	3820.0	0.00517	2.16	955.0	0.00229	1.11507	1.39
16.0	29.88	627.0	24.3	3760.0	0.00526	2.15	802.0	0.00218	1.11445	1.23
17.0	29.72	644.0	23.6	3710.0	0.00533	2.13	686.0	0.00209	1.11382	1.10
18.0	29.57	660.0	23.1	3670.0	0.00538	2.11	599.0	0.00201	1.11320	1.01
19.0	29.41	675.0	22.6	3630.0	0.00542	2.09	530.0	0.00195	1.11257	0.926
20.0	29.25	689.0	22.1	3580.0	0.00544	2.07	475.0	0.00189	1.11193	0.861
21.0	29.09	702.0	21.7	3540.0	0.00546	2.05	432.0	0.00184	1.11131	0.807
22.0	28.93	714.0	21.4	3510.0	0.00547	2.03	396.0	0.00179	1.11068	0.763
23.0	28.77	726.0	21.0	3470.0	0.00547	2.01	366.0	0.00175	1.11005	0.726
24.0	28.61	738.0	20.7	3430.0	0.00547	1.98	341.0	0.00172	1.10943	0.694
25.0	28.46	749.0	20.4	3390.0	0.00547	1.96	321.0	0.00169	1.10882	0.668
26.0	28.30	759.0	20.2	3360.0	0.00546	1.94	303.0	0.00166	1.10821	0.646
28.0	28.00	780.0	19.6	3290.0	0.00544	1.91	275.0	0.00161	1.10700	0.611
30.0	27.69	800.0	19.1	3220.0	0.00541	1.87	254.0	0.00156	1.10580	0.586
32.0	27.40	818.0	18.7	3160.0	0.00538	1.84	237.0	0.00153	1.10463	0.567
34.0	27.10	837.0	18.3	3100.0	0.00535	1.82	225.0	0.00150	1.10348	0.554
36.0	26.82	854.0	17.8	3030.0	0.00532	1.79	215.0	0.00147	1.10235	0.545
38.0	26.53	871.0	17.4	2970.0	0.00529	1.77	207.0	0.00145	1.10123	0.538
40.0	26.26	887.0	17.1	2920.0	0.00526	1.75	200.0	0.00143	1.10014	0.534
45.0	25.58	925.0	16.2	2780.0	0.00519	1.71	189.0	0.00139	1.09748	0.530
50.0	24.93	961.0	15.5	2640.0	0.00512	1.68	181.0	0.00137	1.09493	0.532
55.0	24.30	993.0	14.8	2520.0	0.00505	1.66	177.0	0.00136	1.09248	0.536
60.0	23.70	1020.0	14.2	2410.0	0.00499	1.64	174.0	0.00135	1.09012	0.542
65.0	23.12	1050.0	13.7	2310.0	0.00492	1.63	172.0	0.00136	1.08786	0.549
70.0	22.56	1080.0	13.2	2220.0	0.00485	1.62	171.0	0.00137	1.08569	0.555
75.0	22.03	1110.0	12.8	2140.0	0.00478	1.61	171.0	0.00138	1.08360	0.561
80.0	21.51	1130.0	12.5	2060.0	0.00470	1.61	171.0	0.00140	1.08159	0.566
90.0	20.54	1190.0	11.8	1930.0	0.00455	1.61	172.0	0.00145	1.07782	0.575
100.0	19.64	1240.0	11.3	1830.0	0.00439	1.62	173.0	0.00152	1.07434	0.580
125.0	17.69	1370.0	10.3	1640.0	0.00398	1.65	176.0	0.00171	1.06681	0.581
150.0	16.03	1500.0	9.58	1520.0	0.00361	1.69	182.0	0.00194	1.06065	0.582
175.0	14.76	1630.0	9.07	1430.0	0.00329	1.74	188.0	0.00219	1.05556	0.581
200.0	13.64	1760.0	8.69	1370.0	0.00302	1.79	195.0	0.00246	1.05128	0.581
225.0	12.69	1900.0	8.40	1320.0	0.00279	1.83	201.0	0.00273	1.04764	0.581
250.0	11.86	2020.0	8.16	1270.0	0.00260	1.88	208.0	0.00302	1.04450	0.582
275.0	11.14	2150.0	7.97	1240.0	0.00243	1.93	215.0	0.00331	1.04175	0.583
300.0	10.50	2280.0	7.81	1210.0	0.00229	1.97	221.0	0.00360	1.03934	0.585
350.0	9.424	2530.0	7.56	1160.0	0.00205	2.09	241.0	0.00428	1.03526	0.598
400.0	8.548	2780.0	7.38	1130.0	0.00186	2.22	261.0	0.00502	1.03195	0.608
450.0	7.821	3030.0	7.25	1100.0	0.00170	2.35	280.0	0.00581	1.02921	0.616
500.0	7.207	3280.0	7.14	1080.0	0.00157	2.48	299.0	0.00666	1.02690	0.622
600.0	6.227	3780.0	6.98	1040.0	0.00136	2.73	335.0	0.00852	1.02321	0.631
700.0	5.479	4280.0	6.88	1020.0	0.00120	2.99	370.0	0.0106	1.02041	0.638
800.0	4.890	4790.0	6.80	1000.0	0.00108	3.24	405.0	0.0129	1.01820	0.643
900.0	4.414	5290.0	6.74	984.0	0.000974	3.49	438.0	0.0153	1.01642	0.646
1000.0	4.021	5800.0	6.69	973.0	0.000890	3.74	470.0	0.0180	1.01495	0.649
1100.0	3.693	6310.0	6.65	965.0	0.000818	3.98	502.0	0.0209	1.01373	0.651
1200.0	3.413	6820.0	6.62	957.0	0.000757	4.21	532.0	0.0239	1.01268	0.653
1300.0	3.173	7330.0	6.60	951.0	0.000705	4.44	563.0	0.0271	1.01179	0.654
1400.0	2.964	7840.0	6.57	946.0	0.000659	4.67	592.0	0.0305	1.01101	0.655
1500.0	2.780	8350.0	6.56	942.0	0.000619	4.89	621.0	0.0340	1.01033	0.656

* TWO-PHASE BOUNDARY

** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

1000 ATMOSPHERE ISOBAR

TEMPERATURE DEG. K	VOLUME CC/G ** X .01	ISOTHERM DERIVATIVE CC-ATM/G	ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/G	ENTHALPY J/G	ENTROPY J/G-K	CV J/G-K	CP	VELOCITY OF SOUND M/S
15.0	0.03248	13900.0	20.6	79.50	408.6	2.696	2.591	3.079	1293.0
16.0	0.03264	13800.0	20.7	81.05	411.7	2.900	2.700	3.239	1293.0
17.0	0.03280	13600.0	20.8	82.72	415.0	3.100	2.794	3.381	1293.0
18.0	0.03296	13500.0	20.8	84.48	418.5	3.297	2.874	3.507	1293.0
19.0	0.03313	13400.0	20.7	86.34	422.0	3.490	2.941	3.617	1294.0
20.0	0.03330	13300.0	20.6	88.28	425.7	3.678	2.999	3.715	1294.0
21.0	0.03347	13300.0	20.5	90.30	429.5	3.861	3.048	3.802	1295.0
22.0	0.03365	13200.0	20.3	92.38	433.3	4.040	3.091	3.880	1295.0
23.0	0.03382	13100.0	20.1	94.52	437.2	4.214	3.128	3.950	1296.0
24.0	0.03400	13100.0	19.9	96.72	441.2	4.384	3.160	4.014	1296.0
25.0	0.03418	13000.0	19.7	98.98	445.3	4.549	3.189	4.073	1297.0
26.0	0.03435	12900.0	19.5	101.3	449.4	4.709	3.215	4.127	1297.0
28.0	0.03471	12800.0	19.0	106.0	457.7	5.019	3.260	4.226	1298.0
30.0	0.03507	12700.0	18.6	110.9	466.3	5.314	3.298	4.313	1298.0
32.0	0.03543	12600.0	18.1	116.0	475.0	5.594	3.332	4.392	1297.0
34.0	0.03579	12500.0	17.7	121.2	483.8	5.863	3.363	4.464	1296.0
36.0	0.03615	12400.0	17.2	126.5	492.8	6.120	3.391	4.532	1295.0
38.0	0.03652	12300.0	16.8	131.9	501.9	6.367	3.417	4.594	1294.0
40.0	0.03688	12200.0	16.4	137.5	511.2	6.604	3.441	4.653	1292.0
45.0	0.03780	11900.0	15.4	151.8	534.8	7.160	3.493	4.785	1287.0
50.0	0.03872	11700.0	14.5	166.6	559.0	7.670	3.536	4.898	1281.0
55.0	0.03966	11500.0	13.7	181.9	583.7	8.141	3.572	4.997	1274.0
60.0	0.04060	11200.0	12.9	197.6	608.9	8.580	3.600	5.081	1268.0
65.0	0.04154	11000.0	12.2	213.6	634.5	8.990	3.621	5.153	1262.0
70.0	0.04250	10900.0	11.6	229.8	660.5	9.374	3.637	5.215	1257.0
75.0	0.04347	10700.0	11.0	246.2	686.7	9.735	3.649	5.267	1252.0
80.0	0.04444	10600.0	10.4	262.8	713.1	10.08	3.657	5.310	1247.0
90.0	0.04640	10400.0	9.50	296.4	766.6	10.71	3.663	5.374	1240.0
100.0	0.04839	10200.0	8.68	330.2	820.5	11.27	3.661	5.415	1236.0
125.0	0.05340	10100.0	7.10	415.3	956.4	12.49	3.634	5.446	1236.0
150.0	0.05844	10100.0	5.98	500.2	1092.0	13.48	3.595	5.424	1245.0
175.0	0.06346	10400.0	5.15	584.5	1228.0	14.31	3.555	5.384	1261.0
200.0	0.06845	10700.0	4.52	668.0	1362.0	15.03	3.519	5.342	1280.0
225.0	0.07340	11000.0	4.03	750.9	1495.0	15.66	3.486	5.303	1301.0
250.0	0.07833	11300.0	3.64	833.1	1627.0	16.21	3.458	5.270	1324.0
275.0	0.08324	11700.0	3.31	914.7	1758.0	16.71	3.433	5.243	1347.0
300.0	0.08813	12100.0	3.05	996.0	1889.0	17.17	3.411	5.221	1370.0
350.0	0.09789	12900.0	2.62	1157.0	2149.0	17.97	3.375	5.189	1418.0
400.0	0.1076	13700.0	2.31	1317.0	2408.0	18.66	3.347	5.170	1465.0
450.0	0.1174	14600.0	2.06	1477.0	2666.0	19.27	3.325	5.158	1513.0
500.0	0.1271	15400.0	1.86	1636.0	2924.0	19.81	3.307	5.151	1560.0
600.0	0.1467	17200.0	1.57	1952.0	3439.0	20.75	3.281	5.146	1652.0
700.0	0.1663	19000.0	1.35	2268.0	3953.0	21.55	3.262	5.147	1742.0
800.0	0.1861	20800.0	1.19	2583.0	4468.0	22.23	3.249	5.149	1828.0
900.0	0.2058	22700.0	1.06	2898.0	4983.0	22.84	3.238	5.152	1912.0
1000.0	0.2257	24600.0	0.957	3212.0	5499.0	23.38	3.230	5.155	1993.0
1100.0	0.2455	26500.0	0.873	3527.0	6014.0	23.87	3.223	5.158	2071.0
1200.0	0.2654	28400.0	0.802	3841.0	6530.0	24.32	3.218	5.160	2147.0
1300.0	0.2853	30300.0	0.742	4155.0	7046.0	24.74	3.214	5.162	2221.0
1400.0	0.3053	32200.0	0.690	4469.0	7563.0	25.12	3.210	5.164	2292.0
1500.0	0.3253	34200.0	0.645	4783.0	8079.0	25.47	3.206	5.166	2361.0

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

1000 ATMOSPHERE ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_p$	$V(\partial P/\partial U)_v$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)_p/V$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG.K	G/CC ** X 100	J/G	ATM-CC/J	ATM	1/DEG.K	MW/CM-K	G/CM-S ** X 1000000	SQ-CM/S		
15.0	30.79	640.0	25.8	4280.0	0.00481	2.35	1220.0	0.00247	1.11806	1.60
16.0	30.64	659.0	25.1	4210.0	0.00492	2.33	1000.0	0.00235	1.11746	1.40
17.0	30.49	676.0	24.4	4160.0	0.00500	2.31	849.0	0.00224	1.11686	1.24
18.0	30.34	692.0	23.8	4100.0	0.00507	2.28	730.0	0.00215	1.11625	1.12
19.0	30.18	708.0	23.3	4050.0	0.00511	2.26	639.0	0.00207	1.11564	1.02
20.0	30.03	722.0	22.9	4010.0	0.00514	2.23	567.0	0.00200	1.11503	0.944
21.0	29.87	736.0	22.5	3960.0	0.00517	2.21	510.0	0.00194	1.11442	0.878
22.0	29.72	749.0	22.1	3920.0	0.00518	2.18	464.0	0.00189	1.11381	0.824
23.0	29.57	762.0	21.8	3880.0	0.00519	2.16	426.0	0.00185	1.11320	0.779
24.0	29.41	774.0	21.4	3840.0	0.00519	2.13	394.0	0.00181	1.11259	0.741
25.0	29.26	786.0	21.1	3800.0	0.00518	2.11	367.0	0.00177	1.11199	0.710
26.0	29.11	797.0	20.8	3770.0	0.00518	2.09	345.0	0.00174	1.11139	0.683
28.0	28.81	820.0	20.3	3690.0	0.00515	2.04	310.0	0.00168	1.11021	0.640
30.0	28.52	842.0	19.7	3620.0	0.00512	2.00	283.0	0.00163	1.10905	0.609
32.0	28.23	862.0	19.3	3560.0	0.00509	1.97	263.0	0.00159	1.10790	0.586
34.0	27.94	883.0	18.8	3490.0	0.00506	1.94	247.0	0.00155	1.10678	0.569
36.0	27.66	902.0	18.4	3430.0	0.00502	1.91	235.0	0.00152	1.10567	0.556
38.0	27.39	921.0	17.9	3360.0	0.00499	1.88	225.0	0.00150	1.10459	0.547
40.0	27.11	939.0	17.5	3300.0	0.00495	1.86	217.0	0.00148	1.10352	0.541
45.0	26.46	982.0	16.6	3160.0	0.00487	1.82	202.0	0.00143	1.10093	0.533
50.0	25.82	1020.0	15.9	3020.0	0.00480	1.78	193.0	0.00141	1.09845	0.532
55.0	25.22	1060.0	15.2	2890.0	0.00472	1.75	188.0	0.00139	1.09607	0.534
60.0	24.63	1090.0	14.5	2770.0	0.00465	1.73	184.0	0.00139	1.09378	0.539
65.0	24.07	1120.0	14.0	2660.0	0.00459	1.72	182.0	0.00139	1.09157	0.544
70.0	23.53	1150.0	13.5	2560.0	0.00452	1.71	180.0	0.00139	1.08946	0.549
75.0	23.01	1180.0	13.1	2460.0	0.00446	1.70	179.0	0.00141	1.08742	0.554
80.0	22.50	1210.0	12.7	2380.0	0.00439	1.70	179.0	0.00142	1.08546	0.559
90.0	21.55	1260.0	12.0	2230.0	0.00426	1.70	179.0	0.00146	1.08175	0.567
100.0	20.67	1310.0	11.5	2110.0	0.00412	1.70	180.0	0.00152	1.07832	0.572
125.0	18.73	1440.0	10.4	1880.0	0.00377	1.73	182.0	0.00169	1.07080	0.573
150.0	17.11	1570.0	9.72	1740.0	0.00344	1.76	187.0	0.00190	1.06458	0.575
175.0	15.76	1710.0	9.20	1630.0	0.00315	1.80	192.0	0.00213	1.05938	0.574
200.0	14.61	1840.0	8.80	1560.0	0.00291	1.85	198.0	0.00237	1.05498	0.573
225.0	13.62	1970.0	8.49	1500.0	0.00269	1.89	205.0	0.00262	1.05121	0.573
250.0	12.77	2100.0	8.24	1450.0	0.00251	1.93	211.0	0.00287	1.04794	0.574
275.0	12.01	2230.0	8.04	1410.0	0.00235	1.98	217.0	0.00314	1.04508	0.575
300.0	11.35	2350.0	7.87	1370.0	0.00222	2.02	223.0	0.00341	1.04255	0.577
350.0	10.22	2610.0	7.61	1320.0	0.00199	2.13	243.0	0.00402	1.03826	0.591
400.0	9.291	2860.0	7.42	1270.0	0.00181	2.25	262.0	0.00469	1.03476	0.602
450.0	8.520	3100.0	7.28	1240.0	0.00166	2.38	281.0	0.00541	1.03184	0.610
500.0	7.866	3350.0	7.16	1210.0	0.00154	2.50	300.0	0.00618	1.02938	0.617
600.0	6.817	3850.0	7.00	1170.0	0.00134	2.76	336.0	0.00786	1.02543	0.627
700.0	6.012	4350.0	6.88	1140.0	0.00118	3.01	371.0	0.00974	1.02241	0.635
800.0	5.375	4850.0	6.80	1120.0	0.00106	3.26	406.0	0.0118	1.02002	0.640
900.0	4.858	5360.0	6.74	1100.0	0.000962	3.51	439.0	0.0140	1.01808	0.644
1000.0	4.432	5860.0	6.69	1090.0	0.000879	3.75	471.0	0.0164	1.01649	0.647
1100.0	4.073	6370.0	6.65	1080.0	0.000810	3.99	502.0	0.0190	1.01515	0.649
1200.0	3.768	6880.0	6.62	1070.0	0.000750	4.22	533.0	0.0217	1.01401	0.651
1300.0	3.505	7390.0	6.59	1060.0	0.000699	4.45	563.0	0.0246	1.01302	0.653
1400.0	3.276	7900.0	6.57	1060.0	0.000654	4.68	593.0	0.0277	1.01217	0.654
1500.0	3.074	8410.0	6.55	1050.0	0.000614	4.90	622.0	0.0309	1.01142	0.655

* TWO-PHASE BOUNDARY
** NUMBERS IN THIS COLUMN HAVE BEEN MULTIPLIED BY THE INDICATED FACTOR

FORM NBS-114A (1-71)

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET	1. PUBLICATION OR REPORT NO. NBS-TN-631	2. Gov't Accession No.	3. Recipient's Accession No.

4. TITLE AND SUBTITLE

Thermophysical Properties of Helium-4 from 2 to 1500 K With Pressures to 1000 Atmospheres

5. Publication Date November 1972

6. Performing Organization Code

7. AUTHOR(S) Robert D. McCarty

8. Performing Organization

9. PERFORMING ORGANIZATION NAME AND ADDRESS

NATIONAL BUREAU OF STANDARDS, Boulder Labs.
DEPARTMENT OF COMMERCE
Boulder, Colorado 80302

10. Project/Task/Work Unit No. 2750101

11. Contract/Grant No. T-1813A

12. Sponsoring Organization Name and Address

National Aeronautics and Space Administration
Manned Spacecraft Center
Houston, Texas 77058

13. Type of Report & Period Covered

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.)

Tables of thermophysical properties of helium 4 are presented for temperatures from 2 to 1500 K for pressures to 1000 atmospheres. The tables include, entropy, enthalpy, internal energy, density, volume, speed of sound, specific heat, thermal conductivity, viscosity, thermal diffusivity, Prandtl number and the dielectric constant for 62 isobars. Also included in the isobaric tables are quantitites of special utility in heat transfer calculations: $(\partial P/\partial V)_T$, $(\partial P/\partial T)_\rho$, $V(\partial H/\partial V)_P$, $V(\partial P/\partial U)_V$, $-V(\partial P/\partial V)_T$, $1/V(\partial V/\partial T)_P$.

In addition to the isobaric tables, tables for the saturated vapor and liquid are given which include all of the above properties, plus the surface tension. Tables for the $P\rho T$ of the freezing liquid, $P\rho T$ of the lambda line, index of refraction and the derived Joule-Thomson inversion curve are also presented. A computer program to calculate the various properties is also available. Inquiries should be addressed to the National Bureau of Standards, Cryogenic Data Center, Boulder, Colorado 80302.

Key Words: Density; dielectric constant; enthalpy; entropy; equation of state; fixed points; heat transfer coefficients; helium 4; index of refraction; Joule-Thomson

17. KEY WORDS (Alphabetical order, separated by semicolons) coefficient; lambda line; latent heat; melting point; Prandtl number; specific heats; speed of sound; surface tension; thermal conductivity; thermal diffusivity; vapor pressure; viscosity; volume.

18. AVAILABILITY STATEMENT	19. SECURITY CLASS (THIS REPORT)	21. NO. OF PAGES
[X] UNLIMITED.	UNCLASSIFIED	161
[ ] FOR OFFICIAL DISTRIBUTION. DO NOT RELEASE TO NTIS.	20. SECURITY CLASS (THIS PAGE) UNCLASSIFIED	22. Price $1.25

U.S. Government Printing Office: 1972-784-207/1108 Region 8

USCOMM-DC 66244-P71