Journal of Physical and Chemical Reference Data

Benzene Thermophysical Properties from 279 to 900 K at Pressures to 1000 Bar

Cite as: Journal of Physical and Chemical Reference Data **17**, 1541 (1988); https://doi.org/10.1063/1.555813
Submitted: 15 April 1987 . Published Online: 15 October 2009

Robert D. Goodwin

View Online

Export Citation

ARTICLES YOU MAY BE INTERESTED IN

Toluene Thermophysical Properties from 178 to 800 K at Pressures to 1000 Bar
Journal of Physical and Chemical Reference Data **18**, 1565 (1989); https://doi.org/10.1063/1.555837

Phase Diagram of Benzene to 35 kbar
The Journal of Chemical Physics **55**, 793 (1971); https://doi.org/10.1063/1.1676145

The IAPWS Formulation 1995 for the Thermodynamic Properties of Ordinary Water Substance for General and Scientific Use
Journal of Physical and Chemical Reference Data **31**, 387 (2002); https://doi.org/10.1063/1.1461829

© 1988 American Institute of Physics for the National Institute of Standards and Technology.

Benzene Thermophysical Properties from 279 to 900 K at Pressures to 1000 Bar

Robert D. Goodwin

Thermophysics Division, National Engineering Laboratory, National Institute of Standards and Technology, Boulder, Colorado 80303

Received April 15, 1987; revised manuscript received April 13, 1988.

The thermodynamic data for benzene have been evaluated and fit to a highly constrained, nonanalytic equation of state. Comparisons of the equation with the selected PVT and derived property data are given. Extensive tables are presented providing tabular values for coexisting liquid and vapor as well as for the single phase along isobars. The equation of state and tables cover the range from the triple point (278.68 K) to 900 K, with pressures to 1000 bar.

Key words: benzene; compressibility factor; density; enthalpy; entropy; equation of state; fugacity; heat of vaporization; ideal gas; Joule–Thomson coefficient; orthobaric density; specific heat; speed of sound; thermodynamic property; vapor pressure; virial coefficient.

Contents

1. Introduction 1543
2. Developing the Equation of State 1543
   2.1 Melting and Vapor Pressures 1543
      2.1.a. The Melting Line 1543
      2.1.b. The Vapor Pressures 1544
   2.2 The Orthobaric Densities 1544
      2.2.a. Saturated Liquid Densities 1544
      2.2.b. Saturated Vapor Densities 1544
   2.3 The Second Virial Coefficient 1545
   2.4 Pressure–Density–Temperature Data 1545
   2.5 The Equation of State 1545
3. Thermal Properties and Computations 1551
   3.1 Functions for Ideal Gas States 1551
   3.2 Saturated Liquid Properties 1551
      3.2.a. Enthalpies of Vaporization 1551
      3.2.b. Enthalpies of Saturated Liquid 1552
      3.2.c. Entropies of Saturated Liquid 1552
      3.2.d. Specific Heats of Saturated Liquid ... 1552
   3.3 Computational Methods 1552
      3.3.a. The Homogeneous Domain 1552
      3.3.b. The Saturated Liquid 1583
      3.3.c. The Compressed Liquid 1583
   3.4 Comparisons 1583
4. Tables of Thermophysical Properties 1583
   4.1 Joule–Thomson Inversion Locus 1583
   4.2 Properties at Coexistence 1583
   4.3 Properties Along Selected Isobars 1600
5. Acknowledgments 1633
6. References 1633
   Appendix A 1635

List of Tables

1. Selected fixed-point values for benzene 1544
2. Recently reported critical constants for benzene 1544
3. Comparison of reported melting pressures with values calculated from Eq. (1) 1545
4. Comparison of reported vapor pressures with values calculated from Eq. (2) 1546
5. Comparison of reported saturated liquid densities with values calculated from Eq. (3) 1548
6. Comparison of reported saturated vapor densities with values calculated from Eq. (4) 1549
7. Summary of $P\rho T$ data for benzene 1553
8a. Comparison of Al-Bizreh/Wormald[57] virial equation $P\rho T$ compressibility data with values calculated from Eq. (6) 1554
8b. Comparison of Glanville/Sage[44] $P\rho T$ compressibility data with values calculated from Eq. (6) 1555
8c. Comparison of Connolly/Kandalic[15] $P\rho T$ compressibility data with values calculated from Eq. (6) 1558
8d. Comparison of Kurumov *et al.*[49] $P\rho T$ compressibility data with values calculated from Eq. (6) 1560
8e. Comparison of Figuière *et al.*[30] $P\rho T$ compressibility data with values calculated from Eq. (6) 1560
8f. Comparison of Gornowski *et al.*[10] $P\rho T$ com-

©1988 by the U.S. Secretary of Commerce on behalf of the United States. This copyright is assigned to the American Institute of Physics and the American Chemical Society.
Reprints available from ACS; see Reprints List at back of issue.

pressibility data with values calculated from Eq. (6) 1561
8g. Comparison of Mamedov *et al.*[59] $P\rho T$ compressibility data with values calculated from Eq. (6) 1563
8h. Comparison of Gehrig/Lentz[58] $P\rho T$ compressibility data with values calculated from Eq. (6) 1564
8i. Comparison of Teichmann[38] $P\rho T$ compressibility data with values calculated from Eq. (6) 1569
8j. Comparison of Taslimi[60] $P\rho T$ compressibility data with values calculated from Eq. (6) 1572
8k. Comparison of Kuss[41] $P\rho T$ compressibility data with values calculated from Eq. (6) 1573
8l. Comparison of Straty *et al.*[43] $P\rho T$ compressibility data with values calculated from Eq. (6) ...1574
9. The critical isotherm for benzene....1581
10. Ideal gas state data for benzene 1582
11. Interpolated ideal gas state functions for benzene 1582
12. Comparison of specific heats for saturated liquid benzene with calculated values 1582
13. Comparison of enthalpy data for coexisting gas and liquid phases reported by Gorbunova *et al.*[54] with calculated values 1584
14. Comparison of isothermal enthalpy data reported by Gorbunova *et al.*[54] with calculated values....1585
15. Comparison of enthalpy data for coexisting gas and liquid phases reported by Lenoir *et al.*[72] with calculated values 1586
16. Comparison of isothermal enthalpy data reported by Lenoir *et al.*[72] with calculated values .1587
17a. Comparison of isobaric heat capacities reported by Rastorguev *et al.*[73] with calculated values 1589
17b. Comparison of isobaric heat capacities reported by Akhundov/Sultanov[74] and Mamedov *et al.*[59,75,76] with calculated values....1589
18a. Comparison of reported speed of sound in saturated vapor with calculated values....1590
18b. Comparison of reported speed of sound in saturated liquid with calculated values....1590
19a. Comparison of speed of sound in superheated vapor reported by Aniskin[79] with calculated values....1591
19b. Comparison of speed of sound in compressed liquid reported by Makita/Takagi[26] with calculated values....1591
19c. Comparison of speed of sound in compressed liquid reported by Otpushchennikov *et al.*[81] with calculated values 1592
19d. Comparison of speed of sound in compressed liquid reported by Bobik[80] with calculated values 1592
19e. Comparison of speed of sound in compressed liquid reported by Pankevich[82] with calculated values....1592
19f. Comparison of speed of sound in compressed liquid reported by Pankevich/Zotov[83] (Table 1) with calculated values 1594
19g. Comparison of speed of sound in compressed liquid reported by Pankevich/Zotov[83] (Table 2) with calculated values 1594
20. The Joule–Thomson inversion locus for benzene 1596
21. Properties of saturated liquid benzene 1597
22. Properties of benzene along isobars 1601

List of Figures

1. Density-temperature phase diagram for benzene 1543
2. Melting pressure of benzene....1544
3. P–T map of some benzene $P\rho T$ data 1551
4. P–T map of $P\rho T$ data of Teichmann[38] 1551
5. P–T plot of $P\rho T$ data of Gehrig and Lentz[58]....1552
6. Comparison of isobaric specific heat data for benzene 1590

Symbols and Units

Subscripts c and t refer to critical and to triple points
Subscripts g and l refer to saturated vapor and liquid
Subscript σ refers to liquid–vapor coexistence

$\alpha,\beta,\gamma,\epsilon,\eta,p$	exponents in various functions
$C_\sigma(T)$	saturated liquid heat capacity, J/(mol K)
$C_v(\rho,T)$	isochoric heat capacity, J/(mol K)
$C_v(T)_\sigma$	isochoric heat capacity at the liquid boundary, J/(mol K)
$C_p(\rho,T)$	isobaric heat capacity, J/(mol K)
f	fugacity, bar
f/P	fugacity/pressure ratio
$F(\rho,T)$	defined function in the EOS
$G(\rho,T)$	Gibbs energy, J/mol
$H(\rho,T)$	enthalpy, J/mol
H_0°	enthalpy for ideal gas state at $T=0$
$\Delta_{vap}H$	enthalpy of vaporization, J/mol
J	joule, 1 N m
L	liter, 10^{-3} m^3
P	pressure in bar, 1 bar $\equiv 10^5$ Pa
P°	standard state pressure, 1 atm = 1.013 25 bar = 0.101 325 MPa
$P_\sigma(T)$	vapor pressure of saturated liquid, bar
$P_\sigma(\rho)$	$P_\sigma[T_\sigma(\rho)]$, vapor pressure as function of density
R	gas constant, 8.3145 J/(mol K)
ρ	density, mol/L
σ	ρ/ρ_c, reduced density
$S(\rho,T)$	entropy, J/(mol K)
T	temperature, K
$T_\sigma(\rho)$	liquid–vapor coexistence temperature, K
$\theta(\rho)$	defined locus of temperatures for the EOS, K
$U(\rho,T)$	internal energy, J/mol
$U_0^\circ = H_0^\circ$	22 279.294 J/mol (selected)
$u(\rho,T)$	$T/T_\sigma(\rho)$ for the EOS
v	$1/\rho$, molar volume, L/mol
μ	Joule–Thomson coefficient

$\omega(\rho,T)$	$[1-\theta(\rho)/T]$, for the EOS
$W(\rho,T)$	speed of sound, m/s
$x(T)$	T/T_c, reduced temperature for the EOS
$x_\sigma(\rho)$	$T_\sigma(\rho)/T_c$, reduced coexistence temperature for the EOS
$Z(P,\rho,T)$	$P/(\rho\, R\, T)$, compressibility factor

The molecular weight of benzene was taken to be 78.114.

1. Introduction

No thorough correlation is available for the thermophysical properties of benzene. Properties for the saturated liquid were given in 1972 by Ambrose and Lawrenson[1]. Unpublished 1973 tables by the Engineering Sciences Data Unit, Ltd. (ESDU) were mentioned in 1976 by Counsell *et al.*,[2] who give coexistence properties. The brief 1975 tables by Vargaftik[3] are sparsely documented. Saturated liquid properties were given in 1977 by Akhundov and Abdullaev[4]; in 1978 by Zavaraykina *et al.*[5]; and in 1979 by Chao.[6] In 1984, Kratzke *et al.*[7] reported residual Helmholtz energies for the saturated and compressed liquid at temperatures up to 465 K.

In this report we use a version of the nonanalytic equation of state (EOS), which was used recently for hydrogen sulfide[8] and for carbon monoxide.[9] The density–temperature phase diagram for benzene is outlined in Fig. 1. Selected fixed-point values are given in Table 1.

Critical-point constants of recent workers[1,10–19] are listed in Table 2. Older values are given by Gornowski *et al.*[10] and by Ambrose *et al.*[14] Our critical-point temperature was selected to be 561.75 K. Our critical-point density, 3.90 mol/L, is adjusted for a best fit of orthobaric densities, as compared with 3.86 ± 0.01 mol/L in Ref. 18. Our critical-point pressure, 48.7575 bar, is from vapor-pressure Eq. (2) at $T_c = 561.75$ K.

Our triple-point temperature, 278.68 K, is from Oliver *et al.*,[20] and from Jackowski,[21] while our normal boiling-point temperature is from vapor pressure Eq. (2) below. Our triple-point pressure is from Eq. (2), while fixed-point phase densities are from Eqs. (3) and (4) for orthobaric densities.

2. Developing the Equation of State

The isochoric EOS is constrained to a given liquid–vapor coexistence boundary. We therefore first formulate the melting line, the vapor pressures, and the orthobaric densities. The evaluation of masses of data, to cull inaccurate but sometimes precise sets, is a necessity. Hence, some excluded data in this report are weighted zero, and are tabulated for reference.

2.1. Melting and Vapor Pressures

2.1.a. The Melting Line

Data[22–30] are shown by Fig. 2, with ranges given in Appendix A, and deviations are given in Table 3 from the fitting function

$$(P_m - P_t)/\text{bar} = [a + bx]x, \qquad (1)$$

where P_m is the melting pressure, P_t the triple-point pressure, $x \equiv (T/T_t - 1)$, $a = 9600$, and $b = 7650$. All data and references have been taken from Figuière *et al.*,[30] except for the data of Makita and Takagi.[26] The Simon equation gives an exponent greater than 2.0 for these data, e.g.,

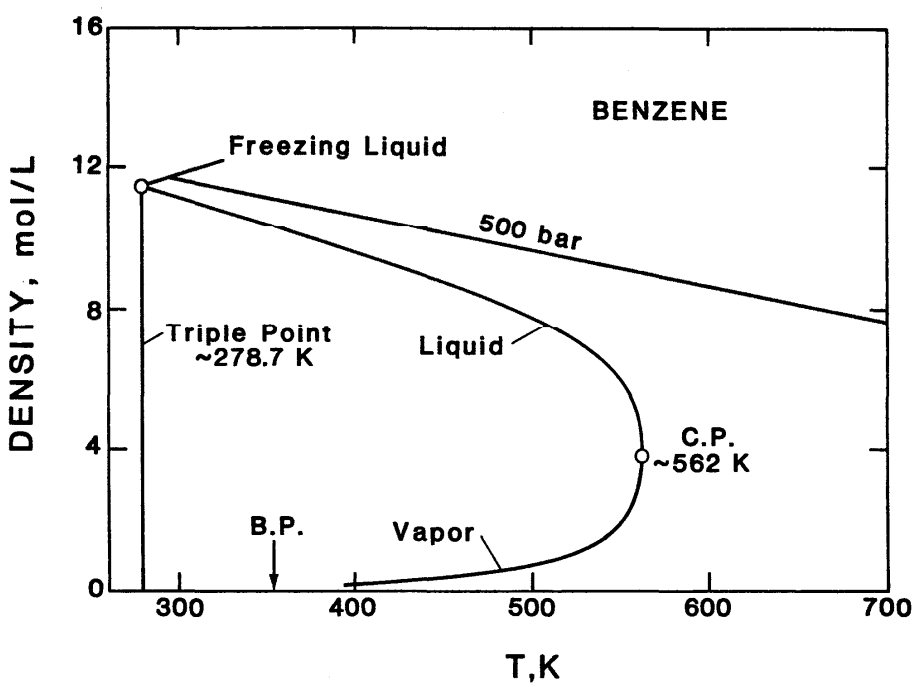

FIG. 1. Density–temperature phase diagram for benzene.

TABLE 1. Selected fixed-point values for benzene (Critical compressibility factor, $Z_c = 0.26767$)

	Triple point	Boiling point	Critical point
T/K	278.680	353.240	561.75
P/bar	0.047 85	1.013 25	48.7575
ρ/(mol/L)			
vapor	0.002 074	0.035 687	3.90
liquid	11.476 6	10.407 5	3.90

$$(P_m - P_t)/\text{bar} = 4237[(T/T_t)^{2/3} - 1]. \quad (1a)$$

2.1.b. The Vapor Pressures

Table 4 presents a selection of recent experimental and some correlated vapor-pressure data for benzene.[1,11,16,21,31,32] Appendix A gives a comprehensive list of references[1,10,11,15,16,21,31-39] for vapor pressure data for benzene. Let $x \equiv T/T_c$ then, for P_σ in bar, and with $p = 1.70$ for the exponent,[40]

$$\ln(P_\sigma) = a/x + b + cx + dx^2 + ex^3 + f(1-x)^p, \quad (2)$$

$a = -10.655\,375\,280$, $d = 20.208\,593\,271$,
$b = 23.941\,912\,372$, $e = -7.219\,556\,515$,
$c = -22.388\,714\,756$, $f = 4.847\,283\,265$.

In the eighth column of Table 4, dP/dT is the slope in bar/K. For 116 selected data the rms (root-mean-square) of relative pressure deviations is 0.035%.

2.2 The Orthobaric Densities

2.2.a. Saturated Liquid Densities

Table 5 presents a selection of experimental and correlated data for benzene.[18,38,41-43] Appendix A gives a comprehensive list of references[1,10,15,17-19,37,38,41-48] for saturated liquid densities for benzene. The large deviations of some data near T_c follow from differences in the critical temperatures of different authors. The argument for our formulation is $u(T) \equiv (1 - T/T_c)$. With $\beta = 0.35$,

$$(\rho_l/\rho_c - 1) = au^\beta + bu + cu^2 + du^3, \quad (3)$$

$a = 1.960\,0182$, $c = -1.585\,6640$,
$b = 1.062\,8812$, $d = 2.092\,6704$.

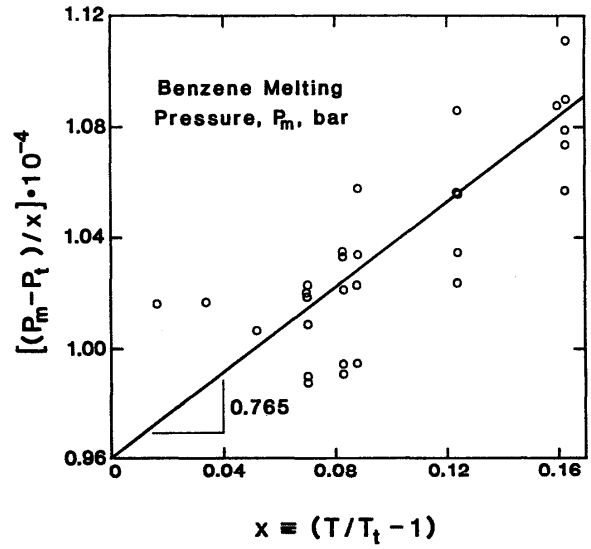

FIG. 2. Melting pressure of benzene.

In the eighth column of Table 5, $d\rho_l/dT$ is the slope of the orthobaric liquid densities curve in mol/(L K). The rms relative deviation for 61 selected saturated liquid densities is 0.24%.

2.2.b. Saturated Vapor Densities

Table 6 presents a selection of experimental and some correlated data for benzene.[7,15,18,31,37,43,49-54] Appendix A gives a comprehensive list of references[1,2,7,10,15,17,18,37,42] for saturated vapor densities for benzene. Enthalpies of vaporization have been used in the Clapeyron equation with Eqs. (2) and (3) to derive vapor densities at the same points as given in experimental papers.[31,49-53]

The compressibility factor for saturated vapor is formulated by using $x(T) \equiv T/T_c$, $u(T) \equiv (1-x)$, and $\beta = 0.35$,

$$\begin{aligned} &Z_\sigma(T) = 1 + (Z_c - 1)g(x)\exp[f(x)], \\ &g(x) = (T/T_t)^n, \quad n = 0 \text{ at } T \geqslant T_t, \\ &n = 3 \text{ at } T < T_t, \\ &f(x) = A_1u^\beta + A_2u + A_3u^2 + A_4u^3, \end{aligned} \quad (4)$$

where

TABLE 2. Recently-reported critical constants for benzene

Reference	Year	T_c/K	P_c/bar	ρ_c/(mol/L)
Gornowski *et al.* (Ref. 10)[a]	1947	562.65	49.345	3.810
Bender *et al.* (Ref. 11)	1952	562.09 ± 0.05	48.98 ± 0.03	3.953 ± 0.05
Kay and Nevens (Ref. 12)	1952	561.86	48.90	3.802
Simon (Ref. 13)	1957	...	...	3.897
Ambrose *et al.* (Ref. 14)[a]	1960	562.09	...	...
Connolly and Kandalic (Ref. 15)	1962	561.99	48.92	...
Ambrose *et al.* (Ref. 16)	1967	...	48.98	...
Campbell and Chatterjee (Ref. 17)	1969	562.10	48.86	3.917
Artyukhovskaya *et al.* (Ref. 18)	1970	561.80	...	3.857 ± 0.01
Ambrose and Lawrenson (Ref. 1)	1972	562.16	48.98	3.891
Hales and Townsend (Ref. 19)	1972	...	...	3.89 ± 0.05
Used here		561.75	48.7575	3.90

[a]These authors give older values from the literature.

Table 3. Comparison of reported melting pressures with values calculated from Eq. (1)

Ref. No.	T K	P bar	P(calc) bar	% Dev.
26	283.15	163.1	156.0	4.55
26	288.15	345.5	335.1	3.10
26	293.15	522.8	519.1	0.71
30	298.15	705.0	708.1	-0.44
23	298.15	690.0	708.1	-2.56
24	298.15	713.0	708.1	0.69
27	298.15	692.0	708.1	-2.27
28	298.15	712.0	708.1	0.55
22	298.15	715.0	708.1	0.98
26	298.15	712.3	708.1	0.59
30	301.65	852.0	843.3	1.03
23	301.65	817.0	843.3	-3.12
24	301.65	842.0	843.3	-0.15
29	301.65	820.0	843.3	-2.76
22	301.65	853.0	843.3	1.15
30	303.15	898.0	902.0	-0.44
23	303.15	874.0	902.0	-3.10
25	303.15	951.0	902.0	5.44
22	303.15	929.0	902.0	3.00
26	303.15	907.9	902.0	0.66
30	313.15	1280.0	1304.5	-1.88
23	313.15	1267.0	1304.5	2.88
28	313.15	1306.0	1304.5	0.11
22	313.15	1344.0	1304.5	3.03
26	313.15	1306.1	1304.5	0.12
26	323.15	1735.7	1726.8	0.52
30	324.15	1752.0	1770.1	-1.02
23	324.15	1725.0	1770.1	-2.55
29	324.15	1760.0	1770.1	-0.57
28	324.15	1780.0	1770.1	0.56
22	324.15	1813.0	1770.1	2.43

References: Bridgman[23], Deffet[24], Figuiere et al.[30], Ghelfenstein[28], Makita/Takagi[26], Osugi et al.[27], Pruzan[29], Tammann[22], Trappeniers[25]

$A_1 = -0.992\,134\,044$, $A_3 = 0.426\,708\,100$,
$A_2 = -3.848\,838\,300$, $A_4 = -19.955\,562\,000$.

In the eighth column of Table 6, $d\rho_g/dT$ is the slope of the vapor-densities curve in mol/(L K). The last column gives the experimental residuals

$$f(Z) \equiv -\ln\{(Z-1)/(Z_c-1)\}. \tag{4a}$$

The rms relative deviation for 130 selected vapor densities is 0.32%.

2.3. The Second Virial Coefficient

Data for the second virial coefficient of benzene are summarized by Pompe and Spurling[55] and by Dymond and Smith[56] who recommend the formulation of Al-Bizreh and Wormald[57] from 295 to 630 K. Let $x \equiv T/100$, the second virial coefficient $B(T)$ is represented by

$$B(T)/(\mathrm{L/mol}) = 0.0415 - 1.118/x - 3.850/x^2 - 1.289/x^3 - 51.58/x^4. \tag{5}$$

We have used this in the truncated virial equation of state,

$$Z(P,\rho,T) = 1 + B(T)\rho + \cdots \tag{5a}$$

to derive some $P\rho T$ data at the same points reported in Al-Bizreh and Wormald,[57] as shown in Table 8.

2.4. Pressure-Density-Temperature Data

The P–T maps of the principal $P\rho T$ data for benzene are shown in Figs. 3–5. Table 7[10,15,30,38,41,43,44,48,57–60] summarizes ranges of the data and gives deviations from our EOS, Eq. (6), while Table 8 compares individual data with this EOS. Appendix A gives a comprehensive list of references[10,15,30,38,41,43,44,48,58–65] for $P\rho T$ data for benzene.

The $P\rho T$ data of Connolly and Kandalic[15] were reported by an equation. Data of Figuière *et al.*[30] occur at low temperatures, at pressures up to the melting line, as do those of Kurumov *et al.*[48] Data of Gehrig and Lentz[58] along isochores cover the widest range (Fig. 5), but densities between adjacent isochores may be irregular; see Table 8 where data are arranged along isotherms. The data of Glanville and Sage[44] have small, systematic deviations from our EOS. The critical-region data of Gornowski *et al.*[10] were obtained using a mercury-in-glass thermometer. The Mamedov *et al.*[59] data are a summary of Russian work, with few points over a wide range. Both Kuss[41] and Taslimi[60] give isothermal $P\rho T$ data to high pressures at temperatures up to the normal boiling point, and via Tait equations, give also the derived isothermal compressibilities, $\rho(\partial P/\partial\rho)_T$.

Recently, a new set of $P\rho T$ data was obtained here by Straty.[43] These pseudoisochores at $1.2 \leqslant \rho \leqslant 9.3$ mol/L extend to 723 K or to 350 bar as boundaries. We finally have used for the equation of state only data from the virial equation (Al-Bizreh and Wormald[57]), from Kuss,[41] and from Straty;[43] see Sec. 2.5 and Table 8.

For each author in Table 7 we give the relative weight of his data for least squares, obtained by taking the sum of weights over the points of one author, and dividing by the sum of weights for all $P\rho T$ data points, expressing the result in percent.

After this manuscript was completed, additional data (Refs. 66 and 67) were kindly communicated by K. M. de Reuck of the IUPAC Thermodynamic Tables Project Centre.

2.5. The Equation of State

The present isochoric EOS is similar to that used recently for carbon monoxide,[9] designed to conform with the negative curvatures of high-density isochores seen in Fig. 5. For any density (isochore) the coexistence temperature, $T_\sigma(\rho)$, is obtained by iteration from equations for the orthobaric densities, and thus the vapor pressure, $P_\sigma[T_\sigma(\rho)]$, is a function of density,

$$P - P_\sigma(\rho) = \rho R\,[T - T_\sigma(\rho)] + \sigma(\rho R T_c)F(\rho,T), \tag{6}$$

$$F(\rho,T) \equiv A_1(u-1) + A_2\rho f_2(\rho,T) + D(\rho)f_3(\rho,T) + E(\rho)f_4(\rho,T), \tag{6a}$$

where $u(\rho,T) \equiv T/T_\sigma(\rho)$, R is the gas constant, σ is the reduced density, and

$$D(\rho) \equiv A_3 + A_4\rho, \quad E(\rho) \equiv A_5(\rho-1)\exp(-\gamma\rho^2).$$

Table 4. Comparison of reported vapor pressures with values calculated from Eq. (2)

Ref. No.	Wt.	T K	T/T_c	P bar	$P(calc)$ bar	% Dev.	dP/dT bar/K
21	1.00	278.680	0.49609	0.0479	0.0478	0.02	0.002600
32	1.00	285.957	0.50905	0.0701	0.0702	-0.09	0.003585
32	1.00	292.893	0.52139	0.0990	0.0990	-0.00	0.004773
1	1.00	293.150	0.52185	0.1003	0.1003	0.00	0.004822
32	1.00	297.769	0.53007	0.1247	0.1247	0.02	0.005774
32	1.00	298.684	0.53170	0.1301	0.1301	0.00	0.005979
32	1.00	302.619	0.53871	0.1555	0.1554	0.02	0.006922
32	1.00	302.633	0.53873	0.1555	0.1555	0.01	0.006926
1	1.00	303.150	0.53965	0.1592	0.1591	0.01	0.007058
32	1.00	304.302	0.54170	0.1675	0.1674	0.01	0.007359
32	1.00	307.159	0.54679	0.1896	0.1896	0.00	0.008146
31	1.00	308.332	0.54888	0.1993	0.1993	0.01	0.008487
32	1.00	308.384	0.54897	0.1998	0.1998	0.02	0.008502
32	1.00	310.167	0.55214	0.2154	0.2154	-0.00	0.009041
1	1.00	313.150	0.55745	0.2438	0.2438	0.01	0.010000
31	1.00	313.787	0.55859	0.2502	0.2502	0.01	0.010214
32	1.00	314.406	0.55969	0.2567	0.2566	0.02	0.010425
32	1.00	314.503	0.55986	0.2576	0.2576	-0.00	0.010458
31	1.00	319.289	0.56838	0.3118	0.3118	-0.00	0.012206
32	1.00	319.512	0.56878	0.3144	0.3145	-0.02	0.012293
32	1.00	319.907	0.56948	0.3194	0.3194	0.00	0.012447
1	1.00	323.150	0.57526	0.3619	0.3619	0.00	0.013765
32	1.00	323.921	0.57663	0.3726	0.3726	0.01	0.014093
32	1.00	324.454	0.57758	0.3802	0.3802	0.00	0.014323
31	1.00	324.834	0.57825	0.3857	0.3857	-0.00	0.014488
32	1.00	329.473	0.58651	0.4577	0.4577	0.00	0.016623
32	1.00	329.536	0.58662	0.4588	0.4588	-0.00	0.016653
31	1.00	330.426	0.58821	0.4738	0.4738	-0.01	0.017088
1	1.00	333.150	0.59306	0.5222	0.5222	-0.00	0.018468
32	1.00	333.842	0.59429	0.5351	0.5351	-0.00	0.018831
32	1.00	334.406	0.59529	0.5458	0.5458	-0.00	0.019131
31	1.00	336.061	0.59824	0.5782	0.5782	-0.01	0.020030
32	1.00	338.144	0.60195	0.6212	0.6212	-0.00	0.021203
32	1.00	339.061	0.60358	0.6408	0.6408	-0.00	0.021735
31	1.00	341.741	0.60835	0.7012	0.7012	-0.00	0.023342
32	1.00	342.687	0.61003	0.7236	0.7236	-0.00	0.023929
1	1.00	343.150	0.61086	0.7347	0.7347	-0.00	0.024220
32	1.00	343.751	0.61193	0.7494	0.7494	0.00	0.024601
31	1.00	347.469	0.61855	0.8453	0.8454	-0.01	0.027054
32	1.00	347.828	0.61919	0.8551	0.8551	-0.00	0.027299
32	1.00	348.357	0.62013	0.8696	0.8697	-0.01	0.027664
32	1.00	352.112	0.62681	0.9785	0.9785	-0.00	0.030349
32	1.00	352.594	0.62767	0.9932	0.9933	-0.01	0.030706
32	1.00	352.617	0.62771	0.9939	0.9940	-0.00	0.030724
32	1.00	352.955	0.62831	1.0044	1.0044	0.00	0.030976
32	1.00	353.078	0.62853	1.0082	1.0082	-0.00	0.031068
1	1.00	353.150	0.62866	1.0104	1.0104	0.00	0.031122
31	1.00	353.242	0.62882	1.0133	1.0133	-0.01	0.031191
32	1.00	353.660	0.62957	1.0263	1.0264	-0.01	0.031507
32	1.00	358.109	0.63749	1.1743	1.1743	-0.00	0.035002
32	1.00	358.727	0.63859	1.1960	1.1961	-0.01	0.035507
31	1.00	359.061	0.63918	1.2079	1.2080	-0.00	0.035782
32	1.00	362.258	0.64487	1.3267	1.3266	0.00	0.038491
32	1.00	363.062	0.64631	1.3578	1.3579	-0.00	0.039193
1	1.00	363.150	0.64646	1.3614	1.3613	0.00	0.039270
31	1.00	364.927	0.64963	1.4324	1.4325	-0.01	0.040856
32	1.00	367.239	0.65374	1.5294	1.5294	-0.00	0.042982
32	1.00	367.554	0.65430	1.5428	1.5430	-0.01	0.043277
31	1.00	370.839	0.66015	1.6903	1.6903	-0.00	0.046438
32	1.00	372.175	0.66253	1.7532	1.7532	-0.00	0.047766
32	1.00	372.630	0.66334	1.7751	1.7751	0.00	0.048225
1	1.00	373.150	0.66426	1.8003	1.8003	0.00	0.048752
11	1.00	373.150	0.66426	1.8005	1.8003	0.01	0.048752
31	1.00	376.795	0.67075	1.9849	1.9849	0.00	0.052555
32	1.00	377.584	0.67216	2.0267	2.0267	0.00	0.053403
32	1.00	377.875	0.67267	2.0422	2.0423	-0.00	0.053718
31	1.00	382.798	0.68144	2.3202	2.3201	0.00	0.059237
1	1.00	383.150	0.68206	2.3409	2.3411	-0.01	0.059645
11	1.00	383.150	0.68206	2.3416	2.3411	0.02	0.059645
32	1.00	383.175	0.68211	2.3426	2.3426	0.00	0.059674

Table 4. Comparison of reported vapor pressures with values calculated from Eq. (2) - Continued

Ref. No.	Wt.	T K	T/T_c	P bar	$P(calc)$ bar	% Dev.	dP/dT bar/K
31	1.00	388.847	0.69221	2.7003	2.7002	0.00	0.066510
1	1.00	393.150	0.69987	2.9977	2.9981	-0.02	0.072022
11	1.00	393.150	0.69987	2.9982	2.9981	0.00	0.072022
1	1.00	403.150	0.71767	3.7856	3.7867	-0.03	0.085948
11	1.00	403.150	0.71767	3.7875	3.7867	0.02	0.085948
1	1.00	413.150	0.73547	4.7204	4.7225	-0.04	0.101483
11	1.00	413.150	0.73547	4.7248	4.7225	0.05	0.101483
16	1.00	420.000	0.74766	5.4580	5.4569	0.02	0.113083
1	1.00	423.150	0.75327	5.8186	5.8219	-0.06	0.118684
11	1.00	423.150	0.75327	5.8272	5.8219	0.09	0.118684
1	1.00	433.150	0.77107	7.0971	7.1019	-0.07	0.137606
11	1.00	433.150	0.77107	7.1090	7.1019	0.10	0.137606
16	1.00	440.000	0.78327	8.0920	8.0919	0.00	0.151588
1	1.00	443.150	0.78887	8.5737	8.5799	-0.07	0.158303
11	1.00	443.150	0.78887	8.5863	8.5799	0.07	0.158303
1	1.00	453.150	0.80668	10.2665	10.2741	-0.07	0.180834
11	1.00	453.150	0.80668	10.2825	10.2741	0.08	0.180834
16	1.00	460.000	0.81887	11.5670	11.5688	-0.02	0.197358
1	1.00	463.150	0.82448	12.1943	12.2029	-0.07	0.205261
11	1.00	463.150	0.82448	12.2107	12.2029	0.06	0.205261
1	1.00	473.150	0.84228	14.3764	14.3859	-0.07	0.231662
11	1.00	473.150	0.84228	14.3932	14.3859	0.05	0.231662
16	1.00	480.000	0.85447	16.0370	16.0382	-0.01	0.250932
1	1.00	483.150	0.86008	16.8328	16.8430	-0.06	0.260129
11	1.00	483.150	0.86008	16.8483	16.8430	0.03	0.260129
1	1.00	493.150	0.87788	19.5844	19.5957	-0.06	0.290787
11	1.00	493.150	0.87788	19.6013	19.5957	0.03	0.290787
16	1.00	500.000	0.89008	21.6670	21.6635	0.02	0.313139
1	1.00	503.150	0.89568	22.6535	22.6666	-0.06	0.323809
11	1.00	503.150	0.89568	22.6765	22.6666	0.04	0.323809
1	1.00	513.150	0.91348	26.0647	26.0806	-0.06	0.359452
11	1.00	513.150	0.91348	26.0912	26.0806	0.04	0.359452
16	1.00	520.000	0.92568	28.6440	28.6315	0.04	0.385577
1	1.00	523.150	0.93129	29.8467	29.8657	-0.06	0.398115
11	1.00	523.150	0.93129	29.8909	29.8657	0.08	0.398115
1	1.00	533.150	0.94909	34.0346	34.0551	-0.06	0 440461
11	1.00	533.150	0.94909	34.0857	34.0551	0.09	0.440461
1	1.00	538.150	0.95799	36.2945	36.3142	-0.05	0.463363
16	1.00	540.000	0.96128	37.1930	37.1795	0.04	0.472192
1	1.00	543.150	0.96689	38.6741	38.6912	-0.04	0.487732
11	1.00	543.150	0.96689	38.7163	38.6912	0.06	0.487732
1	1.00	548.150	0.97579	41.1816	41.1946	-0.03	0.513974
1	1.00	553.150	0.98469	43.8268	43.8353	-0.02	0.542832
11	1.00	553.150	0.98469	43.8433	43.8353	0.02	0.542832
1	1.00	558.150	0.99359	46.6211	46.6301	-0.02	0.576122
16	1.00	560.000	0.99688	47.7170	47.7091	0.02	0.590743

116 data points, rms deviation 0.035%.
References: Ambrose[32], Ambrose/Broderick/Townsend[16], Ambrose/Lawrenson[1], Bender et al.[11], Jackowski[21], Scott/Osborne[31]

Table 5. Comparison of reported saturated liquid densities with values calculated from Eq. (3)

Ref. No.	Wt.	T K	T/T_c	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	$d\rho_l/dT$ mol/(L·K)
42	1.00	293.110	0.52178	11.2574	11.2653	-0.07	-0.0145
41	1.00	298.150	0.53075	11.1840	11.1924	-0.07	-0.0144
38	1.00	299.998	0.53404	11.1580	11.1657	-0.07	-0.0144
42	1.00	310.100	0.55202	11.0256	11.0208	0.04	-0.0143
41	1.00	313.150	0.55745	10.9760	10.9773	-0.01	-0.0143
42	1.00	330.070	0.58757	10.7486	10.7368	0.11	-0.0142
41	1.00	333.150	0.59306	10.6980	10.6931	0.05	-0.0142
42	1.00	350.100	0.62323	10.4648	10.4523	0.12	-0.0143
41	1.00	353.150	0.62866	10.4170	10.4088	0.08	-0.0143
38	1.00	356.531	0.63468	10.3630	10.3605	0.02	-0.0143
42	1.00	370.040	0.65873	10.1781	10.1658	0.12	-0.0145
38	1.00	385.320	0.68593	9.9410	9.9414	-0.00	-0.0149
42	1.00	400.010	0.71208	9.7230	9.7196	0.04	-0.0154
38	1.00	400.966	0.71378	9.6990	9.7049	-0.06	-0.0154
43	1.00	423.531	0.75395	9.3488	9.3464	0.03	-0.0164
38	1.00	424.866	0.75633	9.3110	9.3244	-0.14	-0.0165
42	1.00	430.070	0.76559	9.2282	9.2376	-0.10	-0.0168
38	1.00	442.938	0.78850	8.9960	9.0153	-0.21	-0.0177
43	1.00	444.483	0.79125	8.9905	8.9878	0.03	-0.0179
38	1.00	458.793	0.81672	8.7010	8.7232	-0.25	-0.0192
43	1.00	473.481	0.84287	8.4373	8.4299	0.09	-0.0209
38	1.00	479.504	0.85359	8.2800	8.3018	-0.26	-0.0217
43	1.00	502.346	0.89425	7.7701	7.7608	0.12	-0.0261
38	1.00	506.331	0.90135	7.6440	7.6549	-0.14	-0.0271
43	1.00	514.471	0.91584	7.4271	7.4245	0.04	-0.0296
43	1.00	524.772	0.93417	7.1192	7.0980	0.30	-0.0340
38	1.00	525.252	0.93503	7.0870	7.0816	0.08	-0.0343
43	1.00	528.083	0.94007	7.0019	6.9823	0.28	-0.0359
43	1.00	533.379	0.94950	6.8081	6.7830	0.37	-0.0395
43	1.00	539.954	0.96120	6.5226	6.5034	0.29	-0.0460
43	1.00	542.971	0.96657	6.3733	6.3588	0.23	-0.0501
43	1.00	548.772	0.97690	6.0684	6.0372	0.52	-0.0620
43	0.00	553.212	0.98480	5.7746	5.7275	0.82	-0.0794
18	1.00	553.910	0.98604	5.6546	5.6706	-0.28	-0.0836
18	1.00	554.140	0.98645	5.6418	5.6512	-0.17	-0.0851
18	1.00	554.900	0.98781	5.5637	5.5845	-0.37	-0.0906
18	1.00	555.010	0.98800	5.5944	5.5745	0.36	-0.0915
18	1.00	555.880	0.98955	5.4689	5.4915	-0.41	-0.0995
43	1.00	555.898	0.98958	5.5074	5.4897	0.32	-0.0997
18	1.00	555.950	0.98968	5.4715	5.4845	-0.24	-0.1002
18	1.00	556.170	0.99007	5.4715	5.4622	0.17	-0.1026
18	1.00	556.370	0.99042	5.4318	5.4414	-0.18	-0.1049
18	1.00	557.170	0.99185	5.3576	5.3534	0.08	-0.1157
18	1.00	557.900	0.99315	5.2705	5.2644	0.12	-0.1287
18	1.00	557.920	0.99318	5.2398	5.2618	-0.42	-0.1291
18	1.00	558.680	0.99453	5.1450	5.1569	-0.23	-0.1480
43	1.00	558.798	0.99474	5.1498	5.1393	0.20	-0.1516
18	1.00	558.920	0.99496	5.1066	5.1205	-0.27	-0.1557
43	1.00	558.925	0.99497	5.1019	5.1198	-0.35	-0.1558
18	1.00	559.460	0.99592	5.0106	5.0309	-0.40	-0.1776
18	1.00	559.660	0.99628	4.9863	4.9944	-0.16	-0.1880
18	1.00	559.890	0.99669	4.9761	4.9495	0.54	-0.2022
18	1.00	560.330	0.99747	4.8608	4.8529	0.16	-0.2396
18	1.00	560.670	0.99808	4.7469	4.7644	-0.37	-0.2849
18	1.00	560.770	0.99826	4.7136	4.7350	-0.45	-0.3030
18	0.00	561.010	0.99868	4.6112	4.6557	-0.96	-0.3622
18	1.00	561.250	0.99911	4.5459	4.5578	-0.26	-0.4652
18	1.00	561.280	0.99916	4.5242	4.5435	-0.43	-0.4840
18	1.00	561.450	0.99947	4.4461	4.4492	-0.07	-0.6455
18	1.00	561.640	0.99980	4.2822	4.2858	-0.08	-1.2324
18	0.00	561.650	0.99982	4.2912	4.2731	0.42	-1.3107

61 data points, rms deviation 0.24%.
References: Artyukhovskaya et al.[18], Hales/Gundry[42], Kuss[41], Straty et al.[43], Teichmann[38]

Table 6. Comparison of reported saturated vapor densities with values calculated from Eq. (4)

Ref. No.	Wt.	T K	T/T_c	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	$d\rho_g/dT$ mol/(L·K)	$f(Z)$
53	1.00	298.099	0.53066	0.0052	0.0051	0.03	0.0002	4.5000
51	1.00	298.150	0.53075	0.0052	0.0052	0.00	0.0002	4.5303
52	1.00	298.150	0.53075	0.0052	0.0052	0.00	0.0002	4.5303
37	1.00	298.150	0.53075	0.0052	0.0052	-0.02	0.0002	4.5549
7	1.00	300.000	0.53405	0.0056	0.0056	-0.02	0.0002	4.5056
54	1.00	300.000	0.53405	0.0056	0.0056	0.16	0.0002	4.3074
37	1.00	303.150	0.53965	0.0064	0.0064	-0.05	0.0003	4.4438
53	1.00	307.207	0.54687	0.0075	0.0075	-0.05	0.0003	4.3185
7	1.00	310.000	0.55185	0.0084	0.0084	-0.01	0.0003	4.1946
54	1.00	310.000	0.55185	0.0084	0.0084	-0.06	0.0003	4.2383
50	1.00	313.150	0.55745	0.0095	0.0095	0.12	0.0004	4.0005
52	1.00	313.150	0.55745	0.0095	0.0095	0.02	0.0004	4.0813
53	1.00	314.088	0.55912	0.0098	0.0098	-0.03	0.0004	4.0902
31	1.00	314.750	0.56030	0.0101	0.0101	-0.02	0.0004	4.0622
7	1.00	320.000	0.56965	0.0122	0.0122	-0.01	0.0004	3.9116
54	1.00	320.000	0.56965	0.0122	0.0122	-0.17	0.0004	4.0283
31	1.00	323.050	0.57508	0.0137	0.0136	0.08	0.0005	3.7769
37	1.00	323.150	0.57526	0.0137	0.0137	-0.04	0.0005	3.8470
53	1.00	324.441	0.57755	0.0143	0.0143	0.04	0.0005	3.7633
52	1.00	328.150	0.58416	0.0163	0.0163	-0.02	0.0006	3.7022
7	1.00	330.000	0.58745	0.0173	0.0173	0.01	0.0006	3.6387
54	1.00	330.000	0.58745	0.0173	0.0173	-0.24	0.0006	3.7775
53	1.00	332.298	0.59154	0.0187	0.0187	0.07	0.0006	3.5550
50	1.00	333.150	0.59306	0.0193	0.0193	-0.01	0.0006	3.5681
52	1.00	333.150	0.59306	0.0193	0.0193	0.20	0.0006	3.4744
31	1.00	334.050	0.59466	0.0199	0.0198	0.11	0.0006	3.4923
7	1.00	340.000	0.60525	0.0240	0.0240	0.05	0.0008	3.3777
54	1.00	340.000	0.60525	0.0239	0.0240	-0.26	0.0008	3.5063
50	1.00	343.150	0.61086	0.0265	0.0265	-0.00	0.0008	3.3229
52	1.00	343.150	0.61086	0.0264	0.0265	-0.12	0.0008	3.3657
37	1.00	343.150	0.61086	0.0265	0.0265	0.02	0.0008	3.3160
7	1.00	350.000	0.62305	0.0325	0.0325	0.05	0.0010	3.1490
54	1.00	350.000	0.62305	0.0324	0.0325	-0.18	0.0010	3.2220
50	1.00	353.150	0.62866	0.0356	0.0356	0.07	0.0010	3.0727
53	1.00	353.242	0.62882	0.0357	0.0357	0.14	0.0010	3.0504
31	1.00	353.250	0.62884	0.0357	0.0357	0.07	0.0010	3.0725
52	1.00	353.250	0.62884	0.0357	0.0357	-0.02	0.0010	3.0967
49	1.00	353.350	0.62902	0.0358	0.0358	0.03	0.0010	3.0804
7	1.00	360.000	0.64085	0.0432	0.0432	0.04	0.0012	2.9355
54	1.00	360.000	0.64085	0.0431	0.0432	-0.03	0.0012	2.9534
37	1.00	363.150	0.64646	0.0471	0.0470	0.13	0.0013	2.8486
7	1.00	370.000	0.65866	0.0564	0.0564	0.04	0.0015	2.7310
54	1.00	370.000	0.65866	0.0563	0.0564	-0.04	0.0015	2.7467
53	1.00	377.582	0.67215	0.0685	0.0683	0.23	0.0017	2.5518
7	1.00	380.000	0.67646	0.0725	0.0725	0.02	0.0018	2.5418
54	1.00	380.000	0.67646	0.0724	0.0725	-0.08	0.0018	2.5588
37	1.00	383.150	0.68206	0.0784	0.0783	0.21	0.0019	2.4549
7	1.00	390.000	0.69426	0.0920	0.0920	-0.01	0.0021	2.3636
54	1.00	390.000	0.69426	0.0919	0.0920	-0.10	0.0021	2.3756
7	1.00	400.000	0.71206	0.1153	0.1154	-0.05	0.0025	2.1960
54	1.00	400.000	0.71206	0.1154	0.1154	0.02	0.0025	2.1882
37	0.00	403.150	0.71767	0.1244	0.1236	0.65	0.0027	2.0732
7	1.00	410.000	0.72986	0.1430	0.1432	-0.09	0.0030	2.0378
54	1.00	410.000	0.72986	0.1433	0.1432	0.11	0.0030	2.0195
7	1.00	420.000	0.74766	0.1758	0.1760	-0.11	0.0036	1.8865
54	1.00	420.000	0.74766	0.1764	0.1760	0.23	0.0036	1.8596
37	1.00	423.150	0.75327	0.1878	0.1875	0.17	0.0037	1.8186
7	1.00	430.000	0.76547	0.2140	0.2145	-0.25	0.0042	1.7508
54	1.00	430.000	0.76547	0.2155	0.2145	0.46	0.0042	1.7033
15	1.00	433.150	0.77107	0.2279	0.2280	-0.04	0.0044	1.6930
7	1.00	440.000	0.78327	0.2588	0.2596	-0.33	0.0049	1.6172
54	1.00	440.000	0.78327	0.2609	0.2596	0.48	0.0049	1.5714
15	1.00	443.150	0.78887	0.2751	0.2754	-0.10	0.0051	1.5623
37	1.00	443.150	0.78887	0.2753	0.2754	-0.04	0.0051	1.5593
7	1.00	450.000	0.80107	0.3111	0.3123	-0.38	0.0057	1.4886
54	1.00	450.000	0.80107	0.3138	0.3123	0.48	0.0057	1.4463
15	1.00	453.150	0.80668	0.3295	0.3306	-0.33	0.0060	1.4463
7	1.00	455.000	0.80997	0.3405	0.3418	-0.37	0.0061	1.4250
7	1.00	460.000	0.81887	0.3723	0.3736	-0.35	0.0066	1.3623
54	1.00	460.000	0.81887	0.3757	0.3736	0.55	0.0066	1.3242

Table 6. Comparison of reported saturated vapor densities with values calculated from Eq. (4) - Continued

Ref. No.	Wt.	T K	T/T_c	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	$d\rho_g/dT$ mol/(L·K)	$f(Z)$
15	1.00	463.150	0.82448	0.3939	0.3949	-0.26	0.0069	1.3206
37	1.00	463.150	0.82448	0.3951	0.3949	0.03	0.0069	1.3086
7	1.00	465.000	0.82777	0.4072	0.4079	-0.18	0.0071	1.2955
54	0.00	470.000	0.83667	0.4488	0.4450	0.84	0.0077	1.2003
15	1.00	473.150	0.84228	0.4682	0.4699	-0.36	0.0081	1.2073
54	1.00	480.000	0.85447	0.5315	0.5284	0.58	0.0090	1.0997
15	1.00	483.150	0.86008	0.5562	0.5575	-0.23	0.0095	1.0902
37	1.00	483.150	0.86008	0.5581	0.5575	0.11	0.0095	1.0800
54	1.00	490.000	0.87227	0.6276	0.6260	0.25	0.0106	1.0022
15	1.00	493.150	0.87788	0.6592	0.6602	-0.16	0.0111	0.9794
54	1.00	500.000	0.89008	0.7410	0.7412	-0.03	0.0125	0.9032
15	1.00	503.150	0.89568	0.7800	0.7819	-0.24	0.0133	0.8747
37	1.00	503.150	0.89568	0.7782	0.7819	-0.47	0.0133	0.8799
54	1.00	510.000	0.90788	0.8761	0.8788	-0.30	0.0151	0.8034
15	1.00	513.150	0.91348	0.9276	0.9278	-0.02	0.0160	0.7643
54	1.00	520.000	0.92568	1.0419	1.0459	-0.38	0.0185	0.6980
15	1.00	523.150	0.93129	1.1074	1.1064	0.09	0.0199	0.6561
37	0.00	523.150	0.93129	1.1155	1.1064	0.82	0.0199	0.6443
43	1.00	529.927	0.94335	1.2531	1.2533	-0.02	0.0236	0.5837
54	1.00	530.000	0.94348	1.2500	1.2550	-0.40	0.0237	0.5885
15	1.00	533.150	0.94909	1.3387	1.3329	0.44	0.0258	0.5415
37	0.00	533.150	0.94909	1.3233	1.3329	-0.72	0.0258	0.5573
54	1.00	540.000	0.96128	1.5362	1.5303	0.39	0.0323	0.4629
43	0.00	542.968	0.96657	1.6719	1.6316	2.47	0.0362	0.4048
15	1.00	543.150	0.96689	1.6502	1.6382	0.73	0.0364	0.4207
37	1.00	543.150	0.96689	1.6316	1.6382	-0.40	0.0364	0.4331
37	1.00	548.150	0.97579	1.8436	1.8424	0.06	0.0461	0.3624
54	1.00	550.000	0.97908	1.9511	1.9322	0.98	0.0512	0.3280
43	0.00	550.442	0.97987	1.9953	1.9552	2.05	0.0527	0.3124
15	1.00	553.150	0.98469	2.1142	2.1120	0.11	0.0639	0.2878
37	1.00	553.150	0.98469	2.1315	2.1120	0.93	0.0639	0.2812
43	1.00	556.031	0.98982	2.3136	2.3229	-0.40	0.0849	0.2413
54	0.00	560.000	0.99688	2.6682	2.8024	-4.79	0.1910	0.1730
43	0.00	560.628	0.99800	2.8155	2.9413	-4.28	0.2599	0.1448
43	1.00	561.703	0.99992	3.5380	3.5420	-0.11	2.4400	0.0379
18	0.10	553.910	0.98604	2.2019	2.1621	1.84	0.0682	0.2618
18	0.10	554.140	0.98645	2.2250	2.1780	2.16	0.0696	0.2556
18	0.10	554.900	0.98781	2.2710	2.2329	1.71	0.0749	0.2463
18	0.10	555.010	0.98800	2.2595	2.2412	0.82	0.0758	0.2509
18	0.10	555.880	0.98955	2.3568	2.3102	2.02	0.0833	0.2267
18	0.10	555.950	0.98968	2.3568	2.3161	1.76	0.0840	0.2273
18	0.10	556.170	0.99007	2.3568	2.3348	0.94	0.0863	0.2289
18	0.10	556.370	0.99042	2.3914	2.3523	1.66	0.0885	0.2201
18	0.10	557.170	0.99185	2.4477	2.4271	0.85	0.0988	0.2098
18	0.10	557.900	0.99315	2.5322	2.5035	1.15	0.1113	0.1923
18	0.10	557.920	0.99318	2.5463	2.5057	1.62	0.1116	0.1888
18	0.10	558.680	0.99453	2.6244	2.5971	1.05	0.1299	0.1746
18	0.10	558.920	0.99496	2.6641	2.6291	1.33	0.1373	0.1669
18	0.10	559.460	0.99592	2.7460	2.7087	1.38	0.1587	0.1521
18	0.10	559.660	0.99628	2.7716	2.7414	1.10	0.1690	0.1479
18	0.10	559.890	0.99669	2.8010	2.7819	0.69	0.1831	0.1432
18	0.10	560.330	0.99747	2.8906	2.8701	0.72	0.2207	0.1281
18	0.10	560.670	0.99808	2.9739	2.9523	0.73	0.2669	0.1147
18	0.10	560.770	0.99826	3.0187	2.9799	1.30	0.2856	0.1074
18	0.10	561.010	0.99868	3.0763	3.0553	0.69	0.3477	0.0990
18	0.10	561.250	0.99911	3.1710	3.1506	0.65	0.4583	0.0852
18	0.10	561.280	0.99916	3.1851	3.1646	0.65	0.4788	0.0832
18	0.10	561.450	0.99947	3.2606	3.2593	0.04	0.6580	0.0729
18	0.10	561.640	0.99980	3.4232	3.4311	-0.23	1.3402	0.0517
18	0.10	561.650	0.99982	3.4309	3.4450	-0.41	1.4337	0.0508

130 data points, rms deviation 0.32%.

References: Akhundov/Abdullaev[37], Artyukhovskaya et al.[18], Connolly/Kandalic[15], Fiock et al.[50], Gorbunova et al.[54], Kratzke et al.[7], Mathews[49], Osborne/Ginnings[51], Scott/Osborne[31], Straty et al.[43], Svoboda et al.[52], Todd et al.[53]

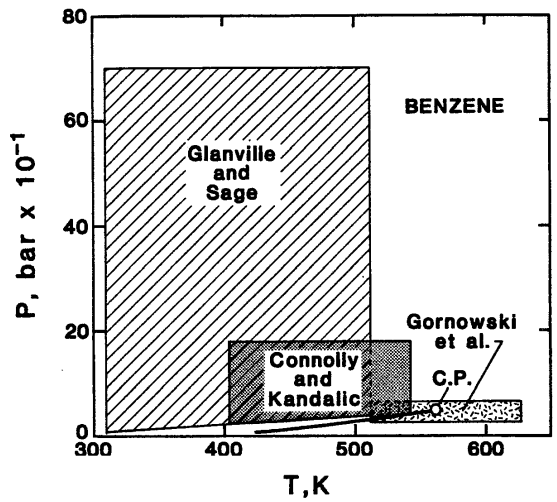

FIG. 3. P–T map of some benzene $P\rho T$ data.

The temperature-dependent functions in Eq. (6a) are

$$f_2(\rho,T) \equiv \ln[(1+u^2)/2], \tag{6b}$$

$$f_3(\rho,T) \equiv \ln[1+\delta(u-1)]/\delta, \tag{6c}$$

$$f_4(\rho,T) \equiv [\psi_\sigma(\rho) - \psi(\rho,T)]\eta/(\eta-1), \tag{6d}$$

where

$$\psi(\rho,T) \equiv \omega - \omega^\eta/\eta, \tag{6e}$$

and $\psi_\sigma(\rho)$ is obtained from $\psi(\rho,T)$ by replacing T with $T_\sigma(\rho)$. The function $\omega(\rho,T)$ is defined by

$$\omega(\rho,T) \equiv [1-\theta(\rho)/T], \tag{6f}$$

where $\theta(\rho)$ is a locus of temperatures inside the coexistence envelope of Fig. 1,

$$\theta(\rho) \equiv T_\sigma(\rho)\exp[-\alpha g(\rho)], \tag{6g}$$

$$g(\rho) \equiv |\sigma-1|^3/(\sigma_t-1)^3, \tag{6h}$$

and σ_t is the reduced density of liquid at the triple point.

The function $f_2(\rho,T)$ has zero curvature versus T (an inflection) at the coexistence boundary ($u=1$), whereas $f_3(\rho,T)$ has its greatest curvature at this boundary. Function $f_4(\rho,T)$ is designed for a maximum in isochoric specific heats at the critical point, as for carbon monoxide.[9] An exponent value $\eta = 1.10$ in Eq. (6e) is assigned because it cannot be found by fitting $P\rho T$ data.[8] Values for parameters α, γ, and δ were estimated to optimize the fit of $P\rho T$ data by Eq. (6). At the critical point, the slope of the critical isochore from Eq. (6) has been constrained to equal the slope of vapor-pressure Eq. (2) via the least-squares program of McCarty.[68] This constraint has been found to give a well-behaved critical isotherm, $P(\rho,T_c)$, with no negative slopes, $(\partial P/\partial\rho)_{T_c}$.

The parameters and least-squares coefficients for Eq. (6) are the following:

$$\alpha = 0.20, \quad \gamma = 0.50, \quad \delta = 5.0, \quad \eta = 1.10,$$

$$A_1 = 0.743\,559\,507, \quad A_4 = 0.504\,701\,641,$$
$$A_2 = 0.397\,531\,574, \quad A_5 = 0.620\,969\,008.$$
$$A_3 = -0.765\,372\,414,$$

For least-squares determination of the coefficients in Eq. (6) we have used a total of about 500 $P\rho T$ data: from the virial equation (Al-Bizreh and Wormald[57]); from Kuss;[41] and from Straty.[43] The number of available $P\rho T$ data from all authors is at least 1510. Table 8 presents deviations of experimental densities and pressures from the EOS, Eq. (6). The least satisfactory representation of the Straty[43] data in this table occurs along isochores near the critical density, $\rho_c = 3.9$ mol/L. Table 9 gives properties computed along the critical isotherm at reduced densities from 0.5 through 1.5.

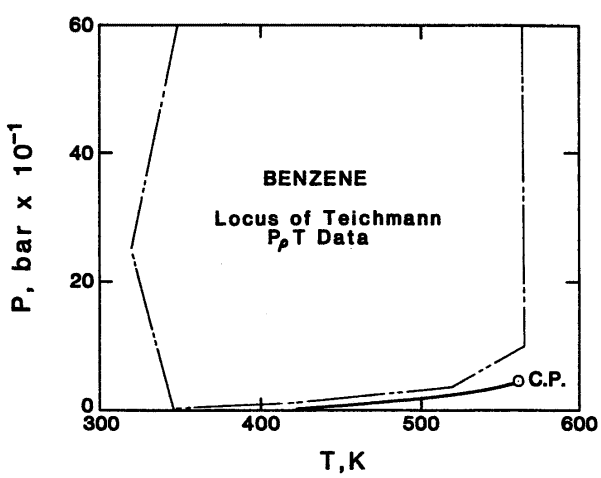

FIG. 4. P–T map of $P\rho T$ data of Teichmann[38].

3. Thermal Properties and Computations

3.1. Functions for Ideal Gas States

Recent tables of ideal gas state thermofunctions for benzene were contributed by Dr. Jing Chao of the Thermodynamics Research Center (TRC)[69] in July, 1983. The data in Table 10 are formulated by using $x(T) \equiv T/100$, and $\epsilon = 8.60$,

$$C_p^\circ(T)/R = 4 + f(x)\exp(-\epsilon/x),$$
$$f(x) = \sum_{i=1}^{5} A_i x^{1-i}, \tag{7}$$

where

$$A_1 = 34.383\,386, \quad A_4 = -1066.570\,15,$$
$$A_2 = 129.858\,849, \quad A_5 = 1697.128\,98.$$
$$A_3 = 415.777\,762,$$

Interpolated results up to 1000 K are presented in Table 11. Numerical integrations are performed to obtain functions from Eq. (7), starting with values at 300 K.

3.2. Saturated Liquid Properties

3.2.a. Enthalpies of Vaporization

The Clapeyron equation,

$$\Delta_{vap}H/(\text{J/mol}) = 100T(dP_\sigma/dT)(v_g - v_l) \tag{8}$$

is used to derive enthalpies of vaporization $\Delta_{vap}H$, where dP_σ/dT from Eq. (2) is in units of bar/K, and the orthobaric volumes, v_g and v_l, in L/mol are from Eqs. (3) and (4).

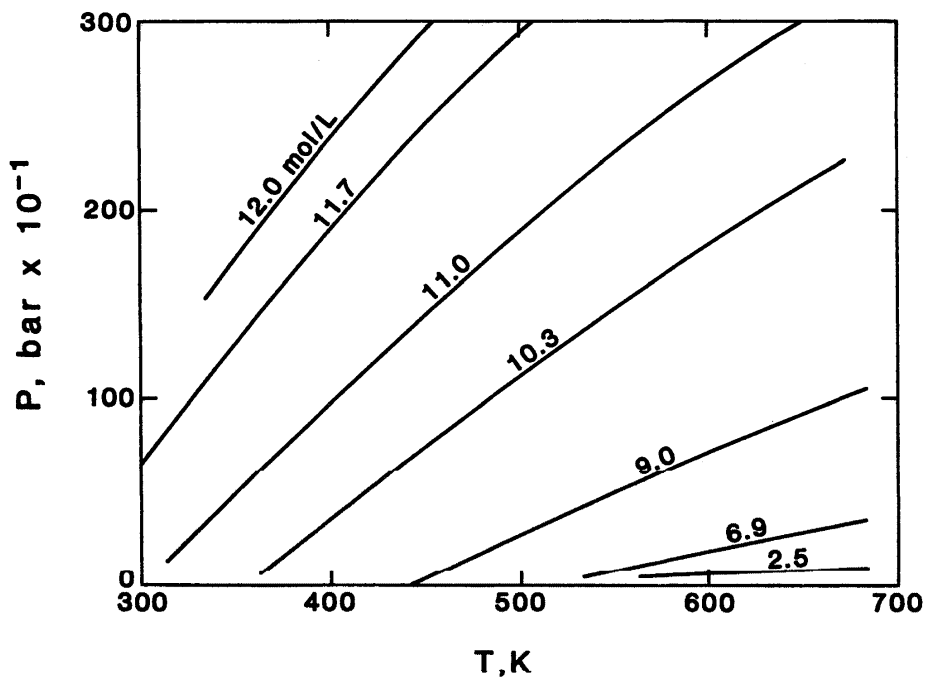

FIG. 5. P–T plot of PpT data of Gehrig and Lentz[58].

3.2.b. Enthalpies of Saturated Liquid

Data for the enthalpy $H_\sigma(T)$ along the saturated liquid boundary, $H_\sigma(T)$, were derived by using the ideal gas enthalpy, the EOS, and the enthalpy of vaporization. They are represented using argument $u(T) \equiv (T_c - T)/(T_c - T_t)$:

$$(H_\sigma - H_c)/(H_t - H_c) = u + (u^\beta - u)\sum_{i=1}^{6} A_i u^{i-1}, \tag{9}$$

where $\beta = 0.35$, $H_t = 0.417$ J/mol, $H_c = 53\,783.950$ J/mol, and

$A_1 =$ 0.241 884 930, $A_4 =$ 0.860 385 975,
$A_2 =$ 0.326 313 907, $A_5 =$ −0.801 031 901,
$A_3 =$ −0.405 280 020, $A_6 =$ 0.241 845 641.

For 18 data at $T_t < T < T_c$, the rms relative deviation is 0.008%, and the maximum absolute deviation is 3.9 J/mol at 561 K.

3.2.c. Entropies of Saturated Liquid

Data for the entropy along the saturated liquid boundary, $S_\sigma(T)$, derived as for $H_\sigma(T)$ above, are represented by using $x(T) \equiv T/T_c$, $u(T) \equiv (1 - x)$, when

$$(S_\sigma - S_c)/(S_t - S_c) = A_1 u^\beta + A_2 \ln(x) + \sum_{i=3}^{5} A_i u^{i-2}, \tag{10}$$

where $\beta = 0.35$, $S_t = 163.795\,56$ J/(mol K), $S_c = 288.797\,05$ J/(mol K), and

$A_1 =$ 0.230 785 854, $A_4 =$ 0.079 145 358,
$A_2 =$ −1.676 590 854, $A_5 =$ −1.390 830 632.
$A_3 =$ −0.394 963 276,

For 18 data at $T_t < T < T_c$, the rms relative deviation is 0.006%, and maximum deviations are under 0.04 J/(mol K).

3.2.d. Specific Heats of Saturated Liquid

Specific heats, $C_\sigma(T)$ in J/(mol K), along the liquid coexistence path, are derived from Eq. (10) via $C_\sigma = T(dS_\sigma/dT)$. Let $S_n = (S_t - S_c)$, and

$$\text{Sum} \equiv -A_1\beta u^{\beta-1} + A_2/x + \sum_{i=3}^{5} A_i(2-i)u^{i-3},$$

then

$$C_\sigma(T) = S_n x \,\text{Sum}. \tag{11}$$

Some comparisons with experimental data[20,70] are given in Table 12.

3.3. Computational Methods

The numerical values for U and H in this report are based on the assigned value $U = 0$ for saturated liquid at the triple point, obtained by adding the arbitrary value $H_0^\circ = H_0^\circ = 22\,279.294$ J/mol to the ideal gas state values of $(U^\circ - U_0^\circ)$ and $(H^\circ - H_0^\circ)$ from Eq. (7).

3.3.a. The Homogeneous Domain

The homogeneous domain of Fig. 1 includes all regions which can be attained by integration along isotherms starting at zero density without crossing the vapor–liquid dome, and without passing very close to the critical point.

We start our computations with ideal gas state thermodynamic functions at zero density, and then apply the Romberg numerical integration technique[71] along isotherms by using equation of state (6) in the following relations,

$$\Delta U = \int \left[P - T\left(\frac{\partial P}{\partial T}\right)\right] \frac{d\rho}{\rho^2}, \tag{12}$$

Table 7. Summary of PρT data for benzene

Reference	Rel. Wt.[a]	Range of the data T/K	ρ/(mol/L)	P/bar	NP[b]	Relative deviations in percent Δρ/ρ rms	trend[c]	ΔP/P av.[d]
Al-Bizreh[57]	6.6	400 - 700	0.1 - 0.2	3 - 11	30	0.50	-0.48	0.5
Connolly[15]	0	403 - 543	6.7 - 10.0	5 - 180	112	0.18	-0.15	6.6
Figuière[30]	0	298 - 324	10.8 - 12.0	10 - 1470	14	0.25	+0.11	10.0
Gehrig[58]	0	298 - 683	3.3 - 12.0	10 - 3000	291	4.35	-0.71	4.2
Glanville[44]	0	311 - 511	7.7 - 11.7	7 - 690	169	0.73	+0.66	21.6
Gornowski[10]	0	513 - 628	0.9 - 5.2	26 - 67	142	2.03	-1.62	1.0
Kurumov[48]	0	283 - 298	11.3 - 11.8	15 - 780	36	0.14	-0.14	14.1
Kuss[41]	13.2	298 - 353	10.6 - 12.6	100 - 2000	60	0.05	+0.01	1.0
Mamedov[59]	0	298 - 673	7.0 - 11.6	100 - 500	18	0.27	-0.15	3.3
Straty[43]	80.2	423 - 723	1.2 - 9.3	33 - 350	439	0.39	-0.03	0.3
Taslimi[60]	0	298 - 353	10.6 - 12.1	100 - 1800	46	0.15	-0.13	3.6
Teichmann[38]	0	330 - 567	7.0 - 11.1	25 - 600	153	0.14	-0.04	2.8

[a]Rel. Wt., see Section 2.4.

[b]NP = number of PρT data.

[c]trend = average of signed relative density deviations.

[d]av. = average of absolute relative pressure deviations.

Table 8a. Comparison of Al-Bizreh/Wormald[57] virial equation $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	400.000	0.1000	0.1001	-0.14	3.093	3.089	0.13
1.000	420.000	0.1000	0.1003	-0.27	3.273	3.265	0.25
1.000	440.000	0.1000	0.1004	-0.39	3.452	3.439	0.37
1.000	460.000	0.1000	0.1005	-0.47	3.629	3.613	0.45
1.000	480.000	0.1000	0.1005	-0.51	3.804	3.786	0.49
1.000	500.000	0.1000	0.1006	-0.55	3.979	3.958	0.53
1.000	520.000	0.1000	0.1006	-0.58	4.153	4.130	0.55
1.000	540.000	0.1000	0.1006	-0.55	4.325	4.302	0.54
1.000	560.000	0.1000	0.1005	-0.54	4.497	4.474	0.52
1.000	580.000	0.1000	0.1005	-0.53	4.669	4.645	0.52
1.000	600.000	0.1000	0.1005	-0.50	4.840	4.816	0.49
1.000	620.000	0.1000	0.1005	-0.48	5.011	4.988	0.47
1.000	640.000	0.1000	0.1004	-0.44	5.181	5.159	0.43
1.000	660.000	0.1000	0.1004	-0.43	5.352	5.330	0.42
1.000	680.000	0.1000	0.1004	-0.38	5.521	5.501	0.37
1.000	700.000	0.1000	0.1004	-0.35	5.691	5.672	0.34
1.000	440.000	0.2000	0.2007	-0.33	6.491	6.472	0.29
1.000	460.000	0.2000	0.2009	-0.45	6.866	6.838	0.40
1.000	480.000	0.2000	0.2011	-0.55	7.236	7.200	0.50
1.000	500.000	0.2000	0.2012	-0.61	7.601	7.559	0.56
1.000	520.000	0.2000	0.2013	-0.65	7.963	7.916	0.60
1.000	540.000	0.2000	0.2013	-0.66	8.322	8.271	0.61
1.000	560.000	0.2000	0.2013	-0.65	8.678	8.625	0.61
1.000	580.000	0.2000	0.2013	-0.63	9.032	8.979	0.59
1.000	600.000	0.2000	0.2012	-0.60	9.384	9.331	0.56
1.000	620.000	0.2000	0.2011	-0.55	9.734	9.683	0.52
1.000	640.000	0.2000	0.2010	-0.51	10.083	10.035	0.48
1.000	660.000	0.2000	0.2009	-0.46	10.431	10.386	0.43
1.000	680.000	0.2000	0.2008	-0.40	10.778	10.737	0.39
1.000	700.000	0.2000	0.2007	-0.34	11.123	11.087	0.32

30 data points, $|\Delta\rho/\rho|$ rms = 0.498%, $\Delta\rho/\rho$ av. = -0.48%, $|\Delta P/P|$ av. = 0.46%, weight = 6.55%

Table 8b. Comparison of Glanville/Sage[44] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	310.928	11.0309	11.0166	0.13	6.895	19.601	-64.82
0.001	310.928	11.0369	11.0244	0.11	13.790	24.954	-44.74
0.001	310.928	11.0428	11.0321	0.10	20.684	30.239	-31.60
0.001	310.928	11.0488	11.0398	0.08	27.579	35.634	-22.61
0.001	310.928	11.0547	11.0475	0.07	34.474	40.960	-15.84
0.001	310.928	11.0607	11.0552	0.05	41.369	46.398	-10.84
0.001	310.928	11.0786	11.0703	0.07	55.158	62.747	-12.09
0.001	310.928	11.0906	11.0853	0.05	68.948	73.815	-6.59
0.001	310.928	11.1146	11.1039	0.10	86.184	96.214	-10.43
0.001	310.928	11.1327	11.1222	0.09	103.421	113.342	-8.75
0.001	310.928	11.1509	11.1404	0.09	120.658	130.769	-7.73
0.001	310.928	11.1691	11.1583	0.10	137.895	148.405	-7.08
0.001	310.928	11.1935	11.1760	0.16	155.132	172.379	-10.01
0.001	310.928	11.2119	11.1935	0.16	172.369	190.712	-9.62
0.001	310.928	11.2303	11.2108	0.17	189.606	209.266	-9.39
0.001	310.928	11.1935	11.2279	-0.31	206.843	172.379	19.99
0.001	310.928	11.2921	11.2616	0.27	241.316	273.230	-11.68
0.001	310.928	11.3296	11.2945	0.31	275.790	313.309	-11.97
0.001	310.928	11.3673	11.3268	0.36	310.264	354.588	-12.50
0.001	310.928	11.3988	11.3584	0.36	344.738	389.852	-11.57
0.001	310.928	11.4562	11.4197	0.32	413.685	455.963	-9.27
0.001	310.928	11.5011	11.4788	0.19	482.633	509.383	-5.25
0.001	310.928	11.5465	11.5357	0.09	551.581	564.960	-2.37
0.001	310.928	11.6053	11.5906	0.13	620.528	639.335	-2.94
0.001	310.928	11.6647	11.6438	0.18	689.476	717.288	-3.88
0.001	344.261	10.5649	10.5441	0.20	6.895	21.700	-68.23
0.001	344.261	10.5704	10.5538	0.16	13.790	25.660	-46.26
0.001	344.261	10.5813	10.5635	0.17	20.684	33.557	-38.36
0.001	344.261	10.5922	10.5731	0.18	27.579	41.519	-33.58
0.001	344.261	10.5977	10.5826	0.14	34.474	45.562	-24.34
0.001	344.261	10.6141	10.5920	0.21	41.369	57.716	-28.32
0.001	344.261	10.6362	10.6107	0.24	55.158	74.330	-25.79
0.001	344.261	10.6583	10.6291	0.27	68.948	91.222	-24.42
0.001	344.261	10.6805	10.6517	0.27	86.184	108.470	-20.55
0.001	344.261	10.7084	10.6740	0.32	103.421	130.552	-20.78
0.001	344.261	10.7364	10.6960	0.38	120.658	153.170	-21.23
0.001	344.261	10.7589	10.7176	0.39	137.895	171.683	-19.68
0.001	344.261	10.7816	10.7388	0.40	155.132	190.668	-18.64
0.001	344.261	10.8100	10.7597	0.47	172.369	214.862	-19.78
0.001	344.261	10.8328	10.7803	0.49	189.606	234.644	-19.19
0.001	344.261	10.8558	10.8007	0.51	206.843	254.927	-18.86
0.001	344.261	10.9019	10.8404	0.57	241.316	296.588	-18.64
0.001	344.261	10.9426	10.8791	0.58	275.790	334.505	-17.55
0.001	344.261	10.9837	10.9167	0.61	310.264	373.896	-17.02
0.001	344.261	11.0250	10.9534	0.65	344.738	414.617	-16.85
0.001	344.261	11.0966	11.0241	0.66	413.685	487.980	-15.22
0.001	344.261	11.1630	11.0915	0.64	482.633	559.237	-13.70
0.001	344.261	11.2303	11.1560	0.67	551.581	634.725	-13.10
0.001	344.261	11.3046	11.2179	0.77	620.528	722.004	-14.05
0.001	344.261	11.3673	11.2773	0.80	689.476	798.970	-13.70
0.001	377.594	10.1217	10.0645	0.57	6.895	38.898	-82.27
0.001	377.594	10.1317	10.0771	0.54	13.790	44.656	-69.12
0.001	377.594	10.1457	10.0895	0.57	20.684	53.387	-61.26
0.001	377.594	10.1618	10.1018	0.59	27.579	62.289	-55.72
0.001	377.594	10.1769	10.1140	0.62	34.474	71.306	-51.65
0.001	377.594	10.1870	10.1260	0.60	41.369	77.402	-46.55
0.001	377.594	10.2124	10.1497	0.62	55.158	92.962	-40.67
0.001	377.594	10.2379	10.1730	0.64	68.948	108.918	-36.70
0.001	377.594	10.2687	10.2014	0.66	86.184	128.644	-33.01
0.001	377.594	10.2944	10.2292	0.64	103.421	145.488	-28.91
0.001	377.594	10.3203	10.2563	0.62	120.658	162.821	-25.90
0.001	377.594	10.3516	10.2829	0.67	137.895	184.255	-25.16
0.001	377.594	10.3778	10.3089	0.67	155.132	202.611	-23.43
0.001	377.594	10.4094	10.3343	0.73	172.369	225.261	-23.48
0.001	377.594	10.4359	10.3593	0.74	189.606	244.690	-22.51
0.001	377.594	10.4572	10.3838	0.71	206.843	260.599	-20.63
0.001	377.594	10.5054	10.4313	0.71	241.316	297.573	-18.91
0.001	377.594	10.5595	10.4772	0.79	275.790	340.712	-19.05
0.001	377.594	10.6141	10.5215	0.88	310.264	386.051	-19.63
0.001	377.594	10.6638	10.5644	0.94	344.738	428.931	-19.63

Table 8b. Comparison of Glanville/Sage[44] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	377.594	10.7533	10.6463	1.00	413.685	510.135	-18.91
0.001	377.594	10.8214	10.7236	0.91	482.633	575.461	-16.13
0.001	377.594	10.8961	10.7969	0.92	551.581	650.755	-15.24
0.001	377.594	10.9719	10.8666	0.97	620.528	731.171	-15.13
0.001	377.594	11.0488	10.9331	1.06	689.476	817.022	-15.61
0.001	410.928	9.6230	9.5556	0.71	6.895	34.586	-80.06
0.001	410.928	9.6411	9.5728	0.71	13.790	42.341	-67.43
0.001	410.928	9.6592	9.5897	0.72	20.684	50.233	-58.82
0.001	410.928	9.6820	9.6064	0.79	27.579	60.372	-54.32
0.001	410.928	9.7003	9.6227	0.81	34.474	68.670	-49.80
0.001	410.928	9.7187	9.6388	0.83	41.369	77.159	-46.38
0.001	410.928	9.7557	9.6703	0.88	55.158	94.678	-41.74
0.001	410.928	9.7883	9.7009	0.90	68.948	110.616	-37.67
0.001	410.928	9.8258	9.7379	0.90	86.184	129.544	-33.47
0.001	410.928	9.8589	9.7737	0.87	103.421	146.789	-29.54
0.001	410.928	9.8922	9.8084	0.85	120.658	164.654	-26.72
0.001	410.928	9.9305	9.8420	0.90	137.895	185.856	-25.81
0.001	410.928	9.9643	9.8746	0.91	155.132	205.157	-24.38
0.001	410.928	9.9934	9.9063	0.88	172.369	222.226	-22.44
0.001	410.928	10.0276	9.9371	0.91	189.606	242.828	-21.92
0.001	410.928	10.0571	9.9672	0.90	206.843	261.077	-20.77
0.001	410.928	10.1167	10.0251	0.91	241.316	299.326	-19.38
0.001	410.928	10.1769	10.0804	0.96	275.790	339.879	-18.86
0.001	410.928	10.2379	10.1332	1.03	310.264	382.995	-18.99
0.001	410.928	10.2944	10.1839	1.08	344.738	424.801	-18.85
0.001	410.928	10.3883	10.2796	1.06	413.685	498.393	-17.00
0.001	410.928	10.4785	10.3687	1.06	482.633	574.103	-15.93
0.001	410.928	10.5704	10.4523	1.13	551.581	656.510	-15.98
0.001	410.928	10.6527	10.5310	1.16	620.528	735.004	-15.57
0.001	410.928	10.7308	10.6055	1.18	689.476	813.747	-15.27
0.001	444.261	9.0817	9.0104	0.79	13.790	33.995	-59.44
0.001	444.261	9.1059	9.0354	0.78	20.684	41.226	-49.83
0.001	444.261	9.1302	9.0597	0.78	27.579	48.681	-43.35
0.001	444.261	9.1506	9.0833	0.74	34.474	55.090	-37.42
0.001	444.261	9.1752	9.1064	0.76	41.369	63.005	-34.34
0.001	444.261	9.2206	9.1508	0.76	55.158	78.156	-29.43
0.001	444.261	9.2622	9.1933	0.75	68.948	92.670	-25.60
0.001	444.261	9.3211	9.2438	0.84	86.184	114.283	-24.59
0.001	444.261	9.3723	9.2919	0.86	103.421	134.112	-22.88
0.001	444.261	9.4240	9.3378	0.92	120.658	155.148	-22.23
0.001	444.261	9.4718	9.3818	0.96	137.895	175.529	-21.44
0.001	444.261	9.5158	9.4240	0.97	155.132	195.103	-20.49
0.001	444.261	9.5601	9.4645	1.01	172.369	215.618	-20.06
0.001	444.261	9.6004	9.5036	1.02	189.606	235.002	-19.32
0.001	444.261	9.6365	9.5414	1.00	206.843	252.962	-18.23
0.001	444.261	9.7049	9.6132	0.95	241.316	288.578	-16.38
0.001	444.261	9.7697	9.6808	0.92	275.790	324.295	-14.96
0.001	444.261	9.8353	9.7447	0.93	310.264	362.482	-14.41
0.001	444.261	9.9017	9.8053	0.98	344.738	403.286	-14.52
0.001	444.261	10.0129	9.9181	0.96	413.685	476.678	-13.21
0.001	444.261	10.1267	10.0215	1.05	482.633	558.672	-13.61
0.001	444.261	10.2277	10.1172	1.09	551.581	637.600	-13.49
0.001	444.261	10.3152	10.2065	1.07	620.528	710.888	-12.71
0.001	444.261	10.3936	10.2902	1.00	689.476	780.591	-11.67
0.001	477.594	8.4320	8.3752	0.68	20.684	30.492	-32.17
0.001	477.594	8.4668	8.4156	0.61	27.579	36.856	-25.17
0.001	477.594	8.5019	8.4539	0.57	34.474	43.557	-20.85
0.001	477.594	8.5373	8.4906	0.55	41.369	50.608	-18.26
0.001	477.594	8.6090	8.5594	0.58	55.158	65.815	-16.19
0.001	477.594	8.6708	8.6231	0.55	68.948	79.953	-13.76
0.001	477.594	8.7522	8.6967	0.64	86.184	100.099	-13.90
0.001	477.594	8.8200	8.7650	0.63	103.421	118.261	-12.55
0.001	477.594	8.8888	8.8286	0.68	120.658	138.035	-12.59
0.001	477.594	8.9548	8.8883	0.75	137.895	158.332	-12.91
0.001	477.594	9.0139	8.9447	0.77	155.132	177.656	-12.68
0.001	477.594	9.0737	8.9981	0.84	172.369	198.357	-13.10
0.001	477.594	9.1262	9.0488	0.85	189.606	217.516	-12.83
0.001	477.594	9.1793	9.0973	0.90	206.843	237.865	-13.04
0.001	477.594	9.2748	9.1881	0.94	241.316	277.019	-12.89
0.001	477.594	9.3594	9.2719	0.94	275.790	314.580	-12.33

Table 8b. Comparison of Glanville/Sage[44] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	477.594	9.4413	9.3500	0.98	310.264	353.654	-12.27
0.001	477.594	9.5158	9.4231	0.98	344.738	391.625	-11.97
0.001	477.594	9.6501	9.5571	0.97	413.685	466.249	-11.27
0.001	477.594	9.7743	9.6777	1.00	482.633	542.783	-11.08
0.001	477.594	9.8779	9.7878	0.92	551.581	612.527	-9.95
0.001	477.594	9.9788	9.8893	0.91	620.528	685.920	-9.53
0.001	477.594	10.0769	9.9835	0.94	689.476	762.723	-9.60
0.001	510.928	7.6147	7.5569	0.77	27.579	32.383	-14.83
0.001	510.928	7.6948	7.6384	0.74	34.474	39.768	-13.31
0.001	510.928	7.7676	7.7110	0.73	41.369	47.254	-12.45
0.001	510.928	7.8932	7.8374	0.71	55.158	62.014	-11.06
0.001	510.928	8.0041	7.9459	0.73	68.948	77.136	-10.61
0.001	510.928	8.1182	8.0640	0.67	86.184	94.913	-9.20
0.001	510.928	8.2223	8.1680	0.67	103.421	113.254	-8.68
0.001	510.928	8.3157	8.2612	0.66	120.658	131.562	-8.29
0.001	510.928	8.3974	8.3460	0.62	137.895	149.108	-7.52
0.001	510.928	8.4738	8.4239	0.59	155.132	166.885	-7.04
0.001	510.928	8.5444	8.4962	0.57	172.369	184.551	-6.60
0.001	510.928	8.6126	8.5637	0.57	189.606	202.802	-6.51
0.001	510.928	8.6818	8.6271	0.63	206.843	222.567	-7.06
0.001	510.928	8.8011	8.7436	0.66	241.316	259.761	-7.10
0.001	510.928	8.9159	8.8488	0.76	275.790	299.535	-7.93
0.001	510.928	9.0178	8.9450	0.81	310.264	338.354	-8.30
0.001	510.928	9.1140	9.0337	0.89	344.738	378.242	-8.86
0.001	510.928	9.2790	9.1934	0.93	413.685	454.554	-8.99
0.001	510.928	9.4196	9.3345	0.91	482.633	528.121	-8.61
0.001	510.928	9.5512	9.4613	0.95	551.581	604.735	-8.79
0.001	510.928	9.6683	9.5767	0.96	620.528	679.697	-8.71
0.001	510.928	9.7743	9.6828	0.94	689.476	753.442	-8.49

169 data points, $|\Delta\rho/\rho|$ rms = 0.731%, $\Delta\rho/\rho$ av. = 0.66%, $|\Delta P/P|$ av. = 21.64%, weight = 0.04%

Table 8c. Comparison of Connolly/Kandalic[15] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	403.150	9.6685	9.6740	-0.06	5.000	2.647	88.86
0.001	403.150	9.6800	9.6856	-0.06	10.000	7.578	31.96
0.001	403.150	9.7153	9.7196	-0.04	25.000	23.063	8.40
0.001	403.150	9.7728	9.7740	-0.01	50.000	49.433	1.15
0.001	403.150	9.8282	9.8257	0.03	75.000	76.221	-1.60
0.001	403.150	9.8812	9.8751	0.06	100.000	103.151	-3.05
0.001	403.150	9.9318	9.9224	0.09	125.000	130.083	-3.91
0.001	403.150	9.9799	9.9678	0.12	150.000	156.818	-4.35
0.001	403.150	10.0342	10.0200	0.14	180.000	188.362	-4.44
0.001	413.150	9.5176	9.5279	-0.11	10.000	5.988	67.00
0.001	413.150	9.5577	9.5656	-0.08	25.000	21.823	14.56
0.001	413.150	9.6216	9.6253	-0.04	50.000	48.399	3.31
0.001	413.150	9.6823	9.6818	0.00	75.000	75.217	-0.29
0.001	413.150	9.7399	9.7355	0.05	100.000	102.127	-2.08
0.001	413.150	9.7941	9.7866	0.08	125.000	128.787	-2.94
0.001	413.150	9.8449	9.8354	0.10	150.000	154.986	-3.22
0.001	413.150	9.9011	9.8914	0.10	180.000	185.374	-2.90
0.000	423.150	9.3483	9.3647	-0.18	10.000	4.302	132.47
0.001	423.150	9.3925	9.4067	-0.15	25.000	19.860	25.88
0.001	423.150	9.4615	9.4728	-0.12	50.000	45.617	9.61
0.001	423.150	9.5267	9.5348	-0.08	75.000	71.654	4.67
0.001	423.150	9.5882	9.5933	-0.05	100.000	97.779	2.27
0.001	423.150	9.6460	9.6487	-0.03	125.000	123.763	1.00
0.001	423.150	9.6998	9.7014	-0.02	150.000	149.234	0.51
0.001	423.150	9.7591	9.7615	-0.02	180.000	178.788	0.68
0.000	433.150	9.1768	9.1948	-0.20	10.000	4.458	124.29
0.001	433.150	9.2259	9.2420	-0.17	25.000	19.801	26.26
0.001	433.150	9.3016	9.3156	-0.15	50.000	45.100	10.86
0.001	433.150	9.3731	9.3840	-0.12	75.000	70.895	5.79
0.001	433.150	9.4406	9.4481	-0.08	100.000	97.006	3.09
0.001	433.150	9.5040	9.5084	-0.05	125.000	123.145	1.51
0.001	433.150	9.5632	9.5654	-0.02	150.000	149.015	0.66
0.001	433.150	9.6284	9.6301	-0.02	180.000	179.198	0.45
0.001	443.150	9.0502	9.0702	-0.22	25.000	19.271	29.73
0.001	443.150	9.1351	9.1529	-0.19	50.000	44.427	12.54
0.001	443.150	9.2144	9.2289	-0.16	75.000	70.089	7.01
0.001	443.150	9.2888	9.2993	-0.11	100.000	96.151	4.00
0.001	443.150	9.3582	9.3652	-0.07	125.000	122.271	2.23
0.001	443.150	9.4225	9.4271	-0.05	150.000	148.091	1.29
0.001	443.150	9.4925	9.4969	-0.05	180.000	178.041	1.10
0.001	453.150	8.8686	8.8900	-0.24	25.000	19.642	27.28
0.001	453.150	8.9631	8.9837	-0.23	50.000	44.282	12.91
0.001	453.150	9.0504	9.0686	-0.20	75.000	69.458	7.98
0.001	453.150	9.1321	9.1465	-0.16	100.000	95.226	5.01
0.001	453.150	9.2083	9.2187	-0.11	125.000	121.277	3.07
0.001	453.150	9.2788	9.2862	-0.08	150.000	147.192	1.91
0.001	453.150	9.3557	9.3617	-0.06	180.000	177.534	1.39
0.001	463.150	8.6806	8.6995	-0.22	25.000	20.919	19.51
0.001	463.150	8.7868	8.8067	-0.23	50.000	45.125	10.80
0.001	463.150	8.8837	8.9023	-0.21	75.000	69.927	7.25
0.001	463.150	8.9737	8.9890	-0.17	100.000	95.423	4.80
0.001	463.150	9.0570	9.0685	-0.13	125.000	121.249	3.09
0.001	463.150	9.1336	9.1422	-0.09	150.000	146.986	2.05
0.001	463.150	9.2160	9.2242	-0.09	180.000	176.903	1.75
0.001	473.150	8.4763	8.4961	-0.23	25.000	21.369	16.99
0.001	473.150	8.6012	8.6205	-0.22	50.000	45.876	8.99
0.001	473.150	8.7112	8.7291	-0.21	75.000	70.664	6.14
0.001	473.150	8.8114	8.8261	-0.17	100.000	96.039	4.12
0.001	473.150	8.9024	8.9141	-0.13	125.000	121.542	2.85
0.001	473.150	8.9840	8.9949	-0.12	150.000	146.515	2.38
0.001	473.150	9.0690	9.0840	-0.17	180.000	174.760	3.00
0.001	483.150	8.2592	8.2764	-0.21	25.000	22.371	11.75
0.001	483.150	8.4049	8.4232	-0.22	50.000	46.633	7.22
0.001	483.150	8.5280	8.5478	-0.23	75.000	70.776	5.97
0.001	483.150	8.6390	8.6571	-0.21	100.000	95.644	4.55
0.001	483.150	8.7393	8.7549	-0.18	125.000	120.828	3.45
0.001	483.150	8.8288	8.8438	-0.17	150.000	145.620	3.01
0.001	483.150	8.9217	8.9410	-0.22	180.000	173.809	3.56
0.001	493.150	8.0147	8.0353	-0.26	25.000	22.464	11.29
0.001	493.150	8.1904	8.2123	-0.27	50.000	46.587	7.33

Table 8c. Comparison of Connolly/Kandalic[15] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	493.150	8.3325	8.3571	-0.29	75.000	70.438	6.48
0.001	493.150	8.4590	8.4812	-0.26	100.000	95.268	4.97
0.001	493.150	8.5726	8.5905	-0.21	125.000	120.705	3.56
0.001	493.150	8.6736	8.6886	-0.17	150.000	146.010	2.73
0.001	493.150	8.7778	8.7949	-0.19	180.000	174.960	2.88
0.001	503.150	7.7442	7.7644	-0.26	25.000	23.082	8.31
0.001	503.150	7.9655	7.9845	-0.24	50.000	47.534	5.19
0.001	503.150	8.1329	8.1553	-0.27	75.000	71.415	5.02
0.001	503.150	8.2772	8.2974	-0.24	100.000	96.195	3.96
0.001	503.150	8.4036	8.4202	-0.20	125.000	121.427	2.94
0.001	503.150	8.5129	8.5289	-0.19	150.000	146.136	2.64
0.001	503.150	8.6211	8.6454	-0.28	180.000	173.450	3.78
0.001	510.930	7.7792	7.7925	-0.17	50.000	48.523	3.04
0.001	510.930	7.9699	7.9893	-0.24	75.000	72.260	3.79
0.001	510.930	8.1303	8.1483	-0.22	100.000	96.945	3.15
0.001	510.930	8.2698	8.2832	-0.16	125.000	122.346	2.17
0.001	510.930	8.3904	8.4013	-0.13	150.000	147.554	1.66
0.001	510.930	8.5105	8.5266	-0.19	180.000	175.924	2.32
0.001	513.150	7.7268	7.7349	-0.10	50.000	49.142	1.75
0.001	513.150	7.9257	7.9402	-0.18	75.000	73.011	2.72
0.001	513.150	8.0917	8.1046	-0.16	100.000	97.861	2.19
0.001	513.150	8.2353	8.2434	-0.10	125.000	123.437	1.27
0.001	513.150	8.3592	8.3644	-0.06	150.000	148.868	0.76
0.001	513.150	8.4821	8.4923	-0.12	180.000	177.458	1.43
0.001	523.150	7.4434	7.4559	-0.17	50.000	48.974	2.10
0.001	523.150	7.6895	7.7091	-0.25	75.000	72.761	3.08
0.001	523.150	7.8821	7.9015	-0.25	100.000	97.216	2.86
0.001	523.150	8.0431	8.0594	-0.20	125.000	122.215	2.28
0.001	523.150	8.1788	8.1945	-0.19	150.000	146.908	2.10
0.001	523.150	8.3108	8.3355	-0.30	180.000	174.445	3.18
0.001	533.150	7.1186	7.1342	-0.22	50.000	49.059	1.92
0.001	533.150	7.4396	7.4580	-0.25	75.000	73.270	2.36
0.001	533.150	7.6657	7.6865	-0.27	100.000	97.430	2.64
0.001	533.150	7.8466	7.8675	-0.27	125.000	121.856	2.58
0.001	533.150	7.9989	8.0190	-0.25	150.000	146.453	2.42
0.001	533.150	8.1535	8.1746	-0.26	180.000	175.660	2.47
0.001	543.150	6.7145	6.7428	-0.42	50.000	48.885	2.28
0.001	543.150	7.1717	7.1815	-0.14	75.000	74.262	0.99
0.001	543.150	7.4455	7.4578	-0.16	100.000	98.708	1.31
0.001	543.150	7.6448	7.6668	-0.29	125.000	122.093	2.38
0.001	543.150	7.8111	7.8374	-0.34	150.000	145.850	2.85
0.001	543.150	7.9943	8.0095	-0.19	180.000	177.135	1.62

112 data points, $|\Delta\rho/\rho|$ rms = 0.180%, $\Delta\rho/\rho$ av. = -0.15%, $|\Delta P/P|$ av. = 6.61%, weight = 0.02%

Table 8d. Comparison of Kurumov et al.[48] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	283.150	11.5431	11.5641	-0.18	166.430	142.777	16.57
0.001	283.150	11.5315	11.5413	-0.09	140.790	129.821	8.45
0.001	283.150	11.4998	11.5205	-0.18	117.600	94.866	23.96
0.001	283.150	11.4874	11.5080	-0.18	103.880	81.371	27.66
0.001	283.150	11.4672	11.4882	-0.18	82.200	59.598	37.92
0.001	283.150	11.4397	11.4610	-0.19	52.973	30.369	74.43
0.000	283.150	11.4227	11.4443	-0.19	35.180	12.535	180.66
0.000	283.150	11.4025	11.4247	-0.19	14.584	-8.429	-273.03
0.001	288.150	11.5913	11.6077	-0.14	295.500	276.206	6.99
0.001	288.150	11.5793	11.5950	-0.14	280.600	262.170	7.03
0.001	288.150	11.5547	11.5701	-0.13	251.440	233.716	7.58
0.001	288.150	11.5179	11.5332	-0.13	209.170	191.939	8.98
0.001	288.150	11.4570	11.4722	-0.13	141.370	124.825	13.25
0.001	288.150	11.4265	11.4418	-0.13	108.420	92.133	17.68
0.001	288.150	11.3763	11.3929	-0.15	56.837	39.616	43.47
0.000	288.150	11.3503	11.3681	-0.16	31.152	13.030	139.09
0.000	288.150	11.3346	11.3525	-0.16	15.219	-2.826	-638.48
0.001	293.150	11.6814	11.7016	-0.17	490.120	464.406	5.54
0.001	293.150	11.6437	11.6617	-0.15	439.640	417.316	5.35
0.001	293.150	11.6280	11.6448	-0.14	418.640	398.026	5.18
0.001	293.150	11.6158	11.6318	-0.14	402.720	383.165	5.10
0.001	293.150	11.5836	11.5986	-0.13	362.410	344.474	5.21
0.001	293.150	11.5477	11.5617	-0.12	318.580	302.234	5.41
0.001	293.150	11.5040	11.5170	-0.11	266.880	252.066	5.88
0.001	293.150	11.4653	11.4780	-0.11	222.830	208.755	6.74
0.001	293.150	11.3771	11.3900	-0.11	127.350	113.830	11.88
0.001	293.150	11.3072	11.3210	-0.12	56.052	42.173	32.91
0.001	298.150	11.8348	11.8537	-0.16	776.970	750.013	3.59
0.001	298.150	11.8243	11.8431	-0.16	761.730	735.208	3.61
0.001	298.150	11.7897	11.8080	-0.15	712.400	687.088	3.68
0.001	298.150	11.7553	11.7727	-0.15	663.770	640.246	3.67
0.001	298.150	11.7248	11.7413	-0.14	621.470	599.534	3.66
0.001	298.150	11.5929	11.6065	-0.12	448.630	432.022	3.84
0.001	298.150	11.3918	11.4024	-0.09	213.060	201.669	5.65
0.001	298.150	11.2998	11.3116	-0.10	117.580	105.571	11.38
0.001	298.150	11.2370	11.2498	-0.11	55.605	43.078	29.08

36 data points, $|\Delta\rho/\rho|$ rms = 0.142%, $\Delta\rho/\rho$ av. = -0.14%, $|\Delta P/P|$ av. = 14.10%, weight = 0.01%

Table 8e. Comparison of Figuiere et al.[30] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	298.150	11.3510	11.3310	0.18	137.500	158.368	-13.18
0.001	298.150	11.8410	11.7610	0.68	648.000	758.799	-14.60
0.001	313.150	11.0960	11.1275	-0.28	137.000	107.163	27.84
0.001	313.150	11.5580	11.5865	-0.25	648.000	611.695	5.94
0.001	313.150	11.7370	11.7317	0.05	843.000	850.479	-0.88
0.001	313.150	11.8340	11.8184	0.13	968.000	991.278	-2.35
0.001	324.150	10.8420	10.8327	0.09	10.000	17.605	-43.20
0.001	324.150	11.0070	10.9810	0.24	137.000	160.650	-14.72
0.001	324.150	11.3510	11.3289	0.20	490.000	515.288	-4.91
0.001	324.150	11.4880	11.4622	0.23	648.000	680.201	-4.73
0.001	324.150	11.6410	11.6125	0.25	843.000	882.013	-4.42
0.001	324.150	11.7100	11.7020	0.07	968.000	979.469	-1.17
0.001	324.150	11.7160	11.7104	0.05	980.000	988.139	-0.82
0.001	324.150	12.0150	12.0194	-0.04	1470.000	1462.363	0.52

14 data points, $|\Delta\rho/\rho|$ rms = 0.250%, $\Delta\rho/\rho$ av. = 0.11%, $|\Delta P/P|$ av. = 9.95%, weight = 0.00%

Table 8f. Comparison of Gornowski et al.[10] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	513.150	0.9144	0.9145	-0.01	25.878	25.876	0.01
0.001	513.150	0.8829	0.9102	-3.00	25.811	25.374	1.72
0.001	523.150	1.0668	1.0806	-1.28	29.531	29.346	0.63
0.001	523.150	0.9848	1.0012	-1.63	28.398	28.145	0.90
0.001	523.150	0.9144	0.9324	-1.93	27.291	26.983	1.14
0.001	533.150	1.2802	1.3010	-1.60	33.731	33.508	0.67
0.001	533.150	1.1638	1.1894	-2.15	32.424	32.087	1.05
0.001	533.150	1.0668	1.0919	-2.30	31.064	30.681	1.25
0.001	533.150	0.9848	1.0059	-2.09	29.691	29.330	1.23
0.001	533.150	0.9144	0.9365	-2.36	28.464	28.049	1.48
0.001	543.150	1.4224	1.4596	-2.55	37.224	36.849	1.02
0.001	543.150	1.2802	1.3103	-2.30	35.570	35.187	1.09
0.001	543.150	1.1638	1.1924	-2.40	33.971	33.542	1.28
0.001	543.150	1.0668	1.0930	-2.40	32.411	31.966	1.39
0.001	543.150	0.9848	1.0095	-2.45	30.944	30.481	1.52
0.001	543.150	0.9144	0.9394	-2.67	29.598	29.091	1.74
0.001	553.150	1.8288	1.8670	-2.05	42.716	42.479	0.56
0.001	553.150	1.6002	1.6290	-1.77	40.930	40.661	0.66
0.001	553.150	1.4224	1.4551	-2.25	39.117	38.722	1.02
0.001	553.150	1.2802	1.3077	-2.10	37.197	36.798	1.08
0.001	553.150	1.1638	1.1863	-1.89	35.330	34.954	1.07
0.001	553.150	1.0668	1.0863	-1.79	33.584	33.221	1.09
0.001	553.150	0.9848	1.0046	-1.97	32.011	31.610	1.27
0.001	553.150	0.9144	0.9397	-2.69	30.664	30.116	1.82
0.001	558.150	2.1336	2.1681	-1.59	45.690	45.548	0.31
0.001	558.150	1.8288	1.8584	-1.59	43.996	43.780	0.49
0.001	558.150	1.6002	1.6255	-1.55	41.997	41.737	0.62
0.001	558.150	1.4224	1.4482	-1.78	39.970	39.635	0.85
0.001	558.150	1.2802	1.3050	-1.90	37.970	37.588	1.02
0.001	558.150	1.1638	1.1852	-1.80	36.024	35.649	1.05
0.001	558.150	1.0668	1.0859	-1.76	34.211	33.840	1.10
0.001	558.150	0.9848	1.0052	-2.03	32.597	32.168	1.33
0.001	558.150	0.9144	0.9370	-2.42	31.131	30.623	1.66
0.001	561.150	2.5604	2.5848	-0.95	47.943	47.897	0.10
0.001	561.150	2.1336	2.1574	-1.10	46.610	46.496	0.25
0.001	561.150	1.8288	1.8522	-1.26	44.730	44.545	0.42
0.001	561.150	1.6002	1.6269	-1.64	42.663	42.373	0.68
0.001	561.150	1.4224	1.4298	-0.51	40.277	40.176	0.25
0.001	561.150	1.2802	1.3040	-1.83	38.437	38.058	1.00
0.001	561.150	1.1638	1.1853	-1.81	36.450	36.063	1.07
0.001	561.150	1.0668	1.0843	-1.61	34.557	34.210	1.02
0.001	561.150	0.9848	1.0030	-1.81	32.891	32.501	1.20
0.001	561.150	0.9144	0.9356	-2.27	31.411	30.926	1.57
0.001	562.650	5.1207	5.1589	-0.74	50.423	50.299	0.25
0.000	562.650	4.2673	3.1520	35.39	49.169	49.356	-0.38
0.001	562.650	3.2005	2.9677	7.84	49.063	49.188	-0.25
0.001	562.650	2.5604	2.5651	-0.18	48.503	48.492	0.02
0.001	562.650	2.1336	2.1531	-0.90	47.063	46.964	0.21
0.001	562.650	1.8288	1.8490	-1.09	45.090	44.924	0.37
0.001	562.650	1.6002	1.6242	-1.48	42.956	42.689	0.63
0.001	562.650	1.4224	1.4498	-1.89	40.823	40.446	0.93
0.001	562.650	1.2802	1.3032	-1.76	38.663	38.292	0.97
0.001	562.650	1.1638	1.1832	-1.64	36.624	36.269	0.98
0.001	562.650	1.0668	1.0849	-1.67	34.757	34.394	1.06
0.001	562.650	0.9848	1.0019	-1.70	33.037	32.667	1.13
0.001	562.650	0.9144	0.9341	-2.11	31.531	31.077	1.46
0.001	563.150	5.1207	5.1592	-0.75	50.876	50.743	0.26
0.000	563.150	4.2673	3.3257	28.31	49.489	49.690	-0.40
0.001	563.150	3.2005	3.0069	6.44	49.329	49.442	-0.23
0.001	563.150	2.5604	2.5493	0.44	48.663	48.689	-0.05
0.001	563.150	2.1336	2.1536	-0.93	47.223	47.119	0.22
0.001	563.150	1.8288	1.8496	-1.12	45.223	45.050	0.38
0.001	563.150	1.6002	1.6266	-1.62	43.090	42.794	0.69
0.001	563.150	1.4224	1.4489	-1.83	40.903	40.536	0.91
0.001	563.150	1.2802	1.3032	-1.76	38.743	38.370	0.97
0.001	563.150	1.1638	1.1838	-1.69	36.704	36.338	1.01

Table 8f. Comparison of Gornowski et al.[10] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	563.150	1.0668	1.0838	-1.56	34.797	34.455	0.99
0.001	563.150	0.9848	1.0030	-1.81	33.117	32.722	1.21
0.001	563.150	0.9144	0.9347	-2.17	31.597	31.127	1.51
0.001	573.150	5.1207	5.1790	-1.13	60.342	59.922	0.70
0.001	573.150	4.2673	4.3082	-0.95	56.635	56.538	0.17
0.001	573.150	3.2005	3.2914	-2.76	54.582	54.395	0.34
0.001	573.150	2.5604	2.6325	-2.74	52.809	52.522	0.55
0.001	573.150	2.1336	2.1613	-1.28	50.356	50.161	0.39
0.001	573.150	1.8288	1.8482	-1.05	47.729	47.533	0.41
0.001	573.150	1.6002	1.6232	-1.42	45.170	44.871	0.67
0.001	573.150	1.4224	1.4459	-1.63	42.676	42.311	0.86
0.001	573.150	1.2802	1.3013	-1.62	40.290	39.914	0.94
0.001	573.150	1.1638	1.1814	-1.49	38.050	37.701	0.93
0.001	573.150	1.0668	1.0836	-1.55	36.037	35.672	1.02
0.001	573.150	0.9848	1.0022	-1.73	34.224	33.821	1.19
0.001	573.150	0.9144	0.9335	-2.05	32.597	32.128	1.46
0.001	583.150	4.2673	4.2908	-0.55	63.661	63.550	0.17
0.001	583.150	3.2005	3.3419	-4.23	59.808	59.264	0.92
0.001	583.150	2.5604	2.6269	2.53	56.635	56.251	0.68
0.001	583.150	2.1336	2.1702	-1.69	53.449	53.128	0.60
0.001	583.150	1.8288	1.8564	-1.49	50.289	49.962	0.65
0.001	583.150	1.6002	1.6289	-1.76	47.329	46.910	0.89
0.001	583.150	1.4224	1.4468	-1.69	44.476	44.058	0.95
0.001	583.150	1.2802	1.3001	-1.53	41.823	41.437	0.93
0.001	583.150	1.1638	1.1802	-1.39	39.397	39.047	0.90
0.001	583.150	1.0668	1.0807	-1.28	37.197	36.877	0.87
0.001	583.150	0.9848	0.9992	-1.44	35.264	34.909	1.02
0.001	583.150	0.9144	0.9328	-1.98	33.597	33.119	1.44
0.001	593.150	3.2005	3.3086	-3.27	64.728	64.105	0.97
0.001	593.150	2.5604	2.6405	-3.04	60.528	59.925	1.01
0.001	593.150	2.1336	2.1822	-2.23	56.555	56.046	0.91
0.001	593.150	1.8288	1.8635	-1.86	52.822	52.354	0.89
0.001	593.150	1.6002	1.6253	-1.54	49.329	48.921	0.83
0.001	593.150	1.4224	1.4437	-1.48	46.183	45.783	0.87
0.001	593.150	1.2802	1.2987	-1.43	43.330	42.943	0.90
0.001	593.150	1.1638	1.1809	-1.45	40.770	40.380	0.97
0.001	593.150	1.0668	1.0818	-1.38	38.437	38.070	0.96
0.001	593.150	0.9848	0.9990	-1.42	36.357	35.989	1.02
0.001	593.150	0.9144	0.9291	-1.58	34.504	34.104	1.17
0.001	603.150	2.5604	2.6150	-2.09	64.075	63.563	0.81
0.001	603.150	2.1336	2.1882	-2.49	59.595	58.930	1.13
0.001	603.150	1.8288	1.8727	-2.35	55.382	54.718	1.21
0.001	603.150	1.6002	1.6274	-1.67	51.396	50.909	0.96
0.001	603.150	1.4224	1.4427	-1.41	47.903	47.491	0.87
0.001	603.150	1.2802	1.2999	-1.52	44.876	44.434	0.99
0.001	603.150	1.1638	1.1815	-1.50	42.130	41.701	1.03
0.001	603.150	1.0668	1.0821	-1.41	39.650	39.254	1.01
0.001	603.150	0.9848	0.9981	-1.33	37.424	37.060	0.98
0.001	603.150	0.9144	0.9282	-1.49	35.477	35.081	1.13
0.001	613.150	2.1336	2.2064	-3.30	62.795	61.787	1.63
0.001	613.150	1.8288	1.8687	-2.13	57.729	57.060	1.17
0.001	613.150	1.6002	1.6281	-1.71	53.422	52.880	1.03
0.001	613.150	1.4224	1.4455	-1.60	49.689	49.184	1.03
0.001	613.150	1.2802	1.3021	-1.68	46.436	45.914	1.14
0.001	613.150	1.1638	1.1824	-1.57	43.490	43.013	1.11
0.001	613.150	1.0668	1.0826	-1.46	40.863	40.431	1.07
0.001	613.150	0.9848	0.9989	-1.41	38.530	38.125	1.06
0.001	613.150	0.9144	0.9285	-1.52	36.477	36.054	1.17
0.001	623.150	2.1336	2.2011	-3.07	65.675	64.623	1.63
0.001	623.150	1.8288	1.8678	-2.09	60.102	59.382	1.21
0.001	623.150	1.6002	1.6300	-1.83	55.462	54.834	1.14
0.001	623.150	1.4224	1.4492	-1.85	51.489	50.865	1.23
0.001	623.150	1.2802	1.3054	-1.93	48.023	47.384	1.35
0.001	623.150	1.1638	1.1835	-1.66	44.850	44.316	1.20
0.001	623.150	1.0668	1.0839	-1.58	42.090	41.600	1.18
0.001	623.150	0.9848	1.0003	-1.55	39.650	39.184	1.19

Table 8f. Comparison of Gornowski et al.[10] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	623.150	0.9144	0.9286	-1.53	37.464	37.021	1.20
0.001	628.150	2.1336	2.1927	-2.69	67.008	66.034	1.48
0.001	628.150	1.8288	1.8629	-1.83	61.195	60.537	1.09
0.001	628.150	1.6002	1.6296	-1.81	56.449	55.807	1.15
0.001	628.150	1.4224	1.4485	-1.80	52.329	51.701	1.22
0.001	628.150	1.2802	1.3043	-1.85	48.743	48.116	1.30
0.001	628.150	1.1638	1.1836	-1.67	45.516	44.965	1.23
0.001	628.150	1.0668	1.0841	-1.60	42.690	42.182	1.20
0.001	628.150	0.9848	1.0002	-1.54	40.183	39.712	1.19
0.001	628.150	0.9144	0.9282	-1.49	37.944	37.503	1.18

142 data points, $|\Delta\rho/\rho|$ rms = 2.030%, $\Delta\rho/\rho$ av. = -1.62%, $|\Delta P/P|$ av. = 0.95%, weight = 0.03%

Table 8g. Comparison of Mamedov et al.[59] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	298.150	11.2877	11.3006	-0.11	106.350	93.339	13.94
0.001	298.150	11.4723	11.4852	-0.11	305.090	290.421	5.05
0.001	298.150	11.6238	11.6402	-0.14	490.530	470.047	4.36
0.001	373.150	10.3031	10.2943	0.09	107.010	112.745	-5.09
0.001	373.150	10.5822	10.5625	0.19	301.280	317.184	-5.01
0.001	373.150	10.8202	10.7967	0.22	506.130	528.603	-4.25
0.001	473.150	8.8399	8.8467	-0.08	105.640	103.768	1.80
0.001	473.150	9.2775	9.2717	0.06	252.050	254.463	-0.95
0.001	473.150	9.4895	9.4805	0.09	347.790	352.308	-1.28
0.001	473.150	9.7350	9.7255	0.10	483.840	489.706	-1.20
0.001	573.150	7.8737	7.9093	-0.45	253.110	245.807	2.97
0.001	573.150	8.2748	8.3031	-0.34	350.510	342.387	2.37
0.001	573.150	8.4419	8.4734	-0.37	403.450	393.114	2.63
0.001	573.150	8.6279	8.6662	-0.44	472.740	458.135	3.19
0.001	673.150	7.0500	7.0778	-0.39	351.420	346.435	1.44
0.001	673.150	7.3262	7.3441	-0.24	404.430	400.543	0.97
0.001	673.150	7.5248	7.5458	-0.28	451.640	446.415	1.17
0.001	673.150	7.7132	7.7454	-0.42	505.270	496.129	1.84

18 data points, $|\Delta\rho/\rho|$ rms = 0.267%, $\Delta\rho/\rho$ av. = -0.15%, $|\Delta P/P|$ av. = 3.31%, weight = 0.00%

Table 8h. Comparison of Gehrig/Lentz[58] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	298.150	11.6686	11.7610	-0.79	648.000	526.487	23.08
0.001	303.150	11.6686	11.7548	-0.73	719.000	603.801	19.08
0.001	304.150	11.6686	11.7323	-0.54	704.000	619.165	13.70
0.000	313.150	11.0211	11.1275	-0.96	137.000	38.740	253.64
0.001	313.150	11.6686	11.7317	-0.54	843.000	756.098	11.49
0.001	313.150	11.6686	11.7281	-0.51	838.000	756.098	10.83
0.001	323.150	11.6549	11.7125	-0.49	968.000	886.561	9.19
0.001	323.150	11.6549	11.7027	-0.41	954.000	886.561	7.61
0.001	333.150	11.6549	11.6912	-0.31	1086.000	1033.085	5.12
0.001	333.150	11.6549	11.6769	-0.19	1065.000	1033.085	3.09
0.001	333.150	11.9351	11.9731	-0.32	1538.000	1472.580	4.44
0.001	343.150	11.6413	11.6752	-0.29	1208.000	1157.321	4.38
0.001	343.150	11.6413	11.6606	-0.17	1186.000	1157.321	2.48
0.001	343.150	11.9208	11.9498	-0.24	1658.000	1606.977	3.18
0.001	353.150	10.9967	11.0513	-0.49	544.000	487.612	11.56
0.001	353.150	11.6413	11.6626	-0.18	1332.000	1299.162	2.53
0.001	353.150	11.6413	11.6523	-0.09	1316.000	1299.162	1.30
0.001	353.150	11.9208	11.9359	-0.13	1791.000	1763.658	1.55
0.000	363.150	10.3115	10.3735	-0.60	70.200	29.980	134.15
0.001	363.150	11.6276	11.6544	-0.23	1460.000	1417.731	2.98
0.001	363.150	11.6276	11.6367	-0.08	1432.000	1417.731	1.01
0.001	363.150	11.9065	11.9216	-0.13	1920.000	1892.063	1.48
0.001	363.150	11.9065	11.9243	-0.15	1925.000	1892.063	1.74
0.001	373.150	10.3008	10.3602	-0.57	151.000	111.241	35.74
0.001	373.150	10.9845	11.0178	-0.30	733.000	696.590	5.23
0.001	373.150	11.6276	11.6464	-0.16	1586.000	1555.547	1.96
0.001	373.150	11.6276	11.6512	-0.20	1594.000	1555.547	2.47
0.001	373.150	11.9065	11.9116	-0.04	2054.000	2044.393	0.47
0.001	383.150	10.3008	10.3492	-0.47	231.000	197.409	17.02
0.001	383.150	11.6140	11.6432	-0.25	1718.000	1669.321	2.92
0.001	383.150	11.9065	11.8941	0.10	2171.000	2195.087	-1.10
0.001	393.150	9.8806	9.9323	-0.52	56.600	30.352	86.48
0.001	393.150	10.9724	10.9895	-0.16	918.000	898.232	2.20
0.001	393.150	11.6140	11.6172	-0.03	1809.000	1803.561	0.30
0.001	393.150	11.6140	11.6036	0.09	1786.000	1803.561	-0.97
0.001	393.150	11.8922	11.8813	0.09	2294.000	2315.680	-0.94
0.001	403.150	9.8806	9.9150	-0.35	121.000	102.839	17.66
0.001	403.150	11.6005	11.6063	-0.05	1923.000	1912.967	0.52
0.001	403.150	11.8780	11.8663	0.10	2410.000	2433.697	-0.97
0.001	413.150	9.8708	9.8986	-0.28	184.000	168.805	9.00
0.001	413.150	10.9603	10.9706	-0.09	1106.000	1093.509	1.14
0.001	413.150	11.6005	11.5779	0.20	2004.000	2043.952	-1.95
0.001	413.150	11.8780	11.8477	0.26	2516.000	2578.416	-2.42
0.001	423.150	9.8708	9.8939	-0.23	252.000	238.840	5.51
0.001	423.150	11.6005	11.5869	0.12	2149.000	2173.718	-1.14
0.001	423.150	11.8780	11.8353	0.36	2632.000	2721.766	-3.30
0.001	423.150	11.8780	11.8468	0.26	2656.000	2721.766	-2.42
0.001	433.150	9.8610	9.8792	-0.18	313.000	302.277	3.55
0.001	433.150	10.2689	10.3250	-0.54	630.000	583.891	7.90
0.001	433.150	10.9482	10.9614	-0.12	1300.000	1283.124	1.32
0.001	433.150	11.5869	11.5821	0.04	2268.000	2276.928	-0.39
0.001	433.150	11.8638	11.8279	0.30	2756.000	2832.972	-2.72
0.001	433.150	11.8638	11.8363	0.23	2774.000	2832.972	-2.08
0.000	443.150	8.9702	9.0168	-0.52	10.000	-2.334	-528.44
0.001	443.150	9.8610	9.8782	-0.17	381.000	370.479	2.84
0.001	443.150	10.2689	10.3221	-0.52	708.000	662.804	6.82
0.001	443.150	11.5869	11.5760	0.09	2383.000	2403.772	-0.86
0.001	443.150	11.8638	11.8291	0.29	2897.000	2973.009	-2.56
0.001	443.150	11.8638	11.8176	0.39	2872.000	2973.009	-3.40
0.001	452.150	11.8496	11.8199	0.25	3000.000	3066.063	-2.15
0.001	453.150	8.9621	9.0030	-0.45	55.500	44.008	26.11
0.001	453.150	9.8610	9.8829	-0.22	452.000	438.026	3.19
0.001	453.150	10.2689	10.3291	-0.58	794.000	741.025	7.15
0.001	453.150	10.9482	10.9379	0.09	1470.000	1483.842	-0.93
0.001	453.150	11.5734	11.5681	0.05	2493.000	2503.301	-0.41
0.001	453.150	11.8496	11.8137	0.30	3000.000	3079.820	-2.59
0.001	463.150	8.9621	8.9956	-0.37	102.000	91.999	10.87
0.001	463.150	9.8512	9.8701	-0.19	511.000	498.576	2.49
0.001	463.150	10.2583	10.3223	-0.62	867.000	809.218	7.14
0.001	463.150	11.5734	11.5600	0.12	2601.000	2627.406	-1.01

Table 8h. Comparison of Gehrig/Lentz[58] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	473.150	8.9540	8.9949	-0.45	150.000	137.096	9.41
0.001	473.150	9.8512	9.8604	-0.09	571.000	564.765	1.10
0.001	473.150	10.2583	10.3155	-0.55	939.000	885.905	5.99
0.001	473.150	10.9361	10.9196	0.15	1641.000	1664.229	-1.40
0.001	473.150	11.5734	11.5453	0.24	2694.000	2750.495	-2.05
0.001	483.150	8.9540	9.0011	-0.52	200.000	184.224	8.56
0.001	483.150	10.2477	10.3096	-0.60	1011.000	952.129	6.18
0.001	483.150	10.9361	10.9156	0.19	1732.000	1761.439	-1.67
0.001	483.150	11.5600	11.5221	0.33	2768.000	2844.994	-2.71
0.001	493.150	8.0797	8.1866	-1.31	46.000	30.733	49.68
0.001	493.150	8.9459	8.9881	-0.47	243.000	228.265	6.46
0.001	493.150	9.8414	9.8475	-0.06	693.000	688.643	0.63
0.001	493.150	10.2477	10.3016	-0.52	1080.000	1027.431	5.12
0.001	493.150	10.9241	10.9158	0.08	1828.000	1840.236	-0.66
0.001	493.150	11.5600	11.5099	0.44	2862.000	2965.560	-3.49
0.001	503.150	8.0797	8.1856	-1.29	80.000	63.285	26.41
0.001	503.150	8.9459	8.9796	-0.37	287.000	274.680	4.49
0.001	503.150	9.8414	9.8424	-0.01	754.000	753.222	0.10
0.001	503.150	10.2477	10.2866	-0.38	1141.000	1102.226	3.52
0.001	503.150	10.9241	10.9016	0.21	1902.000	1935.632	-1.74
0.001	503.150	11.5600	11.5015	0.51	2962.000	3085.196	-3.99
0.001	506.150	11.5600	11.5029	0.50	3000.000	3120.908	-3.87
0.001	513.150	8.0732	8.1655	-1.13	110.500	94.851	16.50
0.001	513.150	8.9459	8.9802	-0.38	334.000	320.848	4.10
0.001	513.150	9.8317	9.8461	-0.15	821.000	810.006	1.36
0.001	513.150	10.2371	10.2756	-0.37	1205.000	1165.847	3.36
0.001	513.150	10.9121	10.8924	0.18	1982.000	2011.971	-1.49
0.001	523.150	8.0732	8.1741	-1.23	146.000	127.393	14.61
0.001	523.150	8.9379	8.9715	-0.37	377.000	363.636	3.68
0.001	523.150	9.8317	9.8412	-0.10	881.000	873.569	0.85
0.001	523.150	10.2371	10.2693	-0.31	1273.000	1239.405	2.71
0.001	523.150	10.9121	10.8852	0.25	2064.000	2105.647	-1.98
0.001	533.150	6.9102	6.9873	-1.10	42.000	38.515	9.05
0.001	533.150	8.9379	8.9782	-0.45	426.000	409.224	4.10
0.001	533.150	9.8317	9.8357	-0.04	940.000	936.762	0.35
0.001	533.150	10.2371	10.2666	-0.29	1344.000	1312.511	2.40
0.001	533.150	10.9121	10.8762	0.33	2142.000	2198.694	-2.58
0.001	543.150	6.9102	6.9874	-1.10	62.000	57.729	7.40
0.001	543.150	8.9299	8.9758	-0.51	471.000	451.209	4.39
0.001	543.150	9.8220	9.8334	-0.12	1001.000	991.601	0.95
0.001	543.150	10.2266	10.2671	-0.39	1418.000	1373.843	3.21
0.001	553.150	6.1792	6.5336	-5.42	59.200	49.458	19.70
0.001	553.150	6.9054	6.9671	-0.89	81.000	77.065	5.11
0.001	553.150	8.9299	8.9674	-0.42	513.000	496.268	3.37
0.001	553.150	9.8220	9.8233	-0.01	1055.000	1053.878	0.11
0.001	553.150	10.9001	10.8737	0.24	2320.000	2363.119	-1.82
0.001	563.150	3.2751	4.9018	-33.19	50.200	49.472	1.47
0.001	563.150	3.3879	4.9532	-31.60	50.300	49.507	1.60
0.001	563.150	3.6122	2.7191	32.85	49.000	49.558	-1.13
0.001	563.150	3.7785	4.5379	-16.74	49.800	49.590	0.42
0.001	563.150	4.0932	4.9018	-16.50	50.200	49.649	1.11
0.001	563.150	4.4649	5.3582	-16.67	51.800	49.761	4.10
0.001	563.150	5.4292	5.5287	-1.80	53.000	52.246	1.44
0.001	563.150	6.1792	6.4887	-4.77	74.000	63.570	16.41
0.001	563.150	6.9054	6.9630	-0.83	101.100	96.918	4.32
0.001	563.150	8.9299	8.9663	-0.41	558.000	541.144	3.11
0.001	563.150	9.8123	9.8326	-0.21	1125.000	1107.446	1.59
0.001	563.150	10.2266	10.2605	-0.33	1556.000	1517.375	2.55
0.001	563.150	10.9001	10.8689	0.29	2402.000	2453.979	-2.12
0.001	573.150	3.2740	3.5069	-6.64	55.000	54.547	0.83
0.001	573.150	3.3868	3.8725	-12.54	55.700	54.770	1.70
0.001	573.150	3.6109	3.2511	11.07	54.500	55.197	-1.26
0.001	573.150	3.7771	4.0213	-6.07	56.000	55.514	0.88
0.001	573.150	4.0915	4.1164	-0.60	56.200	56.147	0.09
0.001	573.150	4.4649	4.9703	-10.17	59.000	57.040	3.44
0.001	573.150	4.9110	5.2607	-6.65	61.000	58.692	3.93
0.001	573.150	5.4262	5.5391	-2.04	64.000	62.625	2.20
0.001	573.150	6.1754	6.4953	-4.93	91.000	77.951	16.74
0.001	573.150	6.9006	6.9730	-1.04	122.500	116.583	5.08
0.001	573.150	8.0601	8.1509	-1.11	309.000	286.638	7.80

Table 8h. Comparison of Gehrig/Lentz[58] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	573.150	8.9218	8.9533	-0.35	597.000	582.020	2.57
0.001	573.150	9.8123	9.8260	-0.14	1181.000	1168.855	1.04
0.001	573.150	10.2160	10.2528	-0.36	1619.000	1576.357	2.71
0.001	573.150	10.9001	10.8604	0.37	2477.000	2544.268	-2.64
0.001	583.150	3.2729	3.4455	-5.01	60.200	59.544	1.10
0.001	583.150	3.3856	3.6565	-7.41	61.000	59.974	1.71
0.001	583.150	3.6096	3.5250	2.40	60.500	60.821	-0.53
0.001	583.150	3.7771	3.7084	1.85	61.200	61.468	-0.44
0.001	583.150	4.0915	4.1465	-1.33	63.000	62.759	0.38
0.001	583.150	4.4629	4.7258	-5.56	66.100	64.527	2.44
0.001	583.150	4.9086	5.0786	-3.35	69.000	67.458	2.29
0.001	583.150	5.4233	5.5694	-2.62	75.800	73.317	3.39
0.001	583.150	6.1754	6.4696	-4.55	106.500	92.698	14.89
0.001	583.150	6.9006	6.9647	-0.92	142.500	136.731	4.22
0.001	583.150	8.9218	8.9635	-0.47	647.000	626.413	3.29
0.001	583.150	9.8123	9.8157	-0.03	1233.000	1229.951	0.25
0.001	583.150	10.2160	10.2416	-0.25	1677.000	1646.855	1.83
0.001	583.150	10.8882	10.8554	0.30	2557.000	2613.323	-2.16
0.001	593.150	3.2718	3.3561	-2.51	65.000	64.517	0.75
0.001	593.150	3.3845	3.5129	-3.65	65.900	65.163	1.13
0.001	593.150	3.6083	3.5302	2.21	66.000	66.454	-0.68
0.001	593.150	3.7757	3.7840	-0.22	67.500	67.450	0.07
0.001	593.150	4.0898	4.0535	0.90	69.200	69.440	-0.35
0.001	593.150	4.4609	4.5873	-2.75	73.200	72.139	1.47
0.001	593.150	4.9086	5.0438	-2.68	78.100	76.430	2.19
0.001	593.150	5.4233	5.5730	-2.69	87.500	84.267	3.84
0.001	593.150	6.1754	6.4629	-4.45	123.000	107.642	14.27
0.001	593.150	6.8958	6.9518	-0.81	162.000	156.535	3.49
0.001	593.150	8.9218	8.9520	-0.34	686.000	670.639	2.29
0.001	593.150	9.8123	9.7952	0.17	1275.000	1290.740	-1.22
0.001	593.150	10.8882	10.8416	0.43	2621.000	2702.135	-3.00
0.001	603.150	3.2708	3.2996	-0.87	69.700	69.478	0.32
0.001	603.150	3.3845	3.4802	-2.75	71.100	70.356	1.06
0.001	603.150	3.6083	3.5312	2.18	71.500	72.111	-0.85
0.001	603.150	3.7742	3.7185	1.50	73.000	73.458	-0.62
0.001	603.150	4.0898	4.0686	0.52	76.000	76.192	-0.25
0.001	603.150	4.4609	4.5796	-2.59	81.200	79.863	1.67
0.001	603.150	4.9061	5.0322	-2.51	87.500	85.507	2.33
0.001	603.150	5.4233	5.5621	-2.50	99.000	95.388	3.79
0.001	603.150	6.1715	6.4628	-4.51	140.000	122.540	14.25
0.001	603.150	6.8958	6.9538	-0.83	183.000	176.849	3.48
0.001	603.150	8.0535	8.1413	-1.08	406.000	381.260	6.49
0.001	603.150	8.9138	8.9491	-0.39	729.000	710.565	2.59
0.001	603.150	9.8026	9.7972	0.06	1337.000	1342.070	-0.38
0.001	603.150	10.8882	10.8302	0.54	2688.000	2790.414	-3.67
0.001	613.150	3.2708	3.2254	1.41	74.000	74.442	-0.59
0.001	613.150	3.3833	3.5504	-4.71	77.200	75.542	2.20
0.001	613.150	3.6070	3.5305	2.17	77.000	77.772	-0.99
0.001	613.150	3.7742	3.7262	1.29	79.000	79.504	-0.63
0.001	613.150	4.0881	4.0380	1.24	82.400	82.978	-0.70
0.001	613.150	4.4589	4.5551	-2.11	89.000	87.643	1.55
0.001	613.150	4.9061	4.9987	-1.85	96.500	94.728	1.87
0.001	613.150	5.4203	5.5955	-3.13	112.000	106.561	5.10
0.001	613.150	6.1715	6.4480	-4.29	156.000	137.743	13.25
0.001	613.150	6.8958	6.9377	-0.60	202.000	197.238	2.41
0.001	613.150	8.9138	8.9448	-0.35	771.000	754.339	2.21
0.001	613.150	9.8026	9.7848	0.18	1385.000	1402.061	-1.22
0.001	613.150	10.8762	10.8234	0.49	2762.000	2856.350	-3.30
0.001	623.150	3.2697	3.2787	-0.27	79.500	79.394	0.13
0.001	623.150	3.3822	3.4049	-0.67	81.000	80.729	0.34
0.001	623.150	3.6057	3.5044	2.89	82.200	83.444	-1.49
0.001	623.150	3.7728	3.6900	2.24	84.500	85.559	-1.24
0.001	623.150	4.0864	3.9716	2.89	88.200	89.800	-1.78
0.001	623.150	4.4589	4.5460	-1.92	97.000	95.512	1.56
0.001	623.150	4.9037	4.9490	-0.91	105.000	103.990	0.97
0.001	623.150	5.4203	5.5647	-2.60	123.000	117.918	4.31
0.001	623.150	6.1677	6.4467	-4.33	173.000	152.808	13.21
0.001	623.150	6.8910	6.9394	-0.70	223.000	217.115	2.71
0.001	623.150	8.0470	8.1286	-1.00	468.000	443.204	5.59
0.001	623.150	8.9138	8.9429	-0.32	814.000	797.956	2.01

Table 8h. Comparison of Gehrig/Lentz[58] PpT compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	623.150	9.8026	9.7834	0.20	1443.000	1461.765	-1.28
0.001	623.150	10.8762	10.8115	0.60	2826.000	2943.229	-3.98
0.001	633.150	3.2686	3.2439	0.76	84.000	84.343	-0.41
0.001	633.150	3.3810	3.4294	-1.41	86.600	85.916	0.80
0.001	633.150	3.6057	3.5133	2.63	87.800	89.145	-1.51
0.001	633.150	3.7714	3.6635	2.95	90.000	91.630	-1.78
0.001	633.150	4.0864	3.9971	2.23	95.200	96.681	-1.53
0.001	633.150	4.4569	4.5219	-1.44	104.700	103.402	1.26
0.001	633.150	4.9037	4.9471	-0.88	114.500	113.376	0.99
0.001	633.150	5.4173	5.5620	-2.60	135.000	129.259	4.44
0.001	633.150	6.1677	6.4447	-4.30	190.000	168.183	12.97
0.001	633.150	6.8910	6.9405	-0.71	244.000	237.576	2.70
0.001	633.150	8.9138	8.9360	-0.25	854.000	841.417	1.50
0.001	633.150	9.7929	9.7793	0.14	1498.000	1511.477	-0.89
0.001	633.150	10.8762	10.8029	0.68	2895.000	3029.609	-4.44
0.001	643.150	3.2686	3.2182	1.57	88.500	89.306	-0.90
0.001	643.150	3.3810	3.3796	0.04	91.100	91.123	-0.03
0.001	643.150	3.6044	3.4951	3.13	93.000	94.838	-1.94
0.001	643.150	3.7714	3.6431	3.52	95.500	97.739	-2.29
0.001	643.150	4.0847	3.9930	2.30	101.800	103.563	-1.70
0.001	643.150	4.4569	4.4973	-0.90	112.300	111.374	0.83
0.001	643.150	4.9013	4.9095	-0.17	123.000	122.760	0.20
0.001	643.150	5.4173	5.5580	-2.53	147.000	140.779	4.42
0.001	643.150	6.1639	6.4211	-4.01	205.000	183.344	11.81
0.001	643.150	6.8910	6.9484	-0.83	266.000	258.077	3.07
0.001	643.150	8.9058	8.9315	-0.29	895.000	880.117	1.69
0.001	643.150	9.7929	9.7677	0.26	1545.000	1570.423	-1.62
0.001	643.150	10.8762	10.7937	0.76	2962.000	3115.498	-4.93
0.001	649.150	10.8762	10.7873	0.82	3000.000	3166.799	-5.27
0.001	653.150	3.2675	3.2206	1.46	93.400	94.252	-0.90
0.001	653.150	3.3799	3.3629	0.51	96.000	96.315	-0.33
0.001	653.150	3.6044	3.4861	3.39	98.300	100.562	-2.25
0.001	653.150	3.7699	3.6012	4.68	100.500	103.837	-3.21
0.001	653.150	4.0847	3.9700	2.89	108.000	110.503	-2.26
0.001	653.150	4.4549	4.4804	-0.57	120.000	119.339	0.55
0.001	653.150	5.4144	5.5533	-2.50	159.000	152.234	4.44
0.001	653.150	6.1639	6.4199	-3.99	222.000	198.834	11.65
0.001	653.150	6.8863	6.9350	-0.70	285.000	277.939	2.54
0.001	653.150	8.0405	8.1142	-0.91	561.000	536.205	4.62
0.001	653.150	8.9058	8.9241	-0.20	934.000	923.151	1.18
0.001	653.150	9.7929	9.7617	0.32	1597.000	1629.098	-1.97
0.001	653.150	10.1951	10.2100	-0.15	2122.000	2102.199	0.94
0.001	663.150	3.2664	3.2076	1.83	98.000	99.195	-1.20
0.001	663.150	3.3799	3.3543	0.76	101.000	101.529	-0.52
0.001	663.150	3.6030	3.4834	3.43	103.700	106.266	-2.41
0.001	663.150	3.7699	3.6137	4.32	106.500	109.976	-3.16
0.001	663.150	4.0831	3.9635	3.02	114.500	117.429	-2.49
0.001	663.150	4.4549	4.4588	-0.09	127.500	127.387	0.09
0.001	663.150	4.8989	4.9334	-0.70	143.000	141.733	0.89
0.001	663.150	5.4144	5.5662	-2.73	172.000	163.871	4.96
0.001	663.150	6.1639	6.4184	-3.96	239.000	214.380	11.48
0.001	663.150	8.0405	8.1159	-0.93	594.000	567.723	4.63
0.001	663.150	8.9058	8.9238	-0.20	977.000	966.036	1.13
0.001	663.150	9.7929	9.7523	0.42	1645.000	1687.506	-2.52
0.001	663.150	10.1951	10.2258	-0.30	2211.000	2169.337	1.92
0.001	673.150	3.2664	3.1925	2.31	102.500	104.160	-1.59
0.001	673.150	3.3787	3.3035	2.28	105.000	106.721	-1.61
0.001	673.150	3.6017	3.4767	3.59	109.000	111.976	-2.66
0.001	673.150	3.7685	3.6110	4.36	112.200	116.095	-3.35
0.001	673.150	4.0831	3.9388	3.66	120.500	124.413	-3.15
0.001	673.150	4.4529	4.4559	-0.07	135.500	135.405	0.07
0.001	673.150	4.8989	4.9403	-0.84	153.000	151.324	1.11
0.001	673.150	5.4144	5.5433	-2.33	183.000	175.561	4.24
0.001	673.150	6.1600	6.3898	-3.60	253.000	229.607	10.19
0.001	673.150	6.8863	6.9299	-0.63	326.000	319.002	2.19
0.001	673.150	8.0405	8.1069	-0.82	623.000	599.178	3.98
0.001	673.150	8.8978	8.9174	-0.22	1016.000	1003.830	1.21
0.001	673.150	9.7833	9.7462	0.38	1696.000	1735.320	-2.27
0.001	673.150	10.1951	10.2197	-0.24	2270.000	2236.147	1.51
0.001	683.150	3.2654	3.1801	2.68	107.000	109.102	-1.93

Table 8h. Comparison of Gehrig/Lentz[58] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	683.150	3.3776	3.3015	2.31	110.000	111.913	-1.71
0.001	683.150	3.6017	3.4594	4.11	114.000	117.723	-3.16
0.001	683.150	3.7671	3.6121	4.29	118.000	122.219	-3.45
0.001	683.150	4.0814	3.9351	3.72	127.000	131.365	-3.32
0.001	683.150	4.4529	4.4668	-0.31	144.000	143.510	0.34
0.001	683.150	4.8989	4.9672	-1.38	164.000	160.955	1.89
0.001	683.150	5.4114	5.5382	-2.29	195.000	187.117	4.21
0.001	683.150	6.1600	6.4232	-4.10	274.000	245.217	11.74
0.001	683.150	6.8815	6.9247	-0.62	346.000	338.764	2.14
0.001	683.150	8.8978	8.9068	-0.10	1052.000	1046.302	0.54
0.001	683.150	9.7833	9.7322	0.53	1738.000	1793.016	-3.07

291 data points, $|\Delta\rho/\rho|$ rms = 4.348%, $\Delta\rho/\rho$ av. = -0.71%, $|\Delta P/P|$ av. = 4.24%, weight = 0.06%

Table 8i. Comparison of Teichmann[38] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	322.446	11.1373	11.1271	0.09	254.146	264.238	-3.82
0.001	324.755	11.1352	11.1238	0.10	279.555	290.981	-3.93
0.001	326.297	11.1337	11.1216	0.11	296.467	308.637	-3.94
0.001	329.189	11.1311	11.1175	0.12	328.027	341.748	-4.01
0.001	331.273	11.1292	11.1146	0.13	350.561	365.410	-4.06
0.001	333.756	11.1270	11.1113	0.14	377.361	393.489	-4.10
0.001	336.248	11.1247	11.1080	0.15	404.119	421.385	-4.10
0.001	338.129	11.1230	11.1056	0.16	424.275	442.356	-4.09
0.001	340.469	11.1209	11.1026	0.16	449.166	468.318	-4.09
0.001	342.984	11.1187	11.0995	0.17	475.909	496.111	-4.07
0.001	344.516	11.1173	11.0975	0.18	491.955	512.893	-4.08
0.001	346.241	11.1158	11.0954	0.18	510.089	531.796	-4.08
0.001	348.699	11.1135	11.0925	0.19	535.879	558.423	-4.04
0.001	354.528	11.1083	11.0856	0.20	596.529	621.231	-3.98
0.000	363.163	10.3612	10.3509	0.10	55.419	62.204	-10.91
0.001	364.875	10.3556	10.3486	0.07	69.396	73.980	-6.20
0.001	366.310	10.3587	10.3468	0.11	81.088	88.952	-8.84
0.001	368.150	10.3572	10.3445	0.12	95.989	104.453	-8.10
0.001	370.213	10.3556	10.3420	0.13	112.636	121.792	-7.52
0.001	372.558	10.3537	10.3393	0.14	131.584	141.329	-6.90
0.001	374.871	10.3519	10.3366	0.15	150.121	160.532	-6.49
0.001	378.050	10.3494	10.3332	0.16	175.543	186.723	-5.99
0.001	381.223	10.3469	10.3299	0.16	200.827	212.660	-5.56
0.001	384.330	10.3445	10.3269	0.17	225.507	237.904	-5.21
0.001	388.202	10.3415	10.3231	0.18	255.974	269.110	-4.88
0.001	392.881	10.3379	10.3189	0.18	292.707	306.490	-4.50
0.001	397.860	10.3341	10.3145	0.19	331.443	345.896	-4.18
0.001	404.197	10.3292	10.3092	0.19	380.391	395.446	-3.81
0.001	408.982	10.3255	10.3052	0.20	416.982	432.469	-3.58
0.001	416.609	10.3197	10.2992	0.20	474.857	490.903	-3.27
0.001	423.458	10.3145	10.2939	0.20	526.302	542.735	-3.03
0.001	430.543	10.3091	10.2886	0.20	578.997	595.725	-2.81
0.001	388.533	9.9383	9.9370	0.01	24.514	25.175	-2.63
0.001	390.845	9.9366	9.9341	0.03	40.337	41.653	-3.16
0.001	394.117	9.9342	9.9301	0.04	62.683	64.807	-3.28
0.001	395.708	9.9330	9.9282	0.05	73.469	75.981	-3.31
0.001	398.379	9.9311	9.9253	0.06	91.644	94.702	-3.23
0.001	400.960	9.9292	9.9226	0.07	109.122	112.649	-3.13
0.001	404.525	9.9266	9.9192	0.07	133.257	137.280	-2.93
0.001	407.741	9.9242	9.9160	0.08	154.793	159.307	-2.83
0.001	412.465	9.9209	9.9118	0.09	186.432	191.524	-2.66
0.001	419.538	9.9159	9.9060	0.10	233.467	239.178	-2.39
0.001	426.580	9.9109	9.9006	0.10	279.948	286.004	-2.12
0.001	432.259	9.9068	9.8965	0.10	317.146	323.314	-1.91
0.001	437.894	9.9028	9.8926	0.10	353.758	360.032	-1.74
0.001	443.040	9.8992	9.8890	0.10	386.949	393.313	-1.62
0.001	448.670	9.8952	9.8853	0.10	423.075	429.390	-1.47
0.001	455.462	9.8904	9.8808	0.10	466.292	472.533	-1.32
0.001	463.085	9.8851	9.8759	0.09	514.403	520.521	-1.18
0.001	472.372	9.8785	9.8699	0.09	572.332	578.219	-1.02
0.000	403.407	9.6973	9.7017	-0.05	18.762	16.837	11.43
0.001	405.739	9.6956	9.6989	-0.03	33.246	31.801	4.54
0.001	407.790	9.6942	9.6964	-0.02	45.915	44.936	2.18
0.001	410.008	9.6926	9.6939	-0.01	59.621	59.033	1.00
0.001	413.144	9.6904	9.6906	-0.00	78.965	78.875	0.11
0.001	416.084	9.6884	9.6876	0.01	97.022	97.385	-0.37
0.001	419.692	9.6859	9.6842	0.02	119.124	119.929	-0.67
0.001	423.708	9.6831	9.6806	0.03	143.638	144.827	-0.82
0.001	428.693	9.6797	9.6765	0.03	173.937	175.511	-0.90
0.001	434.649	9.6756	9.6718	0.04	209.909	211.801	-0.89
0.001	440.506	9.6716	9.6675	0.04	245.046	247.151	-0.85
0.001	447.195	9.6671	9.6629	0.04	284.939	287.158	-0.77
0.001	455.107	9.6617	9.6577	0.04	331.779	333.923	-0.64
0.001	463.240	9.6562	9.6526	0.04	379.447	381.474	-0.53
0.001	471.196	9.6509	9.6478	0.03	425.743	427.529	-0.42
0.001	479.591	9.6452	9.6426	0.03	474.039	475.550	-0.32
0.001	487.894	9.6396	9.6377	0.02	521.416	522.571	-0.22
0.001	495.806	9.6343	9.6331	0.01	566.196	566.960	-0.13
0.000	427.560	9.3088	9.3212	-0.13	20.308	16.067	26.40
0.000	429.834	9.3073	9.3186	-0.12	32.328	28.414	13.78

Table 8i. Comparison of Teichmann[38] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	431.853	9.3060	9.3164	-0.11	42.975	39.343	9.23
0.001	434.833	9.3040	9.3133	-0.10	58.667	55.372	5.95
0.001	437.957	9.3020	9.3102	-0.09	75.069	72.118	4.09
0.001	441.727	9.2996	9.3067	-0.08	94.813	92.214	2.82
0.001	446.819	9.2963	9.3025	-0.07	121.457	119.139	1.95
0.000	450.239	8.9918	9.0071	-0.17	42.388	38.083	11.30
0.001	452.502	8.9904	9.0049	-0.16	52.866	48.741	8.46
0.001	454.262	8.9894	9.0033	-0.15	61.013	57.032	6.98
0.001	457.561	8.9873	9.0002	-0.14	76.241	72.454	5.23
0.001	460.325	8.9856	8.9978	-0.14	88.969	85.338	4.26
0.001	464.241	8.9832	8.9947	-0.13	107.002	103.513	3.37
0.001	467.971	8.9810	8.9918	-0.12	124.127	120.767	2.78
0.001	473.193	8.9778	8.9882	-0.12	148.067	144.751	2.29
0.001	478.454	8.9746	8.9848	-0.11	172.095	168.769	1.97
0.001	485.117	8.9706	8.9807	-0.11	202.420	198.996	1.72
0.001	492.986	8.9659	8.9761	-0.11	237.998	234.415	1.53
0.001	500.828	8.9612	8.9719	-0.12	273.300	269.415	1.44
0.001	509.520	8.9560	8.9674	-0.13	312.171	307.886	1.39
0.001	522.088	8.9485	8.9611	-0.14	367.926	362.942	1.37
0.001	545.369	8.9346	8.9497	-0.17	469.736	463.236	1.40
0.001	565.991	8.9223	8.9394	-0.19	558.264	550.363	1.44
0.000	462.831	8.6990	8.7186	-0.22	27.847	23.526	18.37
0.000	465.895	8.6973	8.7156	-0.21	40.429	36.307	11.35
0.001	469.762	8.6950	8.7119	-0.19	56.271	52.345	7.50
0.001	474.112	8.6925	8.7081	-0.18	74.061	70.329	5.31
0.001	477.549	8.6905	8.7054	-0.17	88.102	84.476	4.29
0.001	481.541	8.6883	8.7025	-0.16	104.416	100.876	3.51
0.001	485.656	8.6858	8.6996	-0.16	121.178	117.654	2.99
0.001	490.419	8.6831	8.6966	-0.16	140.602	137.039	2.60
0.001	496.104	8.6798	8.6932	-0.15	163.689	160.042	2.28
0.001	501.814	8.6766	8.6900	-0.15	186.803	183.054	2.05
0.001	507.975	8.6731	8.6867	-0.16	211.677	207.737	1.90
0.001	514.617	8.6693	8.6833	-0.16	238.380	234.190	1.79
0.001	521.597	8.6654	8.6798	-0.17	266.318	261.853	1.71
0.001	528.329	8.6615	8.6766	-0.17	293.158	288.337	1.67
0.001	536.109	8.6571	8.6730	-0.18	324.029	318.794	1.64
0.001	546.554	8.6511	8.6682	-0.20	365.235	359.352	1.64
0.001	556.599	8.6454	8.6636	-0.21	404.606	398.063	1.64
0.001	565.627	8.6403	8.6595	-0.22	439.727	432.605	1.65
0.000	483.035	8.2781	8.2982	-0.24	28.020	24.858	12.72
0.001	485.677	8.2767	8.2959	-0.23	37.122	34.027	9.10
0.001	488.430	8.2752	8.2936	-0.22	46.599	43.564	6.97
0.001	491.401	8.2736	8.2911	-0.21	56.817	53.847	5.52
0.001	495.031	8.2717	8.2884	-0.20	69.316	66.400	4.39
0.001	499.086	8.2695	8.2857	-0.20	83.292	80.382	3.62
0.001	503.903	8.2670	8.2826	-0.19	99.885	96.969	3.01
0.001	508.788	8.2643	8.2796	-0.18	116.672	113.713	2.60
0.001	513.511	8.2617	8.2771	-0.19	132.926	129.856	2.36
0.001	519.482	8.2586	8.2739	-0.19	153.419	150.235	2.12
0.001	525.380	8.2554	8.2712	-0.19	173.678	170.263	2.01
0.001	531.150	8.2524	8.2685	-0.19	193.395	189.815	1.89
0.001	537.041	8.2493	8.2659	-0.20	213.526	209.696	1.83
0.001	542.822	8.2462	8.2635	-0.21	233.232	229.123	1.79
0.001	551.036	8.2419	8.2598	-0.22	261.083	256.632	1.73
0.001	558.596	8.2378	8.2567	-0.23	286.656	281.792	1.73
0.001	566.691	8.2336	8.2533	-0.24	313.915	308.651	1.71
0.001	510.328	7.6416	7.6540	-0.16	34.293	33.171	3.38
0.001	512.958	7.6403	7.6524	-0.16	41.192	40.054	2.84
0.001	515.882	7.6389	7.6509	-0.16	48.896	47.729	2.44
0.001	518.822	7.6375	7.6495	-0.16	56.673	55.461	2.18
0.001	521.829	7.6361	7.6480	-0.16	64.625	63.384	1.96
0.001	524.577	7.6348	7.6466	-0.15	71.904	70.629	1.80
0.001	527.414	7.6334	7.6454	-0.16	79.442	78.108	1.71
0.001	530.584	7.6319	7.6440	-0.16	87.861	86.476	1.60
0.001	534.514	7.6300	7.6422	-0.16	98.309	96.848	1.51
0.001	538.520	7.6281	7.6408	-0.17	108.993	107.426	1.46
0.001	541.644	7.6266	7.6394	-0.17	117.300	115.672	1.41
0.001	544.466	7.6252	7.6383	-0.17	124.826	123.112	1.39
0.001	547.379	7.6239	7.6373	-0.18	132.595	130.810	1.36
0.001	550.981	7.6222	7.6360	-0.18	142.214	140.312	1.36

Table 8i. Comparison of Teichmann[38] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	555.353	7.6200	7.6344	-0.19	153.869	151.818	1.35
0.001	560.686	7.6175	7.6326	-0.20	168.103	165.866	1.35
0.001	566.896	7.6145	7.6305	-0.21	184.662	182.189	1.36
0.001	531.216	7.0840	7.0823	0.02	42.950	43.042	-0.21
0.001	532.943	7.0833	7.0820	0.02	46.511	46.584	-0.16
0.001	535.367	7.0822	7.0820	0.00	51.556	51.568	-0.02
0.001	537.239	7.0814	7.0816	-0.00	55.446	55.435	0.02
0.001	538.608	7.0808	7.0814	-0.01	58.306	58.268	0.07
0.001	541.542	7.0796	7.0811	-0.02	64.460	64.363	0.15
0.001	544.607	7.0783	7.0805	-0.03	70.896	70.748	0.21
0.001	548.794	7.0764	7.0795	-0.04	79.711	79.491	0.28
0.001	554.622	7.0740	7.0780	-0.06	92.034	91.722	0.34
0.001	563.885	7.0699	7.0758	-0.08	111.718	111.216	0.45

153 data points, $|\Delta\rho/\rho|$ rms = 0.143%, $\Delta\rho/\rho$ av. = -0.04%, $|\Delta P/P|$ av. = 2.78%, weight = 0.03%

Table 8j. Comparison of Taslimi[60] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
0.001	298.150	11.2797	11.2943	-0.13	100.000	85.302	17.23
0.001	298.150	11.3718	11.3902	-0.16	200.000	180.305	10.92
0.001	298.150	11.4589	11.4808	-0.19	300.000	275.335	8.96
0.001	298.150	11.5421	11.5664	-0.21	400.000	371.075	7.79
0.001	298.150	11.6202	11.6477	-0.24	500.000	465.579	7.39
0.001	298.150	11.6944	11.7252	-0.26	600.000	559.706	7.20
0.001	298.150	11.7649	11.7991	-0.29	700.000	653.219	7.16
0.001	313.150	11.0838	11.0883	-0.04	100.000	95.786	4.40
0.001	313.150	11.1849	11.1921	-0.06	200.000	192.882	3.69
0.001	313.150	11.2797	11.2892	-0.08	300.000	289.958	3.46
0.001	313.150	11.3693	11.3806	-0.10	400.000	387.364	3.26
0.001	313.150	11.4538	11.4669	-0.11	500.000	484.506	3.20
0.001	313.150	11.5331	11.5487	-0.14	600.000	580.537	3.35
0.001	313.150	11.6100	11.6265	-0.14	700.000	678.351	3.19
0.001	313.150	11.6816	11.7008	-0.16	800.000	773.731	3.40
0.001	313.150	11.7508	11.7718	-0.18	900.000	870.005	3.45
0.001	313.150	11.8173	11.8398	-0.19	1000.000	966.442	3.47
0.001	313.150	11.9441	11.9681	-0.20	1200.000	1161.432	3.32
0.001	333.150	10.8175	10.8183	-0.01	100.000	99.332	0.67
0.001	333.150	10.9302	10.9338	-0.03	200.000	196.725	1.67
0.001	333.150	11.0339	11.0408	-0.06	300.000	293.341	2.27
0.001	333.150	11.1312	11.1405	-0.08	400.000	390.425	2.45
0.001	333.150	11.2233	11.2339	-0.09	500.000	488.332	2.39
0.001	333.150	11.3091	11.3220	-0.11	600.000	585.037	2.56
0.001	333.150	11.3898	11.4053	-0.14	700.000	681.028	2.79
0.001	333.150	11.4679	11.4844	-0.14	800.000	778.754	2.73
0.001	333.150	11.5408	11.5598	-0.16	900.000	874.410	2.93
0.001	333.150	11.6125	11.6318	-0.17	1000.000	972.816	2.79
0.001	333.150	11.7444	11.7669	-0.19	1200.000	1165.529	2.96
0.001	333.150	11.8673	11.8919	-0.21	1400.000	1359.411	2.99
0.001	333.150	11.9825	12.0083	-0.22	1600.000	1554.418	2.93
0.001	333.150	12.0900	12.1174	-0.23	1800.000	1748.605	2.94
0.001	353.150	10.5564	10.5510	0.05	100.000	103.989	-3.84
0.001	353.150	10.6805	10.6805	0.00	200.000	200.029	-0.01
0.001	353.150	10.7958	10.7986	-0.03	300.000	297.492	0.84
0.001	353.150	10.9020	10.9076	-0.05	400.000	394.670	1.35
0.001	353.150	11.0006	11.0089	-0.08	500.000	491.571	1.71
0.001	353.150	11.0940	11.1036	-0.09	600.000	589.562	1.77
0.001	353.150	11.1811	11.1927	-0.10	700.000	686.610	1.95
0.001	353.150	11.2643	11.2770	-0.11	800.000	784.619	1.96
0.001	353.150	11.3437	11.3569	-0.12	900.000	883.168	1.91
0.001	353.150	11.4179	11.4329	-0.13	1000.000	979.845	2.06
0.001	353.150	11.5587	11.5751	-0.14	1200.000	1176.001	2.04
0.001	353.150	11.6880	11.7060	-0.15	1400.000	1371.547	2.07
0.001	353.150	11.8097	11.8275	-0.15	1600.000	1569.868	1.92
0.001	353.150	11.9223	11.9409	-0.16	1800.000	1766.361	1.90

46 data points, $|\Delta\rho/\rho|$ rms = 0.148%, $\Delta\rho/\rho$ av. = -0.13%, $|\Delta P/P|$ av. = 3.59%, weight = 0.01%

Table 8k. Comparison of Kuss[41] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	298.150	11.2899	11.2943	-0.04	100.000	95.556	4.65
1.000	298.150	11.3872	11.3902	-0.03	200.000	196.732	1.66
1.000	298.150	11.4807	11.4808	-0.00	300.000	299.942	0.02
1.000	298.150	11.5664	11.5664	-0.00	400.000	399.989	0.00
1.000	298.150	11.6496	11.6477	0.02	500.000	502.359	-0.47
1.000	298.150	11.7277	11.7252	0.02	600.000	603.372	-0.56
1.000	298.150	11.8020	11.7991	0.02	700.000	704.078	-0.58
1.000	298.150	11.8724	11.8698	0.02	800.000	803.812	-0.47
1.000	298.150	11.9402	11.9376	0.02	900.000	903.978	-0.44
1.000	298.150	12.0055	12.0027	0.02	1000.000	1004.403	-0.44
1.000	298.150	12.1297	12.1258	0.03	1200.000	1206.598	-0.55
1.000	298.150	12.2449	12.2405	0.04	1400.000	1407.943	-0.56
1.000	298.150	12.3525	12.3480	0.04	1600.000	1608.730	-0.54
1.000	298.150	12.4536	12.4491	0.04	1800.000	1809.216	-0.51
1.000	298.150	12.5509	12.5446	0.05	2000.000	2013.567	-0.67
1.000	313.150	11.0876	11.0883	-0.01	100.000	99.320	0.68
1.000	313.150	11.1901	11.1921	-0.02	200.000	198.052	0.98
1.000	313.150	11.2873	11.2892	-0.02	300.000	298.003	0.67
1.000	313.150	11.3770	11.3806	-0.03	400.000	396.000	1.01
1.000	313.150	11.4627	11.4669	-0.04	500.000	495.045	1.00
1.000	313.150	11.5434	11.5487	-0.05	600.000	593.367	1.12
1.000	313.150	11.6202	11.6265	-0.05	700.000	691.681	1.20
1.000	313.150	11.6932	11.7008	-0.06	800.000	789.585	1.32
1.000	313.150	11.7636	11.7718	-0.07	900.000	888.265	1.32
1.000	313.150	11.8301	11.8398	-0.08	1000.000	985.456	1.48
1.000	313.150	11.9569	11.9681	-0.09	1200.000	1181.953	1.53
1.000	313.150	12.0747	12.0872	-0.10	1400.000	1378.321	1.57
1.000	313.150	12.1848	12.1985	-0.11	1600.000	1574.594	1.61
1.000	313.150	12.2885	12.3031	-0.12	1800.000	1771.338	1.62
1.000	313.150	12.3857	12.4017	-0.13	2000.000	1966.756	1.69
1.000	333.150	10.8226	10.8183	0.04	100.000	103.575	-3.45
1.000	333.150	10.9379	10.9338	0.04	200.000	203.663	-1.80
1.000	333.150	11.0454	11.0408	0.04	300.000	304.485	-1.47
1.000	333.150	11.1440	11.1405	0.03	400.000	403.676	-0.91
1.000	333.150	11.2374	11.2339	0.03	500.000	503.854	-0.76
1.000	333.150	11.3245	11.3220	0.02	600.000	602.972	-0.49
1.000	333.150	11.4077	11.4053	0.02	700.000	703.001	-0.43
1.000	333.150	11.4858	11.4844	0.01	800.000	801.838	-0.23
1.000	333.150	11.5613	11.5598	0.01	900.000	902.102	-0.23
1.000	333.150	11.6330	11.6318	0.01	1000.000	1001.760	-0.18
1.000	333.150	11.7674	11.7669	0.00	1200.000	1200.737	-0.06
1.000	333.150	11.8916	11.8919	-0.00	1400.000	1399.452	0.04
1.000	333.150	12.0081	12.0083	-0.00	1600.000	1599.568	0.03
1.000	333.150	12.1169	12.1174	-0.00	1800.000	1799.114	0.05
1.000	333.150	12.2193	12.2200	-0.01	2000.000	1998.671	0.07
1.000	353.150	10.5576	10.5510	0.06	100.000	104.875	-4.65
1.000	353.150	10.6869	10.6805	0.06	200.000	205.226	-2.55
1.000	353.150	10.8047	10.7986	0.06	300.000	305.358	-1.75
1.000	353.150	10.9135	10.9076	0.05	400.000	405.635	-1.39
1.000	353.150	11.0147	11.0089	0.05	500.000	505.971	-1.18
1.000	353.150	11.1094	11.1036	0.05	600.000	606.317	-1.04
1.000	353.150	11.1990	11.1927	0.06	700.000	707.251	-1.03
1.000	353.150	11.2822	11.2770	0.05	800.000	806.402	-0.79
1.000	353.150	11.3629	11.3569	0.05	900.000	907.753	-0.85
1.000	353.150	11.4397	11.4329	0.06	1000.000	1009.112	-0.90
1.000	353.150	11.5818	11.5751	0.06	1200.000	1209.828	-0.81
1.000	353.150	11.7136	11.7060	0.06	1400.000	1412.089	-0.86
1.000	353.150	11.8353	11.8275	0.07	1600.000	1613.420	-0.83
1.000	353.150	11.9492	11.9409	0.07	1800.000	1815.224	-0.84
1.000	353.150	12.0567	12.0473	0.08	2000.000	2018.174	-0.90

60 data points, $|\Delta\rho/\rho|$ rms = 0.052%, $\Delta\rho/\rho$ av. = 0.01%, $|\Delta P/P|$ av. = 1.03%, weight = 13.10%

Table 81. Comparison of Straty et al.[43] $P\rho T$ compressibility data with values calculated from Eq. (6)

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	533.185	1.2529	1.2510	0.16	33.184	33.206	-0.07
1.000	543.157	1.2522	1.2516	0.05	34.808	34.816	-0.02
1.000	553.141	1.2515	1.2435	0.64	36.243	36.365	-0.34
1.000	563.126	1.2508	1.2432	0.61	37.747	37.876	-0.34
1.000	573.138	1.2502	1.2435	0.54	39.239	39.364	-0.32
1.000	583.157	1.2495	1.2441	0.43	40.721	40.830	-0.27
1.000	593.181	1.2488	1.2450	0.30	42.196	42.277	-0.19
1.000	603.198	1.2481	1.2458	0.18	43.656	43.709	-0.12
1.000	613.141	1.2474	1.2462	0.10	45.086	45.117	-0.07
1.000	623.143	1.2467	1.2462	0.04	46.507	46.521	-0.03
1.000	633.191	1.2460	1.2461	-0.00	47.923	47.921	0.00
1.000	643.184	1.2453	1.2457	-0.03	49.317	49.305	0.02
1.000	653.149	1.2446	1.2454	-0.06	50.699	50.675	0.05
1.000	663.165	1.2439	1.2448	-0.08	52.075	52.045	0.06
1.000	673.173	1.2433	1.2443	-0.08	53.444	53.410	0.06
1.000	683.155	1.2426	1.2437	-0.09	54.800	54.762	0.07
1.000	693.168	1.2419	1.2431	-0.09	56.153	56.111	0.07
1.000	703.156	1.2412	1.2424	-0.09	57.494	57.451	0.07
1.000	573.209	1.6691	1.6532	0.96	45.560	45.756	-0.43
1.000	583.111	1.6682	1.6574	0.65	47.727	47.878	-0.32
1.000	593.177	1.6672	1.6591	0.49	49.872	49.999	-0.25
1.000	603.191	1.6663	1.6604	0.35	51.982	52.083	-0.19
1.000	613.173	1.6654	1.6613	0.24	54.062	54.139	-0.14
1.000	623.110	1.6645	1.6621	0.14	56.117	56.165	-0.09
1.000	633.154	1.6635	1.6619	0.10	58.160	58.195	-0.06
1.000	643.162	1.6626	1.6616	0.06	60.180	60.204	-0.04
1.000	653.178	1.6617	1.6609	0.05	62.183	62.202	-0.03
1.000	663.124	1.6608	1.6604	0.02	64.163	64.173	-0.02
1.000	673.184	1.6598	1.6594	0.02	66.143	66.153	-0.02
1.000	683.186	1.6589	1.6584	0.03	68.100	68.114	-0.02
1.000	693.178	1.6580	1.6573	0.04	70.043	70.064	-0.03
1.000	703.154	1.6571	1.6562	0.05	71.972	72.001	-0.04
1.000	713.114	1.6561	1.6551	0.06	73.890	73.923	-0.05
1.000	723.151	1.6552	1.6538	0.09	75.805	75.856	-0.07
0.000	553.095	1.9950	1.9581	1.88	43.195	43.368	-0.40
0.000	558.146	1.9944	1.9666	1.41	44.699	44.859	-0.36
0.000	563.169	1.9939	1.9720	1.11	46.147	46.294	-0.32
1.000	573.096	1.9928	1.9806	0.62	48.945	49.049	-0.21
1.000	583.095	1.9917	1.9856	0.31	51.692	51.754	-0.12
1.000	593.109	1.9905	1.9880	0.12	54.386	54.415	-0.05
1.000	603.158	1.9894	1.9892	0.01	57.048	57.051	-0.00
1.000	613.145	1.9883	1.9900	-0.09	59.667	59.641	0.04
1.000	623.097	1.9872	1.9918	-0.23	62.277	62.198	0.13
1.000	633.136	1.9861	1.9909	-0.24	64.847	64.756	0.14
1.000	643.123	1.9850	1.9903	-0.27	67.392	67.283	0.16
1.000	653.197	1.9839	1.9889	-0.25	69.927	69.816	0.16
1.000	663.173	1.9828	1.9878	-0.25	72.429	72.309	0.17
1.000	673.170	1.9817	1.9864	-0.24	74.914	74.794	0.16
1.000	683.183	1.9806	1.9848	-0.21	77.385	77.271	0.15
1.000	693.164	1.9795	1.9832	-0.19	79.835	79.728	0.13
1.000	703.194	1.9784	1.9814	-0.15	82.279	82.186	0.11
1.000	713.184	1.9772	1.9797	-0.13	84.703	84.621	0.10
1.000	723.131	1.9761	1.9782	-0.11	87.110	87.039	0.08
1.000	558.086	2.3134	2.3176	-0.18	46.169	46.157	0.03
1.000	563.115	2.3127	2.3178	-0.22	47.941	47.921	0.04
1.000	573.105	2.3114	2.3218	-0.45	51.346	51.287	0.12
1.000	583.115	2.3101	2.3238	-0.59	54.667	54.565	0.19
1.000	593.100	2.3088	2.3245	-0.68	57.922	57.777	0.25
1.000	603.151	2.3075	2.3237	-0.70	61.147	60.969	0.29
1.000	613.136	2.3062	2.3225	-0.70	64.316	64.107	0.33
1.000	623.108	2.3050	2.3211	-0.69	67.451	67.217	0.35
1.000	633.110	2.3037	2.3190	-0.66	70.563	70.313	0.36
1.000	643.102	2.3024	2.3167	-0.62	73.645	73.387	0.35
1.000	653.121	2.3011	2.3140	-0.56	76.707	76.451	0.34
1.000	663.120	2.2998	2.3115	-0.51	79.747	79.493	0.32
1.000	673.206	2.2985	2.3083	-0.43	82.778	82.547	0.28
1.000	683.156	2.2972	2.3060	-0.38	85.770	85.547	0.26

Table 81. Comparison of Straty et al.[43] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	693.181	2.2960	2.3034	-0.32	88.758	88.559	0.22
1.000	703.183	2.2947	2.3008	-0.27	91.727	91.550	0.19
1.000	713.183	2.2934	2.2984	-0.22	94.682	94.530	0.16
1.000	723.185	2.2921	2.2956	-0.15	97.613	97.499	0.12
0.200	563.146	2.8151	2.8818	-2.31	49.214	49.136	0.16
0.200	573.142	2.8135	2.8710	-2.00	53.590	53.421	0.32
0.200	583.133	2.8120	2.8653	-1.86	57.841	57.589	0.44
0.200	593.117	2.8104	2.8599	-1.73	62.022	61.698	0.53
0.200	603.129	2.8088	2.8538	-1.58	66.160	65.782	0.58
0.200	613.129	2.8072	2.8483	-1.44	70.257	69.834	0.61
0.200	623.111	2.8056	2.8435	-1.33	74.319	73.857	0.63
0.200	633.126	2.8041	2.8383	-1.20	78.359	77.877	0.62
0.200	643.101	2.8025	2.8339	-1.11	82.367	81.863	0.62
0.200	653.170	2.8009	2.8284	-0.97	86.369	85.873	0.58
0.200	663.160	2.7994	2.8237	-0.86	90.327	89.841	0.54
0.200	673.115	2.7978	2.8196	-0.77	94.259	93.780	0.51
0.200	683.168	2.7962	2.8150	-0.67	98.196	97.746	0.46
0.200	693.108	2.7947	2.8114	-0.59	102.093	101.659	0.43
0.200	703.175	2.7931	2.8069	-0.49	105.995	105.610	0.36
0.200	713.196	2.7915	2.8030	-0.41	109.876	109.531	0.31
0.200	723.187	2.7899	2.7996	-0.35	113.740	113.431	0.27
0.200	563.052	3.2317	3.3083	-2.31	49.432	49.405	0.05
0.200	573.161	3.2299	3.2109	0.59	54.422	54.462	-0.07
0.200	583.169	3.2281	3.1957	1.01	59.254	59.381	-0.21
0.200	593.056	3.2263	3.1878	1.21	63.986	64.209	-0.35
0.200	603.139	3.2244	3.1794	1.42	68.765	69.114	-0.50
0.200	613.143	3.2226	3.1719	1.60	73.475	73.969	-0.67
0.200	623.126	3.2208	3.1655	1.75	78.154	78.805	-0.83
0.200	633.159	3.2190	3.1584	1.92	82.819	83.658	-1.00
0.200	643.108	3.2172	3.1532	2.03	87.445	88.463	-1.15
0.200	653.162	3.2154	3.1471	2.17	92.079	93.312	-1.32
0.200	663.178	3.2136	3.1413	2.30	96.677	98.136	-1.49
0.200	673.183	3.2118	3.1362	2.41	101.259	102.947	-1.64
0.200	683.142	3.2100	3.1315	2.51	105.808	107.729	-1.78
0.200	693.160	3.2082	3.1265	2.61	110.356	112.532	-1.93
0.200	703.182	3.2064	3.1216	2.72	114.885	117.330	-2.08
0.200	713.169	3.2046	3.1172	2.80	119.392	122.103	-2.22
0.200	723.169	3.2028	3.1128	2.89	123.882	126.874	-2.36
0.000	563.193	3.5377	4.0468	-12.58	49.667	49.567	0.20
0.200	573.131	3.5357	3.5637	-0.79	55.097	55.044	0.10
0.200	583.096	3.5338	3.5238	0.28	60.466	60.504	-0.06
0.200	593.116	3.5318	3.5020	0.85	65.819	65.991	-0.26
0.200	603.125	3.5298	3.4881	1.20	71.148	71.475	-0.46
0.200	613.127	3.5278	3.4774	1.45	76.458	76.960	-0.65
0.200	623.099	3.5258	3.4687	1.65	81.740	82.433	-0.84
0.200	633.149	3.5238	3.4597	1.85	87.032	87.952	-1.05
0.200	643.180	3.5218	3.4520	2.02	92.302	93.461	-1.24
0.200	653.162	3.5199	3.4457	2.15	97.547	98.946	-1.41
0.200	663.163	3.5179	3.4390	2.29	102.770	104.440	-1.60
0.200	673.149	3.5159	3.4333	2.41	107.984	109.923	-1.76
0.200	683.190	3.5139	3.4272	2.53	113.196	115.434	-1.94
0.200	693.155	3.5120	3.4222	2.62	118.374	120.902	-2.09
0.200	703.147	3.5100	3.4171	2.72	123.543	126.378	-2.24
0.200	713.181	3.5080	3.4120	2.81	128.714	131.872	-2.39
0.200	723.087	3.5061	3.4079	2.88	133.833	137.293	-2.52
0.000	563.107	4.0596	4.4215	-8.19	49.712	49.615	0.20
0.000	573.096	4.0573	4.1163	-1.43	56.164	56.040	0.22
0.000	583.100	4.0550	4.0954	-0.99	62.743	62.570	0.28
1.000	593.102	4.0527	4.0871	-0.84	69.390	69.163	0.33
1.000	603.154	4.0504	4.0792	-0.71	76.099	75.839	0.34
1.000	613.147	4.0481	4.0736	-0.63	82.808	82.514	0.36
1.000	623.101	4.0458	4.0688	-0.56	89.517	89.194	0.36
1.000	633.100	4.0435	4.0634	-0.49	96.261	95.930	0.35
1.000	643.145	4.0412	4.0568	-0.39	103.018	102.717	0.29
1.000	653.181	4.0389	4.0513	-0.31	109.785	109.513	0.25
1.000	663.148	4.0367	4.0459	-0.23	116.503	116.277	0.19

Table 81. Comparison of Straty et al.[43] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	673.143	4.0344	4.0414	-0.17	123.259	123.067	0.16
1.000	683.118	4.0321	4.0366	-0.11	129.985	129.850	0.10
1.000	693.179	4.0298	4.0305	-0.02	136.720	136.696	0.02
1.000	703.166	4.0276	4.0256	0.05	143.425	143.496	-0.05
1.000	713.114	4.0253	4.0210	0.11	150.102	150.266	-0.11
1.000	723.120	4.0230	4.0162	0.17	156.796	157.075	-0.18
0.000	563.117	4.4824	4.5670	-1.85	49.794	49.746	0.10
1.000	573.096	4.4799	4.4955	-0.35	57.086	57.042	0.08
1.000	583.111	4.4773	4.4884	-0.25	64.635	64.575	0.09
1.000	593.111	4.4748	4.4861	-0.25	72.313	72.221	0.13
1.000	603.101	4.4722	4.4838	-0.26	80.075	79.948	0.16
1.000	613.154	4.4696	4.4787	-0.20	87.919	87.793	0.14
1.000	623.108	4.4671	4.4758	-0.19	95.762	95.616	0.15
1.000	633.119	4.4646	4.4713	-0.15	103.661	103.529	0.13
1.000	643.171	4.4620	4.4658	-0.09	111.594	111.507	0.08
1.000	653.165	4.4595	4.4615	-0.04	119.521	119.470	0.04
1.000	663.182	4.4569	4.4566	0.01	127.463	127.471	-0.01
1.000	673.183	4.4544	4.4516	0.06	135.389	135.480	-0.07
1.000	683.167	4.4519	4.4469	0.11	143.312	143.489	-0.12
1.000	693.154	4.4494	4.4421	0.16	151.231	151.510	-0.18
1.000	703.184	4.4469	4.4372	0.22	159.171	159.574	-0.25
1.000	713.098	4.4444	4.4332	0.25	167.049	167.547	-0.30
1.000	723.157	4.4419	4.4282	0.31	174.988	175.640	-0.37
1.000	563.110	5.1007	5.1217	-0.41	50.711	50.644	0.13
1.000	573.107	5.0978	5.1187	-0.41	59.868	59.727	0.24
1.000	583.146	5.0948	5.1146	-0.39	69.365	69.161	0.30
1.000	593.154	5.0919	5.1127	-0.41	79.047	78.755	0.37
1.000	603.158	5.0889	5.1099	-0.41	88.851	88.479	0.42
1.000	613.179	5.0860	5.1056	-0.38	98.746	98.324	0.43
1.000	623.102	5.0831	5.1034	-0.40	108.665	108.152	0.47
1.000	633.118	5.0801	5.0993	-0.38	118.692	118.134	0.47
1.000	643.136	5.0772	5.0950	-0.35	128.758	128.172	0.46
1.000	653.160	5.0743	5.0901	-0.31	138.839	138.257	0.42
1.000	663.180	5.0714	5.0854	-0.28	148.940	148.372	0.38
1.000	673.146	5.0686	5.0815	-0.25	159.032	158.461	0.36
1.000	683.150	5.0657	5.0765	-0.21	169.123	168.604	0.31
1.000	693.159	5.0628	5.0716	-0.17	179.223	178.767	0.26
1.000	703.131	5.0600	5.0670	-0.14	189.300	188.907	0.21
1.000	713.151	5.0571	5.0619	-0.10	199.387	199.097	0.15
1.000	723.169	5.0543	5.0569	-0.05	209.457	209.294	0.08
1.000	563.142	5.1485	5.1565	-0.16	50.859	50.831	0.06
1.000	568.128	5.1470	5.1628	-0.31	55.479	55.393	0.15
1.000	573.180	5.1455	5.1633	-0.35	60.254	60.124	0.22
1.000	578.123	5.1440	5.1680	-0.47	65.046	64.827	0.34
1.000	583.117	5.1425	5.1685	-0.50	69.920	69.634	0.41
1.000	588.120	5.1410	5.1680	-0.52	74.846	74.498	0.47
1.000	593.112	5.1396	5.1678	-0.54	79.808	79.392	0.52
1.000	598.122	5.1381	5.1672	-0.56	84.822	84.336	0.58
1.000	603.178	5.1366	5.1644	-0.54	89.873	89.356	0.58
1.000	608.168	5.1351	5.1630	-0.54	94.908	94.336	0.61
1.000	613.135	5.1336	5.1620	-0.55	99.953	99.315	0.64
1.000	618.133	5.1321	5.1604	-0.55	105.036	104.346	0.66
1.000	623.160	5.1306	5.1580	-0.53	110.145	109.424	0.66
1.000	633.181	5.1277	5.1543	-0.52	120.401	119.597	0.67
1.000	643.143	5.1248	5.1512	-0.51	130.662	129.761	0.69
1.000	653.164	5.1218	5.1469	-0.49	140.980	140.025	0.68
1.000	663.146	5.1189	5.1429	-0.47	151.289	150.284	0.67
1.000	673.157	5.1160	5.1384	-0.44	161.627	160.600	0.64
1.000	563.094	5.5052	5.5095	-0.08	52.783	52.749	0.07
1.000	573.160	5.5019	5.5082	-0.11	63.611	63.531	0.13
1.000	583.092	5.4987	5.5094	-0.19	74.659	74.475	0.25
1.000	593.112	5.4955	5.5057	-0.19	85.936	85.716	0.26
1.000	603.113	5.4923	5.5021	-0.18	97.334	97.078	0.26
1.000	613.133	5.4891	5.4978	-0.16	108.838	108.572	0.24
1.000	623.106	5.4860	5.4941	-0.15	120.384	120.100	0.24
1.000	633.131	5.4828	5.4894	-0.12	132.014	131.753	0.20

Table 81. Comparison of Straty et al.[43] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	643.121	5.4797	5.4853	-0.10	143.668	143.421	0.17
1.000	653.095	5.4765	5.4814	-0.09	155.344	155.108	0.15
1.000	663.172	5.4734	5.4759	-0.04	167.084	166.954	0.08
1.000	673.151	5.4703	5.4716	-0.02	178.784	178.709	0.04
1.000	683.160	5.4672	5.4668	0.01	190.491	190.517	-0.01
1.000	693.175	5.4641	5.4618	0.04	202.193	202.344	-0.07
1.000	703.149	5.4610	5.4573	0.07	213.870	214.129	-0.12
1.000	713.133	5.4580	5.4525	0.10	225.527	225.937	-0.18
1.000	723.177	5.4549	5.4472	0.14	237.199	237.808	-0.26
1.000	558.170	5.7729	5.7533	0.34	49.589	49.794	-0.41
1.000	558.197	5.7729	5.7429	0.52	49.514	49.825	-0.62
1.000	563.088	5.7712	5.7595	0.20	55.385	55.540	-0.28
1.000	563.111	5.7712	5.7548	0.29	55.350	55.567	-0.39
1.000	573.111	5.7678	5.7593	0.15	67.423	67.582	-0.23
1.000	573.124	5.7678	5.7594	0.15	67.441	67.598	-0.23
1.000	583.114	5.7644	5.7583	0.11	79.735	79.880	-0.18
1.000	583.217	5.7643	5.7555	0.15	79.798	80.007	-0.26
1.000	593.120	5.7610	5.7561	0.09	92.229	92.372	-0.15
1.000	593.172	5.7610	5.7541	0.12	92.237	92.438	-0.22
1.000	603.147	5.7576	5.7528	0.08	104.866	105.028	-0.15
1.000	603.171	5.7576	5.7518	0.10	104.861	105.059	-0.19
1.000	613.139	5.7543	5.7491	0.09	117.546	117.748	-0.17
1.000	613.155	5.7543	5.7496	0.08	117.586	117.768	-0.15
1.000	623.108	5.7509	5.7470	0.07	130.343	130.514	-0.13
1.000	623.129	5.7509	5.7463	0.08	130.340	130.542	-0.15
1.000	633.122	5.7476	5.7432	0.08	143.190	143.407	-0.15
1.000	633.131	5.7476	5.7423	0.09	143.158	143.418	-0.18
1.000	643.176	5.7443	5.7378	0.11	156.052	156.401	-0.22
1.000	643.200	5.7443	5.7384	0.10	156.111	156.432	-0.21
1.000	653.072	5.7411	5.7357	0.09	168.911	169.230	-0.19
1.000	653.190	5.7410	5.7339	0.12	168.963	169.380	-0.25
1.000	663.106	5.7378	5.7307	0.12	181.812	182.264	-0.25
1.000	663.185	5.7378	5.7300	0.14	181.868	182.368	-0.27
1.000	673.153	5.7345	5.7259	0.15	194.747	195.335	-0.30
1.000	673.166	5.7345	5.7260	0.15	194.770	195.352	-0.30
1.000	683.091	5.7313	5.7220	0.16	207.600	208.282	-0.33
1.000	683.187	5.7313	5.7211	0.18	207.661	208.409	-0.36
1.000	693.117	5.7280	5.7171	0.19	220.492	221.345	-0.39
1.000	693.125	5.7280	5.7172	0.19	220.510	221.356	-0.38
1.000	703.143	5.7248	5.7123	0.22	233.378	234.419	-0.44
1.000	703.176	5.7248	5.7119	0.23	233.391	234.463	-0.46
1.000	713.157	5.7216	5.7074	0.25	246.228	247.475	-0.50
1.000	713.160	5.7216	5.7076	0.24	246.247	247.479	-0.50
1.000	723.120	5.7184	5.7035	0.26	259.074	260.457	-0.53
1.000	723.140	5.7184	5.7026	0.28	259.020	260.483	-0.56
1.000	563.115	6.0634	6.0595	0.06	60.614	60.700	-0.14
1.000	573.124	6.0598	6.0594	0.01	74.366	74.378	-0.02
1.000	583.119	6.0562	6.0581	-0.03	88.338	88.274	0.07
1.000	593.121	6.0526	6.0559	-0.05	102.476	102.345	0.13
1.000	603.144	6.0490	6.0529	-0.06	116.744	116.567	0.15
1.000	613.142	6.0455	6.0495	-0.07	131.053	130.848	0.16
1.000	623.125	6.0420	6.0470	-0.08	145.462	145.178	0.20
1.000	633.155	6.0385	6.0430	-0.07	159.909	159.628	0.18
1.000	643.181	6.0350	6.0387	-0.06	174.367	174.112	0.15
1.000	653.177	6.0316	6.0348	-0.05	188.827	188.587	0.13
1.000	663.146	6.0282	6.0311	-0.05	203.271	203.041	0.11
1.000	673.174	6.0247	6.0267	-0.03	217.754	217.586	0.08
1.000	683.177	6.0213	6.0223	-0.02	232.197	232.106	0.04
1.000	693.170	6.0179	6.0178	0.00	246.604	246.611	-0.00
1.000	703.183	6.0145	6.0132	0.02	261.011	261.139	-0.05
1.000	713.172	6.0112	6.0090	0.04	275.396	275.631	-0.09
1.000	543.117	6.3732	6.3592	0.22	38.819	39.089	-0.69
1.000	548.178	6.3713	6.3633	0.13	46.302	46.493	-0.41
1.000	553.142	6.3693	6.3667	0.04	53.867	53.940	-0.14
1.000	558.114	6.3674	6.3673	0.00	61.518	61.522	-0.01
1.000	563.100	6.3655	6.3673	-0.03	69.275	69.212	0.09
1.000	568.176	6.3635	6.3647	-0.02	77.155	77.109	0.06

Table 81. Comparison of Straty et al.[43] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	573.159	6.3616	6.3638	-0.03	85.011	84.918	0.11
1.000	583.123	6.3578	6.3626	-0.08	100.895	100.660	0.23
1.000	593.139	6.3541	6.3593	-0.08	116.908	116.620	0.25
1.000	603.170	6.3503	6.3553	-0.08	133.004	132.694	0.23
1.000	613.125	6.3466	6.3524	-0.09	149.115	148.717	0.27
1.000	623.128	6.3429	6.3487	-0.09	165.302	164.869	0.26
1.000	633.150	6.3393	6.3446	-0.08	181.528	181.095	0.24
1.000	643.179	6.3356	6.3404	-0.08	197.769	197.347	0.21
1.000	653.135	6.3320	6.3367	-0.07	213.939	213.500	0.21
1.000	663.173	6.3284	6.3323	-0.06	230.187	229.794	0.17
1.000	673.121	6.3249	6.3286	-0.06	246.337	245.947	0.16
1.000	543.136	6.5215	6.5092	0.19	42.236	42.566	-0.78
1.000	553.115	6.5175	6.5145	0.05	58.459	58.565	-0.18
1.000	563.136	6.5135	6.5136	-0.00	75.031	75.026	0.01
1.000	573.093	6.5096	6.5119	-0.04	91.733	91.616	0.13
1.000	583.127	6.5057	6.5087	-0.05	108.664	108.492	0.16
1.000	593.109	6.5018	6.5058	-0.06	125.646	125.386	0.21
1.000	603.090	6.4980	6.5031	-0.08	142.724	142.363	0.25
1.000	613.123	6.4942	6.4994	-0.08	159.891	159.485	0.25
1.000	623.118	6.4904	6.4961	-0.09	177.061	176.578	0.27
1.000	633.116	6.4867	6.4926	-0.09	194.249	193.709	0.28
1.000	643.115	6.4830	6.4890	-0.09	211.441	210.855	0.28
1.000	653.108	6.4793	6.4851	-0.09	228.603	227.994	0.27
1.000	663.122	6.4756	6.4808	-0.08	245.748	245.166	0.24
1.000	673.148	6.4720	6.4763	-0.07	262.865	262.360	0.19
1.000	683.160	6.4683	6.4722	-0.06	279.983	279.501	0.17
1.000	693.194	6.4646	6.4677	-0.05	297.069	296.659	0.14
1.000	703.177	6.4610	6.4635	-0.04	314.058	313.715	0.11
1.000	713.183	6.4573	6.4591	-0.03	331.025	330.767	0.08
1.000	723.129	6.4537	6.4547	-0.02	347.850	347.696	0.04
0.000	538.082	6.8063	6.7911	0.22	42.811	43.406	-1.37
0.000	543.109	6.8041	6.7927	0.17	52.019	52.523	-0.96
0.000	548.142	6.8020	6.7919	0.15	61.268	61.761	-0.80
1.000	553.104	6.7999	6.7918	0.12	70.515	70.942	-0.60
1.000	563.141	6.7957	6.7891	0.10	89.274	89.676	-0.45
1.000	573.107	6.7916	6.7872	0.06	108.124	108.430	-0.28
1.000	583.110	6.7875	6.7844	0.05	127.116	127.353	-0.19
1.000	593.136	6.7835	6.7814	0.03	146.214	146.392	-0.12
1.000	603.180	6.7795	6.7782	0.02	165.388	165.509	-0.07
1.000	613.132	6.7756	6.7753	0.00	184.449	184.481	-0.02
1.000	623.138	6.7717	6.7721	-0.01	203.615	203.569	0.02
1.000	633.087	6.7678	6.7689	-0.02	222.676	222.544	0.06
1.000	643.147	6.7639	6.7645	-0.01	241.797	241.727	0.03
1.000	653.198	6.7600	6.7604	-0.01	260.923	260.874	0.02
1.000	663.170	6.7562	6.7563	-0.00	279.876	279.856	0.01
1.000	673.179	6.7524	6.7523	0.00	298.873	298.880	-0.00
1.000	683.168	6.7486	6.7481	0.01	317.762	317.832	-0.02
1.000	693.188	6.7447	6.7440	0.01	336.674	336.790	-0.03
0.000	528.138	7.0019	6.9889	0.19	32.264	32.826	-1.71
0.000	533.117	6.9997	6.9900	0.14	42.065	42.537	-1.11
0.000	538.155	6.9975	6.9882	0.13	51.999	52.500	-0.95
1.000	543.185	6.9953	6.9867	0.12	62.034	62.538	-0.81
1.000	548.192	6.9931	6.9851	0.11	72.090	72.596	-0.70
1.000	553.118	6.9909	6.9852	0.08	82.147	82.536	-0.47
1.000	558.136	6.9888	6.9836	0.07	92.333	92.710	-0.41
1.000	563.150	6.9866	6.9818	0.07	102.531	102.899	-0.36
1.000	568.122	6.9845	6.9807	0.06	112.719	113.031	-0.28
1.000	573.159	6.9824	6.9788	0.05	123.006	123.318	-0.25
1.000	583.161	6.9782	6.9762	0.03	143.590	143.781	-0.13
1.000	593.112	6.9741	6.9737	0.01	164.140	164.181	-0.02
1.000	603.167	6.9700	6.9698	0.00	184.792	184.813	-0.01
1.000	613.177	6.9660	6.9663	-0.00	205.395	205.363	0.02
1.000	623.127	6.9620	6.9633	-0.02	225.945	225.778	0.07
1.000	633.176	6.9580	6.9593	-0.02	246.548	246.380	0.07
1.000	643.140	6.9540	6.9554	-0.02	266.969	266.776	0.07
1.000	653.150	6.9501	6.9514	-0.02	287.446	287.248	0.07
1.000	663.124	6.9461	6.9476	-0.02	307.831	307.591	0.08

Table 81. Comparison of Straty et al[43] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	673.158	6.9422	6.9433	-0.02	328.211	328.031	0.05
0.000	523.141	7.1334	1.0922	553.14	29.682	28.888	2.75
1.000	528.152	7.1091	7.1027	0.09	37.697	38.037	-0.89
1.000	533.167	7.1069	7.0986	0.12	47.923	48.405	-1.00
1.000	538.156	7.1046	7.0976	0.10	58.364	58.807	-0.75
1.000	543.134	7.1024	7.0963	0.09	68.841	69.259	-0.60
1.000	548.153	7.1001	7.0944	0.08	79.426	79.840	-0.52
1.000	553.131	7.0979	7.0934	0.06	90.030	90.377	-0.38
1.000	558.160	7.0957	7.0914	0.06	100.696	101.053	-0.35
1.000	563.133	7.0936	7.0902	0.05	111.342	111.638	-0.27
1.000	568.121	7.0914	7.0889	0.04	122.031	122.264	-0.19
1.000	573.178	7.0893	7.0864	0.04	132.786	133.061	-0.21
1.000	578.125	7.0872	7.0855	0.02	143.458	143.628	-0.12
1.000	583.132	7.0851	7.0840	0.02	154.218	154.332	-0.07
1.000	588.132	7.0830	7.0826	0.01	164.976	165.025	-0.03
1.000	593.162	7.0809	7.0806	0.00	175.754	175.784	-0.02
1.000	598.118	7.0788	7.0795	-0.01	186.462	186.382	0.04
1.000	603.117	7.0768	7.0780	-0.02	197.225	197.083	0.07
1.000	608.126	7.0747	7.0761	-0.02	207.968	207.792	0.08
1.000	613.119	7.0727	7.0744	-0.02	218.699	218.473	0.10
1.000	618.138	7.0706	7.0725	-0.03	229.442	229.192	0.11
1.000	623.167	7.0686	7.0703	-0.02	240.177	239.939	0.10
0.000	508.160	7.4407	7.6073	-2.19	24.527	12.679	93.45
0.000	513.117	7.4386	7.4686	-0.40	26.376	24.287	8.60
0.000	518.169	7.4138	7.4223	-0.11	35.254	34.641	1.77
1.000	523.107	7.4114	7.4158	-0.06	46.666	46.323	0.74
1.000	533.117	7.4067	7.4104	-0.05	70.533	70.201	0.47
1.000	543.096	7.4020	7.4061	-0.05	94.541	94.135	0.43
1.000	553.117	7.3974	7.4016	-0.06	118.699	118.241	0.39
1.000	563.118	7.3929	7.3976	-0.06	142.894	142.327	0.40
1.000	573.103	7.3884	7.3941	-0.08	167.107	166.367	0.45
1.000	583.105	7.3841	7.3906	-0.09	191.355	190.450	0.48
1.000	593.105	7.3797	7.3869	-0.10	215.553	214.478	0.50
1.000	603.109	7.3755	7.3834	-0.11	239.740	238.500	0.52
1.000	613.201	7.3712	7.3791	-0.11	263.978	262.667	0.50
1.000	623.119	7.3670	7.3758	-0.12	287.912	286.362	0.54
1.000	633.115	7.3628	7.3719	-0.12	311.867	310.183	0.54
1.000	643.115	7.3586	7.3678	-0.12	335.718	333.942	0.53
0.000	503.175	7.7826	7.7784	0.05	26.438	26.857	-1.56
1.000	508.175	7.7575	7.7588	-0.02	38.558	38.421	0.36
1.000	513.181	7.7549	7.7553	-0.01	52.287	52.242	0.09
1.000	518.114	7.7524	7.7532	-0.01	65.983	65.889	0.14
1.000	523.182	7.7499	7.7492	0.01	79.837	79.927	-0.11
1.000	528.127	7.7474	7.7472	0.00	93.588	93.617	-0.03
1.000	533.108	7.7449	7.7450	-0.00	107.424	107.404	0.02
1.000	538.151	7.7425	7.7420	0.01	121.296	121.371	-0.06
1.000	543.183	7.7401	7.7395	0.01	135.203	135.293	-0.07
1.000	548.138	7.7377	7.7378	-0.00	148.996	148.982	0.01
1.000	548.137	7.7377	7.7381	-0.01	149.040	148.980	0.04
1.000	553.059	7.7354	7.7367	-0.02	162.779	162.573	0.13
1.000	553.125	7.7354	7.7361	-0.01	162.867	162.760	0.07
1.000	558.127	7.7330	7.7342	-0.02	176.737	176.546	0.11
1.000	563.115	7.7307	7.7324	-0.02	190.572	190.289	0.15
1.000	568.159	7.7284	7.7300	-0.02	204.439	204.168	0.13
1.000	573.152	7.7261	7.7280	-0.03	218.224	217.881	0.16
1.000	583.121	7.7216	7.7248	-0.04	245.804	245.208	0.24
1.000	593.129	7.7172	7.7208	0.05	273.287	272.568	0.26
1.000	603.176	7.7127	7.7166	-0.05	300.737	299.917	0.27
1.000	613.174	7.7083	7.7124	-0.05	327.936	327.044	0.27
1.000	623.125	7.7038	7.7088	-0.07	355.060	353.908	0.33
1.000	473.147	8.4514	8.4517	-0.00	16.955	16.910	0.26
1.000	478.174	8.4251	8.4270	-0.02	31.810	31.465	1.10
1.000	483.175	8.4221	8.4222	-0.00	49.919	49.894	0.05
1.000	488.169	8.4192	8.4180	0.01	68.010	68.249	-0.35
1.000	493.188	8.4163	8.4139	0.03	86.160	86.632	-0.54

Table 81. Comparison of Straty et al.[43] $P\rho T$ compressibility data with values calculated from Eq. (6) - Continued

Wt.	T K	ρ mol/L	$\rho(calc)$ mol/L	% Dev.	P bar	$P(calc)$ bar	% Dev.
1.000	498.187	8.4135	8.4106	0.03	104.286	104.891	-0.58
1.000	503.128	8.4108	8.4080	0.03	122.290	122.887	-0.49
1.000	508.176	8.4080	8.4046	0.04	140.434	141.196	-0.54
1.000	513.112	8.4054	8.4024	0.04	158.377	159.065	-0.43
1.000	518.106	8.4028	8.4000	0.03	176.427	177.087	-0.37
1.000	523.110	8.4002	8.3973	0.03	194.387	195.084	-0.36
1.000	528.119	8.3976	8.3952	0.03	212.431	213.038	-0.28
1.000	533.110	8.3951	8.3930	0.02	230.359	230.888	-0.23
1.000	543.137	8.3901	8.3883	0.02	266.096	266.578	-0.18
1.000	553.115	8.3852	8.3842	0.01	301.593	301.882	-0.10
1.000	563.202	8.3802	8.3794	0.01	337.093	337.328	-0.07
0.000	443.165	8.9991	9.0123	-0.15	8.862	5.316	66.71
0.000	448.145	8.9940	8.9940	-0.00	28.448	28.438	0.03
0.000	453.121	8.9684	8.9784	-0.11	48.394	45.603	6.12
0.000	458.164	8.9651	8.9732	-0.09	71.280	68.975	3.34
0.000	463.118	8.9620	8.9693	-0.08	93.969	91.817	2.34
0.000	468.166	8.9588	8.9650	-0.07	116.792	114.929	1.62
0.000	473.169	8.9558	8.9612	-0.06	139.428	137.743	1.22
0.000	478.112	8.9529	8.9585	-0.06	161.948	160.170	1.11
1.000	483.171	8.9500	8.9548	-0.05	184.582	183.015	0.86
1.000	488.140	8.9472	8.9520	-0.05	206.965	205.346	0.79
1.000	493.117	8.9444	8.9495	-0.06	229.339	227.598	0.76
1.000	498.141	8.9417	8.9466	-0.05	251.692	249.989	0.68
1.000	503.153	8.9390	8.9440	-0.06	273.997	272.215	0.65
1.000	508.125	8.9363	8.9416	-0.06	296.101	294.149	0.66
1.000	513.136	8.9336	8.9391	-0.06	318.232	316.160	0.66
1.000	518.162	8.9309	8.9366	-0.06	340.318	338.139	0.64
0.000	423.155	9.3634	9.3669	-0.04	10.774	9.564	12.65
0.000	428.144	9.3360	9.3424	-0.07	31.007	28.753	7.84
0.000	433.154	9.3324	9.3358	-0.04	57.232	56.004	2.19
0.000	438.157	9.3289	9.3308	-0.02	83.704	82.999	0.85
0.000	443.118	9.3255	9.3268	-0.01	110.045	109.563	0.44
1.000	448.153	9.3222	9.3224	-0.00	136.439	136.359	0.06
1.000	453.164	9.3191	9.3185	0.01	162.657	162.894	-0.15
1.000	458.130	9.3160	9.3153	0.01	188.699	188.990	-0.15
1.000	463.160	9.3130	9.3118	0.01	214.804	215.296	-0.23
1.000	468.139	9.3101	9.3089	0.01	240.677	241.194	-0.21
1.000	473.125	9.3072	9.3061	0.01	266.491	266.967	-0.18
1.000	478.161	9.3044	9.3029	0.02	292.256	292.896	-0.22
1.000	483.111	9.3015	9.3007	0.01	317.804	318.168	-0.11
1.000	488.129	9.2987	9.2979	0.01	343.354	343.705	-0.10

439 data points, $|\Delta\rho/\rho|$ rms = 0.386%, $\Delta\rho/\rho$ av. = -0.03%, $|\Delta P/P|$ av. = 0.26%, weight = 80.13%

Table 9. The critical isotherm for benzene

ρ/ρ_c	P bar	Z	$\partial P/\partial \rho$ bar·L/mol	$\partial \rho/\partial T$ mol/(L·K)	$\partial P/\partial T$ bar/K	$\partial^2 P/\partial T^2$ bar/K^2
0.50	45.603	0.50070	6.80628	-0.4057E-01	0.27615	-0.001155
0.52	46.102	0.48672	6.00622	-0.4850E-01	0.29129	-0.001343
0.54	46.542	0.47315	5.26535	-0.5823E-01	0.30659	-0.001561
0.56	46.925	0.46002	4.58252	-0.7027E-01	0.32202	-0.001815
0.58	47.258	0.44730	3.95648	-0.8531E-01	0.33755	-0.002111
0.60	47.544	0.43501	3.38581	-0.1043E+00	0.35315	-0.002460
0.62	47.787	0.42313	2.86899	-0.1285E+00	0.36879	-0.002873
0.64	47.993	0.41167	2.40437	-0.1599E+00	0.38445	-0.003364
0.66	48.164	0.40062	1.99018	-0.2010E+00	0.40009	-0.003954
0.68	48.305	0.38997	1.62450	-0.2559E+00	0.41566	-0.004669
0.70	48.418	0.37973	1.30520	-0.3303E+00	0.43114	-0.005544
0.72	48.509	0.36987	1.02998	-0.4335E+00	0.44649	-0.006626
0.74	48.580	0.36040	0.79625	-0.5798E+00	0.46165	-0.007981
0.76	48.634	0.35131	0.60118	-0.7928E+00	0.47659	-0.009705
0.78	48.675	0.34258	0.44161	-0.1112E+01	0.49126	-0.011935
0.80	48.704	0.33422	0.31414	-0.1609E+01	0.50559	-0.014875
0.82	48.725	0.32621	0.21509	-0.2415E+01	0.51954	-0.018846
0.84	48.738	0.31853	0.14063	-0.3790E+01	0.53303	-0.024363
0.86	48.747	0.31118	0.08683	-0.6288E+01	0.54598	-0.032309
0.88	48.752	0.30414	0.04982	-0.1121E+02	0.55833	-0.044295
0.90	48.755	0.29740	0.02591	-0.2200E+02	0.56996	-0.063537
0.92	48.757	0.29094	0.01171	-0.4961E+02	0.58076	-0.097289
0.94	48.757	0.28475	0.00425	-0.1391E+03	0.59056	-0.165151
0.96	48.757	0.27882	0.00103	-0.5804E+03	0.59912	-0.338353
0.98	48.758	0.27313	0.00009	-0.6607E+04	0.60601	-1.113947
1.00	48.758	0.26767	0.00000		0.60976	0.000752
1.02	48.758	0.26242	0.00024	-0.2564E+04	0.61393	0.588976
1.04	48.758	0.25737	0.00246	-0.2530E+03	0.62145	0.200673
1.06	48.758	0.25252	0.00954	-0.6613E+02	0.63093	0.107882
1.08	48.759	0.24785	0.02505	-0.2563E+02	0.64204	0.069918
1.10	48.762	0.24336	0.05320	-0.1231E+02	0.65466	0.050175
1.12	48.768	0.23904	0.09873	-0.6773E+01	0.66872	0.038441
1.14	48.778	0.23490	0.16706	-0.4096E+01	0.68420	0.030794
1.16	48.795	0.23093	0.26417	-0.2654E+01	0.70109	0.025484
1.18	48.820	0.22713	0.39668	-0.1814E+01	0.71941	0.021617
1.20	48.858	0.22352	0.57176	-0.1293E+01	0.73916	0.018694
1.22	48.911	0.22009	0.79716	-0.9539E+00	0.76038	0.016418
1.24	48.984	0.21686	1.08117	-0.7243E+00	0.78308	0.014600
1.26	49.081	0.21385	1.43261	-0.5635E+00	0.80729	0.013117
1.28	49.209	0.21105	1.86079	-0.4477E+00	0.83303	0.011886
1.30	49.374	0.20850	2.37550	-0.3622E+00	0.86033	0.010847
1.32	49.582	0.20621	2.98695	-0.2977E+00	0.88921	0.009957
1.34	49.843	0.20420	3.70576	-0.2482E+00	0.91970	0.009186
1.36	50.163	0.20249	4.54293	-0.2095E+00	0.95181	0.008509
1.38	50.555	0.20111	5.50979	-0.1789E+00	0.98557	0.007909
1.40	51.027	0.20009	6.61803	-0.1543E+00	1.02100	0.007372
1.42	51.591	0.19945	7.87960	-0.1343E+00	1.05811	0.006886
1.44	52.260	0.19923	9.30675	-0.1179E+00	1.09692	0.006444
1.46	53.048	0.19947	10.91199	-0.1042E+00	1.13744	0.006038
1.48	53.967	0.20018	12.70808	-0.9283E-01	1.17968	0.005662
1.50	55.035	0.20142	14.70803	-0.8320E-01	1.22366	0.005313

Table 10. Chao[69] ideal gas state data for benzene

T	$H^\circ(T)-H^\circ_0$		%	$S^\circ(T)$		%	$C^\circ_p(T)$		%
K	J/mol		Dev.	J/(mol·K)		Dev.	J/(mol·K)		Dev.
	Data	Calc.		Data	Calc.		Data	Calc.	
50.0	1662.9	1663.2	-0.02	190.430	190.444	-0.01	33.27	33.26	0.03
100.0	3354.8	3352.8	0.06	213.810	213.796	0.01	35.11	35.11	0.00
150.0	5260.4	5261.6	-0.02	229.170	229.181	-0.00	41.94	42.00	-0.14
200.0	7622.7	7623.2	-0.01	242.690	242.692	-0.00	53.17	53.11	0.11
273.2	12270.0	12269.2	0.01	262.320	262.316	0.00	74.55	74.58	-0.04
298.2	14233.0	14232.5	0.00	269.190	269.188	0.00	82.44	82.49	-0.06
300.0	14386.0	14385.6	0.00	269.700	269.700	-0.00	83.02	83.07	-0.06
400.0	24240.0	24240.5	-0.00	297.840	297.841	-0.00	113.52	113.45	0.06
500.0	36929.0	36917.1	0.03	326.050	326.021	0.01	139.35	139.22	0.09
600.0	51939.0	51919.4	0.04	353.360	353.316	0.01	160.09	160.07	0.01
700.0	68812.0	68797.2	0.02	379.330	379.299	0.01	176.78	176.89	-0.06
800.0	87195.0	87193.9	0.00	403.860	403.844	0.00	190.45	190.59	-0.07
900.0	106830.0	106836.3	-0.01	426.970	426.967	0.00	201.82	201.91	-0.04
1000.0	127500.0	127514.9	-0.01	448.740	448.745	-0.00	211.41	211.39	0.01
1100.0	149060.0	149067.6	-0.00	469.280	469.281	-0.00	219.56	219.45	0.05
1200.0	171370.0	171366.8	0.00	488.690	488.679	0.00	226.52	226.37	0.07
1300.0	194330.0	194310.9	0.01	507.070	507.041	0.01	232.49	232.38	0.05
1400.0	217840.0	217817.7	0.01	524.490	524.459	0.01	237.65	237.65	0.00
1500.0	241840.0	241819.6	0.00	541.040	541.017	0.00	242.11	242.30	-0.08

Table 11. Interpolated ideal gas state functions for benz

T	$U^\circ(T)-U^\circ_0$	$H^\circ(T)-H^\circ_0$	$S^\circ(T)$	$C^\circ_v(T)$	C
K	J/mol	J/mol	J/(mol·K)	J/(mol·K)	J/(r
200.0	5960.3	7623.2	242.692	44.80	5
220.0	6909.8	8739.0	248.006	50.23	5
240.0	7972.0	9967.5	253.347	56.05	6
260.0	9153.8	11315.6	258.738	62.16	7
280.0	10459.4	12787.5	264.190	68.43	7
300.0	11891.2	14385.6	269.700	74.76	8
320.0	13449.7	16110.3	275.263	81.07	8
340.0	15133.7	17960.6	280.870	87.31	9
360.0	16941.2	19934.4	286.509	93.42	10
380.0	18869.4	22028.9	292.170	99.37	10
400.0	20914.7	24240.5	297.841	105.13	11
420.0	23073.5	26565.5	303.512	110.70	11
440.0	25341.5	28999.9	309.173	116.06	12
460.0	27714.6	31539.3	314.816	121.22	12
480.0	30188.8	34179.8	320.434	126.16	13
500.0	32759.8	36917.1	326.021	130.90	13
520.0	35423.6	39747.2	331.570	135.44	14
540.0	38176.3	42666.1	337.078	139.79	14
560.0	41014.1	45670.2	342.540	143.96	15
580.0	43933.4	48755.8	347.953	147.94	15
600.0	46930.7	51919.4	353.316	151.76	16
620.0	50002.7	55157.7	358.624	155.41	16
640.0	53146.2	58467.5	363.878	158.92	16
660.0	56358.4	61845.9	369.076	162.27	17
680.0	59636.2	65290.0	374.216	165.49	17
700.0	62977.1	68797.2	379.299	168.58	17
720.0	66378.4	72364.9	384.324	171.54	17
740.0	69837.8	75990.6	389.291	174.38	18
760.0	73353.1	79672.1	394.200	177.12	18
780.0	76921.9	83407.2	399.051	179.75	18
800.0	80542.3	87193.9	403.844	182.28	19
820.0	84212.3	91030.2	408.581	184.71	19
840.0	87930.1	94914.3	413.261	187.06	19
860.0	91694.0	98844.5	417.884	189.31	19
880.0	95502.2	102819.0	422.453	191.49	19
900.0	99353.2	106836.3	426.967	193.60	20
920.0	103245.5	110894.9	431.427	195.62	20
940.0	107177.7	114993.3	435.834	197.58	20
960.0	111148.4	119130.4	440.189	199.48	20
980.0	115156.4	123304.6	444.492	201.31	20
1000.0	119200.4	127514.9	448.745	203.08	21

Table 12. Comparison of specific heats for saturated liquid benzene with calculated values

Oliver[20], C_σ			
T	C_σ	$C_\sigma(calc)$	%
K	J/(mol·K)	J/(mol·K)	Dev.
278.68	131.88	132.15	-0.20
279.99	132.17	132.40	-0.17
289.99	134.31	134.37	-0.05
298.15	136.05	136.11	-0.04
299.99	136.48	136.51	-0.03
309.99	138.74	138.80	-0.05
319.99	140.96	141.22	-0.19
329.99	143.34	143.76	-0.30
339.99	145.90	146.41	-0.35
349.99	148.53	149.15	-0.41
353.25	149.37	150.06	-0.46

San Jose[70], C_p			
T	C_p	$C_p(calc)$	%
K	J/(mol·K)	J/(mol·K)	Dev.
433.15	173.41	175.46	-1.17
453.15	182.79	182.86	-0.04
463.15	188.25	186.93	0.71
473.15	193.72	191.37	1.23
483.15	200.75	196.39	2.22
493.15	208.54	202.26	3.10

$$\Delta C_v = -T\int\left(\frac{\partial^2 P}{\partial T^2}\right)\frac{d\rho}{\rho^2}, \tag{13}$$

$$\Delta S = R\ln\left[\frac{P^\circ}{(\rho RT)}\right] + \int_0^\rho \left[R - \left(\frac{\partial P}{\partial T}\right)/\rho\right]\frac{d\rho}{\rho}. \tag{14}$$

Equation (14) is for use with initial entropies in hypothetical ideal gas states at $P^\circ = 1$ atm (1.013 25 bar). For all other initial states we use

$$\Delta S = -\int\left(\frac{\partial P}{\partial T}\right)\frac{d\rho}{\rho^2}. \tag{14a}$$

In each (ρ,T) state, reached by above integrations, we compute

$$H = U + P/\rho, \tag{15}$$

$$C_p = C_v + T\left[\left(\frac{\partial P}{\partial T}\right)^2 / \left(\frac{\partial P}{\partial \rho}\right)\right]/\rho^2, \tag{16}$$

$$W^2 = C_p\left(\frac{\partial P}{\partial \rho}\right)/C_v. \tag{17}$$

The fugacity/pressure ratio, f/P, for any state is computed by reference to the hypothetical ideal gas state at the same temperature and at $P^\circ \equiv 1$ atm (1.013 25 bar):

$$f/P = (P^\circ/P)\exp(\Delta G/RT),$$
$$\Delta G = (H - U_0^\circ) - H^\circ - T(S - S^\circ), \tag{18}$$

where ΔG is the isothermal Gibbs free-energy change, and the selected value U_0° was added to the tabulated values for $H(\rho,T)$ relative to $(H^\circ - H_0^\circ)$ from Eq. (7).

3.3.b. The Saturated Liquid

At temperatures from the triple point to the critical point, thermodynamic functions for the saturated vapor are obtained via Eqs. (12)–(15). Then Eq. (8) for the enthalpy of vaporization, $\Delta_{vap}H$, is used to compute

$$\Delta H = -\Delta_{vap}H, \quad \Delta S = \Delta H/T, \tag{19}$$

such that the free-energy of vaporization, $\Delta G \equiv \Delta H - T\Delta S$, is zero. See Sec. 3.2 for consistency of the formulations. Having obtained H and S for the saturated liquid, $U = H - Pv$ is computed.

The single-phase isochoric specific heat, $C_v(T)_\sigma$, at the saturated liquid boundary, is obtained via Eq. (11) for $C_\sigma(T)$ and the relation

$$C_v(T)_\sigma = C_\sigma(T) + T\left(\frac{\partial P}{\partial T}\right)\left(\frac{d\rho_l}{dT}\right)/\rho_l^2, \tag{20}$$

where ρ_l is density of the saturated liquid. Values for $C_p(\rho,T)$ and $W(\rho,T)$ at this boundary follow from Eqs. (16) and (17).

3.3.c. The Compressed Liquid

Starting with the above values for U, S, and $C_v(T)_\sigma$ on the saturated liquid boundary at $T < T_c$, we use Eqs. (12), (13), and (14a) to integrate along isotherms, and then obtain H, C_p, and W via Eqs. (15)–(17).

3.4. Comparisons

Specific heats $C_\sigma(T)$ for saturated liquid were measured by Oliver *et al.*[20] up to 353 K. San Jose *et al.*[70] give $C_p(T)$ at this boundary from 433 to 493 K. Table 12 gives comparisons using Eq. (11), which is based on derived entropies for the saturated liquid. Differences of only a few percent are quite acceptable for these exacting computations.

Enthalpy data for the coexisting vapor (gas) and liquid phases, reported by Gorbunova *et al.*,[54] are compared with computed results in Table 13. We added 2.8 kJ/mol to their enthalpies to obtain correspondence with our values. Differences are on the order of 0.1 kJ/mol. Their enthalpies along isotherms are compared with computed results in Table 14. Differences are on the order of 0.1 to 0.3 kJ/mol.

Enthalpy data for the coexisting vapor (gas) and liquid phases, reported by Lenoir *et al.*,[72] are compared with computed results in Table 15. We subtracted 0.073 kJ/mol from their enthalpies. Differences are on the order of 0.1 to 0.2 kJ/mol. Their enthalpies along isotherms are compared with computed results in Table 16. Most differences again are on the order of a few tenths of 1 kJ/mol.

Isobaric heat capacities of Rastorguev *et al.*[73] are compared with computed results in the first part of Table 17. In the second part comparisons are made with some data along isobars, selected from the copious measurements reported by Akhundov and Sultanov,[74] and by Mamedov *et al.*[59,75,76] Figure 6 gives comparisons of these data along the 60 bar isobar to show that the computed maximum agrees well with experiment.

Speeds of sound at coexistence are compared in Table 18 with data of Zotov *et al.*,[77,78] Aniskin,[79] and Bobik.[80] Table 19 gives comparisons of the EOS with data along isotherms of Aniskin,[79] Makita and Takagi,[26] Otpushchennikov *et al.*,[81] Bobik,[80] and of Pankevich[82] and Pankevich and Zotov.[83] Whereas some deviations are systematic, agreements, generally within a few percent, are reasonable for this exacting computation. Appendix A gives a comprehensive list of references for specific heats,[6,20,31,53,59,69,70,73–76,84–87] for enthalpies of vaporization,[31,39,49–54,72,88,89] and for sound speeds[26,77,79–83,90,91] of benzene.

4. Tables of Thermophysical Properties

All of the following tabulated properties are interpolated or extrapolated in ranges where no $P\rho T$ compressibility data exist as shown in Table 7.

4.1. Joule-Thomson Inversion Locus

The P–ρ–T locus of the Joule–Thomson inversion, $(\partial T/\partial P)_H = 0$, is presented in Table 20. This is computed using the EOS. For each temperature, the density is iterated to satisfy the condition $T(\partial P/\partial T) = \rho(\partial P/\partial \rho)$, by starting with an initial trial density, ρ_i,

$$\rho_i/\rho_c = \exp[1.17 - 0.44\cdot T/T_c]. \tag{21}$$

4.2. Properties at Coexistence

Table 21 gives properties at the saturated liquid coexistence boundary, computed as described in Secs. 3.2 and 3.3 above.

Table 13. Comparison of enthalpy data for coexisting gas and liquid phases reported by Gorbunova et al.[54] with calculated values

T K	H (gas) kJ/mol	$H(calc)$ kJ/mol	Diff. kJ/mol	H (liq.) kJ/mol	$H(calc)$ kJ/mol	Diff. kJ/mol	$\Delta_{vap}H$ kJ/mol	$\Delta_{vap}H(calc)$ kJ/mol	Diff. kJ/mol
300.000	36.623	36.606	0.018	3.050	2.869	0.181	33.573	33.737	-0.163
310.000	37.529	37.429	0.101	4.433	4.246	0.187	33.097	33.183	-0.086
320.000	38.428	38.276	0.152	5.768	5.645	0.123	32.659	32.631	0.028
330.000	39.334	39.147	0.187	7.268	7.070	0.199	32.066	32.078	-0.012
340.000	40.232	40.040	0.192	8.713	8.520	0.193	31.519	31.520	-0.001
350.000	41.131	40.952	0.178	10.197	9.999	0.198	30.933	30.953	-0.020
360.000	42.029	41.882	0.147	11.713	11.507	0.206	30.316	30.375	-0.059
370.000	42.974	42.827	0.147	13.244	13.045	0.199	29.730	29.782	-0.052
380.000	43.950	43.785	0.165	14.814	14.615	0.199	29.137	29.170	-0.034
390.000	44.903	44.753	0.150	16.392	16.215	0.176	28.512	28.538	-0.026
400.000	45.833	45.729	0.104	18.009	17.848	0.160	27.824	27.881	-0.057
410.000	46.763	46.711	0.052	19.665	19.513	0.151	27.098	27.197	-0.099
420.000	47.700	47.695	0.005	21.321	21.211	0.110	26.379	26.483	-0.104
430.000	48.606	48.678	-0.072	23.032	22.942	0.090	25.575	25.737	-0.162
440.000	49.551	49.658	-0.107	24.758	24.705	0.053	24.793	24.953	-0.159
450.000	50.496	50.631	-0.135	26.539	26.503	0.036	23.958	24.128	-0.171
460.000	51.410	51.593	-0.183	28.320	28.336	-0.016	23.090	23.257	-0.166
470.000	52.277	52.538	-0.261	30.171	30.207	-0.036	22.106	22.331	-0.225
480.000	53.269	53.461	-0.192	32.085	32.118	-0.033	21.185	21.343	-0.159
490.000	54.199	54.353	-0.154	33.999	34.074	-0.075	20.200	20.279	-0.078
500.000	55.105	55.202	-0.097	35.998	36.081	-0.083	19.107	19.121	-0.014
510.000	55.980	55.993	-0.013	38.092	38.150	-0.058	17.888	17.843	0.045
520.000	56.738	56.702	0.036	40.271	40.295	-0.024	16.466	16.407	0.060
530.000	57.347	57.290	0.057	42.552	42.543	0.009	14.795	14.747	0.048
540.000	57.652	57.683	-0.031	44.966	44.942	0.024	12.686	12.741	-0.055
550.000	57.456	57.705	-0.248	47.575	47.621	-0.046	9.881	10.084	-0.203
560.000	56.214	56.411	-0.196	50.520	51.321	-0.801	5.695	5.090	0.604

Table 14. Comparison of isothermal enthalpy data reported by Gorbunova et al.[54] with calculated values

T K	P bar	ρ mol/L	H kJ/mol	H(calc) kJ/mol	Diff. kJ/mol
300.000	20.000	11.187	3.169	2.978	0.191
300.000	40.000	11.208	3.285	3.089	0.196
300.000	60.000	11.228	3.381	3.200	0.181
300.000	80.000	11.249	3.517	3.311	0.206
300.000	100.000	11.269	3.634	3.423	0.211
300.000	200.000	11.366	4.222	3.989	0.233
320.000	20.000	10.903	5.948	5.751	0.197
320.000	40.000	10.927	6.057	5.859	0.199
320.000	60.000	10.950	6.151	5.968	0.184
320.000	80.000	10.973	6.292	6.077	0.215
320.000	100.000	10.995	6.401	6.187	0.214
320.000	200.000	11.103	6.979	6.745	0.234
340.000	20.000	10.622	8.823	8.620	0.203
340.000	40.000	10.649	8.932	8.724	0.208
340.000	60.000	10.675	9.018	8.829	0.188
340.000	80.000	10.701	9.143	8.936	0.207
340.000	100.000	10.727	9.252	9.043	0.210
340.000	200.000	10.847	9.807	9.589	0.218
360.000	20.000	10.340	11.799	11.598	0.201
360.000	40.000	10.371	11.885	11.697	0.188
360.000	60.000	10.401	11.963	11.797	0.166
360.000	80.000	10.431	12.088	11.898	0.190
360.000	100.000	10.460	12.174	12.001	0.173
360.000	200.000	10.594	12.728	12.531	0.198
380.000	20.000	10.053	14.869	14.693	0.175
380.000	40.000	10.089	14.939	14.784	0.155
380.000	60.000	10.124	15.001	14.877	0.125
380.000	80.000	10.158	15.119	14.972	0.147
380.000	100.000	10.191	15.212	15.068	0.144
380.000	200.000	10.344	15.720	15.574	0.146
400.000	20.000	9.756	18.032	17.911	0.121
400.000	40.000	9.799	18.079	17.990	0.089
400.000	60.000	9.841	18.134	18.073	0.061
400.000	80.000	9.880	18.235	18.158	0.077
400.000	100.000	9.919	18.337	18.246	0.091
400.000	200.000	10.093	18.806	18.720	0.085
420.000	20.000	9.444	21.321	21.253	0.068
420.000	40.000	9.496	21.344	21.316	0.029
420.000	60.000	9.546	21.376	21.384	-0.008
420.000	80.000	9.593	21.469	21.456	0.013
420.000	100.000	9.638	21.555	21.533	0.022
420.000	200.000	9.840	22.000	21.963	0.037
440.000	20.000	9.108	24.742	24.723	0.019
440.000	40.000	9.174	24.719	24.762	-0.043
440.000	60.000	9.235	24.727	24.809	-0.083
440.000	80.000	9.292	24.820	24.864	-0.043
440.000	100.000	9.347	24.875	24.924	-0.049
440.000	200.000	9.582	25.281	25.297	-0.016
460.000	20.000	8.739	28.296	28.332	-0.035
460.000	40.000	8.824	28.234	28.333	-0.099
460.000	60.000	8.901	28.195	28.350	-0.155
460.000	80.000	8.973	28.265	28.378	-0.113
460.000	100.000	9.039	28.320	28.417	-0.097
460.000	200.000	9.318	28.656	28.713	-0.058
480.000	20.000	8.317	32.038	32.102	-0.064
480.000	40.000	8.434	31.905	32.043	-0.137
480.000	60.000	8.536	31.827	32.012	-0.185
480.000	80.000	8.628	31.858	32.003	-0.144
480.000	100.000	8.711	31.882	32.010	-0.128

Table 14. Comparison of isothermal enthalpy data reported by Gorbunova et al.[54] with calculated values - Continued

T K	P bar	ρ mol/L	H kJ/mol	H(calc) kJ/mol	Diff. kJ/mol
480.000	200.000	9.045	32.132	32.206	-0.074
500.000	20.000	0.655	55.668	55.745	-0.077
500.000	40.000	7.983	35.795	35.925	-0.130
500.000	60.000	8.127	35.639	35.817	-0.177
500.000	80.000	8.249	35.584	35.749	-0.165
500.000	100.000	8.356	35.577	35.711	-0.135
500.000	200.000	8.762	35.702	35.774	-0.072
520.000	20.000	0.596	59.058	59.019	0.038
520.000	40.000	7.427	39.974	40.067	-0.093
520.000	60.000	7.651	39.623	39.808	-0.185
520.000	80.000	7.824	39.475	39.645	-0.170
520.000	100.000	7.967	39.396	39.539	-0.142
520.000	200.000	8.467	39.357	39.422	-0.064
540.000	20.000	0.553	62.307	62.241	0.066
540.000	40.000	6.610	44.810	44.769	0.041
540.000	60.000	7.062	43.888	44.091	-0.203
540.000	80.000	7.331	43.607	43.746	-0.139
540.000	100.000	7.531	43.443	43.529	-0.086
540.000	200.000	8.160	43.122	43.167	-0.044
560.000	20.000	0.518	65.604	65.477	0.127
560.000	40.000	1.425	61.479	61.641	-0.162
560.000	60.000	6.216	48.801	49.051	-0.249
560.000	80.000	6.730	48.083	48.236	-0.154
560.000	100.000	7.034	47.747	47.819	-0.072
560.000	200.000	7.839	47.028	47.113	-0.085
580.000	20.000	0.489	68.970	68.748	0.222
580.000	40.000	1.231	65.643	65.710	-0.068
580.000	60.000	3.900	57.292	57.487	-0.195
580.000	80.000	5.926	53.090	53.460	-0.370
580.000	100.000	6.447	52.262	52.609	-0.347
580.000	200.000	7.504	51.051	51.398	-0.347
600.000	20.000	0.463	72.329	72.067	0.262
600.000	40.000	1.111	69.587	69.486	0.101
600.000	60.000	2.311	65.307	65.308	-0.001
600.000	80.000	4.700	59.456	59.330	0.126
600.000	100.000	5.726	57.167	57.372	-0.204
600.000	200.000	7.156	55.183	55.386	-0.202
620.000	20.000	0.441	75.719	75.437	0.282
620.000	40.000	1.024	73.353	73.169	0.183
620.000	60.000	1.905	70.087	70.085	0.002
620.000	80.000	3.462	65.815	65.657	0.158
620.000	100.000	4.852	62.385	62.595	-0.210
620.000	200.000	6.796	59.409	59.456	-0.047
640.000	20.000	0.422	79.149	78.862	0.287
640.000	40.000	0.955	77.055	76.826	0.229
640.000	60.000	1.682	74.485	74.307	0.178
640.000	80.000	2.763	71.228	71.049	0.179
640.000	100.000	4.010	67.846	67.979	-0.133
640.000	200.000	6.425	63.815	63.622	0.193
660.000	20.000	0.404	82.593	82.341	0.252
660.000	40.000	0.899	80.680	80.488	0.192
660.000	60.000	1.529	78.547	78.329	0.218
660.000	80.000	2.370	76.024	75.746	0.278
660.000	100.000	3.386	73.314	73.063	0.250
660.000	200.000	6.049	68.244	67.881	0.363
680.000	20.000	0.388	86.070	85.875	0.194

Table 14. Comparison of isothermal enthalpy data reported by Gorbunova et al.[54] with calculated values - Continued

T K	P bar	ρ mol/L	H kJ/mol	$H(calc)$ kJ/mol	Diff. kJ/mol
680.000	40.000	0.852	84.242	84.169	0.072
680.000	60.000	1.415	82.398	82.267	0.131
680.000	80.000	2.115	80.578	80.106	0.472
680.000	100.000	2.947	78.164	77.825	0.340
680.000	200.000	5.672	72.454	72.225	0.229
700.000	20.000	0.374	89.569	89.463	0.106
700.000	40.000	0.810	87.819	87.880	-0.061
700.000	60.000	1.323	86.163	86.173	-0.009
700.000	80.000	1.932	84.367	84.301	0.065
700.000	100.000	2.634	82.414	82.341	0.073
700.000	200.000	5.304	76.594	76.634	-0.040

126 data points, |Diff| av. = 0.148 kJ/mol

Table 15. Comparison of enthalpy data for coexisting gas and liquid phases reported by Lenoir et al.[72] with calculated values

T K	P bar	$P(calc)$ bar	Diff. bar	H (gas) kJ/mol	$H(calc)$ kJ/mol	Diff. kJ/mol
414.039	4.826	4.813	0.013	47.191	47.108	0.083
431.594	6.895	6.890	0.005	48.897	48.835	0.063
470.483	13.790	13.778	0.012	52.801	52.584	0.218
517.094	27.579	27.528	0.051	56.796	56.506	0.289
534.094	34.474	34.473	0.001	57.704	57.480	0.223
548.428	41.369	41.338	0.031	57.776	57.741	0.035
554.872	44.816	44.779	0.037	57.286	57.421	-0.135
558.261	46.884	46.694	0.190	56.759	56.927	-0.167
560.483	48.263	47.996	0.268	55.997	56.184	-0.187
561.372	48.815	48.528	0.286	55.379	55.458	-0.079

T K	H (liq.) kJ/mol	$H(calc)$ kJ/mol	Diff. kJ/mol	$\Delta vapH$ kJ/mol	$\Delta vapH(calc)$ kJ/mol	Diff. kJ/mol
414.039	20.463	20.195	0.268	26.727	26.913	-0.185
431.594	23.441	23.220	0.220	25.456	25.614	-0.158
470.483	30.450	30.298	0.151	22.352	22.285	0.066
517.094	39.764	39.663	0.101	17.031	16.843	0.188
534.094	43.541	43.503	0.038	14.163	13.978	0.185
548.428	47.118	47.170	-0.052	10.658	10.571	0.087
554.872	48.988	49.149	-0.161	8.298	8.272	0.026
558.261	50.241	50.446	-0.205	6.518	6.481	0.037
560.483	51.258	51.631	-0.373	4.739	4.553	0.186
561.372	52.002	52.445	-0.442	3.377	3.014	0.364

Table 16. Comparison of isothermal enthalpy data reported by Lenoir et al.[72] with calculated values

T K	P bar	ρ mol/L	H kJ/mol	H(calc) kJ/mol	Diff. kJ/mol
466.483	0.000	0.000	54.889	54.664	0.225
466.483	13.790	8.577	29.723	29.543	0.180
477.594	0.000	0.000	56.396	56.137	0.260
477.594	13.790	0.435	53.800	53.710	0.090
477.594	27.579	8.416	31.793	31.616	0.178
488.706	0.000	0.000	57.940	57.639	0.300
488.706	13.790	0.416	55.379	55.379	0.001
488.706	27.579	8.164	33.936	33.764	0.172
499.817	0.000	0.000	59.483	59.171	0.312
499.817	13.790	0.400	57.014	57.045	-0.032
499.817	27.579	7.883	36.151	35.986	0.165
510.928	0.000	0.000	61.063	60.732	0.331
510.928	13.790	0.386	58.684	58.719	-0.035
510.928	27.579	7.557	38.493	38.309	0.184
522.039	0.000	0.000	62.570	62.320	0.249
522.039	13.790	0.372	60.409	60.406	0.003
522.039	27.579	0.957	57.649	57.573	0.076
522.039	34.474	7.277	40.854	40.622	0.231
533.150	0.000	0.000	64.131	63.936	0.195
533.150	13.790	0.360	62.116	62.108	0.007
533.150	27.579	0.890	59.610	59.637	-0.027
533.150	34.474	6.804	43.341	43.260	0.082
533.150	68.948	7.392	42.651	42.445	0.207
533.150	96.527	7.658	42.415	42.165	0.250
544.261	0.000	0.000	65.747	65.579	0.168
544.261	13.790	0.349	63.859	63.828	0.031
544.261	27.579	0.839	61.571	61.604	-0.033
544.261	34.474	1.216	60.010	59.937	0.073
544.261	41.369	6.402	46.065	45.858	0.207
544.261	68.948	7.062	45.012	44.853	0.159
544.261	96.527	7.397	44.685	44.443	0.242
549.817	0.000	0.000	66.582	66.410	0.172
549.817	13.790	0.344	64.749	64.695	0.054
549.817	27.579	0.817	62.533	62.571	-0.037
549.817	34.474	1.163	61.135	61.066	0.070
549.817	41.369	1.792	58.339	58.411	-0.072
549.817	44.816	6.175	47.499	47.226	0.273
549.817	68.948	6.878	46.246	46.112	0.135
549.817	96.527	7.259	45.901	45.614	0.288
555.372	0.000	0.000	67.418	67.248	0.170
555.372	13.790	0.339	65.602	65.567	0.035
555.372	27.579	0.797	63.496	63.530	-0.035
555.372	34.474	1.119	62.116	62.149	-0.034
555.372	41.369	1.623	60.064	60.064	0.000
555.372	44.816	2.183	57.685	57.870	-0.185
555.372	48.263	5.926	49.133	48.661	0.472
555.372	51.711	6.138	48.534	48.298	0.237
555.372	55.158	6.290	48.026	48.043	-0.017
555.372	68.948	6.677	47.517	47.425	0.092
555.372	96.527	7.114	47.082	46.818	0.264
557.594	0.000	0.000	67.726	67.584	0.142
557.594	13.790	0.337	65.947	65.916	0.031
557.594	27.579	0.790	63.895	63.913	-0.018
557.594	34.474	1.103	62.515	62.574	-0.059
557.594	41.369	1.577	60.609	60.628	-0.019
557.594	44.816	2.016	58.902	58.912	-0.010
557.594	48.263	5.680	49.932	49.506	0.426
557.594	51.711	5.973	49.242	48.997	0.246
557.594	55.158	6.156	48.661	48.682	-0.020
557.594	68.948	6.590	48.171	47.975	0.196
557.594	96.527	7.054	47.572	47.316	0.256
558.706	0.000	0.000	67.908	67.753	0.155
558.706	13.790	0.336	66.129	66.092	0.037
558.706	27.579	0.786	64.077	64.104	-0.027

Table 16. Comparison of isothermal enthalpy data reported by Lenoir et al.[72] with calculated values - Continued

T K	P bar	ρ mol/L	H kJ/mol	H(calc) kJ/mol	Diff. kJ/mol
558.706	34.474	1.096	62.715	62.785	-0.070
558.706	41.369	1.556	60.881	60.899	-0.018
558.706	44.816	1.960	59.356	59.323	0.033
558.706	48.263	5.515	50.332	50.012	0.320
558.706	51.711	5.878	49.605	49.373	0.232
558.706	55.158	6.084	48.988	49.018	-0.030
558.706	68.948	6.546	48.298	48.258	0.040
558.706	96.527	7.024	47.808	47.571	0.237
559.817	0.000	0.000	68.053	67.922	0.131
559.817	13.790	0.336	66.274	66.267	0.007
559.817	27.579	0.782	64.276	64.295	-0.019
559.817	34.474	1.089	62.915	62.995	-0.080
559.817	41.369	1.536	61.153	61.163	-0.010
559.817	44.816	1.912	59.737	59.698	0.039
559.817	48.263	5.282	50.858	50.650	0.208
559.817	51.711	5.773	49.932	49.777	0.155
559.817	55.158	6.007	49.315	49.370	-0.055
559.817	68.948	6.500	48.534	48.550	-0.016
559.817	96.527	6.993	48.044	47.833	0.211
560.928	0.000	0.000	68.253	68.091	0.162
560.928	13.790	0.335	66.455	66.443	0.013
560.928	27.579	0.779	64.458	64.486	-0.028
560.928	34.474	1.081	63.114	63.204	-0.089
560.928	41.369	1.518	61.371	61.423	-0.051
560.928	44.816	1.871	60.100	60.048	0.052
560.928	48.263	4.691	57.231	51.963	5.269
560.928	49.229	5.265	51.657	50.921	0.736
560.928	51.711	5.654	50.332	50.223	0.108
560.928	55.158	5.924	49.696	49.747	-0.051
560.928	68.948	6.453	48.825	48.859	-0.034
560.928	96.527	6.963	48.280	48.111	0.169
562.039	0.000	0.000	68.398	68.261	0.137
562.039	13.790	0.334	66.637	66.619	0.018
562.039	27.579	0.775	64.640	64.676	-0.037
562.039	34.474	1.075	63.314	63.412	-0.098
562.039	41.369	1.500	61.589	61.678	-0.088
562.039	44.816	1.834	60.427	60.379	0.049
562.039	48.263	2.566	58.067	57.773	0.294
562.039	49.229	4.851	53.745	52.142	1.603
562.039	51.711	5.514	50.858	50.929	-0.070
562.039	55.158	5.834	50.114	50.358	-0.244
562.039	68.948	6.405	49.061	49.390	-0.329
562.039	96.527	6.931	48.498	48.609	-0.111
563.150	0.000	0.000	68.543	68.431	0.113
563.150	13.790	0.333	66.800	66.795	0.006
563.150	27.579	0.772	64.821	64.867	-0.046
563.150	34.474	1.068	63.532	63.620	-0.087
563.150	41.369	1.484	61.880	61.928	-0.049
563.150	44.816	1.802	60.736	60.694	0.042
563.150	48.263	2.406	58.666	58.517	0.149
563.150	49.229	2.894	57.014	56.949	0.064
563.150	51.711	5.343	51.548	51.461	0.087
563.150	55.158	5.736	50.495	50.751	-0.256
563.150	68.948	6.356	49.369	49.689	-0.320
563.150	96.527	6.900	48.788	48.874	-0.085
564.261	0.000	0.000	68.707	68.601	0.106
564.261	13.790	0.332	66.982	66.971	0.011
564.261	27.579	0.768	65.021	65.058	-0.037
564.261	34.474	1.061	63.714	63.826	-0.113
564.261	41.369	1.468	62.098	62.176	-0.078
564.261	44.816	1.772	61.008	60.998	0.010
564.261	48,263	2.300	59.156	59.081	0.075
564.261	49.229	2.603	57.903	58.069	-0.166

Table 16. Comparison of isothermal enthalpy data reported by Lenoir et al.[72] with calculated values - Continued

T K	P bar	ρ mol/L	H kJ/mol	H(calc) kJ/mol	Diff. kJ/mol
564.261	51.711	5.113	52.620	52.098	0.522
564.261	55.158	5.628	50.967	51.156	-0.188
564.261	68.948	6.305	49.605	49.982	-0.377
564.261	96.527	6.868	49.006	49.130	-0.124
565.372	0.000	0.000	68.870	68.771	0.099
565.372	13.790	0.331	67.163	67.147	0.016
565.372	27.579	0.765	65.203	65.248	-0.045
565.372	34.474	1.055	63.913	64.033	-0.119
565.372	41.369	1.453	62.316	62.419	-0.104
565.372	44.816	1.744	61.281	61.291	-0.011
565.372	48.263	2.219	59.574	59.559	0.014
565.372	49.229	2.453	58.539	58.765	-0.227
565.372	51.711	4.746	54.708	53.008	1.699
565.372	55.158	5.505	51.421	51.584	-0.163
565.372	68.948	6.253	49.932	50.275	-0.343
565.372	96.527	6.836	49.242	49.383	-0.141
566.483	0.000	0.000	69.034	68.941	0.092
566.483	13.790	0.330	67.345	67.324	0.021
566.483	27.579	0.762	65.384	65.438	-0.054
566.483	34.474	1.048	64.113	64.238	-0.125
566.483	41.369	1.439	62.552	62.660	-0.109
566.483	44.816	1.719	61.535	61.577	-0.042
566.483	48.263	2.154	59.991	59.985	0.006
566.483	49.229	2.348	59.120	59.316	-0.196
566.483	51.711	3.979	56.669	54.810	1.859
566.483	55.158	5.364	52.020	52.049	-0.029
566.483	68.948	6.199	50.277	50.569	-0.292
566.483	96.527	6.803	49.515	49.635	-0.121
569.261	0.000	0.000	69.451	69.369	0.082
569.261	13.790	0.328	67.763	67.766	-0.004
569.261	27.579	0.754	65.874	65.914	-0.040
569.261	34.474	1.033	64.640	64.750	-0.110
569.261	41.369	1.406	63.151	63.252	-0.101
569.261	44.816	1.662	62.134	62.261	-0.127
569.261	48.263	2.029	60.863	60.914	-0.051
569.261	49.229	2.172	60.100	60.412	-0.311
569.261	51.711	2.786	58.829	58.424	0.405
569.261	55.158	4.858	53.546	53.518	0.028
569.261	68.948	6.057	51.022	51.315	-0.293
569.261	96.527	6.720	50.114	50.263	-0.149
572.039	0.000	0.000	69.887	69.798	0.089
572.039	13.790	0.325	68.235	68.210	0.025
572.039	27.579	0.746	66.365	66.389	-0.025
572.039	34.474	1.019	65.148	65.258	-0.110
572.039	41.369	1.375	63.714	63.830	-0.117
572.039	44.816	1.614	62.769	62.913	-0.143
572.039	48.263	1.935	61.662	61.728	-0.066
572.039	49.229	2.052	60.972	61.314	-0.342
572.039	51.711	2.467	60.010	59.916	0.093
572.039	55.158	3.950	55.398	55.924	-0.527
572.039	68.948	5.901	51.766	52.083	-0.317
572.039	96.527	6.635	50.749	50.892	-0.143
577.594	0.000	0.000	70.686	70.660	0.026
577.594	13.790	0.321	69.124	69.101	0.024
577.594	27.579	0.731	67.345	67.340	0.005
577.594	34.474	0.992	66.129	66.269	-0.140
577.594	41.369	1.322	64.821	64.957	-0.136
577.594	44.816	1.533	63.968	64.151	-0.183
577.594	48.263	1.797	63.096	63.174	-0.078
577.594	49.229	1.886	62.515	62.855	-0.340
577.594	51.711	2.162	61.825	61.897	-0.072
577.594	55.158	2.780	60.300	59.948	0.352
577.594	68.948	5.538	53.382	53.727	-0.345

Table 16. Comparison of isothermal enthalpy data reported by Lenoir et al.[72] with calculated values - Continued

T K	P bar	ρ mol/L	H kJ/mol	H(calc) kJ/mol	Diff. kJ/mol
577.594	96.527	6.457	52.057	52.161	-0.105
588.706	0.000	0.000	72.356	72.403	-0.047
588.706	13.790	0.313	70.868	70.897	-0.029
588.706	27.579	0.704	69.197	69.242	-0.045
588.706	34.474	0.945	68.126	68.269	-0.143
588.706	41.369	1.237	66.927	67.130	-0.202
588.706	48.263	1.615	65.584	65.716	-0.132
588.706	51.711	1.861	64.767	64.841	-0.074
588.706	55.158	2.175	63.950	63.780	0.170
588.706	68.948	4.491	57.522	57.755	-0.233
588.706	96.527	6.065	54.581	54.775	-0.195
599.817	0.000	0.000	74.118	74.170	-0.052
599.817	13.790	0.305	72.629	72.713	-0.084
599.817	27.579	0.679	71.067	71.149	-0.082
599.817	34.474	0.904	70.105	70.255	-0.150
599.817	41.369	1.168	69.016	69.239	-0.223
599.817	48.263	1.491	67.908	68.043	-0.135
599.817	55.158	1.914	66.637	66.565	0.072
599.817	68.948	3.430	62.134	62.146	-0.012
599.817	96.527	5.616	57.304	57.534	-0.230
610.928	0.000	0.000	75.897	75.959	-0.062
610.928	13.790	0.298	74.426	74.548	-0.122
610.928	27.579	0.657	72.956	73.064	-0.109
610.928	34.474	0.869	72.102	72.234	-0.132
610.928	41.369	1.112	71.176	71.313	-0.137
610.928	48.263	1.397	70.159	70.265	-0.106
610.928	55.158	1.748	69.070	69.040	0.030
610.928	68.948	2.808	65.747	65.756	-0.009
610.928	96.527	5.107	60.282	60.468	-0.186
622.039	0.000	0.000	77.640	77.772	-0.131
622.039	13.790	0.291	76.224	76.403	-0.179
622.039	27.579	0.637	74.808	74.990	-0.182
622.039	34.474	0.838	74.100	74.214	-0.115
622.039	41.369	1.063	73.264	73.368	-0.104
622.039	48.263	1.322	72.375	72.430	-0.055
622.039	55.158	1.626	71.394	71.369	0.025
622.039	68.948	2.453	68.652	68.738	-0.085
622.039	96.527	4.571	63.459	63.533	-0.074
633.150	0.000	0.000	79.347	79.606	-0.259
633.150	13.790	0.285	78.076	78.278	-0.202
633.150	27.579	0.619	76.660	76.927	-0.268
633.150	34.474	0.810	76.042	76.198	-0.155
633.150	41.369	1.021	75.262	75.414	-0.152
633.150	48.263	1.259	74.463	74.560	-0.097
633.150	55.158	1.530	73.682	73.618	0.064
633.150	68.948	2.221	71.449	71.394	0.054
633.150	96.527	4.077	66.637	66.591	0.046
644.261	0.000	0.000	81.072	81.461	-0.390
644.261	13.790	0.278	79.892	80.171	-0.279
644.261	27.579	0.602	78.566	78.878	-0.311
644.261	34.474	0.784	77.931	78.188	-0.258
644.261	41.369	0.984	77.259	77.456	-0.197
644.261	48.263	1.205	76.551	76.670	-0.119
644.261	55.158	1.452	75.824	75.818	0.006
644.261	68.948	2.052	74.081	73.876	0.205
644.261	96.527	3.665	69.724	69.536	0.188

246 data points, |Diff.| av. = 0.174 kJ/mol

Table 17a. Comparison of isobaric heat capacities reported by Rastorguev et al.[73] with calculated values

P bar	T K	ρ mol/L	C_p J/(mol·K)	$C_p(calc)$ J/(mol·K)	% Dev.
0.98	305.15	11.093	136.47	137.71	-0.91
0.98	323.31	10.833	140.68	142.11	-1.01
0.98	342.89	10.555	146.15	147.30	-0.78
3.24	363.37	10.265	151.46	153.09	-1.07
3.92	382.40	9.988	157.87	158.79	-0.59
5.10	402.16	9.690	164.04	165.00	-0.58
7.45	422.93	9.361	170.37	171.82	-0.85
9.80	442.90	9.021	176.77	178.85	-1.18
13.30	463.09	8.645	182.86	186.73	-2.11

Table 17b. Comparison of isobaric heat capacities reported by Akhundov/Sultanov[74] and Mamedov et al.[59,75,76] with calculated values

P bar	T K	ρ mol/L	C_p J/(mol·K)	$C_p(calc)$ J/(mol·K)	% Dev.
10.0	451.90	0.321	145.75	142.20	2.44
10.0	454.50	0.318	145.70	141.60	2.81
10.0	457.34	0.314	145.54	141.26	2.94
10.0	479.10	0.292	146.45	142.44	2.74
10.0	499.84	0.274	148.51	145.47	2.05
10.0	517.75	0.261	151.17	148.50	1.77
10.0	532.16	0.251	153.14	151.03	1.38
10.0	545.95	0.243	155.30	153.48	1.17
10.0	578.05	0.226	160.27	159.16	0.70
10.0	611.44	0.210	165.81	164.87	0.57
10.0	641.07	0.199	170.37	169.71	0.39
10.0	672.36	0.188	174.90	174.57	0.19
45.0	560.08	1.929	341.16	329.11	3.53
45.0	561.13	1.889	322.74	309.62	4.07
45.0	564.34	1.789	275.88	271.99	1.41
45.0	568.86	1.686	247.29	243.90	1.37
45.0	572.44	1.622	234.03	230.51	1.50
45.0	587.51	1.433	208.24	203.95	2.06
45.0	609.01	1.267	195.39	191.55	1.96
45.0	625.29	1.179	191.99	188.06	2.05
45.0	641.56	1.108	190.20	186.65	1.87
45.0	662.86	1.032	189.67	186.44	1.70
60.0	505.15	8.012	198.26	196.78	0.75
60.0	528.26	7.426	214.28	211.16	1.46
60.0	545.32	6.873	233.64	233.04	0.26
60.0	552.37	6.590	250.68	251.33	-0.26
60.0	558.16	6.315	268.26	281.04	-4.76
60.0	565.58	5.864	312.61	311.49	0.36
60.0	568.55	5.628	354.14	340.10	3.96
60.0	570.40	5.453	386.22	368.64	4.55
60.0	574.06	5.003	485.66	469.39	3.35
60.0	576.91	4.507	594.99	586.08	1.50
60.0	578.18	4.253	645.85	612.17	5.21
60.0	579.35	4.022	654.23	608.48	6.99
60.0	580.18	3.868	651.48	596.05	8.51
60.0	582.93	3.423	532.09	533.99	-0.36
60.0	584.17	3.260	489.00	497.65	-1.77
60.0	586.23	3.036	432.84	438.78	-1.37
60.0	589.50	2.775	363.60	367.98	-1.21
60.0	592.37	2.609	324.55	327.29	-0.85
60.0	596.20	2.440	288.05	292.01	-1.37
60.0	603.29	2.219	258.01	255.29	1.05
60.0	613.32	2.009	233.63	229.62	1.71
60.0	624.24	1.848	219.41	215.30	1.87
60.0	642.61	1.659	207.78	203.53	2.04
60.0	667.11	1.485	201.77	197.21	2.26
150.0	464.10	9.128	174.76	175.81	-0.60
150.0	486.06	8.799	180.97	180.51	0.26
150.0	518.96	8.266	190.93	187.61	1.74
150.0	551.53	7.680	215.50	202.84	5.88
150.0	578.56	7.140	211.49	205.83	2.68
150.0	603.62	6.588	221.60	212.97	3.89
150.0	631.92	5.905	232.19	223.59	3.71
150.0	647.76	5.503	236.41	228.82	3.21
150.0	660.73	5.173	238.26	231.72	2.75
150.0	673.00	4.869	238.73	232.82	2.47

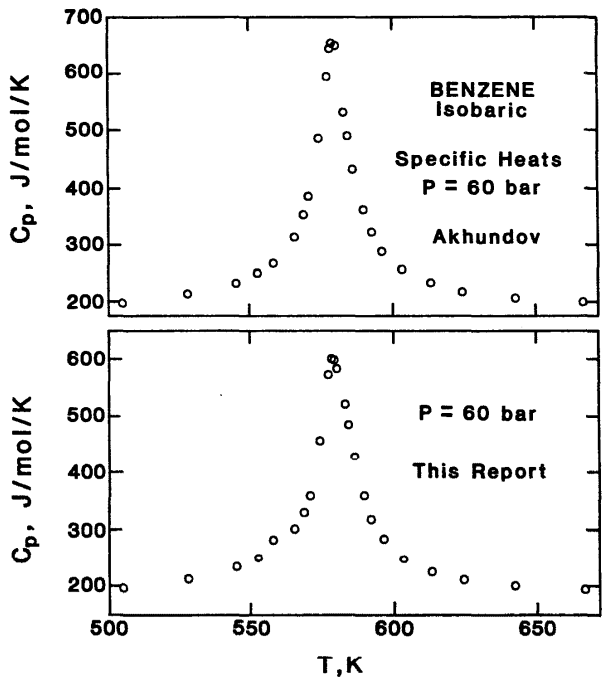

FIG. 6. Comparison of isobaric specific heat data for benzene.

Table 18a. Comparison of reported speed of sound in saturated vapor with calculated values

Ref. No.	T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
77	483.15	16.843	0.557	181.0	180.2	0.42
77	493.15	19.596	0.660	176.0	175.3	0.38
77	503.15	22.667	0.782	170.0	169.6	0.26
77	513.15	26.081	0.928	163.0	162.8	0.14
77	523.15	29.866	1.106	155.0	154.8	0.12
77	533.15	34.055	1.333	145.0	145.4	-0.30
77	543.15	38.691	1.638	134.0	134.2	-0.14
77	548.15	41.195	1.842	127.0	127.6	-0.48
77	553.15	43.835	2.112	120.0	119.9	0.07
77	554.15	44.381	2.179	118.0	118.2	-0.14
77	555.15	44.933	2.252	117.0	116.3	0.60
77	556.15	45.492	2.333	115.0	114.3	0.63
77	557.15	46.058	2.425	114.0	112.1	1.70
77	558.15	46.630	2.532	112.0	109.6	2.18
77	559.15	47.210	2.662	110.0	106.6	3.12
77	560.15	47.798	2.832	108.0	102.6	4.98
79	453.15	10.274	0.331	188.0	190.9	-1.57
79	463.15	12.203	0.395	183.0	188.0	-2.72
79	483.15	16.843	0.557	177.0	180.2	-1.83
79	493.15	19.596	0.660	173.0	175.3	-1.34
79	503.15	22.667	0.782	168.0	169.6	-0.92
79	513.15	26.081	0.928	160.0	162.8	-1.74
79	523.15	29.866	1.106	155.0	154.8	0.12
79	533.15	34.055	1.333	145.0	145.4	-0.30
79	543.15	38.691	1.638	133.0	134.2	-0.90
79	553.15	43.835	2.112	117.0	119.9	-2.49
79	558.15	46.630	2.532	112.0	109.6	2.18

References: Aniskin[79], Zotov et al.[77]

Table 18b. Comparison of reported speed of sound in saturated liquid with calculated values

Ref. No.	T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
77	303.15	0.159	11.120	1275.0	1336.3	-4.81
77	323.15	0.362	10.835	1184.0	1234.4	-4.26
77	343.15	0.735	10.551	1095.0	1138.5	-3.97
77	363.15	1.361	10.265	1009.0	1046.3	-3.70
77	383.15	2.341	9.974	924.0	956.5	-3.52
77	403.15	3.787	9.671	841.0	868.0	-3.21
77	423.15	5.822	9.353	759.0	780.1	-2.78
77	443.15	8.580	9.012	675.0	692.2	-2.55
77	463.15	12.203	8.639	593.0	603.8	-1.82
77	483.15	16.843	8.222	508.0	514.0	-1.18
77	493.15	19.596	7.991	465.0	468.2	-0.68
77	503.15	22.667	7.740	421.0	421.5	-0.11
77	513.15	26.081	7.463	376.0	373.5	0.68
77	523.15	29.866	7.153	329.0	323.6	1.63
77	533.15	34.055	6.792	279.0	271.2	2.81
77	543.15	38.691	6.350	225.0	214.6	4.64
77	548.15	41.195	6.075	195.0	183.8	5.73
77	553.15	43.835	5.732	163.0	150.5	7.67
77	554.15	44.381	5.650	156.0	143.4	8.09
77	555.15	44.933	5.562	149.0	136.1	8.68
77	556.15	45.492	5.464	142.0	128.5	9.51
77	557.15	46.058	5.356	135.0	120.6	10.65
77	558.15	46.630	5.232	127.0	112.3	11.54
77	559.15	47.210	5.084	119.0	103.5	13.06
77	560.15	47.798	4.894	109.0	93.5	14.26
80	280.00	0.051	11.457	1395.8	1465.3	-4.98
80	290.00	0.086	11.311	1341.5	1407.8	-4.94
80	300.00	0.138	11.166	1291.0	1353.0	-4.81
80	310.00	0.214	11.022	1243.3	1300.6	-4.61
80	320.00	0.321	10.880	1197.6	1250.0	-4.38
80	330.00	0.467	10.738	1153.3	1201.0	-4.13
80	340.00	0.662	10.596	1110.0	1153.3	-3.90
80	350.00	0.916	10.454	1067.2	1106.6	-3.69
80	360.00	1.242	10.311	1024.7	1060.6	-3.50
80	370.00	1.652	10.166	982.4	1015.4	-3.35
80	380.00	2.159	10.020	940.2	970.6	-3.23
80	390.00	2.778	9.871	897.9	926.1	-3.14
80	400.00	3.523	9.720	855.7	881.9	-3.06
80	410.00	4.411	9.564	813.6	837.9	-2.98
80	420.00	5.457	9.404	771.6	793.9	-2.90
80	430.00	6.678	9.239	729.7	750.0	-2.78
80	440.00	8.092	9.067	688.0	706.1	-2.62
80	450.00	9.716	8.888	646.5	662.0	-2.40
80	460.00	11.569	8.700	605.1	617.8	-2.09
80	470.00	13.670	8.502	563.7	573.2	-1.69
80	480.00	16.038	8.291	522.1	528.3	-1.18
80	490.00	18.695	8.065	479.9	482.7	-0.58
80	500.00	21.664	7.821	436.7	436.3	0.10
80	510.00	24.967	7.554	392.0	388.7	0.83
80	520.00	28.632	7.255	345.1	339.6	1.60
80	530.00	32.690	6.912	295.0	288.0	2.36
80	540.00	37.180	6.501	240.8	233.0	3.26
80	550.00	42.155	5.959	181.2	171.9	5.16

References: Bobik[80], Zotov et al.[77]

Table 19a. Comparison of speed of sound in superheated vapor reported by Aniskin[79] with calculated values

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
503.15	18.057	0.558	187.0	189.0	-1.05
513.15	18.635	0.558	191.0	193.0	-1.07
513.15	24.647	0.840	172.0	170.0	1.19
523.15	19.206	0.558	194.0	197.0	-1.53
523.15	25.623	0.840	176.0	175.2	0.43
533.15	19.771	0.558	197.0	200.8	-1.91
533.15	26.572	0.840	180.0	180.2	-0.11
533.15	32.714	1.212	163.0	153.5	5.84
543.15	20.331	0.558	202.0	204.4	-1.21
543.15	27.504	0.840	183.0	184.9	-1.04
543.15	34.259	1.212	167.0	159.8	4.29
543.15	38.599	1.625	147.0	134.5	8.50
553.15	20.888	0.558	205.0	208.0	-1.47
553.15	28.423	0.840	187.0	189.4	-1.29
553.15	35.753	1.212	172.0	165.8	3.62
553.15	40.890	1.625	155.0	142.1	8.35
563.15	21.441	0.558	209.0	211.5	-1.20
563.15	29.331	0.840	191.0	193.7	-1.44
563.15	37.214	1.212	176.0	171.4	2.63
563.15	43.068	1.625	161.0	149.1	7.39
563.15	47.081	2.127	141.0	127.2	9.81
563.15	48.804	2.613	128.0	112.0	12.49
563.15	49.502	3.369	115.0	98.1	14.68
563.15	49.610	3.891	96.0	95.1	0.93
573.15	21.991	0.558	212.0	214.9	-1.38
573.15	30.231	0.840	195.0	198.0	-1.51
573.15	38.651	1.212	180.0	176.7	1.82
573.15	45.187	1.625	167.0	155.7	6.75
573.15	50.111	2.127	151.0	135.2	10.48
573.15	52.732	2.613	137.0	121.4	11.37
573.15	54.735	3.369	125.0	113.3	9.34
573.15	55.737	3.891	116.0	116.0	-0.02
583.15	22.539	0.558	216.0	218.3	-1.04
583.15	31.124	0.840	198.0	202.0	-2.03
583.15	40.070	1.212	185.0	181.9	1.69
583.15	47.267	1.625	174.0	162.1	6.87
583.15	53.065	2.127	161.0	142.8	11.30
583.15	56.554	2.613	149.0	130.3	12.56
583.15	59.910	3.369	133.0	124.8	6.18
583.15	61.923	3.891	125.0	129.7	-3.79
593.15	23.084	0.558	220.0	221.5	-0.69
593.15	32.010	0.840	203.0	206.0	-1.47
593.15	41.474	1.212	190.0	186.8	1.67
593.15	49.318	1.625	181.0	168.1	7.13
593.15	55.971	2.127	171.0	150.1	12.22
593.15	60.321	2.613	160.0	138.7	13.30
593.15	65.073	3.369	143.0	135.3	5.38
593.15	68.160	3.891	135.0	141.9	-5.12

Table 19b. Comparison of speed of sound in compressed liquid reported by Makita/Takagi[26] with calculated values

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
283.05	20.000	11.431	1382.9	1452.7	-5.05
283.05	100.000	11.506	1417.8	1475.0	-4.03
288.02	20.000	11.359	1358.6	1424.6	-4.86
288.02	100.000	11.436	1394.6	1447.9	-3.82
288.02	200.000	11.527	1437.0	1478.5	-2.88
292.95	20.000	11.288	1335.1	1397.3	-4.66
292.95	100.000	11.367	1371.8	1421.8	-3.64
292.95	200.000	11.460	1415.6	1453.5	-2.68
292.95	500.000	11.712	1532.5	1550.0	-1.14
298.10	20.000	11.214	1310.7	1369.5	-4.48
298.10	100.000	11.295	1347.7	1395.1	-3.52
298.10	200.000	11.391	1392.0	1428.1	-2.59
298.10	500.000	11.648	1512.0	1527.2	-1.01
303.05	20.000	11.143	1287.5	1343.3	-4.34
303.05	100.000	11.227	1325.3	1370.2	-3.38
303.05	200.000	11.325	1370.5	1404.3	-2.47
303.05	500.000	11.588	1492.1	1506.0	-0.93
313.05	20.000	11.001	1245.9	1292.1	-3.71
313.05	100.000	11.090	1283.6	1321.4	-2.94
313.05	200.000	11.193	1328.7	1358.1	-2.21
313.05	500.000	11.468	1451.3	1464.9	-0.94
313.05	1000.000	11.841	1612.5	1627.3	-0.91
323.00	20.000	10.861	1201.6	1243.0	-3.44
323.00	100.000	10.955	1241.4	1274.8	-2.69
323.00	200.000	11.064	1289.1	1314.1	-1.94
323.00	500.000	11.351	1418.8	1426.3	-0.53
323.00	1000.000	11.736	1590.7	1593.0	-0.15
323.00	1500.000	12.048	1707.1	1739.8	-1.92
333.02	20.000	10.720	1161.4	1195.0	-2.89
333.02	100.000	10.820	1201.8	1229.6	-2.31
333.02	200.000	10.936	1250.3	1271.7	-1.71
333.02	500.000	11.235	1383.1	1389.3	-0.45
333.02	1000.000	11.633	1561.7	1560.5	0.08
333.02	1500.000	11.952	1687.1	1709.2	-1.31
333.02	2000.000	12.221	1759.2	1842.4	-4.73
342.95	20.000	10.581	1119.8	1148.6	-2.58
342.95	100.000	10.687	1162.5	1186.1	-2.03
342.95	200.000	10.809	1213.7	1231.1	-1.43
342.95	500.000	11.123	1352.6	1354.4	-0.13
342.95	1000.000	11.533	1534.9	1530.0	0.32
342.95	1500.000	11.860	1655.8	1680.7	-1.51
342.95	2000.000	12.134	1715.2	1814.8	-5.80

Table 19c. Comparison of speed of sound in compressed liquid reported by Otpushchennikov et al.[81] with calculated values

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
313.15	298.055	11.287	1367.0	1393.3	-1.92
313.15	131.912	11.122	1292.0	1332.6	-3.15
313.15	34.160	11.016	1246.0	1296.8	-4.08
323.15	430.392	11.287	1381.0	1400.5	-1.41
323.15	258.072	11.122	1307.0	1335.9	-2.21
323.15	156.815	11.016	1261.0	1296.6	-2.82
323.15	38.759	10.882	1200.0	1249.7	-4.14
333.15	560.008	11.287	1395.0	1410.9	-1.14
333.15	381.182	11.122	1321.0	1343.8	-1.72
333.15	276.122	11.016	1275.0	1302.2	-2.14
333.15	153.720	10.882	1215.0	1251.8	-3.03
343.15	687.343	11.287	1407.0	1423.3	-1.16
343.15	501.817	11.122	1335.0	1354.4	-1.45
343.15	392.777	11.016	1289.0	1311.5	-1.74
343.15	265.725	10.882	1230.0	1258.8	-2.34
343.15	84.018	10.664	1135.0	1177.8	-3.77
353.15	812.715	11.287	1420.0	1436.9	-1.19
353.15	620.380	11.122	1348.0	1366.9	-1.40
353.15	507.255	11.016	1303.0	1323.0	-1.53
353.15	375.371	10.882	1244.0	1268.8	-1.99
353.15	186.662	10.664	1151.0	1184.5	-2.91
353.15	40.914	10.468	1067.0	1112.8	-4.29
363.15	936.356	11.287	1432.0	1451.4	-1.35
363.15	737.160	11.122	1361.0	1380.5	-1.43
363.15	619.891	11.016	1316.0	1336.0	-1.52
363.15	483.069	10.882	1258.0	1280.8	-1.81
363.15	287.088	10.664	1166.0	1194.3	-2.43
363.15	135.573	10.468	1083.0	1119.8	-3.40

Table 19d. Comparison of speed of sound in compressed liquid reported by Bobik[80] with calculated values

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
400.00	20.000	9.756	872.1	895.1	-2.64
400.00	50.000	9.820	898.2	918.1	-2.22
400.00	100.000	9.919	938.2	954.1	-1.69
400.00	200.000	10.093	1008.3	1019.0	-1.06
400.00	350.000	10.315	1097.7	1103.9	-0.56
400.00	600.000	10.618	1218.7	1223.9	-0.43
440.00	20.000	9.108	706.6	720.2	-1.92
440.00	50.000	9.205	740.8	753.2	-1.67
440.00	100.000	9.347	792.0	802.1	-1.28
440.00	200.000	9.582	877.8	885.0	-0.82
440.00	350.000	9.863	981.1	987.0	-0.60
440.00	600.000	10.222	1118.0	1124.0	-0.54

Table 19e. Comparison of speed of sound in compressed liquid reported by Pankevich[82] with calculated values

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
403.15	197.465	10.049	977.0	1006.5	-3.02
403.15	23.629	9.717	850.0	884.3	-4.04
413.15	272.968	10.049	993.0	1019.6	-2.68
413.15	91.052	9.717	869.0	896.6	-3.17
423.15	347.503	10.049	1009.0	1033.4	-2.42
423.15	157.432	9.717	887.0	909.8	-2.57
433.15	421.197	10.049	1025.0	1047.5	-2.20
433.15	222.942	9.717	904.0	923.7	-2.18
443.15	494.147	10.049	1039.0	1061.9	-2.20
443.15	287.711	9.717	920.0	937.9	-1.94
453.15	566.430	10.049	1052.0	1076.3	-2.31
453.15	351.833	9.717	935.0	952.2	-1.84
453.15	33.465	8.923	664.0	679.0	-2.26
463.15	638.104	10.049	1065.0	1090.7	-2.41
463.15	415.383	9.717	949.0	966.6	-1.86
463.15	80.721	8.923	683.0	695.4	-1.82
463.15	29.105	8.718	614.0	629.4	-2.50
473.15	709.216	10.049	1077.0	1105.0	-2.60
473.15	478.417	9.717	963.0	981.0	-1.87
473.15	127.611	8.923	700.0	711.4	-1.63
473.15	72.307	8.718	634.0	646.8	-2.02
473.15	23.433	8.488	560.0	575.0	-2.68
483.15	779.803	10.049	1089.0	1119.3	-2.78
483.15	540.979	9.717	978.0	995.3	-1.77
483.15	174.176	8.923	718.0	727.0	-1.26
483.15	115.263	8.718	653.0	663.4	-1.60
483.15	62.466	8.488	581.0	593.7	-2.19
483.15	24.011	8.270	517.0	528.6	-2.24
493.15	603.105	9.717	992.0	1009.4	-1.75
493.15	220.450	8.923	753.0	742.3	1.43
493.15	157.989	8.718	670.0	679.4	-1.41
493.15	101.381	8.488	600.0	611.2	-1.86
493.15	59.437	8.270	538.0	548.4	-1.93
503.15	664.824	9.717	1005.0	1023.3	-1.82
503.15	266.459	8.923	751.0	757.1	-.82
503.15	200.503	8.718	687.0	694.9	-1.15
503.15	140.166	8.488	617.0	627.7	-1.73
503.15	94.854	8.270	557.0	566.4	-1.69
503.15	45.558	7.950	471.0	479.0	-1.70
513.15	312.227	8.923	766.0	771.6	-.73
513.15	242.821	8.718	703.0	709.9	-.98
513.15	178.819	8.488	634.0	643.5	-1.49
513.15	130.225	8.270	575.0	583.3	-1.45
513.15	76.342	7.950	491.0	498.7	-1.56
513.15	51.090	7.745	439.0	446.1	-1.62
513.15	33.990	7.566	395.0	400.3	-1.33
523.15	357.769	8.923	780.0	785.7	-.72
523.15	284.956	8.718	717.0	724.4	-1.03
523.15	217.346	8.488	649.0	658.6	-1.47
523.15	165.536	8.270	592.0	599.3	-1.23
523.15	107.209	7.950	509.0	516.5	-1.47
523.15	79.254	7.745	459.0	465.8	-1.48
523.15	59.846	7.566	416.0	422.6	-1.60
533.15	403.101	8.923	794.0	799.1	-.64
533.15	326.920	8.718	731.0	738.1	-.98
533.15	255.750	8.488	664.0	672.9	-1.34
533.15	200.778	8.270	608.0	614.2	-1.03
533.15	138.112	7.950	527.0	532.8	-1.11
533.15	107.549	7.745	477.0	483.5	-1.35
533.15	85.951	7.566	436.0	441.8	-1.33
533.15	46.795	7.079	328.0	334.3	-1.93
543.15	368.721	8.718	744.0	750.9	-.93
543.15	294.036	8.488	679.0	686.1	-1.05
543.15	235.949	8.270	623.0	628.0	-.81
543.15	169.027	7.950	543.0	547.7	-.87
543.15	135.923	7.745	494.0	499.3	-1.07
543.15	112.209	7.566	454.0	458.6	-1.02
543.15	67.742	7.079	350.0	355.8	-1.65

Table 19e. Comparison of speed of sound in compressed liquid reported by Pankevich[82] with calculated values - Continued

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
543.15	47.687	6.683	276.0	278.6	-.94
553.15	410.366	8.718	757.0	761.3	-.57
553.15	332.207	8.488	693.0	696.9	-.57
553.15	271.047	8.270	637.0	639.4	-.37
553.15	199.939	7.950	558.0	560.0	-.36
553.15	164.346	7.745	510.0	512.3	-.46
553.15	138.568	7.566	470.0	472.5	-.53
553.15	88.993	7.079	369.0	372.6	-.96
553.15	65.255	6.683	298.0	299.5	-.52
553.15	50.609	6.234	232.0	226.0	2.59
553.15	47.487	6.068	207.0	200.9	2.96
553.15	44.775	5.850	176.0	168.9	4.01
563.15	451.860	8.718	770.0	790.6	-2.68
563.15	370.265	8.488	706.0	726.1	-2.85
563.15	306.071	8.270	651.0	668.5	-2.68
563.15	230.837	7.950	572.0	589.2	-3.00
563.15	192.799	7.745	525.0	541.7	-3.17
563.15	164.997	7.566	486.0	502.0	-3.30
563.15	110.448	7.079	387.0	403.1	-4.17
563.15	83.185	6.683	318.0	331.6	-4.29
563.15	65.106	6.234	254.0	261.1	-2.80
563.15	60.851	6.068	231.0	237.9	2.98
563.15	56.760	5.850	202.0	210.1	-3.99
563.15	55.308	5.748	187.0	198.0	-5.91
563.15	54.830	5.710	183.0	193.7	-5.86
563.15	52.703	5.492	164.0	171.2	-4.36
573.15	493.209	8.718	782.0	801.8	-2.53
573.15	408.213	8.488	719.0	737.5	-2.58
573.15	341.019	8.270	664.0	680.3	-2.45
573.15	261.714	7.950	586.0	601.6	-2.66
573.15	221.267	7.745	540.0	554.5	-2.69
573.15	191.476	7.566	501.0	515.3	-2.86
573.15	132.055	7.079	403.0	417.9	-3.71
573.15	101.361	6.683	335.0	347.9	-3.87
573.15	79.979	6.234	272.0	279.4	-2.72
573.15	74.649	6.068	251.0	256.9	-2.36
573.15	69.273	5.850	223.0	230.1	-3.19
573.15	67.264	5.748	209.0	218.6	-4.58
573.15	66.585	5.710	206.0	214.4	-4.09
573.15	63.397	5.492	188.0	192.8	-2.54
583.15	534.416	8.718	794.0	813.7	-2.48
583.15	446.053	8.488	732.0	749.7	-2.41
583.15	375.891	8.270	677.0	692.6	-2.31
583.15	292.563	7.950	599.0	614.4	-2.58
583.15	249.739	7.745	554.0	567.7	-2.48
583.15	217.988	7.566	515.0	528.9	-2.70
583.15	153.776	7.079	418.0	432.6	-3.50
583.15	119.721	6.683	351.0	363.6	-3.60
583.15	95.108	6.234	289.0	296.2	-2.49
583.15	88.726	6.068	268.0	274.1	-2.28
583.15	82.093	5.850	240.0	247.7	-3.22
583.15	79.538	5.748	227.0	236.3	-4.11
583.15	78.661	5.710	223.0	232.2	-4.14
583.15	74.426	5.492	205.0	210.8	-2.81
593.15	575.484	8.718	806.0	825.6	-2.43
593.15	483.786	8.488	744.0	761.8	-2.39
593.15	410.686	8.270	690.0	705.0	-2.17
593.15	323.380	7.950	612.0	627.2	-2.48
593.15	278.208	7.745	568.0	580.7	-2.24
593.15	244.522	7.566	529.0	542.2	-2.49
593.15	175.588	7.079	432.0	446.7	-3.41
593.15	138.223	6.683	366.0	378.5	-3.40
593.15	110.429	6.234	305.0	311.8	-2.22
593.15	103.010	6.068	284.0	289.9	-2.07
593.15	95.134	5.850	255.0	263.7	-3.42
593.15	92.036	5.748	242.0	252.4	-4.29
593.15	90.963	5.710	239.0	248.3	-3.89

Table 19e. Comparison of speed of sound in compressed liquid reported by Pankevich[82] with calculated values - Continued

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
593.15	85.683	5.492	221.0	226.8	-2.63
603.15	271.069	7.566	542.0	555.1	-2.41
603.15	197.472	7.079	444.0	460.3	-3.67
603.15	156.839	6.683	380.0	392.5	-3.30
603.15	125.902	6.234	318.0	326.4	-2.63
603.15	117.456	6.068	298.0	304.6	-2.21
603.15	108.345	5.850	269.0	278.5	-3.54
603.15	104.707	5.748	257.0	267.2	-3.97
603.15	103.438	5.710	254.0	263.1	-3.58
603.15	97.112	5.492	236.0	241.5	-2.35

Table 19f. Comparison of speed of sound in compressed liquid reported by Pankevich/Zotov[83] (Table 1) with calculated values

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
293.15	22.376	11.287	1338.0	1396.9	-4.40
313.15	298.055	11.287	1367.0	1393.3	-1.92
313.15	131.912	11.122	1292.0	1332.6	-3.15
313.15	34.160	11.016	1246.0	1296.8	-4.08
333.15	560.008	11.287	1395.0	1410.9	-1.14
333.15	381.182	11.122	1321.0	1343.8	-1.72
333.15	276.122	11.016	1275.0	1302.2	-2.14
333.15	153.720	10.882	1215.0	1251.8	-3.03
353.15	812.715	11.287	1420.0	1436.9	-1.19
353.15	620.380	11.122	1348.0	1366.9	-1.40
353.15	507.255	11.016	1303.0	1323.0	-1.53
353.15	375.371	10.882	1244.0	1268.8	-1.99
353.15	186.662	10.664	1151.0	1184.5	-2.91
353.15	40.032	10.467	1067.0	1112.3	-4.25
373.15	1058.446	11.287	1444.0	1466.3	-1.54
373.15	852.371	11.122	1373.0	1394.9	-1.59
373.15	730.931	11.016	1326.0	1349.8	-1.80
373.15	589.113	10.882	1271.0	1294.0	-1.81
373.15	385.700	10.664	1180.0	1206.0	-2.21
373.15	227.231	10.467	1096.0	1129.2	-3.03
383.15	1179.121	11.287	1455.0	1481.7	-1.83
383.15	966.176	11.122	1385.0	1409.8	-1.79
383.15	840.558	11.016	1340.0	1364.4	-1.82
383.15	693.718	10.882	1284.0	1308.1	-1.87
383.15	482.788	10.664	1194.0	1219.1	-2.10
383.15	318.143	10.467	1113.0	1141.0	-2.52
383.15	35.770	10.037	942.0	979.2	-3.95
393.15	1078.703	11.122	1396.0	1425.0	-2.07
393.15	948.913	11.016	1352.0	1379.4	-2.02
393.15	797.047	10.882	1296.0	1322.6	-2.05
393.15	578.559	10.664	1207.0	1233.0	-2.15
393.15	407.663	10.467	1128.0	1154.0	-2.31
393.15	113.478	10.037	960.0	989.6	-3.09
403.15	899.225	10.882	1308.0	1337.5	-2.25
403.15	673.172	10.664	1220.0	1247.3	-2.24
403.15	495.988	10.467	1142.0	1167.8	-2.26
403.15	189.798	10.037	977.0	1001.7	-2.53
403.15	18.510	9.705	850.0	880.2	-3.55
413.15	766.747	10.664	1233.0	1261.9	-2.34
413.15	583.267	10.467	1155.0	1182.0	-2.34
413.15	264.971	10.037	993.0	1014.8	-2.20
413.15	85.671	9.705	869.0	892.4	-2.69
423.15	859.378	10.664	1245.0	1276.7	-2.55
423.15	669.611	10.467	1168.0	1196.5	-2.44
423.15	339.172	10.037	1009.0	1028.5	-1.94
423.15	151.786	9.705	887.0	905.6	-2.10
433.15	951.140	10.664	1257.0	1291.6	-2.75
433.15	755.109	10.467	1181.0	1211.1	-2.55
433.15	412.533	10.037	1025.0	1042.7	-1.72
433.15	217.030	9.705	904.0	919.5	-1.71
443.15	839.830	10.467	1193.0	1225.8	-2.75
443.15	485.151	10.037	1039.0	1057.0	-1.73
443.15	281.531	9.705	920.0	933.7	-1.49
453.15	923.830	10.467	1205.0	1240.5	-2.94
453.15	557.101	10.037	1053.0	1071.4	-1.75
453.15	345.388	9.705	935.0	948.1	-1.40
463.15	628.445	10.037	1066.0	1085.8	-1.86
463.15	408.673	9.705	949.0	962.5	-1.42
473.15	699.228	10.037	1079.0	1100.1	-1.96
473.15	471.443	9.705	963.0	976.8	-1.44
483.15	769.490	10.037	1079.0	1114.4	-3.28
483.15	533.744	9.705	963.0	991.1	-2.92
483.15	769.490	10.037	1091.0	1114.4	-2.14
483.15	533.744	9.705	978.0	991.1	-1.34
493.15	595.610	9.705	991.0	1005.2	-1.43
503.15	657.071	9.705	1004.0	1019.1	-1.51

Table 19g. Comparison of speed of sound in compressed liquid reported by Pankevich/Zotov[83] (Table 2) with calculated values

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
453.15	26.182	8.895	664.0	669.7	-0.85
463.15	72.912	8.895	683.0	686.3	-0.49
463.15	19.619	8.675	614.0	615.3	-0.22
473.15	119.288	8.895	700.0	702.4	-0.35
473.15	62.048	8.675	634.0	633.2	0.12
473.15	16.086	8.447	560.0	562.2	-0.39
483.15	165.347	8.895	718.0	718.2	-0.02
483.15	104.254	8.675	653.0	650.1	0.44
483.15	54.429	8.447	581.0	581.5	-0.08
483.15	18.638	8.234	517.0	517.7	-0.14
493.15	211.123	8.895	735.0	733.5	0.20
493.15	146.247	8.675	670.0	666.4	0.54
493.15	92.681	8.447	600.0	599.2	0.13
493.15	53.492	8.234	538.0	538.1	-0.02
503.15	256.640	8.895	751.0	748.4	0.34
503.15	188.042	8.675	687.0	682.0	0.73
503.15	130.822	8.447	617.0	616.0	0.16
503.15	88.365	8.234	557.0	556.5	0.09
503.15	41.317	7.915	471.0	469.6	0.29
513.15	301.921	8.895	766.0	763.0	0.39
513.15	229.651	8.675	703.0	697.1	0.84
513.15	168.846	8.447	634.0	632.0	0.32
513.15	123.211	8.234	575.0	573.6	0.24
513.15	71.617	7.915	491.0	489.7	0.26
513.15	47.713	7.713	439.0	437.9	0.24
513.15	30.675	7.525	395.0	389.6	1.36
523.15	346.984	8.895	780.0	777.1	0.38
523.15	271.088	8.675	717.0	711.7	0.74
523.15	206.753	8.447	649.0	647.2	0.28
523.15	158.007	8.234	592.0	589.7	0.38
523.15	102.021	7.915	509.0	507.8	0.24
523.15	75.462	7.713	459.0	458.0	0.21
523.15	56.005	7.525	416.0	412.9	0.75
533.15	391.840	8.895	794.0	790.5	0.44
533.15	312.361	8.675	731.0	725.5	0.75
533.15	244.548	8.447	664.0	661.6	0.36
533.15	192.746	8.234	608.0	604.8	0.52
533.15	132.475	7.915	527.0	524.4	0.50
533.15	103.360	7.713	477.0	475.9	0.23
533.15	81.620	7.525	436.0	432.5	0.81
533.15	44.842	7.044	328.0	326.6	0.43
543.15	353.480	8.675	744.0	738.4	0.75
543.15	282.233	8.447	679.0	674.9	0.60
543.15	227.422	8.234	623.0	618.7	0.68
543.15	162.952	7.915	543.0	539.4	0.66
543.15	131.350	7.713	494.0	491.9	0.42
543.15	107.407	7.525	454.0	449.6	0.98
543.15	65.419	7.044	350.0	348.6	0.40
543.15	47.089	6.666	276.0	275.4	0.20
553.15	394.450	8.675	757.0	748.9	1.08
553.15	319.810	8.447	693.0	685.9	1.03
553.15	262.032	8.234	637.0	630.2	1.07
553.15	193.434	7.915	558.0	551.8	1.11
553.15	159.397	7.713	510.0	505.1	0.96
553.15	133.309	7.525	470.0	463.6	1.36
553.15	86.320	7.044	369.0	365.6	0.91
553.15	64.510	6.666	298.0	296.6	0.46
553.15	51.755	6.284	232.0	233.7	-0.74
553.15	48.545	6.131	207.0	210.2	-1.55
553.15	45.130	5.886	175.0	174.2	0.45
563.15	435.277	8.675	770.0	778.1	-1.06
563.15	357.283	8.447	706.0	715.0	-1.27
563.15	296.575	8.234	651.0	659.3	-1.27
563.15	223.909	7.915	572.0	581.0	-1.57
563.15	187.480	7.713	525.0	534.4	-1.80
563.15	159.291	7.525	486.0	493.2	-1.48
563.15	107.438	7.044	387.0	396.3	-2.41
563.15	82.303	6.666	318.0	328.8	-3.40
563.15	66.607	6.284	253.0	268.4	-6.09

Table 19g. Comparison of speed of sound in compressed liquid reported by Pankevich/Zotov[83] (Table 2) with calculated values - Continued

T K	P bar	ρ mol/L	W m/s	W(calc) m/s	% Dev.
563.15	62.328	6.131	230.0	246.4	-7.14
563.15	57.334	5.886	201.0	214.4	-6.68
563.15	55.475	5.761	187.0	199.5	-6.69
563.15	54.830	5.710	183.0	193.7	-5.86
573.15	475.965	8.675	782.0	789.9	-1.02
573.15	394.651	8.447	719.0	727.1	-1.12
573.15	331.047	8.234	664.0	671.7	-1.16
573.15	254.369	7.915	586.0	594.0	-1.37
573.15	215.585	7.713	540.0	547.9	-1.47
573.15	185.330	7.525	501.0	507.2	-1.23
573.15	128.715	7.044	403.0	411.8	-2.17
573.15	100.346	6.666	335.0	345.7	-3.18
573.15	81.819	6.284	272.0	286.9	-5.47
573.15	76.521	6.131	251.0	265.6	-5.82
573.15	70.049	5.886	223.0	234.7	-5.26
573.15	67.499	5.761	209.0	220.4	-5.45
573.15	66.585	5.710	206.0	214.8	-4.29
583.15	516.517	8.675	794.0	802.1	-1.02
583.15	431.917	8.447	732.0	739.4	-1.02
583.15	365.449	8.234	677.0	684.3	-1.08
583.15	284.807	7.915	599.0	607.1	-1.35
583.15	243.699	7.713	554.0	561.4	-1.33
583.15	211.409	7.525	515.0	521.0	-1.16
583.15	150.113	7.044	418.0	426.7	-2.07
583.15	118.575	6.666	351.0	361.5	-3.00
583.15	97.278	6.284	289.0	303.7	-5.09
583.15	90.985	6.131	268.0	282.8	-5.52
583.15	83.068	5.886	240.0	252.4	-5.18
583.15	79.840	5.761	227.0	238.3	-4.96
583.15	78.661	5.710	223.0	232.8	-4.38
593.15	556.936	8.675	806.0	814.1	-1.01
593.15	469.082	8.447	744.0	751.7	-1.03
593.15	399.779	8.234	690.0	696.8	-0.98
593.15	315.217	7.915	612.0	619.9	-1.30
593.15	271.815	7.713	568.0	574.5	-1.15
593.15	237.516	7.525	529.0	534.4	-1.02
593.15	171.606	7.044	432.0	440.9	-2.07
593.15	136.948	6.666	366.0	376.5	-2.86
593.15	112.925	6.284	305.0	319.3	-4.69
593.15	105.651	6.131	284.0	298.6	-5.14
593.15	96.304	5.886	255.0	268.5	-5.28
593.15	92.404	5.761	242.0	254.4	-5.12
593.15	90.963	5.710	239.0	248.9	-4.14
603.15	263.641	7.525	542.0	547.4	-1.00
603.15	193.175	7.044	445.0	454.6	-2.15
603.15	155.438	6.666	380.0	390.6	-2.79
603.15	128.722	6.284	318.0	333.9	-4.99
603.15	120.476	6.131	298.0	313.3	-5.13
603.15	109.710	5.886	269.0	283.3	-5.31
603.15	105.141	5.761	257.0	269.2	-4.76
603.15	103.438	5.710	254.0	263.8	-3.84

Table 20. The Joule-Thomson inversion locus for benzene

T K	ρ mol/L	P bar	T K	ρ mol/L	P bar	T K	ρ mol/L	P bar
460	8.774	27.98	720	7.135	467.53	980	5.870	638.67
480	8.630	80.47	740	7.027	487.12	1000	5.781	645.53
500	8.490	128.42	760	6.921	505.43	1020	5.693	651.59
520	8.352	172.41	780	6.817	522.53	1040	5.606	656.86
540	8.218	212.88	800	6.716	538.49	1060	5.519	661.36
560	8.087	250.24	820	6.616	553.37	1080	5.433	665.09
580	7.959	284.80	840	6.518	567.24	1100	5.346	668.06
600	7.833	316.84	860	6.421	580.12	1120	5.260	670.25
620	7.710	346.59	880	6.326	592.06	1140	5.173	671.67
640	7.590	374.28	900	6.233	603.10	1160	5.087	672.31
660	7.472	400.07	920	6.140	613.25	1180	5.000	672.18
680	7.357	424.11	940	6.049	622.55	1200	4.913	671.27
700	7.245	446.57	960	5.959	631.02			

Table 21. Properties of saturated liquid benzene

T K	P bar	ρ_l mol/L	ρ_g mol/L	Z_l	Z_g	dP_σ/dT bar/K	$d\rho_l/dT$ mol/(L·K)	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol
278.680	0.0478	11.477	0.00207	0.00018	0.99582	0.00260	-0.01479	15.732	1063.665
280.000	0.0514	11.457	0.00222	0.00019	0.99562	0.00276	-0.01476	15.583	1055.637
285.000	0.0668	11.384	0.00284	0.00025	0.99483	0.00344	-0.01466	15.035	1025.596
290.000	0.0860	11.311	0.00359	0.00032	0.99392	0.00425	-0.01456	14.511	996.106
295.000	0.1095	11.238	0.00450	0.00040	0.99288	0.00519	-0.01448	14.010	967.124
298.150	0.1269	11.192	0.00516	0.00046	0.99215	0.00586	-0.01443	13.704	949.109
300.000	0.1381	11.166	0.00558	0.00050	0.99169	0.00628	-0.01441	13.529	938.612
305.000	0.1726	11.094	0.00687	0.00061	0.99035	0.00755	-0.01434	13.068	910.536
310.000	0.2139	11.022	0.00839	0.00075	0.98885	0.00899	-0.01429	12.626	882.866
315.000	0.2629	10.951	0.01017	0.00092	0.98716	0.01063	-0.01425	12.200	855.579
320.000	0.3205	10.880	0.01223	0.00111	0.98527	0.01248	-0.01421	11.792	828.651
325.000	0.3881	10.809	0.01461	0.00133	0.98317	0.01456	-0.01419	11.398	802.066
330.000	0.4666	10.738	0.01734	0.00158	0.98085	0.01688	-0.01418	11.020	775.808
335.000	0.5573	10.667	0.02045	0.00188	0.97830	0.01945	-0.01418	10.654	749.867
340.000	0.6615	10.596	0.02399	0.00221	0.97549	0.02229	-0.01419	10.302	724.234
345.000	0.7806	10.525	0.02799	0.00259	0.97241	0.02541	-0.01422	9.962	698.905
350.000	0.9161	10.454	0.03248	0.00301	0.96906	0.02882	-0.01425	9.633	673.875
353.240	1.0133	10.408	0.03569	0.00331	0.96673	0.03119	-0.01428	9.426	657.815
355.000	1.0693	10.382	0.03753	0.00349	0.96542	0.03253	-0.01430	9.315	649.146
360.000	1.2419	10.311	0.04315	0.00402	0.96148	0.03656	-0.01436	9.008	624.719
365.000	1.4355	10.239	0.04941	0.00462	0.95723	0.04092	-0.01443	8.710	600.598
370.000	1.6517	10.166	0.05636	0.00528	0.95266	0.04562	-0.01452	8.421	576.788
375.000	1.8922	10.094	0.06403	0.00601	0.94776	0.05066	-0.01462	8.140	553.297
380.000	2.1589	10.020	0.07250	0.00682	0.94252	0.05606	-0.01474	7.868	530.134
385.000	2.4534	9.946	0.08180	0.00771	0.93695	0.06182	-0.01487	7.603	507.308
390.000	2.7777	9.871	0.09201	0.00868	0.93103	0.06796	-0.01501	7.346	484.829
395.000	3.1336	9.796	0.10318	0.00974	0.92475	0.07448	-0.01517	7.095	462.710
400.000	3.5232	9.720	0.11538	0.01090	0.91812	0.08139	-0.01535	6.851	440.962
405.000	3.9482	9.642	0.12869	0.01216	0.91112	0.08870	-0.01555	6.612	419.596
410.000	4.4108	9.564	0.14317	0.01353	0.90377	0.09641	-0.01576	6.380	398.626
415.000	4.9130	9.485	0.15890	0.01501	0.89605	0.10454	-0.01600	6.153	378.063
420.000	5.4569	9.404	0.17598	0.01662	0.88796	0.11308	-0.01626	5.931	357.919
425.000	6.0446	9.322	0.19449	0.01835	0.87950	0.12205	-0.01653	5.714	338.206
430.000	6.6782	9.239	0.21453	0.02022	0.87067	0.13146	-0.01684	5.501	318.936
435.000	7.3599	9.154	0.23621	0.02223	0.86147	0.14130	-0.01717	5.293	300.119
440.000	8.0919	9.067	0.25965	0.02439	0.85189	0.15159	-0.01752	5.089	281.764
445.000	8.8765	8.979	0.28495	0.02672	0.84192	0.16233	-0.01791	4.888	263.883
450.000	9.7160	8.888	0.31228	0.02922	0.83156	0.17353	-0.01833	4.691	246.483
455.000	10.6126	8.795	0.34177	0.03190	0.82081	0.18521	-0.01878	4.498	229.573
460.000	11.5688	8.700	0.37360	0.03477	0.80964	0.19736	-0.01928	4.307	213.160
465.000	12.5870	8.602	0.40795	0.03785	0.79805	0.20999	-0.01982	4.120	197.250
470.000	13.6696	8.502	0.44503	0.04114	0.78603	0.22313	-0.02041	3.935	181.850
475.000	14.8191	8.398	0.48508	0.04468	0.77354	0.23677	-0.02106	3.753	166.966
480.000	16.0382	8.291	0.52838	0.04847	0.76056	0.25093	-0.02177	3.573	152.601
485.000	17.3294	8.180	0.57524	0.05253	0.74707	0.26563	-0.02255	3.395	138.762
490.000	18.6954	8.065	0.62603	0.05690	0.73301	0.28088	-0.02342	3.219	125.452
495.000	20.1391	7.946	0.68119	0.06158	0.71834	0.29671	-0.02440	3.046	112.676
500.000	21.6635	7.821	0.74125	0.06663	0.70301	0.31314	-0.02549	2.873	100.439
505.000	23.2716	7.691	0.80684	0.07207	0.68693	0.33020	-0.02673	2.703	88.745
510.000	24.9666	7.554	0.87876	0.07795	0.67001	0.34792	-0.02816	2.533	77.601
515.000	26.7520	7.409	0.95801	0.08433	0.65214	0.36636	-0.02982	2.365	67.014
520.000	28.6315	7.255	1.04589	0.09128	0.63317	0.38558	-0.03178	2.197	56.994
525.000	30.6092	7.090	1.14410	0.09890	0.61290	0.40564	-0.03416	2.030	47.553
530.000	32.6895	6.912	1.25501	0.10732	0.59108	0.42667	-0.03710	1.863	38.708
535.000	34.8777	6.718	1.38202	0.11672	0.56734	0.44878	-0.04089	1.695	30.481

Table 21. Properties of saturated liquid benzene - Continued

T K	P bar	ρ_l mol/L	ρ_g mol/L	Z_l	Z_g	dP_σ/dT bar/K	$d\rho_l/dT$ mol/(L·K)	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol
540.000	37.1795	6.501	1.53027	0.12737	0.54113	0.47219	-0.04601	1.526	22.907
545.000	39.6022	6.254	1.70831	0.13974	0.51159	0.49719	-0.05347	1.355	16.033
550.000	42.1549	5.959	1.93224	0.15470	0.47708	0.52429	-0.06576	1.178	9.938
555.000	44.8502	5.575	2.24040	0.17433	0.43382	0.55446	-0.09146	0.990	4.761
558.000	46.5437	5.251	2.51473	0.19104	0.39893	0.57502	-0.13081	0.864	2.212
560.000	47.7091	4.927	2.80244	0.20797	0.36563	0.59074	-0.21012	0.766	0.835
561.000	48.3043	4.659	3.05188	0.22226	0.33933	0.59998	-0.35912	0.704	0.289
561.500	48.6057	4.415	3.29438	0.23581	0.31603	0.60558	-0.72581	0.660	0.075
561.750	48.7575	3.900	3.90000	0.26767	0.26767	0.60976		0.610	0.000

Table 21. Properties of saturated liquid benzene - Continued

T K	$\Delta_{vap}H$ J/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_σ J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
278.680	34937.2	0.0	0.4	163.801	82.92	132.15	132.15	0.99305	-0.0423	1473
280.000	34861.7	175.2	175.7	164.426	83.33	132.40	132.40	0.99309	-0.0421	1465
285.000	34577.5	841.7	842.3	166.778	84.90	133.37	133.38	0.99294	-0.0417	1436
290.000	34295.4	1512.4	1513.2	169.106	86.47	134.38	134.39	0.99239	-0.0412	1407
295.000	34015.3	2187.7	2188.7	171.412	88.04	135.43	135.45	0.99147	-0.0407	1380
298.150	33839.6	2615.6	2616.8	172.854	89.04	136.11	136.13	0.99071	-0.0404	1362
300.000	33736.7	2867.9	2869.1	173.698	89.62	136.52	136.54	0.99020	-0.0402	1353
305.000	33459.4	3553.2	3554.7	175.963	91.20	137.64	137.68	0.98861	-0.0396	1326
310.000	33182.9	4243.9	4245.8	178.211	92.77	138.81	138.84	0.98673	-0.0391	1300
315.000	32906.9	4940.2	4942.6	180.441	94.35	140.00	140.05	0.98459	-0.0385	1275
320.000	32631.0	5642.4	5645.3	182.656	95.92	141.23	141.28	0.98219	-0.0378	1250
325.000	32354.7	6350.6	6354.2	184.855	97.48	142.48	142.54	0.97958	-0.0372	1225
330.000	32077.7	7065.2	7069.5	187.040	99.04	143.77	143.84	0.97676	-0.0365	1201
335.000	31799.4	7786.3	7791.5	189.212	100.59	145.08	145.16	0.97374	-0.0358	1176
340.000	31519.5	8514.0	8520.3	191.371	102.13	146.41	146.51	0.97053	-0.0350	1153
345.000	31237.6	9248.7	9256.1	193.518	103.66	147.77	147.88	0.96715	-0.0342	1129
350.000	30953.1	9990.3	9999.0	195.655	105.17	149.15	149.28	0.96360	-0.0334	1106
353.240	30767.3	10474.7	10484.4	197.033	106.15	150.05	150.20	0.96120	-0.0329	1091
355.000	30665.8	10739.0	10749.3	197.780	106.67	150.55	150.70	0.95987	-0.0326	1083
360.000	30375.0	11495.0	11507.0	199.896	108.16	151.97	152.14	0.95597	-0.0317	1060
365.000	30080.5	12258.3	12272.3	202.002	109.63	153.40	153.60	0.95189	-0.0307	1037
370.000	29781.9	13029.0	13045.3	204.098	111.07	154.85	155.08	0.94763	-0.0297	1015
375.000	29478.7	13807.3	13826.0	206.187	112.50	156.32	156.58	0.94319	-0.0287	992
380.000	29170.5	14593.0	14614.6	208.267	113.91	157.80	158.10	0.93854	-0.0276	970
385.000	28857.0	15386.4	15411.0	210.340	115.29	159.29	159.64	0.93369	-0.0264	948
390.000	28537.9	16187.3	16215.5	212.405	116.65	160.80	161.20	0.92862	-0.0252	926
395.000	28212.7	16995.9	17027.9	214.463	117.99	162.31	162.77	0.92332	-0.0239	903
400.000	27881.1	17812.1	17848.3	216.514	119.30	163.84	164.36	0.91780	-0.0226	881
405.000	27542.7	18635.9	18676.8	218.559	120.58	165.37	165.97	0.91202	-0.0211	859
410.000	27197.2	19467.3	19513.4	220.597	121.83	166.92	167.60	0.90600	-0.0196	837
415.000	26844.3	20306.4	20358.2	222.630	123.06	168.48	169.25	0.89972	-0.0179	815
420.000	26483.5	21153.0	21211.1	224.657	124.25	170.04	170.93	0.89318	-0.0162	793
425.000	26114.4	22007.3	22072.2	226.679	125.42	171.62	172.63	0.88638	-0.0143	771
430.000	25736.5	22869.2	22941.5	228.695	126.55	173.21	174.35	0.87931	-0.0122	750
435.000	25349.6	23738.8	23819.2	230.707	127.65	174.82	176.11	0.87199	-0.0100	728
440.000	24952.9	24616.0	24705.3	232.714	128.73	176.44	177.91	0.86441	-0.0077	706
445.000	24545.9	25501.0	25599.8	234.717	129.77	178.08	179.75	0.85659	-0.0051	684
450.000	24128.1	26393.8	26503.1	236.716	130.78	179.75	181.64	0.84854	-0.0023	662
455.000	23698.6	27294.5	27415.2	238.712	131.76	181.44	183.59	0.84027	0.0008	639
460.000	23256.6	28203.4	28336.3	240.704	132.72	183.17	185.61	0.83181	0.0042	617
465.000	22801.3	29120.5	29266.8	242.694	133.65	184.94	187.72	0.82317	0.0080	595
470.000	22331.4	30046.2	30207.0	244.682	134.56	186.76	189.92	0.81437	0.0122	573
475.000	21845.8	30980.8	31157.2	246.668	135.45	188.65	192.25	0.80545	0.0168	550
480.000	21343.0	31924.6	32118.0	248.653	136.32	190.61	194.73	0.79643	0.0220	528
485.000	20821.3	32878.2	33090.0	250.639	137.19	192.67	197.40	0.78733	0.0279	505
490.000	20278.7	33842.2	34074.0	252.626	138.06	194.85	200.29	0.77820	0.0346	482
495.000	19712.7	34817.3	35070.7	254.616	138.94	197.18	203.48	0.76906	0.0423	459
500.000	19120.5	35804.4	36081.4	256.610	139.84	199.71	207.03	0.75994	0.0512	436
505.000	18498.7	36804.7	37107.3	258.611	140.79	202.48	211.07	0.75085	0.0616	412
510.000	17843.0	37819.5	38150.0	260.621	141.81	205.58	215.72	0.74183	0.0739	388
515.000	17147.9	38850.7	39211.8	262.643	142.92	209.10	221.21	0.73288	0.0886	364
520.000	16406.7	39900.6	40295.3	264.683	144.18	213.20	227.86	0.72401	0.1067	339
525.000	15610.4	40972.3	41404.0	266.746	145.65	218.10	236.14	0.71520	0.1291	314
530.000	14747.0	42069.9	42542.8	268.841	147.44	224.14	246.87	0.70641	0.1576	288
535.000	13799.0	43199.5	43718.7	270.980	149.69	231.90	261.44	0.69758	0.1952	261

Table 21. Properties of saturated liquid benzene - Continued

T K	$\Delta_{vap}H$ J/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_σ J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
540.000	12740.6	44370.4	44942.3	273.183	152.68	242.44	282.59	0.68859	0.2468	232
545.000	11529.1	45598.3	46231.5	275.484	156.93	257.88	316.39	0.67924	0.3216	203
550.000	10084.3	46913.1	47620.6	277.944	163.56	283.51	379.78	0.66922	0.4392	171
555.000	8215.9	48388.5	49192.9	280.717	176.02	337.60	543.48	0.65797	0.6501	137
558.000	6649.3	49445.9	50332.2	282.726	192.08	420.88	875.45	0.65026	0.8813	113
560.000	5090.0	50352.4	51320.8	284.470	217.60	589.03	1839.25	0.64458	1.1396	95
561.000	3804.9	51002.8	52039.6	285.738	253.06	905.07	4678.93	0.64173	1.3393	82
561.500	2619.9	51535.6	52636.5	286.789	312.69	1682.68	17006.03	0.64066	1.4856	72
561.750	0.0	52533.8	53784.0	288.797				0.64228	1.6400	0

4.3. Properties Along Selected Isobars

Table 22 gives thermophysical properties along selected isobars, computed as described in Sec. 3.3 via the EOS of Eq. (6). Each isobar starts at the freezing liquid on the melting line of Eq. (1). At pressures below the critical, each table contains a blank line for the transition from saturated liquid to vapor at the constant coexistence temperature. For compressed liquid states at $T < T_c$, properties are based on the formulated saturated liquid properties of Eqs. (9), (10), (11), and (20). The Joule–Thomson coefficients, μ, in Table 22 are computed using the EOS and derived C_p values by the relation

$$\mu/(\mathrm{K/bar}) = 100\left[T\left(\frac{\partial P}{\partial T}\right)/\left(\frac{\partial P}{\partial \rho}\right)/\rho - 1\right]/\rho/C_p. \tag{22}$$

Small discontinuities at $T = T_c$ along isobars at $P > P_c$ are expected, due to change in the paths of computation from $T < T_c$ to $T > T_c$. In particular, the values of C_v, C_p, and W for compressed liquid near T_c must be affected by the inherent, wide margin of uncertainty for $C_v(T)_\sigma$ as derived via Eq. (20).

Table 22. Properties of benzene along isobars

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
					0.10000 bar							
278.682	11.47662	0.00038	15.731611	1063.6857	0.0	0.9	163.802	82.92	132.15	0.47529	-0.0423	1473
280.000	11.45714	0.00037	15.583005	1055.6646	175.1	176.0	164.426	83.34	132.40	0.51040	-0.0421	1465
290.000	11.31053	0.00037	14.511257	996.1145	1512.4	1513.2	169.106	86.47	134.39	0.85351	-0.0412	1407
293.095	11.26553	0.00036	14.198228	978.1114	1929.8	1930.7	170.536	87.44	135.04	0.99186	-0.0409	1390
293.095	0.00413	0.99329	0.000345	24.0711	33632.0	36052.5	286.955	72.67	81.15	0.99186	4.9184	185
300.000	0.00403	0.99365	0.000337	24.6564	34145.7	36624.2	288.878	74.84	83.31	0.99292	4.4754	187
310.000	0.00390	0.99412	0.000325	25.5015	34910.6	37472.9	291.660	77.98	86.43	0.99342	4.0171	190
320.000	0.00378	0.99453	0.000315	26.3449	35706.7	38352.8	294.454	81.11	89.55	0.99388	3.6598	192
330.000	0.00366	0.99489	0.000305	27.1871	36534.1	39263.9	297.257	84.24	92.66	0.99429	3.3638	195
340.000	0.00355	0.99522	0.000296	28.0282	37392.6	40206.0	300.069	87.33	95.75	0.99465	3.1114	198
350.000	0.00345	0.99551	0.000288	28.8686	38281.8	41178.8	302.889	90.40	98.81	0.99499	2.8924	200
360.000	0.00336	0.99578	0.000279	29.7083	39201.6	42182.2	305.715	93.44	101.84	0.99529	2.7002	203
370.000	0.00326	0.99602	0.000272	30.5474	40151.4	43215.5	308.546	96.43	104.83	0.99557	2.5301	206
380.000	0.00318	0.99625	0.000265	31.3860	41131.0	44278.6	311.381	99.38	107.77	0.99583	2.3783	208
390.000	0.00309	0.99645	0.000258	32.2242	42139.8	45370.9	314.218	102.29	110.68	0.99606	2.2421	211
400.000	0.00302	0.99664	0.000251	33.0619	43177.3	46492.0	317.057	105.14	113.53	0.99628	2.1193	213
410.000	0.00294	0.99681	0.000245	33.8993	44243.2	47641.3	319.894	107.95	116.33	0.99648	2.0081	216
420.000	0.00287	0.99697	0.000239	34.7364	45336.9	48818.5	322.731	110.71	119.09	0.99667	1.9069	218
430.000	0.00281	0.99712	0.000233	35.5732	46458.0	50022.9	325.565	113.41	121.79	0.99684	1.8145	221
440.000	0.00274	0.99726	0.000228	36.4096	47605.7	51254.1	328.395	116.07	124.44	0.99700	1.7299	223
450.000	0.00268	0.99739	0.000223	37.2459	48779.8	52511.6	331.221	118.67	127.04	0.99715	1.6521	225
460.000	0.00262	0.99751	0.000218	38.0819	49979.6	53794.8	334.041	121.22	129.59	0.99729	1.5805	228
470.000	0.00257	0.99762	0.000213	38.9177	51204.7	55103.2	336.855	123.72	132.08	0.99742	1.5142	230
480.000	0.00251	0.99773	0.000209	39.7534	52454.4	56436.3	339.662	126.17	134.53	0.99755	1.4529	232
490.000	0.00246	0.99783	0.000205	40.5888	53728.3	57793.6	342.460	128.56	136.92	0.99766	1.3959	235
500.000	0.00241	0.99792	0.000201	41.4241	55026.0	59174.6	345.250	130.91	139.27	0.99777	1.3428	237
510.000	0.00236	0.99801	0.000197	42.2592	56346.8	60578.7	348.031	133.20	141.56	0.99787	1.2933	239
520.000	0.00232	0.99809	0.000193	43.0942	57690.3	62005.6	350.801	135.45	143.80	0.99796	1.2471	242
530.000	0.00227	0.99817	0.000189	43.9290	59056.0	63454.6	353.561	137.64	146.00	0.99805	1.2038	244
540.000	0.00223	0.99824	0.000186	44.7638	60443.5	64925.4	356.311	139.79	148.15	0.99814	1.1631	246
550.000	0.00219	0.99831	0.000182	45.5984	61852.2	66417.5	359.048	141.90	150.25	0.99822	1.1249	248
560.000	0.00215	0.99838	0.000179	46.4329	63281.7	67930.3	361.774	143.96	152.31	0.99830	1.0890	250
565.000	0.00213	0.99841	0.000177	46.8501	64004.2	68694.4	363.132	144.97	153.32	0.99833	1.0718	251
570.000	0.00211	0.99844	0.000176	47.2672	64731.6	69463.5	364.488	145.97	154.32	0.99837	1.0551	252
580.000	0.00208	0.99850	0.000173	48.1015	66201.4	71016.6	367.189	147.94	156.29	0.99843	1.0231	255
590.000	0.00204	0.99856	0.000170	48.9162	67690.7	72589.2	369.877	149.87	158.22	0.99850	1.1168	257
600.000	0.00201	0.99862	0.000167	49.7512	69199.1	74180.9	372.552	151.76	160.11	0.99856	1.0809	259
620.000	0.00194	0.99873	0.000162	51.4209	72271.5	77419.9	377.862	155.41	163.76	0.99867	1.0146	263
640.000	0.00188	0.99883	0.000157	53.0902	75415.3	80730.4	383.117	158.92	167.26	0.99877	0.9550	267
660.000	0.00182	0.99891	0.000152	54.7590	78627.7	84109.4	388.316	162.27	170.61	0.99887	0.9011	271
680.000	0.00177	0.99900	0.000147	56.4275	81905.9	87554.0	393.457	165.49	173.83	0.99895	0.8522	275
700.000	0.00172	0.99907	0.000143	58.0957	85247.0	91061.7	398.541	168.58	176.92	0.99903	0.8076	279
720.000	0.00167	0.99914	0.000139	59.7635	88648.6	94629.9	403.566	171.54	179.88	0.99909	0.7668	283
740.000	0.00163	0.99920	0.000135	61.4311	92108.3	98256.1	408.534	174.38	182.72	0.99916	0.7293	287
760.000	0.00158	0.99925	0.000132	63.0985	95623.7	101938.0	413.443	177.12	185.46	0.99922	0.6949	290
780.000	0.00154	0.99930	0.000128	64.7656	99192.8	105673.6	418.295	179.75	188.08	0.99927	0.6630	294
800.000	0.00150	0.99935	0.000125	66.4325	102813.4	109460.7	423.089	182.28	190.61	0.99932	0.6336	298
820.000	0.00147	0.99940	0.000122	68.0992	106483.6	113297.4	427.826	184.71	193.04	0.99936	0.6062	301
840.000	0.00143	0.99944	0.000119	69.7657	110201.6	117181.9	432.506	187.06	195.39	0.99940	0.5807	305
860.000	0.00140	0.99947	0.000116	71.4320	113965.6	121112.3	437.130	189.31	197.65	0.99944	0.5569	308
880.000	0.00137	0.99951	0.000114	73.0982	117774.0	125087.2	441.699	191.49	199.82	0.99948	0.5347	312
900.000	0.00134	0.99954	0.000111	74.7643	121625.2	129104.8	446.213	193.59	201.93	0.99951	0.5139	315
					0.20000 bar							
278.684	11.47667	0.00075	15.731551	1063.7250	0.1	1.9	163.802	82.93	132.15	0.23777	-0.0423	1473
280.000	11.45724	0.00075	15.583276	1055.7219	174.8	176.5	164.425	83.34	132.40	0.25529	-0.0421	1465
290.000	11.31063	0.00073	14.511540	996.1742	1512.0	1513.8	169.105	86.47	134.39	0.42691	-0.0412	1407
300.000	11.16576	0.00072	13.529153	938.6502	2867.7	2869.5	173.697	89.62	136.54	0.68405	-0.0402	1353

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
308.412	11.04494	0.00071	12.764100	891.6098	4024.0	4025.8	177.499	92.27	138.47	0.98736	-0.0392	1308
308.412	0.00788	0.98934	0.000660	25.1327	34759.4	37296.4	285.376	77.59	86.20	0.98736	4.0903	189
310.000	0.00784	0.98948	0.000657	25.2697	34888.1	37438.5	285.832	78.11	86.71	0.98796	3.9899	189
320.000	0.00759	0.99028	0.000635	26.1279	35686.0	38320.8	288.633	81.19	89.75	0.98881	3.5252	192
330.000	0.00736	0.99098	0.000615	26.9820	36514.7	39233.7	291.442	84.29	92.83	0.98957	3.1893	195
340.000	0.00713	0.99160	0.000596	27.8335	37374.1	40177.3	294.259	87.37	95.89	0.99025	2.9189	197
350.000	0.00693	0.99215	0.000578	28.6831	38264.2	41151.5	297.082	90.43	98.93	0.99086	2.6919	200
360.000	0.00673	0.99265	0.000562	29.5310	39184.7	42155.9	299.912	93.46	101.95	0.99142	2.4967	203
370.000	0.00655	0.99310	0.000546	30.3777	40135.2	43190.3	302.746	96.45	104.92	0.99193	2.3264	205
380.000	0.00637	0.99351	0.000531	31.2232	41115.3	44254.3	305.583	99.40	107.86	0.99239	2.1764	208
390.000	0.00621	0.99388	0.000517	32.0678	42124.6	45347.4	308.422	102.30	110.75	0.99282	2.0430	210
400.000	0.00605	0.99422	0.000504	32.9115	43162.6	46469.2	311.262	105.16	113.60	0.99322	1.9236	213
410.000	0.00590	0.99454	0.000492	33.7545	44229.0	47619.3	314.102	107.96	116.40	0.99358	1.8163	215
420.000	0.00576	0.99483	0.000480	34.5968	45323.0	48797.1	316.940	110.72	119.15	0.99392	1.7191	218
430.000	0.00562	0.99510	0.000468	35.4384	46444.4	50002.1	319.775	113.42	121.85	0.99423	1.6309	220
440.000	0.00549	0.99535	0.000458	36.2796	47592.5	51233.9	322.607	116.08	124.50	0.99452	1.5505	223
450.000	0.00537	0.99558	0.000447	37.1202	48766.9	52491.9	325.434	118.68	127.09	0.99479	1.4769	225
460.000	0.00525	0.99579	0.000438	37.9603	49967.0	53775.6	328.255	121.23	129.64	0.99504	1.4093	227
470.000	0.00514	0.99599	0.000428	38.8001	51192.3	55084.5	331.070	123.72	132.13	0.99527	1.3471	230
480.000	0.00503	0.99618	0.000419	39.6395	52442.3	56418.0	333.878	126.17	134.57	0.99549	1.2896	232
490.000	0.00493	0.99636	0.000410	40.4785	53716.5	57775.8	336.677	128.56	136.96	0.99570	1.2364	234
500.000	0.00483	0.99652	0.000402	41.3171	55014.4	59157.2	339.468	130.91	139.30	0.99589	1.1870	237
510.000	0.00473	0.99668	0.000394	42.1555	56335.4	60561.7	342.249	133.20	141.60	0.99608	1.1410	239
520.000	0.00464	0.99682	0.000386	42.9936	57679.1	61988.9	345.020	135.45	143.84	0.99625	1.0982	241
530.000	0.00455	0.99696	0.000379	43.8314	59045.0	63438.3	347.781	137.65	146.03	0.99641	1.0581	243
540.000	0.00447	0.99709	0.000372	44.6690	60432.7	64909.4	350.531	139.80	148.18	0.99656	1.0206	246
550.000	0.00439	0.99721	0.000365	45.5064	61841.6	66401.8	353.269	141.90	150.28	0.99671	0.9855	248
560.000	0.00431	0.99732	0.000359	46.3435	63271.3	67914.9	355.996	143.96	152.34	0.99684	0.9524	250
565.000	0.00427	0.99738	0.000355	46.7620	63993.8	68679.2	357.354	144.97	153.35	0.99691	0.9366	251
570.000	0.00423	0.99743	0.000352	47.1804	64721.3	69448.4	358.710	145.97	154.35	0.99697	0.9213	252
580.000	0.00416	0.99753	0.000346	48.0172	66191.3	71001.8	361.411	147.94	156.32	0.99709	0.8920	254
590.000	0.00409	0.99763	0.000340	48.8537	67680.7	72574.7	364.100	149.87	158.25	0.99721	0.8643	256
600.000	0.00402	0.99772	0.000335	49.6901	69189.3	74166.6	366.775	151.76	160.13	0.99732	0.8381	259
620.000	0.00389	0.99789	0.000324	51.3624	72261.9	77406.0	372.086	155.41	163.78	0.99752	0.7898	263
640.000	0.00377	0.99805	0.000314	53.0341	75406.0	80716.9	377.342	158.92	167.28	0.99771	0.7463	267
660.000	0.00365	0.99819	0.000304	54.7053	78618.7	84096.3	382.541	162.27	170.63	0.99787	0.7069	271
680.000	0.00354	0.99831	0.000295	56.3760	81897.0	87541.3	387.683	165.49	173.85	0.99803	0.6711	275
700.000	0.00344	0.99843	0.000287	58.0463	85238.4	91049.4	392.767	168.58	176.93	0.99816	0.6384	279
720.000	0.00335	0.99853	0.000279	59.7162	88640.2	94617.9	397.793	171.54	179.89	0.99829	0.6084	283
740.000	0.00326	0.99863	0.000271	61.3858	92100.1	98244.4	402.761	174.38	182.74	0.99841	0.5809	286
760.000	0.00317	0.99872	0.000264	63.0550	95615.7	101926.6	407.671	177.12	185.47	0.99852	0.5554	290
780.000	0.00309	0.99880	0.000257	64.7239	99184.9	105662.5	412.523	179.75	188.10	0.99861	0.5319	294
800.000	0.00301	0.99888	0.000251	66.3925	102805.7	109449.8	417.317	182.28	190.62	0.99871	0.5100	298
820.000	0.00294	0.99895	0.000244	68.0608	106476.1	113286.8	422.054	184.71	193.06	0.99879	0.4897	301
840.000	0.00287	0.99902	0.000239	69.7290	110194.2	117171.5	426.735	187.06	195.40	0.99887	0.4708	305
860.000	0.00280	0.99908	0.000233	71.3969	113958.4	121102.3	431.359	189.31	197.66	0.99894	0.4530	308
880.000	0.00274	0.99913	0.000228	73.0645	117766.9	125077.3	435.928	191.49	199.84	0.99901	0.4364	312
900.000	0.00267	0.99918	0.000223	74.7320	121618.2	129095.2	440.443	193.59	201.94	0.99907	0.4208	315
					0.50000 bar							
278.693	11.47683	0.00188	15.731371	1063.8428	0.3	4.7	163.803	82.93	132.15	0.09526	-0.0423	1473
280.000	11.45752	0.00187	15.584088	1055.8937	173.8	178.2	164.421	83.34	132.40	0.10223	-0.0421	1465
290.000	11.31093	0.00183	14.512389	996.3534	1511.0	1515.5	169.102	86.47	134.39	0.17095	-0.0412	1407
300.000	11.16608	0.00180	13.530040	938.8373	2866.6	2871.1	173.693	89.62	136.54	0.27391	-0.0402	1353
310.000	11.02256	0.00176	12.626421	883.0529	4242.8	4247.4	178.208	92.78	138.84	0.42253	-0.0391	1300
320.000	10.87996	0.00173	11.792324	828.7736	5641.7	5646.3	182.654	95.92	141.28	0.63007	-0.0378	1250
330.000	10.73784	0.00170	11.019727	775.8321	7065.1	7069.7	187.040	99.04	143.84	0.91153	-0.0365	1201
331.927	10.71047	0.00169	10.877328	765.7748	7342.3	7347.0	187.879	99.64	144.35	0.97562	-0.0362	1191
331.927	0.01849	0.97990	0.001562	26.5318	36613.2	39317.6	284.197	85.20	94.12	0.97562	3.2668	193
340.000	0.01803	0.98116	0.001519	27.2529	37320.0	40093.7	286.492	87.60	96.46	0.97863	2.9312	195
350.000	0.01749	0.98254	0.001470	28.1359	38213.6	41072.9	289.331	90.59	99.38	0.98004	2.6382	198
360.000	0.01698	0.98375	0.001426	29.0124	39136.8	42081.4	292.171	93.58	102.32	0.98131	2.4087	201

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
370.000	0.01650	0.98483	0.001384	29.8843	40089.6	43119.3	295.015	96.54	105.25	0.98246	2.2183	204
380.000	0.01605	0.98581	0.001346	30.7524	41071.7	44186.4	297.860	99.47	108.15	0.98351	2.0559	206
390.000	0.01563	0.98669	0.001309	31.6176	42082.7	45282.2	300.707	102.36	111.01	0.98446	1.9149	209
400.000	0.01522	0.98749	0.001275	32.4802	43122.3	46406.5	303.553	105.20	113.84	0.98534	1.7909	212
410.000	0.01484	0.98823	0.001242	33.3407	44190.0	47558.8	306.398	108.00	116.62	0.98615	1.6808	214
420.000	0.01448	0.98890	0.001211	34.1992	45285.4	48738.7	309.241	110.75	119.35	0.98689	1.5824	217
430.000	0.01413	0.98951	0.001182	35.0560	46407.9	49945.6	312.081	113.45	122.03	0.98758	1.4940	219
440.000	0.01380	0.99008	0.001154	35.9113	47556.9	51179.0	314.917	116.10	124.67	0.98819	1.4140	222
450.000	0.01349	0.99061	0.001128	36.7652	48732.3	52438.7	317.747	118.70	127.25	0.98878	1.3414	224
460.000	0.01319	0.99110	0.001102	37.6180	49933.3	53723.9	320.572	121.25	129.79	0.98934	1.2751	227
470.000	0.01290	0.99155	0.001078	38.4696	51159.4	55034.2	323.390	123.74	132.27	0.98986	1.2145	229
480.000	0.01263	0.99198	0.001055	39.3202	52410.2	56369.1	326.200	126.18	134.70	0.99034	1.1588	231
490.000	0.01237	0.99237	0.001033	40.1698	53685.1	57728.1	329.002	128.58	137.09	0.99079	1.1075	234
500.000	0.01212	0.99274	0.001012	41.0187	54983.7	59110.7	331.796	130.92	139.42	0.99122	1.0601	236
510.000	0.01187	0.99308	0.000991	41.8667	56305.4	60516.4	334.579	133.21	141.71	0.99161	1.0162	238
520.000	0.01164	0.99340	0.000972	42.7140	57649.7	61944.7	337.352	135.46	143.94	0.99199	0.9754	241
530.000	0.01142	0.99371	0.000953	43.5606	59016.2	63395.1	340.115	137.65	146.13	0.99234	0.9374	243
540.000	0.01120	0.99399	0.000935	44.4067	60404.4	64867.2	342.867	139.80	148.28	0.99267	0.9020	245
550.000	0.01100	0.99426	0.000918	45.2521	61813.8	66360.5	345.607	141.91	150.37	0.99298	0.8689	247
560.000	0.01080	0.99451	0.000901	46.0970	63244.0	67874.6	348.335	143.97	152.43	0.99328	0.8378	249
565.000	0.01070	0.99463	0.000893	46.5192	63966.8	68639.2	349.694	144.98	153.44	0.99342	0.8231	251
570.000	0.01061	0.99475	0.000885	46.9414	64694.5	69408.9	351.050	145.98	154.43	0.99355	0.8087	252
580.000	0.01042	0.99497	0.000869	47.7853	66165.0	70963.1	353.753	147.95	156.40	0.99382	0.7813	254
590.000	0.01024	0.99519	0.000854	48.6287	67654.8	72536.8	356.443	149.88	158.32	0.99407	0.7556	256
600.000	0.01007	0.99539	0.000840	49.4717	69163.8	74129.5	359.120	151.76	160.21	0.99431	0.7312	258
620.000	0.00974	0.99576	0.000813	51.1566	72237.2	77370.3	364.433	155.42	163.85	0.99474	0.6865	262
640.000	0.00943	0.99609	0.000787	52.8401	75382.0	80682.5	369.691	158.92	167.34	0.99514	0.6464	266
660.000	0.00914	0.99639	0.000763	54.5223	78595.3	84063.1	374.892	162.27	170.69	0.99550	0.6102	270
680.000	0.00887	0.99667	0.000740	56.2034	81874.3	87509.3	380.036	165.49	173.90	0.99583	0.5774	274
700.000	0.00862	0.99692	0.000719	57.8834	85216.2	91018.4	385.121	168.58	176.99	0.99612	0.5475	278
720.000	0.00838	0.99715	0.000698	59.5625	88618.6	94587.9	390.149	171.54	179.94	0.99640	0.5202	282
740.000	0.00815	0.99735	0.000679	61.2407	92079.0	98215.4	395.118	174.39	182.78	0.99665	0.4952	286
760.000	0.00793	0.99754	0.000661	62.9182	95595.1	101898.6	400.029	177.12	185.51	0.99687	0.4722	290
780.000	0.00773	0.99772	0.000644	64.5949	99164.8	105635.3	404.882	179.75	188.14	0.99709	0.4509	294
800.000	0.00753	0.99788	0.000628	66.2709	102786.0	109423.5	409.678	182.28	190.66	0.99728	0.4312	297
820.000	0.00735	0.99803	0.000612	67.9464	106456.7	113261.2	414.416	184.71	193.09	0.99746	0.4129	301
840.000	0.00717	0.99816	0.000598	69.6213	110175.3	117146.6	419.097	187.06	195.44	0.99763	0.3959	305
860.000	0.00700	0.99829	0.000584	71.2956	113939.8	121078.1	423.722	189.31	197.69	0.99778	0.3800	308
880.000	0.00684	0.99841	0.000570	72.9694	117748.7	125053.8	428.292	191.49	199.87	0.99792	0.3651	312
900.000	0.00669	0.99852	0.000558	74.6428	121600.3	129072.3	432.807	193.59	201.97	0.99806	0.3511	315
					1.01325 bar							
278.708	11.47709	0.00381	15.731065	1064.0444	0.7	9.5	163.804	82.94	132.15	0.04714	-0.0423	1473
280.000	11.45801	0.00380	15.585478	1056.1877	172.2	181.1	164.416	83.35	132.40	0.05054	-0.0421	1465
290.000	11.31144	0.00372	14.513843	996.6600	1509.3	1518.3	169.096	86.48	134.39	0.08452	-0.0412	1408
300.000	11.16662	0.00364	13.531560	939.1574	2864.9	2873.9	173.688	89.63	136.54	0.13542	-0.0402	1353
310.000	11.02314	0.00357	12.628011	883.3875	4241.0	4250.1	178.202	92.78	138.84	0.20888	-0.0391	1300
320.000	10.88058	0.00350	11.793988	829.1237	5639.7	5649.0	182.647	95.93	141.27	0.31147	-0.0378	1250
330.000	10.73850	0.00344	11.021472	776.1986	7063.0	7072.4	187.033	99.05	143.83	0.45059	-0.0365	1201
340.000	10.59644	0.00338	10.303441	724.4977	8512.5	8522.1	191.367	102.13	146.50	0.63436	-0.0350	1153
350.000	10.45390	0.00333	9.633715	673.9515	9989.8	9999.5	195.653	105.17	149.28	0.87145	-0.0334	1106
353.240	10.40753	0.00331	9.426146	657.8154	10474.7	10484.4	197.033	106.15	150.20	0.96120	-0.0329	1091
353.240	0.03569	0.96673	0.003053	27.4589	38412.4	41251.7	284.133	92.06	101.48	0.96120	2.7808	196
360.000	0.03495	0.96849	0.002978	28.0985	39052.8	41951.7	286.073	93.97	103.27	0.96551	2.5371	198
370.000	0.03393	0.97079	0.002880	29.0262	40011.4	42997.9	288.940	96.80	105.99	0.96774	2.2805	201
380.000	0.03297	0.97282	0.002791	29.9410	40998.0	44071.6	291.803	99.66	108.76	0.96975	2.0819	204
390.000	0.03206	0.97463	0.002710	30.8469	42012.8	45173.2	294.664	102.51	111.54	0.97158	1.9181	207
400.000	0.03121	0.97626	0.002634	31.7459	43055.6	46302.4	297.523	105.33	114.30	0.97324	1.7787	210
410.000	0.03040	0.97773	0.002563	32.6393	44126.1	47459.1	300.379	108.10	117.03	0.97477	1.6577	212
420.000	0.02964	0.97908	0.002496	33.5279	45223.9	48642.9	303.232	110.84	119.72	0.97617	1.5514	215
430.000	0.02891	0.98030	0.002433	34.4125	46348.6	49853.5	306.080	113.52	122.37	0.97746	1.4571	217
440.000	0.02822	0.98143	0.002373	35.2935	47499.8	51090.3	308.923	116.16	124.98	0.97866	1.3728	220
450.000	0.02756	0.98247	0.002317	36.1714	48677.0	52352.9	311.761	118.75	127.54	0.97977	1.2969	223

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
460.000	0.02694	0.98342	0.002263	37.0466	49879.7	53640.9	314.591	121.29	130.05	0.98079	1.2283	225
470.000	0.02634	0.98431	0.002212	37.9192	51107.3	54953.8	317.415	123.78	132.52	0.98175	1.1659	227
480.000	0.02577	0.98513	0.002163	38.7896	52359.5	56291.2	320.230	126.22	134.94	0.98264	1.1089	230
490.000	0.02523	0.98589	0.002116	39.6580	53635.8	57652.4	323.037	128.61	137.31	0.98348	1.0568	232
500.000	0.02470	0.98661	0.002072	40.5245	54935.6	59037.1	325.834	130.95	139.63	0.98426	1.0088	235
510.000	0.02420	0.98727	0.002029	41.3893	56258.4	60444.8	328.622	133.24	141.90	0.98499	0.9646	237
520.000	0.02372	0.98789	0.001988	42.2525	57603.8	61875.0	331.399	135.48	144.13	0.98567	0.9237	239
530.000	0.02326	0.98847	0.001949	43.1144	58971.3	63327.2	334.165	137.67	146.31	0.98632	0.8857	242
540.000	0.02282	0.98902	0.001912	43.9749	60360.5	64801.0	336.920	139.82	148.44	0.98693	0.8505	244
550.000	0.02239	0.98953	0.001876	44.8341	61770.8	66295.9	339.663	141.92	150.53	0.98750	0.8176	246
560.000	0.02198	0.99001	0.001841	45.6923	63201.8	67811.4	342.393	143.98	152.57	0.98804	0.7869	248
565.000	0.02178	0.99024	0.001824	46.1209	63925.0	68576.8	343.754	144.99	153.58	0.98830	0.7723	250
570.000	0.02159	0.99046	0.001807	46.5493	64653.2	69347.2	345.112	145.99	154.58	0.98855	0.7582	251
580.000	0.02120	0.99089	0.001775	47.4054	66124.2	70902.7	347.817	147.96	156.53	0.98900	0.7313	253
590.000	0.02084	0.99129	0.001744	48.2606	67614.8	72477.7	350.509	149.89	158.45	0.98946	0.7060	255
600.000	0.02048	0.99167	0.001714	49.1148	69124.5	74071.6	353.188	151.77	160.33	0.98989	0.6822	257
620.000	0.01981	0.99237	0.001657	50.8210	72199.2	77314.8	358.505	155.43	163.97	0.99069	0.6386	261
640.000	0.01918	0.99300	0.001604	52.5242	75345.2	80629.3	363.766	158.92	167.45	0.99142	0.5996	266
660.000	0.01858	0.99357	0.001554	54.2249	78559.6	84011.9	368.970	162.28	170.79	0.99207	0.5646	270
680.000	0.01803	0.99408	0.001507	55.9233	81839.6	87460.0	374.117	165.50	174.00	0.99266	0.5330	274
700.000	0.01750	0.99455	0.001463	57.6195	85182.5	90971.0	379.205	168.58	177.07	0.99320	0.5043	278
720.000	0.01701	0.99497	0.001422	59.3139	88585.8	94542.1	384.235	171.54	180.02	0.99370	0.4781	282
740.000	0.01655	0.99536	0.001383	61.0065	92047.0	98171.2	389.207	174.39	182.86	0.99415	0.4542	286
760.000	0.01610	0.99571	0.001346	62.6976	95563.9	101855.8	394.120	177.12	185.59	0.99456	0.4322	289
780.000	0.01569	0.99604	0.001311	64.3873	99134.3	105593.9	398.974	179.75	188.21	0.99494	0.4119	293
800.000	0.01529	0.99634	0.001277	66.0756	102756.2	109383.4	403.771	182.28	190.73	0.99529	0.3932	297
820.000	0.01491	0.99661	0.001246	67.7627	106427.6	113222.4	408.511	184.71	193.16	0.99562	0.3758	301
840.000	0.01455	0.99686	0.001216	69.4487	110146.8	117109.0	413.194	187.06	195.49	0.99592	0.3597	304
860.000	0.01421	0.99710	0.001187	71.1336	113911.9	121041.6	417.820	189.31	197.75	0.99619	0.3446	308
880.000	0.01389	0.99731	0.001160	72.8176	117721.3	125018.4	422.392	191.49	199.92	0.99645	0.3306	311
900.000	0.01357	0.99751	0.001133	74.5007	121573.3	129037.8	426.908	193.59	202.02	0.99668	0.3174	315
					1.50000 bar							
278.722	11.47734	0.00564	15.730777	1064.2358	1.0	14.1	163.805	82.96	132.15	0.03192	-0.0423	1473
280.000	11.45847	0.00562	15.586798	1056.4665	170.7	183.8	164.410	83.35	132.40	0.03421	-0.0422	1465
290.000	11.31193	0.00550	14.515222	996.9507	1507.7	1521.0	169.090	86.49	134.38	0.05719	-0.0412	1408
300.000	11.16714	0.00539	13.533002	939.4611	2863.2	2876.6	173.682	89.64	136.54	0.09163	-0.0402	1353
310.000	11.02369	0.00528	12.629519	883.7049	4239.2	4252.8	178.196	92.79	138.83	0.14134	-0.0391	1301
320.000	10.88117	0.00518	11.795567	829.4558	5637.8	5651.6	182.642	95.93	141.27	0.21075	-0.0378	1250
330.000	10.73913	0.00509	11.023127	776.5461	7061.0	7075.0	187.027	99.05	143.83	0.30488	-0.0365	1201
340.000	10.59711	0.00501	10.305180	724.8614	8510.4	8524.6	191.360	102.14	146.50	0.42921	-0.0350	1153
350.000	10.45462	0.00493	9.635546	674.3320	9987.6	10001.9	195.647	105.18	149.27	0.58961	-0.0334	1106
360.000	10.31115	0.00486	9.008772	624.9300	11493.7	11508.3	199.892	108.16	152.14	0.79216	-0.0317	1060
366.550	10.21637	0.00482	8.619143	593.1853	12496.4	12511.0	202.652	110.08	154.06	0.95059	-0.0304	1030
366.550	0.05149	0.95584	0.004455	27.8257	39586.4	42499.5	284.465	96.33	106.19	0.95059	2.5531	198
370.000	0.05095	0.95706	0.004393	28.1707	39931.9	42876.1	285.441	97.30	107.06	0.95708	2.4284	199
380.000	0.04944	0.96024	0.004237	29.1455	40925.0	43958.9	288.329	99.96	109.54	0.96001	2.1663	202
390.000	0.04803	0.96303	0.004101	30.0986	41944.6	45067.4	291.208	102.72	112.17	0.96264	1.9711	205
400.000	0.04671	0.96551	0.003977	31.0377	42991.3	46202.4	294.081	105.49	114.83	0.96504	1.8126	207
410.000	0.04547	0.96774	0.003863	31.9663	44065.0	47364.0	296.950	108.23	117.49	0.96723	1.6789	210
420.000	0.04429	0.96976	0.003757	32.8864	45165.6	48552.1	299.813	110.94	120.13	0.96924	1.5634	213
430.000	0.04318	0.97159	0.003657	33.7996	46292.8	49766.4	302.670	113.61	122.74	0.97108	1.4623	216
440.000	0.04213	0.97326	0.003564	34.7068	47446.1	51006.7	305.521	116.24	125.31	0.97278	1.3729	218
450.000	0.04113	0.97480	0.003476	35.6088	48625.3	52272.5	308.366	118.81	127.84	0.97436	1.2930	221
460.000	0.04017	0.97622	0.003392	36.5064	49829.7	53563.4	311.203	121.35	130.33	0.97582	1.2213	224
470.000	0.03927	0.97752	0.003313	37.3999	51059.0	54878.9	314.032	123.83	132.77	0.97718	1.1564	226
480.000	0.03840	0.97873	0.003238	38.2898	52312.6	56218.7	316.853	126.26	135.17	0.97844	1.0975	229
490.000	0.03758	0.97985	0.003166	39.1764	53590.2	57582.2	319.665	128.64	137.52	0.97962	1.0438	231
500.000	0.03678	0.98089	0.003098	40.0602	54891.3	58969.1	322.466	130.98	139.83	0.98072	0.9946	233
510.000	0.03603	0.98186	0.003033	40.9413	56215.3	60378.7	325.258	133.27	142.09	0.98176	0.9494	236
520.000	0.03530	0.98276	0.002970	41.8200	57561.8	61810.8	328.038	135.50	144.31	0.98272	0.9077	238
530.000	0.03461	0.98361	0.002911	42.6964	58930.3	63264.7	330.808	137.70	146.48	0.98363	0.8692	241
540.000	0.03394	0.98440	0.002853	43.5708	60320.4	64740.2	333.566	139.84	148.60	0.98449	0.8334	243

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
550.000	0.03330	0.98514	0.002799	44.4433	61731.6	66236.6	336.312	141.94	150.68	0.98529	0.8002	245
560.000	0.03268	0.98584	0.002746	45.3141	63163.5	67753.7	339.045	143.99	152.72	0.98605	0.7693	248
565.000	0.03238	0.98617	0.002720	45.7489	63887.1	68519.8	340.407	145.00	153.72	0.98642	0.7546	249
570.000	0.03208	0.98649	0.002695	46.1833	64615.6	69290.9	341.766	146.00	154.71	0.98677	0.7404	250
580.000	0.03151	0.98711	0.002646	47.0509	66087.4	70847.7	344.474	147.97	156.67	0.98742	0.7134	252
590.000	0.03096	0.98769	0.002599	47.9171	67578.8	72423.9	347.168	149.90	158.58	0.98806	0.6880	254
600.000	0.03043	0.98824	0.002554	48.7821	69089.1	74019.1	349.849	151.78	160.45	0.98867	0.6642	256
620.000	0.02941	0.98925	0.002468	50.5083	72165.0	77264.6	355.170	155.43	164.08	0.98979	0.6207	261
640.000	0.02847	0.99016	0.002388	52.2301	75312.3	80581.2	360.434	158.93	167.55	0.99080	0.5819	265
660.000	0.02758	0.99097	0.002313	53.9481	78527.7	83965.8	365.642	162.28	170.89	0.99172	0.5471	269
680.000	0.02675	0.99171	0.002242	55.6626	81808.7	87415.7	370.791	165.50	174.08	0.99255	0.5157	273
700.000	0.02597	0.99238	0.002176	57.3741	85152.5	90928.3	375.882	168.58	177.15	0.99330	0.4874	277
720.000	0.02523	0.99298	0.002114	59.0827	88556.6	94501.0	380.914	171.55	180.10	0.99399	0.4615	281
740.000	0.02454	0.99354	0.002055	60.7888	92018.5	98131.5	385.887	174.39	182.93	0.99462	0.4379	285
760.000	0.02388	0.99404	0.002000	62.4925	95536.2	101817.5	390.802	177.12	185.65	0.99520	0.4163	289
780.000	0.02326	0.99450	0.001947	64.1942	99107.2	105556.9	395.659	179.75	188.27	0.99573	0.3964	293
800.000	0.02267	0.99493	0.001897	65.8939	102729.8	109347.6	400.457	182.28	190.79	0.99621	0.3780	297
820.000	0.02210	0.99532	0.001850	67.5918	106401.8	113187.8	405.198	184.71	193.21	0.99666	0.3610	300
840.000	0.02157	0.99568	0.001805	69.2881	110121.5	117075.5	409.882	187.06	195.55	0.99708	0.3452	304
860.000	0.02106	0.99601	0.001762	70.9829	113887.2	121009.1	414.510	189.32	197.80	0.99746	0.3305	308
880.000	0.02058	0.99632	0.001722	72.6763	117697.1	124986.9	419.083	191.49	199.97	0.99782	0.3168	311
900.000	0.02011	0.99660	0.001683	74.3683	121549.7	129007.3	423.600	193.60	202.06	0.99814	0.3040	315
					2.00000 bar							
278.737	11.47759	0.00752	15.730482	1064.4325	1.4	18.8	163.806	82.97	132.16	0.02401	-0.0423	1473
280.000	11.45894	0.00750	15.588155	1056.7530	169.1	186.6	164.405	83.36	132.39	0.02570	-0.0422	1465
290.000	11.31243	0.00733	14.516641	997.2495	1506.1	1523.8	169.085	86.50	134.38	0.04297	-0.0412	1408
300.000	11.16767	0.00718	13.534484	939.7730	2861.4	2879.3	173.676	89.65	136.53	0.06885	-0.0402	1353
310.000	11.02426	0.00704	12.631069	884.0310	4237.4	4255.5	178.190	92.80	138.83	0.10619	-0.0391	1301
320.000	10.88177	0.00691	11.797190	829.7969	5635.9	5654.3	182.636	95.94	141.27	0.15834	-0.0379	1250
330.000	10.73977	0.00679	11.024828	776.9030	7059.0	7077.6	187.021	99.06	143.82	0.22905	-0.0365	1201
340.000	10.59780	0.00668	10.306966	725.2349	8508.3	8527.2	191.354	102.15	146.49	0.32245	-0.0350	1153
350.000	10.45537	0.00657	9.637427	674.7229	9985.3	10004.4	195.640	105.19	149.26	0.44293	-0.0334	1107
360.000	10.31195	0.00648	9.010758	625.3388	11491.3	11510.7	199.885	108.17	152.13	0.59508	-0.0317	1061
370.000	10.16698	0.00639	8.422107	577.0856	13027.2	13046.9	204.094	111.08	155.08	0.78347	-0.0297	1015
377.082	10.06304	0.00634	8.025825	543.6111	14133.6	14153.4	207.054	113.09	157.22	0.94128	-0.0282	983
377.082	0.06746	0.94562	0.005898	27.9817	40539.6	43504.4	284.891	99.69	109.99	0.94128	2.4023	198
380.000	0.06685	0.94689	0.005824	28.2880	40844.5	43836.2	285.714	100.50	110.70	0.94847	2.3011	199
390.000	0.06487	0.95083	0.005607	29.3054	41871.1	44954.3	288.619	103.04	112.98	0.95197	2.0504	202
400.000	0.06302	0.95427	0.005420	30.2936	42922.9	46096.6	291.511	105.71	115.48	0.95513	1.8651	205
410.000	0.06128	0.95733	0.005253	31.2633	44000.6	47264.1	294.394	108.40	118.03	0.95801	1.7152	208
420.000	0.05965	0.96008	0.005099	32.2193	45104.6	48457.3	297.269	111.07	120.60	0.96064	1.5888	211
430.000	0.05812	0.96257	0.004957	33.1644	46234.6	49676.0	300.137	113.72	123.15	0.96306	1.4799	214
440.000	0.05666	0.96483	0.004824	34.1004	47390.5	50920.2	302.997	116.33	125.68	0.96528	1.3846	217
450.000	0.05528	0.96690	0.004700	35.0288	48571.9	52189.5	305.850	118.89	128.17	0.96734	1.3003	219
460.000	0.05398	0.96880	0.004583	35.9504	49778.3	53483.6	308.694	121.41	130.63	0.96924	1.2250	222
470.000	0.05273	0.97055	0.004472	36.8663	51009.4	54802.1	311.530	123.88	133.05	0.97100	1.1574	225
480.000	0.05155	0.97216	0.004367	37.7770	52264.7	56144.5	314.356	126.31	135.43	0.97265	1.0963	227
490.000	0.05042	0.97365	0.004268	38.6831	53543.8	57510.5	317.173	128.69	137.76	0.97418	1.0408	230
500.000	0.04934	0.97504	0.004174	39.5850	54846.2	58899.7	319.979	131.02	140.05	0.97561	0.9901	232
510.000	0.04831	0.97632	0.004084	40.4833	56171.5	60311.5	322.775	133.30	142.30	0.97695	0.9437	235
520.000	0.04732	0.97752	0.003998	41.3781	57519.1	61745.5	325.559	135.53	144.50	0.97820	0.9011	237
530.000	0.04638	0.97864	0.003915	42.2698	58888.8	63201.3	328.332	137.72	146.66	0.97938	0.8618	240
540.000	0.04547	0.97969	0.003837	43.1587	60279.9	64678.5	331.094	139.86	148.77	0.98048	0.8254	242
550.000	0.04460	0.98067	0.003762	44.0449	61692.1	66176.6	333.843	141.96	150.84	0.98153	0.7917	244
560.000	0.04376	0.98159	0.003689	44.9288	63124.9	67695.3	336.579	144.01	152.87	0.98251	0.7603	247
565.000	0.04335	0.98203	0.003654	45.3699	63848.9	68462.1	337.942	145.02	153.87	0.98298	0.7455	248
570.000	0.04295	0.98245	0.003620	45.8104	64577.8	69234.0	339.302	146.02	154.86	0.98343	0.7311	249
580.000	0.04218	0.98327	0.003553	46.6900	66050.5	70792.2	342.013	147.99	156.80	0.98428	0.7038	251
590.000	0.04143	0.98403	0.003489	47.5676	67542.5	72369.8	344.709	149.91	158.71	0.98511	0.6782	253
600.000	0.04071	0.98476	0.003428	48.4435	69053.6	73966.2	347.393	151.79	160.57	0.98589	0.6543	256
620.000	0.03934	0.98608	0.003311	50.1903	72130.9	77214.1	352.717	155.44	164.19	0.98734	0.6105	260
640.000	0.03807	0.98727	0.003202	51.9311	75279.3	80532.9	357.985	158.94	167.66	0.98864	0.5717	264

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
660.000	0.03688	0.98834	0.003100	53.6668	78495.9	83919.5	363.196	162.29	170.98	0.98981	0.5369	269
680.000	0.03576	0.98931	0.003005	55.3978	81777.9	87371.3	368.348	165.50	174.17	0.99088	0.5056	273
700.000	0.03470	0.99018	0.002915	57.1246	85122.6	90885.6	373.441	168.59	177.24	0.99185	0.4774	277
720.000	0.03371	0.99097	0.002831	58.8477	88527.5	94459.9	378.475	171.55	180.18	0.99273	0.4517	281
740.000	0.03278	0.99169	0.002752	60.5674	91990.3	98091.9	383.451	174.39	183.00	0.99354	0.4283	285
760.000	0.03189	0.99235	0.002677	62.2840	95508.7	101779.3	388.368	177.13	185.72	0.99428	0.4068	289
780.000	0.03106	0.99295	0.002606	63.9978	99080.5	105520.1	393.226	179.75	188.33	0.99496	0.3871	292
800.000	0.03026	0.99350	0.002539	65.7090	102703.6	109312.0	398.026	182.28	190.85	0.99559	0.3689	296
820.000	0.02951	0.99401	0.002475	67.4179	106376.3	113153.4	402.769	184.71	193.27	0.99616	0.3521	300
840.000	0.02880	0.99448	0.002414	69.1246	110096.6	117042.2	407.454	187.06	195.60	0.99669	0.3365	304
860.000	0.02811	0.99491	0.002357	70.8292	113862.8	120976.9	412.083	189.32	197.85	0.99719	0.3220	307
880.000	0.02746	0.99531	0.002302	72.5320	117673.3	124955.7	416.657	191.49	200.02	0.99764	0.3084	311
900.000	0.02684	0.99568	0.002250	74.2331	121526.3	128977.0	421.175	193.60	202.11	0.99805	0.2958	314
					3.00000 bar							
278.766	11.47810	0.01128	15.729896	1064.8256	2.1	28.3	163.809	82.99	132.16	0.01609	-0.0423	1473
280.000	11.45989	0.01124	15.590873	1057.3262	166.0	192.2	164.393	83.38	132.39	0.01720	-0.0422	1466
290.000	11.31344	0.01100	14.519484	997.8477	1502.8	1529.3	169.073	86.51	134.38	0.02875	-0.0412	1408
300.000	11.16874	0.01077	13.537452	940.3969	2858.0	2884.8	173.665	89.66	136.53	0.04606	-0.0402	1353
310.000	11.02539	0.01056	12.634172	884.6831	4233.7	4260.9	178.178	92.81	138.82	0.07104	-0.0391	1301
320.000	10.88298	0.01036	11.800437	830.4790	5632.1	5659.6	182.624	95.95	141.26	0.10592	-0.0379	1251
330.000	10.74106	0.01018	11.028232	777.6168	7054.9	7082.9	187.009	99.08	143.81	0.15322	-0.0365	1202
340.000	10.59918	0.01001	10.310541	725.9819	8504.0	8532.3	191.341	102.16	146.48	0.21568	-0.0351	1154
350.000	10.45685	0.00986	9.641189	675.5044	9980.7	10009.4	195.627	105.20	149.25	0.29626	-0.0335	1107
360.000	10.31355	0.00972	9.014729	626.1559	11486.4	11515.5	199.872	108.18	152.11	0.39801	-0.0317	1061
370.000	10.16871	0.00959	8.426311	577.9396	13022.0	13051.5	204.079	111.09	155.05	0.52399	-0.0298	1016
380.000	10.02173	0.00947	7.871600	530.8840	14588.3	14618.3	208.255	113.92	158.08	0.67719	-0.0276	971
390.000	9.87193	0.00937	7.346686	485.0362	16186.0	16216.4	212.401	116.66	161.19	0.86041	-0.0252	926
393.176	9.82364	0.00934	7.185635	470.7378	16700.0	16730.5	213.713	117.51	162.19	0.92528	-0.0244	912
393.176	0.09899	0.92708	0.008828	27.9665	42031.9	45062.6	285.772	104.81	115.99	0.92528	2.2111	199
400.000	0.09690	0.93093	0.008557	28.7357	42775.3	45871.3	287.738	106.47	117.32	0.93671	2.0164	201
410.000	0.09403	0.93591	0.008231	29.8122	43864.4	47054.9	290.661	108.89	119.43	0.94098	1.8154	204
420.000	0.09136	0.94029	0.007951	30.8542	44977.1	48260.7	293.568	111.44	121.75	0.94486	1.6599	207
430.000	0.08887	0.94420	0.007700	31.8726	46114.3	49490.0	296.461	114.00	124.13	0.94840	1.5319	210
440.000	0.08653	0.94773	0.007472	32.8731	47276.2	50743.3	299.342	116.55	126.53	0.95166	1.4230	213
450.000	0.08432	0.95093	0.007261	33.8591	48462.7	52020.7	302.213	119.08	128.93	0.95466	1.3286	216
460.000	0.08223	0.95385	0.007065	34.8330	49673.8	53321.9	305.073	121.57	131.31	0.95743	1.2456	219
470.000	0.08026	0.95652	0.006881	35.7967	50909.0	54646.9	307.923	124.02	133.67	0.96000	1.1719	222
480.000	0.07839	0.95898	0.006709	36.7514	52168.0	55995.2	310.762	126.42	135.99	0.96238	1.1059	224
490.000	0.07660	0.96124	0.006547	37.6983	53450.4	57366.6	313.590	128.78	138.28	0.96460	1.0465	227
500.000	0.07491	0.96333	0.006394	38.6382	54755.8	58760.7	316.406	131.10	140.53	0.96667	0.9927	230
510.000	0.07329	0.96527	0.006248	39.5718	56083.9	60177.0	319.211	133.37	142.74	0.96861	0.9437	232
520.000	0.07175	0.96707	0.006111	40.4999	57434.2	61615.3	322.004	135.60	144.91	0.97042	0.8990	235
530.000	0.07027	0.96875	0.005979	41.4230	58806.2	63075.2	324.785	137.78	147.04	0.97212	0.8579	237
540.000	0.06886	0.97032	0.005854	42.3414	60199.5	64556.1	327.553	139.91	149.13	0.97371	0.8201	240
550.000	0.06751	0.97178	0.005735	43.2557	61613.7	66057.7	330.309	142.01	151.18	0.97521	0.7851	242
560.000	0.06621	0.97315	0.005620	44.1660	63048.5	67579.6	333.051	144.05	153.19	0.97662	0.7528	245
565.000	0.06558	0.97381	0.005565	44.6199	63773.4	68348.0	334.417	145.06	154.18	0.97730	0.7375	246
570.000	0.06496	0.97444	0.005511	45.0729	64503.2	69121.4	335.780	146.06	155.16	0.97795	0.7227	247
580.000	0.06376	0.97565	0.005406	45.9765	65977.5	70682.5	338.495	148.02	157.09	0.97918	0.6947	249
590.000	0.06261	0.97678	0.005305	46.8770	67471.2	72262.9	341.197	149.94	158.98	0.98037	0.6686	252
600.000	0.06150	0.97785	0.005209	47.7748	68983.8	73862.0	343.885	151.82	160.83	0.98149	0.6442	254
620.000	0.05940	0.97981	0.005026	49.5626	72063.9	77114.8	349.217	155.46	164.42	0.98357	0.5998	259
640.000	0.05744	0.98156	0.004857	51.3413	75214.8	80438.0	354.493	158.96	167.87	0.98543	0.5605	263
660.000	0.05561	0.98314	0.004699	53.1120	78433.7	83828.7	359.709	162.31	171.18	0.98711	0.5254	267
680.000	0.05389	0.98455	0.004551	54.8756	81717.7	87284.2	364.867	165.52	174.35	0.98864	0.4941	272
700.000	0.05229	0.98583	0.004413	56.6328	85064.3	90802.0	369.966	168.60	177.40	0.99002	0.4658	276
720.000	0.05077	0.98699	0.004283	58.3844	88471.0	94379.6	375.005	171.56	180.33	0.99128	0.4402	280
740.000	0.04935	0.98805	0.004161	60.1308	91935.4	98014.6	379.985	174.40	183.15	0.99243	0.4169	284
760.000	0.04800	0.98901	0.004046	61.8726	95455.3	101704.9	384.905	177.13	185.86	0.99349	0.3956	288
780.000	0.04673	0.98989	0.003937	63.6102	99028.5	105448.2	389.767	179.76	188.46	0.99446	0.3760	292
800.000	0.04553	0.99069	0.003834	65.3439	102653.0	109242.7	394.570	182.28	190.97	0.99535	0.3581	296
820.000	0.04438	0.99143	0.003737	67.0741	106326.9	113086.4	399.316	184.72	193.38	0.99617	0.3414	299

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
840.000	0.04330	0.99211	0.003644	68.8011	110048.4	116977.5	404.004	187.06	195.71	0.99692	0.3261	303
860.000	0.04226	0.99274	0.003556	70.5251	113815.7	120914.3	408.636	189.32	197.95	0.99762	0.3118	307
880.000	0.04128	0.99332	0.003472	72.2463	117627.2	124895.1	413.211	191.50	200.12	0.99827	0.2985	310
900.000	0.04034	0.99385	0.003393	73.9650	121481.2	128918.3	417.732	193.60	202.20	0.99886	0.2861	314
					5.00000 bar							
278.824	11.47912	0.01879	15.728747	1065.6135	3.6	47.1	163.814	83.04	132.16	0.00976	-0.0423	1473
280.000	11.46178	0.01874	15.596323	1058.4730	159.7	203.3	164.371	83.40	132.38	0.01040	-0.0422	1466
290.000	11.31544	0.01833	14.525177	999.0431	1496.2	1540.4	169.051	86.54	134.37	0.01738	-0.0413	1409
300.000	11.17086	0.01794	13.543400	941.6450	2851.1	2895.8	173.642	89.69	136.52	0.02784	-0.0402	1354
310.000	11.02765	0.01759	12.640389	885.9875	4226.4	4271.8	178.155	92.84	138.81	0.04293	-0.0391	1302
320.000	10.88538	0.01726	11.806942	831.8432	5624.4	5670.3	182.600	95.98	141.24	0.06399	-0.0379	1251
330.000	10.74363	0.01696	11.035047	779.0441	7046.8	7093.4	186.984	99.10	143.79	0.09256	-0.0366	1202
340.000	10.60193	0.01668	10.317696	727.4752	8495.4	8542.6	191.316	102.19	146.45	0.13028	-0.0351	1155
350.000	10.45980	0.01643	9.648717	677.0664	9971.6	10019.4	195.601	105.23	149.22	0.17893	-0.0335	1108
360.000	10.31674	0.01619	9.022671	627.7891	11476.7	11525.2	199.845	108.21	152.07	0.24036	-0.0318	1062
370.000	10.17217	0.01598	8.434715	579.6459	13011.6	13060.8	204.051	111.12	155.01	0.31641	-0.0299	1017
380.000	10.02549	0.01578	7.880525	532.6654	14577.1	14627.0	208.225	113.95	158.03	0.40889	-0.0277	972
390.000	9.87604	0.01561	7.356203	486.8947	16173.9	16224.5	212.370	116.68	161.12	0.51948	-0.0253	927
400.000	9.72306	0.01546	6.858208	442.3920	17802.4	17853.8	216.490	119.32	164.30	0.64967	-0.0227	883
410.000	9.56568	0.01533	6.383276	399.2202	19463.1	19515.4	220.587	121.84	167.57	0.80069	-0.0196	838
415.827	9.47157	0.01527	6.115969	374.7036	20445.8	20498.6	222.965	123.26	169.53	0.89866	-0.0177	812
415.827	0.16163	0.89474	0.014950	27.3754	44190.3	47283.8	287.380	111.99	124.98	0.89866	2.0048	197
420.000	0.15940	0.89823	0.014598	27.9259	44689.2	47825.9	288.603	112.95	125.56	0.90941	1.8852	199
430.000	0.15441	0.90571	0.013930	29.1629	45849.9	49088.0	291.574	114.97	126.97	0.91532	1.6840	203
440.000	0.14982	0.91224	0.013387	30.3343	47029.5	50366.8	294.469	117.26	128.85	0.92573	1.5336	206
450.000	0.14557	0.91804	0.012915	31.4639	48230.5	51665.4	297.389	119.63	130.89	0.93060	1.4117	209
460.000	0.14160	0.92325	0.012495	32.5627	49453.7	52984.8	300.290	122.01	133.01	0.93508	1.3091	213
470.000	0.13788	0.92796	0.012113	33.6372	50699.4	54325.7	303.174	124.38	135.16	0.93922	1.2207	216
480.000	0.13439	0.93225	0.011762	34.6917	51967.6	55688.2	306.044	126.73	137.33	0.94305	1.1434	219
490.000	0.13109	0.93618	0.011438	35.7292	53258.2	57072.2	308.898	129.04	139.49	0.94662	1.0750	222
500.000	0.12798	0.93978	0.011136	36.7523	54570.9	58477.8	311.739	131.33	141.63	0.94993	1.0141	225
510.000	0.12503	0.94310	0.010854	37.7626	55905.6	59904.7	314.565	133.57	143.74	0.95302	0.9593	228
520.000	0.12223	0.94617	0.010588	38.7619	57261.9	61352.6	317.377	135.77	145.84	0.95591	0.9097	230
530.000	0.11956	0.94901	0.010339	39.7512	58639.4	62821.3	320.175	137.93	147.90	0.95862	0.8647	233
540.000	0.11702	0.95165	0.010102	40.7316	60037.8	64310.5	322.959	140.05	149.93	0.96115	0.8237	236
550.000	0.11460	0.95411	0.009879	41.7041	61456.7	65819.8	325.729	142.12	151.92	0.96354	0.7860	238
560.000	0.11228	0.95640	0.009666	42.6693	62895.7	67348.8	328.485	144.16	153.88	0.96578	0.7514	241
565.000	0.11116	0.95749	0.009564	43.1494	63622.7	68120.7	329.857	145.16	154.85	0.96685	0.7351	242
570.000	0.11006	0.95855	0.009464	43.6279	64354.5	68897.3	331.226	146.15	155.81	0.96789	0.7195	244
580.000	0.10794	0.96056	0.009271	44.5805	65832.6	70464.8	333.952	148.10	157.70	0.96985	0.6899	246
590.000	0.10590	0.96244	0.009087	45.5276	67329.8	72051.1	336.664	150.02	159.56	0.97173	0.6624	248
600.000	0.10395	0.96421	0.008911	46.4696	68845.6	73655.8	339.362	151.89	161.38	0.97351	0.6369	251
620.000	0.10026	0.96745	0.008580	48.3399	71931.8	76918.9	344.712	155.52	164.91	0.97679	0.5907	256
640.000	0.09684	0.97033	0.008276	50.1939	75088.1	80251.5	350.002	159.00	168.31	0.97973	0.5502	260
660.000	0.09365	0.97290	0.007994	52.0339	78311.8	83650.7	355.232	162.34	171.58	0.98238	0.5144	265
680.000	0.09068	0.97521	0.007732	53.8616	81600.3	87114.0	360.402	165.55	174.73	0.98478	0.4825	269
700.000	0.08790	0.97730	0.007488	55.6783	84950.9	90638.9	365.511	168.62	177.75	0.98696	0.4539	274
720.000	0.08530	0.97918	0.007259	57.4854	88361.3	94223.1	370.560	171.58	180.65	0.98895	0.4281	278
740.000	0.08285	0.98089	0.007045	59.2838	91829.0	97864.2	375.548	174.42	183.44	0.99076	0.4047	282
760.000	0.08054	0.98245	0.006844	61.0744	95352.0	101560.2	380.476	177.15	186.13	0.99242	0.3835	286
780.000	0.07836	0.98387	0.006655	62.8580	98928.1	105308.8	385.345	179.77	188.72	0.99394	0.3640	290
800.000	0.07630	0.98517	0.006476	64.6351	102555.4	109108.3	390.155	182.29	191.21	0.99533	0.3462	294
820.000	0.07435	0.98636	0.006307	66.4064	106231.8	112956.7	394.906	184.73	193.61	0.99662	0.3298	298
840.000	0.07250	0.98746	0.006147	68.1724	109955.6	116852.2	399.600	187.07	195.92	0.99780	0.3146	302
860.000	0.07074	0.98847	0.005995	69.9334	113725.1	120793.1	404.237	189.32	198.16	0.99890	0.3005	306
880.000	0.06907	0.98940	0.005851	71.6899	117538.7	124777.9	408.817	191.50	200.31	0.99991	0.2875	309
900.000	0.06748	0.99026	0.005713	73.4423	121394.7	128804.9	413.342	193.60	202.39	1.00084	0.2753	313

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
					7.00000 bar							
278.882	11.48014	0.02630	15.727627	1066.4029	5.0	66.0	163.819	83.08	132.17	0.00704	-0.0423	1473
280.000	11.46367	0.02623	15.601793	1059.6205	153.4	214.5	164.348	83.43	132.38	0.00748	-0.0422	1467
290.000	11.31744	0.02565	14.530889	1000.2392	1489.6	1551.5	169.028	86.56	134.36	0.01251	-0.0413	1409
300.000	11.17299	0.02512	13.549364	942.8934	2844.2	2906.8	173.619	89.71	136.50	0.02003	-0.0403	1355
310.000	11.02991	0.02462	12.646620	887.2920	4219.2	4282.7	178.131	92.87	138.80	0.03088	-0.0392	1302
320.000	10.88778	0.02416	11.813459	833.2072	5616.8	5681.0	182.576	96.01	141.22	0.04603	-0.0379	1252
330.000	10.74619	0.02374	11.041873	780.4709	7038.7	7103.9	186.960	99.13	143.77	0.06656	-0.0366	1203
340.000	10.60468	0.02335	10.324857	728.9677	8486.9	8552.9	191.291	102.22	146.43	0.09368	-0.0352	1156
350.000	10.46275	0.02299	9.656249	678.6273	9962.5	10029.4	195.575	105.26	149.19	0.12865	-0.0336	1109
360.000	10.31992	0.02266	9.030612	629.4207	11467.0	11534.8	199.818	108.24	152.03	0.17280	-0.0318	1063
370.000	10.17561	0.02236	8.443114	581.3501	13001.2	13070.0	204.023	111.15	154.96	0.22746	-0.0299	1018
380.000	10.02924	0.02209	7.889438	534.4441	14566.0	14635.8	208.196	113.97	157.97	0.29391	-0.0278	973
390.000	9.88014	0.02185	7.365701	488.7497	16161.8	16232.7	212.339	116.71	161.06	0.37338	-0.0255	929
400.000	9.72757	0.02164	6.868375	444.3254	17789.3	17861.3	216.457	119.34	164.22	0.46693	-0.0228	884
410.000	9.57068	0.02146	6.394217	401.2343	19448.8	19522.0	220.552	121.87	167.48	0.57544	-0.0198	840
420.000	9.40849	0.02131	5.940199	359.5377	21140.9	21215.3	224.628	124.27	170.84	0.69956	-0.0163	795
430.000	9.23981	0.02119	5.503420	319.2876	22866.4	22942.2	228.689	126.55	174.33	0.83970	-0.0123	750
432.406	9.19812	0.02117	5.400600	309.8252	23286.6	23362.7	229.664	127.08	175.20	0.87582	-0.0112	739
432.406	0.22475	0.86629	0.021502	26.4837	45799.7	48914.3	288.755	117.27	132.21	0.87582	1.8914	195
440.000	0.21886	0.87425	0.020503	27.5981	46747.8	49946.1	291.005	118.65	132.64	0.89399	1.7001	198
450.000	0.21179	0.88337	0.019517	28.9425	47972.3	51277.4	293.985	120.55	133.75	0.90240	1.5279	202
460.000	0.20533	0.89135	0.018712	30.2094	49213.5	52622.6	296.943	122.69	135.33	0.90867	1.3952	206
470.000	0.19937	0.89845	0.018018	31.4242	50473.8	53984.8	299.874	124.91	137.12	0.91443	1.2864	210
480.000	0.19384	0.90484	0.017402	32.5998	51754.3	55365.5	302.782	127.15	139.02	0.91974	1.1944	213
490.000	0.18868	0.91062	0.016847	33.7442	53055.4	56765.4	305.670	129.40	140.97	0.92467	1.1149	216
500.000	0.18384	0.91589	0.016340	34.8628	54377.4	58185.0	308.538	131.62	142.95	0.92924	1.0453	220
510.000	0.17930	0.92071	0.015873	35.9597	55720.3	59624.4	311.390	133.82	144.93	0.93350	0.9836	223
520.000	0.17501	0.92513	0.015441	37.0378	57083.8	61083.7	314.224	135.98	146.91	0.93747	0.9286	226
530.000	0.17095	0.92922	0.015039	38.0995	58467.9	62562.7	317.042	138.12	148.88	0.94119	0.8791	229
540.000	0.16711	0.93299	0.014662	39.1469	59872.3	64061.3	319.844	140.21	150.83	0.94467	0.8344	232
550.000	0.16345	0.93649	0.014308	40.1815	61296.7	65579.2	322.630	142.27	152.75	0.94793	0.7937	235
560.000	0.15998	0.93975	0.013975	41.2047	62740.7	67116.3	325.400	144.28	154.65	0.95100	0.7565	237
565.000	0.15830	0.94129	0.013815	41.7124	63470.0	67891.9	326.779	145.28	155.59	0.95246	0.7392	239
570.000	0.15667	0.94278	0.013659	42.2176	64204.1	68672.2	328.154	146.26	156.53	0.95388	0.7225	240
580.000	0.15350	0.94562	0.013361	43.2212	65686.5	70246.6	330.893	148.20	158.37	0.95657	0.6911	243
590.000	0.15048	0.94827	0.013077	44.2163	67187.6	71839.4	333.616	150.11	160.18	0.95914	0.6622	245
600.000	0.14759	0.95075	0.012808	45.2037	68707.2	73450.2	336.324	151.97	161.97	0.96156	0.6354	248
620.000	0.14215	0.95528	0.012305	47.1577	71800.0	76724.4	341.693	155.58	165.44	0.96603	0.5873	253
640.000	0.13713	0.95929	0.011845	49.0875	74962.2	80066.9	346.999	159.05	168.78	0.97003	0.5454	258
660.000	0.13248	0.96287	0.011423	50.9966	78191.2	83475.0	352.243	162.39	172.01	0.97364	0.5085	262
680.000	0.12816	0.96607	0.011032	52.8877	81484.3	86946.4	357.425	165.58	175.11	0.97690	0.4759	267
700.000	0.12413	0.96895	0.010670	54.7629	84839.2	90478.7	362.545	168.65	178.10	0.97986	0.4468	272
720.000	0.12035	0.97156	0.010333	56.6243	88253.5	94069.6	367.603	171.60	180.98	0.98256	0.4207	276
740.000	0.11682	0.97391	0.010018	58.4732	91724.8	97717.0	372.600	174.44	183.74	0.98502	0.3972	280
760.000	0.11349	0.97605	0.009723	60.3111	95251.1	101418.8	377.536	177.16	186.41	0.98726	0.3758	285
780.000	0.11036	0.97800	0.009446	62.1390	98830.2	105172.9	382.412	179.78	188.98	0.98932	0.3564	289
800.000	0.10741	0.97979	0.009185	63.9578	102460.2	108977.4	387.228	182.31	191.45	0.99121	0.3386	293
820.000	0.10461	0.98142	0.008939	65.7685	106139.2	112830.4	391.985	184.74	193.84	0.99296	0.3222	297
840.000	0.10197	0.98292	0.008706	67.5718	109865.5	116730.4	396.685	187.08	196.14	0.99456	0.3072	301
860.000	0.09946	0.98430	0.008486	69.3682	113637.3	120675.5	401.326	189.33	198.36	0.99605	0.2932	305
880.000	0.09707	0.98557	0.008278	71.1583	117453.0	124664.2	405.911	191.51	200.50	0.99742	0.2803	308
900.000	0.09480	0.98675	0.008079	72.9427	121311.0	128694.8	410.440	193.61	202.57	0.99868	0.2683	312
					10.00000 bar							
278.969	11.48167	0.03755	15.725998	1067.5898	7.2	94.3	163.827	83.15	132.17	0.00501	-0.0423	1473
280.000	11.46649	0.03746	15.610035	1061.3433	144.0	231.3	164.315	83.47	132.37	0.00530	-0.0422	1467
290.000	11.32044	0.03664	14.539490	1002.0343	1479.8	1568.1	168.994	86.61	134.35	0.00885	-0.0413	1410
300.000	11.17617	0.03587	13.558342	944.7667	2833.8	2923.3	173.584	89.75	136.49	0.01417	-0.0403	1356
310.000	11.03328	0.03516	12.655995	889.2488	4208.3	4299.0	178.096	92.91	138.78	0.02184	-0.0392	1304
320.000	10.89138	0.03451	11.823257	835.2529	5605.3	5697.1	182.540	96.05	141.20	0.03255	-0.0380	1253

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
330.000	10.75003	0.03390	11.052129	782.6102	7026.7	7119.7	186.923	99.17	143.74	0.04707	-0.0367	1205
340.000	10.60879	0.03334	10.335613	731.2050	8474.1	8568.3	191.253	102.26	146.39	0.06623	-0.0352	1157
350.000	10.46717	0.03283	9.667553	680.9664	9948.9	10044.5	195.536	105.29	149.14	0.09095	-0.0336	1111
360.000	10.32467	0.03236	9.042523	631.8649	11452.5	11549.4	199.777	108.28	151.98	0.12214	-0.0319	1065
370.000	10.18076	0.03193	8.455702	583.9025	12985.7	13084.0	203.981	111.19	154.90	0.16075	-0.0300	1020
380.000	10.03484	0.03154	7.902787	537.1072	14549.3	14649.0	208.152	114.01	157.89	0.20770	-0.0279	975
390.000	9.88626	0.03119	7.379912	491.5260	16143.9	16245.0	212.293	116.75	160.96	0.26382	-0.0256	931
400.000	9.73430	0.03089	6.883572	447.2176	17769.8	17872.6	216.408	119.38	164.11	0.32989	-0.0230	887
410.000	9.57813	0.03063	6.410552	404.2459	19427.6	19532.0	220.500	121.90	167.34	0.40653	-0.0200	842
420.000	9.41679	0.03041	5.957863	362.6733	21117.6	21223.8	224.572	124.31	170.66	0.49418	-0.0166	798
430.000	9.24916	0.03024	5.522660	322.5540	22840.6	22948.7	228.628	126.59	174.12	0.59315	-0.0127	753
440.000	9.07385	0.03012	5.102160	283.9294	24597.7	24707.9	232.672	128.75	177.74	0.70351	-0.0080	708
450.000	8.88911	0.03007	4.693503	246.8196	26390.7	26503.2	236.709	130.78	181.61	0.82515	-0.0023	662
451.619	8.85816	0.03006	4.628236	240.9526	26684.6	26797.5	237.363	131.10	182.27	0.84589	-0.0013	654
451.619	0.32159	0.82812	0.032265	24.9211	47678.2	50787.8	290.483	123.47	141.71	0.84589	1.7954	191
460.000	0.31139	0.83967	0.030306	26.3665	48797.3	52008.7	293.029	124.61	141.14	0.86740	1.5883	195
470.000	0.30054	0.85147	0.028643	27.9025	50093.6	53420.9	296.050	126.20	141.50	0.87768	1.4235	200
480.000	0.29076	0.86175	0.027316	29.3278	51401.7	54840.9	299.041	128.11	142.55	0.88525	1.2969	204
490.000	0.28185	0.87086	0.026193	30.6792	52725.2	56273.2	301.996	130.14	143.94	0.89222	1.1937	208
500.000	0.27365	0.87903	0.025211	31.9752	54065.9	57720.2	304.921	132.22	145.50	0.89868	1.1068	212
510.000	0.26605	0.88640	0.024337	33.2275	55424.8	59183.5	307.820	134.32	147.16	0.90467	1.0320	215
520.000	0.25897	0.89311	0.023548	34.4438	56802.3	60663.7	310.696	136.41	148.89	0.91024	0.9667	219
530.000	0.25236	0.89923	0.022829	35.6300	58198.7	62161.4	313.550	138.47	150.65	0.91544	0.9091	222
540.000	0.24614	0.90486	0.022167	36.7903	59614.1	63676.7	316.383	140.52	152.42	0.92031	0.8578	226
550.000	0.24029	0.91004	0.021556	37.9282	61048.3	65209.9	319.198	142.54	154.20	0.92486	0.8118	229
560.000	0.23477	0.91483	0.020987	39.0464	62501.3	66760.8	321.993	144.52	155.98	0.92913	0.7703	232
565.000	0.23212	0.91709	0.020717	39.5989	63234.7	67542.9	323.384	145.50	156.87	0.93117	0.7510	233
570.000	0.22953	0.91927	0.020456	40.1472	63972.8	68329.5	324.770	146.47	157.75	0.93315	0.7326	235
580.000	0.22457	0.92339	0.019957	41.2325	65462.6	69915.6	327.530	148.39	159.50	0.93691	0.6982	238
590.000	0.21985	0.92724	0.019489	42.3039	66970.6	71519.2	330.272	150.27	161.23	0.94047	0.6668	241
600.000	0.21535	0.93083	0.019047	43.3627	68496.5	73140.1	332.996	152.11	162.94	0.94384	0.6378	243
620.000	0.20695	0.93734	0.018232	45.4471	71600.6	76432.6	338.395	155.70	166.29	0.95002	0.5864	249
640.000	0.19927	0.94308	0.017496	47.4934	74772.6	79791.0	343.727	159.15	169.54	0.95557	0.5422	254
660.000	0.19219	0.94817	0.016826	49.5075	78010.3	83213.4	348.994	162.46	172.68	0.96057	0.5036	259
680.000	0.18565	0.95271	0.016213	51.4939	81311.1	86697.6	354.195	165.65	175.72	0.96508	0.4698	264
700.000	0.17958	0.95678	0.015649	53.4565	84672.9	90241.6	359.332	168.71	178.65	0.96917	0.4398	269
720.000	0.17392	0.96045	0.015127	55.3982	88093.4	93843.1	364.405	171.65	181.48	0.97289	0.4131	273
740.000	0.16864	0.96376	0.014642	57.3215	91570.4	97500.1	369.415	174.48	184.21	0.97628	0.3892	278
760.000	0.16369	0.96676	0.014191	59.2285	95101.8	101210.8	374.363	177.19	186.84	0.97938	0.3676	282
780.000	0.15905	0.96949	0.013769	61.1209	98685.6	104973.1	379.250	179.81	189.38	0.98223	0.3480	287
800.000	0.15467	0.97198	0.013374	63.0003	102320.0	108785.2	384.076	182.33	191.82	0.98484	0.3301	291
820.000	0.15055	0.97426	0.013002	64.8679	106003.1	112645.4	388.842	184.76	194.18	0.98724	0.3138	295
840.000	0.14665	0.97635	0.012652	66.7247	109733.1	116552.0	393.549	187.09	196.46	0.98945	0.2987	299
860.000	0.14296	0.97827	0.012321	68.5719	113508.3	120503.4	398.199	189.35	198.66	0.99150	0.2849	303
880.000	0.13946	0.98003	0.012008	70.4101	117327.3	124498.0	402.790	191.52	200.79	0.99339	0.2721	307
900.000	0.13613	0.98167	0.011712	72.2402	121188.4	128534.2	407.326	193.62	202.84	0.99513	0.2602	311
					15.00000 bar							
279.114	11.48422	0.05628	15.723431	1069.5759	10.9	141.5	163.840	83.27	132.18	0.00343	-0.0423	1474
280.000	11.47120	0.05617	15.623868	1064.2181	128.4	259.2	164.259	83.54	132.35	0.00360	-0.0423	1469
290.000	11.32542	0.05493	14.553916	1005.0288	1463.4	1595.9	168.937	86.67	134.33	0.00601	-0.0414	1412
300.000	11.18145	0.05378	13.573385	947.8905	2816.7	2950.8	173.527	89.82	136.46	0.00962	-0.0404	1357
310.000	11.03890	0.05272	12.671690	892.5108	4190.3	4326.2	178.038	92.97	138.74	0.01482	-0.0393	1305
320.000	10.89736	0.05173	11.839649	838.6615	5586.3	5724.0	182.480	96.11	141.15	0.02208	-0.0381	1255
330.000	10.75641	0.05082	11.069272	786.1733	7006.6	7146.1	186.862	99.24	143.69	0.03192	-0.0368	1207
340.000	10.61561	0.04998	10.353572	734.9297	8452.8	8594.1	191.191	102.32	146.33	0.04490	-0.0353	1159
350.000	10.47449	0.04921	9.686409	684.8590	9926.4	10069.6	195.472	105.36	149.06	0.06163	-0.0338	1113
360.000	10.33256	0.04850	9.062371	635.9307	11428.5	11573.7	199.710	108.34	151.89	0.08275	-0.0321	1068
370.000	10.18929	0.04785	8.476654	588.1460	12960.1	13107.3	203.912	111.25	154.79	0.10889	-0.0302	1023
380.000	10.04411	0.04727	7.924978	541.5324	14521.8	14671.1	208.079	114.08	157.76	0.14066	-0.0282	979
390.000	9.89639	0.04674	7.403504	496.1367	16114.2	16265.8	212.217	116.81	160.81	0.17865	-0.0259	935
400.000	9.74542	0.04628	6.908759	452.0177	17737.6	17891.6	216.327	119.45	163.92	0.22335	-0.0233	891
410.000	9.59042	0.04588	6.437576	409.2402	19392.5	19548.9	220.414	121.97	167.11	0.27520	-0.0204	847

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
420.000	9.43048	0.04555	5.987023	367.8683	21079.1	21238.2	224.480	124.37	170.39	0.33450	-0.0171	803
430.000	9.26453	0.04529	5.554339	327.9594	22798.1	22960.0	228.529	126.65	173.77	0.40145	-0.0133	758
440.000	9.09129	0.04510	5.136857	289.5596	24550.3	24715.3	232.564	128.80	177.31	0.47612	-0.0088	714
450.000	8.90913	0.04500	4.731895	252.6969	26337.4	26505.8	236.590	130.83	181.06	0.55842	-0.0034	669
460.000	8.71598	0.04500	4.336618	217.3753	28161.9	28334.0	240.613	132.74	185.13	0.64818	0.0033	622
470.000	8.50903	0.04511	3.947773	183.5653	30027.7	30204.0	244.642	134.56	189.67	0.74512	0.0116	575
475.761	8.38205	0.04524	3.725143	164.7472	31123.7	31302.7	246.970	135.58	192.62	0.80408	0.0176	547
475.761	0.49145	0.77160	0.053112	22.0519	50020.9	53073.2	292.729	131.57	156.77	0.80408	1.7284	183
480.000	0.48170	0.78026	0.050732	23.0361	50671.5	53785.5	294.058	131.91	155.02	0.82494	1.5997	186
490.000	0.46145	0.79788	0.046868	25.0343	52070.8	55321.4	297.219	132.51	152.70	0.83651	1.4021	192
500.000	0.44392	0.81279	0.044074	26.8005	53466.6	56845.5	300.300	133.91	152.30	0.84628	1.2605	197
510.000	0.42838	0.82577	0.041832	28.4284	54868.5	58370.1	303.292	135.62	152.72	0.85826	1.1492	202
520.000	0.41438	0.83725	0.039945	29.9590	56281.4	59901.3	306.268	137.44	153.57	0.86648	1.0578	207
530.000	0.40163	0.84753	0.038310	31.4154	57707.6	61442.4	309.206	139.32	154.67	0.87411	0.9807	211
540.000	0.38993	0.85679	0.036867	32.8124	59148.5	62995.3	312.111	141.23	155.94	0.88123	0.9144	215
550.000	0.37911	0.86521	0.035576	34.1606	60605.0	64561.6	314.987	143.14	157.32	0.88788	0.8565	219
560.000	0.36906	0.87290	0.034408	35.4677	62077.6	66141.9	317.836	145.04	158.76	0.89410	0.8056	222
565.000	0.36429	0.87650	0.033863	36.1077	62820.0	66937.6	319.251	145.98	159.50	0.89706	0.7823	224
570.000	0.35968	0.87996	0.033342	36.7397	63566.6	67737.0	320.661	146.92	160.25	0.89994	0.7602	226
580.000	0.35089	0.88646	0.032364	37.9811	65072.1	69347.0	323.462	148.78	161.77	0.90540	0.7196	229
590.000	0.34262	0.89246	0.031459	39.1960	66594.3	70972.4	326.242	150.61	163.31	0.91057	0.6830	233
600.000	0.33482	0.89803	0.030620	40.3872	68133.1	72613.1	329.001	152.42	164.85	0.91544	0.6497	236
620.000	0.32045	0.90804	0.029103	42.7089	71259.9	75940.8	334.458	155.94	167.92	0.92438	0.5917	242
640.000	0.30748	0.91677	0.027765	44.9625	74451.3	79329.7	339.839	159.35	170.95	0.93239	0.5428	248
660.000	0.29568	0.92445	0.026570	47.1600	77705.6	82778.6	345.147	162.62	173.92	0.93959	0.5009	254
680.000	0.28489	0.93125	0.025494	49.3106	81021.0	86286.2	350.384	165.78	176.82	0.94609	0.4646	259
700.000	0.27496	0.93731	0.024517	51.4213	84395.7	89851.0	355.551	168.82	179.64	0.95197	0.4329	264
720.000	0.26579	0.94274	0.023625	53.4977	87827.6	93471.3	360.651	171.74	182.37	0.95732	0.4049	269
740.000	0.25727	0.94762	0.022804	55.5444	91314.9	97145.3	365.685	174.55	185.02	0.96220	0.3801	274
760.000	0.24934	0.95203	0.022047	57.5651	94855.6	100871.5	370.655	177.26	187.58	0.96665	0.3578	279
780.000	0.24193	0.95602	0.021344	59.5628	98447.9	104648.0	375.560	179.87	190.06	0.97074	0.3378	283
800.000	0.23499	0.95966	0.020690	61.5401	102090.0	108473.3	380.403	182.38	192.45	0.97448	0.3197	288
820.000	0.22847	0.96298	0.020079	63.4991	105780.2	112345.7	385.184	184.79	194.77	0.97793	0.3032	292
840.000	0.22233	0.96601	0.019507	65.4417	109516.8	116263.6	389.905	187.13	197.01	0.98111	0.2882	296
860.000	0.21653	0.96879	0.018970	67.3695	113298.1	120225.5	394.567	189.37	199.17	0.98404	0.2744	301
880.000	0.21106	0.97135	0.018464	69.2839	117122.8	124229.9	399.170	191.54	201.26	0.98676	0.2617	305
900.000	0.20587	0.97371	0.017986	71.1859	120989.1	128275.4	403.716	193.64	203.29	0.98926	0.2499	309
					20.00000 bar							
279.258	11.48677	0.07499	15.721032	1071.5707	14.6	188.7	163.852	83.38	132.19	0.00264	-0.0424	1474
280.000	11.47589	0.07486	15.637820	1067.0973	112.9	287.2	164.203	83.61	132.33	0.00275	-0.0423	1470
290.000	11.33039	0.07321	14.568450	1008.0266	1447.2	1623.7	168.881	86.74	134.30	0.00459	-0.0414	1413
300.000	11.18671	0.07168	13.588527	951.0163	2799.6	2978.4	173.469	89.89	136.43	0.00734	-0.0404	1359
310.000	11.04449	0.07026	12.687472	895.7733	4172.3	4353.4	177.980	93.04	138.71	0.01131	-0.0393	1307
320.000	10.90330	0.06894	11.856114	842.0690	5567.4	5750.8	182.421	96.18	141.11	0.01685	-0.0381	1257
330.000	10.76275	0.06773	11.086472	789.7335	6986.7	7172.5	186.802	99.30	143.64	0.02435	-0.0368	1209
340.000	10.62239	0.06660	10.371572	738.6494	8431.7	8620.0	191.128	102.39	146.27	0.03424	-0.0354	1162
350.000	10.48177	0.06557	9.705286	688.7443	9904.0	10094.8	195.407	105.42	148.99	0.04699	-0.0339	1116
360.000	10.34040	0.06462	9.082214	639.9865	11404.7	11598.1	199.644	108.41	151.80	0.06308	-0.0322	1071
370.000	10.19777	0.06375	8.497573	592.3766	12934.6	13130.7	203.842	111.32	154.68	0.08298	-0.0304	1026
380.000	10.05331	0.06297	7.947100	545.9415	14494.5	14693.4	208.007	114.14	157.64	0.10717	-0.0284	982
390.000	9.90642	0.06226	7.426982	500.7273	16084.8	16286.7	212.141	116.88	160.66	0.13609	-0.0261	938
400.000	9.75642	0.06164	6.933778	456.7930	17705.8	17910.8	216.247	119.51	163.74	0.17012	-0.0236	895
410.000	9.60257	0.06110	6.464360	414.2041	19357.8	19566.1	220.329	122.03	166.89	0.20958	-0.0208	851
420.000	9.44398	0.06064	6.015850	373.0259	21041.2	21253.0	224.389	124.43	170.12	0.25471	-0.0176	808
430.000	9.27966	0.06028	5.585558	333.3185	22756.3	22971.8	228.431	126.70	173.44	0.30567	-0.0139	764
440.000	9.10839	0.06002	5.170919	295.1319	24503.9	24723.4	232.458	128.85	176.90	0.36249	-0.0095	720
450.000	8.92869	0.05987	4.769399	258.5001	26285.3	26509.3	236.473	130.87	180.54	0.42514	-0.0043	675
460.000	8.73867	0.05984	4.378390	223.4372	28102.7	28331.5	240.484	132.77	184.46	0.49347	0.0020	630
470.000	8.53581	0.05996	3.995016	189.9294	29959.5	30193.8	244.496	134.57	188.78	0.56729	0.0098	584
480.000	8.31658	0.06026	3.615802	157.9257	31861.4	32101.9	248.520	136.31	193.76	0.64634	0.0199	536
490.000	8.07572	0.06079	3.235987	127.3156	33817.4	34065.1	252.575	138.04	199.84	0.73033	0.0336	485

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
494.530	7.95734	0.06113	3.061844	113.8546	34725.1	34976.4	254.429	138.86	203.17	0.76992	0.0415	461
494.530	0.67580	0.71975	0.078377	19.0004	51784.0	54743.4	294.400	138.36	173.36	0.76992	1.7229	174
500.000	0.65498	0.73451	0.072820	20.5825	52690.2	55743.7	296.237	137.99	168.02	0.79382	1.5456	179
510.000	0.62311	0.75693	0.066364	22.9579	54186.4	57396.0	299.479	138.08	163.28	0.80932	1.3426	186
520.000	0.59643	0.77559	0.061817	25.0125	55665.1	59018.4	302.619	139.17	161.51	0.82172	1.1988	192
530.000	0.57331	0.79165	0.058249	26.8769	57141.6	60630.2	305.693	140.63	160.99	0.83192	1.0873	198
540.000	0.55285	0.80573	0.055299	28.6084	58622.9	62240.5	308.706	142.27	161.15	0.84136	0.9968	203
550.000	0.53449	0.81826	0.052783	30.2395	60112.7	63854.6	311.671	143.98	161.72	0.85015	0.9211	208
560.000	0.51783	0.82950	0.050592	31.7912	61613.5	65475.8	314.594	145.74	162.56	0.85834	0.8565	213
565.000	0.51005	0.83471	0.049595	32.5420	62368.6	66289.8	316.042	146.63	163.04	0.86224	0.8276	215
570.000	0.50258	0.83968	0.048653	33.2780	63126.9	67106.3	317.482	147.52	163.57	0.86601	0.8006	217
580.000	0.48853	0.84894	0.046917	34.7105	64653.5	68747.5	320.338	149.29	164.70	0.87317	0.7516	221
590.000	0.47550	0.85742	0.045347	36.0969	66194.5	70400.6	323.166	151.06	165.92	0.87992	0.7082	225
600.000	0.46336	0.86521	0.043916	37.4436	67749.9	72066.2	325.966	152.81	167.20	0.88628	0.6695	229
620.000	0.44135	0.87906	0.041391	40.0370	70905.1	75436.7	331.495	156.25	169.87	0.89792	0.6033	236
640.000	0.42183	0.89100	0.039221	42.5216	74120.0	78861.3	336.933	159.58	172.60	0.90833	0.5487	242
660.000	0.40432	0.90141	0.037325	44.9191	77394.1	82340.7	342.288	162.82	175.34	0.91767	0.5027	248
680.000	0.38849	0.91055	0.035646	47.2451	80726.5	85874.7	347.564	165.94	178.05	0.92609	0.4635	254
700.000	0.37407	0.91865	0.034144	49.5116	84115.9	89462.6	352.766	168.95	180.73	0.93371	0.4297	260
720.000	0.36084	0.92585	0.032788	51.7277	87560.8	93103.4	357.895	171.85	183.34	0.94063	0.4002	265
740.000	0.34866	0.93230	0.031556	53.9007	91059.6	96795.8	362.954	174.64	185.89	0.94693	0.3742	271
760.000	0.33739	0.93811	0.030428	56.0365	94610.5	100538.5	367.945	177.33	188.37	0.95269	0.3512	276
780.000	0.32691	0.94335	0.029391	58.1396	98212.1	104330.0	372.870	179.93	190.77	0.95796	0.3306	280
800.000	0.31714	0.94810	0.028432	60.2141	101862.5	108168.9	377.731	182.43	193.11	0.96280	0.3121	285
820.000	0.30800	0.95243	0.027543	62.2632	105560.3	112053.9	382.528	184.84	195.37	0.96725	0.2953	290
840.000	0.29942	0.95637	0.026714	64.2897	109303.9	115983.4	387.263	187.16	197.56	0.97135	0.2801	294
860.000	0.29136	0.95999	0.025939	66.2958	113091.7	119956.1	391.937	189.41	199.69	0.97514	0.2662	299
880.000	0.28376	0.96330	0.025213	68.2835	116922.3	123970.5	396.552	191.57	201.75	0.97864	0.2535	303
900.000	0.27658	0.96635	0.024531	70.2547	120794.1	128025.4	401.109	193.66	203.74	0.98187	0.2418	307
					25.00000 bar							
279.403	11.48931	0.09367	15.718800	1073.5744	18.3	235.9	163.865	83.49	132.20	0.00217	-0.0424	1475
280.000	11.48057	0.09354	15.651886	1069.9807	97.4	315.2	164.148	83.68	132.32	0.00224	-0.0423	1471
290.000	11.33534	0.09147	14.583091	1011.0277	1431.0	1651.5	168.825	86.81	134.28	0.00374	-0.0415	1414
300.000	11.19196	0.08955	13.603764	954.1439	2782.6	3006.0	173.412	89.95	136.41	0.00598	-0.0405	1360
310.000	11.05006	0.08778	12.703338	899.0362	4154.5	4380.7	177.922	93.10	138.68	0.00921	-0.0394	1309
320.000	10.90923	0.08613	11.872650	845.4753	5548.6	5777.8	182.362	96.25	141.07	0.01371	-0.0382	1259
330.000	10.76907	0.08461	11.103729	793.2907	6966.8	7199.0	186.741	99.36	143.59	0.01981	-0.0369	1211
340.000	10.62915	0.08320	10.389614	742.3643	8410.8	8646.0	191.066	102.45	146.21	0.02785	-0.0355	1164
350.000	10.48901	0.08190	9.724181	692.6223	9881.8	10120.1	195.343	105.49	148.92	0.03821	-0.0340	1118
360.000	10.34819	0.08071	9.102053	644.0326	11381.0	11622.6	199.578	108.47	151.71	0.05128	-0.0324	1073
370.000	10.20618	0.07962	8.518458	596.5946	12909.4	13154.3	203.774	111.38	154.58	0.06745	-0.0306	1029
380.000	10.06243	0.07864	7.969154	550.3346	14467.4	14715.9	207.935	114.21	157.51	0.08710	-0.0286	985
390.000	9.91636	0.07775	7.450350	505.2982	16055.6	16307.8	212.065	116.94	160.51	0.11058	-0.0264	942
400.000	9.76731	0.07696	6.958633	461.5443	17674.3	17930.3	216.168	119.57	163.56	0.13820	-0.0239	899
410.000	9.61457	0.07628	6.490912	419.1386	19323.6	19583.6	220.245	122.09	166.67	0.17024	-0.0212	855
420.000	9.45729	0.07570	6.044357	378.1478	21003.8	21268.1	224.299	124.49	169.86	0.20688	-0.0181	812
430.000	9.29454	0.07523	5.616342	338.6337	22715.1	22984.1	228.334	126.76	173.13	0.24824	-0.0145	769
440.000	9.12517	0.07489	5.204387	300.6496	24458.2	24732.2	232.353	128.90	176.51	0.29437	-0.0103	725
450.000	8.94782	0.07467	4.806084	264.2345	26234.2	26513.6	236.359	130.92	180.05	0.34523	-0.0053	682
460.000	8.76075	0.07461	4.419012	229.4101	28045.0	28330.3	240.357	132.81	183.83	0.40072	0.0007	637
470.000	8.56171	0.07472	4.040590	196.1751	29893.4	30185.4	244.353	134.59	187.95	0.46068	0.0081	592
480.000	8.34760	0.07504	3.667848	164.4985	31784.3	32083.8	248.358	136.30	192.63	0.52491	0.0175	545
490.000	8.11395	0.07563	3.296986	134.3074	33725.4	34033.5	252.385	137.98	198.21	0.59319	0.0300	496
500.000	7.85364	0.07657	2.922378	105.4581	35729.2	36047.5	256.458	139.74	205.38	0.66529	0.0474	445
510.000	7.55402	0.07805	2.533790	77.6560	37818.6	38149.5	260.619	141.80	215.69	0.74092	0.0738	388
510.096	7.55089	0.07806	2.529934	77.3925	37839.2	38170.2	260.660	141.83	215.82	0.74166	0.0741	388
510.096	0.88021	0.66968	0.109311	15.8169	53160.0	56000.2	295.614	144.61	194.34	0.74166	1.7567	164
520.000	0.82316	0.70245	0.094221	19.1335	54878.1	57915.2	299.119	142.66	178.27	0.77598	1.4384	174
530.000	0.77926	0.72802	0.085636	21.7260	56455.6	59663.8	302.446	142.83	172.29	0.78982	1.2519	183
540.000	0.74318	0.74923	0.079445	23.9771	58007.5	61371.4	305.642	143.83	169.57	0.80177	1.1169	190
550.000	0.71239	0.76740	0.074578	26.0128	59550.9	63060.1	308.744	145.18	168.35	0.81279	1.0118	196

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
560.000	0.68548	0.78328	0.070570	27.8948	61094.1	64741.2	311.776	146.69	167.97	0.82302	0.9265	202
565.000	0.67319	0.79053	0.068805	28.7902	61867.4	65581.1	313.271	147.48	167.99	0.82787	0.8894	204
570.000	0.66156	0.79737	0.067170	29.6598	62642.3	66421.2	314.752	148.29	168.10	0.83255	0.8553	207
580.000	0.64002	0.80999	0.064223	31.3317	64198.2	68104.3	317.682	149.94	168.58	0.84143	0.7948	212
590.000	0.62044	0.82139	0.061630	32.9275	65764.1	69793.5	320.571	151.61	169.29	0.84977	0.7425	216
600.000	0.60250	0.83176	0.059319	34.4596	67341.3	71490.7	323.426	153.28	170.16	0.85760	0.6967	221
620.000	0.57058	0.84995	0.055351	37.3690	70532.5	74913.9	329.041	156.61	172.22	0.87191	0.6202	229
640.000	0.54288	0.86541	0.052039	40.1148	73776.0	78381.1	334.547	159.87	174.53	0.88466	0.5587	236
660.000	0.51844	0.87874	0.049212	42.7332	77073.7	81895.8	339.956	163.04	176.96	0.89609	0.5080	243
680.000	0.49663	0.89035	0.046755	45.2496	80425.8	85459.8	345.278	166.12	179.44	0.90637	0.4654	250
700.000	0.47698	0.90055	0.044591	47.6825	83832.1	89073.4	350.516	169.09	181.92	0.91567	0.4292	256
720.000	0.45912	0.90958	0.042663	50.0459	87291.5	92736.7	355.677	171.97	184.39	0.92411	0.3979	262
740.000	0.44280	0.91763	0.040929	52.3505	90803.0	96448.9	360.764	174.74	186.82	0.93179	0.3706	267
760.000	0.42779	0.92484	0.039358	54.6048	94365.2	100209.2	365.779	177.42	189.20	0.93880	0.3466	273
780.000	0.41391	0.93132	0.037925	56.8157	97976.8	104016.7	370.725	180.00	191.53	0.94522	0.3253	278
800.000	0.40104	0.93718	0.036611	58.9887	101636.2	107870.0	375.603	182.49	193.79	0.95110	0.3063	283
820.000	0.38905	0.94250	0.035398	61.1284	105342.2	111768.0	380.417	184.89	196.00	0.95652	0.2892	288
840.000	0.37785	0.94734	0.034276	63.2385	109093.1	115709.5	385.166	187.21	198.14	0.96150	0.2737	292
860.000	0.36735	0.95176	0.033232	65.3223	112887.7	119693.3	389.854	189.45	200.22	0.96611	0.2597	297
880.000	0.35748	0.95581	0.032257	67.3826	116724.5	123718.0	394.480	191.60	202.24	0.97037	0.2469	301
900.000	0.34818	0.95953	0.031346	69.4215	120602.1	127782.3	399.048	193.69	204.20	0.97430	0.2351	306
					30.00000 bar							
279.547	11.49185	0.11232	15.716734	1075.5868	22.1	283.1	163.878	83.60	132.22	0.00186	-0.0424	1475
280.000	11.48524	0.11220	15.666071	1072.8686	82.0	343.2	164.092	83.74	132.30	0.00190	-0.0424	1473
290.000	11.34028	0.10971	14.597837	1014.0318	1414.8	1679.3	168.769	86.87	134.26	0.00317	-0.0415	1416
300.000	11.19720	0.10741	13.619096	957.2734	2765.7	3033.6	173.356	90.02	136.38	0.00507	-0.0405	1362
310.000	11.05561	0.10528	12.719286	902.2994	4136.7	4408.1	177.864	93.17	138.64	0.00781	-0.0395	1311
320.000	10.91513	0.10330	11.889255	848.8804	5529.9	5804.8	182.303	96.31	141.03	0.01163	-0.0383	1261
330.000	10.77536	0.10147	11.121040	796.8449	6947.1	7225.5	186.681	99.43	143.54	0.01679	-0.0370	1213
340.000	10.63586	0.09978	10.407690	746.0740	8389.9	8672.0	191.004	102.51	146.15	0.02360	-0.0356	1166
350.000	10.49621	0.09822	9.743094	696.4930	9859.7	10145.5	195.280	105.55	148.85	0.03237	-0.0341	1121
360.000	10.35593	0.09678	9.121886	648.0689	11357.5	11647.2	199.512	108.53	151.63	0.04343	-0.0325	1076
370.000	10.21453	0.09547	8.539310	600.8002	12884.3	13178.0	203.705	111.44	154.48	0.05711	-0.0307	1032
380.000	10.07148	0.09428	7.991142	554.7122	14440.6	14738.5	207.864	114.27	157.39	0.07373	-0.0288	989
390.000	9.92621	0.09320	7.473610	509.8500	16026.8	16329.0	211.991	117.00	160.36	0.09359	-0.0266	945
400.000	9.77809	0.09225	6.983330	466.2723	17643.2	17950.0	216.089	119.63	163.39	0.11696	-0.0242	902
410.000	9.62643	0.09142	6.517244	424.0449	19289.8	19601.4	220.162	122.15	166.47	0.14405	-0.0216	860
420.000	9.47043	0.09071	6.072562	383.2353	20966.9	21283.6	224.211	124.55	169.61	0.17503	-0.0185	817
430.000	9.30919	0.09014	5.646717	343.9072	22674.6	22996.8	228.239	126.82	172.82	0.21000	-0.0150	774
440.000	9.14166	0.08970	5.237299	306.1156	24413.4	24741.6	232.250	128.96	176.13	0.24901	-0.0110	731
450.000	8.96654	0.08942	4.842013	269.9045	26184.2	26518.8	236.246	130.96	179.58	0.29202	-0.0062	688
460.000	8.78227	0.08931	4.458588	235.3013	27988.6	28330.2	240.232	132.85	183.23	0.33895	-0.0005	644
470.000	8.58680	0.08940	4.084678	202.3140	29829.2	30178.5	244.214	134.62	187.18	0.38967	0.0065	600
480.000	8.37742	0.08973	3.717700	170.9266	31709.9	32068.0	248.200	136.30	191.60	0.44403	0.0153	554
490.000	8.15026	0.09035	3.354537	141.0917	33637.4	34005.5	252.202	137.93	196.77	0.50184	0.0268	507
500.000	7.89949	0.09135	2.990941	112.7157	35622.0	36001.7	256.239	139.61	203.21	0.56294	0.0423	458
510.000	7.61529	0.09290	2.620088	85.6216	37681.5	38075.5	260.345	141.50	212.01	0.62710	0.0650	405
520.000	7.27840	0.09533	2.228007	59.4286	39850.7	40262.9	264.585	143.99	225.98	0.69400	0.1020	345
523.487	7.14134	0.09652	2.080449	50.3484	40645.4	41065.5	266.119	145.18	233.42	0.71786	0.1217	321
523.487	1.11316	0.61919	0.147855	12.5304	54228.4	56923.4	296.411	150.84	224.55	0.71786	1.8200	154
530.000	1.04923	0.64884	0.128916	15.3896	55534.6	58393.8	299.000	147.65	199.64	0.74683	1.5427	163
540.000	0.97827	0.68302	0.113578	18.6306	57242.0	60308.6	302.578	146.49	185.56	0.76227	1.3029	173
550.000	0.92399	0.70999	0.103554	21.3050	58882.9	62129.7	305.925	146.96	179.38	0.77576	1.1422	182
560.000	0.87964	0.73247	0.096067	23.6589	60495.6	63906.1	309.129	148.00	176.23	0.78817	1.0225	189
565.000	0.86012	0.74247	0.092934	24.7505	61296.9	64784.8	310.693	148.63	175.28	0.79401	0.9727	193
570.000	0.84202	0.75178	0.090107	25.7965	62096.6	65659.4	312.235	149.31	174.62	0.79964	0.9281	196
580.000	0.80931	0.76867	0.085173	27.7749	63694.4	67401.3	315.267	150.76	173.89	0.81028	0.8510	202
590.000	0.78038	0.78366	0.080981	29.6297	65294.7	69139.0	318.240	152.29	173.73	0.82024	0.7865	208
600.000	0.75444	0.79710	0.077348	31.3853	66900.7	70877.1	321.163	153.85	173.95	0.82956	0.7315	213
620.000	0.70946	0.82029	0.071307	34.6641	70137.8	74366.3	326.887	157.03	175.10	0.84653	0.6422	222
640.000	0.67141	0.83968	0.066433	37.7059	73416.5	77884.7	332.475	160.19	176.81	0.86160	0.5724	230
660.000	0.63851	0.85619	0.062376	40.5691	76742.2	81440.6	337.948	163.29	178.82	0.87508	0.5161	238

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
680.000	0.60960	0.87043	0.058922	43.2927	80117.3	85038.6	343.320	166.32	181.00	0.88719	0.4697	245
700.000	0.58385	0.88285	0.055929	45.9041	83542.7	88681.1	348.601	169.26	183.25	0.89812	0.4307	252
720.000	0.56069	0.89377	0.053299	48.4235	87018.5	92369.0	353.797	172.11	185.54	0.90803	0.3974	258
740.000	0.53970	0.90345	0.050962	50.8661	90544.1	96102.8	358.913	174.86	187.83	0.91704	0.3687	264
760.000	0.52052	0.91208	0.048864	53.2437	94118.6	99882.1	363.953	177.52	190.10	0.92526	0.3436	270
780.000	0.50291	0.91982	0.046967	55.5657	97741.1	103706.4	368.921	180.08	192.33	0.93279	0.3215	275
800.000	0.48665	0.92679	0.045239	57.8394	101410.3	107574.9	373.819	182.56	194.51	0.93969	0.3019	280
820.000	0.47157	0.93309	0.043656	60.0711	105124.9	111486.6	378.649	184.95	196.65	0.94603	0.2844	285
840.000	0.45754	0.93882	0.042199	62.2658	108883.7	115440.6	383.414	187.26	198.74	0.95187	0.2686	290
860.000	0.44443	0.94403	0.040851	64.4276	112685.4	119435.7	388.115	189.49	200.77	0.95727	0.2543	295
880.000	0.43214	0.94880	0.039598	66.5603	116528.7	123470.9	392.754	191.64	202.74	0.96226	0.2414	300
900.000	0.42060	0.95317	0.038431	68.6667	120412.3	127544.9	397.332	193.72	204.66	0.96687	0.2295	304
					35.00000 bar							
279.692	11.49439	0.13094	15.714829	1077.6077	25.8	330.3	163.891	83.71	132.23	0.00163	-0.0424	1476
280.000	11.48989	0.13085	15.680364	1075.7605	66.6	371.3	164.037	83.81	132.29	0.00166	-0.0424	1474
290.000	11.34520	0.12794	14.612684	1017.0388	1398.7	1707.2	168.713	86.94	134.24	0.00277	-0.0415	1417
300.000	11.20241	0.12526	13.634519	960.4045	2748.8	3061.2	173.299	90.08	136.36	0.00443	-0.0406	1364
310.000	11.06114	0.12276	12.735314	905.5630	4119.0	4435.4	177.806	93.23	138.61	0.00681	-0.0395	1312
320.000	10.92101	0.12045	11.905927	852.2841	5511.3	5831.8	182.244	96.37	141.00	0.01014	-0.0384	1263
330.000	10.78162	0.11831	11.138403	800.3960	6927.5	7252.1	186.621	99.49	143.49	0.01464	-0.0371	1215
340.000	10.64255	0.11633	10.425802	749.7786	8369.2	8698.1	190.943	102.58	146.09	0.02057	-0.0357	1169
350.000	10.50337	0.11451	9.762023	700.3566	9837.7	10171.0	195.216	105.61	148.78	0.02820	-0.0343	1123
360.000	10.36362	0.11283	9.141713	652.0958	11334.2	11671.9	199.446	108.59	151.55	0.03783	-0.0327	1079
370.000	10.22282	0.11129	8.560129	604.9936	12859.4	13201.8	203.637	111.50	154.38	0.04974	-0.0309	1035
380.000	10.08046	0.10989	8.013064	559.0745	14414.0	14761.2	207.793	114.33	157.28	0.06420	-0.0290	992
390.000	9.93597	0.10863	7.496766	514.3831	15998.2	16350.5	211.917	117.06	160.22	0.08148	-0.0269	949
400.000	9.78876	0.10751	7.007875	470.9775	17612.3	17969.9	216.011	119.69	163.22	0.10180	-0.0245	906
410.000	9.63815	0.10653	6.543362	428.9237	19256.4	19619.5	220.079	122.21	166.26	0.12536	-0.0219	864
420.000	9.48339	0.10569	6.100477	388.2896	20930.4	21299.5	224.123	124.60	169.36	0.15231	-0.0189	821
430.000	9.32362	0.10500	5.676700	349.1403	22634.6	23010.0	228.145	126.87	172.53	0.18272	-0.0156	779
440.000	9.15785	0.10447	5.269690	311.5328	24369.3	24751.5	232.148	129.01	175.77	0.21665	-0.0116	737
450.000	8.98488	0.10411	4.877238	275.5142	26135.2	26524.7	236.136	131.01	179.14	0.25406	-0.0070	694
460.000	8.80326	0.10395	4.497204	241.1169	27933.6	28331.2	240.111	132.88	182.67	0.29488	-0.0016	651
470.000	8.61115	0.10401	4.127433	208.3559	29766.7	30173.1	244.079	134.64	186.47	0.33901	0.0051	607
480.000	8.40614	0.10433	3.765636	177.2265	31638.0	32054.4	248.048	136.30	190.65	0.38632	0.0133	563
490.000	8.18489	0.10496	3.409198	147.6993	33553.0	33980.7	252.027	137.91	195.46	0.43666	0.0239	517
500.000	7.94252	0.10600	3.054799	119.7127	35520.5	35961.2	256.032	139.52	201.31	0.48990	0.0379	470
510.000	7.67124	0.10760	2.697606	93.1547	37554.8	38011.0	260.090	141.29	208.99	0.54587	0.0577	419
520.000	7.35703	0.11003	2.329164	67.8163	39681.5	40157.2	264.250	143.48	220.33	0.60433	0.0881	365
530.000	6.96880	0.11397	1.929684	43.2141	41956.1	42458.4	268.619	146.80	240.84	0.66478	0.1428	301
535.272	6.70668	0.11726	1.685933	30.0516	43262.1	43783.9	271.098	149.83	262.39	0.69710	0.1976	259
535.272	1.38948	0.56598	0.197313	9.1750	55009.5	57528.4	296.776	157.64	275.28	0.69710	1.9045	143
540.000	1.30759	0.59617	0.171389	11.8821	56150.9	58827.6	299.009	152.81	230.89	0.72168	1.6418	151
550.000	1.19400	0.64101	0.145552	15.8384	58030.1	60961.4	302.926	149.98	201.58	0.73868	1.3433	165
560.000	1.11483	0.67427	0.130331	18.9379	59774.5	62913.9	306.449	149.92	190.33	0.75353	1.1579	175
565.000	1.08238	0.68834	0.124526	20.3115	60623.3	63857.0	308.128	150.24	187.06	0.76046	1.0867	179
570.000	1.05327	0.70116	0.119502	21.6007	61463.0	64785.9	309.766	150.68	184.65	0.76711	1.0252	184
580.000	1.00271	0.72382	0.111142	23.9818	63124.6	66615.2	312.951	151.81	181.52	0.77963	0.9234	191
590.000	0.95975	0.74340	0.104374	26.1615	64774.1	68420.9	316.040	153.12	179.79	0.79126	0.8418	198
600.000	0.92240	0.76061	0.098719	28.1879	66419.4	70213.9	319.056	154.54	178.92	0.80210	0.7744	204
620.000	0.85975	0.78971	0.089679	31.8985	69716.2	73787.1	324.918	157.51	178.66	0.82176	0.6689	215
640.000	0.80848	0.81355	0.082665	35.2748	73038.5	77367.7	330.605	160.55	179.52	0.83915	0.5892	224
660.000	0.76516	0.83355	0.076992	38.4081	76397.7	80971.9	336.153	163.58	180.97	0.85465	0.5265	233
680.000	0.72775	0.85062	0.072267	41.3562	79799.6	84608.9	341.583	166.55	182.76	0.86855	0.4757	241
700.000	0.69490	0.86539	0.068243	44.1586	83246.9	88283.6	346.911	169.44	184.73	0.88108	0.4337	248
720.000	0.66568	0.87828	0.064758	46.8430	86741.0	91998.8	352.145	172.25	186.80	0.89243	0.3983	255
740.000	0.63941	0.88965	0.061696	49.4301	90282.2	95756.0	357.293	174.98	188.92	0.90274	0.3680	261
760.000	0.61561	0.89973	0.058977	51.9358	93870.2	99555.7	362.361	177.62	191.05	0.91214	0.3417	267
780.000	0.59388	0.90874	0.056539	54.3724	97504.5	103397.9	367.352	180.17	193.17	0.92073	0.3188	273
800.000	0.57393	0.91682	0.054334	56.7495	101184.0	107282.4	372.270	182.63	195.27	0.92861	0.2986	278
820.000	0.55551	0.92412	0.052328	59.0750	104907.9	111208.4	377.118	185.01	197.33	0.93586	0.2806	284

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
840.000	0.53844	0.93072	0.050492	61.3555	108675.1	115175.4	381.898	187.31	199.35	0.94253	0.2644	289
860.000	0.52254	0.93672	0.048802	63.5962	112484.3	119182.3	386.613	189.53	201.33	0.94869	0.2499	294
880.000	0.50770	0.94220	0.047239	65.8016	116334.4	123228.3	391.265	191.68	203.26	0.95438	0.2368	298
900.000	0.49379	0.94720	0.045788	67.9755	120224.3	127312.2	395.854	193.76	205.14	0.95964	0.2248	303
					40.00000 bar							
279.836	11.49692	0.14953	15.713085	1079.6371	29.6	377.6	163.904	83.82	132.24	0.00147	-0.0425	1476
280.000	11.49453	0.14948	15.694767	1078.6562	51.3	399.3	163.982	83.88	132.27	0.00148	-0.0425	1475
290.000	11.35011	0.14616	14.627631	1020.0488	1382.7	1735.1	168.657	87.00	134.22	0.00247	-0.0416	1419
300.000	11.20761	0.14308	13.650031	963.5372	2732.0	3088.9	173.243	90.15	136.33	0.00394	-0.0406	1365
310.000	11.06665	0.14023	12.751420	908.8267	4101.4	4462.8	177.749	93.30	138.58	0.00607	-0.0396	1314
320.000	10.92687	0.13759	11.922664	855.6865	5492.8	5858.8	182.186	96.44	140.96	0.00902	-0.0384	1265
330.000	10.78785	0.13514	11.155817	803.9440	6908.0	7278.8	186.561	99.55	143.45	0.01302	-0.0372	1217
340.000	10.64920	0.13287	10.443948	753.4783	8348.6	8724.2	190.882	102.64	146.04	0.01830	-0.0358	1171
350.000	10.51049	0.13078	9.780971	704.2137	9815.9	10196.5	195.153	105.67	148.72	0.02508	-0.0344	1126
360.000	10.37126	0.12885	9.161533	656.1131	11311.0	11696.7	199.381	108.65	151.47	0.03364	-0.0328	1082
370.000	10.23106	0.12709	8.580915	609.1749	12834.8	13225.7	203.570	111.56	154.29	0.04422	-0.0311	1038
380.000	10.08937	0.12548	8.034922	563.4218	14387.6	14784.1	207.723	114.39	157.16	0.05706	-0.0292	995
390.000	9.94565	0.12403	7.519821	518.8979	15969.9	16372.1	211.843	117.12	160.09	0.07241	-0.0271	952
400.000	9.79932	0.12273	7.032273	475.6606	17581.8	17990.0	215.934	119.75	163.06	0.09045	-0.0248	910
410.000	9.64974	0.12160	6.569276	433.7759	19223.3	19637.9	219.997	122.27	166.07	0.11137	-0.0222	868
420.000	9.49618	0.12062	6.128115	393.3121	20894.5	21315.7	224.036	124.66	169.13	0.13529	-0.0194	826
430.000	9.33784	0.11981	5.706313	354.3350	22595.3	23023.6	228.052	126.92	172.24	0.16230	-0.0161	784
440.000	9.17376	0.11919	5.301588	316.9035	24326.0	24762.0	232.048	129.06	175.43	0.19242	-0.0123	742
450.000	9.00284	0.11875	4.911807	281.0672	26087.1	26531.4	236.027	131.06	178.71	0.22563	-0.0079	700
460.000	8.82375	0.11853	4.534938	246.8621	27879.8	28333.1	239.992	132.92	182.14	0.26187	-0.0026	658
470.000	8.63481	0.11854	4.168978	214.3092	29705.8	30169.1	243.947	134.67	185.79	0.30107	0.0037	615
480.000	8.43387	0.11884	3.811876	183.4118	31568.3	32042.6	247.899	136.31	189.77	0.34309	0.0114	571
490.000	8.21802	0.11947	3.461387	154.1535	33472.0	33958.7	251.857	137.89	194.28	0.38784	0.0212	527
500.000	7.98314	0.12053	3.114840	126.4939	35424.1	35925.2	255.834	139.46	199.64	0.43519	0.0340	481
510.000	7.72292	0.12214	2.768660	100.3600	37436.4	37954.4	259.852	141.14	206.45	0.48501	0.0515	433
520.000	7.42677	0.12457	2.417286	75.6274	39528.8	40067.4	263.947	143.13	215.98	0.53713	0.0772	382
530.000	7.07388	0.12832	2.050059	52.0610	41739.3	42304.8	268.194	145.93	231.44	0.59116	0.1191	325
540.000	6.60999	0.13478	1.637882	29.0638	44164.1	44769.2	272.783	150.96	265.04	0.64619	0.2057	255
545.797	6.21069	0.14192	1.326813	15.0067	45800.8	46444.9	275.863	157.78	323.77	0.67770	0.3367	198
545.797	1.74033	0.50648	0.264214	5.7940	55463.9	57762.3	296.598	166.13	383.25	0.67770	1.9942	130
550.000	1.60331	0.54556	0.221133	8.8681	56734.5	59229.4	299.111	157.53	275.50	0.70025	1.7101	140
560.000	1.42468	0.60300	0.180833	13.4907	58833.0	61640.6	303.459	153.11	219.98	0.71869	1.3621	157
565.000	1.36403	0.62424	0.168799	15.3169	59778.9	62711.4	305.365	152.67	209.16	0.72690	1.2495	163
570.000	1.31325	0.64269	0.159188	16.9660	60692.3	63738.2	307.177	152.63	201.99	0.73470	1.1582	169
580.000	1.23098	0.67382	0.144410	19.8989	62460.4	65709.9	310.610	153.17	193.29	0.74927	1.0168	179
590.000	1.16552	0.69960	0.133291	22.4929	64184.5	67616.4	313.872	154.15	188.46	0.76269	0.9104	187
600.000	1.11111	0.72163	0.124452	24.8490	65885.7	69485.7	317.017	155.35	185.64	0.77513	0.8263	194
620.000	1.02388	0.75785	0.111009	29.0628	69261.8	73168.6	323.059	158.07	183.15	0.79754	0.7002	207
640.000	0.95540	0.78679	0.101056	32.8140	72638.7	76825.5	328.867	160.96	182.78	0.81725	0.6087	218
660.000	0.89916	0.81067	0.093262	36.2426	76038.2	80486.8	334.503	163.89	183.48	0.83476	0.5388	227
680.000	0.85156	0.83081	0.086923	39.4322	79471.2	84168.5	340.000	166.79	184.76	0.85043	0.4832	236
700.000	0.81040	0.84806	0.081624	42.4370	82943.5	87879.3	345.381	169.64	186.37	0.86453	0.4379	244
720.000	0.77423	0.86302	0.077102	45.2947	86458.2	91624.6	350.657	172.41	188.18	0.87729	0.4002	251
740.000	0.74203	0.87613	0.073179	48.0326	90016.6	95407.2	355.841	175.11	190.10	0.88887	0.3682	258
760.000	0.71308	0.88771	0.069730	50.6708	93619.4	99228.9	360.938	177.73	192.07	0.89941	0.3407	264
780.000	0.68683	0.89801	0.066664	53.2253	97266.4	103090.3	365.954	180.26	194.07	0.90906	0.3169	270
800.000	0.66286	0.90722	0.063914	55.7081	100957.1	106991.6	370.893	182.71	196.06	0.91789	0.2960	276
820.000	0.64084	0.91551	0.061427	58.1293	104690.9	110932.7	375.760	185.08	198.04	0.92601	0.2775	282
840.000	0.62051	0.92299	0.059164	60.4968	108466.8	114913.1	380.556	187.37	199.99	0.93349	0.2610	287
860.000	0.60166	0.92977	0.057092	62.8171	112283.9	118932.2	385.285	189.58	201.91	0.94038	0.2462	292
880.000	0.58410	0.93595	0.055185	65.0958	116141.2	122989.3	389.949	191.72	203.79	0.94676	0.2329	297
900.000	0.56770	0.94159	0.053421	67.3375	120037.5	127083.5	394.550	193.79	205.63	0.95265	0.2208	302

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
					45.00000 bar							
279.980	11.49945	0.16810	15.711496	1081.6747	33.5	424.8	163.918	83.93	132.25	0.00134	-0.0425	1477
280.000	11.49916	0.16809	15.709276	1081.5559	36.1	427.4	163.927	83.94	132.26	0.00134	-0.0425	1477
290.000	11.35501	0.16436	14.642675	1023.0615	1366.7	1763.0	168.602	87.07	134.20	0.00224	-0.0416	1420
300.000	11.21279	0.16089	13.665630	966.6715	2715.3	3116.6	173.186	90.21	136.31	0.00357	-0.0407	1367
310.000	11.07215	0.15768	12.767602	912.0906	4083.8	4490.3	177.692	93.36	138.55	0.00549	-0.0396	1316
320.000	10.93270	0.15470	11.939464	859.0875	5474.3	5885.9	182.128	96.50	140.92	0.00816	-0.0385	1267
330.000	10.79406	0.15194	11.173280	807.4889	6888.6	7305.5	186.502	99.61	143.40	0.01177	-0.0373	1219
340.000	10.65582	0.14939	10.462127	757.1730	8328.1	8750.4	190.821	102.70	145.98	0.01654	-0.0359	1173
350.000	10.51757	0.14703	9.799929	708.0631	9794.2	10222.1	195.091	105.73	148.65	0.02266	-0.0345	1128
360.000	10.37886	0.14485	9.181346	660.1212	11288.0	11721.6	199.317	108.71	151.39	0.03039	-0.0329	1084
370.000	10.23924	0.14286	8.601669	613.3443	12810.3	13249.8	203.503	111.62	154.19	0.03993	-0.0312	1041
380.000	10.09821	0.14104	8.056718	567.7545	14361.4	14807.1	207.653	114.45	157.05	0.05152	-0.0294	998
390.000	9.95525	0.13940	7.542777	523.3948	15941.9	16393.9	211.770	117.18	159.95	0.06537	-0.0273	956
400.000	9.80978	0.13793	7.056528	480.3222	17551.6	18010.3	215.857	119.81	162.90	0.08164	-0.0251	914
410.000	9.66120	0.13663	6.594993	438.6024	19190.7	19656.5	219.916	122.32	165.88	0.10051	-0.0226	872
420.000	9.50881	0.13552	6.155487	398.3038	20859.0	21332.2	223.950	124.71	168.90	0.12209	-0.0198	831
430.000	9.35184	0.13459	5.735575	359.4929	22556.5	23037.7	227.960	126.98	171.97	0.14644	-0.0166	789
440.000	9.18941	0.13386	5.333021	322.2300	24283.3	24773.0	231.949	129.11	175.10	0.17360	-0.0129	747
450.000	9.02046	0.13333	4.945762	286.5665	26039.9	26538.8	235.920	131.10	178.31	0.20355	-0.0086	706
460.000	8.84378	0.13304	4.571854	252.5417	27827.1	28335.9	239.875	132.96	181.64	0.23625	-0.0036	664
470.000	8.65783	0.13301	4.209423	220.1807	29646.5	30166.3	243.818	134.70	185.16	0.27160	0.0024	622
480.000	8.46069	0.13327	3.856600	189.4934	31500.8	32032.6	247.755	136.33	188.96	0.30953	0.0097	579
490.000	8.24981	0.13389	3.511427	160.4725	33393.9	33939.3	251.694	137.88	193.20	0.34992	0.0188	536
500.000	8.02166	0.13494	3.171698	133.0921	35332.1	35893.1	255.645	139.41	198.14	0.39269	0.0305	492
510.000	7.77109	0.13656	2.834673	107.3036	37325.2	37904.2	259.627	141.02	204.26	0.43773	0.0462	446
520.000	7.48982	0.13896	2.496485	83.0286	39388.8	39989.6	263.669	142.89	212.47	0.48491	0.0683	397
530.000	7.16308	0.14256	2.150681	60.1381	41550.8	42179.1	267.825	145.40	224.85	0.53392	0.1022	345
540.000	6.75869	0.14829	1.783666	38.3882	43870.8	44536.6	272.214	149.49	247.46	0.58404	0.1622	285
550.000	6.17111	0.15946	1.350665	17.0899	46536.4	47265.6	277.214	158.74	312.90	0.63336	0.3130	207
555.270	5.55040	0.17561	0.979141	4.5122	48475.9	49286.7	280.883	177.03	560.00	0.65731	0.6663	135
555.270	2.26111	0.43107	0.366702	2.4341	55391.2	57381.3	295.461	180.57	780.57	0.65731	2.0395	116
560.000	1.93203	0.50023	0.274783	6.6587	57325.4	59654.5	299.364	160.73	330.85	0.68236	1.7148	132
565.000	1.77231	0.54049	0.239961	9.4544	58581.5	61120.5	301.975	157.10	266.65	0.69240	1.5005	143
570.000	1.66424	0.57054	0.217915	11.7244	59673.3	62377.2	304.192	155.70	239.06	0.70172	1.3487	151
580.000	1.51471	0.61606	0.189181	15.4698	61650.3	64621.2	308.097	155.03	213.51	0.71896	1.1387	165
590.000	1.40935	0.65089	0.170129	18.6057	63497.6	66690.6	311.639	155.45	201.66	0.73436	0.9950	175
600.000	1.32779	0.67935	0.156057	21.3652	65282.4	68671.5	314.971	156.33	195.12	0.74850	0.8880	184
620.000	1.20509	0.72438	0.136015	26.1614	68767.3	72501.5	321.255	158.70	188.89	0.77377	0.7358	199
640.000	1.11385	0.75923	0.122001	30.3275	72213.3	76253.4	327.215	161.41	186.72	0.79584	0.6305	211
660.000	1.04142	0.78742	0.111423	34.0748	75661.4	79982.5	332.955	164.22	186.39	0.81537	0.5524	222
680.000	0.98154	0.81088	0.103041	37.5206	79130.9	83715.5	338.529	167.05	187.02	0.83279	0.4917	231
700.000	0.93065	0.83079	0.096173	40.7379	82631.7	87467.0	343.968	169.84	188.19	0.84845	0.4429	240
720.000	0.88652	0.84792	0.090402	43.7758	86169.4	91245.4	349.292	172.58	189.69	0.86258	0.4027	248
740.000	0.84764	0.86285	0.085458	46.6692	89746.9	95055.8	354.513	175.25	191.37	0.87540	0.3690	255
760.000	0.81298	0.87596	0.081158	49.4436	93365.7	98900.9	359.642	177.84	193.16	0.88708	0.3403	262
780.000	0.78176	0.88758	0.077369	52.1186	97026.5	102782.7	364.684	180.36	195.02	0.89774	0.3156	268
800.000	0.75343	0.89793	0.073996	54.7091	100729.2	106701.8	369.646	182.79	196.90	0.90751	0.2940	274
820.000	0.72753	0.90721	0.070967	57.2273	104473.4	110658.7	374.532	185.15	198.78	0.91648	0.2750	280
840.000	0.70372	0.91558	0.068225	59.6828	108258.6	114653.2	379.346	187.43	200.66	0.92473	0.2581	286
860.000	0.68172	0.92314	0.065728	62.0834	112084.0	118684.9	384.090	189.64	202.51	0.93235	0.2431	291
880.000	0.66131	0.93001	0.063440	64.4358	115948.8	122753.5	388.767	191.77	204.34	0.93940	0.2295	296
900.000	0.64229	0.93628	0.061333	66.7454	119851.9	126858.1	393.380	193.83	206.13	0.94590	0.2172	301
					48.00000 bar							
280.067	11.50097	0.17923	15.710618	1082.9011	35.8	453.1	163.925	84.00	132.26	0.00128	-0.0425	1477
290.000	11.35793	0.17527	14.651747	1024.8704	1357.2	1779.8	168.568	87.11	134.19	0.00212	-0.0417	1421
300.000	11.21589	0.17157	13.675031	968.5527	2705.3	3133.3	173.153	90.25	136.29	0.00338	-0.0407	1368
310.000	11.07543	0.16814	12.777347	914.0489	4073.4	4506.8	177.658	93.40	138.53	0.00520	-0.0397	1317
320.000	10.93619	0.16496	11.949573	861.1274	5463.3	5902.2	182.093	96.53	140.90	0.00773	-0.0385	1268
330.000	10.79777	0.16202	11.183781	809.6144	6877.0	7321.5	186.466	99.65	143.38	0.01115	-0.0373	1221
340.000	10.65978	0.15929	10.473049	759.3875	8315.9	8766.2	190.784	102.73	145.95	0.01566	-0.0360	1175
350.000	10.52180	0.15676	9.811311	710.3694	9781.3	10237.5	195.053	105.77	148.61	0.02146	-0.0346	1130
360.000	10.38340	0.15444	9.193230	662.5216	11274.3	11736.6	199.278	108.75	151.34	0.02876	-0.0330	1086

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
370.000	10.24412	0.15231	8.614106	615.8404	12795.7	13264.2	203.463	111.66	154.14	0.03780	-0.0313	1043
380.000	10.10348	0.15037	8.069766	570.3472	14345.8	14820.9	207.611	114.48	156.99	0.04876	-0.0295	1000
390.000	9.96096	0.14861	7.556504	526.0845	15925.1	16407.0	211.727	117.21	159.88	0.06185	-0.0275	958
400.000	9.81601	0.14703	7.071014	483.1091	17533.6	18022.6	215.811	119.84	162.81	0.07725	-0.0253	916
410.000	9.66802	0.14564	6.610331	441.4863	19171.3	19667.7	219.868	122.36	165.77	0.09509	-0.0228	875
420.000	9.51632	0.14444	6.171788	401.2845	20837.9	21342.3	223.899	124.75	168.77	0.11550	-0.0200	833
430.000	9.36015	0.14343	5.752969	362.5706	22533.5	23046.3	227.906	127.01	171.81	0.13853	-0.0169	792
440.000	9.19867	0.14264	5.351668	325.4055	24258.1	24779.9	231.891	129.14	174.91	0.16421	-0.0133	751
450.000	9.03087	0.14206	4.965857	289.8417	26012.0	26543.5	235.857	131.13	178.07	0.19253	-0.0091	709
460.000	8.85558	0.14172	4.593636	255.9197	27796.0	28338.1	239.806	132.99	181.35	0.22345	-0.0042	668
470.000	8.67135	0.14165	4.233199	223.6671	29611.6	30165.2	243.742	134.72	184.80	0.25690	0.0016	626
480.000	8.47637	0.14189	3.882770	193.0965	31461.2	32027.4	247.671	136.34	188.50	0.29277	0.0087	584
490.000	8.26829	0.14249	3.540528	164.2052	33348.3	33928.9	251.598	137.88	192.59	0.33099	0.0174	541
500.000	8.04388	0.14354	3.204486	136.9736	35278.8	35875.6	255.535	139.39	197.32	0.37147	0.0286	498
510.000	7.79853	0.14515	2.872274	111.3636	37261.4	37876.9	259.498	140.97	203.09	0.41412	0.0434	453
520.000	7.52505	0.14753	2.540711	87.3139	39309.8	39947.7	263.511	142.78	210.67	0.45882	0.0638	406
530.000	7.21115	0.15105	2.204857	64.7311	41447.8	42113.4	267.622	145.17	221.72	0.50531	0.0940	355
540.000	6.83205	0.15648	1.855321	43.4594	43722.1	44424.7	271.925	148.96	240.59	0.55295	0.1444	299
550.000	6.32076	0.16606	1.467664	23.1718	46257.0	47016.4	276.674	156.91	284.89	0.60004	0.2505	232
560.000	5.12802	0.20103	0.857964	2.1339	50027.8	50963.9	283.822	202.18	936.79	0.64147	0.8932	112
560.491	4.81298	0.21400	0.737744	0.5319	50638.9	51636.2	285.027	230.41	2616.58	0.64316	1.2282	89
560.491	2.90701	0.35432	0.486940	0.4509	54528.7	56179.8	293.133	209.84	3697.54	0.64316	1.9278	100
565.000	2.19110	0.46633	0.318354	5.1535	57401.1	59591.8	298.996	162.95	394.39	0.67076	1.7276	126
570.000	1.96838	0.51454	0.272141	8.1518	58817.5	61256.1	301.931	158.75	292.40	0.68151	1.5059	138
580.000	1.72884	0.57573	0.224962	12.6204	61052.7	63829.1	306.411	156.51	234.32	0.70055	1.2293	155
590.000	1.58211	0.61847	0.197665	16.1672	63019.9	66053.8	310.218	156.39	213.35	0.71731	1.0545	168
600.000	1.47577	0.65198	0.178762	19.2109	64877.0	68129.5	313.710	157.01	202.83	0.73257	0.9298	178
620.000	1.32381	0.70337	0.153167	24.3961	68447.5	72073.4	320.181	159.12	193.14	0.75964	0.7589	194
640.000	1.21529	0.74224	0.135989	28.8290	71944.0	75893.7	326.250	161.69	189.49	0.78317	0.6445	207
660.000	1.13118	0.77327	0.123339	32.7770	75426.2	79669.5	332.062	164.43	188.37	0.80391	0.5611	219
680.000	1.06274	0.79886	0.113484	36.3821	78920.4	83437.0	337.688	167.21	188.53	0.82239	0.4971	229
700.000	1.00522	0.82044	0.105508	39.7305	82440.2	87215.3	343.166	169.97	189.38	0.83897	0.4461	238
720.000	0.95576	0.83893	0.098872	42.8790	85993.0	91015.2	348.520	172.69	190.66	0.85393	0.4045	246
740.000	0.91248	0.85497	0.093230	45.8675	89582.9	94843.2	353.765	175.34	192.18	0.86748	0.3697	253
760.000	0.87410	0.86902	0.088354	48.7248	93212.0	98703.4	358.913	177.92	193.85	0.87982	0.3403	260
780.000	0.83969	0.88144	0.084081	51.4729	96881.5	102597.9	363.972	180.42	195.61	0.89109	0.3150	267
800.000	0.80856	0.89249	0.080295	54.1287	100591.8	106528.2	368.949	182.84	197.42	0.90140	0.2930	273
820.000	0.78020	0.90237	0.076908	56.7055	104342.6	110494.9	373.847	185.19	199.25	0.91088	0.2737	279
840.000	0.75419	0.91127	0.073853	59.2141	108133.6	114498.1	378.671	187.47	201.07	0.91959	0.2566	285
860.000	0.73021	0.91930	0.071078	61.6631	111964.2	118537.7	383.424	189.67	202.88	0.92764	0.2414	290
880.000	0.70800	0.92659	0.068544	64.0598	115833.6	122613.3	388.109	191.80	204.67	0.93507	0.2277	295
900.000	0.68735	0.93322	0.066215	66.4102	119740.9	126724.2	392.729	193.86	206.43	0.94194	0.2153	300
					48.75750 bar							
280.088	11.50135	0.18204	15.710404	1083.2112	36.3	460.3	163.927	84.02	132.26	0.00126	-0.0425	1477
290.000	11.35867	0.17802	14.654043	1025.3273	1354.8	1784.0	168.560	87.12	134.19	0.00209	-0.0417	1421
300.000	11.21667	0.17427	13.677409	969.0278	2702.8	3137.5	173.144	90.26	136.29	0.00334	-0.0407	1368
310.000	11.07626	0.17079	12.779811	914.5434	4070.7	4510.9	177.649	93.40	138.53	0.00513	-0.0397	1317
320.000	10.93706	0.16755	11.952129	861.6424	5460.5	5906.3	182.084	96.54	140.89	0.00763	-0.0386	1268
330.000	10.79870	0.16456	11.186435	810.1509	6874.1	7325.6	186.457	99.66	143.37	0.01101	-0.0373	1221
340.000	10.66077	0.16178	10.475809	759.9463	8312.8	8770.1	190.775	102.74	145.94	0.01545	-0.0360	1175
350.000	10.52286	0.15922	9.814185	710.9514	9778.0	10241.4	195.044	105.78	148.60	0.02118	-0.0346	1130
360.000	10.38454	0.15686	9.196231	663.1272	11270.9	11740.4	199.268	108.76	151.33	0.02839	-0.0330	1086
370.000	10.24535	0.15470	8.617244	616.4700	12792.0	13267.9	203.453	111.67	154.12	0.03730	-0.0314	1043
380.000	10.10481	0.15272	8.073057	571.0010	14341.9	14824.4	207.601	114.49	156.97	0.04812	-0.0295	1001
390.000	9.96240	0.15093	7.559965	526.7627	15920.9	16410.4	211.716	117.22	159.86	0.06103	-0.0275	958
400.000	9.81758	0.14933	7.074664	483.8116	17529.1	18025.8	215.800	119.85	162.78	0.07623	-0.0253	917
410.000	9.66974	0.14791	6.614193	442.2131	19166.4	19670.6	219.856	122.36	165.74	0.09383	-0.0228	875
420.000	9.51820	0.14669	6.175890	402.0355	20832.6	21344.9	223.886	124.76	168.74	0.11396	-0.0201	834
430.000	9.36224	0.14567	5.757343	363.3457	22527.7	23048.5	227.892	127.02	171.77	0.13668	-0.0169	793
440.000	9.20099	0.14485	5.356352	326.2049	24251.7	24781.7	231.876	129.15	174.86	0.16202	-0.0133	751
450.000	9.03348	0.14426	4.970899	290.6658	26005.0	26544.7	235.841	131.14	178.02	0.18997	-0.0092	710
460.000	8.85853	0.14391	4.599094	256.7692	27788.3	28338.7	239.789	132.99	181.28	0.22047	-0.0044	669

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
470.000	8.67473	0.14383	4.239147	224.5432	29602.9	30165.0	243.723	134.72	184.71	0.25347	0.0014	627
480.000	8.48028	0.14406	3.889303	194.0012	31451.3	32026.2	247.650	136.34	188.38	0.28887	0.0084	585
490.000	8.27289	0.14466	3.547775	165.1412	33337.0	33926.3	251.574	137.88	192.45	0.32658	0.0171	543
500.000	8.04939	0.14570	3.212621	137.9453	35265.6	35871.3	255.508	139.38	197.12	0.36653	0.0281	499
510.000	7.80530	0.14731	2.881555	112.3773	37245.6	37870.3	259.466	140.95	202.81	0.40862	0.0427	454
520.000	7.53367	0.14969	2.551544	88.3799	39290.4	39937.6	263.472	142.75	210.24	0.45274	0.0627	408
530.000	7.22275	0.15319	2.217951	65.8663	41422.7	42097.8	267.573	145.12	221.00	0.49864	0.0922	358
540.000	6.84923	0.15855	1.872170	44.6964	43686.9	44398.8	271.857	148.85	239.12	0.54570	0.1406	303
550.000	6.35248	0.16784	1.492763	24.5943	46196.5	46964.1	276.557	156.61	280.09	0.59227	0.2391	237
560.000	5.36337	0.19524	0.960944	4.4838	49634.1	50543.2	283.045	195.22	596.15	0.63346	0.6686	132
565.000	2.35953	0.43988	0.350370	3.8830	56944.0	59010.4	297.908	165.70	486.54	0.66506	1.7950	120
570.000	2.06730	0.49765	0.290161	7.1784	58545.8	60904.3	301.248	159.80	316.23	0.67626	1.5519	134
580.000	1.79070	0.56462	0.235545	11.8762	60882.6	63605.4	305.951	156.94	241.44	0.69585	1.2545	152
590.000	1.62990	0.60981	0.205461	15.5395	62889.2	65880.7	309.845	156.65	216.98	0.71299	1.0705	165
600.000	1.51578	0.64479	0.185040	18.6604	64768.3	67985.0	313.385	157.19	205.11	0.72855	0.9409	176
620.000	1.35515	0.69795	0.157791	23.9485	68363.6	71961.5	319.910	159.22	194.32	0.75609	0.7650	193
640.000	1.24174	0.73789	0.139708	28.4505	71874.2	75800.7	326.008	161.77	190.24	0.77999	0.6481	206
660.000	1.15441	0.76967	0.126479	32.4501	75365.6	79589.2	331.840	164.49	188.90	0.80104	0.5633	218
680.000	1.08364	0.79581	0.116218	36.0960	78866.5	83365.9	337.479	167.26	188.92	0.81979	0.4984	228
700.000	1.02435	0.81782	0.107941	39.4778	82391.3	87151.2	342.967	170.01	189.70	0.83660	0.4469	237
720.000	0.97347	0.83666	0.101071	42.6545	85948.1	90956.7	348.329	172.71	190.91	0.85176	0.4049	245
740.000	0.92903	0.85299	0.095242	45.6671	89541.2	94789.4	353.581	175.36	192.39	0.86550	0.3699	253
760.000	0.88967	0.86728	0.090213	48.5454	93173.0	98653.4	358.735	177.93	194.03	0.87801	0.3403	260
780.000	0.85443	0.87991	0.085811	51.3121	96844.8	102551.3	363.798	180.43	195.77	0.88942	0.3149	266
800.000	0.82257	0.89113	0.081916	53.9844	100557.0	106484.4	368.778	182.86	197.55	0.89988	0.2928	273
820.000	0.79357	0.90117	0.078434	56.5760	104309.5	110453.6	373.679	185.20	199.36	0.90948	0.2734	279
840.000	0.76699	0.91019	0.075297	59.0980	108102.1	114459.0	378.506	187.48	201.18	0.91831	0.2562	284
860.000	0.74251	0.91835	0.072450	61.5592	111934.0	118500.6	383.261	189.68	202.98	0.92646	0.2410	290
880.000	0.71984	0.92574	0.069850	63.9671	115804.6	122578.0	387.949	191.80	204.76	0.93399	0.2272	295
900.000	0.69876	0.93247	0.067464	66.3278	119712.9	126690.6	392.571	193.86	206.51	0.94095	0.2149	300
					50.00000 bar							
280.124	11.50198	0.18664	15.710062	1083.7203	37.3	472.0	163.931	84.04	132.27	0.00124	-0.0425	1477
290.000	11.35989	0.18254	14.657814	1026.0768	1350.8	1791.0	168.546	87.13	134.19	0.00205	-0.0417	1422
300.000	11.21795	0.17869	13.681314	969.8072	2698.7	3144.4	173.130	90.27	136.28	0.00327	-0.0407	1369
310.000	11.07762	0.17512	12.783857	915.3545	4066.4	4517.7	177.635	93.42	138.52	0.00503	-0.0397	1318
320.000	10.93851	0.17180	11.956325	862.4871	5456.0	5913.1	182.070	96.56	140.89	0.00747	-0.0386	1269
330.000	10.80023	0.16873	11.190790	811.0307	6869.3	7332.2	186.442	99.67	143.36	0.01078	-0.0374	1222
340.000	10.66241	0.16588	10.480337	760.8628	8307.7	8776.7	190.760	102.76	145.93	0.01513	-0.0360	1176
350.000	10.52461	0.16325	9.818901	711.9056	9772.7	10247.8	195.028	105.79	148.59	0.02073	-0.0346	1131
360.000	10.38641	0.16083	9.201151	664.1200	11265.2	11746.6	199.252	108.77	151.31	0.02779	-0.0331	1087
370.000	10.24736	0.15861	8.622390	617.5021	12786.0	13273.9	203.436	111.68	154.10	0.03651	-0.0314	1044
380.000	10.10698	0.15658	8.078452	572.0728	14335.5	14830.2	207.584	114.50	156.94	0.04710	-0.0296	1001
390.000	9.96476	0.15474	7.565637	527.8742	15914.1	16415.8	211.698	117.24	159.82	0.05975	-0.0276	959
400.000	9.82014	0.15309	7.080644	484.9629	17521.7	18030.9	215.781	119.86	162.74	0.07461	-0.0254	918
410.000	9.67254	0.15164	6.620519	443.4039	19158.4	19675.3	219.836	122.38	165.70	0.09185	-0.0229	876
420.000	9.52129	0.15038	6.182605	403.2658	20823.9	21349.1	223.865	124.77	168.68	0.11155	-0.0202	835
430.000	9.36565	0.14932	5.764500	364.6155	22518.3	23052.1	227.870	127.03	171.71	0.13378	-0.0170	794
440.000	9.20480	0.14848	5.364014	327.5142	24241.4	24784.6	231.852	129.16	174.78	0.15858	-0.0135	753
450.000	9.03775	0.14786	4.979142	292.0152	25993.6	26546.8	235.815	131.15	177.92	0.18593	-0.0094	712
460.000	8.86336	0.14750	4.608011	258.1597	27775.5	28339.7	239.760	133.00	181.16	0.21579	-0.0046	670
470.000	8.68024	0.14740	4.248856	225.9767	29588.7	30164.7	243.692	134.73	184.56	0.24808	0.0011	629
480.000	8.48667	0.14762	3.899957	195.4806	31435.1	32024.3	247.615	136.34	188.20	0.28273	0.0080	587
490.000	8.28038	0.14821	3.559574	166.6710	33318.5	33922.3	251.536	137.88	192.21	0.31964	0.0166	545
500.000	8.05835	0.14925	3.225845	139.5319	35244.1	35864.5	255.464	139.38	196.80	0.35875	0.0274	502
510.000	7.81627	0.15086	2.896604	114.0307	37220.0	37859.7	259.414	140.93	202.36	0.39997	0.0416	457
520.000	7.54760	0.15322	2.569042	90.1153	39259.0	39921.5	263.410	142.71	209.57	0.44318	0.0610	411
530.000	7.24135	0.15669	2.238973	67.7089	41382.5	42073.0	267.494	145.04	219.88	0.48815	0.0892	362
540.000	6.87643	0.16195	1.898899	46.6931	43631.0	44358.1	271.748	148.69	236.88	0.53429	0.1347	308
550.000	6.40080	0.17082	1.531305	26.8565	46103.6	46884.7	276.377	156.17	273.39	0.58002	0.2228	245
560.000	5.57212	0.19272	1.061925	7.6039	49273.5	50170.8	282.340	191.48	458.96	0.62074	0.5097	152
565.000	2.84921	0.37356	0.440647	1.4923	55686.0	57440.8	295.043	174.67	1080.21	0.65531	1.8699	108
570.000	2.26413	0.46597	0.326218	5.5033	58016.1	60224.5	299.954	161.94	376.96	0.66753	1.6313	128
580.000	1.90119	0.54536	0.254661	10.6337	60581.8	63211.8	305.156	157.72	255.58	0.68811	1.2978	148

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	∂P/∂T bar/K	∂P/∂ρ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
590.000	1.71265	0.59513	0.219122	14.5003	62664.5	65584.0	309.216	157.10	223.71	0.70590	1.0977	162
600.000	1.58404	0.63273	0.195879	17.7527	64584.0	67740.5	312.844	157.50	209.18	0.72196	0.9595	173
620.000	1.40785	0.68895	0.165652	23.2131	68223.1	71774.7	319.463	159.41	196.39	0.75028	0.7750	191
640.000	1.28590	0.73071	0.145980	27.8301	71758.0	75646.3	325.613	161.89	191.53	0.77479	0.6540	205
660.000	1.19301	0.76374	0.131748	31.9150	75265.2	79456.3	331.478	164.58	189.80	0.79636	0.5669	217
680.000	1.11829	0.79081	0.120792	35.6281	78777.3	83248.4	337.141	167.32	189.59	0.81554	0.5007	227
700.000	1.05599	0.81354	0.112000	39.0650	82310.6	87045.5	342.646	170.06	190.22	0.83273	0.4483	236
720.000	1.00273	0.83295	0.104732	42.2879	85874.1	90860.5	348.021	172.76	191.33	0.84823	0.4057	244
740.000	0.95634	0.84975	0.098587	45.3402	89472.6	94700.8	353.283	175.40	192.74	0.86227	0.3703	252
760.000	0.91535	0.86444	0.093298	48.2531	93108.9	98571.3	358.445	177.96	194.33	0.87505	0.3403	259
780.000	0.87870	0.87740	0.088680	51.0502	96784.4	102474.7	363.516	180.46	196.02	0.88671	0.3147	266
800.000	0.84564	0.88891	0.084601	53.7496	100499.9	106412.6	368.502	182.88	197.78	0.89739	0.2924	272
820.000	0.81557	0.89920	0.080961	56.3656	104255.3	110385.9	373.408	185.22	199.56	0.90720	0.2729	278
840.000	0.78805	0.90845	0.077685	58.9095	108050.3	114395.0	378.239	187.49	201.35	0.91622	0.2557	284
860.000	0.76272	0.91679	0.074717	61.3908	111884.4	118439.9	382.999	189.69	203.13	0.92454	0.2403	290
880.000	0.73928	0.92436	0.072010	63.8170	115756.9	122520.2	387.690	191.82	204.90	0.93223	0.2265	295
900.000	0.71751	0.93124	0.069527	66.1946	119667.0	126635.5	392.314	193.87	206.64	0.93934	0.2141	300
					52.00000 bar							
280.182	11.50299	0.19405	15.709531	1084.5408	38.8	490.9	163.936	84.09	132.27	0.00120	-0.0425	1477
290.000	11.36183	0.18981	14.663896	1027.2837	1344.5	1802.2	168.524	87.16	134.18	0.00198	-0.0417	1422
300.000	11.22001	0.18580	13.687611	971.0618	2692.0	3155.5	173.108	90.30	136.28	0.00317	-0.0408	1369
310.000	11.07980	0.18208	12.790380	916.6601	4059.4	4528.7	177.612	93.44	138.51	0.00487	-0.0397	1318
320.000	10.94082	0.17864	11.963086	863.8465	5448.7	5924.0	182.046	96.58	140.87	0.00723	-0.0386	1270
330.000	10.80270	0.17544	11.197807	812.4465	6861.6	7342.9	186.419	99.70	143.34	0.01043	-0.0374	1222
340.000	10.66503	0.17247	10.487630	762.3373	8299.6	8787.2	190.736	102.78	145.91	0.01465	-0.0361	1177
350.000	10.52742	0.16974	9.826493	713.4406	9764.1	10258.1	195.003	105.82	148.56	0.02007	-0.0347	1132
360.000	10.38942	0.16721	9.209071	665.7170	11256.1	11756.6	199.227	108.80	151.28	0.02690	-0.0331	1088
370.000	10.25060	0.16490	8.630670	619.1620	12776.3	13283.6	203.410	111.70	154.07	0.03533	-0.0315	1045
380.000	10.11047	0.16278	8.087129	573.7961	14325.2	14839.5	207.556	114.53	156.90	0.04558	-0.0296	1003
390.000	9.96854	0.16087	7.574754	529.6612	15903.0	16424.7	211.669	117.26	159.77	0.05781	-0.0277	961
400.000	9.82426	0.15915	7.090252	486.8134	17509.8	18039.1	215.751	119.89	162.68	0.07219	-0.0255	919
410.000	9.67704	0.15763	6.630678	445.3177	19145.6	19682.9	219.804	122.40	165.63	0.08885	-0.0230	878
420.000	9.52624	0.15631	6.193383	405.2425	20810.0	21355.9	223.831	124.79	168.60	0.10790	-0.0203	837
430.000	9.37112	0.15521	5.775979	366.6549	22503.1	23058.0	227.834	127.05	171.60	0.12941	-0.0172	796
440.000	9.21088	0.15432	5.376293	329.6165	24224.8	24789.3	231.814	129.18	174.66	0.15339	-0.0137	755
450.000	9.04457	0.15366	4.992339	294.1810	25975.3	26550.2	235.773	131.17	177.77	0.17984	-0.0097	714
460.000	8.87107	0.15326	4.622273	260.3906	27755.2	28341.4	239.715	133.02	180.98	0.20871	-0.0050	673
470.000	8.68905	0.15314	4.264365	228.2752	29565.9	30164.3	243.642	134.74	184.33	0.23995	0.0007	632
480.000	8.49683	0.15334	3.916947	197.8509	31409.4	32021.4	247.560	136.35	187.91	0.27346	0.0074	590
490.000	8.29229	0.15392	3.578352	169.1194	33289.0	33916.1	251.474	137.88	191.83	0.30918	0.0157	548
500.000	8.07255	0.15495	3.246828	142.0680	35209.8	35854.0	255.393	139.37	196.30	0.34702	0.0262	506
510.000	7.83361	0.15654	2.920392	116.6685	37179.4	37843.2	259.331	140.91	201.66	0.38691	0.0399	462
520.000	7.56946	0.15889	2.596545	92.8764	39209.6	39896.6	263.311	142.66	208.54	0.42875	0.0583	416
530.000	7.27027	0.16231	2.271714	70.6277	41319.6	42034.9	267.370	144.93	218.20	0.47232	0.0848	368
540.000	6.91787	0.16742	1.939827	49.8310	43545.1	44296.8	271.580	148.46	233.67	0.51707	0.1261	316
550.000	6.47078	0.17573	1.587894	30.3456	45967.3	46770.9	276.113	155.62	264.76	0.56151	0.2012	257
560.000	5.77944	0.19324	1.173211	11.9108	48904.0	49803.7	281.621	188.83	382.58	0.60140	0.3864	175
565.000	5.00395	0.22121	0.863425	3.0164	51403.8	52443.0	286.109	172.82	730.49	0.63689	0.8568	127
570.000	2.77794	0.39498	0.418932	2.6172	56711.7	58583.6	296.933	167.40	662.71	0.65292	1.7298	115
580.000	2.11006	0.51103	0.291357	8.5807	60025.1	62489.5	303.738	159.17	288.04	0.67554	1.3711	140
590.000	1.85931	0.57012	0.243778	12.8061	62271.5	65068.3	308.151	157.89	237.09	0.69446	1.1434	156
600.000	1.70163	0.61256	0.214899	16.2818	64269.5	67325.4	311.949	158.03	216.80	0.71137	0.9904	169
620.000	1.49628	0.67416	0.179079	22.0284	67989.0	71464.3	318.740	159.71	200.03	0.74098	0.7914	187
640.000	1.35908	0.71902	0.156550	26.8334	71566.4	75392.6	324.980	162.10	193.74	0.76648	0.6636	202
660.000	1.25654	0.75413	0.140554	31.0570	75100.7	79239.1	330.901	164.73	191.32	0.78887	0.5728	214
680.000	1.17502	0.78273	0.128390	34.8791	78631.9	83057.3	336.603	167.44	190.71	0.80875	0.5044	225
700.000	1.10762	0.80664	0.118715	38.4049	82179.4	86874.2	342.137	170.15	191.09	0.82655	0.4505	234
720.000	1.05035	0.82699	0.110770	41.7026	85754.0	90704.7	347.534	172.83	192.03	0.84259	0.4069	243
740.000	1.00071	0.84456	0.104088	44.8188	89361.4	94557.8	352.814	175.45	193.32	0.85712	0.3708	251
760.000	0.95700	0.85989	0.098362	47.7874	93005.2	98438.8	357.990	178.01	194.81	0.87034	0.3404	258
780.000	0.91804	0.87339	0.093380	50.6336	96687.0	102351.2	363.072	180.50	196.44	0.88239	0.3144	265
800.000	0.88298	0.88537	0.088993	53.3767	100407.8	106296.9	368.068	182.91	198.14	0.89343	0.2918	272
820.000	0.85116	0.89607	0.085089	56.0318	104167.8	110277.1	372.983	185.25	199.88	0.90356	0.2721	278

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
840.000	0.82209	0.90567	0.081584	58.6112	107966.8	114292.2	377.821	187.52	201.63	0.91289	0.2547	284
860.000	0.79537	0.91433	0.078413	61.1247	111804.5	118342.4	382.587	189.71	203.39	0.92149	0.2393	289
880.000	0.77068	0.92217	0.075527	63.5804	115680.3	122427.6	387.283	191.83	205.13	0.92943	0.2254	295
900.000	0.74777	0.92930	0.072885	65.9851	119593.3	126547.2	391.913	193.89	206.85	0.93678	0.2130	300
					55.00000 bar							
280.268	11.50450	0.20516	15.708779	1085.7739	41.2	519.2	163.944	84.15	132.28	0.00116	-0.0426	1478
290.000	11.36475	0.20071	14.673046	1029.0947	1335.0	1819.0	168.491	87.19	134.17	0.00190	-0.0417	1423
300.000	11.22310	0.19647	13.697081	972.9442	2682.1	3172.1	173.074	90.34	136.26	0.00303	-0.0408	1370
310.000	11.08307	0.19253	12.800184	918.6184	4049.0	4545.3	177.578	93.48	138.49	0.00465	-0.0398	1319
320.000	10.94429	0.18888	11.973246	865.8851	5437.7	5940.3	182.012	96.62	140.85	0.00691	-0.0386	1271
330.000	10.80639	0.18549	11.208346	814.5694	6850.1	7359.0	186.383	99.73	143.32	0.00996	-0.0374	1224
340.000	10.66896	0.18236	10.498578	764.5476	8287.5	8803.0	190.699	102.82	145.88	0.01399	-0.0361	1178
350.000	10.53161	0.17946	9.837885	715.7411	9751.3	10273.5	194.966	105.85	148.52	0.01916	-0.0347	1133
360.000	10.39392	0.17678	9.220948	668.1098	11242.5	11771.7	199.188	108.83	151.24	0.02568	-0.0332	1090
370.000	10.25543	0.17433	8.643080	621.6484	12761.8	13298.1	203.370	111.74	154.01	0.03373	-0.0316	1047
380.000	10.11569	0.17209	8.100126	576.3769	14309.8	14853.5	207.515	114.56	156.84	0.04350	-0.0298	1005
390.000	9.97419	0.17005	7.588402	532.3365	15886.5	16437.9	211.626	117.29	159.70	0.05516	-0.0278	963
400.000	9.83041	0.16823	7.104625	489.5831	17492.1	18051.6	215.706	119.92	162.59	0.06888	-0.0256	921
410.000	9.68376	0.16661	6.645862	448.1811	19126.5	19694.4	219.757	122.43	165.52	0.08477	-0.0232	880
420.000	9.53361	0.16520	6.209479	408.1991	20789.3	21366.2	223.781	124.82	168.47	0.10294	-0.0205	839
430.000	9.37927	0.16402	5.793105	369.7041	22480.6	23067.0	227.780	127.08	171.45	0.12345	-0.0175	799
440.000	9.21994	0.16306	5.394592	332.7585	24200.1	24796.6	231.756	129.21	174.47	0.14632	-0.0141	758
450.000	9.05471	0.16235	5.011977	297.4157	25948.1	26555.5	235.711	131.19	177.55	0.17154	-0.0101	717
460.000	8.88252	0.16189	4.643459	263.7200	27725.0	28344.2	239.648	133.04	180.71	0.19908	-0.0055	677
470.000	8.70209	0.16174	4.287359	231.7025	29532.1	30164.2	243.569	134.76	184.00	0.22887	-0.0000	636
480.000	8.51186	0.16191	3.942074	201.3813	31371.3	32017.5	247.478	136.36	187.49	0.26084	0.0065	595
490.000	8.30984	0.16246	3.606038	172.7610	33245.6	33907.4	251.382	137.88	191.29	0.29492	0.0145	553
500.000	8.09339	0.16347	3.277643	145.8327	35159.5	35839.1	255.289	139.35	195.58	0.33103	0.0245	511
510.000	7.85890	0.16504	2.955132	120.5740	37120.1	37819.9	259.211	140.87	200.68	0.36912	0.0374	468
520.000	7.60107	0.16736	2.636394	96.9489	39137.8	39861.4	263.167	142.58	207.10	0.40909	0.0547	424
530.000	7.31150	0.17070	2.318570	74.9079	41229.4	41981.7	267.192	144.78	215.93	0.45075	0.0788	378
540.000	6.97547	0.17561	1.997144	54.3866	43424.6	44213.1	271.346	148.17	229.56	0.49359	0.1151	328
550.000	6.56228	0.18328	1.663433	35.3060	45786.2	46624.3	275.763	155.00	255.10	0.53625	0.1762	272
560.000	5.98456	0.19738	1.294840	17.5956	48526.3	49445.4	280.891	186.87	335.86	0.57485	0.2928	201
565.000	5.53132	0.21167	1.074137	9.3174	50472.7	51467.0	284.281	166.74	395.41	0.60943	0.4927	168
570.000	4.59456	0.25259	0.766380	2.3905	52979.0	54176.1	289.054	167.99	831.41	0.62832	1.0150	123
580.000	2.54495	0.44815	0.368741	5.4659	58919.9	61081.0	301.083	161.90	384.66	0.65635	1.4684	128
590.000	2.12072	0.52868	0.288815	10.2415	61588.8	64182.3	306.392	159.23	266.08	0.67721	1.2131	148
600.000	1.89969	0.58035	0.247801	14.0678	63749.3	66644.5	310.535	158.89	231.46	0.69550	1.0379	161
620.000	1.63827	0.65125	0.201217	20.2563	67617.3	70974.5	317.641	160.19	206.36	0.72712	0.8162	182
640.000	1.47410	0.70116	0.173583	25.3475	71267.9	74999.0	324.034	162.41	197.43	0.75414	0.6780	198
660.000	1.35518	0.73958	0.154553	29.7809	74847.1	78905.6	330.048	164.96	193.78	0.77776	0.5816	211
680.000	1.26244	0.77056	0.140359	33.7672	78409.2	82765.8	335.812	167.61	192.51	0.79869	0.5098	222
700.000	1.18675	0.79628	0.129222	37.4268	81979.5	86614.0	341.391	170.29	192.46	0.81741	0.4538	232
720.000	1.12305	0.81808	0.120169	40.8367	85571.7	90469.1	346.823	172.94	193.13	0.83426	0.4088	241
740.000	1.06823	0.83682	0.112617	44.0490	89193.2	94342.0	352.130	175.54	194.22	0.84951	0.3717	249
760.000	1.02023	0.85313	0.106187	47.1010	92848.5	98239.5	357.328	178.09	195.57	0.86337	0.3405	257
780.000	0.97765	0.86746	0.100624	50.0207	96540.1	102165.8	362.428	180.56	197.08	0.87601	0.3140	264
800.000	0.93948	0.88014	0.095746	52.8291	100269.1	106123.4	367.439	182.97	198.70	0.88758	0.2911	271
820.000	0.90494	0.89144	0.091423	55.5429	104036.2	110114.0	372.367	185.30	200.37	0.89820	0.2711	277
840.000	0.87347	0.90157	0.087555	58.1753	107841.6	114138.3	377.216	187.56	202.07	0.90797	0.2535	283
860.000	0.84461	0.91070	0.084067	60.7370	111684.8	118196.7	381.992	189.75	203.77	0.91698	0.2378	288
880.000	0.81799	0.91895	0.080900	63.2368	115565.5	122289.2	386.697	191.86	205.48	0.92531	0.2239	294
900.000	0.79335	0.92645	0.078007	65.6821	119482.8	126415.5	391.334	193.91	207.16	0.93300	0.2113	299
					60.00000 bar							
280.412	11.50703	0.22364	15.707644	1087.8353	45.1	566.5	163.957	84.26	132.29	0.00109	-0.0426	1478
290.000	11.36960	0.21886	14.688369	1032.1151	1319.2	1847.0	168.436	87.26	134.15	0.00177	-0.0418	1425
300.000	11.22823	0.21423	13.712928	976.0825	2665.6	3199.9	173.018	90.40	136.24	0.00282	-0.0408	1372
310.000	11.08850	0.20993	12.816581	921.8823	4031.7	4572.8	177.521	93.54	138.47	0.00434	-0.0398	1321
320.000	10.95006	0.20594	11.990224	869.2816	5419.6	5967.5	181.954	96.68	140.82	0.00644	-0.0387	1273
330.000	10.81251	0.20224	11.225946	818.1048	6831.0	7385.9	186.324	99.79	143.27	0.00929	-0.0375	1226

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
340.000	10.67549	0.19881	10.516847	768.2274	8267.3	8829.4	190.639	102.88	145.83	0.01303	-0.0362	1180
350.000	10.53858	0.19564	9.856881	719.5697	9730.0	10299.4	194.904	105.91	148.46	0.01785	-0.0348	1136
360.000	10.40138	0.19272	9.240736	672.0905	11220.0	11796.8	199.124	108.89	151.16	0.02392	-0.0333	1092
370.000	10.26345	0.19003	8.663737	625.7833	12737.9	13322.5	203.304	111.79	153.93	0.03141	-0.0317	1050
380.000	10.12433	0.18757	8.121741	580.6671	14284.2	14876.9	207.446	114.62	156.73	0.04050	-0.0299	1008
390.000	9.98354	0.18534	7.611076	536.7821	15859.2	16460.2	211.554	117.35	159.58	0.05135	-0.0280	966
400.000	9.84057	0.18333	7.128477	494.1833	17462.8	18072.5	215.631	119.97	162.45	0.06411	-0.0259	925
410.000	9.69485	0.18155	6.671027	452.9348	19094.9	19713.7	219.678	122.49	165.35	0.07889	-0.0235	884
420.000	9.54579	0.17999	6.236117	413.1045	20755.1	21383.7	223.698	124.87	168.27	0.09579	-0.0209	844
430.000	9.39271	0.17867	5.821402	374.7599	22443.4	23082.2	227.692	127.13	171.21	0.11486	-0.0180	803
440.000	9.23485	0.17760	5.424770	337.9637	24159.4	24809.1	231.661	129.25	174.18	0.13613	-0.0146	763
450.000	9.07137	0.17678	5.044300	302.7705	25903.3	26564.7	235.609	131.24	177.19	0.15958	-0.0108	723
460.000	8.90128	0.17624	4.678246	269.2257	27675.5	28349.6	239.537	133.08	180.28	0.18519	-0.0064	683
470.000	8.72341	0.17601	4.325000	237.3626	29476.9	30164.7	243.448	134.79	183.47	0.21290	-0.0011	643
480.000	8.53634	0.17612	3.983059	207.2021	31309.2	32012.1	247.345	136.39	186.82	0.24264	0.0051	602
490.000	8.33829	0.17662	3.650989	178.7526	33174.9	33894.5	251.233	137.89	190.44	0.27435	0.0126	562
500.000	8.12697	0.17759	3.327380	152.0099	35078.1	35816.4	255.120	139.34	194.48	0.30798	0.0219	521
510.000	7.89931	0.17912	3.010768	126.9586	37024.8	37784.4	259.016	140.82	199.18	0.34346	0.0338	479
520.000	7.65095	0.18138	2.699516	103.5725	39023.7	39807.9	262.938	142.47	204.98	0.38073	0.0492	436
530.000	7.37533	0.18461	2.391593	81.8168	41088.5	41902.0	266.913	144.59	212.70	0.41962	0.0702	392
540.000	7.06171	0.18924	2.084120	61.6523	43241.8	44091.4	270.988	147.81	224.10	0.45969	0.1002	345
550.000	6.69017	0.19612	1.772285	43.0456	45527.8	46424.6	275.263	154.29	243.95	0.49974	0.1461	295
560.000	6.21590	0.20731	1.446227	26.0147	48085.4	49050.7	280.040	185.20	301.73	0.53630	0.2137	232
565.000	5.90543	0.21628	1.270941	18.1623	49782.9	50798.9	282.945	163.71	307.80	0.56911	0.3133	209
570.000	5.49344	0.23046	1.078486	10.9452	51357.5	52440.7	285.855	160.81	361.53	0.58790	0.4644	177
580.000	3.90050	0.31898	0.621606	3.3883	55948.3	57486.6	294.608	164.30	599.05	0.62205	1.1247	125
590.000	2.74308	0.44589	0.399370	6.3173	60063.8	62251.1	302.759	161.69	359.66	0.64824	1.2769	134
600.000	2.31060	0.52052	0.318718	10.4921	62710.6	65307.4	307.905	160.44	269.25	0.66909	1.1072	150
620.000	1.90476	0.61106	0.244485	17.3613	66934.5	70084.5	315.747	161.02	219.86	0.70429	0.8558	174
640.000	1.68152	0.67055	0.205524	22.9198	70737.8	74306.0	322.454	162.96	204.67	0.73390	0.7011	191
660.000	1.52927	0.71497	0.180192	27.6982	74405.0	78328.5	328.646	165.35	198.43	0.75959	0.5957	206
680.000	1.41465	0.75016	0.161942	31.9550	78025.4	82266.8	334.527	167.91	195.79	0.78227	0.5185	218
700.000	1.32329	0.77905	0.147960	35.8355	81637.8	86172.0	340.189	170.52	194.94	0.80250	0.4590	229
720.000	1.24766	0.80332	0.136793	39.4307	85261.9	90070.9	345.683	173.13	195.08	0.82068	0.4117	238
740.000	1.18338	0.82406	0.127601	42.8016	88908.7	93978.9	351.038	175.70	195.80	0.83711	0.3730	247
760.000	1.12766	0.84202	0.119862	45.9916	92584.6	97905.3	356.275	178.21	196.88	0.85203	0.3407	255
780.000	1.07862	0.85773	0.113226	49.0327	96293.2	101855.8	361.407	180.67	198.20	0.86564	0.3133	262
800.000	1.03492	0.87160	0.107452	51.9492	100036.7	105834.2	366.444	183.06	199.66	0.87809	0.2898	269
820.000	0.99561	0.88392	0.102367	54.7600	103816.2	109842.7	371.394	185.37	201.20	0.88950	0.2694	275
840.000	0.95994	0.89494	0.097844	57.4800	107632.4	113882.8	376.262	187.62	202.81	0.90001	0.2515	282
860.000	0.92735	0.90484	0.093785	60.1214	111485.1	117955.1	381.054	189.80	204.43	0.90969	0.2356	287
880.000	0.89741	0.91378	0.090116	62.6941	115374.2	122060.1	385.773	191.91	206.07	0.91863	0.2214	293
900.000	0.86975	0.92189	0.086777	65.2063	119299.1	126197.7	390.423	193.96	207.70	0.92690	0.2088	298
					65.00000 bar							
280.555	11.50955	0.24210	15.706654	1089.9043	49.0	613.7	163.970	84.37	132.30	0.00103	-0.0426	1479
290.000	11.37444	0.23700	14.703781	1035.1379	1303.5	1875.0	168.381	87.32	134.13	0.00166	-0.0418	1426
300.000	11.23335	0.23198	13.728855	979.2219	2649.1	3227.8	172.963	90.46	136.22	0.00265	-0.0409	1373
310.000	11.09392	0.22732	12.833046	925.1460	4014.5	4600.4	177.465	93.60	138.44	0.00408	-0.0399	1323
320.000	10.95580	0.22299	12.007258	872.6766	5401.5	5994.8	181.897	96.74	140.78	0.00605	-0.0388	1275
330.000	10.81861	0.21897	11.243589	821.6371	6812.0	7412.8	186.266	99.85	143.23	0.00872	-0.0376	1228
340.000	10.68198	0.21525	10.535144	771.9023	8247.3	8855.8	190.579	102.93	145.78	0.01223	-0.0363	1182
350.000	10.54551	0.21181	9.875887	723.3915	9708.9	10325.2	194.843	105.97	148.40	0.01675	-0.0349	1138
360.000	10.40880	0.20863	9.260515	676.0623	11197.6	11822.0	199.061	108.94	151.09	0.02243	-0.0335	1095
370.000	10.27141	0.20571	8.684362	629.9070	12714.1	13346.9	203.238	111.85	153.84	0.02946	-0.0319	1053
380.000	10.13291	0.20303	8.143297	584.9436	14258.9	14900.4	207.378	114.67	156.63	0.03797	-0.0301	1011
390.000	9.99282	0.20060	7.633660	541.2113	15832.2	16482.6	211.484	117.40	159.46	0.04814	-0.0282	970
400.000	9.85064	0.19841	7.152201	498.7640	17433.8	18093.6	215.557	120.03	162.31	0.06009	-0.0261	929
410.000	9.70584	0.19645	6.696020	457.6654	19063.6	19733.3	219.600	122.54	165.18	0.07393	-0.0238	888
420.000	9.55782	0.19475	6.262528	417.9830	20721.3	21401.4	223.615	124.93	168.07	0.08976	-0.0213	848
430.000	9.40596	0.19329	5.849406	379.7842	22406.7	23097.7	227.604	127.18	170.97	0.10761	-0.0184	808
440.000	9.24953	0.19209	5.454570	343.1320	24119.3	24822.1	231.568	129.30	173.90	0.12753	-0.0152	768
450.000	9.08774	0.19117	5.076138	308.0817	25859.3	26574.6	235.509	131.28	176.85	0.14949	-0.0115	728
460.000	8.91967	0.19053	4.712411	274.5798	27626.9	28355.7	239.428	133.12	179.87	0.17347	-0.0072	689

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
470.000	8.74423	0.19022	4.361840	242.9613	29422.9	30166.3	243.329	134.83	182.96	0.19943	-0.0022	649
480.000	8.56014	0.19026	4.023003	212.9490	31248.6	32008.0	247.214	136.41	186.20	0.22729	0.0037	610
490.000	8.36581	0.19071	3.694573	184.6542	33106.4	33883.4	251.088	137.90	189.65	0.25700	0.0108	570
500.000	8.15922	0.19163	3.375289	158.0762	34999.7	35796.3	254.957	139.33	193.46	0.28852	0.0195	530
510.000	7.93775	0.19311	3.063902	133.2039	36933.7	37752.5	258.830	140.78	197.83	0.32180	0.0304	489
520.000	7.69777	0.19530	2.759109	110.0173	38915.8	39760.2	262.721	142.39	203.11	0.35678	0.0444	448
530.000	7.43407	0.19842	2.459415	88.4897	40957.5	41831.8	266.653	144.43	209.99	0.39332	0.0629	405
540.000	7.13853	0.20280	2.162904	68.5936	43076.6	43987.1	270.665	147.54	219.81	0.43104	0.0883	361
550.000	6.79743	0.20911	1.866732	50.3117	45306.6	46262.8	274.834	153.80	236.25	0.46884	0.1247	314
560.000	6.38408	0.21867	1.565932	33.6747	47754.7	48772.9	279.402	184.26	284.31	0.50355	0.1696	257
565.000	6.13354	0.22559	1.410957	26.0266	49345.8	50405.5	282.101	162.32	277.20	0.53469	0.2349	238
570.000	5.83515	0.23504	1.250153	18.9198	50718.9	51832.9	284.618	158.62	296.90	0.55286	0.3148	212
580.000	4.95351	0.27211	0.897180	7.5733	53954.1	55266.3	290.587	160.11	411.34	0.58765	0.6317	157
590.000	3.67028	0.36102	0.577017	5.2543	58043.3	59814.3	298.361	162.49	440.02	0.61797	1.0312	134
600.000	2.87231	0.45362	0.420233	7.7037	61383.7	63646.7	304.809	161.82	328.53	0.64249	1.1016	141
620.000	2.21824	0.56843	0.297851	14.6654	66157.7	69087.9	313.746	161.86	238.08	0.68166	0.8855	166
640.000	1.91161	0.63899	0.242653	20.6070	70162.4	73562.7	320.856	163.51	213.55	0.71397	0.7208	185
660.000	1.71668	0.68999	0.209059	25.7013	73936.9	77723.2	327.261	165.74	203.83	0.74178	0.6080	201
680.000	1.57558	0.72967	0.185754	30.2140	77625.2	81750.6	333.275	168.20	199.49	0.76620	0.5260	214
700.000	1.46590	0.76186	0.168339	34.3064	81285.1	85719.2	339.029	170.75	197.66	0.78793	0.4636	225
720.000	1.37670	0.78869	0.154680	38.0807	84944.6	89666.0	344.590	173.31	197.18	0.80742	0.4142	235
740.000	1.30188	0.81148	0.143592	41.6058	88618.9	93611.7	349.997	175.85	197.49	0.82502	0.3741	244
760.000	1.23766	0.83111	0.134357	44.9304	92316.8	97568.7	355.275	178.34	198.27	0.84099	0.3408	252
780.000	1.18159	0.84823	0.126510	48.0903	96043.7	101544.7	360.440	180.78	199.37	0.85554	0.3127	260
800.000	1.13196	0.86329	0.119734	51.1127	99802.5	105544.7	365.504	183.15	200.66	0.86885	0.2886	267
820.000	1.08754	0.87663	0.113806	54.0186	103595.1	109571.9	370.477	185.45	202.07	0.88105	0.2678	274
840.000	1.04743	0.88853	0.108561	56.8247	107422.6	113628.3	375.365	187.69	203.57	0.89227	0.2496	280
860.000	1.01092	0.89921	0.103877	59.5444	111285.3	117715.0	380.174	189.86	205.11	0.90261	0.2335	286
880.000	0.97749	0.90883	0.099662	62.1888	115183.1	121832.8	384.908	191.96	206.67	0.91216	0.2192	292
900.000	0.94669	0.91754	0.095840	64.7669	119115.9	125981.9	389.571	194.00	208.24	0.92099	0.2063	298
					70.00000 bar							
280.699	11.51206	0.26054	15.705808	1091.9808	52.9	661.0	163.984	84.47	132.32	0.00098	-0.0426	1479
290.000	11.37926	0.25512	14.719279	1038.1629	1287.9	1903.0	168.326	87.38	134.12	0.00157	-0.0418	1428
300.000	11.23844	0.24971	13.744858	982.3625	2632.8	3255.6	172.907	90.52	136.20	0.00251	-0.0409	1375
310.000	11.09931	0.24468	12.849576	928.4095	3997.3	4628.0	177.409	93.66	138.41	0.00385	-0.0399	1325
320.000	10.96151	0.24002	12.024347	876.0699	5383.5	6022.1	181.839	96.80	140.75	0.00572	-0.0388	1277
330.000	10.82468	0.23569	11.261272	825.1663	6793.1	7439.7	186.208	99.91	143.19	0.00824	-0.0377	1230
340.000	10.68844	0.23167	10.553467	775.5724	8227.4	8882.3	190.520	102.99	145.73	0.01155	-0.0364	1185
350.000	10.55241	0.22795	9.894902	727.2065	9687.9	10351.2	194.782	106.02	148.34	0.01581	-0.0351	1141
360.000	10.41617	0.22452	9.280285	680.0253	11175.3	11847.4	198.998	109.00	151.02	0.02117	-0.0336	1098
370.000	10.27932	0.22136	8.704956	634.0198	12690.5	13371.5	203.173	111.91	153.76	0.02779	-0.0320	1056
380.000	10.14143	0.21846	8.164795	589.2068	14233.8	14924.0	207.311	114.73	156.53	0.03582	-0.0303	1014
390.000	10.00202	0.21583	7.656157	545.6243	15805.3	16505.2	211.413	117.46	159.34	0.04540	-0.0284	973
400.000	9.86062	0.21345	7.175802	503.3257	17405.0	18114.9	215.483	120.08	162.17	0.05665	-0.0264	932
410.000	9.71671	0.21133	6.720847	462.3737	19032.7	19753.1	219.523	122.59	165.01	0.06970	-0.0241	892
420.000	9.56972	0.20947	6.288722	422.8354	20687.9	21419.4	223.534	124.98	167.87	0.08460	-0.0216	852
430.000	9.41904	0.20787	5.877128	384.7780	22370.4	23113.6	227.517	127.23	170.74	0.10142	-0.0188	813
440.000	9.26400	0.20654	5.484010	348.2647	24079.9	24835.5	231.476	129.35	173.62	0.12018	-0.0157	773
450.000	9.10384	0.20551	5.107517	313.3513	25816.1	26585.0	235.410	131.33	176.53	0.14087	-0.0121	734
460.000	8.93770	0.20478	4.745991	280.0851	27579.3	28362.5	239.321	133.16	179.47	0.16346	-0.0080	695
470.000	8.76458	0.20438	4.397933	248.5022	29370.0	30168.7	243.213	134.86	182.48	0.18791	-0.0032	656
480.000	8.58331	0.20435	4.061987	218.6272	31189.6	32005.1	247.087	136.44	185.61	0.21416	0.0024	617
490.000	8.39247	0.20473	3.736911	190.4732	33039.8	33873.9	250.947	137.91	188.92	0.24216	0.0092	577
500.000	8.19027	0.20559	3.421560	164.0420	34923.9	35778.6	254.799	139.33	192.52	0.27188	0.0173	538
510.000	7.97445	0.20701	3.114846	139.3255	36846.2	37724.0	258.651	140.75	196.60	0.30327	0.0274	499
520.000	7.74196	0.20913	2.815699	116.3074	38813.4	39717.5	262.515	142.33	201.47	0.33629	0.0401	459
530.000	7.48859	0.21212	2.522987	94.9654	40834.8	41769.5	266.409	144.32	207.66	0.37082	0.0566	418
540.000	7.20807	0.21630	2.235386	75.2767	42925.2	43896.4	270.368	147.33	216.33	0.40651	0.0785	376
550.000	6.89050	0.22215	1.951142	57.2286	45111.4	46127.3	274.455	153.45	230.51	0.44236	0.1084	331
560.000	6.51857	0.23063	1.667560	40.8461	47484.0	48557.9	278.879	183.64	273.36	0.47543	0.1407	278
565.000	6.30269	0.23642	1.524678	33.3163	49012.7	50123.3	281.460	161.48	260.72	0.50507	0.1888	262
570.000	6.05795	0.24382	1.379959	26.2823	50289.6	51445.1	283.790	157.45	269.98	0.52256	0.2409	240
580.000	5.42962	0.26734	1.080300	14.2041	53064.7	54354.0	288.849	157.70	319.35	0.55664	0.4109	191

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
590.000	4.49864	0.31720	0.774809	7.3664	56413.2	57969.2	295.027	160.58	398.17	0.58831	0.7143	152
600.000	3.56333	0.39378	0.556423	7.2409	59885.8	61850.3	301.554	162.08	364.13	0.61558	0.9202	144
620.000	2.58943	0.52440	0.364160	12.4521	65275.2	67978.5	311.618	162.59	261.06	0.65924	0.8879	159
640.000	2.16784	0.60681	0.285925	18.5031	69537.8	72766.8	319.228	164.03	224.20	0.69436	0.7329	179
660.000	1.91875	0.66481	0.241572	23.8369	73441.2	77089.4	325.883	166.13	210.01	0.72430	0.6169	196
680.000	1.74579	0.70919	0.212010	28.5721	77207.9	81217.5	332.048	168.50	203.60	0.75048	0.5318	210
700.000	1.61485	0.74479	0.190484	32.8579	80921.1	85255.8	337.903	170.98	200.63	0.77369	0.4670	222
720.000	1.51029	0.77423	0.173908	36.7998	84619.5	89254.4	343.537	173.50	199.44	0.79448	0.4160	232
740.000	1.42374	0.79910	0.160638	40.4710	88323.7	93240.3	348.999	176.00	199.28	0.81323	0.3747	242
760.000	1.35022	0.82043	0.149707	43.9243	92045.3	97229.7	354.320	178.47	199.74	0.83023	0.3405	250
780.000	1.28655	0.83896	0.140501	47.1985	95791.6	101232.5	359.519	180.88	200.59	0.84571	0.3118	258
800.000	1.23056	0.85521	0.132610	50.3232	99566.6	105255.1	364.613	183.24	201.70	0.85985	0.2873	266
820.000	1.18071	0.86957	0.125750	53.3214	103373.0	109301.6	369.609	185.53	202.97	0.87282	0.2662	273
840.000	1.13590	0.88235	0.119714	56.2112	107212.2	113374.7	374.518	187.76	204.35	0.88474	0.2477	279
860.000	1.09528	0.89380	0.114350	59.0072	111085.2	117476.2	379.344	189.92	205.80	0.89573	0.2314	286
880.000	1.05820	0.90409	0.109541	61.7216	114992.1	121607.2	384.093	192.01	207.29	0.90588	0.2170	292
900.000	1.02414	0.91340	0.105199	64.3641	118932.9	125767.9	388.769	194.05	208.80	0.91525	0.2040	297
					80.00000 bar							
280.986	11.51709	0.29732	15.704536	1096.1558	60.9	755.5	164.011	84.68	132.35	0.00091	-0.0427	1480
290.000	11.38887	0.29132	14.750529	1044.2195	1256.8	1959.2	168.217	87.50	134.08	0.00143	-0.0419	1431
300.000	11.24859	0.28512	13.777090	988.6473	2600.2	3311.4	172.797	90.63	136.15	0.00228	-0.0410	1378
310.000	11.11005	0.27937	12.882829	934.9358	3963.3	4683.3	177.297	93.78	138.36	0.00349	-0.0400	1328
320.000	10.97288	0.27402	12.058680	882.8514	5347.8	6076.9	181.726	96.91	140.68	0.00518	-0.0390	1280
330.000	10.83675	0.26905	11.296756	832.2148	6755.5	7493.8	186.092	100.02	143.11	0.00745	-0.0378	1234
340.000	10.70127	0.26445	10.590187	782.8977	8187.9	8935.5	190.401	103.10	145.63	0.01045	-0.0366	1189
350.000	10.56608	0.26018	9.932959	734.8164	9646.2	10403.3	194.660	106.13	148.23	0.01429	-0.0353	1146
360.000	10.43079	0.25623	9.319793	687.9253	11131.3	11898.2	198.873	109.11	150.89	0.01913	-0.0338	1103
370.000	10.29499	0.25260	8.746048	642.2128	12643.8	13420.9	203.044	112.01	153.59	0.02509	-0.0323	1061
380.000	10.15828	0.24926	8.207624	597.6936	14184.1	14971.7	207.177	114.84	156.34	0.03233	-0.0306	1020
390.000	10.02020	0.24621	7.700895	554.4034	15752.4	16550.8	211.274	117.56	159.11	0.04096	-0.0288	980
400.000	9.88031	0.24346	7.222646	512.3937	17348.4	18158.0	215.338	120.19	161.90	0.05111	-0.0268	940
410.000	9.73812	0.24099	6.770022	471.7255	18971.8	19793.3	219.370	122.69	164.70	0.06285	-0.0247	900
420.000	9.59310	0.23881	6.340483	432.4648	20622.3	21456.2	223.373	125.08	167.50	0.07627	-0.0223	861
430.000	9.44470	0.23692	5.931771	394.6782	22299.4	23146.4	227.347	127.33	170.30	0.09142	-0.0196	822
440.000	9.29230	0.23533	5.541870	358.4288	24002.6	24863.5	231.294	129.44	173.11	0.10830	-0.0167	783
450.000	9.13523	0.23406	5.168989	323.7731	25731.6	26607.4	235.216	131.41	175.91	0.12693	-0.0133	744
460.000	8.97273	0.23312	4.811525	290.7585	27486.5	28378.1	239.113	133.24	178.73	0.14726	-0.0095	706
470.000	8.80396	0.23253	4.468066	259.4236	29267.5	30176.2	242.987	134.93	181.59	0.16928	-0.0050	668
480.000	8.62792	0.23233	4.137349	229.7948	31075.5	32002.8	246.840	136.49	184.52	0.19293	0.0001	630
490.000	8.44345	0.23256	3.818257	201.8875	32912.0	33859.5	250.675	137.94	187.58	0.21816	0.0062	592
500.000	8.24915	0.23328	3.509805	175.7065	34779.4	35749.2	254.497	139.33	190.85	0.24496	0.0134	555
510.000	8.04330	0.23456	3.211117	151.2468	36681.1	37675.8	258.312	140.72	194.46	0.27329	0.0221	517
520.000	7.82370	0.23650	2.921413	128.4953	38622.2	39644.7	262.128	142.24	198.66	0.30313	0.0329	479
530.000	7.58748	0.23927	2.639976	107.4327	40609.7	41664.1	265.960	144.14	203.87	0.33439	0.0463	441
540.000	7.33070	0.24306	2.366114	88.0379	42654.4	43745.7	269.834	147.04	210.94	0.36676	0.0634	402
550.000	7.04770	0.24822	2.099092	70.2947	44775.2	45910.4	273.800	152.97	222.38	0.39940	0.0849	361
560.000	6.72997	0.25530	1.838026	54.2074	47047.6	48236.3	278.036	182.86	259.92	0.42970	0.1041	314
565.000	6.55409	0.25983	1.709379	46.7996	48503.0	49723.7	280.477	160.48	242.61	0.45680	0.1351	300
570.000	6.36378	0.26526	1.581761	39.8370	49680.9	50938.0	282.619	156.16	244.56	0.47302	0.1643	282
580.000	5.92593	0.27994	1.328904	27.3997	52109.6	53459.6	287.004	155.52	261.98	0.50511	0.2414	243
590.000	5.37901	0.30318	1.079506	17.5385	54735.2	56222.5	291.727	157.33	292.82	0.53624	0.3651	204
600.000	4.70010	0.34119	0.845362	11.7239	57626.8	59328.9	296.950	159.81	325.37	0.56529	0.5365	174
620.000	3.46248	0.44820	0.537175	11.3876	63345.7	65656.1	307.334	163.02	294.07	0.61544	0.7314	162
640.000	2.76274	0.54417	0.394115	15.5854	68152.3	71048.0	315.902	164.81	248.38	0.65621	0.7079	173
660.000	2.36960	0.61523	0.319095	20.7834	72369.4	75745.5	323.132	166.80	224.38	0.69061	0.6162	189
680.000	2.11522	0.66894	0.272657	25.7335	76323.3	80105.4	329.644	169.04	212.94	0.72019	0.5342	203
700.000	1.93215	0.71140	0.240522	30.2940	80160.2	84300.7	335.728	171.42	207.23	0.74631	0.4687	216
720.000	1.79113	0.74610	0.216660	34.5060	83947.0	88413.4	341.523	173.86	204.39	0.76962	0.4163	227
740.000	1.67746	0.77512	0.198071	38.4276	87717.7	92486.8	347.105	176.30	203.15	0.79060	0.3738	238
760.000	1.58286	0.79983	0.183083	42.1091	91491.5	96545.7	352.519	178.72	202.86	0.80959	0.3387	247
780.000	1.50221	0.82116	0.170677	45.5904	95279.8	100605.3	357.792	181.09	203.18	0.82687	0.3092	255
800.000	1.43220	0.83977	0.160196	48.9034	99089.6	104675.4	362.946	183.42	203.88	0.84265	0.2842	263
820.000	1.37055	0.85614	0.151194	52.0731	102925.3	108762.4	367.993	185.68	204.85	0.85711	0.2626	271

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
840.000	1.31560	0.87066	0.143356	55.1197	106789.7	112870.5	372.943	187.89	205.98	0.87039	0.2438	278
860.000	1.26617	0.88362	0.136454	58.0598	110684.3	117002.6	377.805	190.03	207.24	0.88263	0.2273	284
880.000	1.22133	0.89524	0.130316	60.9068	114610.3	121160.5	382.585	192.12	208.56	0.89393	0.2126	290
900.000	1.18038	0.90571	0.124813	63.6719	118567.9	125345.4	387.288	194.13	209.94	0.90438	0.1996	296
					90.00000 bar							
281.272	11.52210	0.33400	15.703807	1100.3592	68.9	850.0	164.038	84.89	132.37	0.00085	-0.0427	1482
290.000	11.39842	0.32746	14.782102	1050.2844	1225.9	2015.5	168.108	87.61	134.05	0.00132	-0.0420	1434
300.000	11.25867	0.32048	13.809603	994.9349	2568.0	3367.3	172.687	90.75	136.11	0.00210	-0.0411	1382
310.000	11.12070	0.31399	12.916325	941.4606	3929.5	4738.8	177.185	93.89	138.31	0.00321	-0.0402	1332
320.000	10.98417	0.30796	12.093211	889.6260	5312.4	6131.8	181.613	97.02	140.62	0.00476	-0.0391	1284
330.000	10.84872	0.30235	11.332388	839.2504	6718.4	7548.0	185.976	100.13	143.04	0.00685	-0.0380	1238
340.000	10.71399	0.29715	10.626999	790.2037	8148.9	8988.9	190.283	103.21	145.54	0.00960	-0.0368	1194
350.000	10.57962	0.29233	9.971043	742.3998	9605.0	10455.7	194.539	106.24	148.12	0.01312	-0.0355	1151
360.000	10.44525	0.28786	9.359261	695.7918	11087.8	11949.4	198.749	109.22	150.76	0.01755	-0.0341	1108
370.000	10.31047	0.28374	8.787016	650.3636	12597.8	13470.7	202.916	112.12	153.44	0.02302	-0.0326	1067
380.000	10.17489	0.27996	8.250234	606.1293	14135.2	15019.8	207.045	114.94	156.16	0.02965	-0.0309	1026
390.000	10.03810	0.27650	7.745305	563.1218	15700.3	16596.9	211.136	117.67	158.90	0.03755	-0.0292	986
400.000	9.89966	0.27335	7.269034	521.3904	17292.7	18201.8	215.194	120.29	161.65	0.04683	-0.0273	947
410.000	9.75911	0.27053	6.818589	480.9944	18912.1	19834.4	219.220	122.79	164.40	0.05757	-0.0252	907
420.000	9.61597	0.26802	6.391458	441.9984	20558.1	21494.1	223.215	125.17	167.15	0.06985	-0.0229	869
430.000	9.46972	0.26583	5.985411	404.4680	22230.0	23180.4	227.180	127.42	169.89	0.08370	-0.0204	830
440.000	9.31981	0.26397	5.598467	368.4657	23927.4	24893.1	231.117	129.53	172.62	0.09914	-0.0176	792
450.000	9.16563	0.26244	5.228875	334.0482	25649.8	26631.7	235.027	131.50	175.34	0.11617	-0.0144	755
460.000	9.00652	0.26127	4.875081	301.2632	27396.9	28396.2	238.910	133.32	178.05	0.13476	-0.0108	717
470.000	8.84173	0.26048	4.535727	270.1498	29169.0	30186.9	242.768	135.00	180.78	0.15490	-0.0067	680
480.000	8.67043	0.26009	4.209616	240.7355	30966.5	32004.6	246.603	136.55	183.55	0.17653	-0.0020	643
490.000	8.49166	0.26015	3.895714	213.0370	32790.7	33850.5	250.416	137.98	186.39	0.19963	0.0035	606
500.000	8.30429	0.26070	3.593129	187.0604	34643.3	35727.1	254.211	139.35	189.39	0.22416	0.0100	570
510.000	8.10700	0.26180	3.301110	162.8017	36527.2	37637.4	257.994	140.71	192.65	0.25012	0.0176	534
520.000	7.89815	0.26356	3.019028	140.2483	38446.4	39585.9	261.770	142.18	196.36	0.27750	0.0269	497
530.000	7.67571	0.26608	2.746367	119.3806	40406.4	41578.9	265.552	144.03	200.87	0.30620	0.0382	461
540.000	7.43706	0.26953	2.482707	100.1752	42415.6	43625.7	269.361	146.85	206.92	0.33600	0.0520	425
550.000	7.17870	0.27416	2.227700	82.6091	44489.2	45742.9	273.240	152.67	216.78	0.36610	0.0685	387
560.000	6.89585	0.28030	1.981046	66.6688	46696.0	48001.1	277.354	182.40	251.72	0.39419	0.0814	343
565.000	6.74322	0.28411	1.860766	59.3107	48108.1	49442.8	279.714	159.91	232.45	0.41925	0.1039	332
570.000	6.58171	0.28853	1.742476	52.3679	49232.7	50600.1	281.755	155.46	231.75	0.43439	0.1234	316
580.000	6.22649	0.29973	1.511826	39.7851	51509.1	52954.5	285.850	154.48	240.42	0.46456	0.1697	281
590.000	5.81658	0.31542	1.289484	29.1436	53881.3	55428.6	290.079	155.80	255.30	0.49429	0.2349	247
600.000	5.33791	0.33797	1.078108	20.9471	56390.6	58076.6	294.533	157.88	274.72	0.52286	0.3263	216
620.000	4.25701	0.41012	0.730576	14.3080	61717.3	63831.4	303.973	162.11	289.73	0.57525	0.5219	180
640.000	3.41412	0.49539	0.528109	15.6775	66726.7	69362.8	312.760	164.94	262.61	0.62009	0.5928	178
660.000	2.87291	0.57088	0.414239	19.3134	71225.6	74358.3	320.449	167.19	238.24	0.65831	0.5738	187
680.000	2.52054	0.63154	0.345000	23.8322	75384.8	78955.4	327.315	169.45	222.91	0.69128	0.5171	200
700.000	2.27395	0.68003	0.298767	28.3700	79362.1	83319.9	333.644	171.79	214.38	0.72017	0.4599	212
720.000	2.08924	0.71959	0.265478	32.6936	83248.6	87556.4	339.614	174.17	209.73	0.74590	0.4104	224
740.000	1.94373	0.75255	0.240176	36.7701	87093.6	91723.9	345.325	176.57	207.30	0.76902	0.3690	235
760.000	1.82482	0.78050	0.220170	40.6167	90925.0	95857.0	350.838	178.95	206.19	0.78993	0.3342	244
780.000	1.72495	0.80452	0.203875	44.2609	94759.4	99976.9	356.190	181.29	205.91	0.80894	0.3049	253
800.000	1.63928	0.82540	0.190290	47.7292	98606.8	104097.1	361.407	183.59	206.17	0.82628	0.2798	261
820.000	1.56458	0.84371	0.178754	51.0453	102474.0	108226.3	366.506	185.83	206.80	0.84217	0.2582	269
840.000	1.49857	0.85991	0.168807	54.2289	106365.1	112370.8	371.500	188.02	207.68	0.85677	0.2393	276
860.000	1.43959	0.87431	0.160122	57.2968	110282.8	116534.5	376.400	190.15	208.72	0.87022	0.2228	283
880.000	1.38643	0.88721	0.152457	60.2631	114228.8	120720.3	381.212	192.22	209.87	0.88263	0.2082	290
900.000	1.33813	0.89881	0.145629	63.1396	118204.0	124929.8	385.942	194.22	211.11	0.89410	0.1952	296
					100.00000 bar							
281.558	11.52710	0.37058	15.703603	1104.5900	77.0	944.6	164.065	85.10	132.40	0.00080	-0.0428	1483
290.000	11.40791	0.36355	14.813985	1056.3567	1195.3	2071.9	168.000	87.73	134.02	0.00123	-0.0421	1437
300.000	11.26869	0.35577	13.842389	1001.2257	2536.0	3423.4	172.578	90.86	136.08	0.00195	-0.0412	1385
310.000	11.13129	0.34854	12.950053	947.9837	3896.0	4794.4	177.075	94.00	138.26	0.00299	-0.0403	1336
320.000	10.99537	0.34183	12.127929	896.3934	5277.4	6186.8	181.500	97.13	140.56	0.00443	-0.0392	1288
330.000	10.86058	0.33558	11.368158	846.2730	6681.6	7602.4	185.862	100.24	142.97	0.00638	-0.0381	1243

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	∂P/∂T bar/K	∂P/∂ρ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
340.000	10.72659	0.32978	10.663894	797.4903	8110.2	9042.5	190.167	103.32	145.45	0.00893	-0.0369	1198
350.000	10.59303	0.32440	10.009150	749.9572	9564.4	10508.4	194.420	106.35	148.01	0.01220	-0.0357	1155
360.000	10.45954	0.31941	9.398679	703.6242	11044.9	12000.9	198.626	109.32	150.63	0.01631	-0.0343	1114
370.000	10.32575	0.31480	8.827860	658.4732	12552.4	13520.8	202.790	112.22	153.29	0.02138	-0.0328	1073
380.000	10.19128	0.31056	8.292631	614.5154	14087.1	15068.3	206.914	115.04	155.98	0.02753	-0.0313	1032
390.000	10.05572	0.30668	7.789399	571.7816	15649.1	16643.5	211.001	117.77	158.69	0.03485	-0.0296	993
400.000	9.91868	0.30314	7.314988	530.3187	17238.1	18246.3	215.053	120.39	161.41	0.04345	-0.0277	954
410.000	9.77970	0.29995	6.866584	490.1843	18853.7	19876.2	219.072	122.89	164.12	0.05340	-0.0257	915
420.000	9.63836	0.29711	6.441696	451.4413	20495.3	21532.8	223.060	125.27	166.83	0.06476	-0.0235	877
430.000	9.49416	0.29460	6.038119	414.1540	22162.4	23215.7	227.017	127.51	169.51	0.07758	-0.0211	839
440.000	9.34659	0.29245	5.653900	378.3842	23854.2	24924.1	230.944	129.62	172.17	0.09188	-0.0184	802
450.000	9.19512	0.29067	5.287316	344.1880	25570.3	26657.8	234.843	131.58	174.81	0.10764	-0.0154	765
460.000	9.03916	0.28925	4.936854	311.6137	27310.3	28416.6	238.713	133.39	177.43	0.12485	-0.0121	728
470.000	8.87804	0.28824	4.601185	280.6994	29074.1	30200.5	242.557	135.07	180.04	0.14349	-0.0083	692
480.000	8.71107	0.28764	4.279166	251.4740	30862.0	32010.0	246.374	136.60	182.66	0.16352	-0.0039	656
490.000	8.53743	0.28750	3.969810	223.9543	32675.0	33846.3	250.168	138.03	185.33	0.18492	0.0011	620
500.000	8.35622	0.28786	3.672288	198.1468	34514.5	35711.2	253.940	139.37	188.11	0.20766	0.0069	585
510.000	8.16639	0.28878	3.385913	174.0476	36382.8	37607.3	257.694	140.71	191.08	0.23173	0.0138	550
520.000	7.96669	0.29032	3.110137	151.6436	38283.1	39538.4	261.436	142.15	194.41	0.25714	0.0219	515
530.000	7.75565	0.29260	2.844541	130.9140	40220.2	41509.6	265.177	143.96	198.42	0.28381	0.0315	480
540.000	7.53146	0.29573	2.588821	111.8319	42200.8	43528.6	268.934	146.72	203.77	0.31153	0.0430	445
550.000	7.29182	0.29989	2.342776	94.3684	44238.2	45609.6	272.746	152.46	212.62	0.33960	0.0563	410
560.000	7.03384	0.30534	2.106300	78.4970	46397.5	47819.2	276.773	182.09	246.06	0.36588	0.0657	368
565.000	6.89683	0.30865	1.991640	71.1533	47780.2	49230.1	279.078	159.54	225.76	0.38929	0.0830	359
570.000	6.75373	0.31242	1.879372	64.2045	48870.2	50350.9	281.054	155.02	223.77	0.40351	0.0973	344
580.000	6.44655	0.32167	1.662092	51.5082	51057.1	52608.3	284.981	153.85	228.71	0.43200	0.1291	313
590.000	6.10612	0.33385	1.454833	40.4893	53300.0	54937.7	288.963	154.95	237.67	0.46032	0.1703	281
600.000	5.72596	0.35008	1.258701	31.3424	55624.1	57370.6	293.055	156.77	249.27	0.48791	0.2248	252
620.000	4.85242	0.39977	0.914294	20.0835	60533.2	62594.1	301.624	160.94	270.54	0.54021	0.3669	207
640.000	4.00969	0.46868	0.671695	18.2102	65484.1	67978.1	310.175	164.49	263.11	0.58709	0.4633	193
660.000	3.38558	0.53825	0.522823	20.0682	70108.9	73062.7	318.001	167.23	245.66	0.62810	0.4904	194
680.000	2.94681	0.60021	0.428362	23.3638	74430.5	77824.1	325.110	169.67	231.17	0.66394	0.4743	201
700.000	2.63390	0.65233	0.365226	27.3824	78543.7	82340.4	331.660	172.05	221.20	0.69536	0.4368	212
720.000	2.40123	0.69566	0.320472	31.5451	82533.5	86698.0	337.801	174.43	215.08	0.72335	0.3962	223
740.000	2.22041	0.73198	0.287049	35.6178	86457.0	90960.7	343.643	176.80	211.52	0.74849	0.3590	233
760.000	2.07461	0.76280	0.261040	39.5298	90349.5	95169.7	349.257	179.15	209.59	0.77122	0.3264	243
780.000	1.95361	0.78928	0.240143	43.2694	94232.6	99351.4	354.689	181.47	208.71	0.79187	0.2982	252
800.000	1.85088	0.81226	0.222925	46.8452	98119.9	103522.8	359.971	183.75	208.52	0.81072	0.2738	260
820.000	1.76207	0.83239	0.208451	50.2718	102020.2	107695.4	365.123	185.97	208.80	0.82798	0.2527	268
840.000	1.68418	0.85015	0.196079	53.5648	105939.3	111876.9	370.163	188.14	209.40	0.84384	0.2341	276
860.000	1.61504	0.86593	0.185360	56.7387	109881.1	116072.9	375.100	190.26	210.22	0.85844	0.2178	283
880.000	1.55304	0.88003	0.175964	59.8065	113848.0	120286.9	379.945	192.31	211.20	0.87192	0.2034	289
900.000	1.49700	0.89269	0.167645	62.7798	117841.5	124521.6	384.704	194.31	212.29	0.88438	0.1905	296
					120.00000 bar							
282.128	11.53706	0.44341	15.704691	1113.1287	93.6	1133.7	164.120	85.50	132.47	0.00074	-0.0429	1485
290.000	11.42673	0.43554	14.878628	1068.5219	1134.7	2184.9	167.786	87.95	133.97	0.00110	-0.0422	1443
300.000	11.28854	0.42617	13.908727	1013.8148	2472.7	3535.7	172.361	91.08	136.00	0.00175	-0.0414	1392
310.000	11.15224	0.41747	13.018153	961.0227	3830.0	4906.0	176.856	94.22	138.17	0.00267	-0.0405	1343
320.000	11.01751	0.40937	12.197879	909.9058	5208.2	6297.4	181.278	97.34	140.45	0.00396	-0.0395	1296
330.000	10.88402	0.40183	11.440071	860.2788	6609.2	7711.7	185.636	100.45	142.83	0.00568	-0.0384	1251
340.000	10.75144	0.39482	10.737901	812.0060	8034.2	9150.3	189.936	103.52	145.29	0.00795	-0.0372	1207
350.000	10.61943	0.38831	10.085409	764.9951	9484.4	10614.4	194.184	106.55	147.82	0.01085	-0.0360	1165
360.000	10.48765	0.38226	9.477366	719.1916	10960.6	12104.8	198.384	109.52	150.40	0.01449	-0.0347	1124
370.000	10.35576	0.37667	8.909180	674.5730	12463.4	13622.1	202.541	112.42	153.02	0.01897	-0.0333	1084
380.000	10.22339	0.37151	8.376810	631.1450	13992.9	15166.6	206.657	115.24	155.66	0.02441	-0.0318	1044
390.000	10.09019	0.36676	7.876691	588.9335	15549.0	16738.3	210.735	117.96	158.31	0.03087	-0.0302	1005
400.000	9.95577	0.36242	7.405672	547.9811	17131.6	18336.9	214.777	120.57	160.96	0.03846	-0.0285	967
410.000	9.81977	0.35848	6.960973	508.3409	18740.0	19962.0	218.784	123.07	163.60	0.04724	-0.0267	930
420.000	9.68177	0.35493	6.540134	470.0726	20373.6	21613.1	222.758	125.45	166.22	0.05727	-0.0246	892
430.000	9.54136	0.35178	6.140984	433.2374	22031.6	23289.3	226.700	127.69	168.80	0.06857	-0.0224	856
440.000	9.39813	0.34902	5.761609	397.8948	23713.3	24990.2	230.610	129.79	171.35	0.08116	-0.0200	820
450.000	9.25161	0.34667	5.400327	364.0995	25417.9	26715.0	234.488	131.74	173.85	0.09505	-0.0173	784
460.000	9.10133	0.34473	5.055667	331.8986	27144.9	28463.4	238.336	133.54	176.31	0.11022	-0.0143	748

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
470.000	8.94678	0.34323	4.726351	301.3303	28893.9	30235.2	242.153	135.20	178.73	0.12665	-0.0110	714
480.000	8.78744	0.34217	4.411280	272.4222	30664.9	32030.5	245.941	136.72	181.12	0.14430	-0.0073	679
490.000	8.62273	0.34159	4.109524	245.1917	32458.4	33850.1	249.700	138.12	183.52	0.16317	-0.0030	645
500.000	8.45202	0.34152	3.820304	219.6448	34275.4	35695.1	253.432	139.44	185.95	0.18324	0.0018	612
510.000	8.27463	0.34200	3.542990	195.7767	36117.4	37567.6	257.139	140.74	188.50	0.20451	0.0074	579
520.000	8.08981	0.34309	3.277086	173.5726	37987.0	39470.3	260.826	142.14	191.30	0.22699	0.0138	546
530.000	7.89673	0.34484	3.022225	153.0087	39887.5	41407.1	264.501	143.88	194.62	0.25063	0.0212	514
540.000	7.69444	0.34736	2.778153	134.0531	41824.3	43383.9	268.179	146.57	199.08	0.27525	0.0297	482
550.000	7.48186	0.35073	2.544722	116.6679	43808.5	45412.4	271.895	152.22	206.75	0.30026	0.0390	450
560.000	7.25776	0.35510	2.321869	100.8119	45902.3	47555.7	275.802	181.73	238.58	0.32378	0.0449	411
565.000	7.14095	0.35772	2.214410	93.4445	47246.2	48926.7	278.037	159.11	217.25	0.34468	0.0564	404
570.000	7.02072	0.36065	2.109606	86.4448	48292.7	50001.9	279.933	154.51	214.04	0.35749	0.0653	391
580.000	6.76911	0.36761	1.908017	73.5336	50374.5	52147.2	283.665	153.16	215.82	0.38330	0.0837	364
590.000	6.50117	0.37627	1.717267	62.0622	52481.0	54326.8	287.390	154.03	220.36	0.40919	0.1055	337
600.000	6.21519	0.38703	1.537659	52.0444	54627.8	56558.6	291.145	155.59	226.16	0.43475	0.1318	311
620.000	5.58672	0.41667	1.214505	36.6449	59064.9	61212.9	298.781	159.37	239.33	0.48472	0.2003	265
640.000	4.90921	0.45936	0.948610	28.1065	63659.9	66104.3	306.549	163.20	248.22	0.53210	0.2790	233
660.000	4.27421	0.51162	0.750901	25.8447	68251.6	71059.1	314.174	166.60	245.41	0.57567	0.3324	220
680.000	3.75681	0.56496	0.613509	26.9056	72689.5	75883.7	321.377	169.53	236.93	0.61502	0.3513	219
700.000	3.35317	0.61488	0.516779	29.0652	76965.8	80544.5	328.135	172.18	229.38	0.65032	0.3526	222
720.000	3.03759	0.65991	0.446515	31.9800	81118.5	85069.0	334.511	174.68	223.32	0.68204	0.3404	228
740.000	2.78802	0.69955	0.393997	35.3646	85184.4	89488.5	340.568	177.09	218.88	0.71069	0.3207	236
760.000	2.58690	0.73409	0.353570	38.9492	89195.2	93834.0	346.361	179.45	215.90	0.73692	0.2985	244
780.000	2.42133	0.76418	0.321569	42.5698	93176.1	98132.1	351.945	181.75	214.07	0.76056	0.2765	253
800.000	2.28225	0.79048	0.295608	46.1439	97144.6	102402.6	357.353	184.01	213.09	0.78215	0.2561	261
820.000	2.16333	0.81359	0.274100	49.6348	101113.1	106660.1	362.611	186.21	212.73	0.80195	0.2375	269
840.000	2.06011	0.83402	0.255965	53.0289	105090.0	110914.9	367.738	188.36	212.81	0.82015	0.2208	276
860.000	1.96934	0.85217	0.240444	56.3239	109081.4	115174.8	372.751	190.45	213.21	0.83691	0.2058	284
880.000	1.88867	0.86837	0.226989	59.5229	113091.4	119445.1	377.660	192.49	213.84	0.85240	0.1923	290
900.000	1.81629	0.88291	0.215198	62.6312	117122.7	123729.6	382.476	194.47	214.64	0.86671	0.1802	297
					150.00000 bar							
282.980	11.55190	0.55188	15.709830	1126.1189	119.1	1417.6	164.203	86.09	132.57	0.00069	-0.0430	1489
290.000	11.45457	0.54310	14.977595	1086.8132	1045.5	2355.0	167.468	88.27	133.89	0.00098	-0.0425	1452
300.000	11.31786	0.53134	14.009968	1032.7105	2379.7	3705.1	172.041	91.40	135.91	0.00156	-0.0416	1402
310.000	11.18315	0.52039	13.121753	980.5595	3732.9	5074.2	176.532	94.53	138.05	0.00237	-0.0407	1353
320.000	11.05012	0.51020	12.303946	930.1150	5106.8	6464.3	180.950	97.65	140.30	0.00351	-0.0398	1307
330.000	10.91848	0.50070	11.548746	881.1886	6503.1	7876.9	185.303	100.75	142.65	0.00503	-0.0388	1263
340.000	10.78790	0.49186	10.849355	833.6383	7923.1	9313.5	189.597	103.82	145.07	0.00701	-0.0377	1221
350.000	10.65808	0.48362	10.199838	787.3656	9367.8	10775.2	193.838	106.84	147.55	0.00956	-0.0365	1179
360.000	10.52871	0.47597	9.594993	742.3088	10838.0	12262.7	198.030	109.80	150.08	0.01275	-0.0353	1139
370.000	10.39946	0.46886	9.030260	698.4389	12334.2	13776.6	202.177	112.70	152.64	0.01668	-0.0340	1100
380.000	10.27002	0.46228	8.501619	655.7523	13856.4	15317.0	206.282	115.51	155.22	0.02142	-0.0326	1062
390.000	10.14006	0.45619	8.005538	614.2689	15404.7	16883.9	210.348	118.23	157.80	0.02706	-0.0312	1024
400.000	10.00925	0.45060	7.538897	574.0235	16978.4	18477.0	214.376	120.84	160.37	0.03368	-0.0296	987
410.000	9.87728	0.44549	7.098941	535.0628	18577.1	20095.7	218.367	123.33	162.91	0.04133	-0.0279	951
420.000	9.74379	0.44084	6.683242	497.4405	20199.9	21739.4	222.323	125.70	165.42	0.05005	-0.0261	915
430.000	9.60846	0.43665	6.289659	461.2128	21845.9	23407.1	226.245	127.93	167.88	0.05988	-0.0242	880
440.000	9.47093	0.43292	5.916308	426.4350	23514.2	25098.0	230.132	130.02	170.29	0.07082	-0.0220	845
450.000	9.33086	0.42966	5.561538	393.1585	25203.9	26811.5	233.985	131.97	172.63	0.08289	-0.0197	811
460.000	9.18790	0.42686	5.223905	361.4280	26914.1	28546.7	237.804	133.76	174.90	0.09607	-0.0172	777
470.000	9.04167	0.42453	4.902158	331.2797	28644.3	30303.3	241.589	135.40	177.10	0.11034	-0.0144	744
480.000	8.89182	0.42269	4.595217	302.7402	30394.2	32081.1	245.340	136.90	179.24	0.12569	-0.0113	712
490.000	8.73797	0.42136	4.302170	275.8254	32163.9	33880.5	249.057	138.28	181.34	0.14209	-0.0079	680
500.000	8.57974	0.42054	4.022241	250.5400	33953.8	35702.1	252.741	139.57	183.43	0.15955	-0.0041	649
510.000	8.41676	0.42028	3.754801	226.8785	35765.2	37547.4	256.394	140.83	185.56	0.17808	0.0002	618
520.000	8.24862	0.42060	3.499335	204.8241	37599.9	39418.3	260.020	142.18	187.87	0.19768	0.0050	588
530.000	8.07493	0.42154	3.255442	184.3502	39460.4	41318.0	263.624	143.87	190.60	0.21834	0.0103	559
540.000	7.89530	0.42315	3.022816	165.4211	41351.3	43251.2	267.221	146.49	194.34	0.23990	0.0163	530
550.000	7.70933	0.42548	2.801232	147.9934	43282.3	45228.0	270.842	152.06	201.13	0.26187	0.0226	500
560.000	7.51661	0.42859	2.590528	132.0169	45314.2	47309.8	274.639	181.48	231.86	0.28261	0.0265	464
565.000	7.41759	0.43047	2.489220	124.5562	46623.4	48645.7	276.811	158.81	209.89	0.30101	0.0335	459
570.000	7.31674	0.43258	2.390593	117.4379	47632.3	49682.4	278.639	154.15	205.97	0.31238	0.0389	448
580.000	7.10936	0.43752	2.201345	104.2009	49628.8	51738.7	282.216	152.68	206.04	0.33537	0.0494	424

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	∂P/∂T bar/K	∂P/∂ρ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
590.000	6.89412	0.44353	2.022721	92.2526	51634.4	53810.2	285.757	153.41	208.46	0.35861	0.0610	400
600.000	6.67078	0.45074	1.854668	81.5462	53661.8	55910.4	289.290	154.82	211.69	0.38177	0.0740	377
620.000	6.19980	0.46934	1.550150	63.7308	57797.8	60217.2	296.357	158.28	219.10	0.42787	0.1055	336
640.000	5.70091	0.49446	1.287938	50.6508	62042.9	64674.0	303.435	161.94	226.43	0.47314	0.1437	301
660.000	5.19123	0.52655	1.068998	42.3245	66370.6	69260.1	310.492	165.47	231.60	0.51665	0.1839	275
680.000	4.70297	0.56412	0.893671	38.3835	70721.1	73910.6	317.435	168.76	232.73	0.55762	0.2162	260
700.000	4.26794	0.60386	0.758278	37.6819	75031.4	78546.0	324.156	171.77	230.41	0.59561	0.2339	254
720.000	3.89843	0.64274	0.654889	38.7913	79271.8	83119.5	330.600	174.53	226.91	0.63059	0.2394	254
740.000	3.58909	0.67927	0.574939	40.6364	83446.6	87626.0	336.776	177.12	223.85	0.66276	0.2386	256
760.000	3.32908	0.71305	0.511896	42.9106	87572.1	92077.9	342.710	179.58	221.46	0.69265	0.2338	260
780.000	3.10912	0.74391	0.461349	45.5473	91663.6	96488.2	348.440	181.95	219.65	0.71982	0.2257	265
800.000	2.92162	0.77187	0.420195	48.4449	95733.6	100867.8	353.986	184.23	218.39	0.74480	0.2155	271
820.000	2.76031	0.79705	0.386191	51.5011	99792.8	105227.0	359.369	186.44	217.61	0.76781	0.2044	277
840.000	2.62018	0.81968	0.357695	54.6352	103850.1	109574.9	364.609	188.59	217.24	0.78904	0.1931	283
860.000	2.49726	0.84003	0.333499	57.7915	107912.4	113918.9	369.721	190.67	217.21	0.80865	0.1820	290
880.000	2.38844	0.85834	0.312707	60.9349	111984.9	118265.1	374.714	192.70	217.45	0.82713	0.1715	296
900.000	2.29127	0.87485	0.294647	64.0445	116071.7	122618.3	379.607	194.66	217.90	0.84394	0.1617	302
					200.00000 bar							
284.391	11.57637	0.73064	15.726730	1148.1975	163.3	1891.0	164.346	87.04	132.75	0.00067	-0.0432	1497
290.000	11.49994	0.72127	15.147148	1117.3837	901.1	2640.2	166.949	88.77	133.80	0.00088	-0.0428	1468
300.000	11.36555	0.70548	14.182644	1064.2111	2229.4	3989.1	171.518	91.88	135.78	0.00139	-0.0420	1418
310.000	11.23331	0.69076	13.297646	1013.0428	3576.4	5356.8	176.004	95.00	137.88	0.00212	-0.0412	1371
320.000	11.10293	0.67703	12.483200	963.6295	4943.7	6745.0	180.416	98.11	140.09	0.00312	-0.0403	1327
330.000	10.97413	0.66422	11.731539	915.7740	6332.8	8155.3	184.762	101.21	142.39	0.00445	-0.0393	1284
340.000	10.84663	0.65226	11.035903	869.3258	7745.1	9589.0	189.048	104.27	144.75	0.00620	-0.0383	1242
350.000	10.72014	0.64110	10.390392	824.1761	9181.6	11047.2	193.279	107.28	147.17	0.00842	-0.0373	1203
360.000	10.59439	0.63069	9.789841	780.2521	10642.8	12530.6	197.459	110.24	149.63	0.01120	-0.0362	1164
370.000	10.46911	0.62099	9.229718	737.5126	12129.3	14039.6	201.593	113.12	152.12	0.01461	-0.0350	1126
380.000	10.34401	0.61196	8.706038	695.9425	13640.9	15574.4	205.683	115.93	154.61	0.01873	-0.0338	1090
390.000	10.21882	0.60357	8.215290	655.5479	15177.5	17134.7	209.731	118.64	157.09	0.02362	-0.0325	1054
400.000	10.09328	0.59580	7.754386	616.3529	16738.6	18720.1	213.740	121.24	159.54	0.02934	-0.0311	1018
410.000	9.96711	0.58863	7.320597	578.3926	18323.3	20329.9	217.709	123.72	161.96	0.03593	-0.0297	984
420.000	9.84006	0.58203	6.911514	541.7104	19930.8	21963.4	221.641	126.08	164.33	0.04345	-0.0282	950
430.000	9.71185	0.57600	6.525017	506.3537	21560.1	23619.4	225.535	128.30	166.64	0.05190	-0.0265	917
440.000	9.58225	0.57052	6.159236	472.3703	23209.8	25297.0	229.392	130.38	168.87	0.06131	-0.0248	884
450.000	9.45099	0.56559	5.812529	439.8050	24879.1	26995.3	233.210	132.31	171.01	0.07168	-0.0229	853
460.000	9.31785	0.56120	5.483457	408.6979	26566.9	28713.3	236.991	134.08	173.06	0.08299	-0.0209	821
470.000	9.18258	0.55735	5.170763	379.0815	28272.3	30450.3	240.734	135.71	175.02	0.09523	-0.0188	791
480.000	9.04497	0.55405	4.873353	350.9799	29994.8	32206.0	244.438	137.18	176.89	0.10840	-0.0164	761
490.000	8.90481	0.55128	4.590283	324.4073	31734.3	33980.2	248.104	138.54	178.67	0.12247	-0.0139	731
500.000	8.76191	0.54907	4.320742	299.3678	33490.9	35773.5	251.731	139.79	180.41	0.13747	-0.0112	703
510.000	8.61610	0.54741	4.064038	275.8551	35265.4	37586.6	255.320	141.02	182.15	0.15339	-0.0082	675
520.000	8.46722	0.54632	3.819581	253.8524	37059.2	39421.2	258.876	142.33	184.01	0.17026	-0.0049	648
530.000	8.31513	0.54582	3.586876	233.3334	38874.6	41279.9	262.402	143.97	186.24	0.18806	-0.0013	621
540.000	8.15974	0.54591	3.365502	214.2624	40715.5	43166.6	265.911	146.53	189.41	0.20668	0.0026	595
550.000	8.00096	0.54662	3.155101	196.5959	42591.2	45090.9	269.436	152.04	195.54	0.22571	0.0066	568
560.000	7.83876	0.54797	2.955367	180.2831	44561.7	47113.1	273.125	181.38	225.53	0.24375	0.0097	535
565.000	7.75636	0.54889	2.859412	172.6168	45837.8	48416.4	275.239	158.67	203.15	0.25973	0.0131	531
570.000	7.67311	0.54998	2.766022	165.2675	46811.8	49418.3	277.006	153.97	198.79	0.26966	0.0160	522
580.000	7.50404	0.55268	2.586817	151.4891	48732.9	51398.1	280.450	152.40	197.90	0.28982	0.0215	501
590.000	7.33162	0.55609	2.417506	138.8855	50654.9	53382.8	283.843	153.03	199.22	0.31033	0.0274	481
600.000	7.15595	0.56024	2.257846	127.3941	52589.7	55384.6	287.210	154.34	201.23	0.33091	0.0338	461
620.000	6.79563	0.57092	1.966467	107.5098	56511.8	59454.9	293.890	157.59	205.88	0.37242	0.0478	424
640.000	6.42528	0.58495	1.710546	91.4088	60508.0	63620.7	300.507	161.06	210.69	0.41406	0.0638	391
660.000	6.04874	0.60254	1.487839	78.7667	64574.0	67880.5	307.062	164.50	215.19	0.45526	0.0815	363
680.000	5.67222	0.62364	1.296105	69.3505	68698.0	72224.0	313.546	167.81	219.01	0.49543	0.0999	340
700.000	5.30443	0.64782	1.133111	62.9338	72862.9	76633.3	319.939	170.96	221.71	0.53403	0.1170	323
720.000	4.95528	0.67421	0.996383	59.1781	77047.8	81083.9	326.210	173.93	223.12	0.57077	0.1308	311
740.000	4.63320	0.70159	0.882920	57.5830	81234.0	85550.7	332.331	176.72	223.39	0.60551	0.1400	305
760.000	4.34274	0.72881	0.789232	57.5633	85409.5	90014.9	338.282	179.36	222.97	0.63845	0.1445	302
780.000	4.08434	0.75505	0.711737	58.5768	89571.0	94467.7	344.067	181.86	222.30	0.66902	0.1454	302
800.000	3.85564	0.77984	0.647186	60.2023	93720.1	98907.3	349.688	184.24	221.68	0.69758	0.1440	304
820.000	3.65300	0.80303	0.592880	62.1068	97861.9	103336.9	355.158	186.53	221.31	0.72423	0.1414	307

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
840.000	3.47264	0.82462	0.546728	64.2024	102001.8	107761.1	360.488	188.72	221.15	0.74922	0.1380	310
860.000	3.31141	0.84466	0.507154	66.4694	106144.5	112184.2	365.693	190.84	221.19	0.77239	0.1340	314
880.000	3.16664	0.86320	0.472947	68.8828	110293.8	116609.6	370.778	192.88	221.38	0.79431	0.1295	318
900.000	3.03608	0.88031	0.443157	71.4138	114452.8	121040.2	375.757	194.86	221.71	0.81444	0.1247	322
					300.00000 bar							
287.181	11.62425	1.08085	15.786134	1193.6531	258.2	2839.0	164.644	88.79	133.16	0.00074	-0.0435	1513
290.000	11.58707	1.07378	15.499585	1178.6929	626.9	3216.0	165.948	89.65	133.68	0.00084	-0.0433	1499
300.000	11.45685	1.04978	14.539095	1127.1200	1944.9	4563.4	170.512	92.75	135.61	0.00132	-0.0426	1452
310.000	11.32900	1.02738	13.658213	1077.6406	3281.0	5929.1	174.991	95.84	137.65	0.00199	-0.0419	1407
320.000	11.20328	1.00644	12.848052	1029.9945	4636.9	7314.7	179.395	98.93	139.79	0.00291	-0.0411	1364
330.000	11.07944	0.98685	12.100902	983.9711	6013.9	8721.6	183.730	102.01	142.01	0.00413	-0.0403	1324
340.000	10.95724	0.96851	11.410055	939.4040	7413.3	10151.2	188.003	105.05	144.29	0.00571	-0.0394	1285
350.000	10.83644	0.95133	10.769656	896.1662	8835.9	11604.3	192.220	108.05	146.62	0.00772	-0.0385	1247
360.000	10.71681	0.93523	10.174582	854.1649	10282.3	13081.7	196.383	110.98	148.97	0.01022	-0.0376	1211
370.000	10.59813	0.92014	9.620335	813.3373	11752.8	14583.5	200.497	113.85	151.34	0.01326	-0.0366	1176
380.000	10.48018	0.90601	9.102960	773.6462	13247.3	16109.8	204.565	116.64	153.70	0.01692	-0.0356	1142
390.000	10.36274	0.89278	8.618974	735.0757	14765.4	17660.4	208.588	119.33	156.04	0.02125	-0.0346	1109
400.000	10.24561	0.88042	8.165301	697.6273	16306.4	19234.5	212.568	121.92	158.34	0.02628	-0.0335	1076
410.000	10.12859	0.86887	7.739225	661.3158	17869.5	20831.4	216.505	124.39	160.59	0.03208	-0.0324	1045
420.000	10.01149	0.85810	7.338345	626.1653	19453.6	22450.2	220.402	126.73	162.77	0.03865	-0.0312	1014
430.000	9.89414	0.84808	6.960530	592.2053	21057.5	24089.6	224.257	128.93	164.87	0.04602	-0.0300	984
440.000	9.77636	0.83879	6.603905	559.4701	22679.8	25748.5	228.070	130.99	166.88	0.05421	-0.0287	955
450.000	9.65801	0.83020	6.266804	527.9924	24319.4	27425.7	231.842	132.90	168.78	0.06320	-0.0274	926
460.000	9.53894	0.82229	5.947754	497.8027	25975.1	29120.1	235.571	134.65	170.58	0.07300	-0.0260	898
470.000	9.41901	0.81505	5.645451	468.9273	27645.9	30830.9	239.257	136.25	172.25	0.08359	-0.0246	871
480.000	9.29812	0.80844	5.358745	441.3863	29331.0	32557.5	242.900	137.70	173.82	0.09496	-0.0231	844
490.000	9.17617	0.80247	5.086618	415.1930	31030.1	34299.5	246.499	139.02	175.28	0.10710	-0.0215	818
500.000	9.05307	0.79711	4.828173	390.3523	32743.3	36057.1	250.054	140.24	176.67	0.12004	-0.0198	793
510.000	8.92877	0.79236	4.582613	366.8610	34471.2	37831.1	253.566	141.42	178.04	0.13378	-0.0180	768
520.000	8.80323	0.78821	4.349238	344.7075	36214.9	39622.8	257.038	142.69	179.51	0.14834	-0.0161	745
530.000	8.67643	0.78464	4.127423	323.8721	37976.6	41434.2	260.474	144.29	181.32	0.16372	-0.0141	721
540.000	8.54836	0.78164	3.916611	304.3273	39760.2	43269.6	263.888	146.80	184.05	0.17983	-0.0119	698
550.000	8.41904	0.77922	3.716302	286.0384	41574.7	45138.0	267.310	152.25	189.71	0.19633	-0.0095	675
560.000	8.28853	0.77736	3.526043	268.9647	43480.1	47099.6	270.890	181.53	219.21	0.21201	-0.0063	644
565.000	8.22284	0.77663	3.434552	260.8692	44722.1	48370.5	272.947	158.78	196.57	0.22592	-0.0059	642
570.000	8.15687	0.77604	3.345419	253.0600	45661.0	49338.9	274.654	154.05	191.94	0.23458	-0.0049	635
580.000	8.02416	0.77528	3.174041	238.2741	47508.8	51247.5	277.975	152.42	190.50	0.25223	-0.0024	617
590.000	7.89049	0.77505	3.011546	224.5534	49353.3	53155.4	281.236	152.98	191.25	0.27025	0.0002	599
600.000	7.75598	0.77535	2.857584	211.8428	51206.5	55074.5	284.464	154.21	192.66	0.28844	0.0029	582
620.000	7.48496	0.77751	2.573913	189.2260	54952.9	58961.0	290.843	157.31	196.06	0.32547	0.0086	549
640.000	7.21231	0.78168	2.320392	169.9819	58758.2	62917.7	297.126	160.64	199.61	0.36323	0.0147	519
660.000	6.93941	0.78780	2.094447	153.7011	62621.7	66944.8	303.322	163.96	203.08	0.40127	0.0210	493
680.000	6.66778	0.79578	1.893566	140.0266	66540.1	71039.4	309.437	167.19	206.35	0.43907	0.0276	470
700.000	6.39908	0.80551	1.715338	128.6628	70509.2	75197.4	315.466	170.30	209.40	0.47639	0.0342	450
720.000	6.13512	0.81683	1.557496	119.3708	74523.7	79413.6	321.407	173.29	212.16	0.51296	0.0408	432
740.000	5.87783	0.82954	1.417948	111.9542	78578.0	83682.0	327.256	176.15	214.62	0.54855	0.0471	417
760.000	5.62914	0.84339	1.294784	106.2391	82666.4	87995.8	333.006	178.88	216.73	0.58324	0.0529	405
780.000	5.39090	0.85808	1.186251	102.0545	86783.8	92348.7	338.661	181.49	218.50	0.61633	0.0579	396
800.000	5.16464	0.87328	1.090728	99.2202	90925.0	96733.7	344.213	183.98	219.94	0.64799	0.0619	389
820.000	4.95146	0.88866	1.006705	97.5457	95086.0	101144.8	349.660	186.37	221.12	0.67816	0.0648	384
840.000	4.75193	0.90393	0.932773	96.8366	99263.7	105576.9	355.000	188.65	222.07	0.70695	0.0666	382
860.000	4.56610	0.91884	0.867633	96.9055	103456.6	110026.8	360.236	190.84	222.88	0.73411	0.0674	380
880.000	4.39361	0.93321	0.810106	97.5824	107663.6	114491.7	365.366	192.95	223.60	0.76010	0.0675	380
900.000	4.23377	0.94692	0.759143	98.7209	111884.6	118970.5	370.399	194.97	224.28	0.78434	0.0668	381
					400.00000 bar							
289.928	11.67069	1.42179	15.871499	1240.3966	360.8	3788.2	164.956	90.40	133.63	0.00090	-0.0437	1532
290.000	11.66978	1.42155	15.864329	1240.0286	370.1	3797.8	164.989	90.42	133.64	0.00090	-0.0437	1531
300.000	11.54319	1.38924	14.905354	1189.7616	1679.4	5144.7	169.551	93.49	135.53	0.00140	-0.0431	1485
310.000	11.41914	1.35903	14.026032	1141.6612	3006.4	6509.3	174.027	96.56	137.53	0.00210	-0.0424	1442
320.000	11.29740	1.33075	13.217524	1095.4578	4352.8	7893.4	178.426	99.64	139.62	0.00305	-0.0417	1401
330.000	11.17775	1.30423	12.472167	1050.9304	5719.8	9298.4	182.755	102.69	141.79	0.00430	-0.0410	1362

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
340.000	11.05998	1.27935	11.783277	1007.8976	7108.7	10725.4	187.021	105.71	144.00	0.00591	-0.0402	1325
350.000	10.94386	1.25599	11.145039	966.2192	8520.2	12175.2	191.227	108.69	146.26	0.00794	-0.0394	1290
360.000	10.82922	1.23403	10.552351	925.7855	9954.9	13648.6	195.380	111.62	148.54	0.01045	-0.0386	1255
370.000	10.71584	1.21338	10.000728	886.5147	11412.9	15145.7	199.481	114.47	150.82	0.01350	-0.0378	1222
380.000	10.60354	1.19396	9.486234	848.3524	12894.1	16666.4	203.533	117.24	153.09	0.01714	-0.0369	1190
390.000	10.49214	1.17570	9.005391	811.2636	14398.0	18210.4	207.539	119.92	155.33	0.02142	-0.0360	1159
400.000	10.38147	1.15852	8.555126	775.2309	15924.0	19777.0	211.500	122.49	157.53	0.02639	-0.0351	1129
410.000	10.27137	1.14238	8.132720	740.2514	17471.0	21365.3	215.417	124.95	159.67	0.03207	-0.0342	1100
420.000	10.16169	1.12722	7.735762	706.3328	19037.9	22974.3	219.289	127.27	161.73	0.03850	-0.0333	1071
430.000	10.05229	1.11299	7.362111	673.4904	20623.5	24602.7	223.118	129.46	163.71	0.04569	-0.0324	1044
440.000	9.94303	1.09965	7.009867	641.7444	22226.3	26249.3	226.903	131.50	165.58	0.05364	-0.0314	1017
450.000	9.83379	1.08715	6.677338	611.1174	23845.2	27912.8	230.644	133.39	167.35	0.06236	-0.0304	990
460.000	9.72446	1.07548	6.363018	581.6319	25478.8	29592.2	234.340	135.13	168.99	0.07182	-0.0294	964
470.000	9.61496	1.06458	6.065566	553.3084	27126.2	31286.3	237.991	136.71	170.52	0.08203	-0.0283	939
480.000	9.50519	1.05444	5.783787	526.1642	28786.5	32994.7	241.595	138.14	171.92	0.09296	-0.0272	915
490.000	9.39509	1.04503	5.516612	500.2118	30459.4	34716.9	245.153	139.44	173.22	0.10463	-0.0261	891
500.000	9.28460	1.03631	5.263089	475.4579	32144.9	36453.1	248.665	140.65	174.44	0.11703	-0.0249	868
510.000	9.17369	1.02828	5.022364	451.9033	33843.6	38203.9	252.131	141.81	175.64	0.13018	-0.0237	846
520.000	9.06232	1.02089	4.793671	429.5421	35556.7	39970.6	255.555	143.06	176.93	0.14412	-0.0224	824
530.000	8.95049	1.01415	4.576320	408.3623	37286.3	41755.4	258.940	144.63	178.56	0.15883	-0.0210	803
540.000	8.83819	1.00801	4.369691	388.3451	39036.4	43562.2	262.301	147.12	181.11	0.17424	-0.0195	782
550.000	8.72545	1.00247	4.173220	369.4660	40816.0	45400.3	265.667	152.54	186.59	0.19001	-0.0177	760
560.000	8.61230	0.99751	3.986391	351.6951	42685.3	47329.8	269.189	181.79	215.91	0.20499	-0.0141	731
565.000	8.55558	0.99524	3.896443	343.2147	43908.7	48584.0	271.216	159.03	193.18	0.21834	-0.0151	730
570.000	8.49878	0.99310	3.808732	334.9979	44828.6	49535.2	272.894	154.29	188.46	0.22663	-0.0148	723
580.000	8.38493	0.98923	3.639807	319.3355	46637.7	51408.2	276.152	152.62	186.85	0.24352	-0.0135	707
590.000	8.27084	0.98588	3.479208	304.6661	48442.4	53278.7	279.349	153.16	187.42	0.26080	-0.0120	690
600.000	8.15656	0.98303	3.326556	290.9455	50254.7	55158.7	282.512	154.36	188.66	0.27825	-0.0103	674
620.000	7.92781	0.97877	3.043659	266.1649	53916.4	58962.0	288.754	157.40	191.74	0.31388	-0.0070	644
640.000	7.69941	0.97631	2.788420	244.6196	57634.1	62829.3	294.895	160.68	194.99	0.35040	-0.0035	616
660.000	7.47212	0.97552	2.558344	225.9427	61407.9	66761.1	300.945	163.94	198.19	0.38740	0.0000	591
680.000	7.24676	0.97627	2.351101	209.7918	65235.9	70755.6	306.910	167.13	201.25	0.42442	0.0035	568
700.000	7.02411	0.97844	2.164509	195.8606	69115.2	74809.9	312.788	170.21	204.15	0.46129	0.0071	548
720.000	6.80496	0.98190	1.996537	183.8843	73042.4	78920.5	318.580	173.17	206.88	0.49775	0.0106	530
740.000	6.59005	0.98651	1.845311	173.6397	77014.1	83083.9	324.285	176.02	209.44	0.53362	0.0140	514
760.000	6.38010	0.99216	1.709122	164.9416	81027.0	87296.5	329.900	178.76	211.82	0.56895	0.0173	500
780.000	6.17579	0.99870	1.586424	157.6355	85078.4	91555.3	335.434	181.37	214.02	0.60297	0.0205	487
800.000	5.97775	1.00600	1.475829	151.5902	89165.0	95856.4	340.880	183.89	216.05	0.63600	0.0235	477
820.000	5.78654	1.01389	1.376091	146.6896	93283.8	100196.4	346.239	186.30	217.91	0.66785	0.0261	468
840.000	5.60265	1.02223	1.286094	142.8267	97432.2	104571.6	351.510	188.61	219.60	0.69858	0.0285	461
860.000	5.42647	1.03088	1.204835	139.8986	101608.0	108979.2	356.697	190.83	221.13	0.72791	0.0304	455
880.000	5.25823	1.03968	1.131408	137.8048	105808.9	113416.0	361.794	192.96	222.53	0.75624	0.0320	451
900.000	5.09808	1.04852	1.064993	136.4469	110033.3	117879.4	366.810	195.02	223.80	0.78293	0.0331	447
					500.00000 bar							
292.636	11.71570	1.75403	15.975557	1288.0377	470.2	4738.0	165.279	91.90	134.14	0.00116	-0.0439	1551
300.000	11.62511	1.72431	15.277300	1252.0394	1430.5	5731.5	168.629	94.14	135.52	0.00159	-0.0435	1519
310.000	11.50438	1.68620	14.397509	1205.0651	2749.8	7095.9	173.105	97.20	137.49	0.00236	-0.0429	1477
320.000	11.38609	1.65048	13.588604	1160.0430	4088.1	8479.4	177.502	100.25	139.54	0.00340	-0.0422	1437
330.000	11.27004	1.61694	12.842952	1116.7423	5446.8	9883.4	181.828	103.29	141.66	0.00476	-0.0415	1400
340.000	11.15602	1.58542	12.153904	1074.9727	6827.0	11308.9	186.089	106.29	143.83	0.00650	-0.0408	1364
350.000	11.04385	1.55577	11.515658	1034.5797	8229.4	12756.8	190.290	109.26	146.04	0.00868	-0.0401	1330
360.000	10.93335	1.52784	10.923127	995.4407	9654.5	14227.7	194.435	112.16	148.26	0.01136	-0.0394	1297
370.000	10.82433	1.50152	10.371843	957.4602	11102.5	15721.7	198.528	115.00	150.48	0.01460	-0.0387	1266
380.000	10.71664	1.47670	9.857873	920.5677	12573.1	17238.7	202.571	117.76	152.69	0.01845	-0.0379	1236
390.000	10.61011	1.45328	9.377744	884.7131	14065.8	18778.3	206.565	120.42	154.86	0.02295	-0.0371	1206
400.000	10.50459	1.43118	8.928374	849.8625	15580.0	20339.8	210.513	122.98	156.98	0.02815	-0.0364	1178
410.000	10.39995	1.41032	8.507047	815.9993	17114.6	21922.3	214.415	125.42	159.04	0.03408	-0.0356	1150
420.000	10.29604	1.39064	8.111339	783.1164	18668.4	23524.6	218.272	127.74	161.02	0.04075	-0.0348	1124
430.000	10.19275	1.37206	7.739096	751.2165	20240.1	25145.5	222.083	129.91	162.91	0.04819	-0.0340	1098
440.000	10.08997	1.35454	7.388400	720.3085	21828.3	26783.7	225.849	131.95	164.70	0.05638	-0.0333	1072
450.000	9.98758	1.33802	7.057540	690.4052	23431.8	28438.0	229.569	133.82	166.37	0.06533	-0.0325	1048
460.000	9.88549	1.32245	6.744985	661.5218	25049.2	30107.1	233.243	135.55	167.92	0.07501	-0.0317	1024
470.000	9.78363	1.30778	6.449367	633.6735	26679.5	31790.1	236.869	137.12	169.35	0.08543	-0.0308	1000

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
480.000	9.68191	1.29399	6.169461	606.8741	28322.0	33486.3	240.448	138.54	170.65	0.09656	-0.0300	978
490.000	9.58029	1.28103	5.904166	581.1351	29976.2	35195.3	243.979	139.82	171.85	0.10841	-0.0292	956
500.000	9.47871	1.26886	5.652493	556.4640	31642.3	36917.3	247.462	141.01	172.97	0.12098	-0.0283	934
510.000	9.37712	1.25746	5.413554	532.8645	33320.7	38652.8	250.898	142.16	174.06	0.13429	-0.0274	913
520.000	9.27551	1.24679	5.186545	510.3352	35012.8	40403.3	254.290	143.40	175.25	0.14837	-0.0265	893
530.000	9.17386	1.23682	4.970742	488.8699	36720.6	42170.9	257.643	144.96	176.78	0.16321	-0.0254	873
540.000	9.07215	1.22752	4.765485	468.4572	38448.1	43959.5	260.969	147.43	179.23	0.17874	-0.0243	853
550.000	8.97041	1.21887	4.570175	449.0811	40204.5	45778.4	264.301	152.83	184.62	0.19461	-0.0227	833
560.000	8.86863	1.21085	4.384267	430.7206	42049.9	47687.7	267.786	182.07	213.85	0.20965	-0.0188	804
565.000	8.81773	1.20706	4.294680	421.9136	43261.2	48931.6	269.795	159.31	191.08	0.22316	-0.0206	804
570.000	8.76684	1.20342	4.207258	413.3509	44168.8	49872.1	271.453	154.56	186.31	0.23148	-0.0207	798
580.000	8.66507	1.19656	4.038688	396.9433	45952.9	51723.2	274.673	152.88	184.62	0.24844	-0.0199	783
590.000	8.56336	1.19025	3.878127	381.4655	47732.2	53571.0	277.832	153.39	185.11	0.26578	-0.0189	767
600.000	8.46176	1.18446	3.725178	366.8833	49518.6	55427.6	280.955	154.58	186.27	0.28330	-0.0178	752
620.000	8.25906	1.17439	3.440652	340.2580	53127.8	59181.7	287.116	157.59	189.22	0.31907	-0.0154	723
640.000	8.05744	1.16616	3.182386	316.7607	56792.0	62997.4	293.176	160.84	192.36	0.35577	-0.0130	696
660.000	7.85736	1.15961	2.947937	296.0787	60512.1	66875.6	299.143	164.08	195.45	0.39302	-0.0107	671
680.000	7.65934	1.15461	2.735082	277.9078	64286.6	70814.6	305.025	167.24	198.44	0.43039	-0.0083	649
700.000	7.46386	1.15099	2.541789	261.9631	68113.1	74812.1	310.821	170.30	201.29	0.46770	-0.0060	629
720.000	7.27138	1.14864	2.366193	247.9861	71988.8	78865.1	316.532	173.24	203.99	0.50474	-0.0037	611
740.000	7.08233	1.14743	2.206583	235.7484	75910.8	82970.6	322.158	176.08	206.55	0.54132	-0.0015	595
760.000	6.89710	1.14724	2.061397	225.0523	79876.3	87125.8	327.696	178.80	208.97	0.57751	0.0006	580
780.000	6.71605	1.14796	1.929218	215.7292	83883.5	91328.3	333.156	181.42	211.25	0.61255	0.0027	567
800.000	6.53949	1.14948	1.808765	207.6364	87929.3	95575.2	338.534	183.93	213.41	0.64673	0.0047	555
820.000	6.36769	1.15170	1.698887	200.6532	92011.7	99863.8	343.830	186.35	215.43	0.67989	0.0066	544
840.000	6.20089	1.15452	1.598548	194.6764	96128.3	104191.6	349.043	188.67	217.34	0.71208	0.0083	535
860.000	6.03930	1.15784	1.506825	189.6163	100277.4	108556.5	354.180	190.89	219.13	0.74297	0.0099	527
880.000	5.88307	1.16157	1.422890	185.3933	104457.0	112955.9	359.234	193.04	220.81	0.77297	0.0114	521
900.000	5.73233	1.16563	1.345999	181.9346	108665.4	117387.8	364.215	195.10	222.38	0.80141	0.0127	515
					600.00000 bar							
295.306	11.75929	2.07808	16.093098	1336.2995	586.0	5688.4	165.612	93.30	134.69	0.00153	-0.0440	1571
300.000	11.70307	2.05539	15.652199	1313.9098	1196.2	6323.0	167.743	94.72	135.57	0.00186	-0.0438	1551
310.000	11.58527	2.00931	14.770322	1267.8530	2508.8	7687.8	172.220	97.76	137.51	0.00275	-0.0432	1510
320.000	11.47001	1.96608	13.959411	1223.7982	3840.2	9071.3	176.617	100.80	139.53	0.00393	-0.0426	1472
330.000	11.35708	1.92546	13.211857	1181.5070	5191.9	10474.9	180.942	103.82	141.62	0.00547	-0.0420	1436
340.000	11.24630	1.88724	12.521034	1140.7804	6564.7	11899.8	185.201	106.81	143.75	0.00743	-0.0413	1401
350.000	11.13750	1.85123	11.881152	1101.4541	7959.5	13346.7	189.400	109.76	145.92	0.00986	-0.0407	1369
360.000	11.03051	1.81726	11.287137	1063.3942	9376.7	14816.2	193.541	112.65	148.10	0.01284	-0.0400	1337
370.000	10.92516	1.78519	10.734530	1026.4937	10816.4	16308.3	197.628	115.48	150.27	0.01641	-0.0393	1307
380.000	10.82131	1.75490	10.219398	990.6691	12278.4	17823.0	201.665	118.22	152.43	0.02063	-0.0387	1278
390.000	10.71880	1.72625	9.738269	955.8575	13762.1	19359.8	205.652	120.87	154.55	0.02554	-0.0380	1250
400.000	10.61751	1.69915	9.288065	922.0129	15266.8	20917.9	209.591	123.42	156.62	0.03118	-0.0373	1223
410.000	10.51729	1.67351	8.866057	889.1051	16791.5	22496.4	213.484	125.85	158.62	0.03759	-0.0366	1197
420.000	10.41803	1.64923	8.469814	857.1152	18334.9	24094.2	217.329	128.15	160.54	0.04477	-0.0360	1172
430.000	10.31962	1.62623	8.097173	826.0348	19895.7	25709.9	221.129	130.32	162.37	0.05274	-0.0353	1147
440.000	10.22195	1.60446	7.746203	795.8626	21472.6	27342.3	224.881	132.34	164.09	0.06149	-0.0346	1123
450.000	10.12493	1.58384	7.415174	766.6029	23064.2	28990.1	228.587	134.21	165.69	0.07101	-0.0340	1100
460.000	10.02847	1.56431	7.102539	738.2636	24669.2	30652.1	232.245	135.92	167.17	0.08128	-0.0333	1078
470.000	9.93249	1.54582	6.806911	710.8543	26286.6	32327.3	235.854	137.48	168.53	0.09229	-0.0327	1056
480.000	9.83693	1.52832	6.527041	684.3853	27915.6	34015.0	239.415	138.89	169.77	0.10402	-0.0320	1034
490.000	9.74173	1.51176	6.261809	658.8660	29555.8	35714.9	242.927	140.17	170.90	0.11647	-0.0314	1014
500.000	9.64684	1.49610	6.010203	634.3041	31207.3	37427.0	246.390	141.35	171.94	0.12964	-0.0307	993
510.000	9.55221	1.48129	5.771309	610.7044	32870.7	39152.0	249.806	142.49	172.97	0.14357	-0.0300	974
520.000	9.45782	1.46731	5.544300	588.0683	34547.3	40891.3	253.176	143.71	174.10	0.15826	-0.0293	954
530.000	9.36365	1.45410	5.328428	566.3938	36239.1	42646.9	256.506	145.26	175.56	0.17373	-0.0284	936
540.000	9.26967	1.44164	5.123010	545.6751	37950.3	44423.0	259.809	147.72	177.95	0.18988	-0.0275	917
550.000	9.17588	1.42990	4.927426	525.9023	39689.9	46228.8	263.116	153.12	183.28	0.20636	-0.0261	897
560.000	9.08228	1.41884	4.741111	507.0620	41518.1	48124.4	266.577	182.35	212.45	0.22193	-0.0219	869
565.000	9.03555	1.41355	4.651263	497.9859	42720.7	49361.1	268.573	159.58	189.65	0.23603	-0.0243	870
570.000	8.98888	1.40843	4.563541	489.1362	43619.6	50294.5	270.219	154.82	184.86	0.24464	-0.0246	864
580.000	8.89569	1.39865	4.394241	472.1050	45385.9	52130.8	273.413	153.13	183.11	0.26217	-0.0241	850
590.000	8.80273	1.38946	4.232770	455.9444	47147.2	53963.2	276.545	153.64	183.56	0.28007	-0.0234	835
600.000	8.71003	1.38084	4.078719	440.6283	48915.4	55804.1	279.642	154.82	184.68	0.29814	-0.0225	820

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
620.000	8.52551	1.36522	3.791383	412.4131	52487.8	59525.5	285.750	157.81	187.55	0.33501	-0.0207	792
640.000	8.34240	1.35159	3.529483	387.2138	56115.0	63307.2	291.755	161.04	190.62	0.37280	-0.0189	766
660.000	8.16101	1.33976	3.290595	364.7698	59798.1	67150.2	297.668	164.26	193.68	0.41115	-0.0171	742
680.000	7.98167	1.32957	3.072551	344.8184	63536.1	71053.3	303.497	167.41	196.63	0.44963	-0.0153	720
700.000	7.80469	1.32087	2.873403	327.1051	67326.8	75014.5	309.240	170.45	199.46	0.48806	-0.0136	700
720.000	7.63039	1.31352	2.691383	311.3901	71167.5	79030.8	314.899	173.39	202.15	0.52625	-0.0120	681
740.000	7.45906	1.30737	2.524885	297.4540	75055.8	83099.7	320.475	176.21	204.72	0.56401	-0.0103	665
760.000	7.29094	1.30232	2.372449	285.1001	78989.0	87218.4	325.964	178.93	207.16	0.60144	-0.0088	650
780.000	7.12627	1.29825	2.232750	274.1547	82965.4	91384.9	331.378	181.54	209.47	0.63774	-0.0073	636
800.000	6.96523	1.29506	2.104586	264.4669	86982.3	95596.5	336.711	184.05	211.67	0.67323	-0.0058	623
820.000	6.80800	1.29265	1.986873	255.9067	91037.7	99850.9	341.964	186.46	213.75	0.70774	-0.0045	612
840.000	6.65471	1.29094	1.878631	248.3622	95129.7	104145.9	347.138	188.78	215.74	0.74132	-0.0031	602
860.000	6.50547	1.28985	1.778981	241.7374	99256.5	108479.5	352.238	191.01	217.62	0.77364	-0.0019	593
880.000	6.36037	1.28929	1.687130	235.9497	103416.4	112849.8	357.259	193.16	219.40	0.80511	-0.0008	585
900.000	6.21948	1.28920	1.602370	230.9269	107607.7	117254.8	362.209	195.23	221.10	0.83505	0.0003	578
					700.00000 bar							
297.938	11.80153	2.39440	16.220319	1384.9820	707.5	6638.9	165.954	94.64	135.27	0.00207	-0.0441	1591
300.000	11.77745	2.38281	16.028208	1375.3603	974.8	6918.4	166.889	95.25	135.65	0.00225	-0.0440	1583
310.000	11.66227	2.32872	15.142943	1330.0462	2281.6	8283.9	171.367	98.27	137.57	0.00329	-0.0435	1543
320.000	11.54968	2.27794	14.328750	1286.7808	3607.1	9667.9	175.766	101.29	139.57	0.00467	-0.0429	1506
330.000	11.43950	2.23018	13.578035	1245.3193	4952.7	11071.8	180.092	104.30	141.63	0.00646	-0.0423	1471
340.000	11.33156	2.18521	12.884188	1205.4554	6319.3	12496.7	184.352	107.27	143.74	0.00871	-0.0417	1437
350.000	11.22568	2.14280	12.241430	1167.0167	7707.6	13943.3	188.549	110.21	145.87	0.01150	-0.0411	1406
360.000	11.12172	2.10275	11.644696	1129.8602	9118.2	15412.2	192.689	113.09	148.02	0.01488	-0.0405	1375
370.000	11.01951	2.06489	11.089528	1093.8692	10551.0	16903.3	196.773	115.90	150.16	0.01891	-0.0399	1346
380.000	10.91891	2.02908	10.571998	1058.9499	12005.8	18416.7	200.806	118.64	152.28	0.02365	-0.0392	1319
390.000	10.81979	1.99516	10.088632	1025.0285	13482.1	19951.7	204.789	121.28	154.36	0.02915	-0.0386	1292
400.000	10.72203	1.96302	9.636350	992.0485	14979.0	21507.6	208.723	123.81	156.38	0.03543	-0.0380	1266
410.000	10.62548	1.93254	9.212416	959.9685	16495.6	23083.5	212.609	126.23	158.34	0.04253	-0.0374	1241
420.000	10.53006	1.90363	8.814393	928.7595	18030.6	24678.3	216.447	128.53	160.21	0.05045	-0.0368	1217
430.000	10.43564	1.87618	8.440107	898.4031	19582.7	26290.5	220.238	130.68	161.99	0.05919	-0.0363	1194
440.000	10.34213	1.85012	8.087617	868.8892	21150.5	27918.9	223.981	132.69	163.66	0.06876	-0.0357	1171
450.000	10.24945	1.82536	7.755184	840.2147	22732.6	29562.2	227.677	134.55	165.22	0.07912	-0.0351	1149
460.000	10.15751	1.80184	7.441238	812.3788	24327.8	31219.2	231.324	136.26	166.65	0.09027	-0.0346	1127
470.000	10.06623	1.77950	7.144386	785.3877	25935.0	32888.9	234.922	137.81	167.95	0.10217	-0.0340	1106
480.000	9.97556	1.75826	6.863362	759.2470	27553.4	34570.6	238.470	139.21	169.14	0.11482	-0.0335	1086
490.000	9.88542	1.73808	6.597026	733.9634	29182.7	36263.8	241.968	140.48	170.22	0.12820	-0.0330	1066
500.000	9.79577	1.71891	6.344350	709.5430	30823.0	37968.9	245.417	141.66	171.21	0.14232	-0.0324	1047
510.000	9.70658	1.70069	6.104404	685.9908	32474.8	39686.4	248.817	142.79	172.19	0.15720	-0.0319	1029
520.000	9.61779	1.68338	5.876344	663.3100	34139.4	41417.6	252.172	144.01	173.27	0.17288	-0.0313	1010
530.000	9.52939	1.66694	5.659403	641.5010	35819.0	43164.7	255.486	145.55	174.69	0.18934	-0.0306	992
540.000	9.44134	1.65133	5.452883	620.5615	37517.7	44931.9	258.772	148.00	177.03	0.20650	-0.0298	974
550.000	9.35364	1.63651	5.256149	600.4865	39244.5	46728.2	262.062	153.39	182.32	0.22396	-0.0285	955
560.000	9.26628	1.62244	5.068620	581.2674	41059.7	48614.0	265.505	182.62	211.44	0.24039	-0.0241	928
565.000	9.22272	1.61568	4.978139	571.9757	42255.7	49845.7	267.492	159.84	188.62	0.25543	-0.0268	929
570.000	9.17924	1.60909	4.889762	562.8931	43148.0	50773.9	269.129	155.08	183.82	0.26451	-0.0273	924
580.000	9.09254	1.59643	4.719085	545.3491	44901.0	52599.6	272.305	153.39	182.03	0.28297	-0.0271	910
590.000	9.00618	1.58442	4.556138	528.6185	46648.7	54421.1	275.418	153.89	182.45	0.30180	-0.0265	895
600.000	8.92017	1.57303	4.400506	512.6817	48403.3	56250.7	278.496	155.06	183.54	0.32078	-0.0258	881
620.000	8.74925	1.55203	4.109664	483.1012	51948.2	59948.9	284.566	158.04	186.36	0.35944	-0.0244	853
640.000	8.57995	1.53319	3.843779	456.4134	55547.8	63706.4	290.532	161.25	189.40	0.39899	-0.0229	828
660.000	8.41245	1.51634	3.600422	432.4056	59203.6	67524.6	296.407	164.47	192.42	0.43907	-0.0214	804
680.000	8.24696	1.50127	3.377453	410.8554	62914.5	71402.5	302.198	167.60	195.36	0.47922	-0.0200	782
700.000	8.08370	1.48783	3.172962	391.5404	66678.7	75338.1	307.905	170.64	198.18	0.51931	-0.0186	762
720.000	7.92288	1.47586	2.985240	374.2446	70493.7	79328.9	313.528	173.56	200.88	0.55911	-0.0173	744
740.000	7.76470	1.46523	2.812742	358.7645	74357.1	83372.3	319.069	176.38	203.45	0.59846	-0.0160	727
760.000	7.60933	1.45580	2.654076	344.9119	78266.4	87465.7	324.524	179.09	205.90	0.63747	-0.0148	712
780.000	7.45695	1.44746	2.507979	332.5162	82220.1	91607.3	329.906	181.70	208.23	0.67529	-0.0136	698
800.000	7.30768	1.44010	2.373306	321.4251	86215.4	95794.4	335.207	184.20	210.46	0.71230	-0.0125	685
820.000	7.16163	1.43363	2.249023	311.5037	90250.5	100024.8	340.431	186.61	212.57	0.74830	-0.0114	673

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
840.000	7.01891	1.42795	2.134194	302.6341	94323.5	104296.6	345.577	188.93	214.59	0.78336	-0.0104	663
860.000	6.87957	1.42299	2.027972	294.7136	98432.8	108607.9	350.651	191.16	216.52	0.81714	-0.0094	653
880.000	6.74368	1.41867	1.929594	287.6527	102576.6	112956.7	355.647	193.31	218.36	0.85006	-0.0085	644
900.000	6.61126	1.41493	1.838371	281.3741	106753.3	117341.3	360.574	195.38	220.11	0.88141	-0.0076	637
					800.00000 bar							
300.536	11.84247	2.70343	16.354406	1433.9384	834.3	7589.7	166.304	95.90	135.87	0.00282	-0.0442	1612
310.000	11.73576	2.64473	15.514343	1391.6750	2066.7	8883.5	170.544	98.74	137.67	0.00401	-0.0437	1576
320.000	11.62557	2.58636	14.695858	1349.0506	3387.0	10268.4	174.946	101.75	139.65	0.00565	-0.0431	1539
330.000	11.51784	2.53145	13.940987	1308.2680	4727.3	11673.1	179.274	104.74	141.69	0.00776	-0.0426	1505
340.000	11.41239	2.47969	13.243141	1269.1162	6088.5	13098.4	183.535	107.70	143.78	0.01040	-0.0420	1472
350.000	11.30909	2.43085	12.596547	1231.4159	7471.3	14545.3	187.733	110.62	145.88	0.01364	-0.0414	1441
360.000	11.20776	2.38469	11.996145	1195.0168	8876.2	16014.1	191.873	113.49	148.00	0.01756	-0.0408	1412
370.000	11.10827	2.34102	11.437481	1159.7939	10303.1	17505.0	195.957	116.29	150.11	0.02220	-0.0403	1384
380.000	11.01048	2.29966	10.916625	1125.6448	11751.9	19017.7	199.988	119.02	152.20	0.02762	-0.0397	1357
390.000	10.91426	2.26045	10.430103	1092.4868	13222.0	20551.8	203.968	121.65	154.25	0.03387	0.0391	1331
400.000	10.81950	2.22324	9.974829	1060.2542	14712.5	22106.5	207.899	124.17	156.24	0.04098	-0.0386	1306
410.000	10.72607	2.18791	9.548062	1028.8964	16222.4	23680.8	211.781	126.58	158.16	0.04898	-0.0380	1282
420.000	10.63387	2.15434	9.147361	998.3757	17750.5	25273.6	215.615	128.87	160.00	0.05786	-0.0375	1259
430.000	10.54279	2.12241	8.770538	968.6646	19295.4	26883.5	219.400	131.02	161.74	0.06762	-0.0370	1237
440.000	10.45275	2.09204	8.415647	939.7452	20855.7	28509.2	223.137	133.02	163.37	0.07825	-0.0365	1215
450.000	10.36366	2.06314	8.080935	911.6065	22430.1	30149.4	226.826	134.87	164.89	0.08973	-0.0360	1194
460.000	10.27544	2.03562	7.764829	884.2432	24017.3	31802.9	230.465	136.57	166.28	0.10202	-0.0355	1173
470.000	10.18801	2.00940	7.465915	857.6543	25616.3	33468.7	234.054	138.12	167.54	0.11510	-0.0351	1154
480.000	10.10131	1.98443	7.182916	831.8415	27226.3	35146.0	237.594	139.51	168.69	0.12895	-0.0346	1134
490.000	10.01529	1.96062	6.914680	806.8082	28846.8	36834.6	241.082	140.78	169.73	0.14355	-0.0342	1115
500.000	9.92989	1.93794	6.660167	782.5589	30478.1	38534.6	244.521	141.94	170.69	0.15892	-0.0337	1097
510.000	9.84506	1.91631	6.418431	759.0976	32120.7	40246.6	247.910	143.07	171.63	0.17507	-0.0333	1079
520.000	9.76077	1.89569	6.188617	736.4277	33775.9	41972.0	251.253	144.28	172.67	0.19205	-0.0328	1062
530.000	9.67698	1.87602	5.969940	714.5502	35445.8	43712.9	254.555	145.82	174.05	0.20983	-0.0322	1044
540.000	9.59367	1.85727	5.761696	693.4661	37134.6	45473.4	257.829	148.27	176.36	0.22832	-0.0315	1027
550.000	9.51080	1.83939	5.563234	673.1730	38851.4	47262.9	261.107	153.65	181.61	0.24709	-0.0302	1009
560.000	9.42838	1.82234	5.373962	653.6661	40656.4	49141.4	264.537	182.87	210.70	0.26467	-0.0258	981
565.000	9.38732	1.81411	5.282601	644.2055	41847.2	50369.4	266.517	160.10	187.87	0.28095	-0.0287	983
570.000	9.34638	1.80607	5.193337	634.9387	42734.3	51293.7	268.147	155.33	183.05	0.29065	-0.0293	978
580.000	9.26479	1.79057	5.020859	616.9813	44476.8	53111.6	271.309	153.63	181.24	0.31035	-0.0292	965
590.000	9.18362	1.77577	4.856068	599.7819	46213.9	54925.1	274.409	154.13	181.63	0.33042	-0.0288	951
600.000	9.10286	1.76167	4.698541	583.3267	47957.9	56746.4	277.473	155.29	182.70	0.35060	-0.0282	937
620.000	8.94262	1.73539	4.403735	552.5827	51481.3	60427.3	283.514	158.27	185.48	0.39161	-0.0270	910
640.000	8.78412	1.71150	4.133631	524.5997	55059.5	64166.8	289.453	161.47	188.49	0.43347	-0.0257	885
660.000	8.62747	1.68977	3.885784	499.2062	58694.0	67966.7	295.299	164.68	191.49	0.47579	-0.0245	862
680.000	8.47281	1.67000	3.658056	476.2178	62383.9	71825.9	301.062	167.80	194.42	0.51809	-0.0233	840
700.000	8.32026	1.65203	3.448557	455.4433	66127.5	75742.6	306.741	170.83	197.23	0.56025	-0.0221	820
720.000	8.16998	1.63569	3.255606	436.6926	69922.6	79714.5	312.338	173.75	199.93	0.60206	-0.0210	802
740.000	8.02210	1.62082	3.077696	419.7807	73766.7	83739.1	317.853	176.57	202.51	0.64334	-0.0199	785
760.000	7.87675	1.60729	2.913475	404.5329	77657.4	87813.9	323.283	179.27	204.98	0.68423	-0.0189	769
780.000	7.73405	1.59497	2.761719	390.7866	81593.3	91937.2	328.641	181.87	207.32	0.72383	-0.0179	755
800.000	7.59410	1.58375	2.621325	378.3925	85571.8	96106.3	333.920	184.38	209.57	0.76255	-0.0170	742
820.000	7.45698	1.57354	2.491295	367.2164	89591.0	100319.2	339.122	186.78	211.71	0.80021	-0.0161	729
840.000	7.32275	1.56423	2.370723	357.1379	93648.9	104573.8	344.248	189.10	213.75	0.83686	-0.0152	718
860.000	7.19147	1.55574	2.258790	348.0500	97744.2	108868.5	349.301	191.33	215.71	0.87217	-0.0144	708
880.000	7.06317	1.54800	2.154755	339.8587	101874.9	113201.3	354.279	193.47	217.57	0.90658	-0.0137	699
900.000	6.93787	1.54094	2.057946	332.4813	106039.7	117570.6	359.190	195.54	219.36	0.93934	-0.0129	690
					900.00000 bar							
303.100	11.88217	3.00556	16.493275	1483.0630	965.8	8540.2	166.661	97.11	136.49	0.00386	-0.0442	1633
310.000	11.80608	2.95760	15.883850	1452.7763	1862.8	9486.0	169.748	99.18	137.80	0.00496	-0.0438	1607
320.000	11.69805	2.89163	15.060238	1410.6641	3178.6	10872.2	174.153	102.17	139.76	0.00694	-0.0433	1571
330.000	11.59251	2.82953	14.300423	1370.4333	4514.2	12277.9	178.485	105.14	141.79	0.00946	-0.0428	1538
340.000	11.48930	2.77098	13.597812	1331.8672	5870.7	13704.1	182.748	108.09	143.85	0.01259	-0.0422	1506
350.000	11.38827	2.71569	12.946631	1294.7791	7248.8	15151.7	186.948	111.01	145.94	0.01642	-0.0417	1476
360.000	11.28927	2.66341	12.341826	1259.0137	8648.7	16620.9	191.089	113.86	148.04	0.02100	-0.0411	1447
370.000	11.19217	2.61391	11.778945	1224.4392	10070.7	18112.0	195.174	116.65	150.12	0.02641	-0.0406	1420

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
380.000	11.09683	2.56699	11.254057	1190.9460	11514.3	19624.7	199.205	119.37	152.19	0.03269	-0.0401	1394
390.000	11.00313	2.52247	10.763681	1158.4437	12979.0	21158.5	203.184	121.99	154.21	0.03990	-0.0395	1369
400.000	10.91096	2.48018	10.304730	1126.8590	14464.1	22712.7	207.114	124.51	156.17	0.04805	-0.0390	1345
410.000	10.82020	2.43998	9.874456	1096.1332	15968.4	24286.1	210.993	126.91	158.06	0.05716	-0.0385	1322
420.000	10.73076	2.40174	9.470408	1066.2208	17490.7	25877.8	214.824	129.19	159.87	0.06724	-0.0380	1299
430.000	10.64253	2.36534	9.090400	1037.0870	19029.6	27486.2	218.606	131.33	161.58	0.07827	-0.0376	1278
440.000	10.55542	2.33066	8.732465	1008.7065	20583.7	29110.2	222.340	133.32	163.18	0.09023	-0.0371	1257
450.000	10.46936	2.29760	8.394846	981.0616	22151.8	30748.3	226.023	135.17	164.66	0.10309	-0.0367	1236
460.000	10.38426	2.26607	8.075961	954.1412	23732.4	32399.4	229.657	136.86	166.02	0.11680	-0.0363	1217
470.000	10.30006	2.23599	7.774384	927.9388	25324.7	34062.5	233.241	138.40	167.26	0.13134	-0.0359	1198
480.000	10.21668	2.20727	7.488827	902.4518	26927.7	35736.8	236.774	139.79	168.37	0.14668	-0.0355	1179
490.000	10.13407	2.17985	7.218129	877.6802	28541.1	37422.0	240.256	141.05	169.37	0.16280	-0.0351	1161
500.000	10.05218	2.15365	6.961236	853.6260	30165.0	39118.3	243.687	142.21	170.30	0.17971	-0.0347	1143
510.000	9.97096	2.12863	6.717190	830.2905	31800.1	40826.3	247.068	143.34	171.21	0.19744	-0.0343	1126
520.000	9.89036	2.10470	6.485126	807.6777	33447.7	42547.4	250.403	144.54	172.22	0.21601	-0.0339	1109
530.000	9.81036	2.08183	6.264253	785.7891	35109.8	44283.7	253.696	146.07	173.57	0.23542	-0.0334	1093
540.000	9.73092	2.05996	6.053851	764.6257	36790.5	46039.4	256.961	148.52	175.85	0.25556	-0.0328	1076
550.000	9.65200	2.03904	5.853261	744.1876	38499.2	47823.7	260.229	153.90	181.08	0.27594	-0.0316	1058
560.000	9.57360	2.01903	5.661878	724.4719	40296.0	49696.8	263.649	183.11	210.15	0.29492	-0.0270	1031
565.000	9.53459	2.00935	5.569467	714.8841	41482.7	50922.0	265.624	160.34	187.30	0.31274	-0.0301	1033
570.000	9.49569	1.99988	5.479154	705.4755	42365.5	51843.5	267.250	155.57	182.47	0.32320	-0.0308	1029
580.000	9.41827	1.98156	5.304579	687.1925	44099.6	53655.5	270.402	153.87	180.64	0.34443	-0.0308	1016
590.000	9.34131	1.96402	5.137688	669.6153	45828.3	55462.9	273.491	154.36	181.01	0.36600	-0.0305	1002
600.000	9.26481	1.94724	4.978046	652.7332	47563.7	57277.9	276.544	155.52	182.06	0.38765	-0.0300	989
620.000	9.11320	1.91577	4.678957	621.0089	51069.9	60945.7	282.564	158.49	184.81	0.43153	-0.0289	962
640.000	8.96344	1.88691	4.404464	591.9074	54630.9	64671.6	288.481	161.69	187.79	0.47618	-0.0278	938
660.000	8.81558	1.86042	4.152103	565.2938	58248.2	68457.4	294.306	164.88	190.78	0.52118	-0.0268	915
680.000	8.66967	1.83609	3.919726	541.0168	61921.3	72302.3	300.047	168.01	193.70	0.56605	-0.0257	893
700.000	8.52580	1.81373	3.705446	518.9157	65648.4	76204.6	305.706	171.03	196.51	0.61067	-0.0247	873
720.000	8.38407	1.79316	3.507594	498.8254	69427.3	80162.0	311.282	173.95	199.21	0.65482	-0.0237	855
740.000	8.24456	1.77422	3.324682	480.5818	73255.9	84172.2	316.777	176.76	201.80	0.69832	-0.0228	838
760.000	8.10738	1.75676	3.155378	464.0249	77131.7	88232.7	322.189	179.46	204.27	0.74135	-0.0219	822
780.000	7.97259	1.74065	2.998488	449.0035	81053.3	92341.9	327.528	182.06	206.63	0.78295	-0.0210	807
800.000	7.84028	1.72578	2.852933	435.3755	85018.1	96497.3	332.789	184.56	208.89	0.82357	-0.0202	794
820.000	7.71050	1.71203	2.717738	423.0101	89024.3	100696.7	337.975	186.96	211.04	0.86302	-0.0195	781
840.000	7.58330	1.69930	2.592021	411.7880	93070.0	104938.2	343.085	189.27	213.11	0.90139	-0.0187	770
860.000	7.45872	1.68750	2.474984	401.6013	97153.8	109220.2	348.123	191.50	215.08	0.93829	-0.0180	759
880.000	7.33679	1.67655	2.365903	392.3534	101273.8	113540.7	353.087	193.65	216.97	0.97425	-0.0174	750
900.000	7.21753	1.66639	2.264119	383.9582	105428.6	117898.2	357.984	195.71	218.78	1.00843	-0.0168	741
					1000.00000 bar							
305.631	11.92069	3.30115	16.635341	1532.2755	1101.7	9490.5	167.023	98.28	137.12	0.00531	-0.0441	1654
310.000	11.87352	3.26755	16.250988	1513.3857	1668.9	10091.0	168.975	99.58	137.95	0.00619	-0.0439	1638
320.000	11.76745	3.19398	15.421597	1471.6777	2980.6	11478.6	173.385	102.56	139.90	0.00860	-0.0434	1603
330.000	11.66389	3.12469	14.656197	1431.8888	4312.2	12885.6	177.721	105.52	141.91	0.01164	-0.0429	1570
340.000	11.56268	3.05933	13.948200	1393.7976	5664.5	14313.0	181.987	108.46	143.96	0.01540	-0.0424	1538
350.000	11.46369	2.99758	13.291841	1357.2143	7038.4	15761.6	186.190	111.36	146.03	0.01996	-0.0419	1509
360.000	11.36677	2.93917	12.682060	1321.9772	8434.1	17231.6	190.333	114.21	148.11	0.02539	-0.0414	1481
370.000	11.27178	2.88383	12.114407	1287.9495	9851.6	18723.4	194.420	116.99	150.18	0.03175	-0.0408	1454
380.000	11.17861	2.83134	11.584938	1255.0137	11290.8	20236.5	198.452	119.70	152.22	0.03910	-0.0403	1429
390.000	11.08713	2.78151	11.090175	1223.0742	12751.0	21770.5	202.432	122.31	154.21	0.04747	-0.0398	1405
400.000	10.99722	2.73414	10.627025	1192.0508	14231.4	23324.6	206.361	124.82	156.15	0.05690	-0.0393	1381
410.000	10.90879	2.68908	10.192732	1161.8783	15730.9	24897.8	210.240	127.22	158.02	0.06739	-0.0389	1359
420.000	10.82174	2.64617	9.784840	1132.5041	17248.3	26488.9	214.070	129.49	159.80	0.07893	-0.0384	1337
430.000	10.73596	2.60528	9.401152	1103.8869	18782.1	28096.6	217.850	131.62	161.49	0.09151	-0.0380	1316
440.000	10.65138	2.56629	9.039697	1075.9949	20331.1	29719.6	221.581	133.61	163.06	0.10509	-0.0376	1296
450.000	10.56791	2.52908	8.698706	1048.8044	21893.8	31356.4	225.262	135.45	164.52	0.11962	-0.0372	1277
460.000	10.48548	2.49355	8.376587	1022.2986	23469.0	33006.0	228.893	137.14	165.85	0.13505	-0.0368	1258
470.000	10.40401	2.45960	8.071906	996.4662	25055.6	34667.2	232.472	138.67	167.06	0.15136	-0.0365	1239
480.000	10.32345	2.42716	7.783363	971.2992	26652.8	36339.5	236.001	140.06	168.15	0.16849	-0.0361	1221
490.000	10.24373	2.39613	7.509791	946.7953	28260.3	38022.4	239.478	141.31	169.13	0.18643	-0.0358	1204
500.000	10.16480	2.36644	7.250123	922.9528	29878.2	39716.0	242.904	142.47	170.03	0.20519	-0.0355	1187
510.000	10.08660	2.33802	7.003394	899.7720	31507.0	41421.2	246.279	143.59	170.91	0.22480	-0.0352	1170
520.000	10.00911	2.31081	6.768727	877.2542	33148.2	43139.1	249.608	144.79	171.90	0.24528	-0.0348	1154

Table 22. Properties of benzene along isobars - Continued

T K	ρ mol/L	Z	$\partial P/\partial T$ bar/K	$\partial P/\partial \rho$ (bar·L)/mol	U J/mol	H J/mol	S J/(mol·K)	C_v J/(mol·K)	C_p J/(mol·K)	f/P	μ K/bar	W m/s
530.000	9.93228	2.28475	6.545321	855.4007	34803.9	44872.1	252.895	146.32	173.23	0.26664	-0.0344	1138
540.000	9.85607	2.25978	6.332447	834.2129	36478.1	46624.1	256.153	148.76	175.48	0.28874	-0.0338	1122
550.000	9.78045	2.23585	6.129437	813.6912	38180.1	48404.6	259.414	154.14	180.69	0.31102	-0.0326	1105
560.000	9.70540	2.21290	5.935682	793.8354	39970.1	50273.7	262.827	183.35	209.73	0.33167	-0.0279	1078
565.000	9.66808	2.20179	5.842096	784.1562	41153.4	51496.7	264.798	160.57	186.88	0.35132	-0.0313	1080
570.000	9.63090	2.19090	5.750618	774.6429	42032.8	52416.1	266.420	155.80	182.04	0.36269	-0.0320	1076
580.000	9.55692	2.16979	5.573733	756.1112	43760.0	54223.6	269.564	154.09	180.18	0.38571	-0.0321	1063
590.000	9.48346	2.14954	5.404553	738.2353	45481.7	56026.4	272.645	154.58	180.54	0.40904	-0.0318	1050
600.000	9.41050	2.13010	5.242640	721.0088	47210.1	57836.5	275.691	155.74	181.57	0.43242	-0.0314	1037
620.000	9.26605	2.09352	4.939032	688.4700	50702.2	61494.3	281.694	158.70	184.29	0.47965	-0.0305	1011
640.000	9.12354	2.05978	4.660024	658.4127	54249.0	65209.7	287.594	161.90	187.26	0.52753	-0.0295	987
660.000	8.98295	2.02862	4.403125	630.7329	57852.3	68984.5	293.402	165.09	190.23	0.57564	-0.0285	964
680.000	8.84431	1.99982	4.166172	605.3097	61511.5	72818.2	299.127	168.21	193.13	0.62346	-0.0276	943
700.000	8.70766	1.97317	3.947270	582.0093	65225.0	76709.2	304.769	171.23	195.94	0.67086	-0.0267	923
720.000	8.57304	1.94848	3.744749	560.6913	68990.7	80655.2	310.329	174.14	198.64	0.71765	-0.0258	904
740.000	8.44052	1.92559	3.557130	541.2119	72806.5	84654.1	315.808	176.95	201.23	0.76365	-0.0249	887
760.000	8.31016	1.90432	3.383092	523.4281	76669.9	88703.4	321.205	179.65	203.71	0.80905	-0.0242	871
780.000	8.18201	1.88456	3.221454	507.2013	80579.6	92801.5	326.530	182.24	206.08	0.85284	-0.0234	856
800.000	8.05612	1.86616	3.071151	492.3986	84533.1	96946.0	331.778	184.74	208.35	0.89552	-0.0227	843
820.000	7.93254	1.84900	2.931226	478.8956	88528.5	101134.8	336.950	187.14	210.52	0.93689	-0.0220	830
840.000	7.81130	1.83300	2.800813	466.5764	92564.1	105366.0	342.048	189.45	212.60	0.97707	-0.0213	818
860.000	7.69243	1.81803	2.679126	455.3348	96638.2	109638.0	347.075	191.68	214.59	1.01564	-0.0207	807
880.000	7.57595	1.80403	2.565454	445.0737	100749.2	113948.8	352.027	193.82	216.49	1.05317	-0.0201	797
900.000	7.46187	1.79091	2.459150	435.7056	104895.5	118297.0	356.914	195.89	218.32	1.08879	-0.0196	788

5. Acknowledgments

This work could not have been accomplished without the generous assistance of the following individuals. Mr. Frank Williamson searched the literature, provided documents, and prepared the final tables; also Dr. Selby Angus and Mrs. K. M. de Reuck of the I.U.P.A.C. Thermodynamic Tables Project Centre, London, have been most helpful in communicating their references. Robert D. McCarty contributed the essential least-squares computer program.[68] James F. Ely indicated the numerical integration technique,[71] and the method for computing fugacities. Appreciation is expressed to Karen A. Bowie for devotion in preparing the final manuscript. Support from the NBS Office of Standard Reference Data is gratefully acknowledged.

6. References

[1]D. Ambrose and I. J. Lawrenson, Process Technol. Int. **17**, 968 (1972).
[2]J. F. Counsell, I. J. Lawrenson, and E. B. Lees, "The Thermodynamic Properties of Benzene and Toluene," Natl. Phys. Lab., Report No. NPL-Chem-52 (Teddington, England, 1976)
[3]N. B. Vargaftik, *Tables on the Thermophysical Properties of Liquids and Gases*, 2nd ed. (Halsted Press, Wiley, N.Y 1975).
[4]T. S. Akhundov and F. G. Abdullaev, Izv. Vyssh. Uchebn Zaved., Neft Gaz. **13**, 67 (1970).
[5]L. N. Zavarykina, V. V. Zotov, and Yu. A. Neruchev, Nauchn Tr. Kursk. Gos. Pedagog. Inst. **184**, 7 (1978).
[6]J. Chao, Hydrocarbon Process. **58**, 295 (1979).
[7]H. Kratzke, R. Niepmann, E. Spillner, and F. Kohler, Fluid Phase Equilibria **16**, 287 (1984).
[8]R. D. Goodwin, "Hydrogen Sulfide Provisional Thermophysical Properties From 188 to 700 K at Pressures to 75 MPa," Nat. Bur. Stand. (U.S.) Interagency Report No. NBSIR 83-1694, 1983.
[9]R. D. Goodwin, J. Phys. Chem. Ref. Data **14**, 849 (1985).
[10]E. J. Gornowski, E. H. Amick, and A. N. Hixson, Ind. Eng. Chem. **39**, 1348 (1947).
[11]P. Bender, G. T. Furukawa, and J. R. Hyndman, Ind. Eng. Chem. **44**, 387 (1952).
[12]W. B. Kay and T. P. Nevens, Chem. Eng. Progr. Symp. Ser. No. 3, **48**, 108 (1952).
[13]M. Simon, Bull. Soc. Chim. Belg. **66**, 375 (1957).
[14]D. Ambrose, J. D. Cox, and R. Townsend, Trans. Faraday Soc. **56**, 1452 (1960).
[15]J. F. Connolly and G. A. Kandalic, J. Chem. Eng. Data **7**, 137 (1962).
[16]D. Ambrose, B. E. Broderick, and R. Townsend, J. Chem. Soc. A 633 (1967).
[17]A. N. Campbell and R. M. Chatterjee, Can. J. Chem. **47**, 3893 (1969).
[18]L. M. Artyukhovskaya, E. T. Shimanskaya, and Yu. I. Shimanskii, Ukr. Fiz. Zh. (Russ. Ed.) **15**, 1974 (1970).
[19]J. L. Hales and R. Townsend, J. Chem. Thermodynamics **4**, 763 (1972).
[20]G. D. Oliver, M. Eaton, and H. M. Huffman, J. Am. Chem. Soc. **70**, 1502 (1948).
[21]A. W. Jackowski, J. Chem. Thermodyn. **6**, 49 (1974).
[22]G. Tammann, *Kristallisieren und Schmelzen* (University of Leipzig, Leipzig, 1903).
[23]P. W. Bridgman, Phys. Rev. **3**, 153 (1914).
[24]L. Deffet, Bull. Soc. Chim. Belg. **44**, 71 (1935).
[25]N. J. Trappeniers, Acad. Royale de Belgique, Memoires in-8°, **27**, Fasc. 10, 75 (1952).
[26]T. Makita and T. Takagi, Rev. Phys. Chem. Japan **38**, 41 (1968).
[27]J. Osugi, K. Shimizo, K. Yasunami, M. Moritoki, and A. Onodera, Rev. Phys. Chem. Japan **38**, 90 (1968).
[28]M. Ghelfenstein, Thèse de Doctorat ès-Sciences, Orsay (1973).
[29]P. Pruzan, Thèse de Doctorat ès-Sciences, Paris (1976).
[30]P. Figuière, A. H. Fuchs, M. Ghelfenstein, and H. Szwarc, J. Phys. Chem. Solids **39**, 19 (1978).
[31]D W. Scott and A. G. Osborn, J. Phys. Chem. **83**, 2714 (1979).
[32]D. Ambrose, J. Chem. Thermodynamics **13**, 1161 (1981).
[33]A Zmaczynski, J. Chim. Phys. **27**, 503 (1930).
[34]A. F. Forziati, W. R. Norris, and F. D. Rossini, J. Res. Natl. Bur. Stand. (U.S.) **43**, 555 (1949).

[35]A. N. Campbell and R. M. Chatterjee, Can. J. Chem. **46**, 575 (1968).
[36]D. D. Kalafati, D. S. Rasskazov, and E. K. Petrov, Zh. Fiz. Khim. **41**, 1357 (1967).
[37]T. S. Akhundov and F. G. Abdullaev, Russ. J. Phys. Chem. **45**, 1063 (1971).
[38]J. Teichmann, "Pressure-Volume-Temperature Measurements with Fluid Propane and Benzene," Dissertation, Ruhr-Universität, Bochum (1978).
[39]G. Natarajan and D. S. Viswanath, J. Chem. Eng. Data **30**, 137 (1985).
[40]K. R. Hall and P. T. Eubank, Ind. Eng. Chem. Fundam. **15**, 323 (1976).
[41]E. Kuss, "PVT Data at High Pressures," Ber.-Dtsch. Ges. Mineraloelwiss. Kohlechem., 4510 (1976).
[42]J. L. Hales and H. A. Gundry, J. Phys. E **16**, 91 (1983).
[43]G. C. Straty, M. J. Ball, and T. J. Bruno, J. Chem. Eng. Data **32**, 163 (1987).
[44]J. W. Glanville and B. H. Sage, Ind. Eng. Chem. **41**, 1272 (1949).
[45]L. S. Shraiber and N. G. Pechenyuk, Russ. J. Phys. Chem. **39**, 219 (1965).
[46]J. L. Hales, J. Phys. E. **3**, 855 (1970).
[47]I. A. Tugarev, Z. I. Avdus, and V. F. Nozdrev, Russ. J. Phys. Chem. **49**, 732 (1975).
[48]D. S. Kurumov, R. M. Muvdaev, and B. A. Grigorev, Izv. Vyssh. Uchebn. Zaved., Neft Gaz. **20**, 75 (1977).
[49]J. H. Mathews, J. Am. Chem. Soc. **48**, 562 (1926).
[50]E. F. Fiock, D. C. Ginnings, and W. B. Holton, J. Res. Natl. Bur. Stand. (U.S.) **6**, 881 (1931).
[51]N. S. Osborne and D. C. Ginnings, J. Res. Natl. Bur. Stand. (U.S.) **39**, 453 (1947).
[52]V. Svoboda, F. Vesely, R. Holub, and J. Pick, Collect. Czech. Chem. Commun. **38**, 3539 (1973).
[53]S. S. Todd, I. A. Hossenlopp, and D. W. Scott, J. Chem. Thermodynamics **10**, 641 (1978).
[54]N. I. Gorbunova, V. M. Simonov, and V. A. Shipova, in *Proceedings of the 8th Symposium on Thermophysical Properties* (ASME, New York, 1982), Vol. 2 p. 429.
[55]A. Pompe and T. H. Spurling, *Virial Coefficients for Gaseous Hydrocarbons*, (C.S.I.R.O., Australia, 1974).
[56]J. H. Dymond and E. B. Smith, *The Virial Coefficients of Gases and Mixtures*, (Oxford, Fairlawn, NJ, 1979).
[57]N. Al-Bizreh and J. Wormald, J. Chem. Thermodynamics **9**, 749 (1977).
[58]M. Gehrig and H. Lentz, J. Chem. Thermodynamics **9**, 445 (1977).
[59]A. M. Mamedov, T. S. Akhundov, and F. G. Abdullaev, Inzh.-Fiz. Zh. **30**, 705 (1976).
[60]M. Taslimi, "Die PVT-Daten von 20 Organisehen FlussigKeiten und ihre Zusammenhange mit der Molekulstructure," Thesis, Tech. Univ. Hannover, 1969.
[61]H. Essex, Z. Anorg. Chem. **88**, 189 (1914).
[62]T. W. Richards, E. P. Bartlett, and J. H. Hodges, J. Am. Chem. Soc. **43**, 1538 (1921).
[63]P. W. Bridgman, Proc. Amer. Acad. Arts Sci. **66**, 185 (1930).
[64]R. E. Gibson and J. F. Kincaid, J. Am. Chem. Soc. **60**, 511 (1938).
[65]M. D. Pena and G. Tardajos, J. Chem. Thermodyn. **10**, 19 (1978).
[66]N. I. Gorbunova, V. M. Simonov, and V. A. Shipova, High Temp. (U.S.) **21**, 204 (1983); Transl. of Teplofiz. Vys. Temp. (U.S.S.R.) **21**, 270 (1983).
[67]Institut fur Physikalische, Chemie und Elektrochemi, Universität Karlsruhe, Karlsruhe, West Germany, P–V–T data (to be published).
[68]R. D. McCarty, "Determination of Thermodynamic Properties from the Experimental P–V–T Relationships," in *Experimental Thermodynamics* edited by B. Le Neindre and B. Vodar (Butterworths, London, 1975), Vol. II, Chap. 10.
[69]J. Chao (private communication) now published in: *TRC Thermodynamic Tables, Hydrocarbons* (Texas A&M University, College Station, TX, 1986).
[70]J. L. San Jose, G. Mollinger, and R. C. Reid, J. Chem. Eng. Data **21**, 414 (1976).
[71]B. Carnahan, H. A. Luther, and J. O. Wilkes, *Applied Numerical Methods*, (Wiley, New York, 1969).
[72]J. M. Lenoir, K. E. Hayworth, and H. G. Hipkin, J. Chem. Eng. Data **16**, 280 (1971).
[73]Yu. L. Rastorguev, B. A. Grigorev, and G. S. Yanin, Izv. Vyssh. Uchebn. Zaved., Neft Gaz. **18**, 73 (1975).
[74]T. S. Akhundov and Ch. I. Sultanov, Izv. Vyssh. Uchebn. Zaved., Neft Gaz. **17**, 72 (1974).
[75]A. M. Mamedov, T. S. Akhundov, and Ch. I. Sultanov, Izv. Vyssh. Uchebn. Zaved., Nef Gaz. **19**, 65 (1976).
[76]A. M. Mamedov, T. S. Akhundov, Ch. I. Sultanov, and R. A. Eksaev, Teplofiz. Svoistva Gazov, Mater. Vses. Konf. Teplofiz. Svoistram, **5**, 77 (1976).
[77]V. V. Zotov, Yu. A. Neruchev, and N. F. Otpushchennikov, Izv. Vyssh. Uchebn. Zaved. Fix. **11**, 85 (1968).
[78]V. V. Zotov, Yu. A. Neruchev, and N. F. Otpushchennikov, Russ. J. Phys. Chem. **43**, 431 (1969).
[79]M. E. Aniskin, Nauchn. Tr. Kursk. Gos. Pedagog. Inst. **184**, 154 (1978).
[80]M. Bobik, J. Chem. Thermodynamics **10**, 1137 (1978).
[81]N. F. Otpushchennikov, G. M. Pankevich, Yu. S. Shoytov, A. L. Badalyan, V. V. Zotov, and Yu. A. Neruchev, Fluid Mech. Sov. Res. **3**, 96 (1974).
[82]G. M. Pankevich, Nauchn. Tr. Kursk. Gos. Pedgog. Inst. **23**, 174 (1974).
[83]G. M. Pankevich and V. V. Zotov, Nauchn. Tr. Kursk. Gos. Pedgog. Inst. **81**, 91 (1976).
[84]F. W. Reiter, Ber. Bunsenges Phys. Chem. **71**, 629 (1967).
[85]P. G. Francis, M. L. McGlashan, and C. J. Wormald, J. Chem. Thermodynamics **1**, 441 (1969).
[86]J. L. Fortier, G. C. Benson, and P. Picker, J. Chem. Thermodynamics **8**, 289 (1976).
[87]P. H. Clarke, P. G. Francis, M. George, R. C. Phutela, and G. K. St. C. Roberts, J. Chem. Thermodynamics **11**, 125 (1979).
[88]E. H. Griffiths and D. Marshall, Philos. Mag. and J. Sci. **41**, 1 (1896).
[89]J. A. Sutcliffe, F. C. Lay, and W. L. Prichard, Proc. Roy. Soc., London **A115**, 88 (1927).
[90]D. D. Deshpande and L. G. Bhatgadde, Aust. J. Chem. **24**, 1817 (1971).
[91]T. Takagi and H. Teranishi, Zairyo **33**, 134 (1984).

Appendix A: Property Reference Index for Benzene

Reference	Year	(Range of T)/K
Vapor pressure		
Zmaczynski (Ref. 33)	1930	325–395
Gornowski (Ref.10)	1947	403–553
Forziati (Ref. 34)	1949	284–354
Bender (Ref. 11)	1952	373–553
Connolly (Ref. 15)	1962	273–561
Ambrose (Ref. 16)	1967	420–560
Campbell (Ref. 35)	1967	379–561
Kalafati (Ref 36)	1967	422–555
Akhundov (Ref. 37)	1971	298–553
Ambrose (Ref. 1)	1972	293–558
Jackowski (Ref. 21)	1974	268.68
Teichmann (Ref. 38)	1978	454–556
Scott (Ref. 31)	1979	279–389
Ambrose (Ref. 32)	1981	286–383
Natarajan (Ref. 39)	1985	353–480
Enthalpy of vaporization		
Griffiths (Ref. 88)	1896	293–323
Mathews (Ref. 49)	1926	353
Sutcliffe (Ref. 89)	1927	360–425
Fiock (Ref. 50)	1931	313–353
Osborne (Ref. 51)	1947	298
Lenoir (Ref. 72)	1971	414–561
Svoboda (Ref. 52)	1973	298–353
Todd (Ref. 53)	1978	298–378
Scott (Ref. 31)	1979	315–353
Gorbunova (Ref. 54)	1982	300–560
Natarajan (Ref. 39)	1985	353–480

Reference	Year	(Range of T)/K
Saturated liquid density		
Gornowski (Ref. 10)	1947	513–558
Glanville (Ref. 44)	1949	311–511
Connolly (Ref. 15)	1962	403–553
Shraiber (Ref. 45)	1965	293–348
Campbell (Ref. 17)	1967	379–562
Artyukovskaya (Ref. 18)	1970	553–562
Hales (Ref. 46)	1970	293–423
Akhundov (Ref. 37)	1971	298–553
Ambrose (Ref. 1)	1972	293–558
Hales (Ref. 19)	1972	293–490
Tugarev (Ref. 47)	1975	373–562
Kuss (Ref. 41)	1976	298–353
Kurumov (Ref. 48)	1977	279–348
Teichmann (Ref. 38)	1978	300–525
Hales (Ref. 52)	1983	393–557
Straty (Ref. 43)	1986	423–559
Saturated vapor density		
Gornowski (Ref. 10)	1947	513–558
Connolly (Ref. 15)	1962	433–553
Campbell (Ref. 17)	1976	379–559
Akhundov (Ref. 37)	1971	298–553
Artyukovskaya (Ref. 18)	1971	554–561
Ambrose (Ref. 1)	1972	293–558
Counsell (Ref. 2)	1976	290–560
Hales (Ref. 42)	1983	308–561
Kratzke (Ref. 7)	1984	300–465

Reference	Year	Type	(Range of T)/K	(Range of P)/bar
Specific heat				
Scott (Ref. 31)	1947	$C_p^\circ(T)$	341–471	...
Oliver (Ref. 20)	1948	$C_\sigma(T)$	287–353	...
Reiter (Ref. 84)	1967	vapor	298–423	...
Francis (Ref. 85)	1969	J-T	332–403	low
Akhundov (Ref. 74)	1974	$C_p(T,P)$	306–671	50–250
Rastorguev (Ref. 73)	1975	$C_p(T,P)$	305–463	1–13
Fortier (Ref. 86)	1976	C_p	298	...
Mamedov (Ref. 59,75,76)	1976	$C_p(T,P)$	415–670	5–45
San Jose (Ref. 70)	1976	$C_\sigma(T)$	433–493	...
San Jose (Ref. 70)	1976	$C_p(T,P)$	433–493	200–300
Todd (Ref. 53)	1978	$C_p^\circ(T),C_p(T,P)$	333–527	1
Chao (Ref. 69)	1978	$C_p^\circ(T)$	273–1500	1 atm
Chao (Ref. 6)	1979	$C_\sigma(T)$	279–360	...
Clarke (Ref. 87)	1979	Joule–Thomson	310–420	low

Appendix A. (*continued*)

Reference	Year	Type	(Range of T)/K	(Range of P)/bar
		Speed of sound		
Makita (Ref. 26)	1968	$W(T,P)$	283–343	20–2000
Zotov (Ref. 77)	1968	$W_\sigma(T)$	303–560	···
Deshpande (Ref. 90)	1971	$W(\rho,T)$	298–318	1
Otpushchennikov (Ref. 81)	1974	$W(\rho,T)$	313–363	28–850
Pankevich (Ref. 82)	1974	$W(\rho,T)$	403–603	20–690
Pankevich (Ref. 83)	1976	$W(\rho,T)$	293–503	20–1080
Pankevich (Ref. 83)	1976	$W(\rho,T)$	453–603	30–500
Aniskin (Ref. 79)	1978	$W_\sigma(T)$	453–558	···
Aniskin (Ref. 79)	1978	$W(\rho,T)$	503–593	18
Bobik (Ref. 80)	1978	$W_\sigma(T)$	280–550	···
Bobik (Ref. 80)	1978	$W(T,P)$	300–463	2–600
Takagi (Ref. 91)	1984	$W(T,P)$	293–303	1–1600
		$P\rho T$ compressibility data		
Essex (Ref. 61)	1914		293–373	1–3000
Richards (Ref. 62)[a]	1921		293	100–500
Bridgman (Ref. 63)	1930		323–368	0–3500
Gibson (Ref. 64)[a]	1938		298–335	1–1000
Gornowski (Ref. 10)	1947		513–628	26–67
Glanville (Ref. 44)	1949		378–511	7–690
Connolly (Ref. 15)	1962		403–543	5–180
Taslimi (Ref. 60)[a]	1969		298–353	100–1800
Kuss (Ref. 41)[a]	1976		298–353	100–2000
Mamedov (Ref. 59)	1976		298–673	100–510
Gehrig (Ref. 58)	1977		323–683	50–3000
Kurumov (Ref. 48)	1977		283–298	15–780
Figuière (REf. 48)	1978		298–324	10–1470
Pena (Ref. 65)[a]	1978		298–333	···
Teichmann (Ref. 38)	1978		320–566	20–600
Straty (Ref. 43)	1986		423–723	33–350

[a] These authors give isothermal compressibilities, $\rho\left(\frac{\partial P}{\partial \rho}\right)_T$.