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THERMODYNAMIC PROPERTIES OF CARBON TETRAFLUORIDE

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

LIST OF TABLES

LIST OF FIGURES

NOMENCLATURE

A,B,C,D,E,F	Constants of vapor pressure equation
a_1,a_2,a_3,a_4	Constants of liquid density equation
A_2,B_2,C_2	
A_3,B_3,C_3	Constants in the equation state
A_4,A_5,B_5,C_5	
b	Characteristic constant of the equation of state
c	Velocity of light
C_p	Heat capacity at constant pressure
C_v	Heat capacity at constant volume
d	Saturated density
e	Base of natural logarithm
f_1,f_2,f_3,f_4,f_5	Temperature functions of the equation state
h	Planck's constant
H	Enthalpy
ΔH	Enthalpy change
J	Conversion factor
K	Boltzman's constant
k	Constant of equation of state
M	Molecular weight
P	Pressure
R	Universal gas constant
S	Entropy
ΔS	Entropy change
T	Absolute temperature ($^\circ$R + 459.69)

V	Volume
$\alpha,\beta,\gamma,\delta$	Constants of heat capacity equation
ν	Fundamental frequency

Subscripts

-	Bar indicates extensive property per unit mass
V	Constant volume
P	Constant pressure
T	Constant temperature
C	The value at critical point
r	Reduced property

Superscripts

g	Property of gas, Eg. $\underline{V}^g$
l	Property of liquid, Eg. $\underline{V}^\ell$
V	Vaporization property, Eg. ΔH^V
*	Indicates zero pressure

ABSTRACT

Experimental data on the vapor pressure, saturated liquid density, critical properties and calculated heat capacity at zero pressure have been determined for carbon tetrafluoride. The ranges of these determinations are as follows:

1. Vapor pressure was measured from 181°R to 408°R. The corresponding pressure range is from 0.125 psia to 531 psia.

2. The saturated liquid density measurements were made from 165°R to 409°R. The equivalent liquid density range is from 118 lb/cu.ft. to 46 lb/cu.ft.

3. The critical temperature was observed to be 409.50°R with the estimated critical pressure of 543.16 lb/sq.in. absolute and critical density of 39.06 lb/cu.ft.

4. The specific heat at zero pressure was determined from 180°R to 1170°R from the reported spectroscopic data on the fundamental frequencies in the literature.

These data were correlated in the form of equations, which represent the data with satisfactory precision. These equations, along with the other equations available in the literature were then used in the formulas developed for calculating the thermodynamic properties of the saturated liquid and vapor and of the superheated vapor.

The thermodynamic properties of the saturated vapor and liquid are presented in two sections. The first section, entitled the saturation temperature table presents the saturation pressure, specific volume

x

of gas, specific volume of liquid, density of gas, density of liquid, enthalpy of liquid, latent heat of vaporization, enthalpy of gas, entropy of liquid and entropy of gas at saturation conditions corresponding to each temperature in the range of -270°F to the critical temperature. The second section, entitled the saturation pressure table presents the same thermodynamic properties as listed above, but this time in the given range of pressures from 0.2 psia to the critical pressure. The saturation temperature is presented in this table in place of saturation pressure of the first section.

The thermodynamic properties of the superheated vapor are reported as values of volume, enthalpy and entropy up to about 300°F superheat conditions at tabular pressures from 0.2 psia to the critical pressure. Above the critical pressure and up to a pressure of 5000 psia, these properties are presented up to 700°F.

These properties are assumed to cover the range of conditions, where carbon tetrafluoride is normally expected to be used as a refrigerant.

INTRODUCTION

Carbon tetrafluoride, also known as "Freon-14"* is a new refrigerant which offers much promise in the area of ultra low temperatures. Because of its extremely low-boiling, non-toxic, non-inflammable and chemically inert nature, it is not unlikely that carbon tetrafluoride will dominate the area of low-temperature refrigeration in the near future.

So far, the reported data in the literature on certain physical properties of carbon tetrafluoride have been inadequate to determine the precise thermodynamic properties of the compound. Even among certain available data, there has been a wide discrepancy among different sources.

It is, therefore, the purpose of this investigation (a) to determine the necessary data experimentally, (b) to correlate the data by means of suitable equations to represent the data with a high degree of precision, (c) to develop equations for the thermodynamic properties using the above equations and other data available from the literature, and (d) to prepare tables and charts of the thermodynamic properties for the convenient use in the design and operation of refrigerating units using this compound.

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* Trade-marked name of the E. I. duPont de Nemours and Company, Wilmington, Delaware.

LITERATURE SURVEY

The following sections give a summary of the various publications dealing with the physical properties of carbon tetrafluoride, necessary for the computations of the various thermodynamic properties of the compound.

Vapor Pressure

Experimental data on the vapor pressures of carbon tetrafluoride were first reported by Ruff and Keim[37] in the temperature range of 92°K to 143.5°K. The corresponding vapor pressures range from 2.5 mm Hg to 754 mm Hg. The data were correlated by the equation

$$\log_{10}P = 7.3067 - \frac{632.31}{T} \tag{1}$$

where P is in mm Hg and T in °K.

Menzel and Mohry[30] measured vapor pressures in the temperature range of -193.2°C to -127.29°C. The corresponding vapor pressures are from 0.1 mm of Hg to 798.9 mm of Hg. They presented the correlating equation,

$$\log_{10}P = \frac{-701.73}{T} + 1.75 \log_{10}T - 0.0076715T + 5.04420 \tag{2}$$

with the same nomenclature as for Equation (1).

Booth and McNabney[7] measured vapor pressures at eight temperatures in the range of from -198.4°F to 49.9°F. The corresponding vapor pressures are from 14.7 psia to 542.4 psia. The data were represented by the equation:

$$\log_{10}P = 62.8435 - \frac{2735.415}{T} - 22.8079 \log_{10}T + 0.015017T \tag{3}$$

where P is in psia and T in °R.

Fiske[14] and Plank[32] reported vapor pressures calculated from
Equation (3). There is, however, a slight disagreement in these calculated
values from both the sources since Plank used a rounded-off conversion
factor.

Critical Properties

The critical temperature and critical pressure of CF_4 were de-
termined experimentally by Booth and McNabney[7] to be -49.9°F and 542.4
psia respectively. Using these values, the critical density was estimated
to be 39.61 lb/cu.ft. based on a value of $R T_c/P_c \underline{V}_c = 3.65$, a value typi-
cal of compounds of this class.[17]

On the basis of correlations with other fluorochloro derivatives,
Seger[39] estimated the critical temperature to be -49.0°C. The critical
density was estimated to be 0.593 g/cc.

Pressure - Volume - Temperature Behavior

MacCormack and Schneider[26] determined the P-V-T behavior in a
temperature range of 0°C to 400°C and a pressure range of 0 to 50 atmos-
pheres. At each of the temperatures, the data were correlated by an equa-
tion of the form,

$$P \underline{V} = A_T + B_T P + C_T P^2 + D_T P^4 \tag{4}$$

where A_T, B_T, C_T and D_T are the "virial" coefficients at the temperature
in question. These coefficients are tabulated at seven temperatures in
the above range.

Graham[17] estimated the P-V-T behavior from the critical con-
stants of Booth and McNabney and the generalized reduced properties of

other fluor-chlorderivatives of methane. A modified Beattie-Bridgeman equation of state was proposed as

$$P = (0.034506 - 45.729 \times 10^{-6}T)d^3 + (0.0042460T - 3.28)d^2$$
$$+ 0.12194T \, d \qquad (5)$$

where P is in psia, d is the density of vapor in lb/cu.ft., and T in °R.

Bhada[6] determined the P-V-T behavior of carbon tetrafluoride in his newly-developed variable-volume P-V-T bomb. He studied the P-V-T behavior in the temperature range of 360°R to 851.65°R for the specific volumes ranging from 0.30351 ft³/lb to 0.012716 ft³/lb. The corresponding pressure ranges were from about 135 psia to about 2000 psia. He correlated the data within an average deviation of $\pm$ 0.2% for the most part, by means of the following form of the Martin-Hou equation of state:

$$P = \frac{f_1}{(\underline{V}-b)} + \frac{f_2}{(\underline{V}-b)^2} + \frac{f_3}{(\underline{V}-b)^3} + \frac{f_4}{(\underline{V}-b)^4} + \frac{f_5}{(\underline{V}-b)^5} \qquad (6)$$

where,

$$f_1 = RT$$
$$f_2 = A_2 + B_2T + C_2e^{-\frac{kT}{T_c}}$$
$$f_3 = A_3 + B_3T + C_3e^{-\frac{kT}{T_c}}$$
$$f_4 = A_4$$
$$f_5 = A_5 + B_5T + C_5e^{-\frac{kT}{T_c}}$$

Liquid Density

Ruff and Keim[37] determined the liquid density of CF_4 at -178°C and -180°C experimentally and reported a constant value of 1.96 g/cc in this temperature range. The same investigators[38] later measured the liqiud densities at 140.7°K and 143.4°K and reported values of 1.629 and 1.619 g/cc respectively.

Klemm and Henkel[20] measured the liquid density at -183°C as 1.89 ± 0.005 g/cc the same investigators[19] later mentioned this value to be not as reliable as reported because of the presence of impurities.

Using the data of Ruff and Keim[38] and Klemm and Henkel[20], Graham[17] established the equation for the rectilinear diameter to be (70.45 - 0.0753T), where T is in °R. The equation for the liquid densities is then represented by

$$d^l = 2 \text{ (Rectilinear diameter)} - d_{SV} \qquad (7)$$

where d_{SV} is the density of the saturated vapor at that temperature.

From a correlation of various fluorchloro derivatives, Seger[39] derived the expression for the liquid density of CF_4 as a function of temperature,

$$1 - \frac{d_S}{d^c} = 0.73 \left(1 - \frac{T}{T_c}\right)^{0.165} \qquad (8)$$

where d_c is the critical density and T_c the critical temperature.

By the application of a modified theorem of corresponding states, Riedel[35] calculated the density of CF_4 at absolute zero to be 2.3 g/cc.

Normal Boiling Point

Lebeau and Damiens[25] determined the normal boiling point of CF_4 as -128°C. Later Booth and McNabney[7] established the boiling point corresponding to 14.7 psia in their vapor pressure equation as -128°C.

Ruff and Keim[37] obtained a value of -130°C for the boiling point by substituting a value of 760 mm in Equation (1). Menzel and Mohry[30] similarly reported a normal boiling point of -128 ± 0.1°C, by substituting in Equation (2). Seger[39] reported a value of -130°C for the normal boiling point of CF_4 based on correlations with other fluorochloro derivatives.

Melting Point

Lebeau and Damiens[25] determined the melting point experimentally to be -191°C. Ruff and Keim[37] found the melting point to be -186.3 $\pm$ 1°C. Klemm and Henkel[23] measured the melting point as -186.8 $\pm$ 0.5°C. Later, the same investigators used a much purer sample and found it had a higher melting point of -183.6 $\pm$ 0.2°. Eucken and Schroder[13] also determined the melting point experimentally and reported it to be -183.69°C.

Heat of Vaporization

No experimental data have been found on the heat of vaporization of carbon tetrafluoride. Ruff and Keim[37] estimated the heat of vaporization at the boiling point by using Equation (1) and the Clapeyron equation and reported it to be 2.9 K cal/mole. Menzel and Mohry[3] calculated heat of vaporization by a similar method and represented them by the equation,

$$\Delta H = (\Delta H_0 + 3.5T - 0.0350818T^2)(1 - \frac{P}{P_c}) \qquad (9)$$

where ΔH is the heat of vaporization at any temperature T(°K), ΔH_0 is the latent heat of vaporization at absolute zero (given to be 3209 cal/mole), P is the vapor pressure at the given temperature and P_c the critical pressure.

From a correlation of various fluorochloro derivatives, Seger[39] estimated the heat of vaporization at its normal boiling point to be

$$\Delta H_B = 31 \frac{T_B}{M} \qquad (10)$$

where T_B is the normal boiling point in °K, and M the molecular weight. The effect of temperature on the latent heat of vaporization for this

compound was estimated by Seger to follow the equation

$$\Delta H = A(T_c - T)^{3/8} \tag{11}$$

where A is a constant obtained by the substitution of values from Equation (10).

Simmons and Smith[41] calculated the entropy of vaporization at the normal boiling point by assuming ideal gas behavior and using a liquid density of 1.96 g/cc from the data of Ruff and Keim.[32] The value reported is 20.3 cal/(mole)(°K). The heat of vaporization at the normal boiling point may be obtained by multiplying this value by the normal boiling point of 145.16°K.

Specific Heat of Liquid and Solid

Eucken and Schröder[13] measured the heat capacity of solid CF_4 from 12°K to the melting point of 89.47°K. The corresponding heat capacities range from 1.82 to 16.03 cal/(g mole)(°K). Liquid heat capacities were measured from 90°K to 140°K, and found to go from 18.75 to 19.11 cal/(g mole)(°K).

Selby and Aston[40] measured the heat capacity of liquid CF_4 from 91.759°K to 178.703°K, obtaining values from 18.53 to 20.60 cal/(g mole)(°K). These data were correlated by the equation

$$C_{sat} = 24.54 - 0.1140T + 5.160 \times 10^{-4}T^2 \tag{12}$$

where T is in °K.

Based on correlations with various fluorochloro derivatives, Seger[39] estimated that CF_4 would have an approximately constant specific

heat of

$$C = 3.571 \ M^{-0.5704} \tag{13}$$

in the range of reduced temperatures of 0.5 - 0.75. In this equation, M represents the molecular weight.

Specific Heat of Vapor

The only available data on the specific heats of CF_4 in the gaseous state by direct experimental measurement are by Eucken and Bertram[12] who measured the heat capacities at the temperatures of 113, 173 and 199°K. The corresponding specific heats are 6.27, 7.63 and 8.39 ± 0.5 cal/(mole)(°K) respectively. All other published data are based on fundamental spectroscopic absorption frequencies using statistical methods.

The Raman spectrum of liquid CF_4 was first obtained by Yost, Lassetre, and Gross.[43] The fundamental frequencies reported were $\nu_1 = 437$, $\nu_2 = 635$ and $\nu_3 = 904$ cm^{-1} respectively.

The first infrared spectrum for the gaseous state was reported by Eucken and Bertram[12], who reported only two absorption bands of $\nu_2 = 653$ and $\nu_4 = 1350$ cm^{-1}. Later Bailey, Hale and Thompson[3] obtained 10 infrared bands in the region from 630 to 2550 cm^{-1} and determined the fundamental frequencies to be $\nu_2 = 630$ and $\nu_4 = 1252$ cm^{-1}. The same investigators[3] later corrected the value of ν_4 to 1265 cm^{-1}.

Plyler[33] measured the infrared spectra of CF_4 in the gas state and determined two of the fundamental frequencies of ν_2 and ν_4 to be 630 and 1277 cm^{-1} respectively. Later Plyler and Benedict[34] remeasured the

spectra and represented them as the two infrared-active frequencies of $\nu_2 = 629$ and $\nu_4 = 1277$ cm^{-1} and two Raman-active frequencies of $\nu_1 = 437$ cm^{-1} and $\nu_3 = 904$ cm^{-1}.

Woltz and Nielsen[42] used very pure samples and more gas than in previous investigations and measured the infrared frequencies of $\nu_2 = 632$ and $\nu_4 = 1283$ cm^{-1} respectively. The infrared-inactive ν_1 was also observed probably because of interaction with ν_2 at 435 cm^{-1} in agreement with the Raman line of 437 cm^{-1} measured by Yost et al.[43]

Decker, Meister and Cleveland[11] recommended the use of $\nu_1 = 437$ and $\nu_3 = 904$ cm^{-1} from the data of Yost et al.[43] and the use of $\nu_2 = 630$ and $\nu_4 = 1265$ cm^{-1} reported by Bailey, Hale and Thompson.[3]

Claassen[9] measured the Raman spectra of CF$_4$ in a new type of tube and an irradiation apparatus specially designed for gases. The sample used was claimed to have a high purity. The fundamental frequencies were reported to be $\nu_1 = 434.5$, $\nu_2 = 430$, $\nu_3 = 908.2$ and $\nu_4 = 1267$ cm^{-1} respectively. Most recent data on the fundamental frequencies have been obtained by Goubeau et al.[16] who measured the Raman spectra $\nu_3 = 908$ and $\nu_4 = 1261$ respectively. Table I presents the summary of the available data on the fundamental frequencies of CF$_4$ in the literature.

Decher[24] calculated the heat capacity of vapor at constant volume by statistical methods from the assignments of Yost[44] and represented them by the equation.

$$C_V^* = 0.0276 + 2.55 \times 10^{-4} T - 0.765 \times 10^{-7} T^2 \tag{14}$$

where C_V^* is given in Btu/(lb)($^\circ$F) and T in $^\circ$R.

Martin et al.[27] calculated the heat capacity at constant volume based on the assignments recommended by Decker, Meister and Cleveland[9],

TABLE I

SUMMARY OF DATA ON THE FUNDAMENTAL FREQUENCIES OF CF_4

Frequency Source	ν_1	ν_2	ν_3	ν_4	Remarks
Yost et al.[43]	437	635	904	—	Raman spectrum in liquid
Eucken and Bertram[12]	—	653	—	1350	Infrared spectrum for gas
Bailey, Hale and Thompson[3]	—	630	—	1252	Infrared spectrum for gas
Bailey, Hale and Thompson[4]	—	—	—	1265	(corrected the value of ν_4)
Plyler and Benedict[34]	—	629	—	1277	(Remeasurement)
Woltz and Nielsen[42]	435	632	—	1283	Infrared with pure samples
Claassen[9]	434.5	630	908.2	1277	Raman spectrum in gas
Goubeau et al.[16]	435	628	908	1281	Raman spectrum in gas with highly pure samples

and represented them by the equation,

$$C_V^* = 0.012050 + 3.02742 \times 10^{-4}T - 1.07536 \times 10^{-7}T^2 \tag{15}$$

where the units are the same as in Equation (14).

Gelles and Pitzer[15] calculated the C_p^* values from the assignments of Plyler and Benedict[24] and tabulated them in the range of from $100°K$ to $1500°K$. Also the values of $S°$, $H° - H_O°$ and $-(F° - H_O°)/T$ were tabulated in this range of temperatures.

Byers[8] determined the specific heat of the gas by measuring the frequency and absorption of supersonic waves in CF_4. Data were taken at two frequencies of 290.7 K C and 615.6 K C and a pressure range of 1/3 to 3 atmospheres. At a temperature of 22°C and a pressure of 1 atmosphere, the specific heat was determined to be 19.5 $\pm$ 0.5 cal/mole.

EXPERIMENTAL WORK

The sample of carbon tetrafluoride used in the experimental investigations was supplied by the E.I. du Pont de Nemours and Company. According to their analysis by the vapor phase chromatograph, the sample contained 0.004 wt% of $CClF_3$ and 0.25 vol.% of air as impurities. Precautions were therefore taken to remove the air completely before making the experimental runs.

The experimental work in this study involved the measurements of vapor pressure, saturated liquid density and the critical temperature of carbon tetrafluoride. New equipment has been built based upon the previous investigations by Hou[17] on some of the physical properties of trifluoromethane.

The vapor pressure measurements covered the temperature range from 181°R to 408°R (equivalent to a pressure range of 0.125 psia to 531 psia). The saturated liquid density measurements were made from 165°R to 409°R. The corresponding liquid density range was from 118 lb/cu.ft. to 46 lb/cu.ft. The critical temperature was determined to be 409.50°R.

The following sections present a brief description of the experimental techniques employed in these investigations.

Vapor Pressure Measurements

The vapor pressure measurements were made in two different sets of equipment, each designed for a different pressure range. The low pressure vapor pressure equipment was designed for pressures from a few millimeters of mercury absolute to about atmospheric pressure. The high pressure

Vapor pressure equipment was designed for pressures from atmospheric pressure to about 600 psia. In both the cases, the vapor pressures were determined by the static method.

Low-Pressure Vapor Pressure Equipment

The low-pressure vapor pressure equipment was built for the most part of glass. A flow diagram of this equipment is shown in Figure 1. A picture of this apparatus is presented in Figure 2.

The system was initially evacuated by means of the mercury diffusion pump (C) and the Hyvac pump (H) down to a pressure of about 3 microns of mercury. This pressure was measured by means of the McLeod gage (F). Carbon tetrafluoride from the cylinder (A) was slowly introduced into the stainless steel isoteniscope (G) by immersing the isoteniscope in a bath of liquid nitrogen. The isoteniscope was provided with a fitting for 1/4" stainless steel tubing and connected to a stainless steel valve (b). After the isoteniscope was about half-full, determined by the technique of raising and lowering of the bath as described by Hou[17], the stainless steel valve (b) was closed and the isoteniscope was transferred to a constant temperature bath, where repeated boil-offs were made to completely remove the air from the compound. The pressure in the isoteniscope was tested before each run by means of the low pressure Bourdon-tube gage (D) and if it was less than 1-1/2 atmospheres pressure at the temperature of the bath the system was connected to the U-tube manometer (E). The mercury manometer legs of the U-tube manometer are made of 20 mm O.D. glass tubing and are about 45 inches long.

The isoteniscope was maintained at constant temperature for at least 15 - 20 minutes before each run by means of the constant temperature
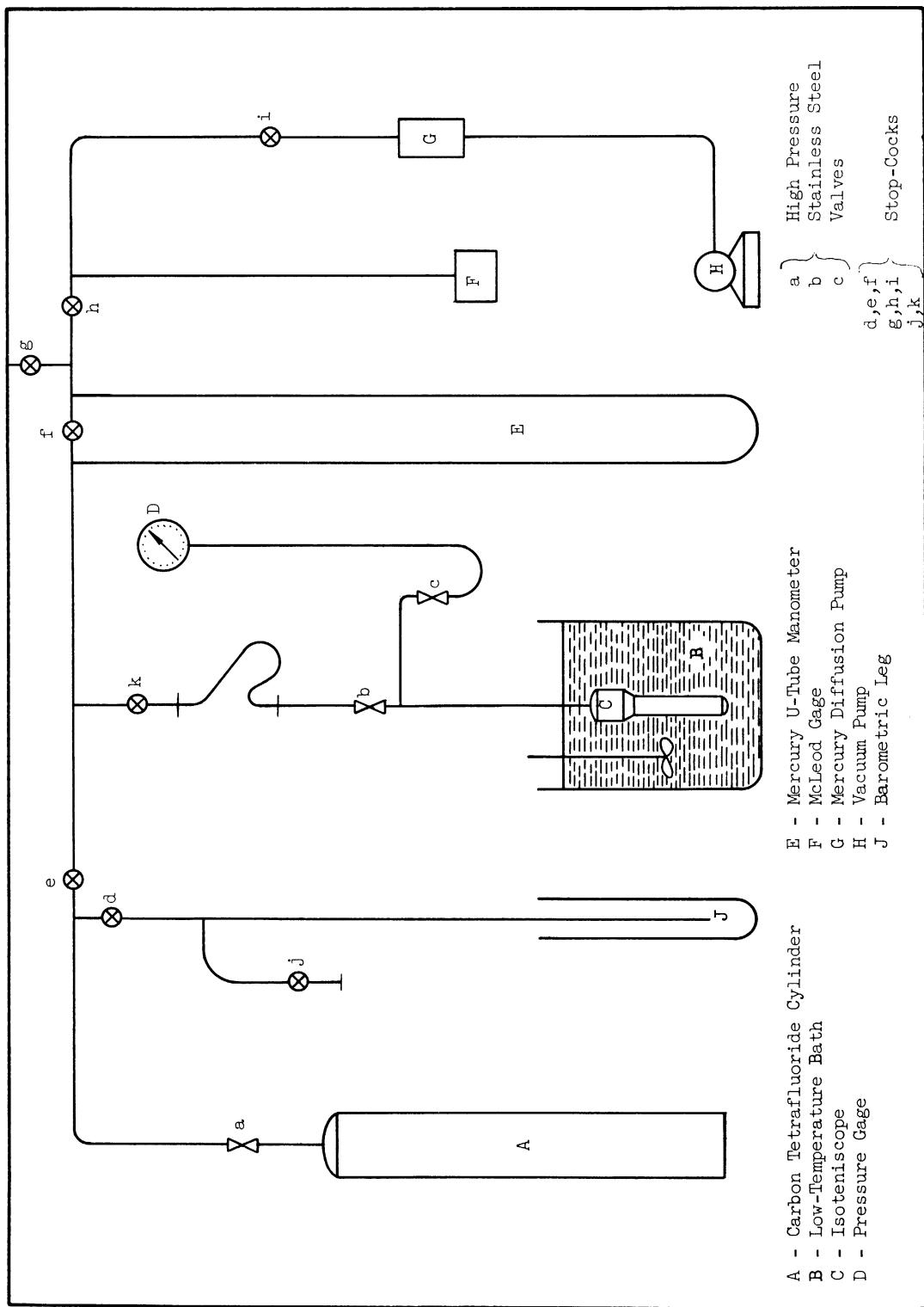
Figure 1. Schematic Diagram of the Low-Pressure Vapor Pressure Equipment.

A – Carbon Tetrafluoride Cylinder
B – Low-Temperature Bath
C – Isoteniscope
D – Pressure Gage

E – Mercury U-Tube Manometer
F – McLeod Gage
G – Mercury Diffusion Pump
H – Vacuum Pump
J – Barometric Leg

a
b ⎬ High Pressure Stainless Steel Valves
c

d,e,f
g,h,i ⎬ Stop-Cocks
j,k
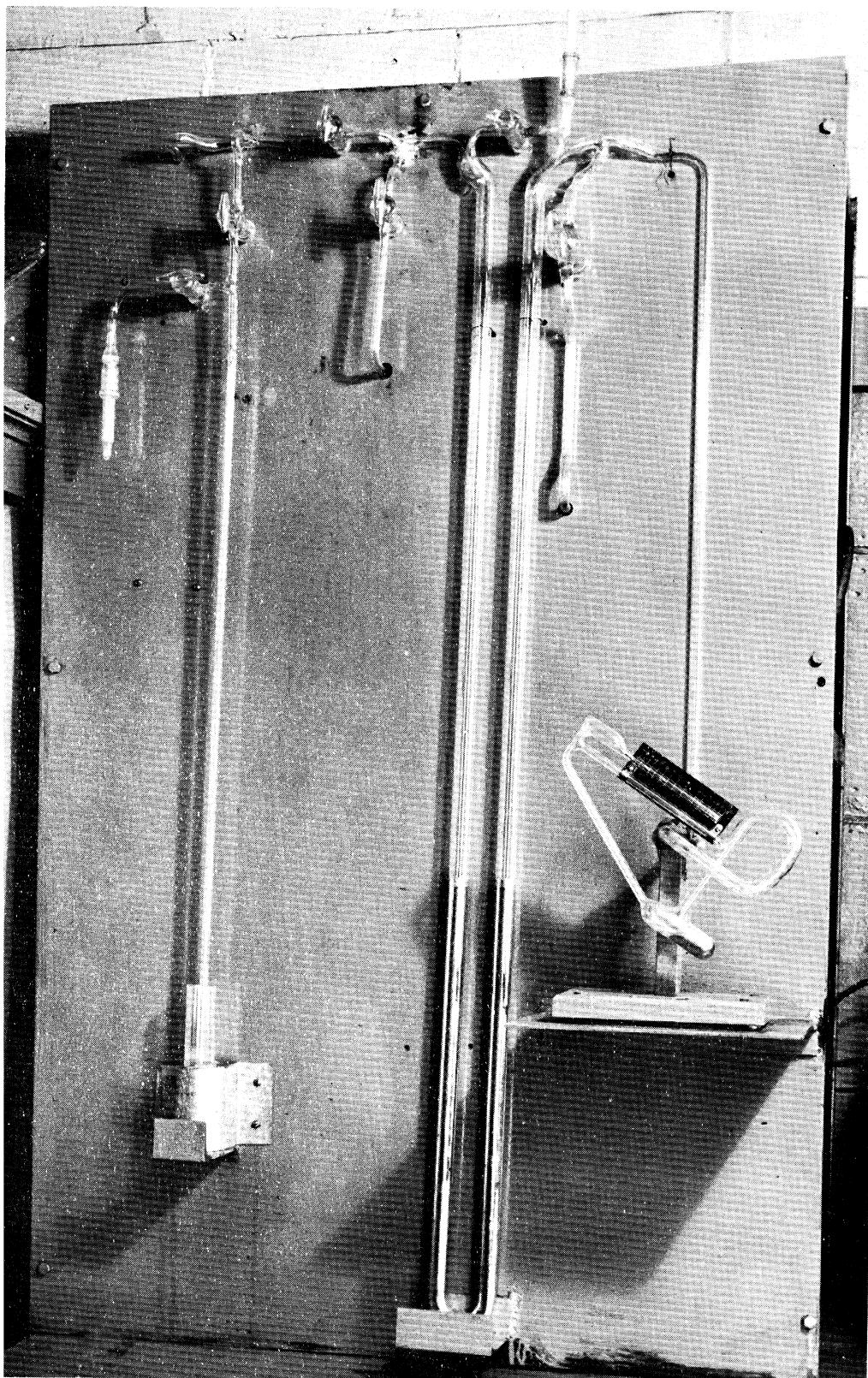
Figure 2. Picture of the Low Pressure Vapor Pressure Equipment.

baths. Two different baths were used in position B, depending upon the required temperature range. A bath of isopentane was used for temperatures from -127°C to 155°C and below -155°C, liquified propane was used as the bath fluid. Figure 3 shows the arrangement of the constant temperature bath system. The bath fluid was agitated vigorously by means of a stirrer. The bath was precooled to the required temperature by means of dry ice and liquid nitrogen. The temperature was maintained constant in the bath by controlling the rate of flow of cold air bubbling through the bath. In order to prevent clogging of the air lines before entering the bath, the condensibles in air were removed by passing through a condensibles trap as shown in Figure 3. The air, free from moisture and other condensibles was cooled by bubbling through liquid nitrogen contained in a dewar flask, and passed into the constant temperature bath through a silvered, vacuum insulated Dewar tube. The temperature of the bath could be controlled accurately by a trial and error procedure of controlling the rate of flow of air bubbling through the liquid nitrogen container.

The right leg of the mercury manometer was continuously evacuated by means of the Hyvac pump and the mercury diffusion pump to about 3 microns of mercury absolute pressure. The pressure exerted by the liquid in the isoteniscope was thus determined by measuring the difference in the mercury levels of the manometer by means of a cathetometer. The cathetometer used in these measurements could be read to 0.01 mm by means of the vernier-attachment. Readings of the cathetometer in these experiments were reproducible to 0.02 mm of mercury.

-17-
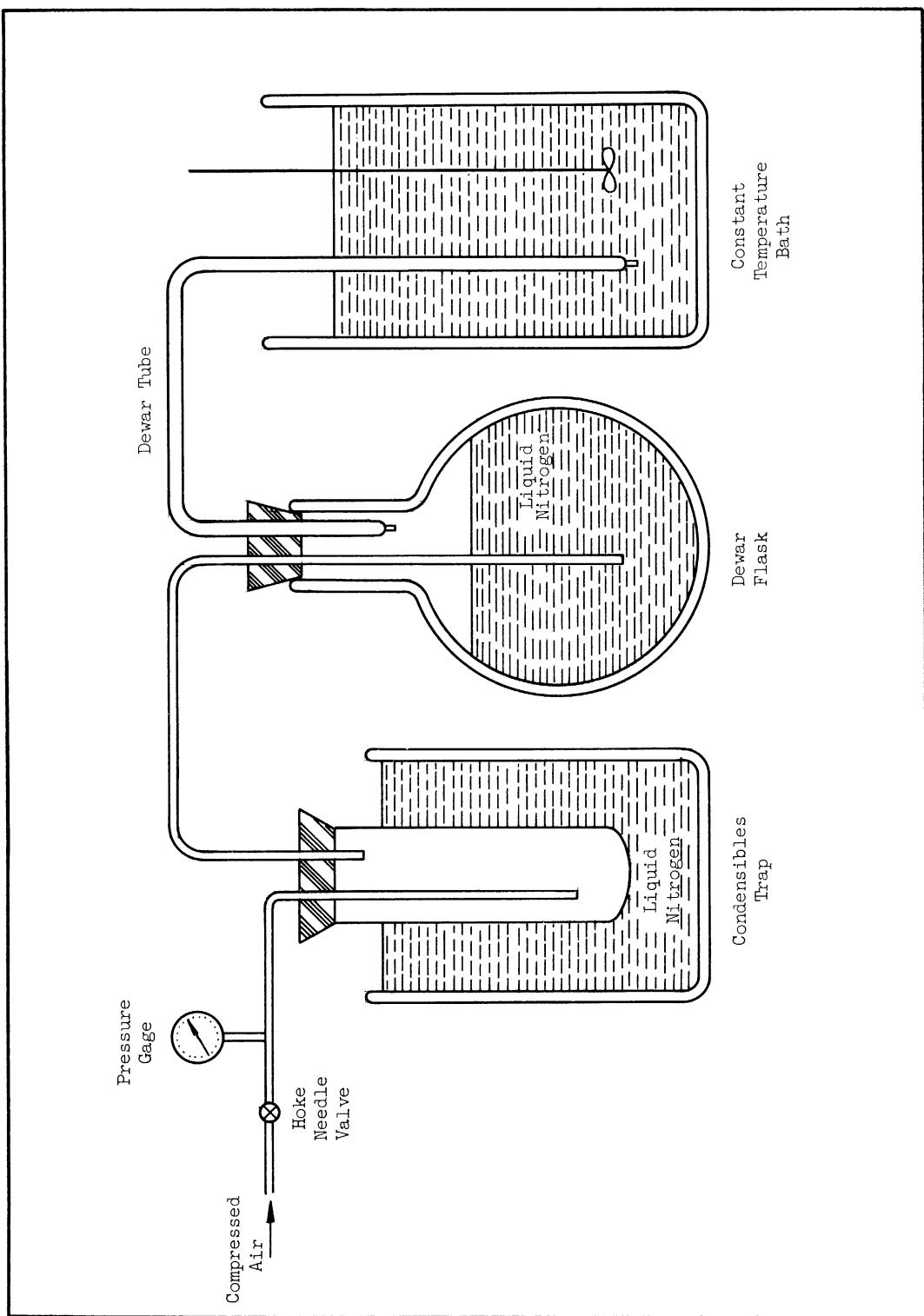
Figure 3. Schematic Diagram of the Low-Temperature Bath.

High-Pressure Vapor Pressure Equipment

The schematic diagram of the high-pressure vapor pressure equipment is shown in Figure 4. Part of the low-pressure vapor pressure equipment was used for the purpose of evacuating the high pressure vapor pressure system. The stop-cocks d,e,f,h and j of the low-pressure vapor pressure equipment were opened and stop-cock k closed. The glass-tube fitting (I) was then connected to the high-pressure vapor pressure system. The system of evacuation and loading of the isoteniscope were the same as described in the section of the low-pressure vapor pressure equipment.

The high-pressure vapor pressure equipment was constructed of stainless steel. All the lines were built of 1/4" stainless steel high pressure tubing connected with proper high pressure fittings. The U-leg, shown in Figure 4 was filled with mercury up to a level slightly above the valve (p). The right leg was filled for the remaining part with oil including the Bourdon tube of the pressure gage.

Two different baths were used in position B, depending upon the temperature ranges required. n-propanol cooled by means of dry ice was used. As the bath fluid for temperatures from about critical down to -78°C. Below -78°C, isopentane was used as the bath fluid down to about -125°C. The method of controlling the temperature down to -78°C was the same as that described by Hou[17], by the variation of the height of immersion of a tube containing a mixture of dry ice and n-propanol in the bath, until constant temperature had been maintained. A number of boil-offs were made during each run which not only served to remove the volatile impurities, but also gave the evidence of the presence of two phases, which is essential for these measurements.
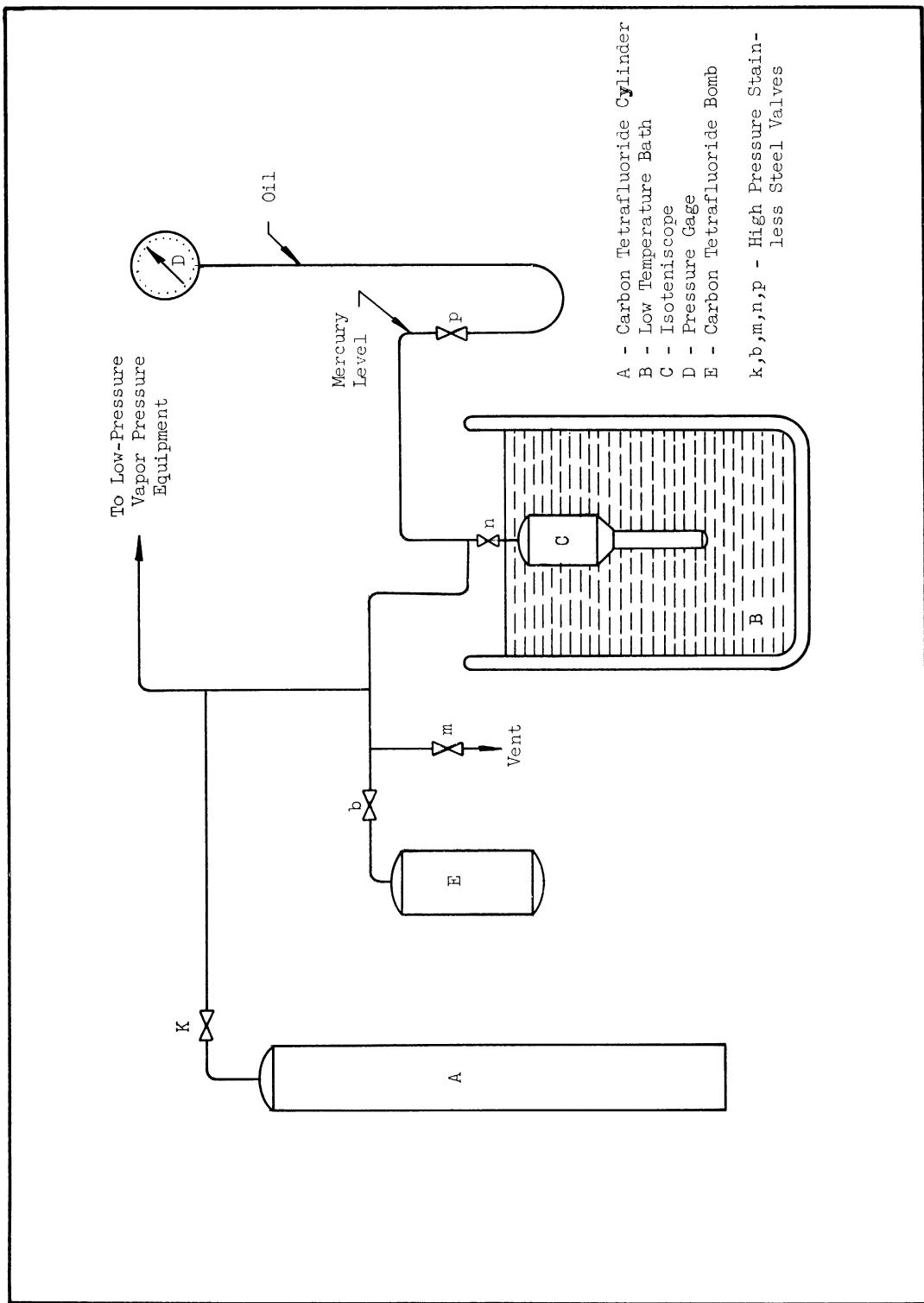
Figure 4. Schematic Diagram of the High-Pressure Vapor Pressure Equipment.

A – Carbon Tetrafluoride Cylinder
B – Low Temperature Bath
C – Isoteniscope
D – Pressure Gage
E – Carbon Tetrafluoride Bomb

k,b,m,n,p – High Pressure Stain-
less Steel Valves

Four pressure gages were used in position D of Figure 4 as
follows: A 0-1000 lb/sq.in. Ashcroft test gage with 5 lb. subdivisions
was used for pressures from 500 psia and up. A 0-500 lb/sq. in. Heise
test gage with 1/2 psia subdivisions was used for pressures ranging from
100 to 500 psia. A 0-100 lb/sq.in. Heise test gage with 0.1 psia sub-
divisions was used for pressures ranging from 100 psia down to about 20
psia. All the Heise test gages were temperature compensated and provided
with external bleeder system so that it was possible to completely evacu-
ate the bourdon tubes of these gages before filling them with oil.

The pressure gages were calibrated before and after the vapor
pressure measurements by means of the Dead Weight Gage Tester in the
Sohma Precision Laboratory.

Saturated Liquid Density Measurements

The methods used in the measurements of the saturated liquid
densities are essentially the same as described by Hou.[17] A number of
floats were prepared in the required density range and calibrated pre-
cisely using the microbalance of the Sohma Precision Laboratory. The
density bulbs were then prepared, which contained the calibrated floats
in them, and each of the density bulbs were numbered. The density bulbs
were then evacuated by being connected to the low pressure vapor pressure
equipment, in the same manner as that described in the section of the
high-pressure vapor pressure equipment.

Each of the bulbs was immersed in a bath of liquid nitrogen
and carbon tetrafluoride, which had been given a number of boil-offs to
remove all impurities in a collection bomb, was loaded into the bulb until

approximately half the volume of the bulb was filled with the liquid.
The liquid was frozen quite rapidly and the bulb was then sealed off,
using a gas-oxygen torch. The sealed tip was annealed with a low tempera-
ture flame. The liquid density bulb was then connected to a rubber tube
for vertical suspension and immersed in the bath as shown in Figure 5.
A transparent Dewar flask was used for containing the bath fluid. The
liquid density apparatus was completely encased in a steel casing with
its front-view section made up of two sheets of shatterproof glass sheets.
This was necessary because there was a chance that certain glass bulbs
could shatter, even though it was expected that they would withstand pres-
sures up to as high as 1000 psia. Further protection from shattering of
the density bulbs was achieved by means of another explosion shield in
front of the glass-window. By means of a lamp behind the bath, the liq-
uid and the float in the density bulb were very clearly visible as shown
in Figure 5. The temperature was controlled by the regulation of the
rate of flow of compressed air, by means of the air-regulator system situ-
ated outside the apparatus.

For the measurements of the saturated liquid density, it was
necessary to determine the saturation temperature at which the liquid had
the same density as the calibrated density float. At this temperature,
the float would have no tendency to either rise to the liquid surface, or
sink to the bottom of the bulb. Since this was extremely hard to detect,
sets of temperatures at which the float started to rise and the float
started to sink were determined. By convergence of these temperatures
after maintaining at each temperature for about 10-15 minutes constantly,
it was possible to make fairly accurate measurements of the saturated
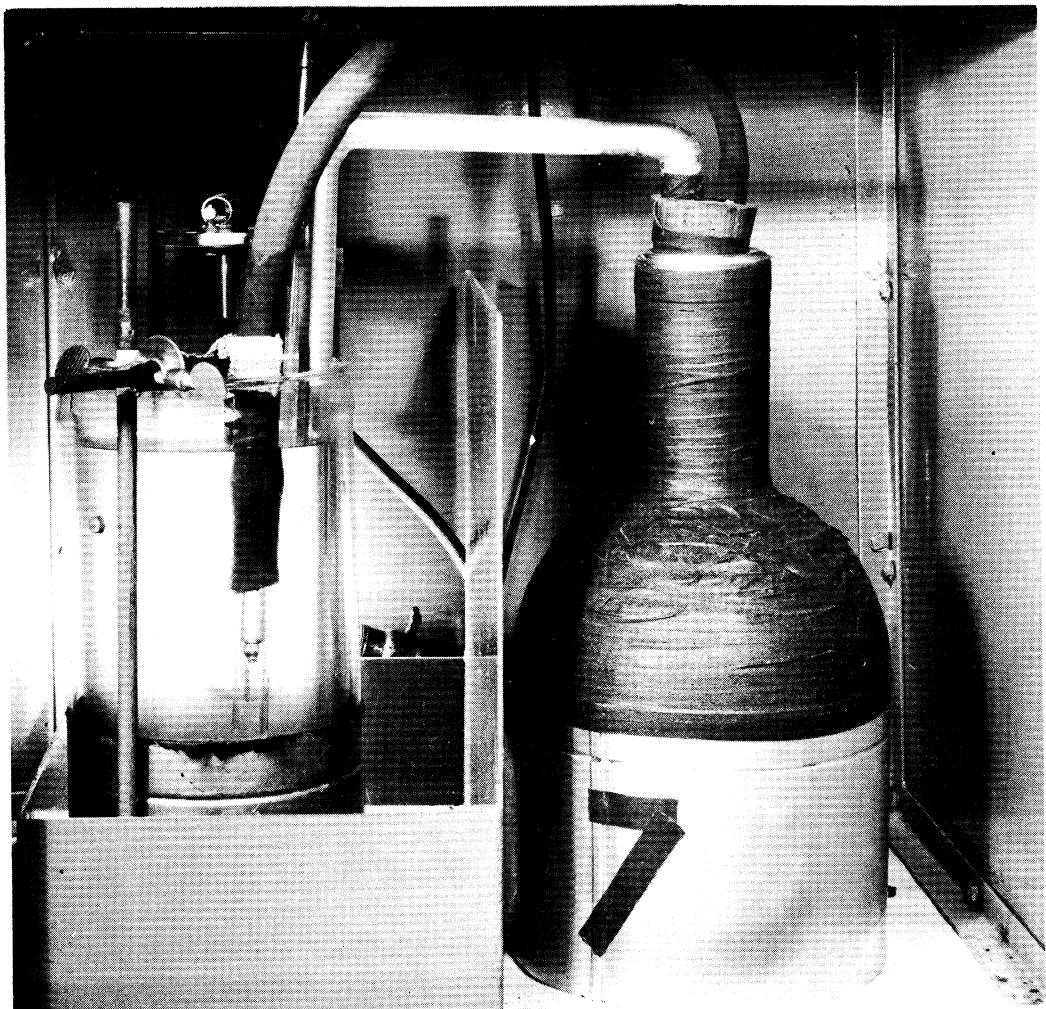
Figure 5. Picture of the Liquid Density Apparatus.

liquid densities by averaging the two temperatures at which the float started to sink and started to rise. The difference in these two temperatures was approximately 0.03°C, at the final convergence.

The same baths, as described in the section on the vapor pressure measurements, were used for the liquid density measurements.

Critical Temperature

The critical temperature was determined by averaging the temperatures at which the liquid meniscus disappeared and reappeared. The same liquid density bulbs as described earlier were used for these determinations. Since it was necessary that the liquid density bulb should contain just the right amount of liquid for observing the critical phenomena, a number of bulbs were made with different quantities of liquid in them, and the correct bulbs were selected among them by trial and error.

CORRELATION OF DATA

Vapor Pressure Data

Precise experimental data on the vapor pressures of some of the compounds were plotted on a $\ln P$ vs $1/T$ graph. It was observed that a straight line did not result as predicted by the Clausius-Clapeyron equation, but a definite S-shaped curve was obtained as shown in an exaggerated manner in Figure 6a. The negative slope of this curve M,[46] which is equivalent to $-d(\ln P)/d(1/T)$ is plotted as a function of T in Figure 6b. The first and second derivatives of M with respect to T, namely the values of $(\frac{dM}{dT})$ and $(\frac{d^2M}{dT^2})$ are plotted in Figures 6c and 6d respectively, as a function of T. It was observed that $\frac{d^2M}{dT^2}$ was a horizontal line up to a temperature close to the critical and from there on it had a tendency of upward curvature. Thus, it was possible to represent the equation of the curve of Figure 6d, by the equation

$$\frac{d^2M}{dT^2} = x + \frac{y}{(F-T)^2} \tag{16}$$

Integrating successively,

$$\frac{dM}{dT} = xT + \frac{y}{F-T} + I_1 \tag{17}$$

and

$$M = \frac{xT^2}{2} - y\ln(F-T) + I_1 T + I_2 \tag{18}$$

$$d(\ln P) = M\frac{dT}{T^2} = [\frac{x}{2} - \frac{y\ln(F-T)}{T^2} + \frac{I_1}{T} + \frac{I_2}{T^2}]dT \tag{19}$$

or

$$\ln P = \frac{xT}{2} - \frac{y\ln T}{F} - \frac{y(F-T)}{FT}\ln(F-T) + I_1\ln T$$

$$- I_2/T + I_3 \tag{20}$$
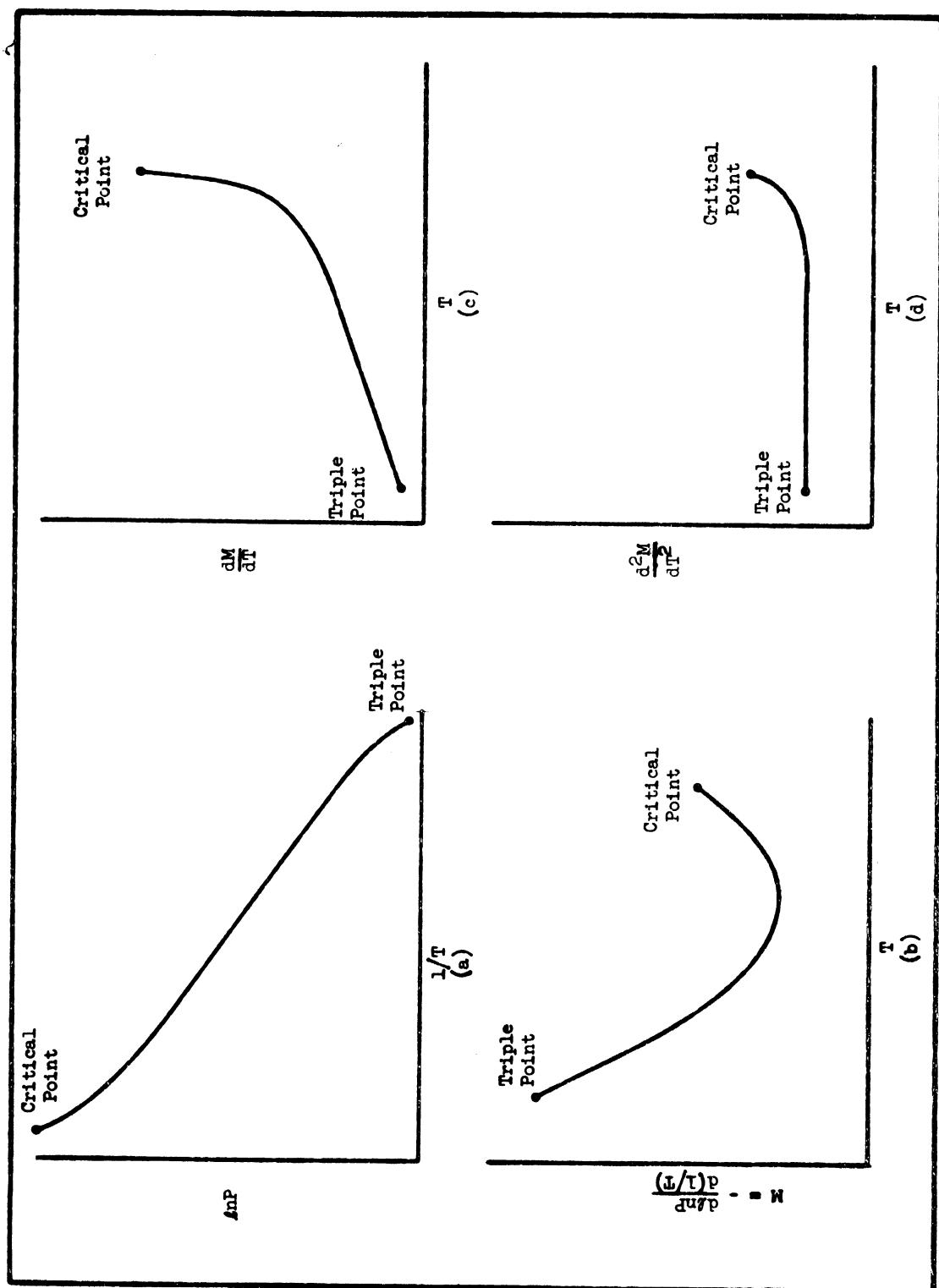
Figure 6. Correlation of the Vapor Pressure Equation.

Grouping the constants,

$$\ln P = A + B/T + C\ln T + DT + E \frac{(F-T)}{T} \ln(F-T) \qquad (21)$$

It was found from an examination of the vapor pressure behavior of several compounds that the constant F was approximately 8°C above the critical temperature of the compound.

The data on the vapor pressures of carbon tetrafluoride were fitted by means of Equation (21) by determining the constants, so that the data were represented with a high degree of precision throughout the entire range. On the basis of several trials, the value of F was determined to be 424°R, since it represented the data best of all other values of F used for testing the equation on carbon tetrafluoride. Other constants were similarly determined by testing the various combinations of the five-point fit in the entire range.

Liquid Density Data

The critical density was determined by the method of rectilinear diameter. The plot is shown in Figure 7. The values of saturated vapor densities were calculated from the simultaneous solution of the vapor pressure equation (Equation 21) and the Martin-Hou equation for the P-V-T behavior presented by Bhada.[6] Also the saturated vapor density values obtained by extrapolation of the experimental isometrices of Bhada to the saturation curve are shown in the figure. A smooth curve was drawn through the saturated liquid density data obtained in this investigation and the locus of the mid-points between the saturation densities of vapor and liquid was drawn. This locus, called the rectilinear diameter, was practically a straight line and by extrapolation of this line to the critical temperature, the critical density was determined to be 39.06 lb/cu.ft. Based on this value of the critical density, the saturated liquid and vapor
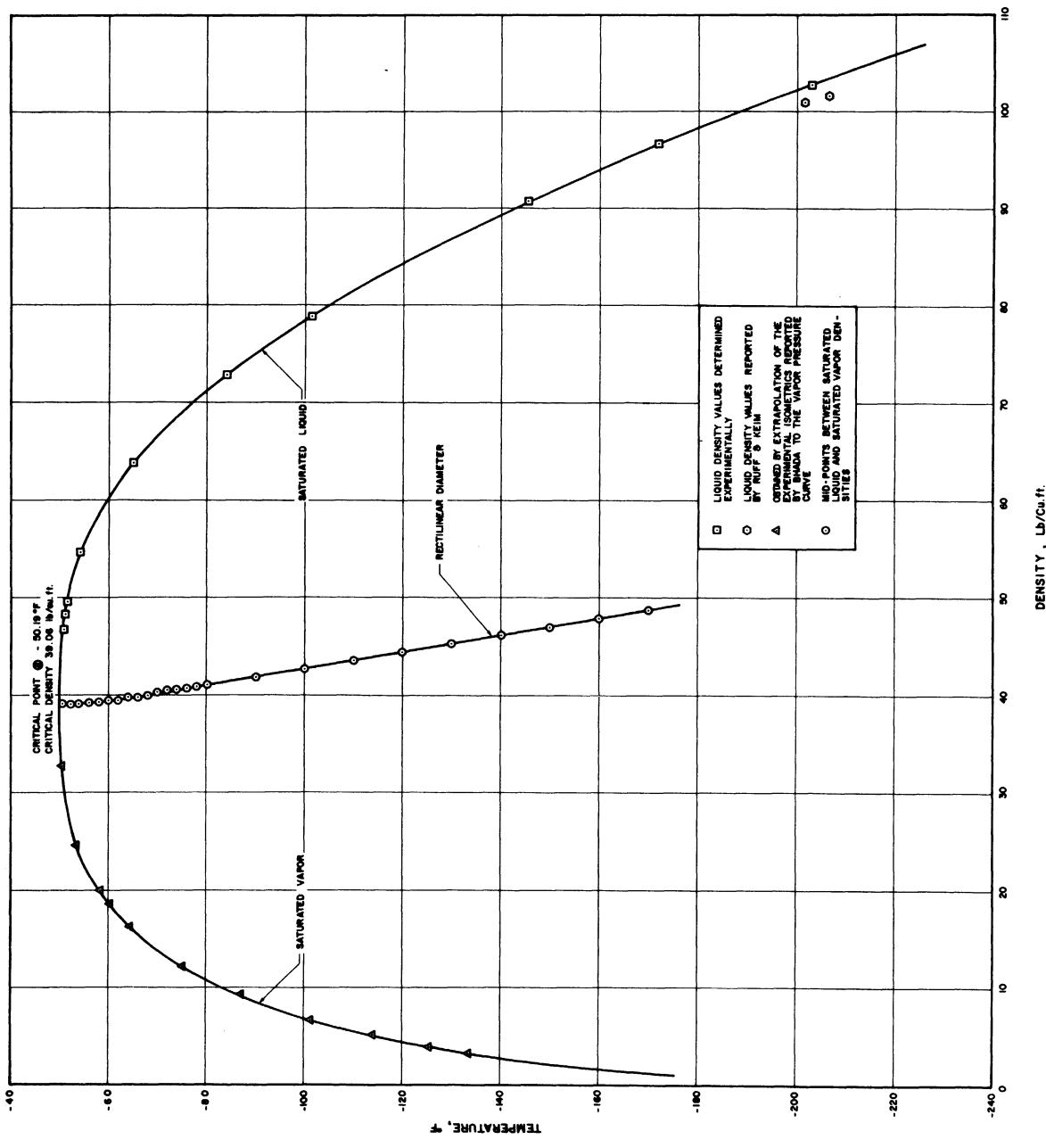
The saturated liquid density curve is drawn
through values calculated from the liquid
density equation.

The saturated vapor density curve is drawn
through values calculated from the simul-
taneous solution of the vapor pressure equa-
tion and the P-V-T equation reported by
Bhada.[6]

Figure 7. Temperature-Density Diagram for CF_4.

densities were recomputed and Figure 7 was prepared on this basis. The rectilinear diameter in this case was found to have a very slight curvature to the right at temperatures close to critical. However, the data in this range are not sufficiently accurate to warrant this slight curvature for this compound.

Hou[17] proposed the following equation for the correlation of the saturated liquid density data:

$$d^\ell = d_c + a_1(1 - \frac{T}{T_c})^{1/3} + a_2(1 - \frac{T}{T_c})^{2/3} + a_3(1 - \frac{T}{T_c})$$
$$+ a_4(1 - \frac{T}{T_c})^{4/3} \tag{22}$$

where d_c is the value of the critical density and T_c the critical temperature. This equation has been tested earlier to successfully represent the data on dichlorodifluoromethane and perfluorocyclobutane.[20,28] This equation was also found to represent the data of carbon tetrafluoride with excellent precision.

Heat Capacity at Zero Pressure

The heat capacity at zero pressure C_v^* was computed from the data available in the literature on the fundamental frequencies of the compound, using the methods of statistical mechanics. The computations were based upon the assumption that the heat capacity consists of components due to translational, rotational and vibrational motions of the molecule. The anharmonic contributions were estimated from the correlation of data on other chlorofluoro compounds as described by Albright et al.[1] and McCullough and co-workers.[31] The details of the methods are outlined below.

The translational and external rotational components for the heat capacity at zero pressure are independent of the nature and size

of the molecule and have each a value of 3/2 R. The total vibrational

contributions were obtained as summations of the contributions of all

individual degrees of freedom, each corresponding to the particular value

of the fundamental frequency v, as follows:

$$(c_v^*)_\omega = R \sum_{i=1}^{4} \frac{x_i^2 \, e^{x_i}}{(e^{x_i} - 1)^2} \tag{23}$$

where
$$x_i = 1.4388 \, v_i/T \tag{24}$$

and T in degrees Kelvin.

The most recent of all the data on the fundamental frequencies

of carbon tetrafluoride are by Goubeau et al.[16] Because of their claim

of the high purity of the sample used and high precision in measurements,

these values have been used in the calculations of the vibrational con-

tributions. The statistical weights of the energy levels are respectively

2, 3, 1 and 3 for the four fundamental frequencies v_1, v_2, v_3 and v_4 values.

The anharmonic contributions were calculated from the semi-

empirical equations presented by McCullough and co-workers.[31] Based

upon the experimental data of Masi[29], which he claims are to within

0.15% from -30°C to 90°C for the heat capacity of CCl_2F_2 Albright and

co-workers[1] determined the corrections for anharmonicity. They assumed

that the difference in the values of the specific heats calculated using

the rigid-rotator harmonic oscillator approximation and the experimental

data was only due to the anharmonic contribution and correlated the data

to obtain the constants in the equation presented by McCullough and co-

workers. In their calculations for the harmonic oscillator case, they

used the fundamental frequencies determined by Claassen[9] and products of

the moments of inertia by Gelles and Pitzer.[15]

The data were correlated in the form of the following equation presented by McCullough and co-workers:

$$C^*(anh) = Z(\frac{C^*}{R})\{[3(C^*/R)/U] - [1 + \frac{2}{U}][\frac{H^* - H_0^\circ}{RT}]\} \tag{25}$$

where

$$U = \frac{hc\nu}{kT} \tag{26}$$

Albright and co-workers determined the constants in this equation for CCl_2F_2 to be $Z = 0.1573$ and the frequency of the harmonic oscillator for (C^*/R) and $(\frac{H^* - H_0^\circ}{T})$ values to be 300 cm^{-1}.

As suggested by Albright et al., the calculations for evaluating the contributions for anharmonicity were made based on the following assumptions:

(1) The value of Z is the same for CCl_2F_2 and CF_4

(2) The value of ν is proportional to the sums of the fundamental frequencies.

Using the values of fundamental frequencies for CCl_2F_2 determined by Claassen and the latest values of fundamental frequencies of CF_4 by Goubeau et al., the proportionality constant was calculated. The following equations were derived using the equations presented by Hougen and Watson[21] and the semi-empirical equations presented by McCullough and co-workers. Other constants were obtained from Rossini et al.[36]

$$x = \frac{547.00914}{T} \tag{27}$$

$$a = \frac{x^2 e^x}{(e^x - 1)^2} \tag{28}$$

$$b = \frac{x}{(e^x - 1)} \tag{29}$$

$$U = \frac{547.113742}{T} \tag{30}$$

$$C_V^*(anh) = 0.15734 \left\{ \frac{3a}{U} - (1 + \frac{2}{U})b \right\} \tag{31}$$

The values of C_V^* were computed at several temperatures as summations of the translational, rotational, vibrational, and anharmonic contributions. The results of these values were correlated by means of an equation of the following form:

$$C_V^* = \alpha + \beta T + \gamma T^2 + \delta T^3 \tag{32}$$

which is the common form for representing the specific heat as a function of temperature in the literature. This equation has been found to represent the values calculated from the statistical methods, quite satisfactorily.

RESULTS

The data obtained in this investigation and other data used in the computation of the thermodynamic properties is correlated by the following equations:

Vapor Pressure

$$\log_{10} P = 20.71545389 - \frac{2467.505285}{T} - 4.69017025 \log_{10} T$$

$$+ 6.4798076 \times 10^{-4} T + \frac{0.770707795}{T} (424 - T) \log_{10} (424 - T)$$

(33)

where P is in psia and T in °R.

This equation represents the vapor pressure data with an average of 0.124 percent deviation.

Liquid Density

$$d^{\ell} = d_c + 69.56848907 (1 - \frac{T}{T_c})^{1/3} + 4.58661139 (1 - \frac{T}{T_c})^{2/3}$$

$$+ 36.17166615 (1 - \frac{T}{T_c}) - 8.05898583 (1 - \frac{T}{T_c})^{4/3}$$

(34)

where d^{ℓ} is the liquid density in lb/cu.ft. and d_c and T_c are respectively the critical density and the critical temperature.

The equation represents the data within 0.14 percent deviation.

Critical Constants

The critical temperature was determined experimentally to be 409.50°R. The critical pressure was calculated by substituting the value

of the critical temperature in the vapor pressure equation, and found to

be 543.16 psia. The critical density was determined to be 39.06 lb/cu.ft.

by the rectilinear diameter method.

PVT Behavior

The following equation, correlated by Bhada[6] has been used in

further computations of the thermodynamic properties of carbon tetrafluoride.

$$P = \frac{RT}{(V-b)} + \frac{A_2 + B_2T + C_2e^{-kT/T_c}}{(V-b)^2} + \frac{A_3 + B_3T + C_3e^{-kT/T_c}}{(V-b)^3}$$

$$+ \frac{A_4}{(V-b)^4} + \frac{A_5 + B_5T + C_5e^{-kT/T_c}}{(V-b)^5} \tag{35}$$

$R = 10.7315/88.011$

$\quad = 0.12193362 \ (ft^3)(psia)/(lb)(°R)$

$A_2 = -3.1553788$

$B_2 = 3.2480704 \times 10^{-3}$

$C_2 = -2.1911976$

$A_3 = 0.056830627$

$B_3 = -5.6536787 \times 10^{-5}$

$C_3 = 0.052630252$

$A_4 = -3.1575738 \times 10^{-4}$

$A_5 = -1.5210836 \times 10^{-6}$

$B_5 = 6.6533754 \times 10^{-9}$

$C_5 = -3.5786565 \times 10^{-6}$

$b = 5.7104970 \times 10^{-3}$

$k = 5.0$

and P is in psia and T in °R.

Heat Capacity at Zero Pressure

$$C_V^* = 3.00559282 \times 10^{-2} + 2.37043352 \times 10^{-4} \, T$$
$$- 2.85660077 \times 10^{-8} \, T^2 - 2.95338806 \times 10^{-11} \, T^3$$

where C_V^* is in Btu/(lb)($°R$) and T in $°R$.

This equation represents the data within 0.3 percent in the range of 180$°R$ to 1170$°R$.

DISCUSSION

Vapor Pressure

The consistency of the data on the vapor pressures of carbon tetrafluoride obtained in this investigation was tested by means of a reduced plot of log P_r vs. $1/T_r$ as presented in Figure 8. The values of P_r and T_r are respectively the reduced vapor pressure and reduced temperature of the compound. Data on other fluoro-chloro-derivatives in this series were also plotted on this graph. Data on the vapor pressures of dichlorodifluoromethane were taken from Kelles et al.[22] and Gryka and co-workers.[18] Data on the vapor pressures of chlorotrifluoromethane were obtained from Albright.[2] Other available data on the vapor pressures of carbon tetrafluoride were taken from Booth and McNabney[7], Menzel and Mohry[30] and Ruff and Keim[37] and are also shown in Figure 8. The data presented in this investigation follow extremely consistently with the general trend for other compounds in this series. The data agree well with the values reported by Booth and McNabney and Menzel and Mohry, but it is quite evident from the examination of the plot that the data by Ruff and Keim are inconsistent with the general trends expected for this compound. The reason could be due to impurities present in the compound.

Liquid Density

The consistency of the liquid density data on CF_4 was tested on a reduced liquid density plot of

$$\left(\frac{d^l}{d_c} - 1\right) / \left(1 - \frac{T}{T_c}\right)^{1/3} \quad \text{vs.} \quad \left(1 - \frac{T}{T_c}\right)^{2/3}$$
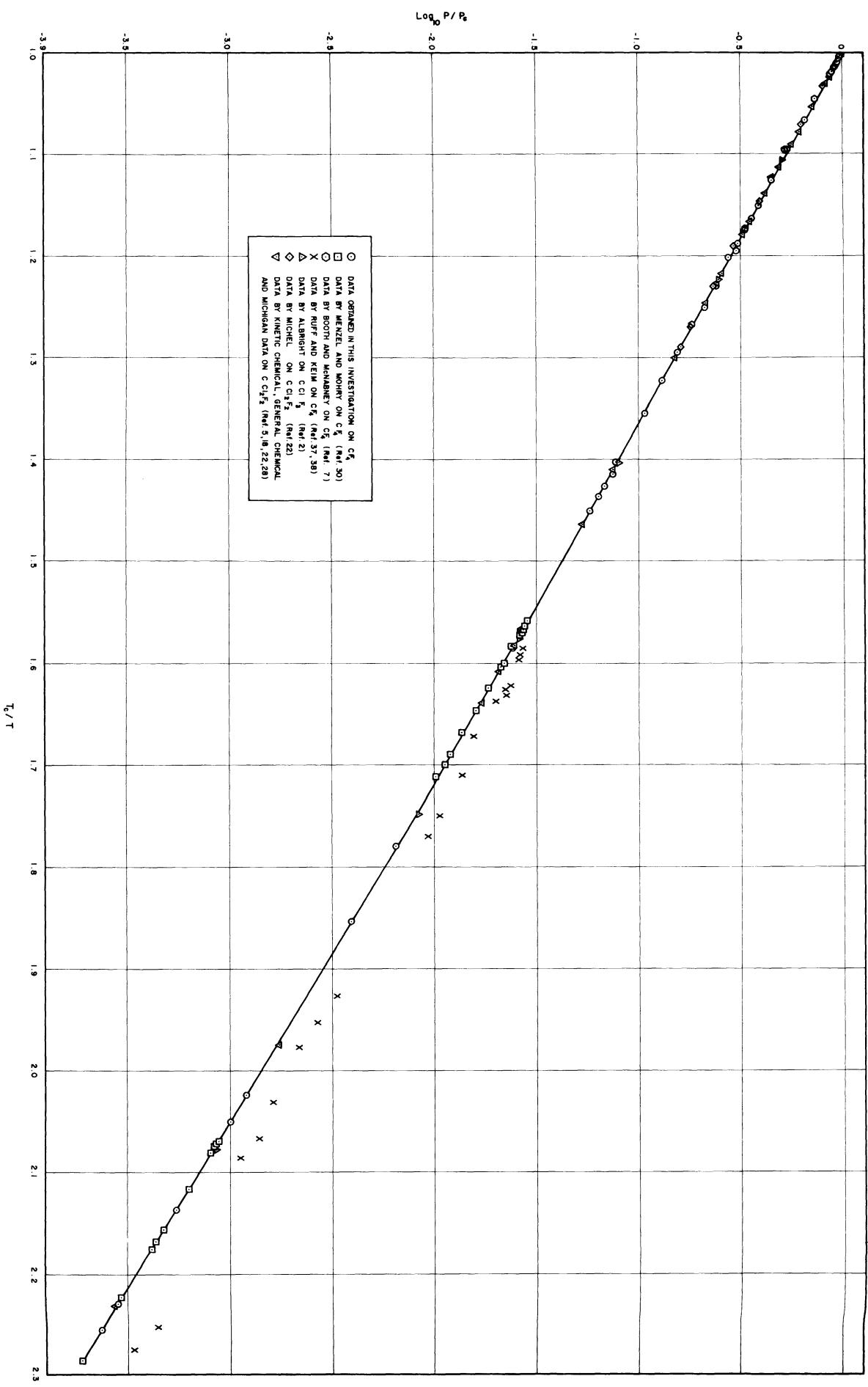
Figure 8. Reduced Vapor Pressure Plot for CCl$_2$F$_2$, CClF$_3$ and CF$_4$.

for a few chloro-fluoro derivatives of methane. These data are presented in Figure 9. The data on the saturated liquid densities of carbon tetra-fluoride obtained in this investigation are plotted along with other data by Ruff and Keim[37,38] in this diagram. Data on dichlorodifluoromethane were taken from Gryka et al.[18] The liquid density data for CCl_3F_3 were obtained from Albright.[2] Data on CH_2F_2 were taken from Benning and McHarness[5] and Martin et al.[28] Data on trifluoromethane were taken from Hou and Martin.[20] It is quite evident from the examination of this plot that there appears to be a general trend for all these compounds. The data on the liquid densities obtained in this investigation follow the general trends extremely well. The data points of Ruff and Keim, however, appear to be quite scattered, thereby proving to be inconsistent with regard to the normal trends. The errors in their data could have been caused either by inaccuracy in the temperature measurements or the density measurements or both.

Critical Constants

Three of the runs made on the critical temperature agree very well within $\pm 0.03°F$. The critical pressure was calculated by extrapolation of the vapor pressure curve up to the critical temperature. Taking into account the error introduced by the critical temperature and the percentage deviation of the neighboring points with respect to the vapor pressure equation, the critical pressure is subject to an error of about 0.2 percent.

The critical density determined from the extrapolation of the rectilinear diameter to the critical temperature may have an error of
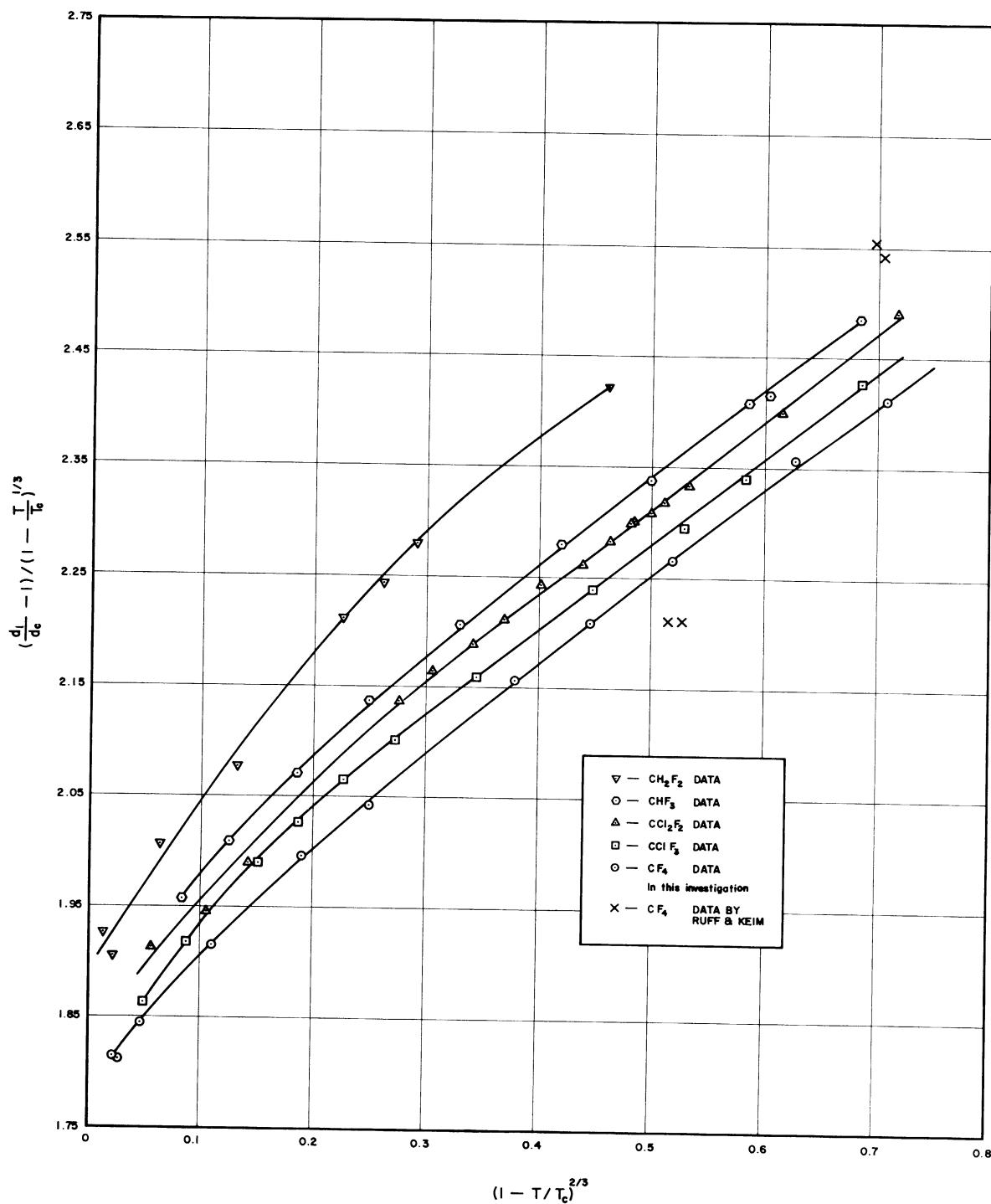
Figure 9. Generalized Liquid Density Data for CH_2F_2, CHF_3, CCl_2F_2, and CF_4.

less than 1.0 percent, taking into account the maximum of 0.14 percent for the liquid density equation fit and 0.2 percent for the error in critical temperature measurement and the remaining in reading from the graph.

Table II presents a summary of the critical constants reported in this investigation along with other data from the literature.

TABLE II

COMPARISON OF CRITICAL CONSTANTS

Literature Source Property	This Investigation	Booth & McNabney[7]
Critical temperature	409.50	409.79
Critical pressure	543.16	540.81
Critical density	39.06	39.61 (estimated)

Heat Capacity at Zero Pressure

To test the consistency of the heat capacity equation which was obtained by statistical methods, the experimental data on the liquid heat capacity of carbon tetrafluoride were taken as the criterion. The procedure consisted of calculating the saturated liquid heat capacity from the vapor pressure equation (Equation 33), liquid density equation (Equation 34), P-V-T equation (Equation 35) and the heat capacity of the gas at zero pressure (Equation 36). The method used is illustrated in Figure 10. The enthalpy changes are calculated along the five steps shown in the diagram.
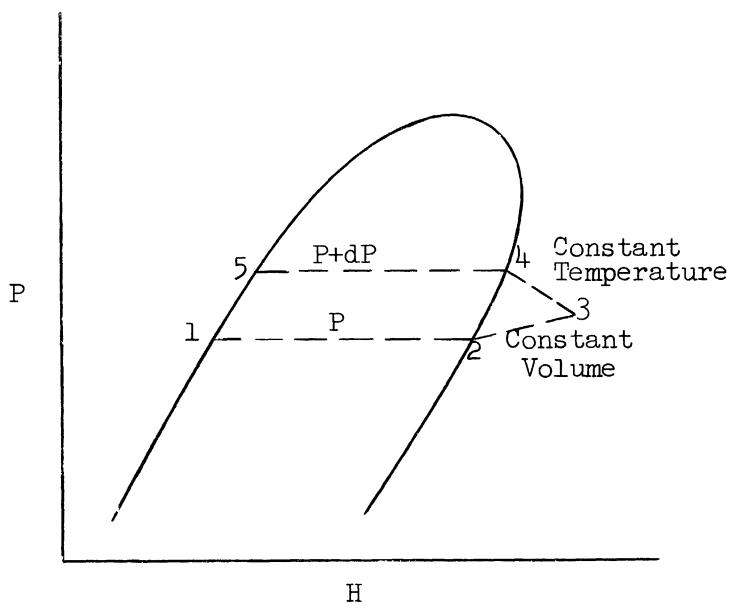
Figure 10. Diagram for Testing the Consistency of
Gas Heat Capacity Equation.

The following are the final forms of the equations derived
from the vapor pressure equation (Equation 21), liquid density equation
(Equation 22), P-V-T equation (Equation 35) and the equation for the
heat capacity at zero pressure (Equation 32).

Step 1-2: $\Delta \underline{H} = (\Delta \underline{H}^V)$ 　　　　　　　　　　　　　(37)

Step 2-3: $d\underline{H} = C_V dT + \underline{V}(\frac{dP}{dT})_{\underline{V}} dT$ 　　　　　　　　(38)

Step 3-4: $d\underline{H} = T(\frac{dP}{dT})_{\underline{V}} d\underline{V} + \underline{V}dP$

$= [T(\frac{dP}{dT})_{\underline{V}} + \underline{V}(\frac{dP}{d\underline{V}})_T]d\underline{V}$ 　　　　　(39)

Step 4-5: $\Delta \underline{H} = (\Delta \underline{H}^V)_{T + dT}$ 　　　　　　　　　　(40)

Step 5-1: $d\underline{H} = C_s^{\ell} dT + \underline{V}^{\ell}(\frac{dP}{dT})_{sat} dT$ 　　　　　(41)

Summing up Equation (37) through Equation (41) and solving for C_v,

$$C_v = C_s + \underline{V}^\ell \left(\frac{dP}{dT}\right)_{sat} + \frac{d(\Delta \underline{H}^V)}{dT} - \underline{V}\left(\frac{dP}{dT}\right)_{\underline{V}}$$

$$- \left[T\left(\frac{dP}{dT}\right)_{\underline{V}} + \underline{V}\left(\frac{dP}{d\underline{V}}\right)_T\right]\left(\frac{d\underline{V}}{dT}\right)_{sat} \tag{42}$$

Since

$$(\Delta \underline{H}^V) = T(\underline{V} - \underline{V}^\ell)\left(\frac{dP}{dT}\right)_{sat} \tag{43}$$

$$\frac{d(\Delta \underline{H}^V)}{dT} = (\underline{V} - \underline{V}^\ell)\left(\frac{dP}{dT}\right)_{sat} + T(\underline{V} - \underline{V}^\ell)\left(\frac{d^2 P}{dT^2}\right)_{sat}$$

$$+ T\left(\frac{dP}{dT}\right)_{sat}\left[\left(\frac{d\underline{V}}{dT}\right)_{sat} - \left(\frac{d\underline{V}^\ell}{dT}\right)_{sat}\right] \tag{44}$$

Also,

$$dP = \left(\frac{dP}{dT}\right)_{\underline{V}}dT + \left(\frac{dP}{d\underline{V}}\right)_T d\underline{V} \tag{45}$$

or

$$\left(\frac{dP}{dT}\right)_{sat} = \left(\frac{dP}{dT}\right)_{\underline{V}} + \left(\frac{dP}{d\underline{V}}\right)_T\left(\frac{d\underline{V}}{dT}\right)_{sat} \tag{46}$$

$$\left(\frac{d\underline{V}}{dT}\right)_{sat} = \frac{\left(\frac{dP}{dT}\right)_{sat} - \left(\frac{dP}{dT}\right)_{\underline{V}}}{\left(\frac{dP}{d\underline{V}}\right)_T} \tag{47}$$

Substituting Equation (44) in Equation (42).

$$C_v = C_s^\ell + \underline{V}^\ell\left(\frac{dP}{dT}\right)_{sat} + (\underline{V} - \underline{V}^\ell)\left[\left(\frac{dP}{dT}\right)_{sat} + T\left(\frac{d^2P}{dT^2}\right)_{sat}\right]$$

$$- T\left(\frac{dP}{dT}\right)_{sat}\left(\frac{d\underline{V}^\ell}{dT}\right) - \underline{V}\left(\frac{dP}{dT}\right)_{\underline{V}}$$

$$+ \left[T\left(\frac{dP}{dT}\right)_{sat} - T\left(\frac{dP}{dT}\right)_{\underline{V}} - \underline{V}\left(\frac{dP}{d\underline{V}}\right)_T\right]\left(\frac{dP}{dT}\right)_{sat} \tag{48}$$

or

$$C_v = C_s{}^\ell + \underline{V}^\ell \left(\frac{dP}{dT}\right)_{sat} + (\underline{V} - \underline{V}^\ell)\left[\left(\frac{dP}{dT}\right)_{sat} - T\left(\frac{d^2P}{dT^2}\right)_{sat}\right]$$

$$- T\left(\frac{dP}{dT}\right)_{sat}\left(\frac{d\underline{V}^\ell}{dT}\right) - \underline{V}\left(\frac{dP}{dT}\right)_{sat}$$

$$+ T\left[\left(\frac{dP}{dT}\right)_{sat} - \left(\frac{dP}{dT}\right)_{\underline{V}}\right]\left(\frac{d\underline{V}}{dT}\right)_{sat} \tag{49}$$

Simplifying and using the value of $\left(\frac{d\underline{V}}{dT}\right)_{sat}$ from Equation (47), with the application of proper conversion factors,

$$C_v = C_s^\ell + 0.185053T\left\{(\underline{V} - \underline{V}^\ell)\left(\frac{d^2P}{dT^2}\right)_{sat} - \left(\frac{dP}{dT}\right)_{sat}\left(\frac{d\underline{V}^\ell}{dT}\right)_{sat}\right.$$

$$\left. + \frac{\left[\left(\frac{dP}{dT}\right)_{sat} - \left(\frac{dP}{dT}\right)_{\underline{V}}\right]^2}{\left(\frac{dP}{d\underline{V}}\right)_T}\right\} \tag{50}$$

where the value of C_v is obtained from the relation

$$C_v = C_v^* + \int_\infty^{\underline{V}} T\left(\frac{d^2P}{dT^2}\right) d\underline{V}_T \tag{51}$$

The following are the final forms of the equations derived from the vapor pressure equation (Equation 21), liquid density equation (Equation 22), P-V-T equation (Equation 35) and the equation for the heat capacity at zero pressure (Equation 32).

$$\underline{V}^\ell = \frac{1}{d^\ell} \tag{52}$$

$$\left(\frac{dP}{dT}\right)_{sat} = P\left\{-\frac{B'}{T^2} + \frac{C}{T} + D' - \frac{E}{T}\left(1 + \frac{F\,\ell n(F-T)}{T}\right)\right\} \tag{53}$$

where $B' = 2.302585093B$ and $D' = 2.302585093D$.

$$\left(\frac{dP}{dT}\right)_{\underline{V}} = \frac{R}{(\underline{V}-b)} + \frac{B2 - \frac{C_2 k}{T_c}\, e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^2} + \frac{B_3 - \frac{C_3 k}{T_c}\, e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^3}$$

$$+ \frac{B_5 - \frac{C_5 k}{T_c}\, e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^5} \tag{54}$$

$$\left(\frac{d^2 P}{dT^2}\right)_{\underline{V}} = \frac{C_2\left(\frac{k}{T_c}\right)^2 e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^2} + \frac{C_3\left(\frac{k}{T_c}\right)^2 e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^3} + \frac{C_5\left(\frac{k}{T_c}\right)^2 e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^5} \tag{55}$$

$$\left(\frac{dP}{d\underline{V}}\right)_{T} = \frac{-RT}{(\underline{V}-b)^2} - \frac{2(A_2 + B_2 T + C_2 e^{-k\frac{T}{T_c}})}{(\underline{V}-b)^3} - \frac{3(A_3 + B_3 T + C_3 e^{-k\frac{T}{T_c}})}{(\underline{V}-b)^4}$$

$$- \frac{4\,A_4}{(\underline{V}-b)^5} - \frac{5(A_5 + B_5 T + C_5 e^{-\frac{kT}{T_c}})}{(\underline{V}-b)^6} \tag{56}$$

$$\left(\frac{d\underline{V}^{\ell}}{dT}\right) = -\left(\frac{1}{d\ell}\right)^2 \frac{d(d\ell)}{dT}$$

$$= \frac{1}{3T_c(d\ell)^2}\left\{ a_1\left(1 - \frac{T}{T_c}\right)^{-2/3} + 2a_2\left(1 - \frac{T}{T_c}\right)^{-1/3} + 3a_3 \right.$$

$$\left. + 4a_4\left(1 - \frac{T}{T_c}\right)^{1/3} \right\} \tag{57}$$

$$C_v = \alpha + \beta T + \gamma T^2 + \delta T^3$$

$$- \left(\frac{k}{T_c}\right)^2 T\, e^{-\frac{kT}{T_c}}\left\{\frac{C_2}{(\underline{V}-b)} + \frac{C_3}{2(\underline{V}-b)^2} + \frac{C_5}{4(\underline{V}-b)^4}\right\} \tag{58}$$

The comparison of the liquid heat capacity obtained from using Equation (50) through (58) with the experimental liquid heat capcity by Selby and Aston[40] is presented in Table III.

TABLE III

COMPARISON OF CALCULATED AND EXPERIMENTAL
HEAT CAPACITIES OF LIQUID CF_4

Temperature	Liquid heat capacity Btu/(lb)(°R)		Percent Deviation
	Experimental	Calculated	
220	0.2081	0.2014	+ 3.3
240	0.2104	0.2148	- 2.3

Because of the second derivatives involved, this presents an excellent check on the consistency of all the equations used, especially the equation on the gas heat capacity.

CALCULATION PROCEDURE FOR EVALUATING THE THERMODYNAMIC
PROPERTIES OF CARBON TETRAFLUORIDE

The datum plane for calculating the thermodynamic properties

of carbon tetrafluoride was taken at absolute zero. Thus, at $0°$ R, for solid,

$\underline{H}$ = 0 and $\underline{S}$ = 0. The properties of saturated liquid at 180 °R were then

calculated from the thermal data on the compound down to 12 °K by Eucken

and Schroder.[13] Below 12 °K, the contributions for the thermodynamic

properties were obtained by evaluating the Debye functions and the Planck-

Einstein functions and integrating the specific heat values calculated

thus in the range from 0 to 12 °K. The entropy checks very well with the

values obtained by the statistical methods. The details of these com-

parisons are shown in the Appendix.

The tables of the thermodynamic properties are divided into two

sections. The first section represents the thermodynamic properties of

saturated vapor and liquid. The second section contains the tables of

thermodynamic properties of superheated vapor.

Saturated Vapor and Liquid

The thermodynamic properties of saturated vapor and liquid are

divided into two parts. Table IV represents the thermodynamic properties

as functions of temperature, and is termed "saturation temperature table."

The properties evaluated are (1) saturation pressure (psia and Gage),

(2) liquid specific volume, (3) gas specific volume, (4) liquid density,

(5) gas density, (6) liquid enthalpy, (7) latent heat, (8) gas enthalpy,

(9) liquid entropy and (10) gas entropy. Table V represents the thermo-

dynamic properties as functions of pressures and is termed "saturation

pressure table." The same properties as listed for Table IV are tabulated except that the saturation temperature is tabulated in place of saturation pressure listed in the previous table. A convenient interval of pressure has been chosen depending upon the pressure, so as to be most useful from the point of view of practical utility.

The equations used for the calculation of the thermodynamic properties are developed as follows:

Enthalpy of Vapor

The following fundamental relation expresses the effect of temperature and pressure on enthalpy.

$$d\underline{H} = C_p dT_P + [\underline{V} - T(d\underline{V}/dT)_P] \, dP_T \tag{59}$$

But

$$\underline{V}dP_T = d(P\underline{V})_T - Pd\underline{V}_T \tag{60}$$

and

$$-(d\underline{V}/dT)_P \, dP_T = (dP/dT)_V \, d\underline{V}_T \tag{61}$$

Substituting Equation (60) and Equation (61) in Equation (59),

$$d\underline{H} = C_p dT_P + d(P\underline{V})_T - Pd\underline{V}_T + T(\frac{dP}{dT})_V \, d\underline{V}_T \tag{62}$$

With the initial datum conditions of T at zero pressure and any given T and P or $\underline{V}$, and evaluating the respective derivatives from the P-V-T equation, the following equation is obtained.

$$\underline{H} - \underline{H}_0 = \int_{T_0}^{T} C_P^* \, dT + [(P\underline{V})_T]_{\infty}^{\underline{V}} + \int_{\underline{V}=\infty}^{\underline{V}} [- \frac{A_2 + C_2 e^{- \frac{kT}{Tc}}(1 + k \frac{T}{Tc})}{(\underline{V}-b)^2}$$

$$- \frac{A_3 + C_3 e^{- \frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{(\underline{V}-b)^3} - \frac{A_4}{(\underline{V}-b)^4}$$

$$- \frac{A_5 + C_5 e^{- \frac{kT}{Tc}}(1 + k \frac{T}{Tc})}{(\underline{V}-b)^5}] \, d\underline{V}_T \qquad (63)$$

where subscript 0 indicates datum condition. By integrating Equation (63),

$$\underline{H} - \underline{H}_0 = \int_{T_0}^{T} C_P^* \, dT + [(P\underline{V})_T]_{\underline{V}=\infty}^{\underline{V}} + [\frac{A_2 + C_2 e^{- \frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{(\underline{V}-b)}$$

$$+ \frac{A_3 + C_3 e^{- \frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{2(\underline{V}-b)^2} + \frac{A_4}{3(\underline{V}-b)^3}$$

$$+ \frac{A_5 + C_5 e^{- \frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{4(\underline{V}-b)^4}]_{\underline{V}=\infty}^{\underline{V}} \qquad (64)$$

From the relation

$$\Delta\underline{H} = \underline{H}_2 - \underline{H}_1$$

$$= (\underline{H}_2 - \underline{H}_0) - (\underline{H}_1 - \underline{H}_0) \qquad (65)$$

and the relation

$$C_P^* = C_V^* + R \qquad (66)$$

we get,

$$\Delta \underline{H} = [\int C_v^* \, dT + P\underline{V} + \frac{A_2 + C_2 e^{-\frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{(\underline{V}-b)}$$

$$+ \frac{A_3 + C_3 e^{-k\frac{T}{Tc}}(1 + \frac{kT}{Tc})}{2(\underline{V}-b)^2} + \frac{A_4}{3(\underline{V}-b)^3}$$

$$+ \frac{A_5 + C_5 e^{-\frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{4(\underline{V}-b)^4}]_{\underline{V}_1, T_1}^{\underline{V}_2, T_2} \qquad (67)$$

Using the reference properties as P_1, $\underline{V}_1$, T_1 and $\underline{H}_1$, Equation (67) gives the values of $\underline{H}_1 - H_{ref}$. Dropping the subscript 2 in order to generalize the properties for any temperature and pressure,

$$\underline{H} = \alpha T + \frac{\beta T^2}{2} + \frac{\gamma T^3}{3} + \frac{\delta T^4}{4} + P\underline{V} + \frac{A_2 + C_2 e^{-\frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{(\underline{V}-b)}$$

$$+ \frac{A_3 + C_3 e^{-\frac{kT}{Tc}}(1 + k\frac{T}{Tc})}{2(\underline{V}-b)^2} + \frac{A_4}{3(\underline{V}-b)^3}$$

$$+ \frac{A_5 + C_5 e^{-\frac{kT}{Tc}}(1 + \frac{kT}{Tc})}{4(\underline{V}-b)^4} + X \qquad (68)$$

where

$$X = H_{ref} - [\alpha T_{ref} + \frac{1}{2}\beta T_{ref}^2 + \frac{1}{3}\gamma T_{ref}^3 + \frac{1}{4}\delta T_{ref}^4 + P_{ref} \underline{V}_{ref}$$

$$+ \frac{A_2 + C_2 e^{-\frac{kT_{ref}}{Tc}}(1 + \frac{kT_{ref}}{Tc})}{(\underline{V}_{ref} - b)}$$

$$+ \frac{A_3 + C_3 e^{-\frac{kT_{ref}}{T_c}}\left(1 + \frac{kT_{ref}}{T_c}\right)}{2(\underline{V}_{ref} - b)^2} + \frac{A_4}{3(\underline{V}_{ref} - b)^3}$$

$$+ \frac{A_5 + C_5 e^{-\frac{kT_{ref}}{T_c}}\left(1 + \frac{kT_{ref}}{T_c}\right)}{4(\underline{V}_{ref} - b)^4} \qquad \text{(69 cont'd)}$$

Entropy of Vapor

The following fundamental relation expresses the effect of temperature and volume on entropy.

$$d\underline{S} = C_V \frac{dT}{T} + \left(\frac{dP}{dT}\right)_V d\underline{V}_T$$

Integrating the above equation between T and zero pressure and any given T and P or $\underline{V}$,

$$\underline{S} - \underline{S}_0 = \int_{T_0}^{T} C_V^* \frac{dT}{T} + \int_{\underline{V}^*}^{\underline{V}} \left[\frac{R}{\underline{V}-b} + \frac{B_2 - C_2 \frac{k}{T_c} e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^2}\right.$$

$$+ \frac{B_3 - C_3 \frac{k}{T_c} e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^3} + \left.\frac{B_5 - C_5 \frac{k}{T_c} e^{-\frac{kT}{T_c}}}{(\underline{V}-b)^5}\right] d\underline{V}_T \qquad (71)$$

or

$$\underline{S} - \underline{S}_0 = \int_{T_0}^{T} C_V^* \frac{dT}{T} + \left[R \, \ell n(\underline{V}-b) - \frac{B_2}{(\underline{V}-b)} - \frac{B_3}{2(\underline{V}-b)^2}\right.$$

$$- \frac{B_5}{4(\underline{V}-b)^4} + \left\{\frac{C_2}{(\underline{V}-b)} + \frac{C_3}{2(\underline{V}-b)^2} + \frac{C_5}{4(\underline{V}-b)^4}\right\} \frac{k}{T_c} e^{-\frac{kT}{T_c}} \left.\right]_{\underline{V}_0}^{\underline{V}} \qquad (72)$$

From the relation that

$$\Delta \underline{S} = (\underline{S_2} - \underline{S_o}) - (\underline{S_1} - \underline{S_o}) \tag{73}$$

$$\Delta \underline{S} = \int_{T_1}^{T_2} C_v^* \frac{dT}{T} + [R\ell n(\underline{V}-b) - \frac{B_2}{\underline{V}-b} - \frac{B_3}{2(\underline{V}-b)^2}$$

$$- \frac{B_5}{4(\underline{V}-b)^4} + \frac{k}{T_c} e^{-\frac{kT}{T_c}} \{\frac{C_2}{\underline{V}-b} + \frac{C_3}{2(\underline{V}-b)^2} + \frac{C_5}{4(\underline{V}-b)^4}\}]_{\underline{V_1},T_1}^{\underline{V_2},T_2} \tag{74}$$

Similar to the case of enthalpy, by using the reference properties of P_1, $\underline{V_1}$, T_1 and $\underline{S_1}$ and dropping the subscript 2 for generalizing the properties,

$$S = \alpha \ell n\, T + \beta\, T + \frac{\gamma}{2}\, T^2 + \frac{\delta}{3}\, T^3 + R\, \ell n\, (\underline{V}-b)$$

$$- \frac{B_2}{(\underline{V}-b)} - \frac{B_3}{2(\underline{V}-b)^2} - \frac{B_5}{4(\underline{V}-b)^4}$$

$$+ \frac{k}{T_c} e^{-\frac{kT}{T_c}} [\frac{C_2}{(\underline{V}-b)} + \frac{C_3}{2(\underline{V}-b)^2} + \frac{C_5}{4(\underline{V}-b)^4}] + Y \tag{75}$$

where

$$Y = S_{ref} - [\alpha\, \ell n\, T_{ref} + \beta\, T_{ref} + \frac{\gamma}{2}\, T_{ref}^2 + \frac{\delta}{3}\, T_{ref}^3$$

$$+ R\, \ell n\, (\underline{V}_{ref} - b) - \frac{B_2}{(\underline{V}_{ref} - b)} - \frac{B_3}{2(\underline{V}_{ref} - b)^2}$$

$$\tag{76}$$

$$- \frac{B_5}{4(\underline{V}_{ref}-b)^4} + \frac{k}{T_c} e^{-\frac{kT}{T_c}} \{\frac{C_2}{(\underline{V}_{ref}-b)} + \frac{C_3}{2(\underline{V}_{ref}-b)^2} + \frac{C_5}{4(\underline{V}_{ref}-b)^4}\}]$$

The method of calculation of these tables is summarized below.

Saturation Temperature Table

(i)   Saturation pressure was obtained by substituting the value of

temperature (°R) in the vapor pressure equation (Equation 33).

(ii)   The volume of saturated vapor was obtained by substituting the

values of pressure and temperature and solving the P-V-T equa-

tion (Equation 35), by trial and error using Newton's iteration

method. The density of the vapor is the reciprocal of the vapor

density.

(iii)   The saturated liquid specific volume was computed from Equation

(34) and Equation (52). The liquid density was obtained directly

from Equation (34).

(iv)   The latent heat ($\Delta \underline{H}^V$) was calculated from Equation (43) and

Equation (53).

(v)   The value of X from Equation (69) was computed from the known

reference condition of the enthalpy at $T_{ref} = 180°R$. The value

of $\underline{H}$ for the saturated vapor was then computed from Equation (68).

(vi)   The liquid enthalpy was determined by subtracting the latent heat

of vaporization from the vapor enthalpy.

(vii)   The value of Y was calculated from Equation (76) from the known

reference conditions and the entropy of vapor was then computed

from Equation (75).

(viii) The entropy of liquid was determined by subtracting the entropy

of vaporization, which has a value of $\Delta \underline{H}^V/T$, from the entropy of

vapor.

Saturation Pressure Table

(i)   Saturation temperature was obtained by substituting the value of

pressure and solving the vapor pressure equation (Equation 33)

by trial and error using Newton's iteration method.

The method of calculating the remaining properties is the same

as (ii) to (viii) mentioned above.

Superheated Vapor

The properties are presented in Table VI as functions of P and T

for about 300°F degree of superheat at each of the pressures. The pres-

sure intervals have been so chosen as to have maximum utility for practi-

cal applications.

(i)   The volume of the gas was computed by substituting the values

of pressure and temperature and solving the P-V-T equation

(Equation 35) by trial and error using Newton's iteration

method.

(ii)   The value of enthalpy was computed in the same manner as de-

scribed for the saturation properties.

(iii)   The value of entropy was similarly computed by the same method

as described for the saturation properties.

Figure 11 presents the pressure-enthalpy diagram summarizing the

results of the tables presented for the saturation vapor and liquid and

for the superheated vapor region. Constant temperature, volume and en-

tropy lines are presented for the convenience of design and operation of

refrigerating equipment using this compound.
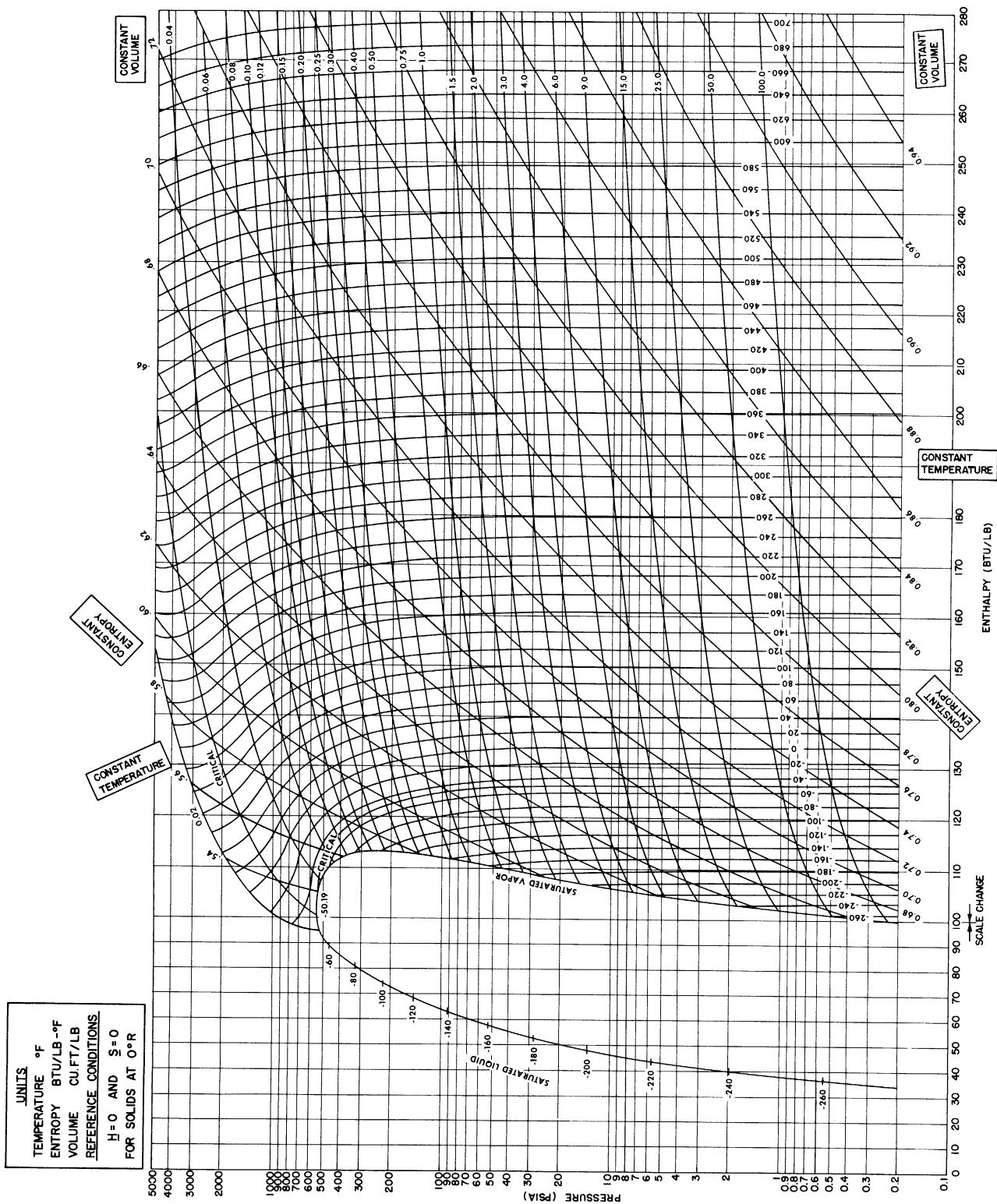
Figure 11. Pressure-Enthalpy Diagram for Carbon Tetrafluoride.

APPENDIX A

TABLES OF THERMODYNAMIC PROPERTIES

TABLE IV

SATURATION TEMPERATURE TABLE

Units

Gage Pressure	Inches of mercury vacuum up to 14.696 psia and psig above that pressure
Liquid Specific Volume Gas Specific Volume	Cu. ft./lb.
Liquid Density Gas Density	lb./cu.ft.
Liquid Enthalpy Latent Heat Gas Enthalpy	Btu/lb.
Liquid Entropy Gas Entropy	Btu/(lb)(°F)

TABLE IV

TEMP DEG F	PRESSURE PSIA	PRESSURE GAGE	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY
-270.											
-269.											
-268.											
-267.											
-266.											
-265.											
-264.											
-263.											
-262.											
-261.											
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-225.											
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-223.											
-222.											
-221.											
-220.											
-219.											
-218.											
-217.											
-216.											

TABLE IV (CONT'D)

TEMP DEG F	PRESSURE PSIA	GAGE	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY
-215	7.2372										
-214	7.5744										
-213	7.9239										
-212	8.2862										
-211	8.6616										
-210	9.0503										
-209	9.4528										
-208	9.8692										
-207	10.300										
-206	10.746										
-205	11.206										
-204	11.682										
-203	12.174										
-202	12.682										
-201	13.207										
-200	13.748										
-199	14.306										
-198	14.882										
-197	15.476										
-196	16.086										
-195	16.719										
-194	17.370										
-193	18.039										
-192	18.726										
-191	19.438										
-190	20.168										
-189	20.919										
-188	21.692										
-187	22.486										
-186	23.303										
-185	24.142										
-184	25.006										
-183	25.869										
-182	26.796										
-181	27.732										
-180	28.696										
-179	29.613										
-178	30.662										
-177	31.716										
-176	32.777										
-175	33.864										
-174	34.975										
-173	36.121										
-172	37.290										
-171	38.489										
-170	39.716										
-169	40.972										
-168	42.256										
-167	43.574										
-166	44.921										
-165	46.298										
-164	47.707										
-163	49.149										
-162	50.621										
-161	52.126										
-160	53.665										
-159	55.237										
-158	56.843										
-157	58.484										
-156	60.160										

TABLE IV (CONT'D)

TEMP DEG F	PRESSURE PSIA	PRESSURE GAGE	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY

TABLE IV (CONT'D)

TEMP DEG F	PRESSURE PSIA	PRESSURE GAGE	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY

TABLE V

SATURATION PRESSURE TABLE

Units

Gage Pressure	Inches of mercury vacuum up to 14.696 psia and psig above that pressure
Liquid Specific Volume Gas Specific Volume	cu.ft./lb.
Liquid Density Gas Density	lb./cu.ft.
Liquid Enthalpy Latent Heat Gas Enthalpy	Btu/lb.
Liquid Entropy Gas Entropy	Btu/(lb)(°F)

TABLE V

PRESSURE PSIA	PRESSURE GAGE	TEMP DEG F	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY
0.22	29.47200	-271.67	0.008711	104.904	114.798	0.009407	34.2431	65.858	100.1016	0.3176	0.6679
0.24	29.43136	-270.62	0.008724	95.944	114.629	0.010423	34.4321	65.769	100.2016	0.3186	0.6665
0.26	29.39064	-269.63	0.008736	89.022	114.468	0.011233	34.6106	65.685	100.2960	0.3196	0.6652
0.28	29.34992	-268.70	0.008748	83.059	114.317	0.012040	34.7784	65.606	100.3848	0.3205	0.6640
0.30	29.30920	-267.84	0.008756	77.365	114.178	0.012843	34.9340	65.533	100.4671	0.3213	0.6629
0.32	29.26848	-267.01	0.008763	73.308	114.043	0.013641	35.0842	65.462	100.5466	0.3221	0.6618
0.34	29.22776	-266.24	0.008778	69.264	113.917	0.014437	35.2238	65.397	100.6204	0.3228	0.6608
0.36	29.18704	-265.50	0.008768	65.643	113.796	0.015229	35.3582	65.333	100.6915	0.3235	0.6599
0.38	29.14632	-264.79	0.008787	62.433	113.680	0.016018	35.4872	65.273	100.7598	0.3241	0.6590
0.40	29.10560	-264.10	0.008805	59.508	113.571	0.016805	35.6092	65.215	100.8243	0.3248	0.6582
0.42	29.06488	-263.47	0.008813	56.858	113.464	0.017588	35.7274	65.159	100.8860	0.3254	0.6574
0.44	29.02416	-262.85	0.008821	54.441	113.362	0.018368	35.8407	65.106	100.9467	0.3259	0.6567
0.46	28.98344	-262.25	0.008829	52.229	113.264	0.019146	35.9502	65.054	101.0046	0.3265	0.6560
0.48	28.94272	-261.68	0.008836	50.194	113.170	0.019923	36.0543	65.005	101.0596	0.3270	0.6553
0.50	28.90200	-261.12	0.008843	48.319	113.078	0.020696	36.1571	64.957	101.1138	0.3275	0.6547
0.52	28.86128	-260.58	0.008850	46.583	112.989	0.021467	36.2561	64.910	101.1650	0.3280	0.6540
0.54	28.82056	-260.06	0.008857	44.977	112.903	0.022236	36.3514	64.855	101.2164	0.3285	0.6534
0.56	28.77984	-259.56	0.008864	43.471	112.821	0.023004	36.4433	64.821	101.2648	0.3290	0.6529
0.58	28.73912	-259.07	0.008870	42.072	112.740	0.023769	36.5334	64.779	101.3123	0.3294	0.6523
0.60	28.69840	-258.59	0.008876	40.764	112.660	0.024532	36.6217	64.737	101.3589	0.3299	0.6518
0.65	28.59660	-257.46	0.008891	37.833	112.473	0.026432	36.8300	64.639	101.4686	0.3309	0.6505
0.70	28.49480	-256.40	0.008905	35.299	112.297	0.028322	37.0259	64.546	101.5717	0.3319	0.6494
0.75	28.39300	-255.40	0.008918	33.111	112.130	0.030201	37.2111	64.458	101.6690	0.3328	0.6483
0.80	28.29120	-254.46	0.008931	31.179	111.973	0.032072	37.3857	64.375	101.7606	0.3336	0.6473
0.85	28.18940	-253.56	0.008943	29.459	111.823	0.033934	37.5532	64.295	101.8484	0.3344	0.6464
0.90	28.08760	-252.71	0.008954	27.942	111.681	0.035788	37.7115	64.220	101.9314	0.3352	0.6455
0.95	27.98580	-251.89	0.008965	26.572	111.543	0.037634	37.8646	64.147	102.0116	0.3359	0.6446
1.00	27.88400	-251.11	0.008976	25.334	111.412	0.039473	38.0108	64.077	102.0878	0.3366	0.6439
1.05	27.78220	-250.36	0.008986	24.216	111.286	0.041300	38.1511	64.010	102.1613	0.3373	0.6431
1.10	27.68040	-249.65	0.008996	23.166	111.166	0.043135	38.2846	63.946	102.2308	0.3379	0.6424
1.15	27.57860	-248.96	0.009005	22.242	111.050	0.044945	38.4145	63.864	102.2984	0.3386	0.6417
1.20	27.47680	-248.29	0.009014	21.337	110.937	0.046676	38.5408	63.822	102.3641	0.3392	0.6411
1.25	27.37500	-247.64	0.009023	20.504	110.827	0.048857	38.6634	63.765	102.4279	0.3398	0.6405
1.30	27.27320	-247.02	0.009032	19.713	110.722	0.050037	38.7807	63.708	102.4888	0.3403	0.6399
1.35	27.17140	-246.42	0.009041	19.167	110.619	0.051717	38.8945	63.655	102.5477	0.3408	0.6393
1.40	27.06960	-245.83	0.009048	18.510	110.516	0.053396	39.0063	63.599	102.6056	0.3414	0.6387
1.45	26.96780	-245.27	0.009056	17.861	110.424	0.055775	39.1129	63.548	102.6607	0.3418	0.6382
1.50	26.86600	-244.71	0.009064	17.310	110.329	0.057753	39.2194	63.605	102.7157	0.3424	0.6377
1.60	26.66240	-243.65	0.009072	16.372	110.143	0.061109	39.4216	63.398	102.8200	0.3433	0.6367
1.70	26.45880	-242.65	0.009095	15.741	109.977	0.063462	39.6131	63.305	102.9184	0.3442	0.6358
1.80	26.25520	-241.69	0.009106	14.549	109.812	0.066814	39.7593	63.216	103.0129	0.3450	0.6350
1.90	26.05160	-240.77	0.009120	13.572	109.654	0.071185	39.9741	63.129	103.1036	0.3458	0.6342
2.00	25.84800	-239.90	0.009132	13.034	109.505	0.075514	40.1419	63.047	103.1893	0.3466	0.6334
2.10	25.64440	-239.06	0.009144	12.195	109.360	0.078862	40.3046	62.967	103.2721	0.3473	0.6327
2.20	25.44080	-238.25	0.009156	12.1826	109.220	0.082008	40.4617	62.890	103.3520	0.3480	0.6320
2.30	25.23720	-237.47	0.009167	11.6625	109.035	0.085544	40.6133	62.816	103.4289	0.3487	0.6314
2.40	25.03360	-236.72	0.009178	11.2045	108.955	0.088984	40.7593	62.744	103.5029	0.3494	0.6308
2.50	24.83000	-235.99	0.009189	10.8714	108.826	0.092411	40.9018	62.673	103.5742	0.3500	0.6302
2.60	24.62640	-235.29	0.009199	10.4550	108.706	0.095683	41.0388	62.605	103.6430	0.3506	0.6296
2.70	24.42280	-234.61	0.009210	10.1763	108.588	0.099241	41.1723	62.539	103.7110	0.3512	0.6291
2.80	24.21920	-233.95	0.009219	9.7425	108.473	0.102644	41.3014	62.475	103.7762	0.3518	0.6285
2.90	24.01560	-233.31	0.009228	9.4377	108.361	0.106040	41.4281	62.411	103.8393	0.3523	0.6280
3.00	23.81200	-232.68	0.009238	9.1394	108.251	0.109420	41.5522	62.349	103.9015	0.3529	0.6276
3.10	23.60840	-232.08	0.009247	8.8657	108.145	0.112790	41.6711	62.290	103.9606	0.3534	0.6271
3.20	23.40480	-231.49	0.009256	8.6657	108.042	0.116160	41.7800	62.231	104.0188	0.3539	0.6266

TABLE V (CONT'D)

PRESSURE PSIA	PRESSURE GAGE	TEMP DEG F	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY
3.30	23.7012	-230.91	0.009264	8.3670	107.940	0.11952	41.9027	62.173	104.0761	0.3544	0.6262
3.40	22.9276	-230.35	0.009270	8.1308	107.841	0.12227	42.0139	62.117	104.1313	0.3549	0.6258
3.50	22.7040	-229.80	0.009281	7.9232	107.745	0.12621	42.1239	62.062	104.1855	0.3554	0.6254
3.60	22.5504	-229.25	0.009289	7.7192	107.649	0.12955	42.2324	62.006	104.2387	0.3559	0.6250
3.70	22.0866	-228.74	0.009297	7.5248	107.557	0.13288	42.3356	61.954	104.2900	0.3563	0.6246
3.80	21.1832	-228.22	0.009306	7.3424	107.465	0.13619	42.4398	61.902	104.3413	0.3568	0.6242
4.00	21.9796	-227.23	0.009316	7.1678	107.377	0.13951	42.5400	61.850	104.3905	0.3572	0.6238
4.20	21.7760	-226.?	0.009321	7.0017	107.290	0.14282	42.6393	61.800	104.4438	0.3576	0.6228
4.20	21.3688	-226.28	0.009335	6.5025	107.121	0.14942	42.8225	61.702	104.5325	0.3584	0.6228
4.40	21.0616	-225.36	0.009355	6.4124	106.958	0.15600	43.0159	61.607	104.6230	0.3592	0.6221
4.60	20.5544	-224.47	0.009363	6.1522	106.792	0.16255	43.1972	61.513	104.7106	0.3600	0.6215
4.80	20.1472	-223.62	0.009377	5.9143	106.647	0.16908	43.3695	61.425	104.7942	0.3607	0.6209
5.00	19.7400	-222.79	0.009400	5.6950	106.498	0.17559	43.5395	61.336	104.8758	0.3614	0.6204
5.20	19.3328	-221.99	0.009403	5.4920	106.354	0.18208	43.7077	61.252	104.9544	0.3621	0.6198
5.40	18.9256	-221.22	0.009415	5.3034	106.216	0.18856	43.8800	61.170	105.0300	0.3628	0.6193
5.60	18.5184	-220.46	0.009427	5.1280	106.079	0.19501	44.0168	61.088	105.1046	0.3634	0.6183
5.80	18.1112	-219.73	0.009430	4.9648	105.947	0.20145	44.1678	61.008	105.1761	0.3641	0.6179
6.00	17.7040	-219.02	0.009451	4.8126	105.819	0.20787	44.3148	60.931	105.2457	0.3647	0.6174
6.20	17.2968	-218.33	0.009463	4.6668	105.694	0.21428	44.4571	60.856	105.3133	0.3653	0.6170
6.40	16.8896	-217.65	0.009472	4.5317	105.576	0.22067	44.5986	60.781	105.3799	0.3659	0.6166
6.60	16.4824	-217.00	0.009480	4.4243	105.452	0.22705	44.7344	60.709	105.4433	0.3664	0.6162
6.80	16.0752	-216.35	0.009494	4.2843	105.334	0.23341	44.8796	60.636	105.5068	0.3670	0.6158
7.00	15.6680	-215.73	0.009504	4.1708	105.220	0.23976	44.9999	60.567	105.5674	0.3675	0.6154
7.20	15.2608	-215.11	0.009514	4.0635	105.107	0.24609	45.1293	60.498	105.6279	0.3680	0.6150
7.40	14.8536	-214.51	0.009524	3.9617	104.997	0.25242	45.2563	60.430	105.6864	0.3686	0.6147
7.60	14.4464	-213.92	0.009534	3.8650	104.891	0.25873	45.3784	60.364	105.7428	0.3690	0.6143
7.80	14.0392	-213.35	0.009543	3.7732	104.784	0.26503	45.5007	60.239	105.7993	0.3695	0.6143
8.00	13.6320	-212.79	0.009553	3.6854	104.682	0.27131	45.6101	60.236	105.8539	0.3700	0.6140
8.20	13.2248	-212.23	0.009562	3.6025	104.578	0.27758	45.7377	60.171	105.9083	0.3705	0.6137
8.40	12.8176	-211.69	0.009571	3.5229	104.481	0.28386	45.8536	60.107	105.9606	0.3710	0.6130
8.60	12.4104	-211.16	0.009580	3.4470	104.381	0.29011	45.9653	60.047	106.0121	0.3714	0.6177
8.80	12.0032	-210.64	0.009589	3.3743	104.285	0.29636	46.0771	59.935	106.0624	0.3719	0.6177
9.20	11.5960	-210.13	0.009590	3.3048	104.190	0.30259	46.1850	59.927	106.1119	0.3723	0.6124
9.40	11.1888	-209.62	0.009607	3.2382	104.096	0.30861	46.2954	59.866	106.1612	0.3727	0.6121
9.60	10.7816	-208.64	0.009615	3.1743	104.005	0.31503	46.3999	59.609	106.2086	0.3731	0.6118
9.80	10.3744	-207.69	0.009622	3.1130	103.914	0.32123	46.5053	59.751	106.2559	0.3736	0.6113
10.0	9.5672	-206.55	0.009633	3.0541	103.824	0.32743	46.6086	59.694	106.3023	0.3740	0.6113
10.5	9.566	-206.44	0.009644	2.9974	103.726	0.33847	46.7106	59.637	106.3475	0.3744	0.6110
11.0	8.542	-206.55	0.009660	2.8645	103.523	0.34905	46.9556	59.502	106.4574	0.3753	0.6104
11.5	7.524	-205.44	0.009672	2.7439	103.315	0.36444	47.1990	59.365	106.5630	0.3763	0.6098
12.0	6.506	-204.56	0.009684	2.6341	103.116	0.37978	47.4291	59.236	106.6656	0.3772	0.6092
12.5	5.488	-203.35	0.009716	2.5512	102.922	0.39507	47.6543	59.110	106.7641	0.3781	0.6081
13.0	4.470	-202.32	0.009734	2.4471	102.733	0.41042	47.8751	58.984	106.8595	0.3789	0.6081
13.5	3.452	-201.35	0.009751	2.3500	102.551	0.42553	48.0857	58.865	106.9510	0.3797	0.6076
14.0	2.434	-200.42	0.009768	2.2601	102.372	0.44072	48.2941	58.746	107.0403	0.3806	0.6072
14.336	0.0	-196.45	0.009765	2.1947	102.196	0.45585	48.4999	58.629	107.1265	0.3813	0.6067
14.5	0.358	-198.66	0.009815	2.1233	102.015	0.47097	48.6989	58.516	107.2096	0.3821	0.6063
15.0	0.204	-197.92	0.009627	2.0675	101.945	0.47760	48.7687	58.473	107.2418	0.3824	0.6061
15.5	0.604	-197.03	0.009617	2.0575	101.865	0.48860	48.8849	58.406	107.2900	0.3828	0.6058
16.0	0.604	-196.60	0.009833	1.9578	101.704	0.50113	49.0786	58.296	107.3699	0.3835	0.6054
16.5	1.204	-196.13	0.009648	1.8767	101.646	0.51411	49.2566	58.168	107.4460	0.3842	0.6050
17.0	2.204	-194.56	0.009863	1.8441	101.240	0.54460	49.4393	58.083	107.5219	0.3849	0.6046
17.5	2.304	-193.36	0.009872	1.7866	101.022	0.54460	49.6162	57.979	107.5948	0.3856	0.6043
18.0	2.604	-192.06	0.009906	1.7351	100.791	0.55610	49.7864	57.877	107.6656	0.3862	0.6039
18.5	3.204	-191.04	0.009926	1.6876	100.649	0.55908	49.9562	57.778	107.7345	0.3868	0.6035
19.0	4.304	-191.61	0.009930	1.6176	100.666	0.56356	50.1726	57.679	107.8023	0.3875	0.6032
19.5	4.004	-189.71	0.009947	1.6117	100.379	0.62053	50.4462	57.484	107.7336	0.3887	0.6025
20.0	5.004	-189.23	0.009961	1.5741	100.295	0.63553	50.6049	57.391	107.7963	0.3892	0.6022
20.5	6.004	-188.55	0.009974	1.5382	100.261	0.64601	50.7627	57.296	108.0588	0.3898	0.6019

TABLE V (CONT'D)

PRESSURE PSIA	PRESSURE GAGE	TEMP DEG F	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY

TABLE V (CONT'D)

PRESSURE PSIA	PRESSURE GAGE	TEMP DEG F	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY
72.0	57.304	-149.46	0.010897	0.447252	91.771	2.1389	60.7004	50.6773	111.3777	0.4237	0.5871
73.0	58.304	-148.95	0.010911	0.446127	91.754	2.1679	60.8367	50.5760	111.4127	0.4242	0.5869
74.0	59.304	-148.44	0.010925	0.455530	91.637	2.1964	60.9626	50.4832	111.4503	0.4245	0.5868
75.0	60.304	-147.94	0.010938	0.444893	91.621	2.2253	61.0956	50.3882	111.4640	0.4250	0.5866
76.0	61.304	-147.44	0.010952	0.443891	91.335	2.2547	61.2374	50.3261	111.5181	0.4254	0.5865
77.0	62.304	-146.94	0.010966	0.443790	91.189	2.2834	61.3601	50.2184	111.5632	0.4258	0.5863
78.0	63.304	-146.45	0.010980	0.443244	91.175	2.3125	61.4969	50.2900	111.5873	0.4263	0.5862
79.0	64.304	-145.97	0.010995	0.442714	90.364	2.3412	61.6192	50.1002	111.6310	0.4266	0.5860
80.0	65.304	-145.48	0.011007	0.442193	90.840	2.3701	61.7485	50.0904	111.6560	0.4270	0.5859
81.0	56.304	-145.01	0.011021	0.441682	90.739	2.3991	61.8747	49.9817	111.6666	0.4274	0.5858
82.0	67.304	-144.54	0.011034	0.441184	90.628	2.4281	62.0000	49.9718	111.7180	0.4278	0.5856
83.0	68.304	-144.07	0.011048	0.440697	90.518	2.4572	62.1261	49.9623	111.7495	0.4282	0.5854
84.0	69.304	-143.60	0.011061	0.440221	90.407	2.4863	62.2525	49.5525	111.7810	0.4286	0.5853
85.0	70.304	-143.14	0.011074	0.439766	90.298	2.5153	62.3750	49.8436	111.8116	0.4290	0.5852
86.0	71.304	-142.68	0.011088	0.439301	90.193	2.5445	62.4977	49.2446	111.8408	0.4294	0.5850
87.0	72.304	-142.24	0.011101	0.438856	90.086	2.5736	62.6183	49.2542	111.8701	0.4297	0.5849
88.0	73.304	-141.79	0.011114	0.438421	89.977	2.6027	62.7395	49.1600	111.8994	0.4301	0.5848
89.0	74.304	-141.34	0.011127	0.437965	89.870	2.6319	62.8613	49.0667	111.9247	0.4305	0.5846
90.0	75.304	-140.90	0.011140	0.437579	89.765	2.6611	62.9793	48.9676	111.9571	0.4308	0.5845
91.0	76.304	-140.46	0.011153	0.437170	89.659	2.6903	63.0906	48.8864	111.9851	0.4312	0.5844
92.0	77.304	-140.03	0.011166	0.436771	89.556	2.7195	63.2153	48.7977	112.0123	0.4316	0.5842
93.0	78.304	-139.60	0.011179	0.436379	89.452	2.7488	63.3326	48.7707	112.0392	0.4320	0.5841
94.0	79.304	-139.17	0.011192	0.435996	89.349	2.7781	63.4400	48.6617	112.0668	0.4323	0.5840
95.0	80.304	-138.75	0.011205	0.435620	89.247	2.8074	63.5626	48.5520	112.0924	0.4327	0.5839
96.0	81.304	-138.33	0.011218	0.435252	89.145	2.8367	63.6775	48.4441	112.1185	0.4330	0.5837
97.0	82.304	-137.91	0.011231	0.434691	89.043	2.8661	63.7920	48.3752	112.1644	0.4334	0.5836
98.0	83.304	-137.50	0.011243	0.434537	88.943	2.8954	63.9030	48.2665	112.1693	0.4337	0.5835
99.0	84.304	-137.09	0.011256	0.434190	88.843	2.9248	64.0157	48.4176	112.0682	0.4340	0.5834
100.0	85.30	-136.68	0.011268	0.433849	88.743	2.9543	64.1784	48.0091	112.2180	0.4344	0.5832
102.0	87.30	-135.87	0.011294	0.433187	88.544	3.0132	64.3504	47.8911	112.2675	0.4351	0.5830
104.0	89.30	-135.07	0.011319	0.432550	88.347	3.0722	64.5692	47.7446	112.3150	0.4357	0.5828
106.0	91.30	-134.29	0.011344	0.431935	88.154	3.1314	64.7842	47.5576	112.3602	0.4364	0.5826
108.0	93.30	-133.51	0.011369	0.431342	87.960	3.1906	64.9902	47.4406	112.4053	0.4370	0.5823
110.0	95.30	-132.75	0.011393	0.430770	87.770	3.2499	65.2087	47.2401	112.4488	0.4376	0.5821
112.0	97.30	-132.00	0.011418	0.430217	87.582	3.3094	65.4184	47.2074	112.2180	0.4383	0.5819
114.0	99.30	-131.25	0.011443	0.429682	87.393	3.3690	65.6252	46.8904	112.5316	0.4389	0.5817
116.0	101.30	-130.52	0.011467	0.429165	87.208	3.4288	65.8283	46.7743	112.5710	0.4395	0.5815
118.0	103.30	-129.80	0.011491	0.428666	87.027	3.4886	66.0414	46.4570	112.4974	0.4401	0.5813
120.0	105.30	-129.07	0.011516	0.428181	86.838	3.5485	66.2319	46.4417	112.6487	0.4407	0.5811
122.0	107.30	-128.37	0.011539	0.427703	86.650	3.6097	66.4404	46.2427	112.6820	0.4413	0.5809
124.0	109.30	-127.67	0.011564	0.427250	86.479	3.6697	66.6340	46.0804	112.7184	0.4419	0.5807
126.0	111.30	-126.97	0.011588	0.426811	86.308	3.7298	66.8275	45.8927	112.7748	0.4424	0.5805
128.0	113.30	-126.29	0.011612	0.426364	86.121	3.7902	67.0175	45.7771	112.7885	0.4430	0.5803
130.0	115.30	-125.61	0.011636	0.425970	85.943	3.8506	67.2070	45.6614	112.8226	0.4436	0.5801
132.0	117.30	-124.95	0.011659	0.425447	85.791	3.9113	67.3929	45.4441	112.8630	0.4441	0.5799
134.0	119.30	-124.28	0.011683	0.425176	85.594	3.9720	67.5807	45.3305	112.8845	0.4446	0.5797
136.0	121.30	-123.63	0.011707	0.424795	85.422	4.0331	67.7660	45.1502	112.9164	0.4452	0.5795
138.0	123.30	-122.98	0.011730	0.424624	85.250	4.0942	67.9485	44.9908	112.9665	0.4457	0.5794
140.0	125.30	-122.34	0.011754	0.424464	85.250	4.1556	68.1513	44.8944	113.0750	0.4462	0.5792
142.0	127.30	-121.71	0.011777	0.423703	84.911	4.2171	68.3113	44.6901	113.0025	0.4468	0.5790
144.0	129.30	-121.08	0.011801	0.423371	84.741	4.2788	68.5016	44.5336	113.0297	0.4472	0.5789
146.0	131.30	-120.46	0.011824	0.423038	84.650	4.3407	68.6603	44.3817	113.0550	0.4478	0.5784
148.0	133.30	-119.84	0.011848	0.422703	84.404	4.4028	68.8481	44.2234	113.0817	0.4483	0.5782
150.0	135.30	-119.25	0.011871	0.422308	84.265	4.4647	69.0215	44.1494	113.1070	0.4488	0.5781
152.0	137.30	-118.63	0.011894	0.421989	84.076	4.5271	69.1956	43.9035	113.1304	0.4493	0.5780
154.0	139.30	-118.03	0.011917	0.421664	83.911	4.5897	69.3601	43.7785	113.1539	0.4498	0.5780
156.0	141.30	-117.44	0.011941	0.421236	83.748	4.6526	69.5407	43.6635	113.1766	0.4503	0.5778
158.0	143.30	-116.86	0.011964	0.420977	83.585	4.7152	69.7107	43.4488	113.1985	0.4508	0.5776
160.0	145.30	-116.27	0.011987	0.420628	83.423	4.6783	69.8796	43.3406	113.2104	0.4513	0.5776
162.0	147.30	-115.70	0.012010	0.420647	83.266	4.8410	70.0618	43.2198	113.2602	0.4517	0.5773

TABLE V (CONT'D)

PRESSURE PSIA	PRESSURE GAGE	TEMP DEG F	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY
164.0	149.30	-115.13	0.012033	0.20301	83.104	4.9341	70.2262	43.254	113.2603	0.14492	0.25771
166.0	151.30	-114.56	0.012056	0.20132	82.943	4.9672	70.3601	43.134	113.2708	0.14526	0.25770
168.0	153.30	-114.00	0.012079	0.19877	82.735	5.0350	70.5320	42.912	113.2902	0.14531	0.25768
170.0	155.30	-113.44	0.012103	0.19629	82.626	5.0945	70.6603	42.624	113.3187	0.14536	0.25767
172.0	157.30	-112.89	0.012126	0.19386	82.460	5.1584	70.5841	42.492	113.3247	0.14540	0.25765
174.0	159.30	-112.35	0.012149	0.19147	82.314	5.2228	71.0160	42.331	113.3514	0.14544	0.25762
176.0	161.30	-111.80	0.012172	0.18915	82.154	5.2868	71.1727	42.196	113.3600	0.14549	0.25760
178.0	163.30	-111.27	0.012195	0.18686	82.000	5.3516	71.3302	42.062	113.3924	0.14558	0.25758
180.0	165.30	-110.73	0.012218	0.18642	81.845	5.4165	71.4600	41.909	113.3948	0.14558	0.25756
182.0	167.30	-110.20	0.012241	0.18241	81.691	5.4822	71.6606	41.762	113.4172	0.14562	0.25757
184.0	169.30	-109.68	0.012264	0.18027	81.539	5.5472	71.8037	41.622	113.4257	0.14566	0.25756
186.0	171.30	-109.16	0.012287	0.17817	81.396	5.6126	71.9676	41.491	113.4399	0.14571	0.25754
188.0	173.30	-108.64	0.012310	0.17612	81.232	5.6776	72.1090	41.347	113.4523	0.14577	0.25753
190.0	175.30	-108.13	0.012333	0.17400	81.096	5.7442	72.2241	41.199	113.4626	0.14570	0.25751
192.0	177.30	-107.62	0.012357	0.17212	80.928	5.8069	72.4141	41.061	113.4755	0.14583	0.25750
194.0	179.30	-107.11	0.012380	0.17010	80.775	5.8758	72.5428	40.924	113.4876	0.14588	0.25748
196.0	181.30	-106.61	0.012403	0.16829	80.625	5.9421	72.7126	40.794	113.4981	0.14592	0.25747
198.0	183.30	-106.11	0.012426	0.16647	80.474	6.0080	72.8724	40.645	113.5165	0.14594	0.25746
200.0	185.30	-105.62	0.012449	0.16459	80.324	6.0761	73.0114	40.505	113.5265	0.14600	0.25744
202.0	187.30	-105.13	0.012473	0.16278	80.176	6.1433	73.1500	40.366	113.5352	0.14604	0.25743
204.0	189.30	-104.64	0.012496	0.16114	80.026	6.2096	73.3000	40.235	113.5564	0.14608	0.25741
206.0	191.30	-104.16	0.012519	0.15932	79.878	6.2747	73.4420	40.101	113.5636	0.14611	0.25740
208.0	193.30	-103.68	0.012542	0.15762	79.730	6.3444	73.5872	39.964	113.5716	0.14616	0.25738
210.0	195.30	-103.20	0.012566	0.15604	79.581	6.4127	73.7240	39.824	113.5677	0.14619	0.25737
212.0	197.30	-102.73	0.012589	0.15439	79.444	6.4800	73.8761	39.688	113.5638	0.14623	0.25736
214.0	199.30	-102.26	0.012612	0.15268	79.299	6.5494	74.0261	39.549	113.5691	0.14627	0.25724
216.0	201.30	-101.79	0.012636	0.15100	79.130	6.6186	74.1626	39.411	113.5765	0.14631	0.25721
218.0	203.30	-101.33	0.012659	0.14901	78.994	6.6876	74.3040	39.274	113.5788	0.14635	0.25731
220.0	205.30	-100.87	0.012683	0.14650	78.848	6.7563	74.4619	39.142	113.5838	0.14639	0.25730
222.0	207.30	-100.41	0.012706	0.14655	78.701	6.8259	74.5821	39.005	113.5877	0.14643	0.25729
224.0	209.30	-99.96	0.012730	0.14502	78.557	6.8956	74.7200	38.870	113.5906	0.14646	0.25727
226.0	211.30	-99.50	0.012754	0.14357	78.412	6.9652	74.8506	38.726	113.6040	0.14650	0.25725
228.0	213.30	-99.06	0.012777	0.14211	78.266	7.0358	75.0015	38.592	113.5963	0.14654	0.25724
230.0	215.30	-98.61	0.012801	0.14077	78.120	7.1063	75.1351	38.462	113.5943	0.14657	0.25722
232.0	217.30	-98.17	0.012824	0.13924	77.976	7.1767	75.2000	38.331	113.6000	0.14661	0.25721
234.0	219.30	-97.73	0.012848	0.13797	77.832	7.2480	75.4061	38.196	113.5766	0.14664	0.25720
236.0	221.30	-97.29	0.012872	0.13661	77.687	7.3201	75.4457	38.055	113.5717	0.14668	0.25719
238.0	223.30	-96.85	0.012896	0.13520	77.541	7.3915	75.5800	37.920	113.5841	0.14672	0.25711
240.0	225.30	-96.42	0.012920	0.13777	77.398	7.4627	75.8116	37.781	113.5905	0.14675	0.25710
242.0	227.30	-95.99	0.012944	0.13271	77.254	7.5352	75.9466	37.651	113.5800	0.14679	0.25709
244.0	229.30	-95.57	0.012968	0.13145	77.113	7.6052	76.0000	37.521	113.5984	0.14683	0.25708
246.0	231.30	-95.14	0.012992	0.13026	76.969	7.6805	76.2126	37.384	113.5068	0.14687	0.25706
248.0	233.30	-94.72	0.013016	0.12907	76.826	7.7537	76.3451	37.240	113.5717	0.14691	0.25705
250.0	235.30	-94.30	0.013041	0.12777	76.683	7.8266	76.4747	37.117	113.5841	0.14694	0.25703
252.0	237.30	-93.88	0.013065	0.12658	76.539	7.9001	76.4300	36.982	113.5895	0.14698	0.25700
254.0	239.30	-93.47	0.013089	0.12541	76.398	7.9729	76.7040	36.851	113.6557	0.14700	0.25704
256.0	241.30	-93.06	0.013114	0.11870	76.256	8.0489	76.8477	36.712	113.5984	0.14702	0.25712
258.0	243.30	-92.65	0.013138	0.11763	76.113	8.1228	77.0057	36.583	113.5766	0.14705	0.25711
260.0	245.30	-92.24	0.013163	0.11660	75.970	8.1991	77.1257	36.444	113.5717	0.14710	0.25709
262.0	247.30	-91.84	0.013187	0.11557	75.830	8.2734	77.2535	36.312	113.5622	0.14712	0.25700
264.0	249.30	-91.43	0.013213	0.11456	75.685	8.3486	77.3822	36.179	113.5610	0.14717	0.25699
266.0	251.30	-91.03	0.013237	0.11354	75.543	8.4246	77.5200	36.044	113.5646	0.14700	0.25704
268.0	253.30	-90.64	0.013262	0.11763	75.404	8.5012	77.6374	35.909	113.5944	0.14705	0.25705
270.0	255.30	-90.24	0.013287	0.11660	75.261	8.5763	77.7631	35.781	113.5766	0.14716	0.25702
272.0	257.30	-89.85	0.013313	0.11557	75.120	8.6528	77.8842	35.650	113.5415	0.14721	0.25700
274.0	259.30	-89.45	0.013338	0.11456	74.975	8.7298	78.0114	35.516	113.5340	0.14723	0.25694
276.0	261.30	-89.06	0.013363	0.11354	74.833	8.8075	78.1375	35.381	113.5271	0.14726	0.25692
278.0	263.30	-88.68	0.013388	0.11254	74.694	8.8857	78.3623	35.244	113.5184	0.14733	0.25690
280.0	265.30	-88.29	0.013414	0.11155	74.551	8.9646	78.3800	35.100	113.4680	0.14742	0.25690
282.0	267.30	-87.91	0.013439	0.11058	74.411	9.0432	78.5136	34.975	113.4848	0.14746	0.25687

TABLE V (CONT'D)

PRESSURE PSIA	PRESSURE GAGE	TEMP DEG F	LIQUID SP VOL	GAS SP VOL	LIQUID DENSITY	GAS DENSITY	LIQUID ENTHALPY	LATENT HEAT	GAS ENTHALPY	LIQUID ENTROPY	GAS ENTROPY
284.0	269.30	-87.53	0.013465	0.10962	74.269	9.1224	78.6389	34.840	113.4782	0.4749	0.5806
286.0	271.30	-87.15	0.013490	0.10869	74.127	9.2005	78.7577	34.711	113.4692	0.4752	0.5804
288.0	273.30	-86.77	0.013516	0.10775	73.985	9.2807	78.4831	34.676	113.4578	0.4766	0.5803
290.0	275.30	-86.40	0.013542	0.10682	73.845	9.3615	79.0070	34.438	113.4449	0.4759	0.5801
292.0	277.30	-86.02	0.013568	0.10592	73.701	9.4411	79.1280	34.307	113.4222	0.4762	0.5800
294.0	279.30	-85.65	0.013594	0.10502	73.559	9.5220	79.2500	34.172	113.4104	0.4765	0.5808
296.0	281.30	-85.28	0.013621	0.10414	73.417	9.6025	79.3608	34.041	114.3972	0.4768	0.5807
298.0	283.30	-84.91	0.013647	0.10326	73.274	9.6843	79.4920	33.905	114.3826	0.4771	0.5806
300.0	285.30	-84.55	0.013673	0.10239	73.135	9.7666	79.6124	33.770	113.3826	0.4774	0.5804
305.0	290.30	-83.64	0.013740	0.10025	72.778	9.9751	79.9100	33.426	113.3441	0.4782	0.5801
310.0	295.30	-82.75	0.013808	0.09821	72.424	10.1823	80.2100	33.007	113.2084	0.4789	0.5807
315.0	300.30	-81.86	0.013876	0.09626	72.066	10.3950	80.5110	32.756	113.2660	0.4797	0.5805
320.0	305.30	-80.99	0.013945	0.09426	71.708	10.6090	80.8026	32.426	113.2234	0.4804	0.5805
325.0	310.30	-80.13	0.014015	0.09233	71.350	10.8207	81.1066	32.066	113.1718	0.4812	0.5807
330.0	315.30	-79.27	0.014087	0.09047	70.987	11.0534	81.4045	31.716	113.1200	0.4820	0.5803
335.0	320.30	-78.43	0.014159	0.08867	70.627	11.2778	81.6957	31.372	113.0674	0.4827	0.5806
340.0	325.30	-77.60	0.014232	0.08691	70.265	11.5062	81.9873	31.023	113.0105	0.4834	0.5805
345.0	330.30	-76.78	0.014306	0.08519	69.901	11.7385	82.2748	30.671	112.9498	0.4841	0.5803
350.0	335.30	-75.96	0.014382	0.08351	69.532	11.9746	82.5716	30.315	112.8870	0.4849	0.5807
355.0	340.30	-75.16	0.014458	0.08187	69.165	12.2146	82.8476	29.948	112.8198	0.4856	0.5805
360.0	345.30	-74.36	0.014537	0.08027	68.792	12.4580	83.1515	29.598	112.7508	0.4863	0.5805
365.0	350.30	-73.57	0.014616	0.07870	68.416	12.7045	83.4497	29.235	112.6776	0.4870	0.5807
370.0	355.30	-72.79	0.014698	0.07716	68.030	12.9601	83.7364	28.866	112.6000	0.4877	0.5806
375.0	360.30	-72.02	0.014780	0.07566	67.650	13.2170	84.0276	28.496	112.5100	0.4885	0.5804
380.0	365.30	-71.26	0.014864	0.07418	67.277	13.4807	84.3150	28.118	112.4242	0.4892	0.5810
385.0	370.30	-70.51	0.014950	0.07275	66.899	13.7657	84.6016	27.747	112.2481	0.4900	0.5810
390.0	375.30	-69.76	0.015038	0.07134	66.499	14.0174	84.8016	27.366	112.2577	0.4906	0.5808
395.0	380.30	-69.02	0.015128	0.06995	66.103	14.2959	85.1838	26.978	112.1620	0.4913	0.5806
400.0	385.30	-68.29	0.015220	0.06858	65.704	14.5815	85.4779	26.583	112.0609	0.4920	0.5809
405.0	390.30	-67.57	0.015314	0.06722	65.301	14.8765	85.7768	26.176	111.9524	0.4927	0.5805
410.0	395.30	-66.85	0.015411	0.06591	64.888	15.1722	86.0600	25.776	111.8446	0.4935	0.5801
415.0	400.30	-66.14	0.015511	0.06461	64.472	15.4775	86.3431	25.364	111.7316	0.4942	0.5806
420.0	405.30	-65.44	0.015613	0.06333	64.050	15.7903	86.6661	24.946	111.6123	0.4949	0.5802
425.0	410.30	-64.75	0.015717	0.06206	63.624	16.1126	86.9400	24.517	111.4864	0.4956	0.5807
430.0	415.30	-64.06	0.015826	0.06080	63.186	16.4474	87.2778	24.075	111.3525	0.4964	0.5807
435.0	420.30	-63.38	0.015938	0.05956	62.742	16.7808	87.5676	23.626	111.2140	0.4971	0.5806
440.0	425.30	-62.71	0.016054	0.05833	62.291	17.1408	87.9013	23.166	111.0677	0.4979	0.5808
445.0	430.30	-62.04	0.016174	0.05712	61.826	17.5130	88.2178	22.699	110.9170	0.4986	0.5807
450.0	435.30	-61.38	0.016299	0.05594	61.362	17.8763	88.5320	22.231	110.7623	0.4994	0.5805
455.0	440.30	-60.73	0.016428	0.05474	60.870	18.2682	88.8656	21.724	110.5950	0.5002	0.5804
460.0	445.30	-60.08	0.016565	0.05355	60.370	18.6741	89.1923	21.224	110.4173	0.5010	0.5801
465.0	450.30	-59.44	0.016706	0.05237	59.858	19.0949	89.4512	20.701	110.2318	0.5018	0.5807
470.0	455.30	-58.80	0.016856	0.05119	59.324	19.5361	89.8700	20.157	110.0358	0.5026	0.5809
475.0	460.30	-58.17	0.017014	0.05002	58.776	19.9920	90.1500	19.600	109.8200	0.5043	0.5808
480.0	465.30	-57.55	0.017179	0.04884	58.216	20.4750	90.5652	19.014	109.6023	0.5043	0.5806
485.0	470.30	-56.93	0.017357	0.04765	57.615	20.9864	90.9732	18.400	109.2738	0.5053	0.5801
490.0	475.30	-56.32	0.017545	0.04645	56.996	21.5285	91.3634	17.755	109.1199	0.5061	0.5801
495.0	480.30	-55.72	0.017746	0.04523	56.340	22.1792	91.7607	17.773	108.9432	0.5071	0.5804
500.0	485.30	-55.12	0.017967	0.04399	55.650	22.7324	92.1940	16.349	108.5454	0.5081	0.5803
505.0	490.30	-54.53	0.018206	0.04277	54.977	23.3682	92.6647	15.574	108.2190	0.5092	0.5802
510.0	495.30	-53.94	0.018474	0.04142	54.131	24.1429	93.1186	14.744	108.8620	0.5102	0.5806
515.0	500.30	-53.36	0.018773	0.04075	53.269	24.0649	93.6577	13.842	107.4733	0.5116	0.5806
520.0	505.30	-52.78	0.019120	0.03864	52.453	24.8799	94.1344	12.899	107.0120	0.5128	0.5804
525.0	510.30	-52.21	0.019529	0.03713	51.397	26.9374	94.7569	11.593	106.3452	0.5142	0.5802
530.0	515.30	-51.65	0.020032	0.03541	49.019	28.2406	95.4095	10.531	105.8454	0.5160	0.5803
535.0	520.30	-51.09	0.020721	0.03347	48.734	30.0412	96.2477	9.627	105.8104	0.5181	0.5800
540.0	525.30	-50.54	0.021866	0.03044	45.734	32.8507	97.4774	5.894	103.6573	0.5212	0.5806
543.16 (CRIT.)	528.46	-50.19	0.025602	0.02560	39.060	39.0600	100.6363	0.000	100.6363	0.5394	0.5396

TABLE VI

THERMODYNAMIC PROPERTIES OF SUPERHEATED VAPOR

Units

V	cu.ft./lb.
H	Btu/lb.
S	Btu/(lb)(°F)
P	Psia
Gage	Inches mercury vacuum up to 14.696 psia and psig above that pressure
Saturation Temperature	°F

TABLE VI

SAT	PRESSURE= GAGE= TEMP =	0.2 29.5128 -272.82			PRESSURE= GAGE= TEMP =	0.3 29.3092 -267.83	
T F°	V	H	S	T F°	V	H	S
-270.00	115.5343	100.2634	0.6709	-260.00	81.0579	101.2339	0.6668
-260.00	121.6393	101.2388	0.6759	-250.00	85.1297	102.2318	0.6716
-250.00	127.7435	102.2363	0.6808	-240.00	89.2008	103.2517	0.6764
-240.00	133.8468	103.2559	0.6856	-230.00	93.2712	104.2935	0.6810
-230.00	139.9495	104.2975	0.6902	-220.00	97.3411	105.3571	0.6856
-220.00	146.0516	105.3609	0.6947	-210.00	101.4105	106.4425	0.6900
-210.00	152.1533	106.4461	0.6992	-200.00	105.4795	107.5496	0.6943
-200.00	158.2544	107.5530	0.7035	-190.00	109.5481	108.6783	0.6986
-190.00	164.3553	108.6814	0.7078	-180.00	113.6164	109.8284	0.7028
-180.00	170.4557	109.8314	0.7120	-170.00	117.6843	110.9999	0.7069
-170.00	176.5559	111.0028	0.7161	-160.00	121.7520	112.1927	0.7110
-160.00	182.6559	112.1954	0.7201	-150.00	125.8195	113.4066	0.7149
-150.00	188.7556	113.4092	0.7241	-140.00	129.8868	114.6416	0.7189
-140.00	194.8550	114.6441	0.7280	-130.00	133.9538	115.8975	0.7227
-130.00	200.9543	115.9000	0.7319	-120.00	138.0207	117.1743	0.7266
-120.00	207.0535	117.1766	0.7357	-110.00	142.0875	118.4718	0.7303
-110.00	213.1524	118.4741	0.7395	-100.00	146.1541	119.7899	0.7340
-100.00	219.2513	119.7921	0.7432	-90.00	150.2206	121.1285	0.7377
-90.00	225.3500	121.1306	0.7469	-80.00	154.2870	122.4875	0.7413
-80.00	231.4486	122.4895	0.7505	-70.00	158.3532	123.8667	0.7449
-70.00	237.5471	123.8686	0.7541	-60.00	162.4194	125.2660	0.7485
-60.00	243.6455	125.2679	0.7576	-50.00	166.4855	126.6853	0.7520
-50.00	249.7438	126.6871	0.7611	-40.00	170.5515	128.1245	0.7554
-40.00	255.8420	128.1263	0.7646	-30.00	174.6174	129.5835	0.7589
-30.00	261.9402	129.5851	0.7680	-20.00	178.6833	131.0620	0.7623
-20.00	268.0383	131.0636	0.7714	-10.00	182.7491	132.5600	0.7656
-10.00	274.1363	132.5615	0.7748	0.	186.8148	134.0773	0.7690
0.	280.2342	134.0788	0.7781	10.00	190.8805	135.6138	0.7723
10.00	286.3321	135.6153	0.7814	20.00	194.9461	137.1694	0.7756
20.00	292.4300	137.1709	0.7847	30.00	199.0117	138.7440	0.7788
30.00	298.5278	138.7453	0.7880	40.00	203.0772	140.3372	0.7820

SAT	PRESSURE= GAGE= TEMP =	0.4 29.1056 -264.12			PRESSURE= GAGE= TEMP =	0.5 28.902 -261.12	
T F°	V	H	S	T F°	V	H	S
-260.00	60.7670	101.2291	0.6603	-260.00	48.5925	101.2242	0.6552
-250.00	63.8228	102.2273	0.6651	-250.00	51.0387	102.2227	0.6601
-240.00	66.8778	103.2474	0.6699	-240.00	53.4840	103.2431	0.6648
-230.00	69.9322	104.2895	0.6745	-230.00	55.9287	104.2855	0.6695
-220.00	72.9859	105.3533	0.6791	-220.00	58.3728	105.3496	0.6740
-210.00	76.0392	106.4390	0.6835	-210.00	60.8163	106.4354	0.6785
-200.00	79.0920	107.5462	0.6879	-200.00	63.2595	107.5428	0.6828
-190.00	82.1445	108.6750	0.6921	-190.00	65.7023	108.6718	0.6871
-180.00	85.1967	109.8253	0.6963	-180.00	68.1448	109.8223	0.6913
-170.00	88.2485	110.9970	0.7004	-170.00	70.5870	110.9941	0.6954
-160.00	91.3001	112.1899	0.7045	-160.00	73.0289	112.1871	0.6994
-150.00	94.3515	113.4040	0.7085	-150.00	75.4706	113.4013	0.7034
-140.00	97.4026	114.6391	0.7124	-140.00	77.9121	114.6366	0.7073
-130.00	100.4536	115.8951	0.7162	-130.00	80.3534	115.8927	0.7112
-120.00	103.5044	117.1720	0.7201	-120.00	82.7945	117.1697	0.7150
-110.00	106.5550	118.4696	0.7238	-110.00	85.2355	118.4674	0.7188
-100.00	109.6055	119.7878	0.7275	-100.00	87.6764	119.7857	0.7225
-90.00	112.6559	121.1265	0.7312	-90.00	90.1171	121.1244	0.7262
-80.00	115.7062	122.4855	0.7348	-80.00	92.5577	122.4835	0.7298
-70.00	118.7563	123.8648	0.7384	-70.00	94.9981	123.8629	0.7334
-60.00	121.8064	125.2642	0.7420	-60.00	97.4385	125.2623	0.7369
-50.00	124.8563	126.6836	0.7455	-50.00	99.8788	126.6818	0.7404
-40.00	127.9062	128.1228	0.7489	-40.00	102.3191	128.1211	0.7439
-30.00	130.9560	129.5818	0.7524	-30.00	104.7592	129.5801	0.7473
-20.00	134.0058	131.0604	0.7558	-20.00	107.1993	131.0588	0.7507
-10.00	137.0555	132.5584	0.7592	-10.00	109.6393	132.5569	0.7541
0.	140.1051	134.0758	0.7625	0.	112.0792	134.0743	0.7575
10.00	143.1546	135.6124	0.7658	10.00	114.5191	135.6109	0.7608
20.00	146.2041	137.1680	0.7691	20.00	116.9590	137.1666	0.7640
30.00	149.2536	138.7426	0.7723	30.00	119.3988	138.7412	0.7673
40.00	152.3030	140.3359	0.7755	40.00	121.8385	140.3346	0.7705

TABLE VI (CONT'D)

	PRESSURE=	0.6			PRESSURE=	0.7	
	GAGE=	28.6984			GAGE=	28.4948	
SAT	TEMP =	-258.59		SAT	TEMP =	-256.40	

T F°	V	H	S	T F°	V	H	S
-250.00	42.5159	102.2182	0.6560	-250.00	36.4279	102.2136	0.6525
-240.00	44.5548	103.2389	0.6607	-240.00	38.1765	103.2346	0.6572
-230.00	46.5930	104.2814	0.6654	-230.00	39.9247	104.2774	0.6619
-220.00	48.6307	105.3458	0.6699	-220.00	41.6720	105.3420	0.6664
-210.00	50.6679	106.4318	0.6743	-210.00	43.4189	106.4283	0.6708
-200.00	52.7045	107.5395	0.6787	-200.00	45.1653	107.5361	0.6752
-190.00	54.7409	108.6686	0.6830	-190.00	46.9113	108.6654	0.6795
-180.00	56.7769	109.8192	0.6871	-180.00	48.6570	109.8162	0.6837
-170.00	58.8127	110.9912	0.6913	-170.00	50.4024	110.9883	0.6878
-160.00	60.8482	112.1844	0.6953	-160.00	52.1476	112.1816	0.6918
-150.00	62.8834	113.3987	0.6993	-150.00	53.8925	113.3960	0.6958
-140.00	64.9185	114.6340	0.7032	-140.00	55.6373	114.6315	0.6997
-130.00	66.9533	115.8903	0.7071	-130.00	57.3818	115.8879	0.7036
-120.00	68.9880	117.1674	0.7109	-120.00	59.1262	117.1651	0.7074
-110.00	71.0225	118.4652	0.7147	-110.00	60.8704	118.4629	0.7112
-100.00	73.0569	119.7835	0.7184	-100.00	62.6145	119.7814	0.7149
-90.00	75.0912	121.1224	0.7221	-90.00	64.3584	121.1203	0.7186
-80.00	77.1253	122.4816	0.7257	-80.00	66.1022	122.4796	0.7222
-70.00	79.1594	123.8610	0.7293	-70.00	67.8460	123.8591	0.7258
-60.00	81.1933	125.2605	0.7328	-60.00	69.5896	125.2587	0.7293
-50.00	83.2272	126.6800	0.7363	-50.00	71.3331	126.6782	0.7328
-40.00	85.2610	128.1194	0.7398	-40.00	73.0766	128.1177	0.7363
-30.00	87.2947	129.5785	0.7432	-30.00	74.8200	129.5768	0.7397
-20.00	89.3283	131.0572	0.7466	-20.00	76.5633	131.0556	0.7432
-10.00	91.3618	132.5553	0.7500	-10.00	78.3065	132.5538	0.7465
0.	93.3953	134.0728	0.7533	0.	80.0497	134.0713	0.7499
10.00	95.4288	135.6095	0.7566	10.00	81.7928	135.6080	0.7532
20.00	97.4622	137.1652	0.7599	20.00	83.5359	137.1638	0.7564
30.00	99.4955	138.7398	0.7632	30.00	85.2789	138.7385	0.7597
40.00	101.5288	140.3332	0.7664	40.00	87.0219	140.3319	0.7629
50.00	103.5621	141.9453	0.7696	50.00	88.7649	141.9440	0.7661

	PRESSURE=	0.8			PRESSURE=	0.9	
	GAGE=	28.2912			GAGE=	28.0876	
SAT	TEMP =	-254.46		SAT	TEMP =	-252.71	

T F°	V	H	S	T F°	V	H	S
-250.00	31.8624	102.2091	0.6494	-250.00	28.3112	102.2045	0.6468
-240.00	33.3932	103.2304	0.6542	-240.00	29.6727	103.2261	0.6515
-230.00	34.9234	104.2734	0.6588	-230.00	31.0336	104.2694	0.6562
-220.00	36.4530	105.3382	0.6634	-220.00	32.3938	105.3345	0.6607
-210.00	37.9822	106.4247	0.6678	-210.00	33.7536	106.4211	0.6652
-200.00	39.5109	107.5327	0.6722	-200.00	35.1129	107.5293	0.6695
-190.00	41.0392	108.6622	0.6764	-190.00	36.4719	108.6590	0.6738
-180.00	42.5671	109.8132	0.6806	-180.00	37.8305	109.8101	0.6780
-170.00	44.0948	110.9854	0.6848	-170.00	39.1888	110.9825	0.6821
-160.00	45.6222	112.1788	0.6888	-160.00	40.5469	112.1761	0.6861
-150.00	47.1494	113.3934	0.6928	-150.00	41.9047	113.3908	0.6901
-140.00	48.6764	114.6290	0.6967	-140.00	43.2623	114.6264	0.6941
-130.00	50.2032	115.8855	0.7006	-130.00	44.6198	115.8830	0.6979
-120.00	51.7298	117.1627	0.7044	-120.00	45.9771	117.1604	0.7017
-110.00	53.2563	118.4607	0.7082	-110.00	47.3342	118.4585	0.7055
-100.00	54.7826	119.7792	0.7119	-100.00	48.6912	119.7771	0.7092
-90.00	56.3088	121.1182	0.7156	-90.00	50.0480	121.1162	0.7129
-80.00	57.8349	122.4776	0.7192	-80.00	51.4048	122.4756	0.7165
-70.00	59.3609	123.8572	0.7228	-70.00	52.7614	123.8552	0.7201
-60.00	60.8868	125.2568	0.7263	-60.00	54.1179	125.2550	0.7237
-50.00	62.4126	126.6765	0.7298	-50.00	55.4744	126.6747	0.7272
-40.00	63.9383	128.1159	0.7333	-40.00	56.8308	128.1142	0.7306
-30.00	65.4640	129.5752	0.7367	-30.00	58.1871	129.5735	0.7341
-20.00	66.9895	131.0540	0.7401	-20.00	59.5433	131.0523	0.7375
-10.00	68.5150	132.5522	0.7435	-10.00	60.8994	132.5507	0.7408
0.	70.0405	134.0698	0.7468	0.	62.2555	134.0683	0.7442
10.00	71.5659	135.6066	0.7501	10.00	63.6116	135.6051	0.7475
20.00	73.0912	137.1624	0.7534	20.00	64.9675	137.1610	0.7508
30.00	74.6165	138.7371	0.7567	30.00	66.3235	138.7357	0.7540
40.00	76.1417	140.3306	0.7599	40.00	67.6794	140.3293	0.7572
50.00	77.6669	141.9427	0.7631	50.00	69.0352	141.9414	0.7604

TABLE VI (CONT'D)

	PRESSURE=	1.			PRESSURE=	1.1	
	GAGE=	27.884			GAGE=	27.6804	
SAT	TEMP =	-251.11		SAT	TEMP =	-249.65	

T F°	V	H	S	T F°	V	H	S
-250.00	25.4702	102.1999	0.6444	-240.00	24.2610	103.2175	0.6470
-240.00	26.6963	103.2218	0.6491	-230.00	25.3755	104.2614	0.6516
-230.00	27.9216	104.2654	0.6538	-220.00	26.4895	105.3269	0.6562
-220.00	29.1464	105.3307	0.6583	-210.00	27.6029	106.4140	0.6606
-210.00	30.3707	106.4176	0.6628	-200.00	28.7160	107.5226	0.6650
-200.00	31.5946	107.5260	0.6671	-190.00	29.8286	108.6526	0.6692
-190.00	32.8181	108.6558	0.6714	-180.00	30.9409	109.8040	0.6734
-180.00	34.0412	109.8071	0.6756	-170.00	32.0529	110.9767	0.6775
-170.00	35.2640	110.9796	0.6797	-160.00	33.1645	112.1705	0.6816
-160.00	36.4866	112.1733	0.6838	-150.00	34.2761	113.3855	0.6856
-150.00	37.7090	113.3881	0.6877	-140.00	35.3874	114.6214	0.6895
-140.00	38.9311	114.6239	0.6917	-130.00	36.4985	115.8782	0.6934
-130.00	40.1531	115.8806	0.6955	-120.00	37.6094	117.1558	0.6972
-120.00	41.3749	117.1581	0.6994	-110.00	38.7202	118.4540	0.7010
-110.00	42.5965	118.4562	0.7031	-100.00	39.8309	119.7728	0.7047
-100.00	43.8180	119.7750	0.7068	-90.00	40.9414	121.1121	0.7084
-90.00	45.0394	121.1141	0.7105	-80.00	42.0518	122.4716	0.7120
-80.00	46.2607	122.4736	0.7141	-70.00	43.1621	123.8514	0.7156
-70.00	47.4818	123.8533	0.7177	-60.00	44.2724	125.2513	0.7191
-60.00	48.7029	125.2531	0.7213	-50.00	45.3825	126.6711	0.7226
-50.00	49.9238	126.6729	0.7248	-40.00	46.4925	128.1108	0.7261
-40.00	51.1447	128.1125	0.7283	-30.00	47.6025	129.5702	0.7295
-30.00	52.3655	129.5718	0.7317	-20.00	48.7124	131.0491	0.7329
-20.00	53.5863	131.0507	0.7351	-10.00	49.8222	132.5475	0.7363
-10.00	54.8069	132.5491	0.7385	0.	50.9320	134.0653	0.7397
0.	56.0276	134.0668	0.7418	10.00	52.0417	135.6022	0.7430
10.00	57.2481	135.6036	0.7451	20.00	53.1513	137.1581	0.7462
20.00	58.4686	137.1595	0.7484	30.00	54.2609	138.7330	0.7495
30.00	59.6891	138.7344	0.7516	40.00	55.3705	140.3266	0.7527
40.00	60.9095	140.3279	0.7549	50.00	56.4800	141.9388	0.7559
50.00	62.1298	141.9401	0.7581	60.00	57.5895	143.5695	0.7591

	PRESSURE=	1.2			PRESSURE=	1.4	
	GAGE=	27.4768			GAGE=	27.0696	
SAT	TEMP =	-248.29		SAT	TEMP =	-245.83	

T F°	V	H	S	T F°	V	H	S
-240.00	22.2316	103.2133	0.6450	-240.00	19.0426	103.2047	0.6415
-230.00	23.2538	104.2574	0.6497	-230.00	19.9196	104.2493	0.6462
-220.00	24.2754	105.3231	0.6542	-220.00	20.7960	105.3155	0.6507
-210.00	25.2964	106.4104	0.6586	-210.00	21.6719	106.4032	0.6551
-200.00	26.3171	107.5192	0.6630	-200.00	22.5474	107.5124	0.6595
-190.00	27.3373	108.6494	0.6673	-190.00	23.4225	108.6430	0.6638
-180.00	28.3573	109.8010	0.6715	-180.00	24.2973	109.7949	0.6680
-170.00	29.3769	110.9738	0.6756	-170.00	25.1718	110.9680	0.6721
-160.00	30.3963	112.1678	0.6796	-160.00	26.0460	112.1622	0.6761
-150.00	31.4153	113.3828	0.6836	-150.00	26.9200	113.3775	0.6801
-140.00	32.4343	114.6189	0.6875	-140.00	27.7936	114.6138	0.6841
-130.00	33.4530	115.8758	0.6914	-130.00	28.6672	115.8709	0.6879
-120.00	34.4716	117.1534	0.6952	-120.00	29.5407	117.1488	0.6917
-110.00	35.4900	118.4518	0.6990	-110.00	30.4139	118.4473	0.6955
-100.00	36.5083	119.7707	0.7027	-100.00	31.2871	119.7664	0.6992
-90.00	37.5264	121.1100	0.7064	-90.00	32.1601	121.1059	0.7029
-80.00	38.5445	122.4697	0.7100	-80.00	33.0329	122.4657	0.7065
-70.00	39.5624	123.8495	0.7136	-70.00	33.9057	123.8457	0.7101
-60.00	40.5803	125.2494	0.7172	-60.00	34.7784	125.2458	0.7137
-50.00	41.5980	126.6693	0.7207	-50.00	35.6510	126.6658	0.7172
-40.00	42.6157	128.1091	0.7241	-40.00	36.5235	128.1056	0.7207
-30.00	43.6333	129.5685	0.7276	-30.00	37.3959	129.5652	0.7241
-20.00	44.6508	131.0475	0.7310	-20.00	38.2683	131.0443	0.7275
-10.00	45.6682	132.5460	0.7343	-10.00	39.1406	132.5429	0.7309
0.	46.6856	134.0638	0.7377	0.	40.0128	134.0607	0.7342
10.00	47.7029	135.6007	0.7410	10.00	40.8850	135.5978	0.7375
20.00	48.7202	137.1567	0.7443	20.00	41.7571	137.1539	0.7408
30.00	49.7375	138.7316	0.7475	30.00	42.6292	138.7289	0.7440
40.00	50.7546	140.3253	0.7507	40.00	43.5012	140.3226	0.7473
50.00	51.7718	141.9375	0.7539	50.00	44.3732	141.9349	0.7505
60.00	52.7889	143.5683	0.7571	60.00	45.2451	143.5658	0.7536

TABLE VI (CONT'D)

	PRESSURE=	1.6				PRESSURE=	1.8	
	GAGE=	26.6624				GAGE=	26.2552	
SAT	TEMP =	-243.65			SAT	TEMP =	-241.69	
T F°	V	H	S		T F°	V	H	S
-240.00	16.6508	103.1961	0.6385		-240.00	14.7904	103.1875	0.6358
-230.00	17.4189	104.2413	0.6431		-230.00	15.4739	104.2332	0.6404
-220.00	18.1865	105.3079	0.6477		-220.00	16.1568	105.3004	0.6450
-210.00	18.9535	106.3961	0.6521		-210.00	16.8392	106.3889	0.6494
-200.00	19.7202	107.5057	0.6565		-200.00	17.5212	107.4989	0.6538
-190.00	20.4864	108.6366	0.6607		-190.00	18.2028	108.6301	0.6581
-180.00	21.2523	109.7888	0.6649		-180.00	18.8840	109.7827	0.6623
-170.00	22.0179	110.9622	0.6691		-170.00	19.5649	110.9564	0.6664
-160.00	22.7833	112.1567	0.6731		-160.00	20.2456	112.1512	0.6704
-150.00	23.5484	113.3723	0.6771		-150.00	20.9260	113.3670	0.6744
-140.00	24.3133	114.6088	0.6810		-140.00	21.6063	114.6037	0.6784
-130.00	25.0779	115.8661	0.6849		-130.00	22.2862	115.8612	0.6822
-120.00	25.8425	117.1441	0.6887		-120.00	22.9661	117.1395	0.6861
-110.00	26.6069	118.4429	0.6925		-110.00	23.6458	118.4384	0.6898
-100.00	27.3711	119.7621	0.6962		-100.00	24.3254	119.7578	0.6935
-90.00	28.1353	121.1018	0.6999		-90.00	25.0048	121.0976	0.6972
-80.00	28.8993	122.4617	0.7035		-80.00	25.6842	122.4577	0.7009
-70.00	29.6632	123.8419	0.7071		-70.00	26.3634	123.8380	0.7044
-60.00	30.4270	125.2421	0.7107		-60.00	27.0426	125.2384	0.7080
-50.00	31.1907	126.6622	0.7142		-50.00	27.7216	126.6586	0.7115
-40.00	31.9543	128.1022	0.7176		-40.00	28.4006	128.0987	0.7150
-30.00	32.7179	129.5619	0.7211		-30.00	29.0794	129.5585	0.7184
-20.00	33.4814	131.0411	0.7245		-20.00	29.7583	131.0379	0.7218
-10.00	34.2448	132.5398	0.7278		-10.00	30.4370	132.5366	0.7252
0.	35.0082	134.0577	0.7312		0.	31.1157	134.0547	0.7285
10.00	35.7715	135.5949	0.7345		10.00	31.7943	135.5920	0.7318
20.00	36.5347	137.1511	0.7378		20.00	32.4729	137.1482	0.7351
30.00	37.2979	138.7261	0.7410		30.00	33.1514	138.7234	0.7384
40.00	38.0611	140.3199	0.7442		40.00	33.8299	140.3173	0.7416
50.00	38.8242	141.9324	0.7474		50.00	34.5084	141.9298	0.7448
60.00	39.5873	143.5633	0.7506		60.00	35.1867	143.5607	0.7479

	PRESSURE=	2.				PRESSURE=	2.5	
	GAGE=	25.848				GAGE=	24.83	
SAT	TEMP =	-239.90			SAT	TEMP =	-235.99	
T F°	V	H	S		T F°	V	H	S
-230.00	13.9179	104.2251	0.6380		-230.00	11.1171	104.2049	0.6330
-220.00	14.5331	105.2928	0.6426		-220.00	11.6104	105.2737	0.6375
-210.00	15.1478	106.3817	0.6470		-210.00	12.1031	106.3638	0.6420
-200.00	15.7620	107.4921	0.6514		-200.00	12.5954	107.4751	0.6463
-190.00	16.3758	108.6237	0.6557		-190.00	13.0873	108.6076	0.6506
-180.00	16.9893	109.7765	0.6599		-180.00	13.5789	109.7612	0.6548
-170.00	17.6025	110.9505	0.6640		-170.00	14.0702	110.9360	0.6589
-160.00	18.2155	112.1456	0.6681		-160.00	14.5612	112.1317	0.6630
-150.00	18.8282	113.3617	0.6720		-150.00	15.0520	113.3484	0.6670
-140.00	19.4406	114.5986	0.6760		-140.00	15.5425	114.5860	0.6709
-130.00	20.0529	115.8564	0.6799		-130.00	16.0329	115.8443	0.6748
-120.00	20.6650	117.1348	0.6837		-120.00	16.5231	117.1232	0.6786
-110.00	21.2770	118.4339	0.6874		-110.00	17.0131	118.4228	0.6824
-100.00	21.8888	119.7535	0.6912		-100.00	17.5029	119.7428	0.6861
-90.00	22.5005	121.0935	0.6948		-90.00	17.9927	121.0832	0.6898
-80.00	23.1121	122.4538	0.6985		-80.00	18.4824	122.4438	0.6934
-70.00	23.7236	123.8342	0.7021		-70.00	18.9720	123.8246	0.6970
-60.00	24.3350	125.2347	0.7056		-60.00	19.4614	125.2254	0.7006
-50.00	24.9463	126.6551	0.7091		-50.00	19.9508	126.6462	0.7041
-40.00	25.5575	128.0953	0.7126		-40.00	20.4401	128.0867	0.7075
-30.00	26.1687	129.5552	0.7160		-30.00	20.9293	129.5469	0.7110
-20.00	26.7798	131.0347	0.7194		-20.00	21.4184	131.0266	0.7144
-10.00	27.3908	132.5335	0.7228		-10.00	21.9075	132.5257	0.7178
0.	28.0017	134.0517	0.7261		0.	22.3965	134.0442	0.7211
10.00	28.6126	135.5890	0.7294		10.00	22.8855	135.5817	0.7244
20.00	29.2234	137.1454	0.7327		20.00	23.3744	137.1383	0.7277
30.00	29.8342	138.7206	0.7360		30.00	23.8633	138.7138	0.7309
40.00	30.4450	140.3146	0.7392		40.00	24.3521	140.3079	0.7342
50.00	31.0557	141.9272	0.7424		50.00	24.8408	141.9207	0.7374
60.00	31.6663	143.5582	0.7456		60.00	25.3295	143.5520	0.7405
70.00	32.2769	145.2076	0.7487		70.00	25.8182	145.2015	0.7437

TABLE VI (CONT'D)

	PRESSURE=	3.			PRESSURE=	3.5	
	GAGE=	23.812			GAGE=	22.794	
SAT	TEMP =	-232.68		SAT	TEMP =	-229.80	

T F°	V	H	S	T F°	V	H	S
-230.00	9.2499	104.1846	0.6288	-220.00	8.2700	105.2355	0.6298
-220.00	9.6619	105.2546	0.6333	-210.00	8.6235	106.3277	0.6343
-210.00	10.0733	106.3458	0.6378	-200.00	8.9764	107.4410	0.6387
-200.00	10.4844	107.4581	0.6422	-190.00	9.3290	108.5753	0.6429
-190.00	10.8950	108.5915	0.6465	-180.00	9.6813	109.7306	0.6471
-180.00	11.3053	109.7459	0.6507	-170.00	10.0332	110.9068	0.6513
-170.00	11.7153	110.9214	0.6548	-160.00	10.3849	112.1039	0.6553
-160.00	12.1250	112.1178	0.6589	-150.00	10.7363	113.3219	0.6593
-150.00	12.5345	113.3351	0.6628	-140.00	11.0875	114.5606	0.6633
-140.00	12.9438	114.5733	0.6668	-130.00	11.4385	115.8200	0.6672
-130.00	13.3528	115.8321	0.6707	-120.00	11.7894	117.0999	0.6710
-120.00	13.7618	117.1116	0.6745	-110.00	12.1401	118.4004	0.6748
-110.00	14.1705	118.4116	0.6783	-100.00	12.4906	119.7213	0.6785
-100.00	14.5791	119.7321	0.6820	-90.00	12.8411	121.0626	0.6822
-90.00	14.9875	121.0728	0.6857	-80.00	13.1913	122.4239	0.6858
-80.00	15.3959	122.4339	0.6893	-70.00	13.5415	123.8054	0.6894
-70.00	15.8042	123.8150	0.6929	-60.00	13.8916	125.2069	0.6929
-60.00	16.2124	125.2162	0.6964	-50.00	14.2416	126.6283	0.6964
-50.00	16.6205	126.6372	0.6999	-40.00	14.5916	128.0695	0.6999
-40.00	17.0285	128.0781	0.7034	-30.00	14.9414	129.5302	0.7034
-30.00	17.4364	129.5386	0.7069	-20.00	15.2912	131.0105	0.7068
-20.00	17.8442	131.0186	0.7103	-10.00	15.6410	132.5102	0.7101
-10.00	18.2520	132.5180	0.7136	0.	15.9906	134.0291	0.7135
0.	18.6598	134.0366	0.7170	10.00	16.3402	135.5671	0.7168
10.00	19.0674	135.5744	0.7203	20.00	16.6898	137.1241	0.7201
20.00	19.4750	137.1312	0.7236	30.00	17.0393	138.7000	0.7233
30.00	19.8826	138.7069	0.7268	40.00	17.3887	140.2946	0.7265
40.00	20.2901	140.3013	0.7300	50.00	17.7382	141.9078	0.7297
50.00	20.6976	141.9143	0.7332	60.00	18.0875	143.5394	0.7329
60.00	21.1050	143.5457	0.7364	70.00	18.4369	145.1893	0.7361
70.00	21.5124	145.1954	0.7395	80.00	18.7862	146.8573	0.7392

	PRESSURE=	4.			PRESSURE=	4.5	
	GAGE=	21.776			GAGE=	20.758	
SAT	TEMP =	-227.23		SAT	TEMP =	-224.91	

T F°	V	H	S	T F°	V	H	S
-220.00	7.2261	105.2163	0.6268	-220.00	6.4142	105.1971	0.6241
-210.00	7.5360	106.3096	0.6312	-210.00	6.6902	106.2915	0.6285
-200.00	7.8455	107.4239	0.6356	-200.00	6.9658	107.4068	0.6329
-190.00	8.1545	108.5591	0.6399	-190.00	7.2410	108.5428	0.6372
-180.00	8.4632	109.7152	0.6441	-180.00	7.5158	109.6998	0.6414
-170.00	8.7716	110.8922	0.6482	-170.00	7.7904	110.8775	0.6455
-160.00	9.0797	112.0900	0.6523	-160.00	8.0646	112.0760	0.6496
-150.00	9.3876	113.3086	0.6563	-150.00	8.3387	113.2952	0.6536
-140.00	9.6953	114.5479	0.6602	-140.00	8.6125	114.5351	0.6576
-130.00	10.0028	115.8078	0.6641	-130.00	8.8861	115.7956	0.6614
-120.00	10.3101	117.0883	0.6679	-120.00	9.1595	117.0766	0.6653
-110.00	10.6172	118.3892	0.6717	-110.00	9.4328	118.3780	0.6690
-100.00	10.9242	119.7106	0.6754	-100.00	9.7059	119.6998	0.6728
-90.00	11.2311	121.0522	0.6791	-90.00	9.9790	121.0419	0.6764
-80.00	11.5379	122.4140	0.6828	-80.00	10.2519	122.4041	0.6801
-70.00	11.8446	123.7959	0.6864	-70.00	10.5246	123.7863	0.6837
-60.00	12.1510	125.1977	0.6899	-60.00	10.7972	125.1884	0.6872
-50.00	12.4575	126.6194	0.6934	-50.00	11.0698	126.6104	0.6907
-40.00	12.7639	128.0608	0.6969	-40.00	11.3424	128.0522	0.6942
-30.00	13.0702	129.5219	0.7003	-30.00	11.6148	129.5135	0.6977
-20.00	13.3765	131.0024	0.7037	-20.00	11.8872	130.9944	0.7011
-10.00	13.6826	132.5024	0.7071	-10.00	12.1595	132.4946	0.7044
0.	13.9888	134.0215	0.7105	0.	12.4318	134.0140	0.7078
10.00	14.2948	135.5598	0.7138	10.00	12.7040	135.5525	0.7111
20.00	14.6008	137.1171	0.7170	20.00	12.9761	137.1100	0.7144
30.00	14.9068	138.6932	0.7203	30.00	13.2482	138.6863	0.7176
40.00	15.2127	140.2880	0.7235	40.00	13.5202	140.2813	0.7209
50.00	15.5186	141.9013	0.7267	50.00	13.7922	141.8949	0.7240
60.00	15.8244	143.5331	0.7299	60.00	14.0642	143.5268	0.7272
70.00	16.1302	145.1832	0.7330	70.00	14.3361	145.1771	0.7304
80.00	16.4359	146.8514	0.7362	80.00	14.6080	146.8455	0.7335

TABLE VI (CONT'D)

	PRESSURE=	5.			PRESSURE=	5.5	
	GAGE=	19.74			GAGE=	18.722	
SAT	TEMP =	-222.79		SAT	TEMP =	-220.84	
T F°	V	H	S	T F°	V	H	S
-220.00	5.7646	105.1778	0.6216	-220.00	5.2331	105.1584	0.6194
-210.00	6.0136	106.2733	0.6261	-210.00	5.4599	106.2551	0.6239
-200.00	6.2621	107.3896	0.6305	-200.00	5.6863	107.3724	0.6283
-190.00	6.5102	108.5266	0.6348	-190.00	5.9122	108.5103	0.6326
-180.00	6.7579	109.6843	0.6390	-180.00	6.1378	109.6689	0.6368
-170.00	7.0054	110.8628	0.6431	-170.00	6.3631	110.8481	0.6410
-160.00	7.2525	112.0620	0.6472	-160.00	6.5881	112.0480	0.6450
-150.00	7.4995	113.2819	0.6512	-150.00	6.8129	113.2685	0.6490
-140.00	7.7462	114.5224	0.6552	-140.00	7.0374	114.5096	0.6530
-130.00	7.9927	115.7834	0.6590	-130.00	7.2618	115.7712	0.6569
-120.00	8.2391	117.0649	0.6629	-120.00	7.4860	117.0532	0.6607
-110.00	8.4853	118.3668	0.6666	-110.00	7.7100	118.3556	0.6645
-100.00	8.7313	119.6891	0.6704	-100.00	7.9339	119.6783	0.6682
-90.00	8.9772	121.0315	0.6741	-90.00	8.1576	121.0212	0.6719
-80.00	9.2230	122.3941	0.6777	-80.00	8.3812	122.3841	0.6755
-70.00	9.4687	123.7767	0.6813	-70.00	8.6048	123.7671	0.6791
-60.00	9.7143	125.1792	0.6848	-60.00	8.8282	125.1700	0.6827
-50.00	9.9597	126.6015	0.6884	-50.00	9.0515	126.5926	0.6862
-40.00	10.2052	128.0436	0.6918	-40.00	9.2747	128.0349	0.6897
-30.00	10.4505	129.5052	0.6953	-30.00	9.4979	129.4968	0.6931
-20.00	10.6958	130.9863	0.6987	-20.00	9.7210	130.9782	0.6965
-10.00	10.9410	132.4867	0.7021	-10.00	9.9440	132.4789	0.6999
0.	11.1862	134.0064	0.7054	0.	10.1670	133.9988	0.7032
10.00	11.4313	135.5452	0.7087	10.00	10.3900	135.5378	0.7065
20.00	11.6763	137.1029	0.7120	20.00	10.6128	137.0958	0.7098
30.00	11.9213	138.6794	0.7152	30.00	10.8357	138.6725	0.7131
40.00	12.1662	140.2746	0.7185	40.00	11.0584	140.2679	0.7163
50.00	12.4111	141.8884	0.7217	50.00	11.2812	141.8819	0.7195
60.00	12.6560	143.5206	0.7248	60.00	11.5039	143.5143	0.7227
70.00	12.9008	145.1710	0.7280	70.00	11.7265	145.1649	0.7258
80.00	13.1456	146.8396	0.7311	80.00	11.9491	146.8336	0.7289

	PRESSURE=	6.			PRESSURE=	6.5	
	GAGE=	17.704			GAGE=	16.686	
SAT	TEMP =	-219.02		SAT	TEMP =	-217.32	
T F°	V	H	S	T F°	V	H	S
-210.00	4.9986	106.2368	0.6219	-210.00	4.6081	106.2185	0.6200
-200.00	5.2064	107.3551	0.6263	-200.00	4.8004	107.3378	0.6244
-190.00	5.4139	108.4940	0.6306	-190.00	4.9923	108.4776	0.6288
-180.00	5.6210	109.6534	0.6348	-180.00	5.1838	109.6379	0.6330
-170.00	5.8279	110.8334	0.6390	-170.00	5.3750	110.8187	0.6371
-160.00	6.0344	112.0340	0.6430	-160.00	5.5659	112.0200	0.6412
-150.00	6.2407	113.2552	0.6470	-150.00	5.7565	113.2418	0.6452
-140.00	6.4468	114.4969	0.6510	-140.00	5.9470	114.4841	0.6492
-130.00	6.6527	115.7590	0.6549	-130.00	6.1372	115.7467	0.6530
-120.00	6.8584	117.0415	0.6587	-120.00	6.3273	117.0298	0.6569
-110.00	7.0639	118.3444	0.6625	-110.00	6.5172	118.3331	0.6607
-100.00	7.2693	119.6675	0.6662	-100.00	6.7070	119.6567	0.6644
-90.00	7.4746	121.0108	0.6699	-90.00	6.8967	121.0004	0.6681
-80.00	7.6798	122.3741	0.6735	-80.00	7.0862	122.3642	0.6717
-70.00	7.8848	123.7575	0.6771	-70.00	7.2756	123.7479	0.6753
-60.00	8.0898	125.1607	0.6807	-60.00	7.4650	125.1514	0.6789
-50.00	8.2946	126.5837	0.6842	-50.00	7.6542	126.5748	0.6824
-40.00	8.4994	128.0264	0.6877	-40.00	7.8433	128.0177	0.6859
-30.00	8.7040	129.4885	0.6911	-30.00	8.0323	129.4801	0.6893
-20.00	8.9087	130.9701	0.6945	-20.00	8.2213	130.9621	0.6927
-10.00	9.1132	132.4711	0.6979	-10.00	8.4103	132.4633	0.6961
0.	9.3178	133.9913	0.7013	0.	8.5991	133.9837	0.6994
10.00	9.5222	135.5305	0.7046	10.00	8.7880	135.5232	0.7028
20.00	9.7266	137.0887	0.7079	20.00	8.9767	137.0816	0.7060
30.00	9.9310	138.6656	0.7111	30.00	9.1654	138.6588	0.7093
40.00	10.1353	140.2613	0.7143	40.00	9.3541	140.2546	0.7125
50.00	10.3395	141.8754	0.7175	50.00	9.5427	141.8690	0.7157
60.00	10.5437	143.5080	0.7207	60.00	9.7313	143.5017	0.7189
70.00	10.7479	145.1588	0.7238	70.00	9.9199	145.1527	0.7220
80.00	10.9521	146.8277	0.7270	80.00	10.1084	146.8218	0.7252
90.00	11.1562	148.5146	0.7301	90.00	10.2969	148.5088	0.7283

TABLE VI (CONT'D)

PRESSURE=	7.			PRESSURE=	7.5		
GAGE=	15.668			GAGE=	14.65		
SAT TEMP =	-215.73			SAT TEMP =	-214.22		

T F°	V	H	S	T F°	V	H	S
-210.00	4.2735	106.2002	0.6183	-210.00	3.9834	106.1818	0.6167
-200.00	4.4524	107.3205	0.6227	-200.00	4.1507	107.3032	0.6211
-190.00	4.6308	108.4612	0.6270	-190.00	4.3176	108.4448	0.6254
-180.00	4.8089	109.6223	0.6313	-180.00	4.4841	109.6068	0.6297
-170.00	4.9867	110.8039	0.6354	-170.00	4.6503	110.7891	0.6338
-160.00	5.1643	112.0059	0.6395	-160.00	4.8162	111.9918	0.6379
-150.00	5.3415	113.2284	0.6435	-150.00	4.9819	113.2150	0.6419
-140.00	5.5186	114.4713	0.6475	-140.00	5.1473	114.4584	0.6459
-130.00	5.6955	115.7345	0.6514	-130.00	5.3126	115.7222	0.6498
-120.00	5.8721	117.0181	0.6552	-120.00	5.4777	117.0063	0.6536
-110.00	6.0487	118.3219	0.6590	-110.00	5.6426	118.3106	0.6574
-100.00	6.2251	119.6459	0.6627	-100.00	5.8073	119.6351	0.6611
-90.00	6.4013	120.9900	0.6664	-90.00	5.9720	120.9796	0.6648
-80.00	6.5774	122.3542	0.6700	-80.00	6.1365	122.3442	0.6685
-70.00	6.7535	123.7382	0.6736	-70.00	6.3009	123.7286	0.6721
-60.00	6.9294	125.1422	0.6772	-60.00	6.4652	125.1329	0.6756
-50.00	7.1052	126.5658	0.6807	-50.00	6.6295	126.5569	0.6791
-40.00	7.2810	128.0091	0.6842	-40.00	6.7936	128.0005	0.6826
-30.00	7.4566	129.4719	0.6876	-30.00	6.9577	129.4635	0.6861
-20.00	7.6321	130.9540	0.6910	-20.00	7.1216	130.9460	0.6895
-10.00	7.8077	132.4555	0.6944	-10.00	7.2855	132.4476	0.6928
0.	7.9832	133.9761	0.6978	0.	7.4493	133.9686	0.6962
10.00	8.1586	135.5158	0.7011	10.00	7.6132	135.5085	0.6995
20.00	8.3340	137.0745	0.7044	20.00	7.7769	137.0674	0.7028
30.00	8.5093	138.6519	0.7076	30.00	7.9406	138.6450	0.7060
40.00	8.6846	140.2479	0.7108	40.00	8.1043	140.2412	0.7093
50.00	8.8598	141.8625	0.7140	50.00	8.2679	141.8560	0.7125
60.00	9.0350	143.4954	0.7172	60.00	8.4315	143.4891	0.7156
70.00	9.2101	145.1466	0.7204	70.00	8.5950	145.1405	0.7188
80.00	9.3852	146.8158	0.7235	80.00	8.7585	146.8099	0.7219
90.00	9.5603	148.5030	0.7266	90.00	8.9220	148.4973	0.7250

PRESSURE=	8.			PRESSURE=	8.5		
GAGE=	13.632			GAGE=	12.614		
SAT TEMP =	-212.79			SAT TEMP =	-211.43		

T F°	V	H	S	T F°	V	H	S
-210.00	3.7296	106.1633	0.6152	-210.00	3.5057	106.1448	0.6138
-200.00	3.8868	107.2858	0.6196	-200.00	3.6539	107.2683	0.6182
-190.00	4.0435	108.4283	0.6240	-190.00	3.8016	108.4119	0.6225
-180.00	4.1999	109.5912	0.6282	-180.00	3.9490	109.5755	0.6268
-170.00	4.3559	110.7743	0.6323	-170.00	4.0961	110.7595	0.6309
-160.00	4.5117	111.9777	0.6364	-160.00	4.2429	111.9636	0.6350
-150.00	4.6672	113.2015	0.6404	-150.00	4.3895	113.1881	0.6390
-140.00	4.8225	114.4456	0.6444	-140.00	4.5358	114.4328	0.6430
-130.00	4.9776	115.7100	0.6483	-130.00	4.6819	115.6977	0.6469
-120.00	5.1325	116.9946	0.6521	-120.00	4.8279	116.9828	0.6507
-110.00	5.2872	118.2994	0.6559	-110.00	4.9737	118.2881	0.6545
-100.00	5.4418	119.6243	0.6596	-100.00	5.1193	119.6134	0.6583
-90.00	5.5963	120.9692	0.6633	-90.00	5.2649	120.9588	0.6620
-80.00	5.7507	122.3342	0.6670	-80.00	5.4103	122.3242	0.6656
-70.00	5.9049	123.7190	0.6706	-70.00	5.5555	123.7093	0.6692
-60.00	6.0591	125.1236	0.6741	-60.00	5.7007	125.1143	0.6728
-50.00	6.2132	126.5479	0.6777	-50.00	5.8458	126.5389	0.6763
-40.00	6.3671	127.9918	0.6811	-40.00	5.9908	127.9831	0.6798
-30.00	6.5210	129.4552	0.6846	-30.00	6.1358	129.4468	0.6832
-20.00	6.6749	130.9379	0.6880	-20.00	6.2806	130.9299	0.6866
-10.00	6.8285	132.4398	0.6914	-10.00	6.4253	132.4320	0.6900
0.	6.9822	133.9610	0.6947	0.	6.5701	133.9534	0.6933
10.00	7.1359	135.5012	0.6980	10.00	6.7148	135.4938	0.6967
20.00	7.2895	137.0602	0.7013	20.00	6.8594	137.0531	0.6999
30.00	7.4430	138.6381	0.7046	30.00	7.0040	138.6312	0.7032
40.00	7.5965	140.2345	0.7078	40.00	7.1485	140.2279	0.7064
50.00	7.7500	141.8495	0.7110	50.00	7.2930	141.8430	0.7096
60.00	7.9034	143.4828	0.7142	60.00	7.4375	143.4765	0.7128
70.00	8.0568	145.1344	0.7173	70.00	7.5819	145.1282	0.7159
80.00	8.2101	146.8040	0.7204	80.00	7.7262	146.7980	0.7191
90.00	8.3634	148.4915	0.7235	90.00	7.8706	148.4857	0.7222

TABLE VI (CONT'D)

PRESSURE=	9.
GAGE=	11.596
SAT TEMP =	-210.13

T F°	V	H	S
-210.00	3.3066	106.1263	0.6125
-200.00	3.4468	107.2508	0.6169
-190.00	3.5866	108.3953	0.6212
-180.00	3.7261	109.5599	0.6255
-170.00	3.8652	110.7446	0.6296
-160.00	4.0040	111.9495	0.6337
-150.00	4.1426	113.1746	0.6377
-140.00	4.2810	114.4199	0.6417
-130.00	4.4192	115.6854	0.6456
-120.00	4.5572	116.9710	0.6494
-110.00	4.6950	118.2768	0.6532
-100.00	4.8327	119.6026	0.6570
-90.00	4.9702	120.9484	0.6606
-80.00	5.1076	122.3141	0.6643
-70.00	5.2450	123.6997	0.6679
-60.00	5.3822	125.1050	0.6714
-50.00	5.5193	126.5300	0.6750
-40.00	5.6564	127.9745	0.6785
-30.00	5.7933	129.4385	0.6819
-20.00	5.9302	130.9218	0.6853
-10.00	6.0671	132.4243	0.6887
0.	6.2037	133.9458	0.6920
10.00	6.3404	135.4865	0.6954
20.00	6.4771	137.0460	0.6986
30.00	6.6137	138.6243	0.7019
40.00	6.7503	140.2212	0.7051
50.00	6.8868	141.8365	0.7083
60.00	7.0233	143.4702	0.7115
70.00	7.1597	145.1221	0.7146
80.00	7.2961	146.7921	0.7178
90.00	7.4325	148.4800	0.7209

PRESSURE=	9.5
GAGE=	10.578
SAT TEMP =	-208.88

T F°	V	H	S
-200.00	3.2616	107.2333	0.6156
-190.00	3.3943	108.3788	0.6200
-180.00	3.5266	109.5442	0.6242
-170.00	3.6586	110.7297	0.6284
-160.00	3.7903	111.9353	0.6325
-150.00	3.9218	113.1611	0.6365
-140.00	4.0530	114.4070	0.6404
-130.00	4.1841	115.6731	0.6443
-120.00	4.3149	116.9592	0.6482
-110.00	4.4456	118.2655	0.6520
-100.00	4.5762	119.5918	0.6557
-90.00	4.7066	120.9380	0.6594
-80.00	4.8369	122.3041	0.6630
-70.00	4.9671	123.6900	0.6667
-60.00	5.0972	125.0957	0.6702
-50.00	5.2272	126.5210	0.6737
-40.00	5.3571	127.9658	0.6772
-30.00	5.4869	129.4301	0.6807
-20.00	5.6167	130.9137	0.6841
-10.00	5.7464	132.4165	0.6875
0.	5.8759	133.9382	0.6908
10.00	6.0055	135.4791	0.6941
20.00	6.1351	137.0389	0.6974
30.00	6.2645	138.6174	0.7007
40.00	6.3940	140.2145	0.7039
50.00	6.5234	141.8300	0.7071
60.00	6.6527	143.4639	0.7103
70.00	6.7820	145.1160	0.7134
80.00	6.9113	146.7861	0.7165
90.00	7.0405	148.4742	0.7196
100.00	7.1697	150.1800	0.7227

PRESSURE=	10.
GAGE=	9.56
SAT TEMP =	-207.69

T F°	V	H	S
-200.00	3.0949	107.2158	0.6144
-190.00	3.2211	108.3622	0.6188
-180.00	3.3471	109.5285	0.6230
-170.00	3.4726	110.7148	0.6272
-160.00	3.5979	111.9211	0.6313
-150.00	3.7230	113.1476	0.6353
-140.00	3.8478	114.3941	0.6393
-130.00	3.9725	115.6607	0.6432
-120.00	4.0969	116.9474	0.6470
-110.00	4.2212	118.2542	0.6508
-100.00	4.3453	119.5809	0.6545
-90.00	4.4693	120.9276	0.6582
-80.00	4.5932	122.2941	0.6619
-70.00	4.7170	123.6804	0.6655
-60.00	4.8407	125.0864	0.6690
-50.00	4.9643	126.5120	0.6726
-40.00	5.0877	127.9572	0.6760
-30.00	5.2112	129.4217	0.6795
-20.00	5.3345	130.9056	0.6829
-10.00	5.4578	132.4087	0.6863
0.	5.5810	133.9308	0.6896
10.00	5.7041	135.4718	0.6930
20.00	5.8272	137.0318	0.6962
30.00	5.9503	138.6105	0.6995
40.00	6.0733	140.2078	0.7027
50.00	6.1963	141.8235	0.7059
60.00	6.3192	143.4576	0.7091
70.00	6.4421	145.1099	0.7123
80.00	6.5649	146.7802	0.7154
90.00	6.6878	148.4684	0.7185
100.00	6.8105	150.1744	0.7216

PRESSURE=	11.
GAGE=	7.524
SAT TEMP =	-205.44

T F°	V	H	S
-200.00	2.8068	107.1805	0.6122
-190.00	2.9221	108.3289	0.6165
-180.00	3.0369	109.4970	0.6208
-170.00	3.1514	110.6849	0.6250
-160.00	3.2657	111.8927	0.6291
-150.00	3.3796	113.1205	0.6331
-140.00	3.4934	114.3683	0.6371
-130.00	3.6069	115.6360	0.6410
-120.00	3.7203	116.9238	0.6448
-110.00	3.8335	118.2315	0.6486
-100.00	3.9466	119.5592	0.6523
-90.00	4.0595	120.9067	0.6560
-80.00	4.1723	122.2740	0.6597
-70.00	4.2850	123.6610	0.6633
-60.00	4.3976	125.0678	0.6669
-50.00	4.5101	126.4941	0.6704
-40.00	4.6225	127.9398	0.6739
-30.00	4.7349	129.4050	0.6773
-20.00	4.8471	130.8894	0.6807
-10.00	4.9593	132.3930	0.6841
0.	5.0715	133.9157	0.6875
10.00	5.1835	135.4573	0.6908
20.00	5.2955	137.0175	0.6941
30.00	5.4074	138.5967	0.6973
40.00	5.5194	140.1944	0.7006
50.00	5.6313	141.8106	0.7038
60.00	5.7431	143.4450	0.7069
70.00	5.8549	145.0977	0.7101
80.00	5.9667	146.7683	0.7132
90.00	6.0784	148.4569	0.7163
100.00	6.1901	150.1632	0.7194

TABLE VI (CONT'D)

PRESSURE=	12.			PRESSURE=	13.		
GAGE=	5.488			GAGE=	3.452		
SAT TEMP =	-203.35			SAT TEMP =	-201.39		

T F°	V	H	S	T F°	V	H	S
-200.00	2.5668	107.1452	0.6101	-200.00	2.3637	107.1096	0.6083
-190.00	2.6728	108.2955	0.6145	-190.00	2.4619	108.2620	0.6126
-180.00	2.7784	109.4654	0.6188	-180.00	2.5597	109.4337	0.6169
-170.00	2.8837	110.6549	0.6229	-170.00	2.6572	110.6248	0.6211
-160.00	2.9888	111.8642	0.6270	-160.00	2.7544	111.8356	0.6252
-150.00	3.0935	113.0934	0.6311	-150.00	2.8514	113.0661	0.6292
-140.00	3.1980	114.3424	0.6350	-140.00	2.9481	114.3164	0.6332
-130.00	3.3024	115.6113	0.6389	-130.00	3.0446	115.5865	0.6371
-120.00	3.4065	116.9001	0.6428	-120.00	3.1409	116.8764	0.6409
-110.00	3.5105	118.2088	0.6466	-110.00	3.2371	118.1861	0.6447
-100.00	3.6143	119.5374	0.6503	-100.00	3.3331	119.5156	0.6485
-90.00	3.7180	120.8858	0.6540	-90.00	3.4290	120.8648	0.6522
-80.00	3.8216	122.2539	0.6577	-80.00	3.5248	122.2337	0.6558
-70.00	3.9250	123.6417	0.6613	-70.00	3.6204	123.6223	0.6595
-60.00	4.0284	125.0491	0.6649	-60.00	3.7160	125.0304	0.6630
-50.00	4.1316	126.4761	0.6684	-50.00	3.8114	126.4581	0.6666
-40.00	4.2348	127.9225	0.6719	-40.00	3.9068	127.9051	0.6700
-30.00	4.3379	129.3882	0.6753	-30.00	4.0021	129.3714	0.6735
-20.00	4.4410	130.8732	0.6787	-20.00	4.0973	130.8570	0.6769
-10.00	4.5439	132.3773	0.6821	-10.00	4.1924	132.3617	0.6803
0.	4.6468	133.9005	0.6855	0.	4.2875	133.8853	0.6836
10.00	4.7497	135.4426	0.6888	10.00	4.3825	135.4279	0.6870
20.00	4.8523	137.0033	0.6921	20.00	4.4775	136.9892	0.6903
30.00	4.9551	138.5829	0.6953	30.00	4.5723	138.5690	0.6935
40.00	5.0578	140.1810	0.6986	40.00	4.6672	140.1676	0.6967
50.00	5.1604	141.7976	0.7018	50.00	4.7620	141.7846	0.7000
60.00	5.2631	143.4324	0.7050	60.00	4.8568	143.4198	0.7031
70.00	5.3656	145.0854	0.7081	70.00	4.9516	145.0732	0.7063
80.00	5.4682	146.7564	0.7112	80.00	5.0463	146.7445	0.7094
90.00	5.5707	148.4453	0.7143	90.00	5.1410	148.4338	0.7125
100.00	5.6731	150.1519	0.7174	100.00	5.2357	150.1407	0.7156

PRESSURE=	14.			PRESSURE=	14.696		
GAGE=	1.416			GAGE=	0.		
SAT TEMP =	-199.54			SAT TEMP =	-198.32		

T F°	V	H	S	T F°	V	H	S
-190.00	2.2811	108.2283	0.6109	-190.00	2.1697	108.2048	0.6097
-180.00	2.3722	109.4018	0.6151	-180.00	2.2568	109.3796	0.6140
-170.00	2.4631	110.5947	0.6193	-170.00	2.3435	110.5736	0.6182
-160.00	2.5536	111.8070	0.6234	-160.00	2.4299	111.7869	0.6223
-150.00	2.6438	113.0388	0.6275	-150.00	2.5160	113.0198	0.6263
-140.00	2.7339	114.2904	0.6315	-140.00	2.6020	114.2722	0.6303
-130.00	2.8237	115.5616	0.6354	-130.00	2.6877	115.5443	0.6342
-120.00	2.9133	116.8526	0.6392	-120.00	2.7732	116.8360	0.6381
-110.00	3.0028	118.1633	0.6430	-110.00	2.8585	118.1474	0.6419
-100.00	3.0921	119.4937	0.6468	-100.00	2.9437	119.4785	0.6457
-90.00	3.1813	120.8438	0.6505	-90.00	3.0288	120.8292	0.6494
-80.00	3.2704	122.2136	0.6541	-80.00	3.1137	122.1995	0.6530
-70.00	3.3593	123.6029	0.6578	-70.00	3.1986	123.5894	0.6566
-60.00	3.4482	125.0117	0.6613	-60.00	3.2833	124.9987	0.6602
-50.00	3.5369	126.4400	0.6649	-50.00	3.3679	126.4275	0.6637
-40.00	3.6256	127.8877	0.6683	-40.00	3.4525	127.8756	0.6672
-30.00	3.7142	129.3546	0.6718	-30.00	3.5369	129.3429	0.6707
-20.00	3.8027	130.8408	0.6752	-20.00	3.6213	130.8294	0.6741
-10.00	3.8911	132.3460	0.6786	-10.00	3.7056	132.3350	0.6775
0.	3.9795	133.8701	0.6820	0.	3.7899	133.8596	0.6808
10.00	4.0678	135.4132	0.6853	10.00	3.8741	135.4030	0.6842
20.00	4.1561	136.9750	0.6886	20.00	3.9583	136.9651	0.6875
30.00	4.2442	138.5552	0.6918	30.00	4.0423	138.5458	0.6907
40.00	4.3324	140.1542	0.6951	40.00	4.1263	140.1448	0.6939
50.00	4.4206	141.7715	0.6983	50.00	4.2103	141.7625	0.6972
60.00	4.5087	143.4072	0.7014	60.00	4.2943	143.3984	0.7003
70.00	4.5967	145.0609	0.7046	70.00	4.3782	145.0524	0.7035
80.00	4.6847	146.7326	0.7077	80.00	4.4621	146.7243	0.7066
90.00	4.7727	148.4222	0.7108	90.00	4.5460	148.4142	0.7097
100.00	4.8607	150.1295	0.7139	100.00	4.6298	150.1217	0.7128
110.00	4.9486	151.8543	0.7170	110.00	4.7136	151.8467	0.7158

TABLE VI (CONT'D)

	PRESSURE=	15.	
	GAGE=	0.304	
SAT	TEMP =	-197.80	
T F°	V	H	S
-190.00	2.1244	108.1945	0.6092
-180.00	2.2097	109.3699	0.6135
-170.00	2.2948	110.5644	0.6177
-160.00	2.3795	111.7782	0.6218
-150.00	2.4639	113.0115	0.6259
-140.00	2.5482	114.2643	0.6298
-130.00	2.6322	115.5367	0.6333
-120.00	2.7160	116.8288	0.6376
-110.00	2.7997	118.1405	0.6414
-100.00	2.8832	119.4718	0.6452
-90.00	2.9666	120.8228	0.6489
-80.00	3.0499	122.1934	0.6525
-70.00	3.1330	123.5835	0.6562
-60.00	3.2161	124.9930	0.6597
-50.00	3.2990	126.4220	0.6633
-40.00	3.3819	127.8703	0.6668
-30.00	3.4647	129.3378	0.6702
-20.00	3.5474	130.8245	0.6736
-10.00	3.6300	132.3302	0.6770
0.	3.7126	133.8549	0.6804
10.00	3.7951	135.3985	0.6837
20.00	3.8776	136.9608	0.6870
30.00	3.9600	138.5416	0.6902
40.00	4.0423	140.1407	0.6935
50.00	4.1246	141.7585	0.6967
60.00	4.2069	143.3945	0.6999
70.00	4.2892	145.0486	0.7030
80.00	4.3714	146.7207	0.7061
90.00	4.4536	148.4106	0.7092
100.00	4.5357	150.1182	0.7123
110.00	4.6178	151.8434	0.7154

	PRESSURE=	16.	
	GAGE=	1.304	
SAT	TEMP =	-196.14	
T F°	V	H	S
-190.00	1.9872	108.1605	0.6077
-180.00	2.0675	109.3378	0.6120
-170.00	2.1475	110.5340	0.6162
-160.00	2.2271	111.7493	0.6203
-150.00	2.3065	112.9840	0.6244
-140.00	2.3857	114.2381	0.6283
-130.00	2.4647	115.5118	0.6323
-120.00	2.5434	116.8049	0.6361
-110.00	2.6220	118.1176	0.6399
-100.00	2.7005	119.4499	0.6437
-90.00	2.7788	120.8018	0.6474
-80.00	2.8569	122.1731	0.6511
-70.00	2.9350	123.5640	0.6547
-60.00	3.0130	124.9743	0.6582
-50.00	3.0909	126.4039	0.6618
-40.00	3.1686	127.8529	0.6653
-30.00	3.2463	129.3210	0.6687
-20.00	3.3240	130.8082	0.6722
-10.00	3.4015	132.3145	0.6755
0.	3.4790	133.8397	0.6789
10.00	3.5565	135.3838	0.6822
20.00	3.6339	136.9465	0.6855
30.00	3.7112	138.5278	0.6888
40.00	3.7885	140.1276	0.6920
50.00	3.8657	141.7455	0.6952
60.00	3.9429	143.3819	0.6984
70.00	4.0200	145.0364	0.7015
80.00	4.0972	146.7088	0.7047
90.00	4.1743	148.3991	0.7078
100.00	4.2513	150.1070	0.7109
110.00	4.3284	151.8325	0.7139

	PRESSURE=	17.	
	GAGE=	2.304	
SAT	TEMP =	-194.56	
T F°	V	H	S
-190.00	1.8662	108.1264	0.6062
-180.00	1.9420	109.3056	0.6105
-170.00	2.0175	110.5035	0.6147
-160.00	2.0927	111.7204	0.6189
-150.00	2.1676	112.9565	0.6229
-140.00	2.2423	114.2119	0.6269
-130.00	2.3168	115.4867	0.6308
-120.00	2.3911	116.7810	0.6347
-110.00	2.4652	118.0947	0.6385
-100.00	2.5392	119.4280	0.6423
-90.00	2.6130	120.7807	0.6460
-80.00	2.6867	122.1529	0.6497
-70.00	2.7603	123.5445	0.6533
-60.00	2.8338	124.9555	0.6568
-50.00	2.9072	126.3858	0.6604
-40.00	2.9805	127.8354	0.6639
-30.00	3.0537	129.3041	0.6673
-20.00	3.1269	130.7920	0.6708
-10.00	3.1999	132.2988	0.6741
0.	3.2730	133.8245	0.6775
10.00	3.3459	135.3690	0.6808
20.00	3.4188	136.9322	0.6841
30.00	3.4917	138.5140	0.6874
40.00	3.5645	140.1142	0.6906
50.00	3.6372	141.7325	0.6938
60.00	3.7099	143.3692	0.6970
70.00	3.7826	145.0241	0.7002
80.00	3.8552	146.6969	0.7033
90.00	3.9279	148.3875	0.7064
100.00	4.0004	150.0957	0.7095
110.00	4.0730	151.8215	0.7125

	PRESSURE=	18.	
	GAGE=	3.304	
SAT	TEMP =	-193.06	
T F°	V	H	S
-190.00	1.7586	108.0922	0.6049
-180.00	1.8305	109.2732	0.6092
-170.00	1.9020	110.4729	0.6134
-160.00	1.9732	111.6914	0.6175
-150.00	2.0442	112.9289	0.6216
-140.00	2.1149	114.1856	0.6256
-130.00	2.1854	115.4617	0.6295
-120.00	2.2557	116.7570	0.6334
-110.00	2.3258	118.0718	0.6372
-100.00	2.3958	119.4060	0.6410
-90.00	2.4657	120.7596	0.6447
-80.00	2.5354	122.1326	0.6483
-70.00	2.6050	123.5250	0.6519
-60.00	2.6745	124.9367	0.6555
-50.00	2.7439	126.3677	0.6591
-40.00	2.8132	127.8179	0.6626
-30.00	2.8825	129.2873	0.6660
-20.00	2.9517	130.7757	0.6694
-10.00	3.0207	132.2831	0.6728
0.	3.0898	133.8093	0.6762
10.00	3.1588	135.3543	0.6795
20.00	3.2277	136.9180	0.6828
30.00	3.2966	138.5002	0.6861
40.00	3.3654	140.1008	0.6893
50.00	3.4341	141.7194	0.6925
60.00	3.5028	143.3566	0.6957
70.00	3.5715	145.0118	0.6989
80.00	3.6402	146.6850	0.7020
90.00	3.7088	148.3759	0.7051
100.00	3.7774	150.0845	0.7082
110.00	3.8460	151.8106	0.7112

TABLE VI (CONT'D)

PRESSURE= 19.
GAGE= 4.304
SAT TEMP = -191.61

T F°	V	H	S
-190.00	1.6623	108.0578	0.6036
-180.00	1.7306	109.2408	0.6079
-170.00	1.7986	110.4422	0.6121
-160.00	1.8663	111.6623	0.6162
-150.00	1.9337	112.9013	0.6203
-140.00	2.0009	114.1593	0.6243
-130.00	2.0678	115.4365	0.6282
-120.00	2.1345	116.7330	0.6321
-110.00	2.2011	118.0488	0.6359
-100.00	2.2676	119.3839	0.6397
-90.00	2.3338	120.7384	0.6434
-80.00	2.4000	122.1123	0.6471
-70.00	2.4660	123.5055	0.6507
-60.00	2.5320	124.9179	0.6543
-50.00	2.5978	126.3496	0.6578
-40.00	2.6636	127.8005	0.6613
-30.00	2.7293	129.2704	0.6648
-20.00	2.7949	130.7594	0.6682
-10.00	2.8604	132.2673	0.6716
0.	2.9259	133.7941	0.6749
10.00	2.9913	135.3395	0.6783
20.00	3.0567	136.9037	0.6816
30.00	3.1220	138.4863	0.6848
40.00	3.1872	140.0874	0.6881
50.00	3.2524	141.7067	0.6913
60.00	3.3175	143.3439	0.6945
70.00	3.3827	144.9995	0.6976
80.00	3.4478	146.6730	0.7007
90.00	3.5128	148.3643	0.7038
100.00	3.5779	150.0732	0.7069
110.00	3.6429	151.7997	0.7100

PRESSURE= 20.
GAGE= 5.304
SAT TEMP = -190.23

T F°	V	H	S
-190.00	1.5756	108.0232	0.6023
-180.00	1.6408	109.2082	0.6066
-170.00	1.7056	110.4114	0.6109
-160.00	1.7700	111.6331	0.6150
-150.00	1.8343	112.8735	0.6191
-140.00	1.8982	114.1329	0.6231
-130.00	1.9620	115.4113	0.6270
-120.00	2.0255	116.7089	0.6309
-110.00	2.0889	118.0258	0.6347
-100.00	2.1521	119.3619	0.6385
-90.00	2.2152	120.7173	0.6422
-80.00	2.2781	122.0920	0.6459
-70.00	2.3410	123.4859	0.6495
-60.00	2.4037	124.8991	0.6531
-50.00	2.4664	126.3315	0.6566
-40.00	2.5289	127.7830	0.6601
-30.00	2.5914	129.2535	0.6636
-20.00	2.6538	130.7431	0.6670
-10.00	2.7161	132.2515	0.6704
0.	2.7784	133.7788	0.6738
10.00	2.8406	135.3248	0.6771
20.00	2.9027	136.8894	0.6804
30.00	2.9648	138.4725	0.6837
40.00	3.0269	140.0740	0.6869
50.00	3.0889	141.6937	0.6901
60.00	3.1507	143.3313	0.6933
70.00	3.2127	144.9872	0.6964
80.00	3.2746	146.6611	0.6996
90.00	3.3364	148.3527	0.7027
100.00	3.3983	150.0620	0.7058
110.00	3.4601	151.7887	0.7088

PRESSURE= 21.
GAGE= 6.304
SAT TEMP = -188.89

T F°	V	H	S
-180.00	1.5595	109.1755	0.6055
-170.00	1.6214	110.3805	0.6097
-160.00	1.6830	111.6038	0.6139
-150.00	1.7443	112.8457	0.6179
-140.00	1.8053	114.1064	0.6219
-130.00	1.8662	115.3861	0.6259
-120.00	1.9268	116.6848	0.6298
-110.00	1.9873	118.0027	0.6336
-100.00	2.0477	119.3398	0.6374
-90.00	2.1078	120.6961	0.6411
-80.00	2.1679	122.0716	0.6447
-70.00	2.2278	123.4663	0.6484
-60.00	2.2877	124.8802	0.6520
-50.00	2.3474	126.3133	0.6555
-40.00	2.4071	127.7655	0.6590
-30.00	2.4666	129.2366	0.6625
-20.00	2.5261	130.7268	0.6659
-10.00	2.5856	132.2358	0.6693
0.	2.6449	133.7635	0.6726
10.00	2.7042	135.3100	0.6760
20.00	2.7635	136.8751	0.6793
30.00	2.8227	138.4586	0.6825
40.00	2.8818	140.0605	0.6858
50.00	2.9409	141.6807	0.6890
60.00	3.0000	143.3190	0.6922
70.00	3.0589	144.9749	0.6953
80.00	3.1179	146.6492	0.6985
90.00	3.1769	148.3411	0.7016
100.00	3.2358	150.0507	0.7046
110.00	3.2947	151.7778	0.7077
120.00	3.3535	153.5222	0.7107

PRESSURE= 22.
GAGE= 7.304
SAT TEMP = -187.61

T F°	V	H	S
-180.00	1.4855	109.1427	0.6043
-170.00	1.5448	110.3495	0.6086
-160.00	1.6038	111.5744	0.6127
-150.00	1.6625	112.8178	0.6168
-140.00	1.7209	114.0799	0.6208
-130.00	1.7791	115.3608	0.6248
-120.00	1.8371	116.6606	0.6287
-110.00	1.8950	117.9796	0.6325
-100.00	1.9527	119.3176	0.6363
-90.00	2.0102	120.6748	0.6400
-80.00	2.0677	122.0512	0.6437
-70.00	2.1250	123.4467	0.6473
-60.00	2.1822	124.8614	0.6509
-50.00	2.2393	126.2951	0.6544
-40.00	2.2963	127.7479	0.6579
-30.00	2.3532	129.2197	0.6614
-20.00	2.4101	130.7104	0.6648
-10.00	2.4669	132.2200	0.6682
0.	2.5236	133.7483	0.6716
10.00	2.5802	135.2952	0.6749
20.00	2.6369	136.8608	0.6782
30.00	2.6934	138.4448	0.6815
40.00	2.7499	140.0471	0.6847
50.00	2.8064	141.6677	0.6879
60.00	2.8628	143.3064	0.6911
70.00	2.9191	144.9626	0.6943
80.00	2.9755	146.6372	0.6974
90.00	3.0318	148.3295	0.7005
100.00	3.0881	150.0395	0.7036
110.00	3.1443	151.7668	0.7066
120.00	3.2005	153.5115	0.7097

TABLE VI (CONT'D)

	PRESSURE=	23.			PRESSURE=	24.	
	GAGE=	8.304			GAGE=	9.304	
SAT	TEMP =	-186.37		SAT	TEMP =	-185.17	

T F°	V	H	S	T F°	V	H	S
-180.00	1.4180	109.1097	0.6033	-180.00	1.3561	109.0766	0.6022
-170.00	1.4749	110.3183	0.6075	-170.00	1.4108	110.2871	0.6065
-160.00	1.5315	111.5449	0.6117	-160.00	1.4652	111.5154	0.6107
-150.00	1.5878	112.7898	0.6158	-150.00	1.5193	112.7618	0.6147
-140.00	1.6438	114.0532	0.6198	-140.00	1.5731	114.0266	0.6188
-130.00	1.6996	115.3354	0.6237	-130.00	1.6268	115.3100	0.6227
-120.00	1.7553	116.6364	0.6276	-120.00	1.6802	116.6122	0.6266
-110.00	1.8107	117.9564	0.6314	-110.00	1.7334	117.9332	0.6304
-100.00	1.8660	119.2954	0.6352	-100.00	1.7865	119.2732	0.6342
-90.00	1.9211	120.6536	0.6389	-90.00	1.8394	120.6323	0.6379
-80.00	1.9761	122.0308	0.6426	-80.00	1.8922	122.0103	0.6416
-70.00	2.0310	123.4271	0.6462	-70.00	1.9449	123.4074	0.6453
-60.00	2.0858	124.8425	0.6498	-60.00	1.9975	124.8236	0.6488
-50.00	2.1405	126.2769	0.6534	-50.00	2.0500	126.2587	0.6524
-40.00	2.1951	127.7304	0.6569	-40.00	2.1024	127.7128	0.6559
-30.00	2.2497	129.2028	0.6604	-30.00	2.1547	129.1858	0.6594
-20.00	2.3041	130.6941	0.6638	-20.00	2.2070	130.6777	0.6628
-10.00	2.3585	132.2042	0.6672	-10.00	2.2591	132.1884	0.6662
0.	2.4128	133.7330	0.6705	0.	2.3113	133.7177	0.6696
10.00	2.4671	135.2805	0.6739	10.00	2.3633	135.2657	0.6729
20.00	2.5213	136.8465	0.6772	20.00	2.4153	136.8321	0.6762
30.00	2.5754	138.4309	0.6804	30.00	2.4672	138.4170	0.6795
40.00	2.6295	140.0337	0.6837	40.00	2.5191	140.0202	0.6827
50.00	2.6836	141.6546	0.6869	50.00	2.5710	141.6416	0.6859
60.00	2.7376	143.2937	0.6901	60.00	2.6228	143.2811	0.6891
70.00	2.7914	144.9503	0.6932	70.00	2.6745	144.9385	0.6923
80.00	2.8454	146.6253	0.6964	80.00	2.7262	146.6133	0.6954
90.00	2.8993	148.3179	0.6995	90.00	2.7779	148.3063	0.6985
100.00	2.9532	150.0282	0.7026	100.00	2.8295	150.0169	0.7016
110.00	3.0070	151.7559	0.7056	110.00	2.8812	151.7449	0.7046
120.00	3.0608	153.5009	0.7087	120.00	2.9328	153.4902	0.7077

	PRESSURE=	25.			PRESSURE=	26.	
	GAGE=	10.304			GAGE=	11.304	
SAT	TEMP =	-184.00		SAT	TEMP =	-182.88	

T F°	V	H	S	T F°	V	H	S
-180.00	1.2991	109.0434	0.6012	-180.00	1.2466	109.0101	0.6003
-170.00	1.3518	110.2558	0.6055	-170.00	1.2974	110.2243	0.6045
-160.00	1.4042	111.4857	0.6097	-160.00	1.3479	111.4559	0.6087
-150.00	1.4563	112.7336	0.6138	-150.00	1.3981	112.7054	0.6128
-140.00	1.5081	113.9998	0.6178	-140.00	1.4481	113.9730	0.6168
-130.00	1.5597	115.2845	0.6217	-130.00	1.4978	115.2589	0.6208
-120.00	1.6111	116.5878	0.6256	-120.00	1.5473	116.5635	0.6247
-110.00	1.6623	117.9100	0.6295	-110.00	1.5967	117.8867	0.6285
-100.00	1.7134	119.2510	0.6333	-100.00	1.6459	119.2287	0.6323
-90.00	1.7643	120.6109	0.6370	-90.00	1.6949	120.5895	0.6361
-80.00	1.8151	121.9898	0.6407	-80.00	1.7438	121.9693	0.6397
-70.00	1.8657	123.3877	0.6443	-70.00	1.7926	123.3680	0.6434
-60.00	1.9163	124.8046	0.6479	-60.00	1.8413	124.7857	0.6470
-50.00	1.9667	126.2405	0.6514	-50.00	1.8899	126.2222	0.6505
-40.00	2.0171	127.6952	0.6549	-40.00	1.9384	127.6776	0.6540
-30.00	2.0674	129.1689	0.6584	-30.00	1.9868	129.1519	0.6575
-20.00	2.1176	130.6613	0.6618	-20.00	2.0351	130.6449	0.6609
-10.00	2.1678	132.1725	0.6652	-10.00	2.0834	132.1567	0.6643
0.	2.2178	133.7024	0.6686	0.	2.1316	133.6871	0.6677
10.00	2.2678	135.2509	0.6719	10.00	2.1797	135.2360	0.6710
20.00	2.3178	136.8178	0.6752	20.00	2.2278	136.8035	0.6743
30.00	2.3677	138.4031	0.6785	30.00	2.2758	138.3892	0.6776
40.00	2.4176	140.0068	0.6818	40.00	2.3238	139.9933	0.6809
50.00	2.4674	141.6285	0.6850	50.00	2.3718	141.6155	0.6841
60.00	2.5172	143.2684	0.6882	60.00	2.4197	143.2557	0.6873
70.00	2.5669	144.9262	0.6913	70.00	2.4675	144.9139	0.6904
80.00	2.6165	146.6014	0.6945	80.00	2.5152	146.5894	0.6935
90.00	2.6662	148.2947	0.6976	90.00	2.5630	148.2831	0.6967
100.00	2.7158	150.0056	0.7006	100.00	2.6108	149.9944	0.6997
110.00	2.7654	151.7340	0.7037	110.00	2.6585	151.7230	0.7028
120.00	2.8150	153.4796	0.7067	120.00	2.7062	153.4689	0.7058

TABLE VI (CONT'D)

PRESSURE=	27.			PRESSURE=	28.		
GAGE=	12.304			GAGE=	13.304		
SAT TEMP =	-181.78			SAT TEMP =	-180.72		

T F°	V	H	S	T F°	V	H	S
-180.00	1.1979	108.9766	0.5993	-180.00	1.1526	108.9429	0.5984
-170.00	1.2470	110.1927	0.6036	-170.00	1.2002	110.1610	0.6027
-160.00	1.2958	111.4261	0.6078	-160.00	1.2474	111.3961	0.6069
-150.00	1.3443	112.6771	0.6119	-150.00	1.2942	112.6487	0.6110
-140.00	1.3925	113.9461	0.6159	-140.00	1.3409	113.9191	0.6151
-130.00	1.4405	115.2333	0.6199	-130.00	1.3873	115.2077	0.6190
-120.00	1.4883	116.5390	0.6238	-120.00	1.4335	116.5146	0.6229
-110.00	1.5359	117.8633	0.6277	-110.00	1.4795	117.8399	0.6268
-100.00	1.5834	119.2063	0.6314	-100.00	1.5253	119.1840	0.6306
-90.00	1.6307	120.5681	0.6352	-90.00	1.5710	120.5467	0.6343
-80.00	1.6778	121.9488	0.6389	-80.00	1.6166	121.9282	0.6380
-70.00	1.7249	123.3483	0.6425	-70.00	1.6620	123.3285	0.6416
-60.00	1.7718	124.7667	0.6461	-60.00	1.7074	124.7477	0.6452
-50.00	1.8187	126.2039	0.6496	-50.00	1.7526	126.1856	0.6488
-40.00	1.8655	127.6600	0.6532	-40.00	1.7978	127.6424	0.6523
-30.00	1.9121	129.1349	0.6566	-30.00	1.8428	129.1179	0.6558
-20.00	1.9587	130.6285	0.6601	-20.00	1.8878	130.6121	0.6592
-10.00	2.0053	132.1408	0.6635	-10.00	1.9327	132.1250	0.6626
0.	2.0517	133.6718	0.6668	0.	1.9776	133.6564	0.6660
10.00	2.0981	135.2212	0.6702	10.00	2.0224	135.2064	0.6693
20.00	2.1445	136.7891	0.6735	20.00	2.0671	136.7747	0.6726
30.00	2.1908	138.3753	0.6767	30.00	2.1118	138.3614	0.6759
40.00	2.2370	139.9798	0.6800	40.00	2.1564	139.9663	0.6791
50.00	2.2832	141.6024	0.6832	50.00	2.2010	141.5894	0.6824
60.00	2.3294	143.2431	0.6864	60.00	2.2456	143.2304	0.6855
70.00	2.3755	144.9016	0.6895	70.00	2.2901	144.8893	0.6887
80.00	2.4216	146.5780	0.6927	80.00	2.3346	146.5660	0.6918
90.00	2.4676	148.2715	0.6958	90.00	2.3789	148.2599	0.6950
100.00	2.5136	149.9831	0.6989	100.00	2.4233	149.9718	0.6980
110.00	2.5596	151.7120	0.7019	110.00	2.4677	151.7011	0.7011
120.00	2.6055	153.4583	0.7050	120.00	2.5120	153.4476	0.7041

PRESSURE=	29.			PRESSURE=	30.		
GAGE=	14.304			GAGE=	15.304		
SAT TEMP =	-179.68			SAT TEMP =	-178.67		

T F°	V	H	S	T F°	V	H	S
-170.00	1.1566	110.1292	0.6019	-170.00	1.1159	110.0973	0.6010
-160.00	1.2023	111.3661	0.6061	-160.00	1.1602	111.3359	0.6052
-150.00	1.2477	112.6203	0.6102	-150.00	1.2042	112.5917	0.6094
-140.00	1.2928	113.8921	0.6142	-140.00	1.2479	113.8650	0.6134
-130.00	1.3377	115.1820	0.6182	-130.00	1.2914	115.1562	0.6174
-120.00	1.3824	116.4900	0.6221	-120.00	1.3347	116.4655	0.6213
-110.00	1.4269	117.8165	0.6260	-110.00	1.3779	117.7930	0.6251
-100.00	1.4713	119.1616	0.6297	-100.00	1.4208	119.1391	0.6289
-90.00	1.5155	120.5252	0.6335	-90.00	1.4636	120.5037	0.6327
-80.00	1.5595	121.9076	0.6372	-80.00	1.5063	121.8870	0.6364
-70.00	1.6035	123.3087	0.6408	-70.00	1.5489	123.2889	0.6400
-60.00	1.6473	124.7286	0.6444	-60.00	1.5913	124.7096	0.6436
-50.00	1.6911	126.1673	0.6480	-50.00	1.6336	126.1490	0.6472
-40.00	1.7347	127.6247	0.6515	-40.00	1.6759	127.6071	0.6507
-30.00	1.7783	129.1009	0.6550	-30.00	1.7181	129.0838	0.6542
-20.00	1.8218	130.5957	0.6584	-20.00	1.7601	130.5792	0.6576
-10.00	1.8652	132.1091	0.6618	-10.00	1.8022	132.0932	0.6610
0.	1.9086	133.6411	0.6652	0.	1.8441	133.6257	0.6644
10.00	1.9518	135.1915	0.6685	10.00	1.8860	135.1767	0.6677
20.00	1.9951	136.7604	0.6718	20.00	1.9278	136.7460	0.6710
30.00	2.0383	138.3475	0.6751	30.00	1.9696	138.3336	0.6743
40.00	2.0814	139.9529	0.6783	40.00	2.0114	139.9394	0.6775
50.00	2.1245	141.5763	0.6815	50.00	2.0531	141.5632	0.6808
60.00	2.1675	143.2177	0.6847	60.00	2.0947	143.2051	0.6840
70.00	2.2105	144.8770	0.6879	70.00	2.1363	144.8647	0.6871
80.00	2.2535	146.5541	0.6910	80.00	2.1779	146.5421	0.6903
90.00	2.2964	148.2482	0.6941	90.00	2.2193	148.2366	0.6934
100.00	2.3393	149.9605	0.6972	100.00	2.2608	149.9492	0.6965
110.00	2.3821	151.6901	0.7003	110.00	2.3023	151.6791	0.6995
120.00	2.4250	153.4369	0.7033	120.00	2.3437	153.4263	0.7026
130.00	2.4678	155.2009	0.7064	130.00	2.3852	155.1905	0.7056

TABLE VI (CONT'D)

PRESSURE=	31.			PRESSURE=	32.		
GAGE=	16.304			GAGE=	17.304		
SAT TEMP =	-177.69			SAT TEMP =	-176.73		

T F°	V	H	S	T F°	V	H	S
-170.00	1.0778	110.0653	0.6002	-170.00	1.0421	110.0331	0.5994
-160.00	1.1208	111.3057	0.6044	-160.00	1.0839	111.2753	0.6036
-150.00	1.1635	112.5631	0.6086	-150.00	1.1254	112.5344	0.6078
-140.00	1.2060	113.8378	0.6126	-140.00	1.1666	113.8106	0.6118
-130.00	1.2482	115.1303	0.6166	-130.00	1.2076	115.1044	0.6158
-120.00	1.2902	116.4408	0.6205	-120.00	1.2484	116.4161	0.6197
-110.00	1.3320	117.7695	0.6244	-110.00	1.2890	117.7460	0.6236
-100.00	1.3736	119.1166	0.6282	-100.00	1.3294	119.0941	0.6274
-90.00	1.4151	120.4822	0.6319	-90.00	1.3697	120.4606	0.6311
-80.00	1.4565	121.8663	0.6356	-80.00	1.4098	121.8456	0.6348
-70.00	1.4977	123.2691	0.6392	-70.00	1.4498	123.2492	0.6385
-60.00	1.5389	124.6905	0.6428	-60.00	1.4897	124.6714	0.6421
-50.00	1.5799	126.1306	0.6464	-50.00	1.5295	126.1122	0.6457
-40.00	1.6209	127.5894	0.6499	-40.00	1.5693	127.5717	0.6492
-30.00	1.6617	129.0668	0.6534	-30.00	1.6089	129.0497	0.6527
-20.00	1.7025	130.5628	0.6568	-20.00	1.6484	130.5463	0.6561
-10.00	1.7432	132.0773	0.6602	-10.00	1.6879	132.0614	0.6595
0.	1.7838	133.6104	0.6636	0.	1.7273	133.5950	0.6629
10.00	1.8244	135.1618	0.6670	10.00	1.7667	135.1470	0.6662
20.00	1.8650	136.7316	0.6703	20.00	1.8060	136.7172	0.6695
30.00	1.9054	138.3197	0.6735	30.00	1.8452	138.3057	0.6728
40.00	1.9458	139.9259	0.6768	40.00	1.8844	139.9124	0.6761
50.00	1.9862	141.5502	0.6800	50.00	1.9236	141.5371	0.6793
60.00	2.0266	143.1924	0.6832	60.00	1.9627	143.1797	0.6825
70.00	2.0669	144.8524	0.6864	70.00	2.0017	144.8401	0.6856
80.00	2.1071	146.5302	0.6895	80.00	2.0408	146.5182	0.6888
90.00	2.1473	148.2256	0.6926	90.00	2.0798	148.2140	0.6919
100.00	2.1874	149.9379	0.6957	100.00	2.1186	149.9266	0.6950
110.00	2.2276	151.6682	0.6988	110.00	2.1576	151.6572	0.6980
120.00	2.2677	153.4156	0.7018	120.00	2.1965	153.4049	0.7011
130.00	2.3079	155.1801	0.7048	130.00	2.2354	155.1698	0.7041

PRESSURE=	33.			PRESSURE=	34.		
GAGE=	18.304			GAGE=	19.304		
SAT TEMP =	-175.79			SAT TEMP =	-174.88		

T F°	V	H	S	T F°	V	H	S
-170.00	1.0085	110.0008	0.5987	-170.00	0.9769	109.9684	0.5979
-160.00	1.0492	111.2449	0.6029	-160.00	1.0165	111.2143	0.6021
-150.00	1.0895	112.5055	0.6070	-150.00	1.0558	112.4767	0.6063
-140.00	1.1296	113.7833	0.6111	-140.00	1.0948	113.7559	0.6104
-130.00	1.1695	115.0785	0.6151	-130.00	1.1336	115.0524	0.6143
-120.00	1.2091	116.3914	0.6190	-120.00	1.1721	116.3666	0.6183
-110.00	1.2485	117.7224	0.6229	-110.00	1.2105	117.6987	0.6221
-100.00	1.2878	119.0715	0.6267	-100.00	1.2487	119.0489	0.6259
-90.00	1.3269	120.4390	0.6304	-90.00	1.2867	120.4173	0.6297
-80.00	1.3659	121.8249	0.6341	-80.00	1.3247	121.8041	0.6334
-70.00	1.4048	123.2293	0.6378	-70.00	1.3624	123.2094	0.6371
-60.00	1.4436	124.6523	0.6414	-60.00	1.4001	124.6331	0.6407
-50.00	1.4822	126.0938	0.6449	-50.00	1.4377	126.0754	0.6442
-40.00	1.5208	127.5539	0.6485	-40.00	1.4752	127.5362	0.6477
-30.00	1.5593	129.0326	0.6519	-30.00	1.5125	129.0155	0.6512
-20.00	1.5977	130.5298	0.6554	-20.00	1.5499	130.5133	0.6547
-10.00	1.6360	132.0455	0.6588	-10.00	1.5871	132.0296	0.6581
0.	1.6742	133.5796	0.6622	0.	1.6243	133.5642	0.6615
10.00	1.7124	135.1321	0.6655	10.00	1.6614	135.1172	0.6648
20.00	1.7506	136.7028	0.6688	20.00	1.6985	136.6884	0.6681
30.00	1.7887	138.2918	0.6721	30.00	1.7355	138.2779	0.6714
40.00	1.8267	139.8989	0.6753	40.00	1.7724	139.8854	0.6746
50.00	1.8647	141.5240	0.6786	50.00	1.8093	141.5109	0.6779
60.00	1.9027	143.1670	0.6817	60.00	1.8462	143.1543	0.6811
70.00	1.9406	144.8278	0.6849	70.00	1.8830	144.8155	0.6842
80.00	1.9785	146.5063	0.6881	80.00	1.9198	146.4943	0.6874
90.00	2.0163	148.2024	0.6912	90.00	1.9566	148.1908	0.6905
100.00	2.0540	149.9153	0.6943	100.00	1.9932	149.9040	0.6936
110.00	2.0918	151.6462	0.6973	110.00	2.0299	151.6352	0.6966
120.00	2.1295	153.3943	0.7004	120.00	2.0665	153.3836	0.6997
130.00	2.1673	155.1594	0.7034	130.00	2.1032	155.1490	0.7027

TABLE VI (CONT'D)

	PRESSURE=	35.			PRESSURE=	36.	
	GAGE=	20.304			GAGE=	21.304	
SAT	TEMP =	-173.98		SAT	TEMP =	-173.10	

T F°	V	H	S	T F°	V	H	S
-170.00	0.9471	109.9359	0.5972	-170.00	0.9190	109.9032	0.5965
-160.00	0.9857	111.1837	0.6014	-160.00	0.9566	111.1529	0.6007
-150.00	1.0240	112.4477	0.6056	-150.00	0.9940	112.4186	0.6049
-140.00	1.0620	113.7284	0.6096	-140.00	1.0310	113.7009	0.6090
-130.00	1.0998	115.0263	0.6136	-130.00	1.0678	115.0002	0.6130
-120.00	1.1373	116.3418	0.6176	-120.00	1.1044	116.3169	0.6169
-110.00	1.1746	117.6750	0.6214	-110.00	1.1408	117.6512	0.6208
-100.00	1.2118	119.0262	0.6253	-100.00	1.1770	119.0035	0.6246
-90.00	1.2488	120.3957	0.6290	-90.00	1.2130	120.3739	0.6283
-80.00	1.2857	121.7834	0.6327	-80.00	1.2490	121.7625	0.6320
-70.00	1.3225	123.1895	0.6364	-70.00	1.2848	123.1695	0.6357
-60.00	1.3591	124.6140	0.6400	-60.00	1.3204	124.5948	0.6393
-50.00	1.3957	126.0570	0.6435	-50.00	1.3560	126.0385	0.6429
-40.00	1.4321	127.5184	0.6471	-40.00	1.3915	127.5007	0.6464
-30.00	1.4685	128.9984	0.6505	-30.00	1.4269	128.9813	0.6499
-20.00	1.5048	130.4968	0.6540	-20.00	1.4622	130.4803	0.6533
-10.00	1.5410	132.0136	0.6574	-10.00	1.4975	131.9977	0.6567
0.	1.5772	133.5488	0.6608	0.	1.5327	133.5334	0.6601
10.00	1.6133	135.1023	0.6641	10.00	1.5678	135.0874	0.6635
20.00	1.6493	136.6740	0.6674	20.00	1.6029	136.6596	0.6668
30.00	1.6853	138.2639	0.6707	30.00	1.6379	138.2499	0.6701
40.00	1.7212	139.8719	0.6740	40.00	1.6729	139.8583	0.6733
50.00	1.7571	141.4978	0.6772	50.00	1.7078	141.4847	0.6765
60.00	1.7929	143.1416	0.6804	60.00	1.7426	143.1289	0.6797
70.00	1.8287	144.8032	0.6836	70.00	1.7775	144.7908	0.6829
80.00	1.8645	146.4824	0.6867	80.00	1.8123	146.4704	0.6860
90.00	1.9002	148.1791	0.6898	90.00	1.8470	148.1675	0.6892
100.00	1.9358	149.8927	0.6929	100.00	1.8818	149.8820	0.6922
110.00	1.9715	151.6242	0.6960	110.00	1.9164	151.6132	0.6953
120.00	2.0071	153.3729	0.6990	120.00	1.9510	153.3622	0.6984
130.00	2.0428	155.1386	0.7020	130.00	1.9857	155.1283	0.7014

	PRESSURE=	37.			PRESSURE=	38.	
	GAGE=	22.304			GAGE=	23.304	
SAT	TEMP =	-172.25		SAT	TEMP =	-171.40	

T F°	V	H	S	T F°	V	H	S
-170.00	0.8924	109.8704	0.5958	-170.00	0.8671	109.8375	0.5951
-160.00	0.9291	111.1220	0.6000	-160.00	0.9030	111.0911	0.5994
-150.00	0.9655	112.3894	0.6042	-150.00	0.9386	112.3602	0.6035
-140.00	1.0017	113.6732	0.6083	-140.00	0.9739	113.6456	0.6076
-130.00	1.0376	114.9739	0.6123	-130.00	1.0089	114.9476	0.6116
-120.00	1.0732	116.2919	0.6162	-120.00	1.0437	116.2669	0.6156
-110.00	1.1087	117.6274	0.6201	-110.00	1.0783	117.6036	0.6195
-100.00	1.1440	118.9808	0.6239	-100.00	1.1128	118.9580	0.6233
-90.00	1.1792	120.3522	0.6277	-90.00	1.1471	120.3304	0.6270
-80.00	1.2142	121.7417	0.6314	-80.00	1.1812	121.7208	0.6307
-70.00	1.2491	123.1495	0.6350	-70.00	1.2152	123.1294	0.6344
-60.00	1.2838	124.5756	0.6387	-60.00	1.2492	124.5563	0.6380
-50.00	1.3185	126.0200	0.6422	-50.00	1.2830	126.0015	0.6416
-40.00	1.3531	127.4829	0.6458	-40.00	1.3167	127.4651	0.6451
-30.00	1.3876	128.9641	0.6492	-30.00	1.3503	128.9470	0.6486
-20.00	1.4220	130.4637	0.6527	-20.00	1.3838	130.4472	0.6521
-10.00	1.4563	131.9817	0.6561	-10.00	1.4173	131.9657	0.6555
0.	1.4906	133.5180	0.6595	0.	1.4507	133.5025	0.6589
10.00	1.5248	135.0725	0.6628	10.00	1.4841	135.0575	0.6622
20.00	1.5590	136.6452	0.6661	20.00	1.5174	136.6307	0.6655
30.00	1.5931	138.2360	0.6694	30.00	1.5506	138.2220	0.6688
40.00	1.6271	139.8448	0.6727	40.00	1.5838	139.8313	0.6721
50.00	1.6611	141.4716	0.6759	50.00	1.6169	141.4584	0.6753
60.00	1.6951	143.1162	0.6791	60.00	1.6500	143.1034	0.6785
70.00	1.7290	144.7785	0.6823	70.00	1.6831	144.7662	0.6816
80.00	1.7629	146.4584	0.6854	80.00	1.7161	146.4465	0.6848
90.00	1.7967	148.1559	0.6885	90.00	1.7490	148.1443	0.6879
100.00	1.8305	149.8708	0.6916	100.00	1.7820	149.8595	0.6910
110.00	1.8642	151.6022	0.6947	110.00	1.8148	151.5912	0.6941
120.00	1.8980	153.3516	0.6977	120.00	1.8477	153.3409	0.6971
130.00	1.9317	155.1179	0.7007	130.00	1.8806	155.1075	0.7001

TABLE VI (CONT'D)

PRESSURE= 39. GAGE= 24.304 SAT TEMP = -170.58				PRESSURE= 40. GAGE= 25.304 SAT TEMP = -169.77			
T F°	V	H	S	T F°	V	H	S
-170.00	0.8432	109.8044	0.5945	-160.00	0.8548	111.0288	0.5981
-160.00	0.8783	111.0600	0.5987	-150.00	0.8888	112.3014	0.6023
-150.00	0.9130	112.3309	0.6029	-140.00	0.9225	113.5899	0.6063
-140.00	0.9475	113.6178	0.6070	-130.00	0.9559	114.8949	0.6104
-130.00	0.9817	114.9213	0.6110	-120.00	0.9891	116.2167	0.6143
-120.00	1.0157	116.2418	0.6149	-110.00	1.0222	117.5558	0.6182
-110.00	1.0495	117.5797	0.6188	-100.00	1.0550	118.9124	0.6220
-100.00	1.0832	118.9352	0.6226	-90.00	1.0877	120.2867	0.6258
-90.00	1.1166	120.3086	0.6264	-80.00	1.1203	121.6790	0.6295
-80.00	1.1500	121.6999	0.6301	-70.00	1.1527	123.0893	0.6332
-70.00	1.1832	123.1094	0.6338	-60.00	1.1850	124.5178	0.6368
-60.00	1.2163	124.5371	0.6374	-50.00	1.2172	125.9645	0.6404
-50.00	1.2492	125.9830	0.6410	-40.00	1.2493	127.4294	0.6439
-40.00	1.2821	127.4472	0.6445	-30.00	1.2813	128.9126	0.6474
-30.00	1.3149	128.9298	0.6480	-20.00	1.3133	130.4140	0.6509
-20.00	1.3477	130.4306	0.6514	-10.00	1.3452	131.9337	0.6543
-10.00	1.3803	131.9497	0.6549	0.	1.3770	133.4716	0.6577
0.	1.4129	133.4871	0.6582	10.00	1.4087	135.0277	0.6610
10.00	1.4454	135.0426	0.6616	20.00	1.4404	136.6018	0.6643
20.00	1.4779	136.6163	0.6649	30.00	1.4720	138.1940	0.6676
30.00	1.5103	138.2080	0.6682	40.00	1.5036	139.9042	0.6709
40.00	1.5427	139.8177	0.6714	50.00	1.5351	141.4322	0.6741
50.00	1.5750	141.4453	0.6747	60.00	1.5666	143.0780	0.6773
60.00	1.6072	143.0907	0.6779	70.00	1.5981	144.7415	0.6805
70.00	1.6395	144.7538	0.6810	80.00	1.6295	146.4225	0.6836
80.00	1.6717	146.4345	0.6842	90.00	1.6609	148.1210	0.6867
90.00	1.7038	148.1327	0.6873	100.00	1.6922	149.8369	0.6898
100.00	1.7359	149.8482	0.6904	110.00	1.7234	151.5692	0.6929
110.00	1.7679	151.5802	0.6935	120.00	1.7547	153.3195	0.6959
120.00	1.8000	153.3302	0.6965	130.00	1.7860	155.0867	0.6989
130.00	1.8321	155.0971	0.6995	140.00	1.8172	156.8708	0.7019

PRESSURE= 42. GAGE= 27.304 SAT TEMP = -168.20				PRESSURE= 44. GAGE= 29.304 SAT TEMP = -166.68			
T F°	V	H	S	T F°	V	H	S
-160.00	0.8111	110.9660	0.5968	-160.00	0.7713	110.9029	0.5957
-150.00	0.8437	112.2423	0.6010	-150.00	0.8026	112.1828	0.5999
-140.00	0.8759	113.5340	0.6051	-140.00	0.8336	113.4778	0.6040
-130.00	0.9079	114.8418	0.6092	-130.00	0.8643	114.7885	0.6080
-120.00	0.9397	116.1663	0.6131	-120.00	0.8948	116.1156	0.6120
-110.00	0.9713	117.5077	0.6170	-110.00	0.9251	117.4595	0.6159
-100.00	1.0027	118.8665	0.6208	-100.00	0.9552	118.8205	0.6197
-90.00	1.0340	120.2429	0.6246	-90.00	0.9851	120.1989	0.6235
-80.00	1.0651	121.6370	0.6283	-80.00	1.0149	121.5949	0.6272
-70.00	1.0961	123.0491	0.6320	-70.00	1.0446	123.0087	0.6309
-60.00	1.1269	124.4791	0.6356	-60.00	1.0742	124.4404	0.6345
-50.00	1.1577	125.9273	0.6392	-50.00	1.1036	125.8901	0.6381
-40.00	1.1884	127.3936	0.6427	-40.00	1.1330	127.3578	0.6416
-30.00	1.2189	128.8781	0.6462	-30.00	1.1622	128.8436	0.6451
-20.00	1.2494	130.3808	0.6497	-20.00	1.1914	130.3475	0.6486
-10.00	1.2799	131.9017	0.6531	-10.00	1.2205	131.8696	0.6520
0.	1.3102	133.4407	0.6565	0.	1.2495	133.4097	0.6554
10.00	1.3405	134.9977	0.6599	10.00	1.2785	134.9678	0.6588
20.00	1.3707	136.5729	0.6632	20.00	1.3074	136.5439	0.6621
30.00	1.4009	138.1660	0.6665	30.00	1.3363	138.1380	0.6654
40.00	1.4311	139.7771	0.6697	40.00	1.3651	139.7499	0.6686
50.00	1.4611	141.4059	0.6729	50.00	1.3939	141.3796	0.6719
60.00	1.4912	143.0525	0.6761	60.00	1.4226	143.0270	0.6751
70.00	1.5212	144.7168	0.6793	70.00	1.4513	144.6920	0.6782
80.00	1.5511	146.3986	0.6825	80.00	1.4799	146.3746	0.6814
90.00	1.5811	148.0978	0.6856	90.00	1.5085	148.0745	0.6845
100.00	1.6110	149.8143	0.6887	100.00	1.5371	149.7917	0.6876
110.00	1.6408	151.5480	0.6917	110.00	1.5656	151.5261	0.6907
120.00	1.6705	153.2981	0.6948	120.00	1.5940	153.2767	0.6937
130.00	1.7004	155.0659	0.6978	130.00	1.6225	155.0451	0.6967
140.00	1.7301	156.8506	0.7008	140.00	1.6510	156.8303	0.6997

TABLE VI (CONT'D)

	PRESSURE=	46.			PRESSURE=	48.	
	GAGE=	31.304			GAGE=	33.304	
SAT	TEMP =	-165.21		SAT	TEMP =	-163.79	

T F°	V	H	S	T F°	V	H	S
-160.00	0.7350	110.8392	0.5945	-160.00	0.7017	110.7751	0.5934
-150.00	0.7652	112.1229	0.5987	-150.00	0.7308	112.0625	0.5976
-140.00	0.7950	113.4212	0.6028	-140.00	0.7595	113.3643	0.6018
-130.00	0.8245	114.7349	0.6069	-130.00	0.7880	114.6811	0.6058
-120.00	0.8538	116.0647	0.6109	-120.00	0.8162	116.0136	0.6098
-110.00	0.8829	117.4111	0.6148	-110.00	0.8442	117.3625	0.6137
-100.00	0.9118	118.7743	0.6186	-100.00	0.8720	118.7280	0.6176
-90.00	0.9405	120.1548	0.6224	-90.00	0.8997	120.1105	0.6214
-80.00	0.9691	121.5527	0.6261	-80.00	0.9272	121.5104	0.6251
-70.00	0.9976	122.9682	0.6298	-70.00	0.9545	122.9277	0.6288
-60.00	1.0260	124.4016	0.6334	-60.00	0.9818	124.3626	0.6324
-50.00	1.0542	125.8528	0.6370	-50.00	1.0089	125.8154	0.6360
-40.00	1.0824	127.3219	0.6406	-40.00	1.0360	127.2859	0.6396
-30.00	1.1104	128.8091	0.6441	-30.00	1.0629	128.7744	0.6431
-20.00	1.1384	130.3142	0.6475	-20.00	1.0898	130.2808	0.6465
-10.00	1.1663	131.8374	0.6510	-10.00	1.1166	131.8052	0.6500
0.	1.1941	133.3786	0.6544	0.	1.1434	133.3475	0.6533
10.00	1.2219	134.9378	0.6577	10.00	1.1700	134.9078	0.6567
20.00	1.2496	136.5149	0.6610	20.00	1.1966	136.4859	0.6600
30.00	1.2773	138.1099	0.6643	30.00	1.2232	138.0819	0.6633
40.00	1.3049	139.7227	0.6676	40.00	1.2497	139.6955	0.6566
50.00	1.3325	141.3533	0.6708	50.00	1.2762	141.3270	0.6698
60.00	1.3600	143.0015	0.6740	60.00	1.3026	142.9760	0.6730
70.00	1.3875	144.6673	0.6772	70.00	1.3289	144.6426	0.6762
80.00	1.4149	146.3506	0.6803	80.00	1.3553	146.3266	0.6793
90.00	1.4423	148.0512	0.6835	90.00	1.3816	148.0279	0.6825
100.00	1.4697	149.7691	0.6866	100.00	1.4078	149.7465	0.6856
110.00	1.4970	151.5041	0.6896	110.00	1.4341	151.4821	0.6886
120.00	1.5242	153.2553	0.6927	120.00	1.4603	153.2348	0.6917
130.00	1.5515	155.0243	0.6957	130.00	1.4864	155.0035	0.6947
140.00	1.5787	156.8101	0.6987	140.00	1.5125	156.7899	0.6977

	PRESSURE=	50.			PRESSURE=	52.	
	GAGE=	35.304			GAGE=	37.304	
SAT	TEMP =	-162.42		SAT	TEMP =	-161.08	

T F°	V	H	S	T F°	V	H	S
-160.00	0.6711	110.7105	0.5923	-160.00	0.6428	110.6453	0.5913
-150.00	0.6992	112.0018	0.5966	-150.00	0.6699	111.9407	0.5956
-140.00	0.7269	113.3070	0.6007	-140.00	0.6968	113.2494	0.5997
-130.00	0.7544	114.6269	0.6048	-130.00	0.7233	114.5725	0.6038
-120.00	0.7816	115.9623	0.6088	-120.00	0.7496	115.9107	0.6078
-110.00	0.8086	117.3136	0.6127	-110.00	0.7757	117.2646	0.6117
-100.00	0.8354	118.6815	0.6166	-100.00	0.8016	118.6347	0.6156
-90.00	0.8620	120.0661	0.6204	-90.00	0.8273	120.0215	0.6194
-80.00	0.8885	121.4679	0.6241	-80.00	0.8529	121.4253	0.6231
-70.00	0.9149	122.8870	0.6278	-70.00	0.8783	122.8462	0.6268
-60.00	0.9411	124.3236	0.6314	-60.00	0.9036	124.2845	0.6305
-50.00	0.9673	125.7779	0.6350	-50.00	0.9288	125.7403	0.6341
-40.00	0.9933	127.2499	0.6386	-40.00	0.9539	127.2138	0.6376
-30.00	1.0193	128.7397	0.6421	-30.00	0.9789	128.7050	0.6411
-20.00	1.0451	130.2474	0.6456	-20.00	1.0039	130.2139	0.6446
-10.00	1.0709	131.7730	0.6490	-10.00	1.0287	131.7407	0.6480
0.	1.0966	133.3164	0.6524	0.	1.0535	133.2852	0.6514
10.00	1.1223	134.8777	0.6557	10.00	1.0782	134.8476	0.6548
20.00	1.1479	136.4568	0.6591	20.00	1.1029	136.4277	0.6581
30.00	1.1734	138.0537	0.6624	30.00	1.1275	138.0255	0.6614
40.00	1.1989	139.6683	0.6656	40.00	1.1520	139.6411	0.6647
50.00	1.2244	141.3006	0.6689	50.00	1.1766	141.2742	0.6679
60.00	1.2498	142.9504	0.6721	60.00	1.2010	142.9249	0.6711
70.00	1.2751	144.6178	0.6752	70.00	1.2254	144.5930	0.6743
80.00	1.3004	146.3025	0.6784	80.00	1.2498	146.2785	0.6775
90.00	1.3257	148.0046	0.6815	90.00	1.2742	147.9812	0.6806
100.00	1.3510	149.7238	0.6846	100.00	1.2985	149.7012	0.6837
110.00	1.3762	151.4601	0.6877	110.00	1.3227	151.4381	0.6868
120.00	1.4014	153.2134	0.6907	120.00	1.3470	153.1921	0.6898
130.00	1.4264	154.9827	0.6938	130.00	1.3711	154.9618	0.6929
140.00	1.4516	156.7697	0.6968	140.00	1.3953	156.7494	0.6959

TABLE VI (CONT'D)

PRESSURE=	54.			PRESSURE=	56.		
GAGE=	39.304			GAGE=	41.304		
SAT TEMP =	-159.78			SAT TEMP =	-158.52		
T F°	V	H	S	T F°	V	H	S
-150.00	0.6429	111.8792	0.5946	-150.00	0.6177	111.8172	0.5936
-140.00	0.6689	113.1915	0.5988	-140.00	0.6429	113.1332	0.5978
-130.00	0.6946	114.5178	0.6028	-130.00	0.6679	114.4628	0.6019
-120.00	0.7200	115.8588	0.6068	-120.00	0.6925	115.8067	0.6059
-110.00	0.7452	117.2154	0.6108	-110.00	0.7170	117.1659	0.6099
-100.00	0.7703	118.5879	0.6147	-100.00	0.7412	118.5408	0.6137
-90.00	0.7951	119.9768	0.6185	-90.00	0.7653	119.9319	0.6176
-80.00	0.8198	121.3825	0.6222	-80.00	0.7892	121.3396	0.6213
-70.00	0.8444	122.8053	0.6259	-70.00	0.8130	122.7642	0.6250
-60.00	0.8689	124.2452	0.6296	-60.00	0.8366	124.2059	0.6287
-50.00	0.8932	125.7026	0.6332	-50.00	0.8601	125.6649	0.6323
-40.00	0.9175	127.1776	0.6367	-40.00	0.8836	127.1413	0.6358
-30.00	0.9416	128.6701	0.6402	-30.00	0.9069	128.6352	0.6394
-20.00	0.9657	130.1804	0.6437	-20.00	0.9302	130.1468	0.6428
-10.00	0.9897	131.7083	0.6471	-10.00	0.9534	131.6759	0.6463
0.	1.0136	133.2540	0.6505	0.	0.9765	133.2227	0.6497
10.00	1.0374	134.8174	0.6539	10.00	0.9995	134.7872	0.6530
20.00	1.0612	136.3986	0.6572	20.00	1.0225	136.3694	0.6564
30.00	1.0850	137.9974	0.6605	30.00	1.0455	137.9692	0.6597
40.00	1.1086	139.6138	0.6638	40.00	1.0683	139.5865	0.6629
50.00	1.1323	141.2478	0.6670	50.00	1.0912	141.2214	0.6662
60.00	1.1559	142.8993	0.6703	60.00	1.1140	142.8737	0.6694
70.00	1.1794	144.5682	0.6734	70.00	1.1367	144.5434	0.6726
80.00	1.2029	146.2544	0.6766	80.00	1.1594	146.2304	0.6757
90.00	1.2264	147.9579	0.6797	90.00	1.1821	147.9345	0.6789
100.00	1.2499	149.6785	0.6828	100.00	1.2047	149.6558	0.6820
110.00	1.2733	151.4161	0.6859	110.00	1.2273	151.3941	0.6850
120.00	1.2967	153.1707	0.6889	120.00	1.2499	153.1493	0.6881
130.00	1.3199	154.9410	0.6920	130.00	1.2724	154.9213	0.6911
140.00	1.3432	156.7292	0.6950	140.00	1.2949	156.7089	0.6941
150.00	1.3665	158.5338	0.6980	150.00	1.3174	158.5141	0.6971

PRESSURE=	58.			PRESSURE=	60.		
GAGE=	43.304			GAGE=	45.304		
SAT TEMP =	-157.29			SAT TEMP =	-156.09		
T F°	V	H	S	T F°	V	H	S
-150.00	0.5943	111.7548	0.5927	-150.00	0.5724	111.6918	0.5918
-140.00	0.6188	113.0746	0.5969	-140.00	0.5962	113.0154	0.5960
-130.00	0.6430	114.4074	0.6010	-130.00	0.6198	114.3521	0.6001
-120.00	0.6669	115.7544	0.6050	-120.00	0.6430	115.7020	0.6042
-110.00	0.6906	117.1162	0.6090	-110.00	0.6660	117.0665	0.6081
-100.00	0.7141	118.4936	0.6129	-100.00	0.6889	118.4462	0.6120
-90.00	0.7374	119.8869	0.6167	-90.00	0.7115	119.8418	0.6158
-80.00	0.7606	121.2966	0.6204	-80.00	0.7340	121.2535	0.6196
-70.00	0.7837	122.7231	0.6242	-70.00	0.7563	122.6818	0.6233
-60.00	0.8066	124.1665	0.6278	-60.00	0.7785	124.1270	0.6270
-50.00	0.8294	125.6271	0.6314	-50.00	0.8006	125.5892	0.6306
-40.00	0.8520	127.1049	0.6350	-40.00	0.8226	127.0685	0.6342
-30.00	0.8746	128.6003	0.6385	-30.00	0.8445	128.5652	0.6377
-20.00	0.8972	130.1131	0.6420	-20.00	0.8663	130.0794	0.6412
-10.00	0.9196	131.6435	0.6454	-10.00	0.8881	131.6110	0.6446
0.	0.9420	133.1914	0.6438	0.	0.9097	133.1601	0.6480
10.00	0.9643	134.7570	0.6522	10.00	0.9313	134.7268	0.6514
20.00	0.9865	136.3402	0.6555	20.00	0.9529	136.3109	0.6547
30.00	1.0087	137.9409	0.6588	30.00	0.9744	137.9126	0.6580
40.00	1.0308	139.5592	0.6621	40.00	0.9958	139.5318	0.6613
50.00	1.0529	141.1949	0.6654	50.00	1.0172	141.1684	0.6646
60.00	1.0749	142.8480	0.6686	60.00	1.0385	142.8224	0.6678
70.00	1.0969	144.5185	0.6718	70.00	1.0598	144.4937	0.6710
80.00	1.1189	146.2063	0.6749	80.00	1.0811	146.1822	0.6741
90.00	1.1408	147.9112	0.6780	90.00	1.1023	147.8878	0.6772
100.00	1.1627	149.6332	0.6811	100.00	1.1235	149.6105	0.6803
110.00	1.1846	151.3721	0.6842	110.00	1.1446	151.3501	0.6834
120.00	1.2064	153.1279	0.6873	120.00	1.1658	153.1065	0.6865
130.00	1.2282	154.9005	0.6903	130.00	1.1869	154.8797	0.6895
140.00	1.2498	156.6886	0.6933	140.00	1.2079	156.6694	0.6925
150.00	1.2716	158.4944	0.6963	150.00	1.2290	158.4757	0.6955

TABLE VI (CONT'D)

	PRESSURE= 62. GAGE= 47.304 SAT TEMP = -154.92				PRESSURE= 64. GAGE= 49.304 SAT TEMP = -153.78		
T F°	V	H	S	T F°	V	H	S
-150.00	0.5519	111.6285	0.5909	-150.00	0.5327	111.5647	0.5901
-140.00	0.5751	112.9560	0.5951	-140.00	0.5553	112.8962	0.5943
-130.00	0.5981	114.2962	0.5993	-130.00	0.5777	114.2399	0.5984
-120.00	0.6207	115.6491	0.6033	-120.00	0.5997	115.5960	0.6025
-110.00	0.6430	117.0164	0.6073	-110.00	0.6215	116.9661	0.6065
-100.00	0.6652	118.3986	0.6112	-100.00	0.6430	118.3508	0.6104
-90.00	0.6872	119.7964	0.6150	-90.00	0.6644	119.7509	0.6142
-80.00	0.7090	121.2102	0.6188	-80.00	0.6856	121.1668	0.6180
-70.00	0.7307	122.6405	0.6225	-70.00	0.7067	122.5990	0.6217
-60.00	0.7523	124.0873	0.6262	-60.00	0.7277	124.0476	0.6254
-50.00	0.7737	125.5511	0.6298	-50.00	0.7485	125.5131	0.6290
-40.00	0.7951	127.0320	0.6334	-40.00	0.7693	126.9955	0.6326
-30.00	0.8163	128.5301	0.6369	-30.00	0.7899	128.4950	0.6361
-20.00	0.8375	130.0456	0.6404	-20.00	0.8104	130.0117	0.6396
-10.00	0.8586	131.5784	0.6438	-10.00	0.8309	131.5458	0.6431
0.	0.8796	133.1287	0.6472	0.	0.8513	133.0973	0.6465
10.00	0.9005	134.6964	0.6506	10.00	0.8717	134.6661	0.6498
20.00	0.9214	136.2817	0.6539	20.00	0.8919	136.2524	0.6532
30.00	0.9423	137.8843	0.6573	30.00	0.9122	137.8560	0.6565
40.00	0.9630	139.5044	0.6605	40.00	0.9323	139.4770	0.6598
50.00	0.9838	141.1419	0.6638	50.00	0.9524	141.1154	0.6630
60.00	1.0044	142.7967	0.6670	60.00	0.9725	142.7710	0.6662
70.00	1.0251	144.4688	0.6702	70.00	0.9925	144.4439	0.6694
80.00	1.0457	146.1580	0.6733	80.00	1.0125	146.1339	0.6726
90.00	1.0663	147.8644	0.6765	90.00	1.0325	147.8410	0.6757
100.00	1.0868	149.5878	0.6796	100.00	1.0524	149.5650	0.6788
110.00	1.1073	151.3280	0.6827	110.00	1.0723	151.3060	0.6819
120.00	1.1278	153.0851	0.6857	120.00	1.0921	153.0637	0.6850
130.00	1.1482	154.8589	0.6887	130.00	1.1120	154.8381	0.6880
140.00	1.1686	156.6492	0.6918	140.00	1.1318	156.6290	0.6910
150.00	1.1890	158.4560	0.6947	150.00	1.1515	158.4364	0.6940

	PRESSURE= 66. GAGE= 51.304 SAT TEMP = -152.67				PRESSURE= 68. GAGE= 53.304 SAT TEMP = -151.58		
T F°	V	H	S	T F°	V	H	S
-150.00	0.5147	111.5004	0.5892	-150.00	0.4976	111.4356	0.5884
-140.00	0.5367	112.8361	0.5935	-140.00	0.5192	112.7755	0.5927
-130.00	0.5585	114.1834	0.5976	-130.00	0.5405	114.1265	0.5968
-120.00	0.5800	115.5426	0.6017	-120.00	0.5614	115.4890	0.6009
-110.00	0.6012	116.9155	0.6057	-110.00	0.5821	116.8648	0.6049
-100.00	0.6222	118.3028	0.6096	-100.00	0.6026	118.2547	0.6088
-90.00	0.6430	119.7052	0.6134	-90.00	0.6229	119.6594	0.6127
-80.00	0.6636	121.1221	0.6172	-80.00	0.6429	121.0787	0.6165
-70.00	0.6842	122.5573	0.6210	-70.00	0.6630	122.5156	0.6202
-60.00	0.7046	124.0078	0.6246	-60.00	0.6828	123.9678	0.6239
-50.00	0.7248	125.4749	0.6283	-50.00	0.7024	125.4353	0.6275
-40.00	0.7450	126.9588	0.6318	-40.00	0.7222	126.9221	0.6311
-30.00	0.7651	128.4597	0.6354	-30.00	0.7417	128.4244	0.6346
-20.00	0.7850	129.9778	0.6389	-20.00	0.7611	129.9439	0.6381
-10.00	0.8049	131.5132	0.6423	-10.00	0.7805	131.4805	0.6416
0.	0.8248	133.0658	0.6457	0.	0.7998	133.0342	0.6450
10.00	0.8445	134.6357	0.6491	10.00	0.8190	134.6053	0.6484
20.00	0.8642	136.2230	0.6524	20.00	0.8382	136.1936	0.6517
30.00	0.8839	137.8276	0.6558	30.00	0.8573	137.7992	0.6550
40.00	0.9035	139.4496	0.6590	40.00	0.8763	139.4221	0.6583
50.00	0.9230	141.0888	0.6623	50.00	0.8953	141.0623	0.6616
60.00	0.9425	142.7453	0.6655	60.00	0.9143	142.7196	0.6648
70.00	0.9620	144.4190	0.6687	70.00	0.9332	144.3941	0.6680
80.00	0.9814	146.1098	0.6719	80.00	0.9520	146.0856	0.6711
90.00	1.0007	147.8176	0.6750	90.00	0.9709	147.7941	0.6743
100.00	1.0201	149.5423	0.6781	100.00	0.9897	149.5196	0.6774
110.00	1.0394	151.2839	0.6812	110.00	1.0084	151.2619	0.6805
120.00	1.0587	153.0423	0.6842	120.00	1.0272	153.0209	0.6835
130.00	1.0779	154.8173	0.6873	130.00	1.0459	154.7965	0.6866
140.00	1.0971	156.6088	0.6903	140.00	1.0645	156.5886	0.6896
150.00	1.1163	158.4167	0.6933	150.00	1.0832	158.3971	0.6926

TABLE VI (CONT'D)

PRESSURE=	70.			PRESSURE=	72.		
GAGE=	55.304			GAGE=	57.304		
SAT TEMP =	-150.51			SAT TEMP =	-149.46		
T F°	V	H	S	T F°	V	H	S
-150.00	0.4816	111.3703	0.5876	-140.00	0.4870	112.6530	0.5911
-140.00	0.5027	112.7145	0.5919	-130.00	0.5073	114.0112	0.5953
-130.00	0.5234	114.0682	0.5961	-120.00	0.5274	115.3809	0.5994
-120.00	0.5439	115.4351	0.6002	-110.00	0.5471	116.7625	0.6034
-110.00	0.5641	116.8138	0.6042	-100.00	0.5666	118.1577	0.6074
-100.00	0.5841	118.2063	0.6081	-90.00	0.5858	119.5662	0.6112
-90.00	0.6039	119.6134	0.6119	-80.00	0.6050	120.9914	0.6150
-80.00	0.6234	121.0352	0.6157	-70.00	0.6240	122.4307	0.6188
-70.00	0.6430	122.4737	0.6195	-60.00	0.6429	123.8867	0.6225
-60.00	0.6622	123.9265	0.6232	-50.00	0.6616	125.3590	0.6261
-50.00	0.6814	125.3972	0.6268	-40.00	0.6803	126.8484	0.6297
-40.00	0.7006	126.8852	0.6304	-30.00	0.6988	128.3536	0.6332
-30.00	0.7197	128.3891	0.6339	-20.00	0.7173	129.8758	0.6367
-20.00	0.7386	129.9099	0.6374	-10.00	0.7357	131.4149	0.6402
-10.00	0.7574	131.4477	0.6409	0.	0.7540	132.9710	0.6436
0.	0.7762	133.0027	0.6443	10.00	0.7722	134.5443	0.6470
10.00	0.7949	134.5748	0.6477	20.00	0.7904	136.1348	0.6504
20.00	0.8136	136.1642	0.6510	30.00	0.8085	137.7424	0.6537
30.00	0.8322	137.7708	0.6543	40.00	0.8265	139.3671	0.6570
40.00	0.8507	139.3947	0.6576	50.00	0.8445	141.0091	0.6602
50.00	0.8692	141.0357	0.6609	60.00	0.8625	142.6681	0.6634
60.00	0.8876	142.6938	0.6641	70.00	0.8804	144.3441	0.6666
70.00	0.9060	144.3691	0.6673	80.00	0.8983	146.0372	0.6698
80.00	0.9244	146.0614	0.6705	90.00	0.9161	147.7472	0.6729
90.00	0.9427	147.7707	0.6736	100.00	0.9339	149.4741	0.6760
100.00	0.9610	149.4968	0.6767	110.00	0.9517	151.2177	0.6791
110.00	0.9792	151.2398	0.6798	120.00	0.9694	152.9780	0.6822
120.00	0.9975	152.9994	0.6829	130.00	0.9871	154.7548	0.6852
130.00	1.0157	154.7756	0.6859	140.00	1.0048	156.5481	0.6882
140.00	1.0338	156.5683	0.6889	150.00	1.0225	158.3577	0.6912
150.00	1.0520	158.3774	0.6919	160.00	1.0401	160.1836	0.6942

PRESSURE=	74.			PRESSURE=	76.		
GAGE=	59.304			GAGE=	61.304		
SAT TEMP =	-148.44			SAT TEMP =	-147.44		
T F°	V	H	S	T F°	V	H	S
-140.00	0.4722	112.5912	0.5904	-140.00	0.4582	112.5289	0.5897
-130.00	0.4921	113.9537	0.5946	-130.00	0.4777	113.8957	0.5939
-120.00	0.5117	115.3264	0.5987	-120.00	0.4968	115.2704	0.5980
-110.00	0.5309	116.7099	0.6027	-110.00	0.5157	116.6586	0.6020
-100.00	0.5501	118.1090	0.6066	-100.00	0.5344	118.0600	0.6060
-90.00	0.5689	119.5202	0.6105	-90.00	0.5528	119.4739	0.6098
-80.00	0.5876	120.9475	0.6143	-80.00	0.5711	120.9033	0.6136
-70.00	0.6061	122.3889	0.6181	-70.00	0.5892	122.3469	0.6174
-60.00	0.6245	123.8467	0.6218	-60.00	0.6072	123.8065	0.6211
-50.00	0.6428	125.3207	0.6254	-50.00	0.6251	125.2822	0.6247
-40.00	0.6610	126.8101	0.6290	-40.00	0.6428	126.7733	0.6283
-30.00	0.6792	128.3181	0.6326	-30.00	0.6605	128.2826	0.6319
-20.00	0.6972	129.8416	0.6361	-20.00	0.6781	129.8074	0.6354
-10.00	0.7151	131.3820	0.6395	-10.00	0.6956	131.3491	0.6389
0.	0.7329	132.9394	0.6429	0.	0.7130	132.9077	0.6423
10.00	0.7507	134.5138	0.6463	10.00	0.7303	134.4832	0.6457
20.00	0.7684	136.1053	0.6497	20.00	0.7476	136.0758	0.6490
30.00	0.7860	137.7139	0.6530	30.00	0.7648	137.6854	0.6524
40.00	0.8036	139.3396	0.6563	40.00	0.7820	139.3120	0.6557
50.00	0.8212	140.9824	0.6595	50.00	0.7991	140.9557	0.6589
60.00	0.8387	142.6423	0.6628	60.00	0.8162	142.6165	0.6621
70.00	0.8561	144.3192	0.6660	70.00	0.8331	144.2928	0.6653
80.00	0.8736	146.0130	0.6691	80.00	0.8502	145.9888	0.6685
90.00	0.8909	147.7238	0.6723	90.00	0.8671	147.7003	0.6716
100.00	0.9083	149.4513	0.6754	100.00	0.8840	149.4285	0.6748
110.00	0.9256	151.1956	0.6785	110.00	0.9009	151.1735	0.6779
120.00	0.9429	152.9565	0.6815	120.00	0.9177	152.9351	0.6809
130.00	0.9601	154.7340	0.6846	130.00	0.9346	154.7131	0.6840
140.00	0.9774	156.5279	0.6876	140.00	0.9514	156.5076	0.6870
150.00	0.9946	158.3381	0.6906	150.00	0.9681	158.3184	0.6900
160.00	1.0117	160.1644	0.6936	160.00	0.9849	160.1453	0.6929

TABLE VI (CONT'D)

	PRESSURE=	78.			PRESSURE=	80.
	GAGE=	63.304			GAGE=	65.304
SAT TEMP =		-146.45		SAT TEMP =		-145.48

T F°	V	H	S	T F°	V	H	S
-140.00	0.4449	112.4662	0.5889	-140.00	0.4322	112.4030	0.5882
-130.00	0.4640	113.8372	0.5932	-130.00	0.4510	113.7782	0.5925
-120.00	0.4827	115.2159	0.5973	-120.00	0.4694	115.1609	0.5966
-110.00	0.5012	116.6070	0.6013	-110.00	0.4875	116.5550	0.6006
-100.00	0.5195	118.0108	0.6053	-100.00	0.5053	117.9601	0.6046
-90.00	0.5375	119.4275	0.6092	-90.00	0.5230	119.3808	0.6085
-80.00	0.5554	120.8589	0.6130	-80.00	0.5405	120.8144	0.6123
-70.00	0.5731	122.3047	0.6167	-70.00	0.5579	122.2624	0.6161
-60.00	0.5907	123.7663	0.6204	-60.00	0.5751	123.7258	0.6198
-50.00	0.6082	125.2436	0.6241	-50.00	0.5922	125.2049	0.6235
-40.00	0.6255	126.7364	0.6277	-40.00	0.6091	126.6994	0.6271
-30.00	0.6427	128.2454	0.6312	-30.00	0.6259	128.2099	0.6306
-20.00	0.6600	129.7732	0.6348	-20.00	0.6428	129.7388	0.6341
-10.00	0.6770	131.3161	0.6382	-10.00	0.6594	131.2831	0.6376
0.	0.6940	132.8759	0.6417	0.	0.6761	132.8441	0.6410
10.00	0.7110	134.4526	0.6451	10.00	0.6926	134.4219	0.6444
20.00	0.7278	136.0462	0.6484	20.00	0.7091	136.0166	0.6478
30.00	0.7446	137.6568	0.6517	30.00	0.7255	137.6283	0.6511
40.00	0.7614	139.2845	0.6550	40.00	0.7419	139.2568	0.6544
50.00	0.7781	140.9291	0.6583	50.00	0.7582	140.9024	0.6577
60.00	0.7948	142.5906	0.6615	60.00	0.7745	142.5648	0.6609
70.00	0.8113	144.2679	0.6647	70.00	0.7906	144.2430	0.6641
80.00	0.8280	145.9646	0.6679	80.00	0.8068	145.9388	0.6673
90.00	0.8445	147.6768	0.6710	90.00	0.8230	147.6533	0.6704
100.00	0.8610	149.4057	0.6741	100.00	0.8391	149.3829	0.6735
110.00	0.8775	151.1514	0.6772	110.00	0.8552	151.1292	0.6766
120.00	0.8939	152.9136	0.6803	120.00	0.8712	152.8921	0.6797
130.00	0.9103	154.6923	0.6833	130.00	0.8873	154.6714	0.6827
140.00	0.9267	156.4874	0.6864	140.00	0.9033	156.4671	0.6858
150.00	0.9430	158.2987	0.6894	150.00	0.9192	158.2790	0.6888
160.00	0.9594	160.1262	0.6923	160.00	0.9352	160.1070	0.6917

	PRESSURE=	82.			PRESSURE=	84.
	GAGE=	67.304			GAGE=	69.304
SAT TEMP =		-144.54		SAT TEMP =		-143.60

T F°	V	H	S	T F°	V	H	S
-140.00	0.4202	112.3393	0.5875	-140.00	0.4088	112.2771	0.5869
-130.00	0.4386	113.7187	0.5918	-130.00	0.4268	113.6587	0.5911
-120.00	0.4567	115.1054	0.5959	-120.00	0.4445	115.0496	0.5953
-110.00	0.4744	116.5027	0.6000	-110.00	0.4619	116.4497	0.5993
-100.00	0.4919	117.9109	0.6040	-100.00	0.4791	117.8615	0.6033
-90.00	0.5092	119.3338	0.6079	-90.00	0.4961	119.2866	0.6072
-80.00	0.5264	120.7696	0.6117	-80.00	0.5129	120.7246	0.6111
-70.00	0.5433	122.2199	0.6155	-70.00	0.5295	122.1772	0.6148
-60.00	0.5602	123.6852	0.6192	-60.00	0.5460	123.6445	0.6186
-50.00	0.5769	125.1660	0.6228	-50.00	0.5624	125.1270	0.6222
-40.00	0.5935	126.6623	0.6264	-40.00	0.5786	126.6251	0.6258
-30.00	0.6099	128.1744	0.6300	-30.00	0.5947	128.1388	0.6294
-20.00	0.6264	129.7045	0.6335	-20.00	0.6107	129.6684	0.6329
-10.00	0.6427	131.2500	0.6370	-10.00	0.6268	131.2169	0.6364
0.	0.6590	132.8122	0.6404	0.	0.6427	132.7803	0.6398
10.00	0.6751	134.3912	0.6438	10.00	0.6585	134.3605	0.6432
20.00	0.6912	135.9870	0.6472	20.00	0.6743	135.9573	0.6466
30.00	0.7073	137.5996	0.6505	30.00	0.6899	137.5710	0.6499
40.00	0.7233	139.2292	0.6538	40.00	0.7056	139.2015	0.6532
50.00	0.7392	140.8756	0.6571	50.00	0.7212	140.8489	0.6565
60.00	0.7551	142.5389	0.6603	60.00	0.7367	142.5130	0.6597
70.00	0.7709	144.2181	0.6635	70.00	0.7522	144.1931	0.6629
80.00	0.7867	145.9146	0.6667	80.00	0.7676	145.8905	0.6661
90.00	0.8026	147.6297	0.6698	90.00	0.7831	147.6062	0.6693
100.00	0.8183	149.3601	0.6730	100.00	0.7985	149.3373	0.6724
110.00	0.8340	151.1071	0.6760	110.00	0.8139	151.0850	0.6755
120.00	0.8497	152.8706	0.6791	120.00	0.8292	152.8491	0.6785
130.00	0.8653	154.6506	0.6822	130.00	0.8445	154.6297	0.6816
140.00	0.8810	156.4468	0.6852	140.00	0.8597	156.4266	0.6846
150.00	0.8966	158.2593	0.6882	150.00	0.8750	158.2396	0.6876
160.00	0.9121	160.0879	0.6912	160.00	0.8902	160.0688	0.6906

TABLE VI (CONT'D)

PRESSURE=	86.			PRESSURE=	88.		
GAGE=	71.304			GAGE=	73.304		
SAT TEMP =	-142.69			SAT TEMP =	-141.79		

T F°	V	H	S	T F°	V	H	S
-140.00	0.3978	112.2127	0.5862	-140.00	0.3874	112.1478	0.5855
-130.00	0.4155	113.5981	0.5905	-130.00	0.4047	113.5371	0.5898
-120.00	0.4329	114.9933	0.5946	-120.00	0.4219	114.9366	0.5940
-110.00	0.4500	116.3971	0.5987	-110.00	0.4387	116.3437	0.5981
-100.00	0.4669	117.8117	0.6027	-100.00	0.4552	117.7617	0.6021
-90.00	0.4835	119.2392	0.6066	-90.00	0.4716	119.1915	0.6060
-80.00	0.5000	120.6794	0.6105	-80.00	0.4877	120.6340	0.6099
-70.00	0.5163	122.1343	0.6142	-70.00	0.5037	122.0913	0.6136
-60.00	0.5325	123.6036	0.6180	-60.00	0.5195	123.5625	0.6174
-50.00	0.5485	125.0879	0.6216	-50.00	0.5353	125.0487	0.6210
-40.00	0.5644	126.5877	0.6252	-40.00	0.5509	126.5502	0.6247
-30.00	0.5802	128.1030	0.6288	-30.00	0.5663	128.0672	0.6282
-20.00	0.5959	129.6342	0.6323	-20.00	0.5817	129.5999	0.6318
-10.00	0.6116	131.1837	0.6358	-10.00	0.5971	131.1505	0.6352
0.	0.6270	132.7467	0.6393	0.	0.6122	132.7150	0.6387
10.00	0.6426	134.3297	0.6427	10.00	0.6275	134.2989	0.6421
20.00	0.6580	135.9276	0.6460	20.00	0.6426	135.8979	0.6455
30.00	0.6734	137.5423	0.6494	30.00	0.6576	137.5136	0.6488
40.00	0.6887	139.1738	0.6527	40.00	0.6725	139.1445	0.6521
50.00	0.7040	140.8221	0.6559	50.00	0.6875	140.7953	0.6554
60.00	0.7192	142.4871	0.6592	60.00	0.7024	142.4612	0.6586
70.00	0.7343	144.1681	0.6624	70.00	0.7172	144.1431	0.6618
80.00	0.7494	145.8663	0.6655	80.00	0.7320	145.8421	0.6650
90.00	0.7645	147.5810	0.6687	90.00	0.7468	147.5576	0.6681
100.00	0.7796	149.3145	0.6718	100.00	0.7616	149.2916	0.6713
110.00	0.7946	151.0628	0.6749	110.00	0.7763	151.0406	0.6744
120.00	0.8096	152.8276	0.6780	120.00	0.7909	152.8061	0.6774
130.00	0.8246	154.6088	0.6810	130.00	0.8055	154.5863	0.6805
140.00	0.8395	156.4063	0.6840	140.00	0.8202	156.3860	0.6835
150.00	0.8544	158.2199	0.6870	150.00	0.8347	158.2002	0.6865
160.00	0.8693	160.0496	0.6900	160.00	0.8493	160.0305	0.6895

PRESSURE=	90.			PRESSURE=	92.		
GAGE=	75.304			GAGE=	77.304		
SAT TEMP =	-140.90			SAT TEMP =	-140.03		

T F°	V	H	S	T F°	V	H	S
-140.00	0.3774	112.0824	0.5849	-140.00	0.3678	112.0165	0.5843
-130.00	0.3945	113.4779	0.5892	-130.00	0.3847	113.4167	0.5886
-120.00	0.4113	114.8795	0.5934	-120.00	0.4012	114.8219	0.5928
-110.00	0.4278	116.2900	0.5975	-110.00	0.4174	116.2358	0.5969
-100.00	0.4441	117.7113	0.6015	-100.00	0.4334	117.6606	0.6009
-90.00	0.4601	119.1435	0.6054	-90.00	0.4491	119.0953	0.6048
-80.00	0.4759	120.5883	0.6093	-80.00	0.4647	120.5425	0.6087
-70.00	0.4917	122.0480	0.6131	-70.00	0.4801	122.0046	0.6125
-60.00	0.5072	123.5213	0.6168	-60.00	0.4954	123.4799	0.6162
-50.00	0.5226	125.0093	0.6205	-50.00	0.5105	124.9697	0.6199
-40.00	0.5379	126.5126	0.6241	-40.00	0.5255	126.4749	0.6235
-30.00	0.5531	128.0313	0.6277	-30.00	0.5404	127.9952	0.6271
-20.00	0.5682	129.5654	0.6312	-20.00	0.5552	129.5309	0.6306
-10.00	0.5831	131.1155	0.6347	-10.00	0.5699	131.0824	0.6341
0.	0.5981	132.6831	0.6381	0.	0.5845	132.6512	0.6376
10.00	0.6130	134.2680	0.6415	10.00	0.5991	134.2353	0.6410
20.00	0.6278	135.8681	0.6449	20.00	0.6137	135.8383	0.6444
30.00	0.6425	137.4849	0.6482	30.00	0.6281	137.4562	0.6477
40.00	0.6571	139.1169	0.6515	40.00	0.6424	139.0893	0.6510
50.00	0.6718	140.7684	0.6548	50.00	0.6568	140.7416	0.6543
60.00	0.6864	142.4352	0.6581	60.00	0.6711	142.4093	0.6575
70.00	0.7009	144.1181	0.6613	70.00	0.6853	144.0931	0.6607
80.00	0.7154	145.8179	0.6644	80.00	0.6995	145.7936	0.6639
90.00	0.7298	147.5341	0.6676	90.00	0.7137	147.5107	0.6671
100.00	0.7443	149.2687	0.6707	100.00	0.7278	149.2442	0.6702
110.00	0.7587	151.0185	0.6738	110.00	0.7419	150.9963	0.6733
120.00	0.7731	152.7846	0.6769	120.00	0.7560	152.7631	0.6764
130.00	0.7873	154.5655	0.6799	130.00	0.7700	154.5447	0.6794
140.00	0.8017	156.3657	0.6830	140.00	0.7840	156.3454	0.6824
150.00	0.8160	158.1805	0.6860	150.00	0.7980	158.1608	0.6854
160.00	0.8302	160.0113	0.6889	160.00	0.8120	159.9921	0.6884

TABLE VI (CONT'D)|

	PRESSURE=	94.			PRESSURE=	96.	
	GAGE=	79.304			GAGE=	81.304	
SAT	TEMP =	-139.17		SAT	TEMP =	-138.33	

T F°	V	H	S	T F°	V	H	S
-130.00	0.3752	113.3550	0.5880	-130.00	0.3662	113.2929	0.5874
-120.00	0.3914	114.7638	0.5922	-120.00	0.3821	114.7053	0.5916
-110.00	0.4074	116.1813	0.5963	-110.00	0.3978	116.1265	0.5957
-100.00	0.4232	117.6096	0.6003	-100.00	0.4134	117.5583	0.5997
-90.00	0.4386	119.0468	0.6042	-90.00	0.4285	118.9981	0.6037
-80.00	0.4539	120.4964	0.6081	-80.00	0.4437	120.4523	0.6076
-70.00	0.4691	121.9610	0.6119	-70.00	0.4585	121.9172	0.6114
-60.00	0.4841	123.4383	0.6157	-60.00	0.4732	123.3966	0.6151
-50.00	0.4989	124.9301	0.6194	-50.00	0.4878	124.8903	0.6188
-40.00	0.5137	126.4371	0.6230	-40.00	0.5023	126.3992	0.6224
-30.00	0.5283	127.9591	0.6266	-30.00	0.5166	127.9228	0.6260
-20.00	0.5428	129.4963	0.6301	-20.00	0.5309	129.4617	0.6296
-10.00	0.5572	131.0492	0.6336	-10.00	0.5450	131.0160	0.6331
0.	0.5716	132.6193	0.6371	0.	0.5591	132.5873	0.6365
10.00	0.5858	134.2045	0.6405	10.00	0.5731	134.1738	0.6399
20.00	0.6001	135.8085	0.6438	20.00	0.5872	135.7786	0.6433
30.00	0.6143	137.4274	0.6472	30.00	0.6011	137.3985	0.6467
40.00	0.6283	139.0617	0.6505	40.00	0.6148	139.0340	0.6500
50.00	0.6424	140.7130	0.6538	50.00	0.6286	140.6863	0.6532
60.00	0.6565	142.3833	0.6570	60.00	0.6424	142.3573	0.6565
70.00	0.6704	144.0680	0.6602	70.00	0.6561	144.0429	0.6597
80.00	0.6843	145.7694	0.6634	80.00	0.6697	145.7451	0.6629
90.00	0.6982	147.4872	0.6666	90.00	0.6833	147.4637	0.6660
100.00	0.7120	149.2214	0.6697	100.00	0.6969	149.1986	0.6692
110.00	0.7259	150.9741	0.6728	110.00	0.7105	150.9519	0.6723
120.00	0.7397	152.7415	0.6759	120.00	0.7240	152.7200	0.6754
130.00	0.7533	154.5238	0.6789	130.00	0.7374	154.5030	0.6784
140.00	0.7670	156.3233	0.6819	140.00	0.7508	156.3031	0.6814
150.00	0.7808	158.1411	0.6849	150.00	0.7643	158.1213	0.6844
160.00	0.7945	159.9730	0.6879	160.00	0.7777	159.9538	0.6874
170.00	0.8081	161.8208	0.6909	170.00	0.7911	161.8021	0.6904

	PRESSURE=	98.			PRESSURE=	100.	
	GAGE=	83.304			GAGE=	85.304	
SAT	TEMP =	-137.50		SAT	TEMP =	-136.68	

T F°	V	H	S	T F°	V	H	S
-130.00	0.3575	113.2304	0.5868	-130.00	0.3491	113.1675	0.5862
-120.00	0.3733	114.6489	0.5910	-120.00	0.3647	114.5902	0.5904
-110.00	0.3888	116.0737	0.5951	-110.00	0.3800	116.0189	0.5946
-100.00	0.4040	117.5067	0.5992	-100.00	0.3949	117.4547	0.5986
-90.00	0.4189	118.9490	0.6031	-90.00	0.4097	118.9023	0.6026
-80.00	0.4338	120.4063	0.6070	-80.00	0.4243	120.3602	0.6065
-70.00	0.4483	121.8732	0.6108	-70.00	0.4386	121.8290	0.6103
-60.00	0.4628	123.3548	0.6146	-60.00	0.4528	123.3127	0.6141
-50.00	0.4771	124.8503	0.6183	-50.00	0.4669	124.8102	0.6178
-40.00	0.4914	126.3611	0.6219	-40.00	0.4809	126.3229	0.6214
-30.00	0.5055	127.8865	0.6255	-30.00	0.4948	127.8500	0.6250
-20.00	0.5195	129.4269	0.6291	-20.00	0.5085	129.3920	0.6285
-10.00	0.5334	130.9827	0.6326	-10.00	0.5222	130.9493	0.6320
0.	0.5472	132.5552	0.6360	0.	0.5358	132.5231	0.6355
10.00	0.5610	134.1429	0.6394	10.00	0.5493	134.1120	0.6389
20.00	0.5746	135.7467	0.6428	20.00	0.5627	135.7170	0.6423
30.00	0.5884	137.3697	0.6462	30.00	0.5762	137.3408	0.6457
40.00	0.6019	139.0062	0.6495	40.00	0.5895	138.9785	0.6490
50.00	0.6154	140.6595	0.6527	50.00	0.6027	140.6327	0.6522
.60.00	0.6289	142.3312	0.6560	60.00	0.6159	142.3033	0.6555
70.00	0.6424	144.0178	0.6592	70.00	0.6292	143.9926	0.6587
80.00	0.6557	145.7208	0.6624	80.00	0.6423	145.6964	0.6619
90.00	0.6691	147.4401	0.6655	90.00	0.6554	147.4166	0.6651
100.00	0.6824	149.1759	0.6687	100.00	0.6684	149.1530	0.6682
110.00	0.6956	150.9279	0.6718	110.00	0.6815	150.9058	0.6713
120.00	0.7090	152.6984	0.6749	120.00	0.6945	152.6769	0.6744
130.00	0.7221	154.4822	0.6779	130.00	0.7075	154.4613	0.6774
140.00	0.7353	156.2829	0.6809	140.00	0.7204	156.2627	0.6805
150.00	0.7485	158.1016	0.6839	150.00	0.7333	158.0800	0.6835
160.00	0.7617	159.9347	0.6869	160.00	0.7463	159.9155	0.6864
170.00	0.7748	161.7835	0.6899	170.00	0.7591	161.7649	0.6894

TABLE VI (CONT'D)

PRESSURE= 105.				PRESSURE= 110.			
GAGE= 90.304				GAGE= 95.304			
SAT TEMP = -134.68				SAT TEMP = -132.75			
T F°	V	H	S	T F°	V	H	S
-130.00	0.3296	113.0081	0.5847	-130.00	0.3118	112.8458	0.5833
-120.00	0.3447	114.4421	0.5890	-120.00	0.3264	114.2917	0.5877
-110.00	0.3594	115.8804	0.5932	-110.00	0.3407	115.7400	0.5919
-100.00	0.3738	117.3234	0.5973	-100.00	0.3547	117.1939	0.5960
-90.00	0.3881	118.7796	0.6013	-90.00	0.3684	118.6556	0.6000
-80.00	0.4021	120.2441	0.6052	-80.00	0.3819	120.1269	0.6039
-70.00	0.4159	121.7203	0.6090	-70.00	0.3952	121.6092	0.6078
-60.00	0.4295	123.2069	0.6128	-60.00	0.4084	123.1035	0.6115
-50.00	0.4430	124.7094	0.6165	-50.00	0.4214	124.6108	0.6153
-40.00	0.4564	126.2269	0.6201	-40.00	0.4342	126.1302	0.6189
-30.00	0.4698	127.7585	0.6237	-30.00	0.4470	127.6662	0.6225
-20.00	0.4830	129.3045	0.6273	-20.00	0.4597	129.2164	0.6261
-10.00	0.4960	130.8655	0.6308	-10.00	0.4723	130.7811	0.6296
0.	0.5091	132.4424	0.6343	0.	0.4848	132.3613	0.6331
10.00	0.5220	134.0346	0.6377	10.00	0.4972	133.9567	0.6365
20.00	0.5348	135.6425	0.6411	20.00	0.5095	135.5677	0.6399
30.00	0.5476	137.2663	0.6444	30.00	0.5218	137.1943	0.6433
40.00	0.5604	138.9089	0.6478	40.00	0.5341	138.8391	0.6466
50.00	0.5731	140.5656	0.6510	50.00	0.5462	140.4983	0.6499
60.00	0.5858	142.2385	0.6543	60.00	0.5583	142.1735	0.6532
70.00	0.5984	143.9296	0.6575	70.00	0.5705	143.8665	0.6564
80.00	0.6110	145.6355	0.6607	80.00	0.5825	145.5745	0.6596
90.00	0.6235	147.3576	0.6639	90.00	0.5945	147.2986	0.6627
100.00	0.6360	149.0960	0.6670	100.00	0.6064	149.0388	0.6659
110.00	0.6484	150.8504	0.6701	110.00	0.6183	150.7950	0.6690
120.00	0.6608	152.6210	0.6732	120.00	0.6302	152.5673	0.6721
130.00	0.6732	154.4092	0.6763	130.00	0.6421	154.3570	0.6751
140.00	0.6856	156.2121	0.6793	140.00	0.6539	156.1614	0.6782
150.00	0.6979	158.0308	0.6823	150.00	0.6657	157.9816	0.6812
160.00	0.7103	159.8675	0.6853	160.00	0.6775	159.8176	0.6842
170.00	0.7226	161.7183	0.6882	170.00	0.6893	161.6717	0.6871

PRESSURE= 115.				PRESSURE= 120.			
GAGE= 100.304				GAGE= 105.304			
SAT TEMP = -130.88				SAT TEMP = -129.07			
T F°	V	H	S	T F°	V	H	S
-130.00	0.2955	112.6804	0.5820	-120.00	0.2944	113.9833	0.5851
-120.00	0.3097	114.1387	0.5863	-110.00	0.3078	115.4533	0.5893
-110.00	0.3236	115.5977	0.5906	-100.00	0.3210	116.9258	0.5935
-100.00	0.3371	117.0607	0.5947	-90.00	0.3339	118.4037	0.5975
-90.00	0.3504	118.5304	0.5987	-80.00	0.3464	119.8876	0.6015
-80.00	0.3634	120.0087	0.6027	-70.00	0.3590	121.3843	0.6054
-70.00	0.3763	121.4972	0.6065	-60.00	0.3711	122.8879	0.6092
-60.00	0.3890	122.9971	0.6103	-50.00	0.3833	124.4072	0.6129
-50.00	0.4015	124.5085	0.6141	-40.00	0.3953	125.9362	0.6166
-40.00	0.4140	126.0350	0.6178	-30.00	0.4072	127.4808	0.6203
-30.00	0.4262	127.5731	0.6214	-20.00	0.4189	129.0372	0.6239
-20.00	0.4385	129.1279	0.6250	-10.00	0.4306	130.6104	0.6274
-10.00	0.4505	130.6952	0.6285	0.	0.4422	132.1974	0.6309
0.	0.4625	132.2788	0.6320	10.00	0.4537	133.7986	0.6343
10.00	0.4745	133.8767	0.6354	20.00	0.4652	135.4171	0.6377
20.00	0.4864	135.4925	0.6388	30.00	0.4765	137.0494	0.6411
30.00	0.4982	137.1220	0.6422	40.00	0.4878	138.6973	0.6444
40.00	0.5099	138.7672	0.6455	50.00	0.4991	140.3622	0.6477
50.00	0.5216	140.4298	0.6488	60.00	0.5103	142.0418	0.6510
60.00	0.5332	142.1070	0.6521	70.00	0.5215	143.7387	0.6542
70.00	0.5449	143.8018	0.6553	80.00	0.5326	145.4503	0.6574
80.00	0.5564	145.5113	0.6585	90.00	0.5437	147.1801	0.6606
90.00	0.5680	147.2394	0.6617	100.00	0.5547	148.9241	0.6638
100.00	0.5795	148.9815	0.6648	110.00	0.5657	150.6840	0.6669
110.00	0.5909	150.7395	0.6679	120.00	0.5767	152.4597	0.6700
120.00	0.6023	152.5135	0.6710	130.00	0.5876	154.2512	0.6730
130.00	0.6137	154.3034	0.6741	140.00	0.5985	156.0585	0.6761
140.00	0.6251	156.1116	0.6771	150.00	0.6095	157.8843	0.6791
150.00	0.6364	157.9337	0.6801	160.00	0.6203	159.7236	0.6821
160.00	0.6477	159.7716	0.6831	170.00	0.6312	161.5784	0.6850
170.00	0.6590	161.6250	0.6861	180.00	0.6420	163.4478	0.6880

TABLE VI (CONT'D)

PRESSURE=	125.			PRESSURE=	130.		
GAGE=	110.304			GAGE=	115.304		
SAT TEMP =	-127.32			SAT TEMP =	-125.61		

T F°	V	H	S	T F°	V	H	S
-120.00	0.2802	113.8250	0.5838	-120.00	0.2670	113.6607	0.5826
-110.00	0.2933	115.3068	0.5881	-110.00	0.2799	115.1562	0.5869
-100.00	0.3061	116.7892	0.5923	-100.00	0.2924	116.6508	0.5911
-90.00	0.3186	118.2757	0.5964	-90.00	0.3046	118.1462	0.5952
-80.00	0.3309	119.7680	0.6004	-80.00	0.3165	119.6469	0.5992
-70.00	0.3430	121.2704	0.6043	-70.00	0.3282	121.1537	0.6032
-60.00	0.3548	122.7809	0.6081	-60.00	0.3398	122.6728	0.6070
-50.00	0.3666	124.3048	0.6119	-50.00	0.3512	124.2015	0.6108
-40.00	0.3782	125.8391	0.6156	-40.00	0.3624	125.7412	0.6145
-30.00	0.3897	127.3878	0.6192	-30.00	0.3735	127.2941	0.6182
-20.00	0.4010	128.9485	0.6228	-20.00	0.3845	128.8593	0.6218
-10.00	0.4123	130.5252	0.6263	-10.00	0.3954	130.4394	0.6253
0.	0.4235	132.1156	0.6298	0.	0.4062	132.0333	0.6288
10.00	0.4346	133.7201	0.6333	10.00	0.4170	133.6413	0.6323
20.00	0.4457	135.3413	0.6367	20.00	0.4277	135.2651	0.6357
30.00	0.4566	136.9766	0.6401	30.00	0.4383	136.9034	0.6391
40.00	0.4675	138.6272	0.6434	40.00	0.4488	138.5568	0.6424
50.00	0.4784	140.2945	0.6467	50.00	0.4593	140.2265	0.6457
60.00	0.4892	141.9764	0.6500	60.00	0.4697	141.9109	0.6490
70.00	0.5000	143.6754	0.6532	70.00	0.4801	143.6120	0.6522
80.00	0.5107	145.3892	0.6564	80.00	0.4904	145.3279	0.6555
90.00	0.5214	147.1207	0.6596	90.00	0.5008	147.0612	0.6586
100.00	0.5320	148.8666	0.6628	100.00	0.5110	148.8091	0.6618
110.00	0.5426	150.6283	0.6659	110.00	0.5212	150.5726	0.6649
120.00	0.5531	152.4058	0.6690	120.00	0.5314	152.3518	0.6680
130.00	0.5637	154.1989	0.6720	130.00	0.5416	154.1466	0.6711
140.00	0.5742	156.0078	0.6751	140.00	0.5517	155.9571	0.6741
150.00	0.5847	157.8349	0.6781	150.00	0.5618	157.7831	0.6771
160.00	0.5952	159.6755	0.6811	160.00	0.5719	159.6275	0.6801
170.00	0.6056	161.5317	0.6841	170.00	0.5820	161.4850	0.6831
180.00	0.6160	163.4025	0.6870	180.00	0.5920	163.3573	0.6861

PRESSURE=	135.			PRESSURE=	140.		
GAGE=	120.304			GAGE=	125.304		
SAT TEMP =	-123.96			SAT TEMP =	-122.34		

T F°	V	H	S	T F°	V	H	S
-120.00	0.2549	113.4987	0.5814	-120.00	0.2436	113.3325	0.5802
-110.00	0.2675	115.0064	0.5858	-110.00	0.2558	114.8506	0.5846
-100.00	0.2797	116.5106	0.5900	-100.00	0.2678	116.3661	0.5889
-90.00	0.2915	118.0135	0.5941	-90.00	0.2794	117.8821	0.5931
-80.00	0.3032	119.5241	0.5982	-80.00	0.2908	119.3995	0.5971
-70.00	0.3145	121.0388	0.6021	-70.00	0.3019	120.9224	0.6011
-60.00	0.3258	122.5635	0.6060	-60.00	0.3128	122.4530	0.6050
-50.00	0.3368	124.0973	0.6098	-50.00	0.3235	123.9920	0.6088
-40.00	0.3477	125.6425	0.6135	-40.00	0.3341	125.5430	0.6125
-30.00	0.3585	127.1997	0.6172	-30.00	0.3446	127.1046	0.6162
-20.00	0.3692	128.7695	0.6208	-20.00	0.3550	128.6791	0.6198
-10.00	0.3798	130.3532	0.6243	-10.00	0.3652	130.2664	0.6234
0.	0.3903	131.9517	0.6278	0.	0.3754	131.8674	0.6269
10.00	0.4006	133.5621	0.6313	10.00	0.3855	133.4825	0.6304
20.00	0.4110	135.1887	0.6347	20.00	0.3955	135.1119	0.6338
30.00	0.4212	136.8300	0.6381	30.00	0.4054	136.7563	0.6372
40.00	0.4314	138.4862	0.6415	40.00	0.4153	138.4154	0.6405
50.00	0.4416	140.1583	0.6448	50.00	0.4251	140.0899	0.6439
60.00	0.4516	141.8452	0.6481	60.00	0.4349	141.7793	0.6471
70.00	0.4617	143.5485	0.6513	70.00	0.4446	143.4847	0.6504
80.00	0.4717	145.2665	0.6545	80.00	0.4543	145.2050	0.6536
90.00	0.4816	146.9998	0.6577	90.00	0.4639	146.9418	0.6568
100.00	0.4916	148.7514	0.6609	100.00	0.4735	148.6936	0.6600
110.00	0.5014	150.5168	0.6640	110.00	0.4831	150.4609	0.6631
120.00	0.5113	152.2977	0.6671	120.00	0.4926	152.2436	0.6662
130.00	0.5211	154.0942	0.6702	130.00	0.5021	154.0418	0.6693
140.00	0.5308	155.9063	0.6732	140.00	0.5115	155.8554	0.6723
150.00	0.5406	157.7338	0.6762	150.00	0.5209	157.6845	0.6753
160.00	0.5503	159.5767	0.6792	160.00	0.5303	159.5289	0.6783
170.00	0.5601	161.4383	0.6822	170.00	0.5398	161.3916	0.6813
180.00	0.5698	163.3120	0.6852	180.00	0.5491	163.2667	0.6843

TABLE VI (CONT'D)

PRESSURE=	145.			PRESSURE=	150.		
GAGE=	130.304			GAGE=	135.304		
SAT TEMP =	-120.77			SAT TEMP =	-119.23		
T F°	V	H	S	T F°	V	H	S
-120.00	0.2330	113.1617	0.5791	-110.00	0.2349	114.5365	0.5824
-110.00	0.2451	114.6967	0.5835	-100.00	0.2464	116.0778	0.5868
-100.00	0.2568	116.2234	0.5878	-90.00	0.2576	117.6126	0.5910
-90.00	0.2681	117.7485	0.5920	-80.00	0.2683	119.1449	0.5951
-80.00	0.2792	119.2732	0.5961	-70.00	0.2790	120.6853	0.5991
-70.00	0.2900	120.8041	0.6001	-60.00	0.2893	122.2284	0.6030
-60.00	0.3007	122.3413	0.6040	-50.00	0.2995	123.7783	0.6068
-50.00	0.3111	123.8857	0.6078	-40.00	0.3096	125.3413	0.6106
-40.00	0.3214	125.4426	0.6115	-30.00	0.3195	126.9122	0.6143
-30.00	0.3316	127.0088	0.6152	-20.00	0.3293	128.4963	0.6179
-20.00	0.3417	128.5880	0.6189	-10.00	0.3390	130.0912	0.6215
-10.00	0.3517	130.1790	0.6224	0.	0.3486	131.6996	0.6251
0.	0.3615	131.7837	0.6260	10.00	0.3581	133.3221	0.6286
10.00	0.3713	133.4006	0.6294	20.00	0.3676	134.9572	0.6320
20.00	0.3810	135.0348	0.6329	30.00	0.3769	136.6080	0.6354
30.00	0.3907	136.6823	0.6363	40.00	0.3863	138.2729	0.6388
40.00	0.4003	138.3443	0.6396	50.00	0.3955	139.9525	0.6421
50.00	0.4098	140.0213	0.6430	60.00	0.4047	141.6470	0.6454
60.00	0.4193	141.7132	0.6463	70.00	0.4138	143.3568	0.6487
70.00	0.4287	143.4208	0.6495	80.00	0.4229	145.0816	0.6519
80.00	0.4381	145.1434	0.6527	90.00	0.4320	146.8220	0.6551
90.00	0.4474	146.8819	0.6559	100.00	0.4410	148.5778	0.6582
100.00	0.4567	148.6357	0.6591	110.00	0.4500	150.3488	0.6614
110.00	0.4660	150.4049	0.6622	120.00	0.4589	152.1351	0.6645
120.00	0.4752	152.1894	0.6653	130.00	0.4678	153.9367	0.6676
130.00	0.4844	153.9893	0.6684	140.00	0.4767	155.7536	0.6706
140.00	0.4935	155.8045	0.6715	150.00	0.4856	157.5857	0.6737
150.00	0.5026	157.6351	0.6745	160.00	0.4944	159.4330	0.6767
160.00	0.5117	159.4810	0.6775	170.00	0.5032	161.2955	0.6796
170.00	0.5208	161.3420	0.6805	180.00	0.5120	163.1761	0.6826
180.00	0.5299	163.2214	0.6834	190.00	0.5208	165.0692	0.6855

PRESSURE=	155.			PRESSURE=	160.		
GAGE=	140.304			GAGE=	145.304		
SAT TEMP =	-117.74			SAT TEMP =	-116.27		
T F°	V	H	S	T F°	V	H	S
-110.00	0.2255	114.3766	0.5814	-110.00	0.2165	114.2118	0.5803
-100.00	0.2367	115.9292	0.5858	-100.00	0.2276	115.7776	0.5847
-90.00	0.2476	117.4744	0.5900	-90.00	0.2383	117.3337	0.5890
-80.00	0.2583	119.0192	0.5941	-80.00	0.2487	118.8895	0.5932
-70.00	0.2686	120.5644	0.5981	-70.00	0.2588	120.4419	0.5972
-60.00	0.2787	122.1141	0.6021	-60.00	0.2687	121.9985	0.6011
-50.00	0.2887	123.6739	0.6059	-50.00	0.2786	123.5661	0.6050
-40.00	0.2985	125.2391	0.6097	-40.00	0.2881	125.1359	0.6088
-30.00	0.3081	126.8149	0.6134	-30.00	0.2975	126.7167	0.6125
-20.00	0.3177	128.4040	0.6171	-20.00	0.3069	128.3110	0.6162
-10.00	0.3272	130.0027	0.6206	-10.00	0.3160	129.9138	0.6198
0.	0.3365	131.6151	0.6242	0.	0.3251	131.5300	0.6233
10.00	0.3458	133.2413	0.6277	10.00	0.3342	133.1601	0.6268
20.00	0.3549	134.8795	0.6311	20.00	0.3431	134.8014	0.6303
30.00	0.3641	136.5335	0.6346	30.00	0.3520	136.4586	0.6337
40.00	0.3731	138.2013	0.6379	40.00	0.3608	138.1295	0.6371
50.00	0.3821	139.8835	0.6413	50.00	0.3696	139.8142	0.6404
60.00	0.3911	141.5805	0.6446	60.00	0.3782	141.5121	0.6437
70.00	0.4000	143.2950	0.6478	70.00	0.3869	143.2282	0.6470
80.00	0.4088	145.0196	0.6511	80.00	0.3955	144.9576	0.6502
90.00	0.4176	146.7619	0.6542	90.00	0.4041	146.7016	0.6534
100.00	0.4263	148.5197	0.6574	100.00	0.4126	148.4615	0.6566
110.00	0.4351	150.2927	0.6606	110.00	0.4211	150.2387	0.6598
120.00	0.4437	152.0808	0.6637	120.00	0.4295	152.0264	0.6629
130.00	0.4524	153.8841	0.6668	130.00	0.4379	153.8314	0.6660
140.00	0.4610	155.7026	0.6698	140.00	0.4463	155.6516	0.6690
150.00	0.4696	157.5363	0.6728	150.00	0.4546	157.4868	0.6721
160.00	0.4781	159.3851	0.6759	160.00	0.4629	159.3371	0.6751
170.00	0.4867	161.2490	0.6788	170.00	0.4712	161.2024	0.6781
180.00	0.4953	163.1308	0.6818	180.00	0.4795	163.0854	0.6810
190.00	0.5037	165.0251	0.6847	190.00	0.4878	164.9811	0.6840

TABLE VI (CONT'D)

	PRESSURE=	165.			PRESSURE=	170.	
	GAGE=	150.304			GAGE=	155.304	
SAT	TEMP =	-114.84		SAT	TEMP =	-113.44	

T F°	V	H	S	T F°	V	H	S
-110.00	0.2081	114.0439	0.5793	-110.00	0.2001	113.8725	0.5782
-100.00	0.2190	115.6226	0.5837	-100.00	0.2109	115.4695	0.5827
-90.00	0.2295	117.1905	0.5880	-90.00	0.2213	117.0514	0.5871
-80.00	0.2398	118.7584	0.5922	-80.00	0.2313	118.6215	0.5913
-70.00	0.2497	120.3178	0.5963	-70.00	0.2411	120.1975	0.5954
-60.00	0.2595	121.8868	0.6002	-60.00	0.2507	121.7706	0.5994
-50.00	0.2690	123.4575	0.6041	-50.00	0.2600	123.3469	0.6033
-40.00	0.2783	125.0319	0.6079	-40.00	0.2692	124.9319	0.6071
-30.00	0.2876	126.6222	0.6117	-30.00	0.2782	126.5233	0.6108
-20.00	0.2966	128.2173	0.6153	-20.00	0.2870	128.1228	0.6145
-10.00	0.3056	129.8242	0.6189	-10.00	0.2958	129.7361	0.6181
0.	0.3145	131.4445	0.6225	0.	0.3045	131.3609	0.6217
10.00	0.3233	133.0785	0.6260	10.00	0.3130	132.9953	0.6252
20.00	0.3320	134.7228	0.6295	20.00	0.3216	134.6457	0.6287
30.00	0.3407	136.3834	0.6329	30.00	0.3300	136.3065	0.6321
40.00	0.3493	138.0573	0.6363	40.00	0.3384	137.9850	0.6355
50.00	0.3578	139.7447	0.6396	50.00	0.3467	139.6747	0.6389
60.00	0.3663	141.4471	0.6430	60.00	0.3549	141.3781	0.6422
70.00	0.3747	143.1637	0.6462	70.00	0.3632	143.0992	0.6455
80.00	0.3831	144.8954	0.6495	80.00	0.3713	144.8330	0.6487
90.00	0.3914	146.6413	0.6527	90.00	0.3794	146.5817	0.6519
100.00	0.3997	148.4033	0.6558	100.00	0.3875	148.3452	0.6551
110.00	0.4079	150.1801	0.6590	110.00	0.3955	150.1238	0.6582
120.00	0.4161	151.9719	0.6621	120.00	0.4035	151.9174	0.6614
130.00	0.4243	153.7787	0.6652	130.00	0.4115	153.7260	0.6645
140.00	0.4324	155.6005	0.6683	140.00	0.4194	155.5498	0.6675
150.00	0.4405	157.4373	0.6713	150.00	0.4273	157.3885	0.6706
160.00	0.4486	159.2891	0.6743	160.00	0.4352	159.2423	0.6736
170.00	0.4567	161.1558	0.6773	170.00	0.4430	161.1111	0.6766
180.00	0.4648	163.0400	0.6803	180.00	0.4509	162.9947	0.6795
190.00	0.4728	164.9370	0.6832	190.00	0.4587	164.8932	0.6825

	PRESSURE=	175.			PRESSURE=	180.	
	GAGE=	160.304			GAGE=	165.304	
SAT	TEMP =	-112.07		SAT	TEMP =	-110.73	

T F°	V	H	S	T F°	V	H	S
-110.00	0.1925	113.6934	0.5772	-110.00	0.1854	113.5172	0.5762
-100.00	0.2033	115.3111	0.5818	-100.00	0.1960	115.1500	0.5808
-90.00	0.2135	116.9063	0.5862	-90.00	0.2061	116.7590	0.5852
-80.00	0.2234	118.4891	0.5904	-80.00	0.2158	118.3545	0.5895
-70.00	0.2330	120.0724	0.5945	-70.00	0.2253	119.9460	0.5936
-60.00	0.2423	121.6508	0.5985	-60.00	0.2345	121.5338	0.5976
-50.00	0.2515	123.2373	0.6024	-50.00	0.2435	123.1265	0.6016
-40.00	0.2604	124.8248	0.6062	-40.00	0.2522	124.7210	0.6054
-30.00	0.2693	126.4250	0.6100	-30.00	0.2609	126.3258	0.6092
-20.00	0.2780	128.0298	0.6137	-20.00	0.2694	127.9362	0.6129
-10.00	0.2866	129.6473	0.6173	-10.00	0.2778	129.5579	0.6166
0.	0.2951	131.2758	0.6209	0.	0.2861	131.1903	0.6201
10.00	0.3034	132.9142	0.6244	10.00	0.2943	132.8328	0.6237
20.00	0.3117	134.5678	0.6279	20.00	0.3024	134.4895	0.6272
30.00	0.3199	136.2319	0.6314	30.00	0.3105	136.1570	0.6306
40.00	0.3281	137.9124	0.6348	40.00	0.3184	137.8395	0.6340
50.00	0.3362	139.6054	0.6381	50.00	0.3264	139.5359	0.6374
60.00	0.3443	141.3115	0.6414	60.00	0.3342	141.2447	0.6407
70.00	0.3523	143.0345	0.6447	70.00	0.3420	142.9698	0.6440
80.00	0.3603	144.7706	0.6480	80.00	0.3498	144.7081	0.6472
90.00	0.3682	146.5213	0.6512	90.00	0.3575	146.4609	0.6505
100.00	0.3760	148.2869	0.6544	100.00	0.3652	148.2285	0.6536
110.00	0.3838	150.0674	0.6575	110.00	0.3728	150.0109	0.6568
120.00	0.3916	151.8628	0.6606	120.00	0.3804	151.8081	0.6599
130.00	0.3994	153.6731	0.6637	130.00	0.3880	153.6202	0.6630
140.00	0.4071	155.4985	0.6668	140.00	0.3955	155.4472	0.6661
150.00	0.4148	157.3388	0.6698	150.00	0.4030	157.2891	0.6691
160.00	0.4225	159.1941	0.6729	160.00	0.4105	159.1458	0.6722
170.00	0.4301	161.0643	0.6759	170.00	0.4180	161.0174	0.6752
180.00	0.4378	162.9493	0.6788	180.00	0.4254	162.9038	0.6781
190.00	0.4454	164.8491	0.6818	190.00	0.4328	164.8049	0.6811

TABLE VI (CONT'D)

	PRESSURE=	185.			PRESSURE=	190.	
	GAGE=	170.304			GAGE=	175.304	
SAT	TEMP =	-109.42		SAT	TEMP =	-108.13	

T F°	V	H	S	T F°	V	H	S
-100.00	0.1891	114.9858	0.5799	-100.00	0.1825	114.8140	0.5789
-90.00	0.1990	116.6063	0.5843	-90.00	0.1924	116.4563	0.5834
-80.00	0.2087	118.2177	0.5886	-80.00	0.2019	118.0785	0.5877
-70.00	0.2179	119.8143	0.5928	-70.00	0.2111	119.6869	0.5919
-60.00	0.2270	121.4154	0.5968	-60.00	0.2200	121.2954	0.5960
-50.00	0.2359	123.0146	0.6008	-50.00	0.2287	122.9013	0.6000
-40.00	0.2445	124.6162	0.6046	-40.00	0.2371	124.5104	0.6038
-30.00	0.2530	126.2258	0.6084	-30.00	0.2455	126.1250	0.6076
-20.00	0.2613	127.8418	0.6121	-20.00	0.2536	127.7468	0.6114
-10.00	0.2696	129.4679	0.6158	-10.00	0.2617	129.3774	0.6150
0.	0.2777	131.1043	0.6194	0.	0.2697	131.0177	0.6187
10.00	0.2857	132.7509	0.6229	10.00	0.2775	132.6685	0.6222
20.00	0.2936	134.4108	0.6264	20.00	0.2853	134.3318	0.6257
30.00	0.3015	136.0818	0.6299	30.00	0.2930	136.0063	0.6292
40.00	0.3093	137.7663	0.6333	40.00	0.3006	137.6929	0.6326
50.00	0.3170	139.4661	0.6367	50.00	0.3082	139.3962	0.6360
60.00	0.3247	141.1777	0.6400	60.00	0.3157	141.1105	0.6393
70.00	0.3323	142.9048	0.6433	70.00	0.3232	142.8398	0.6426
80.00	0.3399	144.6454	0.6465	80.00	0.3306	144.5827	0.6458
90.00	0.3475	146.4005	0.6498	90.00	0.3379	146.3399	0.6491
100.00	0.3549	148.1701	0.6529	100.00	0.3452	148.1115	0.6523
110.00	0.3624	149.9544	0.6561	110.00	0.3525	149.8978	0.6554
120.00	0.3698	151.7534	0.6592	120.00	0.3598	151.6986	0.6586
130.00	0.3772	153.5672	0.6623	130.00	0.3670	153.5142	0.6617
140.00	0.3845	155.3959	0.6654	140.00	0.3742	155.3445	0.6647
150.00	0.3919	157.2393	0.6685	150.00	0.3813	157.1895	0.6678
160.00	0.3992	159.0976	0.6715	160.00	0.3884	159.0493	0.6708
170.00	0.4064	160.9706	0.6745	170.00	0.3955	160.9237	0.6738
180.00	0.4137	162.8584	0.6775	180.00	0.4026	162.8129	0.6768
190.00	0.4209	154.7608	0.6804	190.00	0.4096	164.7166	0.6797
200.00	0.4281	166.6778	0.6833	200.00	0.4167	166.6349	0.6827

	PRESSURE=	195.			PRESSURE=	200.	
	GAGE=	180.304			GAGE=	185.304	
SAT	TEMP =	-106.86		SAT	TEMP =	-105.62	

T F°	V	H	S	T F°	V	H	S
-100.00	0.1763	114.6461	0.5780	-100.00	0.1703	114.4736	0.5771
-90.00	0.1861	116.3032	0.5825	-90.00	0.1801	116.1468	0.5816
-80.00	0.1955	117.9368	0.5869	-80.00	0.1893	117.7925	0.5860
-70.00	0.2045	119.5576	0.5911	-70.00	0.1983	119.4264	0.5903
-60.00	0.2133	121.1739	0.5952	-60.00	0.2069	121.0509	0.5944
-50.00	0.2218	122.7869	0.5992	-50.00	0.2153	122.6711	0.5984
-40.00	0.2302	124.4036	0.6031	-40.00	0.2235	124.2958	0.6023
-30.00	0.2383	126.0233	0.6069	-30.00	0.2315	125.9207	0.6061
-20.00	0.2464	127.6510	0.6106	-20.00	0.2394	127.5546	0.6099
-10.00	0.2543	129.2862	0.6143	-10.00	0.2472	129.1944	0.6136
0.	0.2621	130.9307	0.6179	0.	0.2548	130.8432	0.6172
10.00	0.2698	132.5858	0.6215	10.00	0.2624	132.5026	0.6208
20.00	0.2775	134.2554	0.6250	20.00	0.2699	134.1726	0.6243
30.00	0.2849	135.9305	0.6285	30.00	0.2772	135.8543	0.6278
40.00	0.2923	137.6192	0.6319	40.00	0.2845	137.5452	0.6312
50.00	0.2998	139.3260	0.6353	50.00	0.2918	139.2555	0.6346
60.00	0.3071	141.0431	0.6386	60.00	0.2990	140.9755	0.6379
70.00	0.3144	142.7747	0.6419	70.00	0.3061	142.7094	0.6412
80.00	0.3217	144.5199	0.6452	80.00	0.3132	144.4570	0.6445
90.00	0.3288	146.2752	0.6484	90.00	0.3202	146.2150	0.6477
100.00	0.3360	148.0530	0.6516	100.00	0.3273	147.9943	0.6509
110.00	0.3431	149.8411	0.6548	110.00	0.3342	149.7844	0.6541
120.00	0.3502	151.6438	0.6579	120.00	0.3412	151.5890	0.6572
130.00	0.3573	153.4611	0.6610	130.00	0.3481	153.4080	0.6604
140.00	0.3643	155.2931	0.6641	140.00	0.3549	155.2417	0.6634
150.00	0.3713	157.1397	0.6671	150.00	0.3617	157.0899	0.6665
160.00	0.3782	159.0010	0.6702	160.00	0.3686	158.9526	0.6695
170.00	0.3852	160.8769	0.6732	170.00	0.3753	160.8300	0.6725
180.00	0.3921	162.7674	0.6761	180.00	0.3821	162.7219	0.6755
190.00	0.3990	164.6725	0.6791	190.00	0.3888	164.6283	0.6785
200.00	0.4058	166.5920	0.6820	200.00	0.3955	166.5491	0.6814

TABLE VI (CONT'D)

	PRESSURE=	210.			PRESSURE=	220.	
	GAGE=	195.304			GAGE=	205.304	
SAT	TEMP =	-103.20		SAT	TEMP =	-100.87	

T F°	V	H	S	T F°	V	H	S
-100.00	0.1591	114.1141	0.5752	-100.00	0.1488	113.7329	0.5734
-90.00	0.1687	115.8231	0.5799	-90.00	0.1584	115.4919	0.5782
-80.00	0.1779	117.5019	0.5844	-80.00	0.1674	117.2011	0.5827
-70.00	0.1866	119.1577	0.5887	-70.00	0.1759	118.8801	0.5871
-60.00	0.1950	120.7997	0.5928	-60.00	0.1842	120.5481	0.5913
-50.00	0.2031	122.4354	0.5969	-50.00	0.1922	122.2042	0.5954
-40.00	0.2111	124.0768	0.6008	-40.00	0.1998	123.8533	0.5994
-30.00	0.2189	125.7129	0.6047	-30.00	0.2074	125.5084	0.6033
-20.00	0.2265	127.3594	0.6085	-20.00	0.2148	127.1611	0.6071
-10.00	0.2340	129.0091	0.6122	-10.00	0.2220	128.8211	0.6108
0.	0.2414	130.6665	0.6158	0.	0.2292	130.4877	0.6145
10.00	0.2487	132.3350	0.6194	10.00	0.2362	132.1655	0.6181
20.00	0.2559	134.0120	0.6230	20.00	0.2432	133.8499	0.6217
30.00	0.2630	135.7017	0.6264	30.00	0.2500	135.5466	0.6252
40.00	0.2700	137.4015	0.6299	40.00	0.2568	137.2536	0.6286
50.00	0.2770	139.1140	0.6333	50.00	0.2635	138.9716	0.6320
60.00	0.2839	140.8398	0.6366	60.00	0.2702	140.7033	0.6354
70.00	0.2907	142.5753	0.6399	70.00	0.2767	142.4449	0.6387
80.00	0.2976	144.3308	0.6432	80.00	0.2832	144.2001	0.6420
90.00	0.3043	146.0942	0.6465	90.00	0.2898	145.9730	0.6452
100.00	0.3109	147.8725	0.6497	100.00	0.2962	147.7557	0.6485
110.00	0.3177	149.6708	0.6528	110.00	0.3027	149.5570	0.6516
120.00	0.3243	151.4791	0.6560	120.00	0.3090	151.3691	0.6548
130.00	0.3308	153.2976	0.6591	130.00	0.3153	153.1918	0.6579
140.00	0.3375	155.1387	0.6622	140.00	0.3217	155.0356	0.6610
150.00	0.3441	156.9901	0.6653	150.00	0.3280	156.8902	0.6641
160.00	0.3506	158.8559	0.6683	160.00	0.3342	158.7591	0.6671
170.00	0.3571	160.7362	0.6713	170.00	0.3404	160.6423	0.6701
180.00	0.3635	162.6309	0.6743	180.00	0.3466	162.5398	0.6731
190.00	0.3700	164.5400	0.6773	190.00	0.3528	164.4516	0.6761
200.00	0.3764	166.4633	0.6802	200.00	0.3590	166.3776	0.6790

	PRESSURE=	230.			PRESSURE=	240.	
	GAGE=	215.304			GAGE=	225.304	
SAT	TEMP =	-98.61		SAT	TEMP =	-96.42	

T F°	V	H	S	T F°	V	H	S
-90.00	0.1489	115.1456	0.5765	-90.00	0.1400	114.7818	0.5748
-80.00	0.1578	116.8899	0.5811	-80.00	0.1489	116.5702	0.5795
-70.00	0.1662	118.6007	0.5856	-70.00	0.1572	118.3066	0.5841
-60.00	0.1743	120.2867	0.5898	-60.00	0.1652	120.0232	0.5884
-50.00	0.1821	121.9634	0.5940	-50.00	0.1728	121.7171	0.5926
-40.00	0.1896	123.6297	0.5980	-40.00	0.1801	123.4030	0.5967
-30.00	0.1969	125.2975	0.6019	-30.00	0.1873	125.0830	0.6006
-20.00	0.2041	126.9630	0.6058	-20.00	0.1943	126.7630	0.6045
-10.00	0.2111	128.6349	0.6095	-10.00	0.2011	128.4408	0.6083
0.	0.2181	130.3146	0.6132	0.	0.2078	130.1313	0.6120
10.00	0.2249	131.9952	0.6168	10.00	0.2144	131.8245	0.6156
20.00	0.2316	133.6885	0.6204	20.00	0.2209	133.5255	0.6192
30.00	0.2382	135.3895	0.6239	30.00	0.2273	135.2344	0.6227
40.00	0.2447	137.1048	0.6274	40.00	0.2337	136.9555	0.6262
50.00	0.2512	138.8294	0.6308	50.00	0.2399	138.6864	0.6296
60.00	0.2576	140.5649	0.6342	60.00	0.2461	140.4280	0.6330
70.00	0.2640	142.3151	0.6375	70.00	0.2523	142.1831	0.6364
80.00	0.2703	144.0760	0.6408	80.00	0.2584	143.9493	0.6397
90.00	0.2765	145.8519	0.6441	90.00	0.2644	145.7287	0.6429
100.00	0.2828	147.6408	0.6473	100.00	0.2704	147.5223	0.6462
110.00	0.2889	149.4429	0.6505	110.00	0.2764	149.3313	0.6494
120.00	0.2951	151.2584	0.6536	120.00	0.2823	151.1482	0.6525
130.00	0.3012	153.0879	0.6568	130.00	0.2881	152.9808	0.6557
140.00	0.3072	154.9322	0.6599	140.00	0.2940	154.8287	0.6588
150.00	0.3133	156.7903	0.6629	150.00	0.2998	156.6902	0.6618
160.00	0.3193	158.6622	0.6660	160.00	0.3056	158.5654	0.6649
170.00	0.3253	160.5481	0.6690	170.00	0.3114	160.4543	0.6679
180.00	0.3312	162.4486	0.6720	180.00	0.3171	162.3574	0.6709
190.00	0.3372	164.3632	0.6750	190.00	0.3228	164.2747	0.6739
200.00	0.3431	166.2917	0.6779	200.00	0.3285	166.2021	0.6768
210.00	0.3490	168.2342	0.6808	210.00	0.3342	168.1510	0.6798

TABLE VI (CONT'D)

	PRESSURE=	250.			PRESSURE=	260.	
	GAGE=	235.304			GAGE=	245.304	
SAT	TEMP =	-94.30		SAT	TEMP =	-92.24	

T F°	V	H	S	T F°	V	H	S
-90.00	0.1318	114.4066	0.5731	-90.00	0.1241	114.0075	0.5714
-80.00	0.1406	116.2358	0.5780	-80.00	0.1330	115.8941	0.5764
-70.00	0.1489	118.0123	0.5826	-70.00	0.1412	117.7064	0.5811
-60.00	0.1567	119.7516	0.5870	-60.00	0.1489	119.4713	0.5856
-50.00	0.1642	121.4643	0.5912	-50.00	0.1563	121.2137	0.5899
-40.00	0.1714	123.1713	0.5953	-40.00	0.1633	122.9342	0.5940
-30.00	0.1784	124.8644	0.5993	-30.00	0.1701	124.6416	0.5980
-20.00	0.1852	126.5596	0.6032	-20.00	0.1769	126.3528	0.6020
-10.00	0.1919	128.2527	0.6070	-10.00	0.1833	128.0574	0.6058
0.	0.1984	129.9484	0.6108	0.	0.1897	129.7631	0.6096
10.00	0.2048	131.6518	0.6144	10.00	0.1959	131.4773	0.6133
20.00	0.2111	133.3609	0.6180	20.00	0.2021	133.1946	0.6169
30.00	0.2173	135.0781	0.6216	30.00	0.2081	134.9204	0.6204
40.00	0.2235	136.8052	0.6251	40.00	0.2141	136.6537	0.6239
50.00	0.2296	138.5424	0.6285	50.00	0.2200	138.3975	0.6274
60.00	0.2356	140.2904	0.6319	60.00	0.2258	140.1519	0.6308
70.00	0.2416	142.0533	0.6353	70.00	0.2316	141.9171	0.6342
80.00	0.2474	143.8220	0.6386	80.00	0.2373	143.6941	0.6375
90.00	0.2532	145.6051	0.6418	90.00	0.2429	145.4809	0.6408
100.00	0.2590	147.4033	0.6451	100.00	0.2485	147.2840	0.6440
110.00	0.2648	149.2141	0.6483	110.00	0.2541	149.0992	0.6472
120.00	0.2705	151.0378	0.6515	120.00	0.2596	150.9267	0.6504
130.00	0.2762	152.8734	0.6546	130.00	0.2651	152.7658	0.6536
140.00	0.2818	154.7250	0.6577	140.00	0.2706	154.6211	0.6567
150.00	0.2874	156.5899	0.6608	150.00	0.2760	156.4895	0.6598
160.00	0.2930	158.4684	0.6638	160.00	0.2814	158.3713	0.6628
170.00	0.2986	160.3604	0.6669	170.00	0.2868	160.2664	0.6659
180.00	0.3041	162.2661	0.6699	180.00	0.2921	162.1747	0.6689
190.00	0.3096	164.1863	0.6729	190.00	0.2975	164.0977	0.6719
200.00	0.3151	166.1201	0.6758	200.00	0.3028	166.0343	0.6748
210.00	0.3206	168.0677	0.6787	210.00	0.3081	167.9845	0.6778

	PRESSURE=	270.			PRESSURE=	280.	
	GAGE=	255.304			GAGE=	265.304	
SAT	TEMP =	-90.24		SAT	TEMP =	-88.29	

T F°	V	H	S	T F°	V	H	S
-90.00	0.1167	113.5810	0.5696	-80.00	0.1190	115.1588	0.5732
-80.00	0.1258	115.5355	0.5748	-70.00	0.1272	117.0633	0.5782
-70.00	0.1340	117.3879	0.5796	-60.00	0.1348	118.8945	0.5828
-60.00	0.1416	119.1895	0.5842	-50.00	0.1420	120.6881	0.5872
-50.00	0.1489	120.9536	0.5886	-40.00	0.1488	122.4464	0.5915
-40.00	0.1558	122.6916	0.5927	-30.00	0.1555	124.1976	0.5956
-30.00	0.1626	124.4240	0.5968	-20.00	0.1618	125.9303	0.5996
-20.00	0.1691	126.1424	0.6008	-10.00	0.1681	127.6633	0.6035
-10.00	0.1754	127.8591	0.6046	0.	0.1742	129.3942	0.6073
0.	0.1816	129.5754	0.6084	10.00	0.1801	131.1236	0.6110
10.00	0.1877	131.3007	0.6121	20.00	0.1859	132.8600	0.6147
20.00	0.1937	133.0267	0.6158	30.00	0.1916	134.5987	0.6183
30.00	0.1996	134.7613	0.6193	40.00	0.1973	136.3491	0.6218
40.00	0.2054	136.5010	0.6229	50.00	0.2029	138.1064	0.6253
50.00	0.2111	138.2517	0.6263	60.00	0.2083	139.8712	0.6287
60.00	0.2168	140.0126	0.6297	70.00	0.2138	141.6487	0.6321
70.00	0.2223	141.7831	0.6331	80.00	0.2191	143.4344	0.6354
80.00	0.2279	143.5658	0.6365	90.00	0.2245	145.2355	0.6388
90.00	0.2333	145.3563	0.6397	100.00	0.2298	147.0462	0.6420
100.00	0.2388	147.1642	0.6430	110.00	0.2350	148.8685	0.6452
110.00	0.2442	148.9840	0.6462	120.00	0.2402	150.7028	0.6484
120.00	0.2496	150.8160	0.6494	130.00	0.2454	152.5529	0.6516
130.00	0.2548	152.6580	0.6526	140.00	0.2505	154.4146	0.6547
140.00	0.2602	154.5170	0.6557	150.00	0.2556	156.2890	0.6578
150.00	0.2654	156.3890	0.6588	160.00	0.2607	158.1764	0.6609
160.00	0.2707	158.2741	0.6619	170.00	0.2657	160.0769	0.6639
170.00	0.2758	160.1707	0.6649	180.00	0.2707	161.9928	0.6670
180.00	0.2810	162.0833	0.6679	190.00	0.2757	163.9211	0.6700
190.00	0.2862	164.0092	0.6709	200.00	0.2807	165.8627	0.6729
200.00	0.2913	165.9485	0.6739	210.00	0.2856	167.8176	0.6759
210.00	0.2964	167.8984	0.6768	220.00	0.2906	169.7858	0.6788

TABLE VI (CONT'D)

PRESSURE=	290.			PRESSURE=	300.		
GAGE=	275.304			GAGE=	285.304		
SAT TEMP =	-86.40			SAT TEMP =	-84.55		

T F°	V	H	S	T F°	V	H	S
-80.00	0.1125	114.7607	0.5716	-80.00	0.1065	114.3529	0.5700
-70.00	0.1209	116.7247	0.5767	-70.00	0.1149	116.3685	0.5752
-60.00	0.1285	118.5965	0.5815	-60.00	0.1225	118.2872	0.5801
-50.00	0.1356	120.4158	0.5860	-50.00	0.1295	120.1351	0.5847
-40.00	0.1424	122.2011	0.5903	-40.00	0.1363	121.9494	0.5890
-30.00	0.1489	123.9673	0.5944	-30.00	0.1427	123.7321	0.5932
-20.00	0.1551	125.7183	0.5985	-20.00	0.1488	125.5025	0.5973
-10.00	0.1612	127.4636	0.6024	-10.00	0.1548	127.2608	0.6013
0.	0.1672	129.2047	0.6062	0.	0.1606	129.0130	0.6051
10.00	0.1730	130.9461	0.6100	10.00	0.1663	130.7667	0.6089
20.00	0.1787	132.6911	0.6136	20.00	0.1719	132.5205	0.6126
30.00	0.1842	134.4390	0.6172	30.00	0.1773	134.2779	0.6162
40.00	0.1898	136.1961	0.6208	40.00	0.1828	136.0464	0.6198
50.00	0.1952	137.9599	0.6243	50.00	0.1880	137.8125	0.6233
60.00	0.2005	139.7315	0.6277	60.00	0.1932	139.5911	0.6268
70.00	0.2058	141.5144	0.6311	70.00	0.1984	141.3795	0.6302
80.00	0.2110	143.3059	0.6345	80.00	0.2035	143.1768	0.6335
90.00	0.2162	145.1109	0.6378	90.00	0.2085	144.9859	0.6368
100.00	0.2214	146.9266	0.6411	100.00	0.2135	146.8066	0.6401
110.00	0.2265	148.7534	0.6443	110.00	0.2185	148.6381	0.6434
120.00	0.2315	150.5920	0.6475	120.00	0.2234	150.4809	0.6466
130.00	0.2365	152.4452	0.6507	130.00	0.2283	152.3372	0.6498
140.00	0.2415	154.3106	0.6538	140.00	0.2331	154.2065	0.6529
150.00	0.2465	156.1886	0.6569	150.00	0.2379	156.0856	0.6560
160.00	0.2514	158.0794	0.6600	160.00	0.2427	157.9822	0.6591
170.00	0.2563	159.9830	0.6630	170.00	0.2475	159.8891	0.6621
180.00	0.2611	161.9014	0.6661	180.00	0.2522	161.8100	0.6652
190.00	0.2660	163.8326	0.6690	190.00	0.2569	163.7441	0.6682
200.00	0.2708	165.7769	0.6720	200.00	0.2616	165.6912	0.6711
210.00	0.2756	167.7344	0.6750	210.00	0.2662	167.6513	0.6741
220.00	0.2804	169.7052	0.6779	220.00	0.2709	169.6245	0.6770

PRESSURE=	320.			PRESSURE=	340.		
GAGE=	305.304			GAGE=	325.304		
SAT TEMP =	-80.99			SAT TEMP =	-77.60		

T F°	V	H	S	T F°	V	H	S
-80.00	0.0952	113.4494	0.5666	-70.00	0.0938	114.8015	0.5692
-70.00	0.1038	115.6246	0.5723	-60.00	0.1016	116.9418	0.5747
-60.00	0.1114	117.6302	0.5774	-50.00	0.1087	118.9526	0.5796
-50.00	0.1186	119.5626	0.5822	-40.00	0.1152	120.8826	0.5843
-40.00	0.1251	121.4259	0.5866	-30.00	0.1214	122.7613	0.5887
-30.00	0.1314	123.2561	0.5910	-20.00	0.1272	124.5978	0.5929
-20.00	0.1374	125.0586	0.5951	-10.00	0.1329	126.4256	0.5971
-10.00	0.1432	126.8454	0.5991	0.	0.1383	128.2328	0.6010
0.	0.1487	128.6215	0.6030	10.00	0.1436	130.0292	0.6049
10.00	0.1543	130.4013	0.6069	20.00	0.1487	131.8258	0.6087
20.00	0.1596	132.1739	0.6106	30.00	0.1537	133.6165	0.6124
30.00	0.1648	133.9514	0.6143	40.00	0.1587	135.4156	0.6160
40.00	0.1700	135.7300	0.6179	50.00	0.1636	137.2190	0.6196
50.00	0.1750	137.5146	0.6214	60.00	0.1683	139.0206	0.6231
60.00	0.1800	139.3077	0.6249	70.00	0.1730	140.8342	0.6265
70.00	0.1849	141.1076	0.6283	80.00	0.1777	142.6539	0.6299
80.00	0.1898	142.9170	0.6317	90.00	0.1822	144.4827	0.6333
90.00	0.1945	144.7343	0.6350	100.00	0.1868	146.3235	0.6366
100.00	0.1993	146.5653	0.6383	110.00	0.1913	148.1735	0.6399
110.00	0.2041	148.4082	0.6416	120.00	0.1957	150.0335	0.6431
120.00	0.2087	150.2581	0.6448	130.00	0.2001	151.9029	0.6463
130.00	0.2133	152.1205	0.6480	140.00	0.2045	153.7881	0.6495
140.00	0.2179	153.9977	0.6512	150.00	0.2088	155.6846	0.6526
150.00	0.2225	155.8866	0.6543	160.00	0.2131	157.5926	0.6557
160.00	0.2270	157.7876	0.6574	170.00	0.2174	159.5125	0.6588
170.00	0.2315	159.7009	0.6604	180.00	0.2216	161.4449	0.6619
180.00	0.2359	161.6270	0.6635	190.00	0.2259	163.3903	0.6649
190.00	0.2404	163.5670	0.6665	200.00	0.2301	165.3480	0.6679
200.00	0.2448	165.5196	0.6695	210.00	0.2342	167.3183	0.6708
210.00	0.2492	167.4850	0.6724	220.00	0.2384	169.3011	0.6738
220.00	0.2536	169.4632	0.6754	230.00	0.2425	171.2982	0.6767

TABLE VI (CONT'D)

PRESSURE= 360.					PRESSURE= 380.			
GAGE= 345.304					GAGE= 365.304			
SAT TEMP = -74.36					SAT TEMP = -71.26			

T F°	V	H	S		T F°	V	H	S
-70.00	0.0844	113.8758	0.5660		-70.00	0.0755	112.8002	0.5625
-60.00	0.0927	116.1955	0.5719		-60.00	0.0843	115.3629	0.5690
-50.00	0.0998	118.3124	0.5771		-50.00	0.0918	117.6264	0.5746
-40.00	0.1064	120.3150	0.5820		-40.00	0.0983	119.7102	0.5796
-30.00	0.1124	122.2465	0.5865		-30.00	0.1043	121.7047	0.5843
-20.00	0.1182	124.1348	0.5909		-20.00	0.1101	123.6522	0.5888
-10.00	0.1237	125.9920	0.5950		-10.00	0.1154	125.5429	0.5931
0.	0.1290	127.8280	0.5991		0.	0.1205	127.4108	0.5972
10.00	0.1341	129.6541	0.6030		10.00	0.1256	129.2694	0.6012
20.00	0.1391	131.4709	0.6068		20.00	0.1304	131.1081	0.6050
30.00	0.1439	133.2837	0.6106		30.00	0.1351	132.9439	0.6088
40.00	0.1487	135.0980	0.6142		40.00	0.1397	134.7752	0.6125
50.00	0.1534	136.9128	0.6178		50.00	0.1442	136.6054	0.6162
60.00	0.1579	138.7331	0.6214		60.00	0.1487	138.4422	0.6197
70.00	0.1625	140.5583	0.6249		70.00	0.1530	140.2795	0.6232
80.00	0.1669	142.3909	0.6283		80.00	0.1573	142.1255	0.6267
90.00	0.1713	144.2279	0.6317		90.00	0.1614	143.9711	0.6301
100.00	0.1756	146.0797	0.6350		100.00	0.1656	145.8343	0.6334
110.00	0.1799	147.9398	0.6383		110.00	0.1698	147.7047	0.6367
120.00	0.1842	149.8090	0.6415		120.00	0.1739	149.5898	0.6400
130.00	0.1883	151.6845	0.6447		130.00	0.1778	151.4652	0.6432
140.00	0.1925	153.5779	0.6479		140.00	0.1818	153.3670	0.6464
150.00	0.1967	155.4820	0.6511		150.00	0.1858	155.2789	0.6496
160.00	0.2008	157.3972	0.6542		160.00	0.1898	157.2014	0.6527
170.00	0.2049	159.3238	0.6573		170.00	0.1937	159.1348	0.6558
180.00	0.2089	161.2618	0.6603		180.00	0.1975	161.0786	0.6589
190.00	0.2129	163.2132	0.6634		190.00	0.2014	163.0361	0.6619
200.00	0.2170	165.1766	0.6664		200.00	0.2052	165.0053	0.6649
210.00	0.2209	167.1523	0.6693		210.00	0.2090	166.9863	0.6679
220.00	0.2249	169.1402	0.6723		220.00	0.2128	168.9794	0.6708
230.00	0.2288	171.1416	0.6752		230.00	0.2165	170.9851	0.6738

PRESSURE= 400.					PRESSURE= 420.			
GAGE= 385.304					GAGE= 405.304			
SAT TEMP = -68.29					SAT TEMP = -65.44			

T F°	V	H	S		T F°	V	H	S
-60.00	0.0765	114.4538	0.5660		-60.00	0.0691	113.4019	0.5627
-50.00	0.0842	116.8814	0.5720		-50.00	0.0774	116.0873	0.5693
-40.00	0.0910	119.0878	0.5773		-40.00	0.0842	118.4216	0.5749
-30.00	0.0970	121.1600	0.5822		-30.00	0.0903	120.5720	0.5800
-20.00	0.1027	123.1493	0.5868		-20.00	0.0960	122.6365	0.5848
-10.00	0.1080	125.0929	0.5911		-10.00	0.1012	124.6229	0.5892
0.	0.1131	126.9967	0.5953		0.	0.1062	126.5616	0.5935
10.00	0.1179	128.8777	0.5994		10.00	0.1110	128.4802	0.5976
20.00	0.1226	130.7444	0.6033		20.00	0.1156	130.3708	0.6016
30.00	0.1272	132.5980	0.6071		30.00	0.1200	132.2510	0.6055
40.00	0.1317	134.4506	0.6109		40.00	0.1243	134.1217	0.6093
50.00	0.1359	136.2925	0.6145		50.00	0.1286	135.9876	0.6130
60.00	0.1403	138.1473	0.6181		60.00	0.1327	137.8531	0.6166
70.00	0.1445	140.0047	0.6217		70.00	0.1368	139.7195	0.6201
80.00	0.1486	141.8574	0.6251		80.00	0.1408	141.5897	0.6236
90.00	0.1527	143.7203	0.6286		90.00	0.1447	143.4617	0.6271
100.00	0.1567	145.5917	0.6319		100.00	0.1486	145.3451	0.6305
110.00	0.1606	147.4696	0.6353		110.00	0.1524	147.2338	0.6338
120.00	0.1645	149.3551	0.6385		120.00	0.1561	149.1292	0.6371
130.00	0.1684	151.2511	0.6418		130.00	0.1598	151.0311	0.6404
140.00	0.1723	153.1597	0.6450		140.00	0.1636	152.9485	0.6436
150.00	0.1761	155.0779	0.6482		150.00	0.1672	154.8747	0.6468
160.00	0.1798	157.0062	0.6513		160.00	0.1709	156.8142	0.6499
170.00	0.1836	158.9450	0.6544		170.00	0.1745	158.7563	0.6530
180.00	0.1873	160.8952	0.6575		180.00	0.1780	160.7116	0.6561
190.00	0.1910	162.8588	0.6605		190.00	0.1816	162.6815	0.6592
200.00	0.1947	164.8338	0.6635		200.00	0.1851	164.6624	0.6622
210.00	0.1983	166.8204	0.6665		210.00	0.1886	166.6539	0.6652
220.00	0.2019	168.8187	0.6695		220.00	0.1921	168.6581	0.6682
230.00	0.2055	170.8288	0.6724		230.00	0.1955	170.6726	0.6711
240.00	0.2091	172.8524	0.6753		240.00	0.1990	172.7010	0.6740

TABLE VI (CONT'D)

	PRESSURE=	440.			PRESSURE=	460.	
	GAGE=	425.304			GAGE=	445.304	
SAT	TEMP =	-62.71		SAT	TEMP =	-60.08	

T F°	V	H	S	T F°	V	H	S
-60.00	0.0617	112.1445	0.5589	-60.00	0.0537	110.4581	0.5542
-50.00	0.0708	115.2035	0.5665	-50.00	0.0645	114.2094	0.5635
-40.00	0.0779	117.6998	0.5725	-40.00	0.0721	116.9466	0.5701
-30.00	0.0842	119.9744	0.5779	-30.00	0.0784	119.3292	0.5757
-20.00	0.0898	122.0983	0.5828	-20.00	0.0841	121.5424	0.5808
-10.00	0.0950	124.1341	0.5873	-10.00	0.0894	123.6557	0.5855
0.	0.0999	126.1272	0.5917	0.	0.0942	125.6715	0.5899
10.00	0.1046	128.0719	0.5959	10.00	0.0988	127.6593	0.5942
20.00	0.1091	129.9886	0.5999	20.00	0.1032	129.6093	0.5983
30.00	0.1135	131.8973	0.6039	30.00	0.1075	131.5378	0.6023
40.00	0.1177	133.7874	0.6077	40.00	0.1116	133.4523	0.6062
50.00	0.1218	135.6712	0.6114	50.00	0.1156	135.3560	0.6100
60.00	0.1258	137.5554	0.6151	60.00	0.1195	137.2538	0.6136
70.00	0.1298	139.4346	0.6187	70.00	0.1234	139.1511	0.6173
80.00	0.1336	141.3197	0.6222	80.00	0.1271	141.0466	0.6208
90.00	0.1374	143.2012	0.6257	90.00	0.1308	142.9445	0.6243
100.00	0.1412	145.0969	0.6291	100.00	0.1344	144.8501	0.6277
110.00	0.1449	146.9968	0.6324	110.00	0.1380	146.7588	0.6311
120.00	0.1485	148.9023	0.6358	120.00	0.1415	148.6722	0.6344
130.00	0.1521	150.8104	0.6390	130.00	0.1450	150.5948	0.6377
140.00	0.1557	152.7366	0.6423	140.00	0.1485	152.5279	0.6410
150.00	0.1592	154.6710	0.6455	150.00	0.1519	154.4708	0.6442
160.00	0.1627	156.6144	0.6486	160.00	0.1553	156.4179	0.6474
170.00	0.1662	158.5673	0.6517	170.00	0.1586	158.3762	0.6505
180.00	0.1696	160.5279	0.6548	180.00	0.1619	160.3463	0.6536
190.00	0.1730	162.5042	0.6579	190.00	0.1652	162.3282	0.6567
200.00	0.1764	164.4910	0.6609	200.00	0.1685	164.3204	0.6597
210.00	0.1798	166.4888	0.6639	210.00	0.1717	166.3231	0.6627
220.00	0.1831	168.4976	0.6669	220.00	0.1750	168.3365	0.6657
230.00	0.1864	170.5166	0.6699	230.00	0.1781	170.3607	0.6687
240.00	0.1897	172.5498	0.6728	240.00	0.1813	172.3988	0.6716

	PRESSURE=	480.			PRESSURE=	500.	
	GAGE=	465.304			GAGE=	485.304	
SAT	TEMP =	-57.55		SAT	TEMP =	-55.12	

T F°	V	H	S	T F°	V	H	S
-50.00	0.0584	113.0569	0.5601	-50.00	0.0522	111.6765	0.5562
-40.00	0.0666	116.1097	0.5675	-40.00	0.0613	115.2005	0.5647
-30.00	0.0732	118.6606	0.5735	-30.00	0.0682	117.9411	0.5712
-20.00	0.0789	120.9652	0.5788	-20.00	0.0740	120.3511	0.5767
-10.00	0.0841	123.1299	0.5836	-10.00	0.0792	122.6038	0.5818
0.	0.0888	125.2003	0.5882	0.	0.0840	124.7359	0.5865
10.00	0.0935	127.2361	0.5926	10.00	0.0886	126.8043	0.5909
20.00	0.0978	129.2149	0.5967	20.00	0.0928	128.8228	0.5952
30.00	0.1020	131.1746	0.6008	30.00	0.0969	130.8018	0.5993
40.00	0.1060	133.1115	0.6047	40.00	0.1009	132.7662	0.6032
50.00	0.1099	135.0338	0.6085	50.00	0.1047	134.7120	0.6071
60.00	0.1138	136.9518	0.6122	60.00	0.1084	136.6419	0.6108
70.00	0.1175	138.8630	0.6159	70.00	0.1121	138.5743	0.6145
80.00	0.1212	140.7743	0.6194	80.00	0.1156	140.4962	0.6181
90.00	0.1247	142.6816	0.6229	90.00	0.1191	142.4223	0.6217
100.00	0.1283	144.6001	0.6264	100.00	0.1226	144.3510	0.6251
110.00	0.1317	146.5143	0.6298	110.00	0.1260	146.2804	0.6286
120.00	0.1352	148.4445	0.6332	120.00	0.1293	148.2124	0.6319
130.00	0.1385	150.3735	0.6365	130.00	0.1325	150.1514	0.6352
140.00	0.1419	152.3158	0.6397	140.00	0.1358	152.1031	0.6385
150.00	0.1452	154.2650	0.6429	150.00	0.1390	154.0609	0.6417
160.00	0.1485	156.2220	0.6461	160.00	0.1422	156.0258	0.6449
170.00	0.1517	158.1875	0.6493	170.00	0.1453	157.9986	0.6481
180.00	0.1549	160.1627	0.6524	180.00	0.1484	159.9810	0.6512
190.00	0.1581	162.1511	0.6555	190.00	0.1515	161.9751	0.6543
200.00	0.1612	164.1493	0.6585	200.00	0.1546	163.9786	0.6574
210.00	0.1644	166.1577	0.6615	210.00	0.1576	165.9919	0.6604
220.00	0.1675	168.1765	0.6645	220.00	0.1606	168.0154	0.6634
230.00	0.1705	170.2050	0.6675	230.00	0.1636	170.0514	0.6664
240.00	0.1736	172.2480	0.6704	240.00	0.1665	172.0987	0.6693
250.00	0.1767	174.3021	0.6734	250.00	0.1695	174.1568	0.6722

TABLE VI (CONT'D)

	PRESSURE= 520. GAGE= 505.304 SAT TEMP = -52.78				PRESSURE= 540. GAGE= 525.304 SAT TEMP = -50.54		
T F°	V	H	S	T F°	V	H	S
-50.00	0.0452	109.7559	0.5511	-50.00	0.0353	106.0716	0.5417
-40.00	0.0562	114.1849	0.5618	-40.00	0.0512	113.0174	0.5585
-30.00	0.0634	117.1617	0.5688	-30.00	0.0590	116.3547	0.5664
-20.00	0.0694	119.7272	0.5747	-20.00	0.0652	119.0632	0.5726
-10.00	0.0747	122.0520	0.5799	-10.00	0.0704	121.4733	0.5780
0.	0.0794	124.2403	0.5847	0.	0.0753	123.7533	0.5831
10.00	0.0840	126.3648	0.5893	10.00	0.0798	125.9120	0.5877
20.00	0.0882	128.4170	0.5936	20.00	0.0839	128.0010	0.5921
30.00	0.0923	130.4316	0.5978	30.00	0.0879	130.0462	0.5963
40.00	0.0961	132.4048	0.6018	40.00	0.0918	132.0656	0.6004
50.00	0.0999	134.3850	0.6057	50.00	0.0955	134.0533	0.6043
60.00	0.1036	136.3367	0.6095	60.00	0.0990	136.0278	0.6082
70.00	0.1071	138.2831	0.6132	70.00	0.1025	137.9888	0.6119
80.00	0.1106	140.2217	0.6168	80.00	0.1059	139.9448	0.6156
90.00	0.1140	142.1570	0.6204	90.00	0.1092	141.8898	0.6192
100.00	0.1173	144.0994	0.6239	100.00	0.1125	143.8463	0.6227
110.00	0.1206	146.0410	0.6273	110.00	0.1158	145.8103	0.6262
120.00	0.1239	147.9840	0.6307	120.00	0.1188	147.7546	0.6295
130.00	0.1270	149.9286	0.6340	130.00	0.1219	149.7050	0.6329
140.00	0.1302	151.8898	0.6373	140.00	0.1250	151.6760	0.6362
150.00	0.1333	153.8564	0.6406	150.00	0.1280	153.6514	0.6395
160.00	0.1364	155.8293	0.6438	160.00	0.1310	155.6325	0.6427
170.00	0.1394	157.8095	0.6470	170.00	0.1340	157.6203	0.6459
180.00	0.1424	159.7975	0.6501	180.00	0.1369	159.6139	0.6490
190.00	0.1454	161.7982	0.6532	190.00	0.1398	161.6213	0.6521
200.00	0.1484	163.8078	0.6563	200.00	0.1427	163.6372	0.6552
210.00	0.1513	165.8270	0.6593	210.00	0.1455	165.6621	0.6582
220.00	0.1542	167.8559	0.6623	220.00	0.1484	167.6965	0.6613
230.00	0.1571	169.8962	0.6653	230.00	0.1512	169.7413	0.6642
240.00	0.1600	171.9485	0.6683	240.00	0.1540	171.7985	0.6672
250.00	0.1629	174.0113	0.6712	250.00	0.1567	173.8660	0.6701

	PRESSURE= 600. GAGE= 585.304				PRESSURE= 700. GAGE= 685.304		
T F°	V	H	S	T F°	V	H	S
-20.00	0.0537	116.8364	0.5661	-20.00	0.0379	112.0968	0.5534
0.00	0.0643	122.1666	0.5779	0.00	0.0497	119.1918	0.5692
20.00	0.0728	126.7296	0.5876	20.00	0.0583	124.4522	0.5804
40.00	0.0803	130.9730	0.5963	40.00	0.0656	129.0953	0.5899
60.00	0.0873	135.0822	0.6044	60.00	0.0720	133.4480	0.5984
80.00	0.0937	139.1020	0.6120	80.00	0.0781	137.6694	0.6064
100.00	0.0999	143.0859	0.6192	100.00	0.0837	141.8015	0.6139
120.00	0.1058	147.0594	0.6262	120.00	0.0891	145.8948	0.6211
140.00	0.1115	151.0388	0.6329	140.00	0.0942	149.9745	0.6280
160.00	0.1171	155.0349	0.6395	160.00	0.0992	154.0570	0.6347
180.00	0.1224	159.0550	0.6459	180.00	0.1041	158.1535	0.6412
200.00	0.1279	163.1264	0.6522	200.00	0.1088	162.2716	0.6475
220.00	0.1331	167.2196	0.6583	220.00	0.1134	166.4167	0.6537
240.00	0.1382	171.3511	0.6643	240.00	0.1180	170.6103	0.6598
260.00	0.1433	175.5229	0.6701	260.00	0.1225	174.8277	0.6658
280.00	0.1483	179.7360	0.6759	280.00	0.1269	179.0826	0.6716
300.00	0.1532	183.9913	0.6816	300.00	0.1313	183.3762	0.6773
320.00	0.1581	188.2890	0.6872	320.00	0.1356	187.7094	0.6830
340.00	0.1630	192.6290	0.6927	340.00	0.1398	192.0824	0.6885
360.00	0.1677	197.0111	0.6981	360.00	0.1440	196.4955	0.6939
380.00	0.1725	201.4348	0.7034	380.00	0.1482	200.9483	0.6993
400.00	0.1772	205.8992	0.7087	400.00	0.1523	205.4404	0.7046
420.00	0.1819	210.4036	0.7138	420.00	0.1564	209.9711	0.7098
440.00	0.1865	214.9468	0.7189	440.00	0.1605	214.5396	0.7149
460.00	0.1913	219.5419	0.7240	460.00	0.1645	219.1450	0.7200
480.00	0.1959	224.1635	0.7290	480.00	0.1686	223.7860	0.7250
500.00	0.2005	228.8210	0.7339	500.00	0.1725	228.4616	0.7299
520.00	0.2050	233.5132	0.7387	520.00	0.1765	233.1704	0.7348
540.00	0.2096	238.2385	0.7435	540.00	0.1804	237.9110	0.7396
560.00	0.2141	242.9956	0.7482	560.00	0.1845	242.6974	0.7443
580.00	0.2186	247.7827	0.7528	580.00	0.1884	247.5010	0.7490
600.00	0.2231	252.5984	0.7574	600.00	0.1923	252.3324	0.7536
620.00	0.2276	257.4409	0.7620	620.00	0.1962	257.1900	0.7581
640.00	0.2320	262.3085	0.7664	640.00	0.2001	262.0721	0.7626
660.00	0.2365	267.1994	0.7708	660.00	0.2039	266.9769	0.7670
680.00	0.2409	272.1118	0.7752	680.00	0.2078	271.9028	0.7714
700.00	0.2453	277.0439	0.7795	700.00	0.2116	276.8478	0.7757

TABLE VI (CONT'D)

| PRESSURE= | 800. | | | PRESSURE= | 900. | | |
| GAGE= | 785.304 | | | GAGE= | 885.304 | | |

T F°	V	H	S	T F°	V	H	S
-20.00	0.0271	106.7678	0.5399	-20.00	0.0225	103.4629	0.5314
0.00	0.0387	115.7763	0.5600	0.00	0.0308	112.3122	0.5510
20.00	0.0475	121.9844	0.5732	20.00	0.0391	119.3540	0.5661
40.00	0.0546	127.1147	0.5837	40.00	0.0461	125.0577	0.5777
60.00	0.0607	131.7776	0.5928	60.00	0.0520	130.0615	0.5875
80.00	0.0664	136.1973	0.6012	80.00	0.0573	134.7184	0.5963
100.00	0.0716	140.4797	0.6090	100.00	0.0622	139.1799	0.6045
120.00	0.0766	144.7212	0.6164	120.00	0.0668	143.5267	0.6121
140.00	0.0813	148.9056	0.6235	140.00	0.0713	147.8369	0.6194
160.00	0.0859	153.0763	0.6304	160.00	0.0755	152.0982	0.6264
180.00	0.0903	157.2490	0.6370	180.00	0.0796	156.3481	0.6331
200.00	0.0946	161.4343	0.6434	200.00	0.0835	160.6004	0.6397
220.00	0.0988	165.6396	0.6497	220.00	0.0874	164.8650	0.6460
240.00	0.1029	169.8704	0.6559	240.00	0.0911	169.1491	0.6523
260.00	0.1069	174.1304	0.6619	260.00	0.0948	173.4576	0.6583
280.00	0.1108	178.4221	0.6677	280.00	0.0984	177.7940	0.6643
300.00	0.1148	182.7689	0.6735	300.00	0.1020	182.1611	0.6701
320.00	0.1187	187.1372	0.6792	320.00	0.1055	186.5604	0.6758
340.00	0.1225	191.5428	0.6848	340.00	0.1089	190.9929	0.6814
360.00	0.1262	195.9861	0.6903	360.00	0.1124	195.4843	0.6870
380.00	0.1300	200.4672	0.6957	380.00	0.1158	199.9932	0.6924
400.00	0.1336	204.9858	0.7010	400.00	0.1191	204.5379	0.6978
420.00	0.1373	209.5416	0.7062	420.00	0.1224	209.1181	0.7030
440.00	0.1409	214.1338	0.7114	440.00	0.1257	213.7333	0.7082
460.00	0.1445	218.7618	0.7165	460.00	0.1290	218.3831	0.7133
480.00	0.1481	223.4245	0.7215	480.00	0.1322	223.0665	0.7184
500.00	0.1517	228.1208	0.7264	500.00	0.1354	227.7825	0.7233
520.00	0.1552	232.8497	0.7313	520.00	0.1386	232.5302	0.7282
540.00	0.1587	237.6097	0.7361	540.00	0.1418	237.3083	0.7331
560.00	0.1622	242.3995	0.7409	560.00	0.1449	242.1155	0.7378
580.00	0.1657	247.2176	0.7456	580.00	0.1481	246.9504	0.7425
600.00	0.1691	252.0626	0.7502	600.00	0.1512	251.8116	0.7471
620.00	0.1726	256.9327	0.7547	620.00	0.1543	256.6976	0.7517
640.00	0.1760	261.8263	0.7592	640.00	0.1574	261.6067	0.7562
660.00	0.1795	266.7583	0.7637	660.00	0.1604	266.5371	0.7607
680.00	0.1829	271.6973	0.7680	680.00	0.1635	271.4873	0.7650
700.00	0.1863	276.6549	0.7723	700.00	0.1665	276.4554	0.7694

| PRESSURE= | 1000. | | | PRESSURE= | 1200. | | |
| GAGE= | 985.304 | | | GAGE= | 1185.304 | | |

T F°	V	H	S	T F°	V	H	S
-20.00	0.0204	101.6236	0.5263	-20.00	0.0185	99.5523	0.5199
0.00	0.0258	109.4247	0.5436	0.00	0.0215	106.2923	0.5349
20.00	0.0329	116.8093	0.5594	20.00	0.0254	112.7109	0.5486
40.00	0.0393	122.9348	0.5719	40.00	0.0303	119.0936	0.5617
60.00	0.0451	128.3244	0.5825	60.00	0.0351	124.9120	0.5731
80.00	0.0502	133.2256	0.5917	80.00	0.0397	130.2759	0.5832
100.00	0.0548	137.8695	0.6002	100.00	0.0439	135.2700	0.5923
120.00	0.0592	142.3601	0.6081	120.00	0.0478	140.0404	0.6007
140.00	0.0633	146.7578	0.6155	140.00	0.0515	144.6674	0.6085
160.00	0.0672	151.1003	0.6226	160.00	0.0550	149.2032	0.6160
180.00	0.0711	155.4538	0.6296	180.00	0.0583	153.6826	0.6231
200.00	0.0747	159.7735	0.6362	200.00	0.0615	158.1293	0.6299
220.00	0.0783	164.0972	0.6427	220.00	0.0646	162.5597	0.6365
240.00	0.0818	168.4337	0.6490	240.00	0.0678	167.0287	0.6430
260.00	0.0852	172.7895	0.6551	260.00	0.0707	171.4770	0.6493
280.00	0.0885	177.1690	0.6611	280.00	0.0736	175.9403	0.6554
300.00	0.0918	181.5758	0.6670	300.00	0.0765	180.4233	0.6614
320.00	0.0950	186.0120	0.6727	320.00	0.0793	184.9297	0.6672
340.00	0.0982	190.4794	0.6784	340.00	0.0820	189.4621	0.6730
360.00	0.1013	194.9788	0.6840	360.00	0.0847	194.0224	0.6786
380.00	0.1044	199.5109	0.6894	380.00	0.0874	198.6118	0.6841
400.00	0.1074	204.0758	0.6948	400.00	0.0901	203.2310	0.6896
420.00	0.1105	208.7012	0.7001	420.00	0.0927	207.8804	0.6949
440.00	0.1135	213.3391	0.7053	440.00	0.0952	212.5601	0.7002
460.00	0.1165	218.0102	0.7105	460.00	0.0978	217.2696	0.7054
480.00	0.1195	222.7137	0.7155	480.00	0.1003	222.0085	0.7105
500.00	0.1224	227.4489	0.7205	500.00	0.1028	226.7762	0.7155
520.00	0.1253	232.2148	0.7254	520.00	0.1053	231.5717	0.7204
540.00	0.1282	237.0103	0.7303	540.00	0.1079	236.4275	0.7253
560.00	0.1311	241.8341	0.7350	560.00	0.1103	241.2834	0.7301
580.00	0.1340	246.6850	0.7398	580.00	0.1128	246.1649	0.7349
600.00	0.1368	251.5616	0.7444	600.00	0.1152	251.0707	0.7396
620.00	0.1396	256.4623	0.7490	620.00	0.1176	255.9996	0.7442
640.00	0.1424	261.3857	0.7535	640.00	0.1200	260.9501	0.7487
660.00	0.1452	266.3301	0.7580	660.00	0.1224	265.9205	0.7532
680.00	0.1480	271.2938	0.7623	680.00	0.1248	270.9094	0.7576
700.00	0.1508	276.2751	0.7667	700.00	0.1271	275.9150	0.7620

TABLE VI (CONT'D)

| PRESSURE= | 1400. | | | PRESSURE= | 1600. | | |
| GAGE= | 1385.304 | | | GAGE= | 1585.304 | | |

T F°	V	H	S	T F°	V	H	S
-20.00	0.0176	98.5090	0.5160	-20.00	0.0170	97.7267	0.5128
0.00	0.0197	104.7536	0.5299	0.00	0.0186	103.7755	0.5263
20.00	0.0221	110.4267	0.5420	20.00	0.0204	109.2087	0.5379
40.00	0.0252	116.2045	0.5538	40.00	0.0226	114.5220	0.5487
60.00	0.0289	122.0018	0.5652	60.00	0.0251	119.8273	0.5591
80.00	0.0326	127.5273	0.5756	80.00	0.0280	125.2613	0.5694
100.00	0.0363	132.7559	0.5852	100.00	0.0311	130.5606	0.5790
120.00	0.0398	137.7999	0.5940	120.00	0.0341	135.6938	0.5880
140.00	0.0432	142.6337	0.6022	140.00	0.0370	140.6613	0.5965
160.00	0.0463	147.3472	0.6100	160.00	0.0399	145.5701	0.6045
180.00	0.0493	151.9807	0.6173	180.00	0.0427	150.3392	0.6121
200.00	0.0522	156.5627	0.6244	200.00	0.0453	155.0430	0.6193
220.00	0.0550	161.1140	0.6312	220.00	0.0479	159.7038	0.6263
240.00	0.0578	165.6497	0.6377	240.00	0.0503	164.3386	0.6330
260.00	0.0604	170.1805	0.6441	260.00	0.0527	168.9600	0.6395
280.00	0.0630	174.7148	0.6503	280.00	0.0551	173.5779	0.6459
300.00	0.0656	179.3027	0.6565	300.00	0.0574	178.1995	0.6520
320.00	0.0681	183.8763	0.6624	320.00	0.0596	182.8304	0.6580
340.00	0.0705	188.4706	0.6682	340.00	0.0618	187.4747	0.6639
360.00	0.0729	193.0881	0.6739	360.00	0.0640	192.1807	0.6697
380.00	0.0753	197.7309	0.6795	380.00	0.0662	196.8745	0.6754
400.00	0.0776	202.4002	0.6850	400.00	0.0683	201.5914	0.6809
420.00	0.0799	207.0968	0.6904	420.00	0.0703	206.3326	0.6864
440.00	0.0822	211.8210	0.6957	440.00	0.0724	211.0988	0.6918
460.00	0.0845	216.5731	0.7009	460.00	0.0744	215.8906	0.6970
480.00	0.0867	221.3528	0.7061	480.00	0.0764	220.7080	0.7022
500.00	0.0889	226.1596	0.7112	500.00	0.0784	225.5507	0.7073
520.00	0.0911	230.9929	0.7161	520.00	0.0804	230.4184	0.7123
540.00	0.0932	235.8520	0.7210	540.00	0.0823	235.3104	0.7173
560.00	0.0954	240.7357	0.7259	560.00	0.0842	240.2259	0.7221
580.00	0.0975	245.6431	0.7306	580.00	0.0862	245.1640	0.7269
600.00	0.0996	250.5729	0.7353	600.00	0.0881	250.1236	0.7317
620.00	0.1017	255.5238	0.7400	620.00	0.0899	255.1035	0.7363
640.00	0.1039	260.5262	0.7446	640.00	0.0918	260.1024	0.7409
660.00	0.1060	265.5215	0.7491	660.00	0.0937	265.1188	0.7454
680.00	0.1081	270.5342	0.7535	680.00	0.0955	270.1512	0.7499
700.00	0.1102	275.5628	0.7579	700.00	0.0973	275.1981	0.7543

| PRESSURE= | 1800. | | | PRESSURE= | 2000. | | |
| GAGE= | 1785.304 | | | GAGE= | 1985.304 | | |

T F°	V	H	S	T F°	V	H	S
-20.00	0.0166	97.0360	0.5098	-20.00	0.0163	96.5847	0.5074
0.00	0.0180	103.1778	0.5235	0.00	0.0175	102.7516	0.5211
20.00	0.0194	108.3962	0.5346	20.00	0.0187	107.9442	0.5322
40.00	0.0210	113.4977	0.5450	40.00	0.0200	112.8590	0.5423
60.00	0.0228	118.4959	0.5549	60.00	0.0214	117.6249	0.5516
80.00	0.0250	123.5506	0.5644	80.00	0.0231	122.4691	0.5608
100.00	0.0274	128.7488	0.5739	100.00	0.0249	127.3608	0.5697
120.00	0.0300	133.8827	0.5829	120.00	0.0270	132.4020	0.5785
140.00	0.0325	138.9308	0.5914	140.00	0.0292	137.4176	0.5870
160.00	0.0351	143.8762	0.5995	160.00	0.0314	142.3978	0.5952
180.00	0.0375	148.7276	0.6073	180.00	0.0336	147.3201	0.6030
200.00	0.0400	153.5902	0.6147	200.00	0.0358	152.1823	0.6105
220.00	0.0423	158.3470	0.6218	220.00	0.0379	156.9920	0.6177
240.00	0.0446	163.0703	0.6287	240.00	0.0400	161.8564	0.6247
260.00	0.0468	167.7735	0.6353	260.00	0.0421	166.6313	0.6315
280.00	0.0490	172.4669	0.6418	280.00	0.0441	171.3922	0.6380
300.00	0.0511	177.1587	0.6480	300.00	0.0460	176.1474	0.6443
320.00	0.0531	181.8552	0.6541	320.00	0.0479	180.9035	0.6505
340.00	0.0551	186.5614	0.6601	340.00	0.0498	185.6657	0.6565
360.00	0.0571	191.2809	0.6659	360.00	0.0516	190.4382	0.6624
380.00	0.0590	196.0164	0.6716	380.00	0.0534	195.2241	0.6682
400.00	0.0609	200.7699	0.6772	400.00	0.0551	200.0258	0.6738
420.00	0.0629	205.5894	0.6828	420.00	0.0569	204.8450	0.6794
440.00	0.0648	210.3959	0.6882	440.00	0.0586	209.6830	0.6848
460.00	0.0666	215.2256	0.6935	460.00	0.0603	214.5404	0.6902
480.00	0.0684	220.0788	0.6987	480.00	0.0619	219.4176	0.6954
500.00	0.0702	224.9555	0.7038	500.00	0.0637	224.3749	0.7006
520.00	0.0720	229.8556	0.7089	520.00	0.0653	229.3059	0.7057
540.00	0.0738	234.7785	0.7138	540.00	0.0669	234.2584	0.7107
560.00	0.0755	239.7236	0.7187	560.00	0.0685	239.2318	0.7157
580.00	0.0773	244.6902	0.7236	580.00	0.0701	244.2253	0.7205
600.00	0.0790	249.6771	0.7283	600.00	0.0717	249.2382	0.7253
620.00	0.0807	254.6835	0.7330	620.00	0.0733	254.2695	0.7300
640.00	0.0824	259.7079	0.7376	640.00	0.0748	259.3180	0.7346
660.00	0.0841	264.7492	0.7422	660.00	0.0764	264.3824	0.7392
680.00	0.0858	269.8059	0.7466	680.00	0.0779	269.4616	0.7437
700.00	0.0874	274.8765	0.7510	700.00	0.0795	274.5539	0.7481

TABLE VI (CONT'D)

| PRESSURE= | 2200. | | | PRESSURE= | 2400. | | |
| GAGE= | 2185.30402 | | | GAGE= | 2385.30402 | | |

T F°	V	H	S	T F°	V	H	S
0.00	0.0171	102.4114	0.5190	0.00	0.0168	102.0770	0.5169
20.00	0.0182	107.6643	0.5302	20.00	0.0177	107.2451	0.5279
40.00	0.0193	112.4678	0.5400	40.00	0.0187	112.1407	0.5380
60.00	0.0204	117.0539	0.5490	60.00	0.0198	116.7579	0.5470
80.00	0.0217	121.7104	0.5578	80.00	0.0208	121.2953	0.5556
100.00	0.0232	126.4664	0.5665	100.00	0.0220	125.7913	0.5638
120.00	0.0248	131.2506	0.5749	120.00	0.0234	130.5015	0.5720
140.00	0.0267	136.1864	0.5832	140.00	0.0248	135.2156	0.5800
160.00	0.0286	141.1189	0.5913	160.00	0.0264	140.0813	0.5880
180.00	0.0305	146.0482	0.5992	180.00	0.0281	144.9569	0.5958
200.00	0.0325	150.9516	0.6067	200.00	0.0298	149.8504	0.6033
220.00	0.0344	155.8212	0.6140	220.00	0.0316	154.7407	0.6106
240.00	0.0363	160.6580	0.6210	240.00	0.0333	159.6173	0.6177
260.00	0.0382	165.5424	0.6279	260.00	0.0350	164.4774	0.6245
280.00	0.0401	170.3613	0.6345	280.00	0.0367	169.3225	0.6312
300.00	0.0419	175.1724	0.6409	300.00	0.0385	174.2397	0.6377
320.00	0.0436	179.9819	0.6471	320.00	0.0401	179.0955	0.6440
340.00	0.0454	184.7949	0.6532	340.00	0.0417	183.9536	0.6502
360.00	0.0471	189.6156	0.6592	360.00	0.0433	188.8178	0.6562
380.00	0.0487	194.4474	0.6650	380.00	0.0449	193.6913	0.6621
400.00	0.0504	199.2929	0.6707	400.00	0.0464	198.5767	0.6678
420.00	0.0520	204.1540	0.6763	420.00	0.0479	203.4762	0.6734
440.00	0.0536	209.0322	0.6818	440.00	0.0494	208.3913	0.6790
460.00	0.0552	213.9285	0.6872	460.00	0.0509	213.3231	0.6844
480.00	0.0567	218.8434	0.6925	480.00	0.0523	218.2723	0.6897
500.00	0.0582	223.7772	0.6977	500.00	0.0538	223.2392	0.6949
520.00	0.0597	228.7297	0.7028	520.00	0.0552	228.2241	0.7001
540.00	0.0612	233.7008	0.7078	540.00	0.0566	233.2266	0.7051
560.00	0.0628	238.7506	0.7128	560.00	0.0579	238.2464	0.7101
580.00	0.0643	243.7701	0.7177	580.00	0.0593	243.2829	0.7150
600.00	0.0657	248.8079	0.7225	600.00	0.0607	248.3352	0.7198
620.00	0.0672	253.8630	0.7272	620.00	0.0621	253.4642	0.7246
640.00	0.0686	258.9345	0.7319	640.00	0.0634	258.5578	0.7293
660.00	0.0701	264.0211	0.7364	660.00	0.0648	263.6657	0.7339
680.00	0.0715	269.1216	0.7410	680.00	0.0661	268.7868	0.7384
700.00	0.0729	274.2346	0.7454	700.00	0.0674	273.9196	0.7429

| PRESSURE= | 2600. | | | PRESSURE= | 2800. | | |
| GAGE= | 2585.30402 | | | GAGE= | 2785.30402 | | |

T F°	V	H	S	T F°	V	H	S
0.00	0.0166	102.0139	0.5154	0.00	0.0163	101.8640	0.5138
20.00	0.0174	107.2168	0.5265	20.00	0.0172	107.1639	0.5251
40.00	0.0183	112.0358	0.5364	40.00	0.0179	111.8678	0.5347
60.00	0.0192	116.5627	0.5453	60.00	0.0187	116.3873	0.5436
80.00	0.0201	121.0103	0.5537	80.00	0.0196	120.7944	0.5519
100.00	0.0211	125.4599	0.5617	100.00	0.0204	125.1696	0.5599
120.00	0.0222	129.8897	0.5695	120.00	0.0214	129.6301	0.5677
140.00	0.0235	134.5825	0.5775	140.00	0.0223	134.0190	0.5751
160.00	0.0248	139.2524	0.5851	160.00	0.0235	138.7142	0.5828
180.00	0.0261	143.9711	0.5926	180.00	0.0247	143.3587	0.5902
200.00	0.0277	148.9115	0.6003	200.00	0.0260	148.0562	0.5974
220.00	0.0293	153.7819	0.6075	220.00	0.0274	152.9688	0.6048
240.00	0.0309	158.6653	0.6146	240.00	0.0289	157.8263	0.6118
260.00	0.0324	163.5503	0.6215	260.00	0.0303	162.7085	0.6187
280.00	0.0340	168.4318	0.6282	280.00	0.0317	167.6039	0.6254
300.00	0.0355	173.3086	0.6347	300.00	0.0331	172.5062	0.6320
320.00	0.0370	178.1819	0.6410	320.00	0.0346	177.4124	0.6383
340.00	0.0386	183.1461	0.6473	340.00	0.0360	182.3218	0.6446
360.00	0.0401	188.0483	0.6534	360.00	0.0373	187.2352	0.6506
380.00	0.0416	192.9591	0.6593	380.00	0.0388	192.2542	0.6567
400.00	0.0430	197.8808	0.6651	400.00	0.0402	197.2079	0.6625
420.00	0.0445	202.8153	0.6708	420.00	0.0415	202.1739	0.6682
440.00	0.0459	207.7642	0.6763	440.00	0.0428	207.1536	0.6738
460.00	0.0472	212.7286	0.6818	460.00	0.0441	212.1480	0.6793
480.00	0.0486	217.7094	0.6871	480.00	0.0454	217.1577	0.6847
500.00	0.0500	222.7068	0.6924	500.00	0.0467	222.1834	0.6900
520.00	0.0513	227.7213	0.6976	520.00	0.0479	227.2252	0.6952
540.00	0.0526	232.7526	0.7026	540.00	0.0492	232.2831	0.7003
560.00	0.0539	237.8004	0.7076	560.00	0.0504	237.3568	0.7053
580.00	0.0552	242.8643	0.7126	580.00	0.0516	242.4459	0.7103
600.00	0.0565	247.9435	0.7174	600.00	0.0528	247.5498	0.7151
620.00	0.0577	253.0372	0.7222	620.00	0.0540	252.6676	0.7199
640.00	0.0590	258.1443	0.7269	640.00	0.0552	257.7984	0.7246
660.00	0.0602	263.2637	0.7315	660.00	0.0564	262.9412	0.7293
680.00	0.0615	268.4571	0.7361	680.00	0.0575	268.0947	0.7338
700.00	0.0628	273.6091	0.7405	700.00	0.0587	273.2577	0.7383

TABLE VI (CONT'D)

PRESSURE=	3000.			PRESSURE=	3500.		
GAGE=	2985.30402			GAGE=	3485.30402		

T F	V	H	S	T F	V	H	S
160.00	0.0226	138.3392	0.5605	160.00	0.0209	138.?21?	0.5770
180.00	0.0236	142.8995	0.5681	180.00	0.0217	142.2703	0.5838
200.00	0.0247	147.?51?	0.5752	200.00	0.0224	146.?506	0.5906
220.00	0.0259	152.2210	0.5822	220.00	0.0233	151.3094	0.5976
240.00	0.0272	157.1135	0.5893	240.00	0.0242	155.?196	0.6042
260.00	0.0285	161.?716	0.5962	260.00	0.0251	160.5946	0.6103
280.00	0.0298	166.?3?8	0.6025	280.00	0.0261	165.5410	0.6173
300.00	0.0311	171.7696	0.6279	300.00	0.0272	170.?732	0.6235
320.00	0.0324	176.6838	0.6358	320.00	0.0282	175.?100	0.6303
340.00	0.0337	181.6423	0.6421	340.00	0.0291	180.1012	0.6362
360.00	0.0350	186.?855	0.6482	360.00	0.0302	185.0548	0.6427
380.00	0.0363	191.5159	0.6541	380.00	0.0310	190.0551	0.6457
400.00	0.0376	196.4769	0.6600	400.00	0.0321	195.0528	0.6546
420.00	0.0389	201.5541	0.6???	420.00	0.0335	200.0501	0.6603
440.00	0.0402	206.5617	0.6715	440.00	0.0346	205.1533	0.6660
460.00	0.0414	211.5832	0.6770	460.00	0.0355	210.1514	0.6716
480.00	0.0426	216.6193	0.6824	480.00	0.0310	215.?829	0.6770
500.00	0.0438	221.6712	0.6877	500.00	0.0381	220.4516	0.6825
520.00	0.0450	226.7393	0.6929	520.00	0.0392	225.5725	0.6878
540.00	0.0462	231.8403	0.6981	540.00	0.0402	230.7083	0.6930
560.00	0.0474	236.9166	0.7031	560.00	0.0412	235.8585	0.6981
580.00	0.0485	242.0012	0.7031	580.00	0.0422	241.0226	0.7031
600.00	0.0497	247.1?7?	0.7120	600.00	0.0433	246.2000	0.7080
620.00	0.0508	252.2?91	0.7176	620.00	0.0443	251.3898	0.7129
640.00	0.0517	257.??08	0.7223	640.00	0.0453	256.5911	0.7176
660.00	0.0530	262.6190	0.7212	660.00	0.0462	261.8030	0.7223
680.00	0.0541	267.?897	0.7317	660.00	0.0472	267.0244	0.7270
700.00	0.0552	272.9734	0.7352	700.00	0.0482	272.2540	0.7315

PRESSURE=	4000.			PRESSURE=	5000.		
GAGE=	3985.30402			GAGE=	4985.30402		

T F	V	H	S	T F	V	H	S
160.00	0.0200	138.1795	0.5743	160.00	0.0186	138.6783	0.5694
180.00	0.0204	142.2026	0.5807	180.00	0.0190	142.9882	0.5762
200.00	0.0211	146.6017	0.5875	200.00	0.0194	147.0958	0.5826
220.00	0.0217	150.9627	0.5940	220.00	0.0199	151.4979	0.5891
240.00	0.0223	155.3511	0.6004	240.00	0.0203	155.7752	0.5953
260.00	0.0231	160.0393	0.6070	260.00	0.0208	160.1842	0.6016
280.00	0.0239	164.6625	0.6133	280.00	0.0213	164.5998	0.6076
300.00	0.0246	169.3515	0.6196	300.00	0.0217	169.0577	0.6136
320.00	0.0255	174.0987	0.6257	320.00	0.0222	173.5512	0.6194
340.00	0.0264	179.0303	0.6320	340.00	0.0228	178.3211	0.6254
360.00	0.0273	183.9377	0.6380	360.00	0.0234	183.0218	0.6312
380.00	0.0282	188.8939	0.6440	380.00	0.0240	187.7853	0.6370
400.00	0.0291	193.8915	0.6499	400.00	0.0246	192.6069	0.6427
420.00	0.0300	198.9235	0.6557	420.00	0.0252	197.4811	0.6483
440.00	0.0310	203.9851	0.6614	440.00	0.0259	202.4022	0.6538
460.00	0.0319	209.0717	0.6670	460.00	0.0266	207.5391	0.6594
480.00	0.0329	214.1801	0.6725	480.00	0.0273	212.6027	0.6649
500.00	0.0338	219.3077	0.6779	500.00	0.0280	217.7084	0.6703
520.00	0.0347	224.4521	0.6832	520.00	0.0287	222.8511	0.6756
540.00	0.0356	229.6117	0.6884	540.00	0.0295	228.0260	0.6808
560.00	0.0365	234.7849	0.6935	560.00	0.0302	233.2290	0.6860
580.00	0.0374	239.9704	0.6985	580.00	0.0309	238.4562	0.6910
600.00	0.0384	245.2909	0.7036	600.00	0.0316	243.7042	0.6960
620.00	0.0393	250.5214	0.7085	620.00	0.0324	248.9700	0.7010
640.00	0.0402	255.7633	0.7133	640.00	0.0331	254.2508	0.7058
660.00	0.0411	261.0154	0.7180	660.00	0.0338	259.5442	0.7106
680.00	0.0420	266.2765	0.7227	680.00	0.0345	264.8479	0.7153
700.00	0.0429	271.5453	0.7273	700.00	0.0352	270.1598	0.7199

APPENDIX B

VAPOR PRESSURE

TABLE VII

COMPARISON OF VAPOR PRESSURE DATA WITH THE
VAPOR PRESSURE EQUATION FOR CARBON TETRAFLUORIDE

Critical Temperature (obs.) = 409.50 °R
Critical Pressure (calcd.) = 543.16 PSIA

Equation:

$$\log_{10} P = 20.71545389 - \frac{2467.505285}{T} - 4.69017025 \log_{10} T$$

$$+ 6.4798076 \times 10^{-4} T + \frac{0.770707795}{T}(424-T)\log_{10}(424-T)$$

where P is in psia and T in °R.

Temperature °R	P (observed) psia	P (calculated) psia	Percent Deviation $\frac{P_{obs} - P_{calc}}{P_{obs}} \times 100$	Source
166.59	0.0290	0.0290	0.000	30
169.94	0.0425	0.0413	+2.823	30
173.66	0.0599	0.0602	-0.501	30
179.14	0.1006	0.1014	-0.795	30
181.55	0.1258	0.1262	-0.317	*
183.62	0.1523	0.1515	+0.525	*
184.14	0.1586	0.1585	+0.063	30
188.17	0.2243	0.2228	+0.669	30
188.84	0.2359	0.2354	+0.212	30
189.79	0.2572	0.2543	+1.127	30
191.63	0.2952	0.2947	+0.169	*
193.45	0.3403	0.3399	+0.118	30
196.74	0.4351	0.4366	-0.345	30
197.30	0.4544	0.4553	-0.198	30
197.55	0.4622	0.4638	-0.346	30
197.84	0.4738	0.4738	0.000	30
199.64	0.5427	0.5404	+0.424	*
202.18	0.6512	0.6477	+0.537	*
220.84	2.1316	2.1254	+0.291	*
230.02	3.517	3.5237	-0.191	*
239.11	5.569	5.5690	0.000	30

TABLE VII (CONT'D)

COMPARISON OF VAPOR PRESSURE DATA WITH THE
VAPOR PRESSURE EQUATION FOR CARBON TETRAFLUORIDE

Temperature °R	P (observed) psia	P (calculated) psia	Percent Deviation $\dfrac{P_{obs} - P_{calc}}{P_{obs}} \times 100$	Source
241.07	6.118	6.1154	+0.042	30
242.12	6.414	6.4253	-0.176	30
245.29	7.421	7.4380	-0.229	30
248.62	8.618	8.6422	-0.281	30
252.02	10.003	10.010	-0.070	30
255.29	11.492	11.490	+0.017	30
256.03	11.844	11.848	-0.034	30
258.26	13.229	12.979	+1.889	*
258.32	13.002	13.010	-0.062	30
260.24	14.056	14.053	+0.021	30
260.84	14.404	14.392	+0.083	30
261.40	14.723	14.713	+0.068	30
261.77	14.936	14.929	+0.047	30
261.79	14.949	14.941	+0.054	30
262.64	15.448	15.446	+0.013	30
282.22	31.34	31.227	+0.361	*
285.14	34.71	34.362	+1.002	*
287.19	36.91	36.702	+0.563	*
289.33	40.37	39.271	+2.722	*
291.96	42.61	42.61	0.000	*
302.33	57.66	57.89	-0.399	*
309.47	70.16	70.549	-0.554	*
316.33	83.86	84.533	-0.802	*
322.85	94.05	99.600	-5.901	7
327.33	111.26	111.03	+0.207	*
333.04	127.34	126.95	+0.306	*
339.10	149.24	145.58	+2.452	*
343.04	161.34	158.70	+1.636	*
344.54	165.64	163.92	+1.038	*
344.57	166.44	164.02	+1.454	*
348.59	180.04	178.62	+0.789	*
348.77	179.29	179.29	0.000	7
351.86	193.22	191.17	+1.061	*
355.66	208.02	206.54	+0.711	*
358.49	217.50	218.56	-0.487	7
363.65	242.22	241.78	+0.182	*

TABLE VII (CONT'D)

COMPARISON OF VAPOR PRESSURE DATA WITH THE
VAPOR PRESSURE EQUATION FOR CARBON TETRAFLUORIDE

Temperature °R	P (observed) psia	P (calculated) psia	Percent Deviation $\dfrac{P_{obs} - P_{calc}}{P_{obs}}$ x 100	Source
363.71	238.08	242.06	-1.672	37
365.69	248.36	251.44	-1.240	37
373.88	292.72	293.14	-0.143	*
373.97	292.45	293.63	-0.403	37
378.83	317.43	320.75	-1.046	37
380.99	330.66	333.40	-0.829	37
383.72	353.22	349.95	+0.926	*
387.83	373.28	376.07	-0.747	37
391.61	402.67	401.46	+0.300	37
394.49	418.84	421.74	-0.692	37
398.63	449.70	452.44	-0.609	37
400.63	468.22	467.97	+0.053	37
401.47	476.22	474.63	+0.333	*
403.13	487.22	488.06	-0.017	*
403.99	494.72	495.16	-0.089	*
404.03	490.85	495.49	-0.945	37
405.18	504.22	505.15	-0.184	*
405.54	509.72	508.21	+0.296	*
406.58	516.72	517.16	-0.085	*
407.39	524.22	524.22	0.000	*
407.45	518.77	524.77	-1.156	37
408.17	531.22	531.15	+0.013	*
409.50	(critical temperature observed)	543.16	—	*
409.79	540.81	(critical temperature and pressure observed)		

* This investigation.

APPENDIX C

SATURATED LIQUID DENSITY

TABLE VIII

COMPARISON OF LIQUID DENSITY DATA WITH THE
LIQUID DENSITY EQUATION

Equation:

d_ℓ in lb/cu.ft.

d_c = 39.06 lb/cu.ft.

$d_\ell = d_c + 69.56848907 \ (1 - T/T_c)^{1/3} + 4.58661139 \ (1 - T/T_c)^{2/3}$
$\qquad + 36.17166615 \ (1 - T/T_c) - 8.05898583 \ (1 - T/T_c)^{4/3}$

$T_c = 409.50\,°R$

TEMPERATURE (°R)	EXPERIMENTAL DENSITY (lb/cu. ft)	CALCULATED DENSITY (lb/cu. ft)	PERCENT DEVIATION $\dfrac{P_{exp}-P_{calc}}{P_{exp}} \times 100$	SOURCE
165.39	118.31	118.38	- 0.057	*
167.69	122.36	118.02	+ 3.547	37
171.29	122.36	117.46	.+ 4.005	37
206.44	111.92	111.77	+ 0.133	*
253.26	101.70	103.50	- 1.771	38
256.57	102.80	102.88	- 0.076	*
258.12	101.07	102.58	- 1.499	38
287.69	96.67	96.70	- 0.034	*
314.14	90.89	90.87	+ 0.027	*
358.19	78.99	79.05	- 0.073	*
375.64	73.02	72.94	+ 0.124	*
394.46	63.92	63.92	- 0.002	*
405.35	54.65	54.68	- 0.052	*
407.74	50.57	50.64	- 0.142	*
408.16	49.58	49.60	- 0.048	*
408.58	48.39	48.33	+ 0.126	*
408.96	46.84	46.79	+ 0.106	*

* This investigation.

APPENDIX D

HEAT CAPACITY OF VAPOR AT ZERO PRESSURE

TABLE IX

HEAT CAPACITIES AT ZERO PRESSURE (c_v^*)
BY STATISTICAL METHODS FOR CF_4
[IN BTU/(LB)(°F)]

Temperature °R	180	360	540	720	900	1080	1170
Translational	0.033846	0.033846	0.033846	0.033846	0.033846	0.033846	0.033846
Rotational	0.033846	0.033846	0.033846	0.033846	0.033846	0.033846	0.033846
Vibrational	0.004064	0.042322	0.076358	0.106492	0.129010	0.145442	0.151902
Anharmonic	0.000009	0.000278	0.000709	0.001120	0.001500	0.001862	0.002037
Total	0.071765	0.110292	0.144759	0.175304	0.198202	0.214996	0.221631

TABLE X

COMPARISON OF HEAT CAPACITIES AT ZERO PRESSURE
WITH THE HEAT CAPACITY EQUATION

Equation:

$$c_v^* = 3.00559282 \times 10^{-2} + 2.37043352 \times 10^{-4}T$$

$$- 2.8\text{?}660077 \times 10^{-8}T^2 - 2.95338806 \times 10^{-11}T^3$$

where c_v^* is in Btu/(lb)(°F) and T in °R

T(°R)	c_v^* (Stat.)	c_v^* (Equation)	Percent Deviation[‡]
180	0.071765	0.071626	+ 0.199
360	0.110292	0.110311	- 0.017
540	0.144759	0.145079	- 0.221
720	0.175304	0.174895	+ 0.233
900	0.198202	0.198726	- 0.264
1080	0.214996	0.215539	- 0.252
1170	0.221631	0.220991	+ 0.289

[‡] Percent Deviation = $\dfrac{c_v^*(\text{Stat.}) - c_v^*(\text{Equation})}{c_v^*(\text{Stat.})} \times 100$

APPENDIX E

EVALUATION OF THERMODYNAMIC PROPERTIES
AT THE REFERENCE CONDITIONS

TABLE XI

ENTROPY DETERMINATION BY THERMAL METHODS
AT THE REFERENCE TEMPERATURE

Datum plane $\underline{S} = 0$ at $0\,^\circ K$
Reference temperature = $100\,^\circ K$

Temperature Range	ΔS cal/(g.mole)($^\circ$K)	Method of Evaluation
0 - 12°K	0.689	$\int_{0^\circ K}^{12^\circ K} C_p \frac{dT}{T}$ evaluated from Debye and Planck-Einstein extrapolation.
12 - 76.23°K	15.261	$\int_{12^\circ K}^{76.23^\circ K} C_p \frac{dT}{T}$ evaluated graphically from the data of Eucken and Schroder.[13]
Transition at 76.23°K	4.640	Data of Eucken and Schroder.
76.23 - 89.47°K	2.590	$\int_{76.23}^{89.47} C_p \frac{dT}{T}$ evaluated graphically from the data of Eucken and Schroder.
Fusion at 89.47°K	1.870	Data of Eucken and Schroder.
89.47 - 100 °K	2.218	$\int_{89.47^\circ K}^{100^\circ K} C_p^\ell \frac{dT}{T}$ evaluated from the liquid heat capacity equation of Selby and Aston.[40]
Entropy of saturated liquid at 100°K	27.268 [0.30962 Btu/(lb)($^\circ$R)]	

TABLE XII

ENTHALPY DETERMINATION BY THERMAL METHODS
AT THE REFERENCE TEMPERATURE

Datum plane $\underline{H} = 0$ at $0°K$
Reference temperature: $100°K$

Temperature Range	ΔH cal/g.mole	Method of evaluation
$0 - 12°K$	6.262	$\int_{0°K}^{12°K} C_p \, dT$ evaluated from Debye and Planck-Einstein extrapolation.
$12 - 76.23°K$	667.10	$\int_{12°K}^{76.23°K} C_p \, dT$ evaluated graphically from the data of Eucken and Schroder.[13]
Transition at 76.23°K	353.707	Data of Eucken and Schroder.
$76.23 - 89.47°K$	215.580	$\int_{76.23}^{89.47} C_p \, dT$ evaluated graphically from the data of Eucken and Schroder.
Fusion at 89.47°K	167.309	Data of Eucken and Schroder.
$89.47 - 100°K$	193.323	$\int_{89.47°K}^{100°K} C_p^{\ell} \, dT$ evaluated from the liquid heat capacity equation of Selby and Aston.[40]
Enthalpy of Saturated liquid at 100°K	1603.281 (32.76883 Btu/lb)	

TABLE XIII

ENTROPY OF IDEAL GAS AT 300°K AND 1 ATM
BY STATISTICAL METHODS

Component	S[cal/(mole)(°K)]
Translational	39.3846
Rotational	19.9584
Vibrational	3.1618
Anharmonic	0.0231
Total	62.5279

This value compares well with the value of 62.9321 obtained by thermal methods. (See page 171.) This presents a further check on the consistency of the heat capacity equation, obtained from the correlation of heat capacity values by statistical methods.

APPENDIX F

CALIBRATION OF THE PLATINUM RESISTANCE THERMOMETERS

Calibration of the Platinum Resistance Thermometers

Two platinum thermometers were used to measure the temperatures in this investigation. The older platinum thermometer No. 169313, made by Leeds and Northrup Company was used for the vapor pressure and critical temperature measurements. The thermometer was recalibrated at the melting point of ice and the boiling point of water by means of a standard platinum resistance thermometer in the Sohma Precision Laboratory. The modified Callendar formula,

$$t(°C) = 100(\frac{R_t - 2.4980}{0.9680} + 1.501(\frac{t}{100} - 1)(\frac{t}{100})$$

$$+ 0.1089(\frac{t}{100} - 1)(\frac{t}{100})^3 \tag{77}$$

was used to evaluate the temperatures above 0°C, corresponding to any resistance, measured by means of Mueller Bridge No. 203295, also made by Leeds and Northrup Company. The third term was zero for temperatures above 0°C.

All other temperature measurements were obtained with the new platinum resistance thermometer, No. 1504255 using the new Mueller Bridge No. 1327006, both made by Leeds and Northrup Company. This thermometer has been calibrated by the National Bureau of Standards on January 21, 1959. The following values have been reported by them in the Callendar formula:

$$t(°C) = \frac{R_t - R_0}{\alpha R_0} + \delta(\frac{t}{100} - 1) \frac{t}{100} + \beta(\frac{t}{100} - 1)(\frac{t}{100})^3 \tag{78}$$

where

$$\alpha \ = 0.003926395$$

$$\delta \ = 1.49159$$

$$\beta \ = 0.11020 \ \text{(t below 0°C)}$$

$$= 0 \quad \text{(t above 0°C)}$$

and $\quad R_o = 25.543 \ \text{abs. ohms.}$

They supplied a complete table of values in the temperature range of interest for quick interpolation.

APPENDIX G

PROGRAMS FOR CALCULATING THE THERMODYNAMIC
PROPERTIES ON IBM 704

Nomenclature for the Variables on the Machine

Machine Variable	Equivalent
DC	d_c
PC	P_c
TC	T_c
R	R
X1	a_1
X2	a_2
X3	a_3
X4	a_4
Y1	
Y2	Variables specified for individual programs
Y3	
Y4	
Z1	α
Z2	β
Z3	γ
Z4	δ
A,B,C,D,E,F	A,B,C,D,E,F
A2,B2,C2,A3,B3,C3 A4,A5,B5,C5	A_2,B_2,C_2,A_3,B_3,C_3 A_4,A_5,B_5,C_5
SB	b
SK	k
EPSI	ϵ
ZERO	CONTROL WORD
EXP	2.302585093

PROGRAM 1

Determination of Constants of the Vapor Pressure Equation and Correlation of Vapor Pressure Data

This program evaluates the constants A, B, C, D, E, F of the vapor pressure equation (Equation 21) by the method of five point fit and evaluates the values of percent deviation for the given set of data points. The values of five temperatures and pressures T_1, P_1, T_2, P_2, T_3, P_3, T_4, P_5, T_5, P_5, F and EXP are fed into the machine in FORMAT (2E 36.8), followed by the given set of T, and P data in FORMAT (2F 36.8). The machine prints out the constants and tabulates the values of temperature, experimental pressure, calculated pressure and percent deviation defined by

$$\frac{P_{exp} - P_{calc}}{P_{exp}} \times 100 .$$

NALLAN C S CHARI   C12-N   004   002   2   V P CONS

```
*COMPILEFORTRAN,EXECUTE
      DIMENSION X(50),B(10),E(50)
    2 READ INPUT TAPE 7,3,T1,P1,T2,P2,T3,P3,T4,P4,T5,P5,F,EXP
    3 FORMAT(2E36.8)
      X(1)=1.0
      X(2)=1.0
      X(3)=1.0
      X(4)=1.0
      X(5)=1.0
      X(6)=1.0/T1
      X(7)=1.0/T2
      X(8)=1.0/T3
      X(9)=1.0/T4
      X(10)=1.0/T5
      X(11)=LOGF(T1)/EXP
      X(12)=LOGF(T2)/EXP
      X(13)=LOGF(T3)/EXP
      X(14)=LOGF(T4)/EXP
      X(15)=LOGF(T5)/EXP
      X(16)=T1
      X(17)=T2
      X(18)=T3
      X(19)=T4
      X(20)=T5
      X(21)=((F-T1)/T1)*(LOGF(F-T1)/EXP)
      X(22)=((F-T2)/T2)*(LOGF(F-T2)/EXP)
      X(23)=((F-T3)/T3)*(LOGF(F-T3)/EXP)
      X(24)=((F-T4)/T4)*(LOGF(F-T4)/EXP)
      X(25)=((F-T5)/T5)*(LOGF(F-T5)/EXP)
      B(1)=LOGF(P1)/EXP
      B(2)=LOGF(P2)/EXP
      B(3)=LOGF(P3)/EXP
      B(4)=LOGF(P4)/EXP
      B(5)=LOGF(P5)/EXP
    5 D=1.0
    6 M=XSIMEQF(5,5,1,X,B,D,E)
    7 GO TO (8,2,2),M
    8 WRITE OUTPUT TAPE 6,9,X(1),X(2),X(3),X(4),X(5)
    9 FORMAT(99H1          THE FOLLOWING ARE THE CONSTANTS FOR TH
   XE VAPOR PRESSURE EQUATION FOR FREONC318/14HO          A=F14.8
   X /14HO          B=F14.8/14HO          C=F14.8/14HO          D=E
   X14.8)/14HO          E=E14.8)
      A=X(1)
      B=X(2)
      C=X(3)
      D=X(4)
      E=X(5)
   11 WRITE OUTPUT TAPE 6,12
   12 FORMAT(106H1COMPARISON OF THE CALCULATED VAPOR PRESSURES WITH EXPE
   XRIMENTAL DATA FROM DIFFERENT SOURCES FOR FREON C318/74HOTEMPERATUR
   XE    EXP PRESSURE   CALC PRESSURE    PERCENT DEVIATION        SOURCE)
   24 READ INPUT TAPE 7,25,T,PEXP
   25 FORMAT(2F36.8)
   26 OGP=A+(B/T)+(C*LOGF(T)/2.302585093)+(D*T)+(E*((F-T)/T)*(LOGF(F-T)/
   X   2.302585093))
   27 P=EXPF(2.302585093*OGP)
   28 DEV=100.0*(PEXP-P)/PEXP

   13 WRITE OUTPUT TAPE 6,14,T,PEXP,P,DEV
   14 FORMAT(F9.2,F15.4,F15.4,F16.3)
   29 GO TO 24
*DATA
```

PROGRAM 2

Determination of Constants of the Liquid Density
Equation by the Method of Least Squares
and Correlation of Liquid Density Data

The program evaluates the constants a_1, a_2, a_3 and a_4 of the

liquid density equation (Equation 22) by the method of least squares.

The data T_c and d_c are fed into the machine in FORMAT (2F 36.8) followed

by two sets of the given T, d^ℓ data in the same format, both separated

by a blank card. The first set of data are used in computing the con-

stants by the method of least squares and the second set for correlation

of data. The machine prints out the constants and tabulates the values

of T, d^ℓ (experimental), d^ℓ (calculated) and percent deviation defined

by

$$\frac{d^\ell_{exp.} - d^\ell_{calc.}}{d^\ell_{exp.}} \times 100$$

```
NALLAN C S CHARI                 C12-N              009   008   2        LIQ DENS
* COMPILE FORTRAN,EXECUTE
      DIMENSION X(50),B(10),E(50)
    2 READ INPUT TAPE 7,3,TC,DC
    3 FORMAT (2F36.8)
    4 X(1)=0.0
      X(2)=0.0
      X(3)=0.0
      X(4)=0.0
      X(5)=0.0
      X(6)=0.0
      X(7)=0.0
      X(8)=0.0
      X(9)=0.0
      X(10)=0.0
      X(11)=0.0
      X(12)=0.0
      X(13)=0.0
      X(14)=0.0
      X(15)=0.0
      X(16)=0.0
      B(1)=0.0
      B(2)=0.0
      B(3)=0.0
      B(4)=0.0
    5 READ INPUT TAPE 7,3,T,DL
      IF (T-0.0)5,8,6
    6 U3=1.0-(T/TC)
      U1=U3**(1.0/3.0)
      U2=U3**(2.0/3.0)
      U4=U3**(4.0/3.0)
      U5=U3**(5.0/3.0)
      U6=U3**2.0
      U7=U3**(7.0/3.0)
      U8=U3**(8.0/3.0)
      BETA=(DL-DC)
      X(1)=X(1)+U2
      X(2)=X(2)+U3
      X(3)=X(3)+U4
      X(4)=X(4)+U5
      X(5)=X(5)+U3
      X(6)=X(6)+U4
      X(7)=X(7)+U5
      X(8)=X(8)+U6
      X(9)=X(9)+U4
      X(10)=X(10)+U5
      X(11)=X(11)+U6
      X(12)=X(12)+U7
      X(13)=X(13)+U5
      X(14)=X(14)+U6
      X(15)=X(15)+U7
      X(16)=X(16)+U8
      B(1)=B(1)+(BETA*U1)
      B(2)=B(2)+(BETA*U2)
      B(3)=B(3)+(BETA*U3)
      B(4)=B(4)+(BETA*U4)
    7 GO TO 5
    8 D=1.0
    9 M=XSIMEQF(4,4,1,X,B,D,E)
   10 GO TO (11,2,2),M
   11 WRITE OUTPUT TAPE 6,25,X(1),X(2),X(3),X(4)
   25 FORMAT(99H1           THE   FOLLOWING   ARE   THE   CONSTANTS   FOR   TH
     XE  LIQUID DENSITY  EQUATION  FOR  FREON  14/14H0           A=F14.8
     X /14H0              B=F14.8/14H0           C=F14.8/14H0          D=F
     X14.8)
   26 WRITE OUTPUT TAPE 6,27
   27 FORMAT(116H0           TEMPERATURE              5XPL D5N2ITY
     X        CALC DENSITY                  PERCENT DEVIATION)
   28 READ INPUT TAPE 7,3,T,DEXP
      IF(T-0.0)28,2,29
   29 U3=1.0-T/TC
      U1=U3**0.33333333
      U2=U3**0.66666666
      U4=U3**1.3333333
      DLCALC=DC+X(1)*U1+X(2)*U2+X(3)*U3+X(4)*U4
      DEV=((DEXP-DLCALC)/ DEXP)*100.0
   30 WRITE OUTPUT TAPE6,31,T,DEXP,DLCALC,DEV
   31 FORMAT(F25.5,F27.8,F27.8,F32.9)
      GO TO28
```

PROGRAM 3

Determination of Liquid Heat Capacity from the Heat Capacity of Gas

The program calculates the heat capacity of liquid from the given heat capacity equation at zero pressure (C_V^*) in the form of Equation (32). The machine solves the saturated gas volume for a given temperature by Newton's iteration method and solves Equations (50) through (58). The constants of the liquid heat capacity equation are fed in Y1, Y2, Y3 and Y4 locations. It gives out a table of values of temperature, pressure, $\underline{V}^g$, $\underline{V}^\ell$, $(\frac{dP}{dT})_{sat}$, $(\frac{d^2P}{dT^2})_{sat}$, $(\frac{d\underline{V}^\ell}{dT})_{sat}$, $(\frac{dP}{dT})_{\underline{V}}$, $(\frac{dP}{d\underline{V}})_{T}$, C_V^*, C_V, $C^\ell_{(calc.)}$, $C^\ell_{(exp)}$ and percent deviation defined by

$$\frac{C^\ell_{(exp)} - C^\ell_{(calc.)}}{C^\ell_{(exp}} \times 100$$

```
NALLAN C S CHARI              C12-N            009  008  2       SP HEAT
*COMPILEFORTRAN,EXECUTE
   2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
     XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
   3 FORMAT(3E24.8)
   4 READ INPUT TAPE 7,5,T,VAPP
   5 FORMAT(2F36.8)
   6 CVSTR=Z1+Z2*T+Z3*T*T+Z4*T*T*T
   7 U3=1.0-(T/TC)
     U1=U3**(1.0/3.0)
     U2=U3**(2.0/3.0)
   8 U4=U3**(4.0/3.0)
   9 VL=1.0/(DC+(X1*U1)+(X2*U2)+(X3*U3)+(X4*U4))
  11 OGP=A+(B/T)+(C*LOGF(T)/2.302585093)+(D*T)+(E*((F-T)/T)*(LOGF(F-T)/
     X2.302585093))
     P=EXPF(2.302585093*OGP)
  12 VMB1=VAPP-SB
  14 EXP=EXPF(-SK*T/TC)
  13 VMB2=VMB1**2.0
     VMB3=VMB1**3.0
     VMB4=VMB1**4.0
     VMB5=VMB1**5.0
     VMB6=VMB1**6.0
  15 FU1=R*T
     FU2=A2+B2*T+C2*EXP
     FU3=A3+B3*T+C3*EXP
     FU4=A4
     FU5=A5+B5*T+C5*EXP
     FX=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)-P
     FPRMX=-((FU1/VMB2)+(2.0*FU2/VMB3)+(3.0*FU3/VMB4)+(4.0*FJ4/VMB5)+
     X(5.0*FU5/VMB6))
  16 Q=FX/FPRMX
  17 IF (ABSF(Q)-EPSI) 20,20,18
  18 VMB1=VMB1-Q
  19 GO TO 14
  20 VG=VMB1+SB
  22 BNU=2.302585093*B
     DNU=2.302585093*D
     PAN1=-BNU/(T*T)
     PAN2=(C/T)+DNU-(E/T)
     PAN3=-E*F*LOGF(F-T)/(T*T)
     DPDTS=P*(PAN1+PAN2+PAN3)
  23 Q1=(SK*SK/(TC*TC))*EXP
  24 VMB1=VG-SB
  25 VMB2=VMB1*VMB1
  26 VMB3=VMB2*VMB1
  27 VMB4=VMB3*VMB1
  28 VMB5=VMB4*VMB1
  29 VMB6=VMB5*VMB1
  31 SP1=C2*Q1/VMB1
     SP2=C3*Q1/(2.0*VMB2)
     SP3=C5*Q1/(4.0*VMB4)
     CV=CVSTR-(0.185053* T*(SP1+SP2+SP3))
     PART1=2.0*BNU/T
     PART2=E-C
     PART3=2.0*E*F*LOGF(F-T)/T
     PART4=E*F/(F-T)
     PART5=P/(T*T)
     D2PDTS=PART5*(PART1+PART2+PART3+PART4) +(DPDTS*DPDTS/P)
     DPDVT=-((FU1/VMB2)+(2.0*FU2/VMB3)+(3.0*FU3/VMB4)+(4.0*FU4/VMB5)+
     X(5.0*FU5/VMB6))
     CH=(-SK/TC)*EXP
     F2PRM=B2+C2*CH
     F3PRM=B3+C3*CH
     F5PRM=B5+C5*CH
  40 DPDTV='R/VMB1)+(F2PRM/VMB2)+(F3PRM/VMB3)+(F5PRM/VMB5)
  41 DVLDTS=(VL*VL)*(1.0/(3.0*TC))*((X1/U2)+(2.0*X2/U1)+(3.0*X3)+(4.0*X
     X4*U1))
     SEC1=T*(VG-VL)*D2PDTS
     SEC2=T*DPDTS*DVLDTS
     SEC3=T*(DPDTS-DPDTV)*(DPDTS-DPDTV)/DPDVT
  42 CLCALC=CV-(.185053*(SEC1-SEC2+SEC3))
  43 CLEXP=Y1+Y2*T+Y3*T*T+Y4*T*T*T
  44 DEV=((CLEXP-CLCALC)/CLEXP)*100.0
  45 WRITE OUTPUT TAPE 6,46,T,P,VG,VL,DPDTS,D2PDTS,DVLDTS,DPDTV,DPDVT,
     XCVSTR,CV,CLCALC,CLEXP,DEV
  46 FORMAT(12H1     TEMP=E16.8/12H0       PRES=E16.8/12H0        VG=E1
     X6.8/12H0       VL=E16.8/12H0  (DP/DT)S=E16.8/12H0(D2P/DT2)S=E16.8
     X/12H0 (DVL/DT)S=E16.8/12H0  (DP/DT)V=E16.8/12H0  (DP/DV)T=E16.8/12
     XH0       CV*=E16.8/12H0        CV=E16.8/12H0   CL(CAL)=E16.8/12H0
     X   CL(EXP)=E16.8/12H0PERCNT DEV=E16.8)
  47 GO TO 4
```

PROGRAM 4

Determination of H_{ref}, S_{ref}, X and Y

The program calculates the values of H_{ref}, S_{ref}, X and Y from Equations (43), (53), (69) and (76) and from the relation that the entropy of vaporization is equivalent to $\Delta \underline{H}^V/T$. The following are the locations of the variables fed into the machine.

Y1 T_{ref}

Y2   Enthalpy of liquid at T_{ref}

Y3   Entropy of liquid at T_{ref}

```
      NALLAN C S CHARI              C12-N              004   004   2          THRMPROP
*COMPILE FORTRAN,EXECUTE
* PUNCH OBJECT
      2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
        XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
      3 FORMAT(3E24.8)
        T=Y1
        EXP=EXPF(-SK*T/TC)
        OGP=A+(B/T)+(C*LOGF(T)/2.302585093)+(D*T)+(E*((F-T)/T)*(LOGF(F-T)/
       X2.302585093))
        P=EXPF(2.302585093*OGP)
        VMB1=(R*T/P)
      6 VMB2=VMB1**2.0
        VMB3=VMB1**3.0
        VMB4=VMB1**4.0
        VMB5=VMB1**5.0
        VMB6=VMB1**6.0
        FX=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)-P
        FPRMX=-((FU1/VMB2)+(2.0*FU2/VMB3)+(3.0*FU3/VMB4)+(4.0*FU4/VMB5)+
       X(5.0*FU5/VMB6))
        Q=FX/FPRMX
        IF (ABSF(Q)-EPSI) 8,8,7
      7 VMB1=VMB1-Q
        GO TO 6
        VG=VMB1+SB
        DG=1.0/VG
        VMB2=VMB1**2.0
        VMB3=VMB1**3.0
        VMB4=VMB1**4.0
        VMB5=VMB1**5.0
        U3=1.0-(T/TC)
        U1=U3**(1.0/3.0)
        U2=U3**(2.0/3.0)
        U4=U3**(4.0/3.0)
        DL=DC+X1*U1+X2*U2+X3*U3+X4*U4
        VL=1.0/DL
        BNU=2.302585093*B
        DNU=2.302585093*D
        PAN1=-BNU/(T*T)
        PAN2=(C/T)+DNU-(E/T)
        PAN3=-E*F*LOGF(F-T)/(T*T)
        DPDTS=P*(PAN1+PAN2+PAN3)
        Q1=1.0+(SK*T/TC)
        Q2=SK*EXP/TC
        FN1=A2+(C2*EXP*Q1)
        FN2=A3+(C3*EXP*Q1)
        FN3=A5+(C5*EXP*Q1)
        TP2=T*T
        TP3=TP2*T
        TP4=TP3*T
        PIN1=(Z1*T)+(0.5*Z2*TP2)+(Z3*TP3/3.0)+(0.25*Z4*TP4)
        PIN2=(P*VG)+(FN1/VMB1)+(FN2/(2.0*VMB2))+(A4/(3.0*VMB3))+(FN3/(4.0*
       XVMB4))
        QIN1=Z1*LOGF(T)+Z2*T+(Z3*TP2/2.0)+(Z4*TP3/3.0)
        QIN2=R*LOGF(VMB1)-(B2/VMB1)-(B3/(2.0*VMB2))-(B5/(4.0*VMB4))
        QIN3=(C2/VMB1)+(C3/(2.0*VMB2))+(C5/(4.0*VMB4))
        HREF=Y2+(T*(VG-VL)*DPDTS*0.185053)
        SREF=Y3+((VG-VL)*DPDTS*0.185053)
        X=HREF-PIN1-(0.185053*PIN2)
        Y=SREF-QIN1-0.185053*(QIN2+Q2*QIN3)
        WRITE OUTPUT TAPE 6,3,T,HREF,X
        WRITE OUTPUT TAPE 6,3,T,SREF,Y
```

PROGRAM 5

Saturation Temperature Table

The program calculates the values of vapor pressure, gage, specific volume of liquid, specific volume of gas, density of liquid, density of gas, enthalpy of liquid, latent heat of vaporization, enthalpy of gas, entropy of liquid and entropy of gas for a given temperature and tabulates them as shown in Table IV. The values of X and Y from Program 4 are fed into locations Y1 and Y2. The temperatures and approximate values of volumes are fed in FORMAT (2F 36.8). The volumes of gas are computed by simultaneous solution of the vapor pressure equation (Equation 21) and P-V-T equation (Equation 35) by the Newton's iteration method with a tolerance of ϵ.

```
         NALLAN C S CHARI                 C12-N               004   004   2           THRMPROP
      *COMPILE FORTRAN,EXECUTE
      * PUNCH OBJECT
            2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
             XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
            3 FORMAT(3E24.8)
              X=Y1
              Y=Y2
              DELTA=Y3
              WRITE OUTPUT TAPE 6,20
           20 FORMAT(119H1 TEMP    P R E S S U R E       LIQUID     GAS    LIQUID
              X      GAS        LIQUID     LATENT      GAS      LIQUID     GAS /
              X120HODEG F   PSIA    G A G E     SP VOL    SP VOL  DENSITY     DE
              XNSITY   ENTHALPY    HEAT     ENTHALPY   ENTROPY  ENTROPY/4HO   )
            4 READ INPUT TAPE7,5,T,VAPP
            5 FORMAT(2F36.8)
          100 IF(T-TC)103,101,103
          101 P=PC
              VMB1=1.0/DC-SB
              VL=1.0/DC
              GO TO 8
          103 U3=1.0-(T/TC)
              U1=U3**(1.0/3.0)
              U2=U3**(2.0/3.0)
              U4=U3**(4.0/3.0)
              DL=DC+X1*U1+X2*U2+X3*U3+X4*U4
              VL=1.0/DL
           31 IF (T-210.69) 32,32,33
           32 EPSI=0.001
           33 EXP=EXPF(-SK*T/TC)
              OGP=A+(B/T)+(C*LOGF(T)/2.302585093)+(D*T)+(E*((F-T)/T)*(LOGF(F-T)/
              X2.302585093))
              P=EXPF(2.302585093*OGP)
              FU1=R*T
              FU2=A2+B2*T+C2*EXP
              FU3=A3+B3*T+C3*EXP
              FU4=A4
              FU5=A5+B5*T+C5*EXP
              VMB1=VAPP-SB
            6 VMB2=VMB1**2.0
              VMB3=VMB1**3.0
              VMB4=VMB1**4.0
              VMB5=VMB1**5.0
              VMB6=VMB1**6.0
              FX=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)-P
              FPRMX=-((FU1/VMB2)+(2.0*FU2/VMB3)+(3.0*FU3/VMB4)+(4.0*FU4/VMB5)+
              X(5.0*FU5/VMB6))
              Q=FX/FPRMX
              IF (ABSF(Q)-EPSI) 8,8,7
            7 VMB1=VMB1-Q
              GO TO 6
            8 VG=VMB1+SB
              DG=1.0/VG
              VMB2=VMB1**2.0
              VMB3=VMB1**3.0
              VMB4=VMB1**4.0
              VMB5=VMB1**5.0
              VMB6=VMB1**6.0
              BNU=2.302585093*B
```

```
      DNU=2.302585093*D
      PAN1=-BNU/(T*T)
      PAN2=(C/T)+DNU-(E/T)
      PAN3=-E*F*LOGF(F-T)/(T*T)
      DPDTS=P*(PAN1+PAN2+PAN3)
      Q1=1.0+(SK*T/TC)
      Q2=SK*EXP/TC
      FN1=A2+(C2*EXP*Q1)
      FN2=A3+(C3*EXP*Q1)
      FN3=A5+(C5*EXP*Q1)
      TP2=T*T
      TP3=TP2*T
      TP4=TP3*T
      PIN1=(Z1*T)+(0.5*Z2*TP2)+(Z3*TP3/3.0)+(0.25*Z4*TP4)
      PIN2=(P*VG)+(FN1/VMB1)+(FN2/(2.0*VMB2))+(A4/(3.0*VMB3))+(FN3/(4.0*
     XVMB4))
      QIN1=Z1*LOGF(T)+Z2*T+(Z3*TP2/2.0)+(Z4*TP3/3.0)
      QIN2=R*LOGF(VMB1)-(B2/VMB1)-(B3/(2.0*VMB2))-(B5/(4.0*VMB4))
      QIN3=(C2/VMB1)+(C3/(2.0*VMB2))+(C5/(4.0*VMB4))
   10 HG=X+PIN1+(PIN2*0.185053)
      SG=Y+QIN1+0.185053*(QIN2+Q2*QIN3)
      HEAT=T*(VG-VL)*DPDTS*0.185053
      HL=HG-HEAT
      SL=SG-(HEAT/T)
      TF=T-459.69
      IF (P-115.0) 11,11,15
   11 IF (P-14.7) 12,12,16
   12 IF (P-10.0)13,13,17
   13 IF (P-1.0)14,14,18
   14 IF (P-0.20) 19,15,19
   15 PG=P-14.696
      WRITE OUTPUT TAPE 6,21,TF,P,PG,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
   21 FORMAT(F6.0,F9.2,F10.2,F11.6,F10.5,F11.3,F 9.4,F12.4,F11.3,F12.4,F
     X9.4,F10.4)
      GO TO 4
   16 PG=P-14.696
      WRITE OUTPUT TAPE 6,22,TF,P,PG,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
   22 FORMAT(F6.0,F9.3,F10.3,F11.6,F10.5,F11.3,F 9.4,F12.4,F11.3,F12.4,F
     X9.4,F10.4)
      GO TO 4
   17 PG=29.92-(P*2.036)
      WRITE OUTPUT TAPE 6,23,TF,P,PG,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
   23 FORMAT(F6.0,F9.3,F10.3,F11.6,F10.5,F11.3,F10.5,F11.4,F11.3,F12.4,F
     X9.4,F10.4)
      GO TO 4
   18 PG=29.92-(P*2.036)
      WRITE OUTPUT TAPE 6,24,TF,P,PG,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
   24 FORMAT(F6.0,F9.4,F10.4,F11.6,F10.5,F11.3,F10.5,F11.4,F11.3,F12.4,F
     X9.4,F10.4)
      GO TO 4
   19 PG=29.92-(P*2.036)
      WRITE OUTPUT TAPE 6,25,TF,P,PG,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
   25 FORMAT(F6.0,F10.5,F10.5,F10.6,F10.5,F11.3,F11.6,F10.4,F11.3,F12.4,
     XF9.4,F10.4)
      GO TO 4
```

PROGRAM 6

Saturation Pressure Table

The program calculates the values of gage pressure, saturation temperature, specific volume of liquid, specific volume of gas, density of liquid, density of gas, enthalpy of liquid, latent heat of vaporization, enthalpy of gas, entropy of liquid and entropy of gas for a given pressure as shown in Table V. The saturation temperature is obtained by the Newton's iteration method with a tolerance ϵ. The specific volume of gas is obtained in a similar manner to that of the saturation temperature table. However, the scanning time on the machine is considerably reduced by feeding in the values of z as functions of T_r and P_r. The values of S_1 to S_{21} represent the values of z fed in this manner. At the completion of each set of z values for the given set of pressures, a blank (control card) is introduced followed by the next set of z values. The machine thus interpolates the value of z and for the first assumption uses a value of $\underline{V} = zRT/P$ instead of RT/P, thereby reducing the machine scanning time by nearly half.

```
NALLAN C S CHARI              C12-N           008   006   2      SAT PRES
*COMPILEFORTRAN,EXECUTE,PUNCH OBJECT
    2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
     XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
    3 FORMAT(3E24.8)
      X=Y1
      Y=Y2
      DELTA=Y3
      WRITE OUTPUT TAPE 6,20
   20 FORMAT(119H1   P R E S S U R E   TEMP   LIQUID      GAS      LIQUI
     XD       GAS      LIQUID    LATENT      GAS      LIQUID    GAS  /
      X120H0    PSIA   G A G E   DEG F  SP VOL     SP VOL   DENSITY
      XDENSITY ENTHALPY   HEAT      ENTHALPY ENTROPY   ENTROPY/4HO     )
    4 READ INPUT TAPE 7,5,P,TAPP,VFIN
    5 FORMAT(3F24.8)
  100 IF(P-PC)32,101,32
  101 T=TC
      VMB1=(1.0/DC)-SB
      VL=1.0/DC
      GO TO 40
   32 IF(P-0.0)4,33,34
   33 READ INPUT TAPE 7,5,S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12,S13,S14
     X,S15,S16,S17,S18,S19,S20,S21
      GO TO 4
   34 T=TAPP
    6 FOP=A+(B/T)+(C*LOGF(T)/2.302585093)+(D*T)+(E*((F-T)/T)*(LOGF(F-T)/
     X2.302585093))-(LOGF(P)/2.302585093)
      BNU=2.302585093*B
      DNU=2.302585093*D
      PAN1=-BNU/(T*T)
      PAN2=(C/T)+DNU-(E/T)
      PAN3=-E*F*LOGF(F-T)/(T*T)
      FPRMP=PAN1+PAN2+PAN3
      G=FOP/FPRMP
      IF(ABSF(G)-EPSI)8,8,7
    7 T=T-G
      GO TO 6
    8 TF=T-459.69
      U3=1.0-(T/TC)
      U1=U3**(1.0/3.0)
      U2=U3**(2.0/3.0)
      U4=U3**(4.0/3.0)
      DL=DC+X1*U1+X2*U2+X3*U3+X4*U4
      VL=1.0/DL
   30 TR=T/TC
   41 IF(TR-2.08)42,42,71
   42 IF(TR-2.00) 43,43,72
   43 IF(TR-1.92)44,44,73
   44 IF(TR-1.80)45,45,74
   45 IF(TR-1.68)46,46,75
   46 IF(TR-1.56) 47,47,76
   47 IF(TR-1.44)48,48,77
   48 IF(TR-1.32)49,49,78
   49 IF (TR-1.28)50,50,79
   50 IF(TR-1.24)51,51,80
   51 IF (TR-1.20)52,52,81
   52 IF(TR-1.16)53,53,82
   53 IF(TR-1.12)54,54,83
   54 IF(TR-1.08)55,55,84
```

```
55 IF(TR-1.04)56,56,85
56 IF(TR-1.00)57,57,86
57 IF(TR-0.96)58,58,87
58 IF (TR-0.92)59,59,88
59 IF(TR-0.88)60,60,89
60 IF(TR-0.84)70,70,90
70 IF(TR-0.80)71,71,91
71 Z=S1
   GO TO 93
72 Z=S2
   GO TO 93
73 Z=S3
   GO TO 93
74 Z=S4
   GO TO 93
75 Z=S5
   GO TO 93
76 Z=S6
   GO TO 93
77 Z=S7
   GO TO 93
78 Z=S8
   GO TO 93
79 Z=S9
   GO TO 93
80 Z=S10
   GO TO 93
81 Z=S11
   GO TO 93
82 Z=S12
   GO TO 93
83 Z=S13
   GO TO 93
84 Z=S14
   GO TO 93
85 Z=S15
   GO TO 93
86 Z=S16
   GO TO 93
87 Z=S17
   GO TO 93
88 Z=S18
   GO TO 93
89 Z=S19
   GO TO 93
90 Z=S20
   GO TO 93
91 Z=S21
   GO TO 93
93 EXP=EXPF(-SK*T/TC)
   FU1=R*T
   FU2=A2+B2*T+C2*EXP
   FU3=A3+B3*T+C3*EXP
   FU4=A4
   FU5=A5+B5*T+C5*EXP
   V=Z*R*T/P
   VMB1=V-SB
   IF(V-300.0)61,61,4
```

```
61 IF(V-100.0)62,62,64
62 IF(V-40.0)63,63,65
63 IF(V-0.02)4,66,66
64 EPSI=0.001
   GO TO 66
65 EPSI=0.0001
66 VMB2=VMB1**2.0
   VMB3=VMB1**3.0
   VMB4=VMB1**4.0
   VMB5=VMB1**5.0
   VMB6=VMB1**6.0
   FX=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)-P
   FPRMX=-((FU1/VMB2)+(2.0*FU2/VMB3)+(3.0*FU3/VMB4)+(4.0*FU4/VMB5)+
  X(5.0*FU5/VMB6))
   Q=FX/FPRMX
67 IF(ABSF(Q)-EPSI) 40,40,68
68 VMB1=VMB1-Q
69 GO TO 66
40 VG=VMB1+SB
   TF=T-459.69
   DG=1.0/VG
   VMB2=VMB1*VMB1
   VMB3=VMB1**3.0
   VMB4=VMB1**4.0
   VMB5=VMB1**5.0
   VMB6=VMB1**6.0
   BNU=2.302585093*B
   DNU=2.302585093*D
   PAN1=-BNU/(T*T)
   PAN2=(C/T)+DNU-(E/T)
   PAN3=-E*F*LOGF(F-T)/(T*T)
   DPDTS=P*(PAN1+PAN2+PAN3)
   Q1=1.0+(SK*T/TC)
   Q2=SK*EXP/TC
   FN1=A2+(C2*EXP*Q1)
   FN2=A3+(C3*EXP*Q1)
   FN3=A5+(C5*EXP*Q1)
   TP2=T*T
   TP3=TP2*T
   TP4=TP3*T
   PIN1=(Z1*T)+(0.5*Z2*TP2)+(Z3*TP3/3.0)+(0.25*Z4*TP4)
   PIN2=(P*VG)+(FN1/VMB1)+(FN2/(2.0*VMB2))+(A4/(3.0*VMB3))+(FN3/(4.0*
  XVMB4))
   QIN1=Z1*LOGF(T)+Z2*T+(Z3*TP2/2.0)+(Z4*TP3/3.0)
   QIN2=R*LOGF(VMB1)-(B2/VMB1)-(B3/(2.0*VMB2))-(B5/(4.0*VMB4))
   QIN3=(C2/VMB1)+(C3/(2.0*VMB2))+(C5/(4.0*VMB4))
   HG=X+PIN1+(PIN2*0.185053)
   SG=Y+QIN1+0.185053*(QIN2+Q2*QIN3)
   HEAT=T*(VG-VL)*DPDTS*0.185053
   HL=HG-HEAT
   SL=SG-(HEAT/T)
   IF (P-100.0) 11,15,15
11 IF(P-14.696) 12,27,16
12 IF (P-10.0)13,17,17
13 IF (P-1.0)14,14,18
14 IF (P-0.20) 15,19,19
15 PG=P-14.696
   WRITE OUTPUT TAPE 6,21,P,PG,TF,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
```

```
21 FORMAT(F6.1,F8.2,F12.2,F11.6,F10.5,F9.3,F10.4,F12.4,F 9.3,F12.4,
   XF9.4,F10.4)
   GO TO 4
16 PG=P-14.696
   WRITE OUTPUT TAPE 6,22,P,PG,TF,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
22 FORMAT(F6.1,F 9.3,F11.2,F11.6,F10.5,F9.3,F10.4,F12.4,F 9.3,F12.4,
   XF9.4,F10.4)
   GO TO 4
17 PG=29.92-(P*2.036)
   WRITE OUTPUT TAPE 6,23,P,PG,TF,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
23 FORMAT(F6.1,F9.3,F11.2,F11.6,F9.4,F10.3,F11.5,F11.4,F9.3,F12.4,
   XF9.4,F10.4)
   GO TO 4
18 PG=29.92-(P*2.036)
   WRITE OUTPUT TAPE 6,24,P,PG,TF,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
24 FORMAT(F7.2,F9.4,F10.2,F11.6,F9.4,F10.3,F11.5,F11.4,F9.3,F12.4,
   XF9.4,F10.4)
   GO TO 4
19 PG=29.92-(P*2.036)
   WRITE OUTPUT TAPE 6,25,P,PG,TF,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
25 FORMAT(F7.2,F10.5,F9.2,F11.6,F8.3,F11.3,F12.6,F10.4,F9.3,F12.4,
   XF9.4,F10.4)
   GO TO 4
27 PG=P-14.696
   WRITE OUTPUT TAPE 6,28,P,PG,TF,VL,VG,DL,DG,HL,HEAT,HG,SL,SG
28 FORMAT(F8.3,F7.3,F11.2,F11.6,F10.5,F9.3,F10.4,F12.4,F9.3,F12.4,
   XF9.4,F10.4)
   GO TO 4
```

PROGRAM 7

Superheat Tables Up To Critical Pressure

This program computes the saturation temperature for a given
pressure and evaluates the values of specific volume, enthalpy and
entropy for a series of temperatures. The evaluation of these proper-
ties starts from the nearest round figure of temperature higher than
the saturation temperature. This program can be used to prepare the
tables for a given degree of superheat or for a given range of tempera-
tures. A value of 0.0 is fed for the control word ZERO in the former
case. In the other case it has a value of 1.0. The locations of the
variables are

$$Y1 \ = \ Y$$

$$Y2 \ = \ Y$$

$$Y3 \ = \ \text{Increment of temperatures required}$$

$$Y4 \ = \ \text{Degree of superheat}$$

The method of evaluating the properties is the same as described for
Program 6.

```
NALLAN C S CHARI                    C12-N                  010   200   2         HI  SUP H
*COMPILEFORTRAN,EXECUTE,PUNCH OBJECT
    2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
      XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
    3 FORMAT(3E24.8)
   62 READ INPUT TAPE 7,63,TINIL,TNU
   63 FORMAT(2F36.8)
      X=Y1
      Y=Y2
      DELTA=Y3
      DEGR=Y4
    4 READ INPUT TAPE 7,5,P,TAPP,VFIN
    5 FORMAT(3F24.8)
   22 IF(P-0.0)4,23,24
   23 READ INPUT TAPE 7,5,S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12,S13,S14
      X,S15,S16,S17,S18,S19,S20,S21
      GO TO 4
   24 T=TAPP
      IF (P-14.696) 26,27,27
   26 PG=29.92-(2.036*P)
      GO TO 6
   27 PG=P-14.696
    6 FOP=A+(B/T)+(C*LOGF(T)/2.302585093)+(D*T)+(E*((F-T)/T)*(LOGF(F-T)/
      X2.302585093))-(LOGF(P)/2.302585093)
      BNU=2.302585093*B
      DNU=2.302585093*D
      PAN1=-BNU/(T*T)
      PAN2=(C/T)+DNU-(E/T)
      PAN3=-E*F*LOGF(F-T)/(T*T)
      FPRMP=PAN1+PAN2+PAN3
      G=FOP/FPRMP
      IF(ABSF(G)-EPSI)8,8,7
    7 T=T-G
      GO TO 6
    8 TSAT=T-459.69
      WRITE OUTPUT TAPE 6,29,P,PG,TSAT
   29 FORMAT(16H1       PRESSURE=F14.5/16H           GAGE=F14.5/16H        S
      XAT   TEMP  =F11.2)
      WRITE OUTPUT TAPE 6,25
   25 FORMAT(41H0   T F         V         H         S      )
   28 IF(T-TINIL)10,10,9
    9 TINIL=TINIL+10.0
      GO TO 28
   10 T=TINIL
   30 TR=T/TC
   41 IF(TR-2.08)42,42,71
   42 IF(TR-2.00) 43,43,72
   43 IF(TR-1.92)44,44,73
   44 IF(TR-1.80)45,45,74
   45 IF(TR-1.68)46,46,75
   46 IF(TR-1.56) 47,47,76
   47 IF(TR-1.44)48,48,77
   48 IF(TR-1.32)49,49,78
   49 IF (TR-1.28)50,50,79
   50 IF(TR-1.24)51,51,80
   51 IF (TR-1.20)52,52,81
   52 IF(TR-1.16)53,53,82
   53 IF(TR-1.12)54,54,83
   54 IF(TR-1.08)55,55,84
```

```
 55  IF(TR-1.04)56,56,85
 56  IF(TR-1.00)57,57,86
 57  IF(TR-0.96)58,58,87
 58  IF (TR-0.92)59,59,88
 59  IF(TR-0.88)60,60,89
 60  IF(TR-0.84)61,61,90
 61  IF(TR-0.80)71,71,91
 71  Z=S1
     GO TO 93
 72  Z=S2
     GO TO 93
 73  Z=S3
     GO TO 93
 74  Z=S4
     GO TO 93
 75  Z=S5
     GO TO 93
 76  Z=S6
     GO TO 93
 77  Z=S7
     GO TO 93
 78  Z=S8
     GO TO 93
 79  Z=S9
     GO TO 93
 80  Z=S10
     GO TO 93
 81  Z=S11
     GO TO 93
 82  Z=S12
     GO TO 93
 83  Z=S13
     GO TO 93
 84  Z=S14
     GO TO 93
 85  Z=S15
     GO TO 93
 86  Z=S16
     GO TO 93
 87  Z=S17
     GO TO 93
 88  Z=S18
     GO TO 93
 89  Z=S19
     GO TO 93
 90  Z=S20
     GO TO 93
 91  Z=S21
     GO TO 93
 93  EXP=EXPF(-SK*T/TC)
     FU1=R*T
     FU2=A2+B2*T+C2*EXP
     FU3=A3+B3*T+C3*EXP
     FU4=A4
     FU5=A5+B5*T+C5*EXP
     V=Z*R*T/P
     VMB1=V-SB
     IF(V-300.0) 11,11,4
```

```
   11 IF(V-100.0) 12,12,14
   12 IF (V-40.0)13,13,15
   13 IF (V-0.020) 4,16,16
   14 EPSI=0.001
      GO TO 16
   15 EPSI=0.0001
   16 VMB2=VMB1**2.0
      VMB3=VMB1**3.0
      VMB4=VMB1**4.0
      VMB5=VMB1**5.0
      VMB6=VMB1**6.0
      FX=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)-P
      FPRMX=-((FU1/VMB2)+(2.0*FU2/VMB3)+(3.0*FU3/VMB4)+(4.0*FU4/VMB5)+
     X(5.0*FU5/VMB6))
      Q=FX/FPRMX
   17 IF (ABSF(Q)-EPSI) 20,20,18
   18 VMB1=VMB1-Q
   19 GO TO 16
   20 VG=VMB1+SB
      TF=T-459.69
  100 IF(ZERO-0.0) 102,101,102
  101 TNU=TINIL+DEGR
  102 IF(T-TNU)21,21,4
   21 DG=1.0/VG
      VMB2=VMB1*VMB1
      VMB3=VMB1**3.0
      VMB4=VMB1**4.0
      Q1=1.0+(SK*T/TC)
      Q2=SK*EXP/TC
      FN1=A2+(C2*EXP*Q1)
      FN2=A3+(C3*EXP*Q1)
      FN3=A5+(C5*EXP*Q1)
      TP2=T*T
      TP3=TP2*T
      TP4=TP3*T
      PIN1=(Z1*T)+(0.5*Z2*TP2)+(Z3*TP3/3.0)+(0.25*Z4*TP4)
      PIN2=(P*VG)+(FN1/VMB1)+(FN2/(2.0*VMB2))+(A4/(3.0*VMB3))+(FN3/(4.0*
     XVMB4))
      QIN1=Z1*LOGF(T)+Z2*T+(Z3*TP2/2.0)+(Z4*TP3/3.0)
      QIN2=R*LOGF(VMB1)-(B2/VMB1)-(B3/(2.0*VMB2))-(B5/(4.0*VMB4))
      QIN3=(C2/VMB1)+(C3/(2.0*VMB2))+(C5/(4.0*VMB4))
      HG=X+PIN1+(PIN2*0.185053)
      SG=Y+QIN1+0.185053*(QIN2+Q2*QIN3)
      WRITE OUTPUT TAPE6,31,TF,VG,HG,SG
   31 FORMAT(F8.2,F11.4,F11.4,F11.4)
      T=T+DELTA
      GO TO 30
```

PROGRAM 8

Superheat Tables Above the Critical Pressure

The program computes the values of specific volume, enthalpy and entropy of gas, for a series of temperatures with a given increment of temperature. The values of the initial and final temperatures and the increment of temperature required are fed into the machine. The input variables are:

$$Y1 = X$$

$$Y2 = Y$$

$$Y3 = \text{Increment of Temperature chosen}$$

$$TINIL = \text{Initial temperature}$$

$$TNU = \text{Final temperature}$$

The method of calculation of properties is the same as described for Program 7.

```
*COMPILE FORTRAN,EXECUTE,PUNCH OBJECT
    2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
      XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
    3 FORMAT(3E24.8)
   62 READ INPUT TAPE 7,63,TINIL,TNU
   63 FORMAT(2F36.8)
      X=Y1
      Y=Y2
      DELTA=Y3
    4 READ INPUT TAPE 7,5,P
    5 FORMAT(F72.8)
   24 PG=P-14.696
      WRITE OUTPUT TAPE 6,29,P,PG
   29 FORMAT(16H1          PRESSURE=F14.5/16H             GAGE=F14.5)
      WRITE OUTPUT TAPE 6,25
   25 FORMAT(41H0   T F        V         H         S     )
   10 T=TINIL
   30 EXP=EXPF(-SK*T/TC)
      FU1=R*T
      FU2=A2+B2*T+C2*EXP
      FU3=A3+B3*T+C3*EXP
      FU4=A4
      FU5=A5+B5*T+C5*EXP
      V=0.02
      VMB1=V-SB
   15 EPSI=0.0001
   16 VMB2=VMB1**2.0
      VMB3=VMB1**3.0
      VMB4=VMB1**4.0
      VMB5=VMB1**5.0
      VMB6=VMB1**6.0
      FX=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)-P
      FPRMX=-((FU1/VMB2)+(2.0*FU2/VMB3)+(3.0*FU3/VMB4)+(4.0*FU4/VMB5)+
      X(5.0*FU5/VMB6))
      Q=FX/FPRMX
   17 IF (ABSF(Q)-EPSI) 20,20,18
   18 VMB1=VMB1-Q
   19 GO TO 16
   20 VG=VMB1+SB
      TF=T-459.69
      IF(T-TNU)21,21,4
   21 DG=1.0/VG
      VMB2=VMB1*VMB1
      VMB3=VMB1**3.0
      VMB4=VMB1**4.0
      Q1=1.0+(SK*T/TC)
      Q2=SK*EXP/TC
      FN1=A2+(C2*EXP*Q1)
      FN2=A3+(C3*EXP*Q1)
      FN3=A5+(C5*EXP*Q1)
      TP2=T*T
      TP3=TP2*T
      TP4=TP3*T
      PIN1=(Z1*T)+(0.5*Z2*TP2)+(Z3*TP3/3.0)+(0.25*Z4*TP4)
      PIN2=(P*VG)+(FN1/VMB1)+(FN2/(2.0*VMB2))+(A4/(3.0*VMB3))+(FN3/(4.0*
      XVMB4))
      QIN1=Z1*LOGF(T)+Z2*T+(Z3*TP2/2.0)+(Z4*TP3/3.0)
      QIN2=R*LOGF(VMB1)-(B2/VMB1)-(B3/(2.0*VMB2))-(B5/(4.0*VMB4))
      QIN3=(C2/VMB1)+(C3/(2.0*VMB2))+(C5/(4.0*VMB4))
      HG=X+PIN1+(PIN2*0.185053)
      SG=Y+QIN1+0.185053*(QIN2+Q2*QIN3)
      WRITE OUTPUT TAPE6,31,TF,VG,HG,SG
   31 FORMAT(F8.2,F11.4,F11.4,F11.4)
   32 T=T+DELTA
      GO TO 30
```

PROGRAM 9

Constant Volume Tables

This program evaluates the pressure, enthalpy and entropy of the gas at a given volume as functions of temperature. The volumes and the initial temperatures corresponding to each volume are fed into the machine in FORMAT (2F 36.8). The other variables fed into the machine are:

$$Y1 = X$$

$$Y2 = Y$$

$$Y3 = \text{Increment of temperatures chosen}$$

$$Y4 = \text{Final temperature}$$

$$ZERO = \text{Nearest round figure higher than the critical temperature}$$

The method of calculation is the same as described earlier.

```
NALLAN C S CHARI                C12-N               004    040    2          CON VOLU
*COMPILE FORTRAN,EXECUTE
* PUNCH OBJECT
      2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
       XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
      3 FORMAT(3E24.8)
      4 READ INPUT TAPE 7,5,VG,TIN
        X=Y1
        Y=Y2
        DELTA=Y3
      5 FORMAT(2F36.8)
        WRITE OUTPUT TAPE 6,29,VG
     29 FORMAT(19H1           VOLUME=F8.3)
        WRITE OUTPUT TAPE 6,21
     21 FORMAT(40H0  T(F)        P         H         S   /4H    )
        T=TIN+459.69
     20 EXP=EXPF(-SK*T/TC)
        FU1=R*T
        FU2=A2+B2*T+C2*EXP
        FU3=A3+B3*T+C3*EXP
        FU4=A4
        FU5=A5+B5*T+C5*EXP
        VMB1=VG-SB
        VMB2=VMB1**2.0
        VMB3=VMB1**3.0
        VMB4=VMB1**4.0
        VMB5=VMB1**5.0
        P=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)
        Q1=1.0+(SK*T/TC)
        Q2=SK*EXP/TC
        FN1=A2+(C2*EXP*Q1)
        FN2=A3+(C3*EXP*Q1)
        FN3=A5+(C5*EXP*Q1)
        TP2=T*T
        TP3=TP2*T
        TP4=TP3*T
        PIN1=(Z1*T)+(0.5*Z2*TP2)+(Z3*TP3/3.0)+(0.25*Z4*TP4)
        PIN2=(P*VG)+(FN1/VMB1)+(FN2/(2.0*VMB2))+(A4/(3.0*VMB3))+(FN3/(4.0*
       XVMB4))
        QIN1=Z1*LOGF(T)+Z2*T+(Z3*TP2/2.0)+(Z4*TP3/3.0)
        QIN2=R*LOGF(VMB1)-(B2/VMB1)-(B3/(2.0*VMB2))-(B5/(4.0*VMB4))
        QIN3=(C2/VMB1)+(C3/(2.0*VMB2))+(C5/(4.0*VMB4))
     10 HG=X+PIN1+(PIN2*0.185053)
        SG=Y+QIN1+0.185053*(QIN2+Q2*QIN3)
        TF=T-459.69
        WRITE OUTPUT TAPE 6,31,TF,P,HG,SG
     31 FORMAT(F7.2,F11.4,F11.4,F11.4)
        IF(VG-(1.0/DC))32,35,32
     35 IF(T-TC)32,37,32
     37 T=ZERO
        T=T+DELTA
        IF(T-Y4)20,20,4
```

PROGRAM 10

Constant Entropy Tables

This program evaluates the pressure, specific volume of gas and enthalpy of gas for the given entropy as functions of temperature. The entropy and the initial and final temperatures corresponding to each entropy required for the computation are fed into the machine in FORMAT (3F 24.8). Other variables fed into the machine are:

$$Y1 = X$$

$$Y2 = Y$$

$$Y3 = \text{Increment of temperature required}$$

The equation for entropy (Equation 75) is solved for the volume by the Newton's iteration procedure for a given temperature. Further computations are the same as described earlier.

```
NALLAN C S CHARI                 C12-N              010   040   2        ENTROPY
*COMPILE FORTRAN,EXECUTE,PUNCH OBJECT
    2 READINPUT TAPE7,3,DC,PC,TC,R,X1,X2,X3,X4,Y1,Y2,Y3,Y4,Z1,Z2,Z3,Z4,
      XA,B,C,D,E,F,A2,B2,C2,A3,B3,C3,A4,A5,B5,C5,SB,SK,EPSI,ZERO
    3 FORMAT(3E24.8)
    4 READ INPUT TAPE 7,6,S,TIN,TFIN
    6 FORMAT(3F24.8)
      TIN=TIN+459.69
      TFIN=TFIN+459.69
      WRITE OUTPUT TAPE 6,22,S
   22 FORMAT(17H1              S=F10.4)
   24 WRITE OUTPUT TAPE 6,24
   24 FORMAT(37H0 TEMP  PRESSURE    VOLUME   ENTHALPY  /4H    )
      X=Y1
      Y=Y2
      DELTA=Y3
      T=TIN
   30 Q1=1.0+(SK*T/TC)
      EXP=EXPF(-SK*T/TC)
      Q2=SK*EXP/TC
      FN1=A2+(C2*EXP*Q1)
      FN2=A3+(C3*EXP*Q1)
      FN3=A5+(C5*EXP*Q1)
      TP2=T*T
      TP3=TP2*T
      TP4=TP3*T
      PIN1=(Z1*T)+(0.5*Z2*TP2)+(Z3*TP3/3.0)+(0.25*Z4*TP4)
      QIN1=Z1*LOGF(T)+Z2*T+(Z3*TP2/2.0)+(Z4*TP3/3.0)
      GUF=(S-QIN1-Y)/(0.185053*R)
      VMB1=EXPF(GUF)
      V=VMB1+SB
      IF(V-300.0)11,11,4
   11 IF(V-100.0)12,12,14
   12 IF(V-40.0)13,13,15
   13 IF (V-0.02)15,15,16
   14 EPSI=0.001
      GO TO 17
   15 EPSI=0.00001
      GO TO 17
   16 EPSI=0.0001
   17 VMB2=VMB1**2.0
      VMB3=VMB1**3.0
      VMB4=VMB1**4.0
      VMB5=VMB1**5.0
      QIN2=R*LOGF(VMB1)-(B2/VMB1)-(B3/(2.0*VMB2))-(B5/(4.0*VMB4))
      QIN3=(C2/VMB1)+(C3/(2.0*VMB2))+(C5/(4.0*VMB4))
      FS=Y-S+QIN1+0.185053*(QIN2+Q2*QIN3)
      QPR2=(R/VMB1)+(B2/VMB2)+(B3/VMB3)+(B5/VMB5)
      QPR3=-((C2/VMB2)+(C3/VMB3)+(C5/VMB5))
      SPRM=0.185053*(QPR2+Q2*QPR3)
      Q=FS/SPRM
      IF(ABSF(Q)-EPSI)20,20,18
   18 VMB1=VMB1-Q
   19 GO TO 17
   20 VG=VMB1+SB
      FU1=R*T
      FU2=A2+B2*T+C2*EXP
      FU3=A3+B3*T+C3*EXP
      FU4=A4
      FU5=A5+B5*T+C5*EXP
      P=(FU1/VMB1)+(FU2/VMB2)+(FU3/VMB3)+(FU4/VMB4)+(FU5/VMB5)
      PIN2=(P*VG)+(FN1/VMB1)+(FN2/(2.0*VMB2))+(A4/(3.0*VMB3))+(FN3/(4.0*
      XVMB4))
      HG=X+PIN1+(PIN2*0.185053)
      TF=T-459.69
      WRITE OUTPUT TAPE 6,21,TF,P,VG,HG
   21 FORMAT(F7.1,F10.5,F10.5,F10.4)
      T=T+DELTA
      IF(T-TFIN) 30,30,4
*DATA
```

APPENDIX H

SATURATED VAPOR DENSITIES OBTAINED BY EXTRAPOLATION OF
P-V-T DATA BY BHADA[6] TO THE VAPOR PRESSURE CURVE

TABLE XIII

SATURATED VAPOR DENSITIES OBTAINED BY EXTRAPOLATION OF
P-V-T DATA BY BHADA[6] TO THE VAPOR PRESSURE CURVE

Density (lb/cu.ft.)	Saturation Temperature (°F)
3.2948	-133.6
3.9018	-125.5
5.0429	-114.1
6.6133	-101.3
9.2498	-87.1
12.163	-74.9
16.205	-64.3
18.519	-60.5
19.849	-58.5
24.637	-53.4
32.669	-50.3

APPENDIX I

GENERALIZED DATA ON THE LIQUID DENSITIES OF
SOME FLUOROCHLORO DERIVATIVES OF METHANE

TABLE XIV

GENERALIZED DATA ON THE LIQUID DENSITIES OF
SOME FLUOROCHLORO DERIVATIVES OF METHANE

T(°R)	d^1(lb/cu.ft.)	$(1-T/T_c)^{2/3}$	$\dfrac{\frac{d^1}{d_c}-1}{(1-T/T_c)^{1/3}}$	Source
		1. CCl_2F_2		
Values of critical constants used - T_c=693.29°R; d_c=34.84 lb/cu.ft.				
683.75	50.816	.05742342	1.9135746	18
669.71	56.809	.10497501	1.9462076	18
655.57	61.086	.14332963	1.9898346	18
593.39	73.877	.27485294	2.1372143	18
576.11	76.537	.30569784	2.1646141	18
555.05	79.421	.34130753	2.1902753	18
554.87	79.440	.34160373	2.1902587	18
537.77	81.662	.36918798	2.2118111	18
516.53	84.409	.40208023	2.2437561	18
491.69	87.062	.43891836	2.2624734	18
474.59	88.985	.46339987	2.2829808	18
461.63	90.452	.48153082	2.3002674	18
459.65	90.589	.48427070	2.2994016	18
448.67	91.700	.49932659	2.3095978	18
440.57	92.531	.51028930	2.3180440	18
423.65	94.235	.53281887	2.3355111	18
359.01	100.403	.61488938	2.3998393	18
272.25	108.263	.71714277	2.4885774	18
		2. $CClF_3$		
Values of critical constants used - T_c=543.62°R; d_c=36.07 lb/cu.ft.				
537.77	50.90	.04874241	1.8622650	2
529.51	56.55	.08766394	1.9176675	2
511.81	63.95	.15072275	1.9909356	2
499.83	67.64	.18651754	2.0266026	2
484.87	71.55	.22688630	2.0650630	2
466.42	75.62	.27219570	2.1016467	2
433.55	81.81	.34481199	2.1595279	2
380.85	90.11	.44756141	2.2394577	2
334.44	96.30	.52903350	2.2957528	2
301.66	100.51	.58295107	2.3398786	2
235.64	108.48	.68467543	2.4261075	2

TABLE XIV (CON'T)

GENERALIZED DATA ON THE LIQUID DENSITIES OF
SOME FLUOROCHLORO DERIVATIVES OF METHANE

T(°R)	d^1(lb/cu.ft.)	$(1-T/T_c)^{2/3}$	$\dfrac{\dfrac{d^1}{d_c}-1}{(1-T/T_c)^{1/3}}$	Source
		3. CF_4		
	Values of critical constants used - T_c=409.50°R; d_c=39.06 lb/cu.ft.			
165.39	118.31	0.70830635	2.41077381	*
167.69	122.36	0.70385022	2.54198292	37
171.29	122.36	0.69684696	2.55472437	37
206.44	111.92	0.62648932	2.35667709	*
253.26	101.70	0.52604823	2.21109155	38
256.57	102.80	0.51859207	2.26603633	*
258.12	101.07	0.51508205	2.21203133	38
287.69	96.67	0.44560773	2.20947590	*
314.14	90.89	0.37850786	2.15680811	*
358.19	78.99	0.25039873	2.04291835	*
375.64	73.03	0.18979673	1.99626838	*
394.46	63.92	0.11049161	1.91471528	*
405.35	54.65	0.04683059	1.84437402	*
407.74	50.57	0.02643462	1.81240997	*
408.16	49.58	0.02204115	1.81412132	*
408.58	48.39	0.01715366	1.82377385	*
408.96	46.84	0.01202525	1.81635277	*
		4. $CHClF_2$		
	Values of critical constants used - T_c=664.5°R; d_c=32.76 lb/cu.ft.			
648.86	51.02	0.08212866	1.94495475	5
635.29	55.99	0.12455402	2.00921509	5
611.71	61.93	0.18480106	2.07128707	5
582.11	67.67	0.24864880	2.13704053	5
538.84	74.26	0.32945903	2.20700586	5
484.27	81.10	0.41900712	2.27956530	5
431.09	86.82	0.49783222	2.33878684	5
367.50	93.07	0.58457600	2.40782511	5
353.24	94.23	0.60314106	2.41607201	28
289.78	100.03	0.68256069	2.48546067	28

TABLE XVI (CON'T)

GENERALIZED DATA ON THE LIQUID DENSITIES OF
SOME FLUOROCHLORO DERIVATIVES OF METHANE

$T(°R)$	$d^\perp$(lb/cu.ft.)	$(1-T/T_c)^{2/3}$	$\dfrac{\dfrac{d^\perp}{d_c} - 1}{(1-T/T_c)^{1/3}}$	Source
		5. CHF_3		
Values of critical constants used - T_c=538.33°R; d_c=32.78 lb/cu.ft.				
370.79	86.587	0.45924732	2.42268002	20
454.14	73.037	0.29027388	2.27997151	20
466.70	70.317	0.26063392	2.24356866	20
480.73	67.195	0.22538030	2.21202222	20
512.77	57.429	0.13112181	2.07722014	20
529.76	49.322	0.06328321	2.00678444	20
536.69	41.827	0.02101505	1.90496787	20
537.60	39.763	0.01225139	1.92600347	20

* This investigation

APPENDIX J

REDUCED VAPOR PRESSURE DATA FOR SOME
CHLOROFLUORO DERIVATIVES OF METHANE

TABLE XV

REDUCED VAPOR PRESSURE DATA FOR CF_4

$$T_c = 409.50°R$$
$$P_c = 543.16 \text{ psia}$$

T°R	P(psia)	T_c/T	$-\log_{10}(P/P_c)$	Source
166.59	0.0290	2.45813	4.27254	30
169.94	0.0425	2.40967	4.10653	30
173.66	0.0599	2.35806	3.95751	30
179.14	0.1066	2.28592	3.70714	30
181.55	0.1258	2.25558	3.63528	*
183.62	0.1523	2.23015	3.55218	*
184.14	0.1586	2.22385	3.53466	30
188.17	0.2243	2.17622	3.38417	30
188.84	0.2359	2.16850	3.36229	30
189.79	0.2572	2.15765	3.32469	30
191.63	0.2952	2.136931	3.26482	*
193.45	0.3403	2.11683	3.20303	30
196.74	0.4351	2.08143	3.09621	30
197.30	0.4544	2.07552	3.07737	30
197.55	0.4622	2.07289	3.08004	30
197.84	0.4738	2.06985	3.05918	30
199.64	0.5427	2.05119	3.00043	*
202.18	0.6512	2.02542	2.92122	*
220.84	2.1316	1.85428	2.40620	*
230.02	3.517	1.78028	2.18865	*
239.11	5.569	1.71260	1.98914	30
241.07	6.118	1.69868	1.94832	30
242.12	6.414	1.69131	1.92778	30
245.29	7.421	1.66945	1.86445	30
248.62	8.618	1.64709	1.79955	30
252.02	10.003	1.62487	1.73480	30
255.29	11.492	1.60406	1.67449	30
256.03	11.844	1.59942	1.66143	30
258.26	13.229	1.58561	1.61342	*
258.32	13.002	1.58524	1.62097	30
260.24	14.056	1.57355	1.58707	30
260.84	14.404	1.56993	1.57645	30
261.40	14.723	1.56656	1.56693	30
261.77	14.936	1.56435	1.56069	30
261.79	14.949	1.56423	1.56032	30
262.64	15.448	1.55917	1.54606	30
282.22	31.34	1.45100	1.23883	*
285.14	34.71	1.43614	1.19450	*
287.19	36.91	1.42590	1.16780	*

TABLE XV (CON'T)

REDUCED VAPOR PRESSURE DATA FOR CF_4

$T_c = 409.50°R$
$P_c = 543.16$ psia

T°R	P(psia)	T_c/T	$-\log_{10}(P/P_c)$	Source
289.33	40.37	1.41534	1.12889	*
291.96	42.61	1.40259	1.10544	*
302.33	57.66	1.35448	0.97405	*
309.47	70.16	1.32323	0.88884	*
316.33	83.86	1.29453	0.81137	*
322.85	94.05	1.26839	0.76156	7
327.33	111.26	1.25103	0.68859	*
333.04	127.34	1.22958	0.62996	*
339.10	149.24	1.20761	0.56104	*
343.04	161.34	1.19374	0.52719	*
344.54	165.64	1.18854	0.51577	*
344.57	166.44	1.18844	0.51368	*
348.59	180.04	1.17473	0.47956	*
348.77	179.29	1.17413	0.48137	7
351.86	193.22	1.16382	0.44888	*
355.66	208.02	1.15138	0.41683	*
358.49	217.50	1.14229	0.39747	7
363.65	242.22	1.12608	0.35072	*
363.71	238.08	1.12590	0.35821	37
365.69	248.36	1.11980	0.33985	37
373.88	292.72	1.09527	0.26848	*
373.97	292.45	1.09501	0.26888	37
378.83	317.43	1.08096	0.23328	37
380.99	330.66	1.07483	0.21556	37
383.72	353.22	1.06718	0.18687	*
387.83	373.28	1.05587	0.16289	37
391.61	402.67	1.04568	0.13001	37
394.49	418.84	1.03805	0.11291	37
398.63	449.70	1.02727	0.08201	37
400.63	468.22	1.02214	0.06450	37
401.47	476.22	1.02000	0.05715	*
403.13	487.22	1.01580	0.04722	*
403.99	494.72	1.01364	0.04061	*
404.03	490.85	1.01354	0.04401	37
405.18	504.22	1.01066	0.03230	*
405.54	509.72	1.00976	0.02761	*
406.58	516.72	1.00718	0.02169	*
407.39	524.22	1.00518	0.01540	*
407.45	518.77	1.00503	0.01995	37
408.17	531.22	1.00326	0.00967	*
409.50 (critical)	543.16 (calculated)	1.00000	0.00000	*

* This investigation

TABLE XVI

REDUCED VAPOR PRESSURE DATA FOR CCl_2F_2

$$T_c = 693.29°R$$
$$P_c = 596.9 \text{ psia}$$

$T°R$	$P(psia)$	T_c/T	$-\log_{10}(P/P_c)$	Source
310.72	0.1622	2.23126	3.56585	18
350.95	1.0202	1.97548	2.76726	18
423.04	10.15	1.63884	1.76942	22
430.88	12.38	1.60899	1.68319	22
438.05	14.696	1.58268	1.60869	22
473.51	31.69	1.46415	1.27498	22
491.69	44.74	1.41002	1.12521	18
533.12	89.9	1.30043	0.82215	22
537.28	95.20	1.29037	0.79725	22
545.58	107.69	1.27074	0.74371	22
556.34	127.0	1.24615	0.67209	22
563.59	138.83	1.23013	0.63342	22
565.61	144.2	1.22573	0.61694	22
569.77	151.8	1.21678	0.59463	18
580.85	174.49	1.19358	0.53413	22
588.19	193.0	1.17869	0.49034	22
594.74	210.0	1.16570	0.45367	22
604.86	234.75	1.14620	0.40531	22
608.83	248.1	1.13872	0.38127	22
617.44	273.3	1.12285	0.34925	22
622.87	290.4	1.11305	0.31291	18
626.53	301.30	1.10656	0.29690	22
635.74	336.3	1.09052	0.24917	22
643.07	362.7	1.07809	0.21635	22
647.41	377.53	1.07087	0.19896	22
658.42	427.5	1.05295	0.14497	22
671.06	480.75	1.033127	0.09398	22
673.20	494.0	1.02984	0.08217	22
677.12	514.8	1.02387	0.06425	22
688.19	573.1	1.00740	0.01766	18
690.53	586.0	1.00399	0.00800	22
692.57	596.04	1.00104	0.00063	22

TABLE XVII

REDUCED VAPOR PRESSURE DATA FOR $CClF_3$

$$T_c = 543.62°R$$
$$P_c = 561.3 \text{ psia}$$

T°R	P(psia)	T_c/T	$-\log_{10}(P/P_c)$	Source
261.50	0.4797	2.07885	3.06823	2
310.84	4.674	1.74887	2.07950	2
344.92	14.623	1.57608	1.58416	2
387.50	44.38	1.40289	1.10201	2
444.47	137.44	1.22308	0.61109	2
491.69	285.9	1.10562	0.29298	2
540.06	537.9	1.00659	0.01849	2

APPENDIX K

DETAILS OF CALCULATION FOR THE ENTHALPY AND
ENTROPY AT THE REFERENCE TEMPERATURE

DETAILS OF CALCULATION FOR THE ENTHALPY AND
ENTROPY AT THE REFERENCE CONDITIONS

The datum plane for computing the enthalpy and entropy was taken
to be solid state at absolute zero. Thus at $0°R$, $\underline{H} = 0$ and $\underline{S} = 0$ for solid
CF_4.

Eucken and Schroder [13] measured the heat capacity of solid CF_4
in the temperature range of from $12°K$ upto the melting point of $89.47°K$.
Their values are presented in Table XIX.

TABLE XIX

HEAT CAPACITY (C_p) OF SOLID CF_4

T(°K)	C_p cal/(g. mole)(°K)
12	1.82
15	2.98
20	4.85
25	6.50
30	7.95
35	9.16
40	10.23
45	11.21
50	12.07
55	12.95
60	13.88
65	15.02
70	16.57
75	20.79
76.23	Transition point
80	16.10
85	16.52
87	16.48
89	16.03
89.47	Melting point

For heat capacities below $12°K$, Eucken and Schroeder developed
the following equation for carbon tetrafluoride:

$$C_p = \varphi_D (70/T) + \varphi_P (93/T) + 0.030 \ T \ C_p^2 \tag{77}$$

where C_p is in cal/(g. mole)(°K) and T in °K. φ_D and φ_P are respectively the Debye function and the Planck-Einstein function.

Table XX presents a summary of the C_p values in the range of 0 - 12°K obtained by solving Equation (77) at each of the temperatures. The values of the Debye functions and the Planck-Einstein functions have been obtained from the tables presented by Mac Dougall.[45]

TABLE XX

HEAT CAPACITY (C_p) OF SOLID CF_4 BELOW 12°K

T(°K)	C_p cal/(g. mole)(°K)
0	0.000
2	0.017
4	0.087
6	0.288
8	0.682
10	1.185
12	1.819

Other data available from Eucken and Schroder are the $(\Delta H)_{Transition}$ at 76.23°K of 353.707 cal/g.mole and the enthalpy change of fusion at 89.47°K of 167.309 cal/g.mole

Figures 12 and 13 present the graphical methods used in obtaining some of the values given in Table XII. The entropy values have been similarly obtained by plotting C_p/T versus T evaluated from Tables XIX and XX, and determining the area under the curve between the given temperature limits.

From the liquid state at 89.47°K to the saturated liquid condition
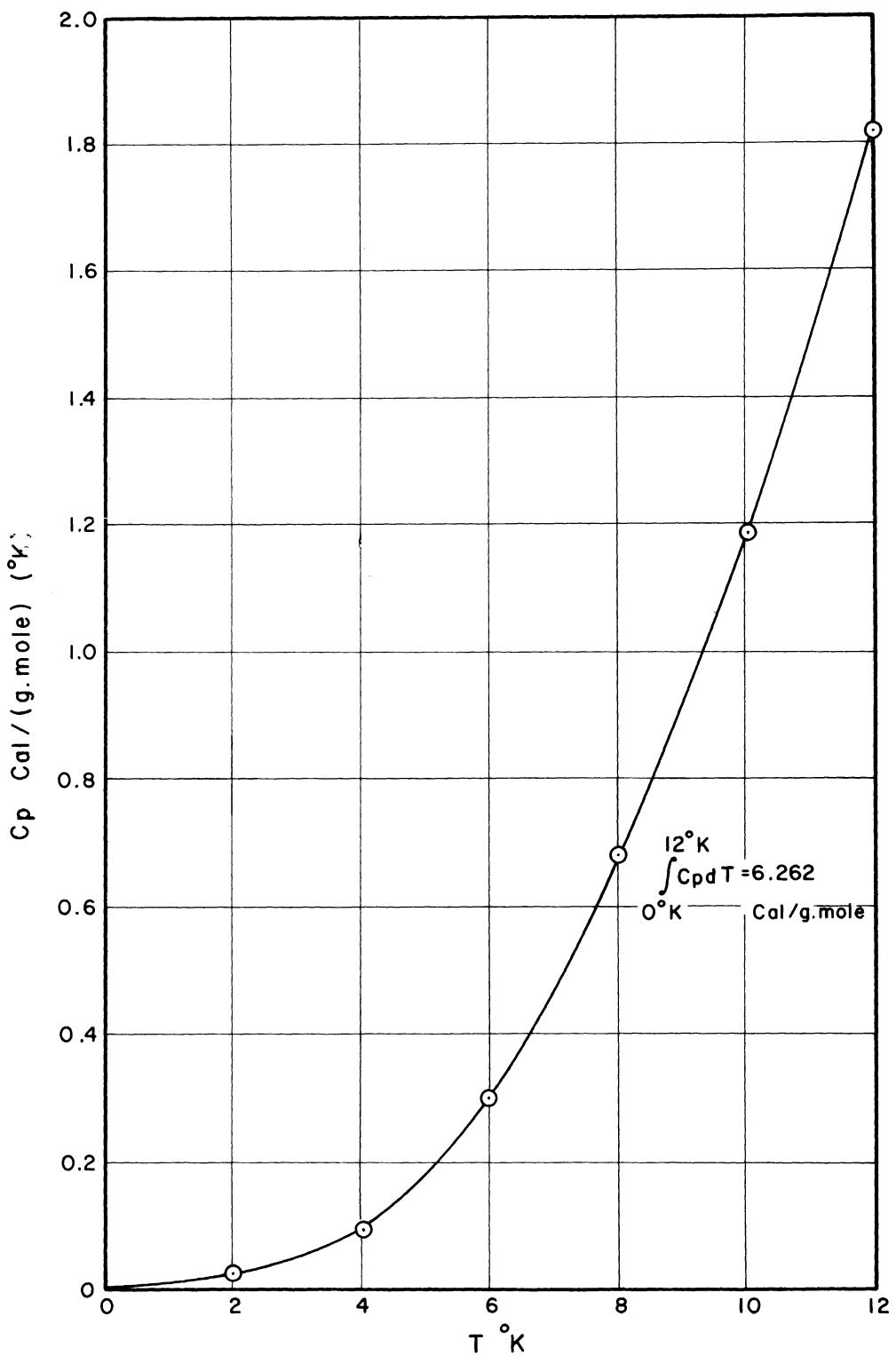
Figure 12. Graphical Integration of $\int C_p dt$ for Solid CF_4
Between 0°K and 12°K.
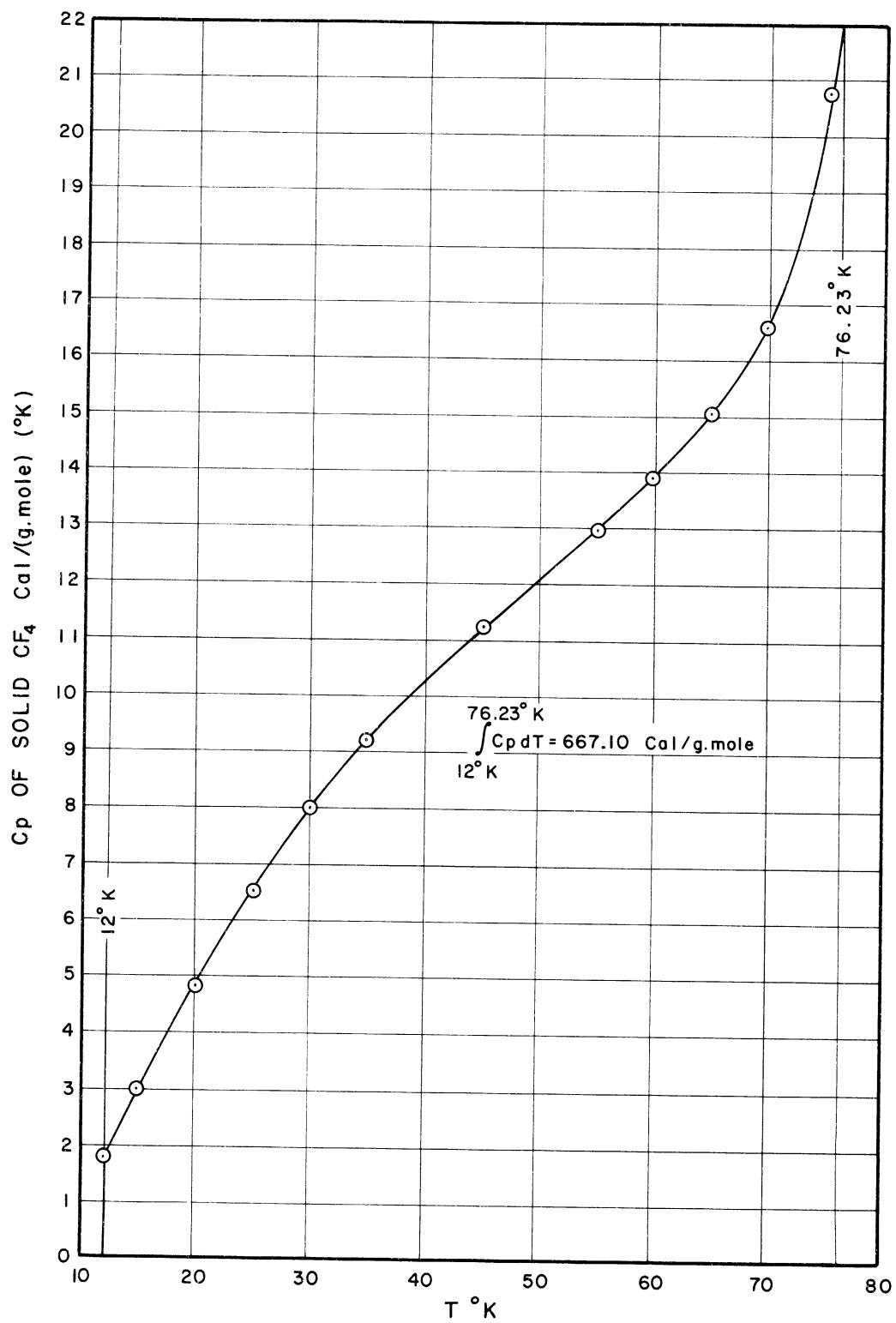
Figure 13. Graphical Integration of $\int C_p dt$ for Solid CF_4
Between 12°K and 76.23°K.

at 100°K, the liquid heat capacity equation by Selby and Aston[40] has

been used in evaluating the enthalpy and entropy changes as follows:

$$\Delta H_{liq} = \int_{89.47}^{100°K} c_p^1 dT = \int_{89.47°K}^{100°K} (24.54 - 0.1140 + 5.160 \times 10^{-4} T^2) \, dT$$

$$= 193.323 \quad cal/g. \; mole$$

$$\Delta S_{liq} = \int_{89.47}^{100°K} c_p^1 \frac{dT}{T} = \int_{89.47°K}^{100°K} (\frac{24.54}{T} - 0.1140 + 5.160 \times 10^{-4} T) \, dT$$

$$= 2.218 \quad cal/(g. \; mole)(°K)$$

The remaining steps shown in Tables XI and XII are self-explanatory. The values of entropy changes of transition and fusion have been obtained by dividing the enthalpy changes by the respective temperatures of transition and fusion.

The value of $\underline{H}_{ref}$ has been obtained by adding the enthalpy change of vaporization obtained by the Clausius-Clapeyron equation to the enthalpy of liquid at the reference temperature. The entropy at the reference condition $\underline{S}_{ref}$ was similarly obtained by adding the entropy change of vaporization, which is equivalent to $\Delta \underline{H}^V/T$, to the entropy of liquid at 180°R. Program 4 in Appendix G has been used for the computation of these values.

Following are the results from this program:

T_{ref} = 180°R and saturated vapor (P = 0.1097263 psia)

$\underline{H}_{ref}$ = 99.347077 Btu/lb

$\underline{S}_{ref}$ = 0.67950135 Btu/(lb)(°R)

The values of X and Y obtained from Equations (69) and (76) calculated by means of program 4 are:

X = 86.102162

Y = 0.36172528

APPENDIX L

DETAILS OF CALCULATIONS FOR THE DETERMINATION OF ENTROPY BY STATISTICAL
METHODS AND THERMAL METHODS FOR THE IDEAL CASE

DETERMINATION OF ENTROPY BY STATISTICAL METHODS

The methods of calculation used in obtaining the values of entropies presented in Table XIII are summarized below:

1. Translational Component:

   The translational contribution to entropy has been derived by statistical methods and has been expressed by the following Sackur-Tetrode Equation [21]:

$$S^* \text{ (trans.)} = \frac{3}{2} R \ln M + \frac{5}{2} R \ln T - 2.298 \tag{78}$$

2. External rotational component:

   The energy possessed by a molecule as a result of its rotation is a function of its moment of inertia and its speed of rotation. The symmetry number σ, which is the number of different positions in which the molecule can be rotated with identical appearance from every point of view, has been determined to be 12 for CF_4. Gelles and Pitzer [15] computed the product of the principal moments of inertia for CF_4 and reported the value to be 3.24×10^{-114}. The following equation has been presented by Hougen and Watson [21] for the rotational contribution for the entropy:

$$S^* \text{ (rot.)} = \frac{3}{2} R \ln T + \frac{1}{2} R \ln (I_x I_y I_z)$$

$$- R \ln T + 267.54 \tag{79}$$

where the product $I_x I_y I_z$ represents the product of the principal moments of inertia.

-168-

3. Vibrational energy component:

The vibrational contribution for entropy has been obtained as summation of the contributions of all individual degrees of freedom, each corresponding to the particular value of the fundamental frequency v, as follows:

$$S_\omega^* = R \sum_{i=1}^{4} \left[\frac{x_i}{(e^{x_i}-1)} - \ln (1-e^{-x_i}) \right] \tag{80}$$

where

$$x_i = 1.4388 \, v_i/T \tag{81}$$

and T is in degrees Kelvin.

Details of the fundamental frequencies used and the statistical weights of the energy levels are the same as described for the heat capacity at zero pressure in the section entitled "Correlation of Data."

4. Anharmonic contribution:

The anharmonic contribution for entropy was computed by an extension of the methods described in detail for the heat capacity at zero pressure in the section entitled "Correlation of Data." The final form for the entropy contribution is given below:

$$S^* \, (\text{anh.}) = \frac{(0.1573) \, a \, b}{U} \tag{82}$$

where the values of a, b, and U are obtained from Equations (27) through (30).

DETERMINATION OF ENTROPY BY THERMAL METHODS
FOR THE IDEAL CASE

The value of entropy of gaseous CF_4 for the ideal case at 1 atmosphere pressure and any temperature T has been obtained from the following steps:

Step 1:

$\underline{S}$ (sat. liquid) ──── $\underline{S}$ (sat. liquid)
at 180°R   at -198.32°F
                                (261.37°R)
                                (normal boiling point)

Data by Selby and Aston[40] on the saturated liquid heat capacities have been used for the computation of entropy change as follows:

$$\Delta \underline{S} = \int_{180°R}^{261.37°R} C_p \frac{dT}{T}$$

$$= \int_{180°R}^{261.37°R} \left(\frac{24.54}{T} - 0.1140 + 5.160 \times 10^{-4} T \right) dT \qquad (83)$$

(where T is in °K)

Step 2:

$\underline{S}$ (sat. liquid) ──── $\underline{S}$ (sat. vapor)
at 261.37°R   at 261.37°R
and 14.696 psia   and 14.696 psia

From Equations (43) and (53),

$$\Delta \underline{S} = \frac{\Delta \underline{H}^V}{T} = \text{JPM} \ (\underline{V} - \underline{V}^1) \ \left\{ \frac{-B'}{T} + \frac{C}{T} + D' - \frac{E}{T} \left(1 + \frac{F \ \ln \ (F-T)}{T} \right) \right\} \qquad (84)$$

where $T = 261.37°R$, $P = 14.696$ psia, $B' = 2.302585093$ B, and $D = 2.302585093$ D'.

The value of $\underline{V} = RT/P$ has been used for the ideal case.

Step 3:

$\underline{S}$ (sat. vapor) $\underline{S}$ (gas)
  at 261.37°R ——   at 540°R
  and 14.696 psia   and 14.696 psia

$$\Delta \underline{S} = \int_{261.37°R}^{540°R} C_p \frac{dT}{T} = \int_{261.37°R}^{540°R} C_p^* \frac{dT}{T} \quad \text{(for ideal gas)}$$

$$= M \int_{261.37°R}^{540} \left(\frac{3.00559282 \times 10^{-2}}{T} + 2.37043352 \times 10^{-4} \right.$$

$$\left. - 2.85660077 \times 10^{-8} T - 2.95338806 \times 10^{-11} T^2 \right) dT \quad (85)$$

The summary of these calculations is given as follows:

$\underline{S}$ of liquid at 180°R = 27.2680 $\dfrac{\text{cal}}{(\text{mole})(°K)}$

$\Delta \underline{S}_{\text{Step 1}}$ 6.8594

$\Delta \underline{S}_{\text{Step 2}}$ 20.4692

$\Delta \underline{S}_{\text{Step 3}}$ 7.3355

$\underline{S}$ of ideal gas   61.9321
  (at 540°R and
  1 atm. pressure)

APPENDIX M

TABLE OF CONSTANTS AND CONVERSION FACTORS

TABLE OF CONSTANTS AND CONVERSION FACTORS

Constants of the vapor pressure equation:

$$A \quad 20.71545389$$
$$B \quad -2467.505285$$
$$C \quad -4.69017025$$
$$D \quad 6.4798076 \times 10^{-4}$$
$$E \quad 0.770707795$$
$$F \quad 424$$

Constants of the liquid density equation:

$$a_1 \quad 69.56848907$$
$$a_2 \quad 4.58661139$$
$$a_3 \quad 36.17166615$$
$$a_4 \quad -8.05898583$$

Constants of the Martin-Hou equation of state:

$$A_2 \quad -3.1553788$$
$$B_2 \quad 3.2480704 \times 10^{-3}$$
$$C_2 \quad -2.1911976$$
$$A_3 \quad 0.056830627$$
$$B_3 \quad -5.6586787 \times 10^{-5}$$
$$C_3 \quad 0.052630252$$
$$A_4 \quad -3.1575738 \times 10^{-4}$$
$$A_5 \quad -1.5210836 \times 10^{-6}$$
$$B_5 \quad 6.6533754 \times 10^{-9}$$
$$C_5 \quad -3.5786565 \times 10^{-6}$$
$$b \quad 5.7104970 \times 10^{-3}$$
$$k \quad 5.0$$
$$R \quad 0.12193362 \quad (\text{cu.ft.})(\text{psia})/(\text{lb})(°R)$$

Constants of the heat capacity equation:

$$\alpha \quad 3.00559282 \times 10^{-2}$$
$$\beta \quad 2.37043352 \times 10^{-4}$$
$$\gamma \quad -2.85660077 \times 10^{-8}$$
$$\delta \quad -2.95338806 \times 10^{-11}$$

Critical properties:

$$T_c \quad 409.50 \ °R$$
$$P_c \quad 543.16 \ \text{psia}$$
$$\underline{V}_c \quad 0.025601639 \ \text{cu.ft./lb}$$
$$d_c \quad 39.06 \ \text{lb/cu.ft.}$$

$$Z_c = \frac{P_c \underline{V}_c}{R \, T_c} = 0.27849549$$

TABLE OF CONSTANTS AND CONVERSION FACTORS (CON'T)

Other constants and conversion factors:

R 10.7315   (cu.ft.)(psia)/(lb mole)(°R)
       1.98589   Btu/(lbmole)(°R)
       1.98719   thermochemical cal/(g. mole)(°R)

M 88.011

hc/K 1.4388

J 0.185053   Btu/(psia)(cu.ft.)

°R   °F + 459.69

Reference conditions for the tables:

$\underline{H} = 0$ and $\underline{S} = 0$ for solid CF_4 at 0°R

At the reference temperature, $T_{ref} = 180$°R

$\underline{H}_{ref} = 99.347077$ Btu/lb

$\underline{S}_{ref} = 0.67950135$ Btu/(lb)(°R)

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