

Carbon Monoxide Thermophysical Properties from 68 to 1000 K at Pressures to 100 MPa

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Carbon Monoxide Thermophysical Properties from 68 to 1000 K at Pressures to 100 MPa

Robert D. Goodwin

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An improved form of the nonanalytic equation of state is used to compute thermodynamic properties of carbon monoxide along isobars up to 100 MPa, at integral temperatures from coexistence to 1000 K.

Key words: carbon monoxide; compressibility factors; densities; enthalpies; entropies; equation of state; fugacities; heats of vaporization; ideal gas; Joule-Thomson inversion; orthobaric densities; specific heats; speeds of sounds; vapor pressures.

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Symbols and Units

Subscripts c and t refer to critical and to liquid 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, $\text{J mol}^{-1} \text{K}^{-1}$ |
| $C_v(\rho, T)$ | isochoric heat capacity, $\text{J mol}^{-1} \text{K}^{-1}$ |
| $C_v(T)_\sigma$ | isochoric heat capacity at the liquid boundary, $\text{J mol}^{-1} \text{K}^{-1}$ |
| $C_p(\rho, T)$ | isobaric heat capacity, $\text{J mol}^{-1} \text{K}^{-1}$ |
| d | density, kg/m^3 |
| $E(\rho, T)$ | internal energy, J/mol |
| E_0° | 4555.006 J/mol (arbitrary) |
| f/P | fugacity/pressure coefficient |
| $F(\rho, T)$ | 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 $T = 0$ |
| J | joule, $1 \text{ N} \cdot \text{m}$ |
| L | liter, 10^{-3} m^3 |
| mol | 28.01 g of carbon monoxide |
| P | pressure in MPa; 1 MPa = 10^6 N/m^2 , 1 bar = 10^5 N/m^2 , 1 atm = 1.013 25 bar = 0.101 325 MPa |
| $P_\sigma(T)$ | vapor pressure of saturated liquid, MPa |
| $P_\sigma(\rho)$ | $P_\sigma[T_\sigma(\rho)]$, vapor pressure as function of density |
| Q_{vap} | ΔH_{vap} , the heat of vaporization, J/mol |
| R | gas constant, $8.3145 \text{ J mol}^{-1} \text{ K}^{-1}$, 0.008 314 5 (MPa · L/mol)/K |
| ρ | density, mol/L |
| σ | ρ/ρ_c , reduced density |
| $S(\rho, T)$ | entropy, $\text{J mol}^{-1} \text{ K}^{-1}$ |
| T | temperature, K |
| $T_\sigma(\rho)$ | liquid-vapor coexistence temperature, K |
| $\Theta(\rho)$ | defined locus of temperatures for the EOS, K |
| v | $1/\rho$, molal volume, L/mol |
| $\omega(\rho, T)$ | $[1 - \Theta(\rho)/T]$, 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 |
| $Z(P, \rho, T)$ | $P/(\rho \cdot R \cdot T)$, the "compressibility factor" |

1. Introduction

Carbon monoxide (CO) is an industrially important fluid, yet the only thorough correlation of its thermophysical properties apparently is the 1956 report by Leah.⁵⁰ In 1955, ideal gas state functions and low-density $P\rho T$ data were tabulated to high temperatures by Hilsenrath *et al.*⁴⁵ In 1963, Mullins *et al.* derived vapor pressures and heats of vaporization up to the normal boiling point (nbp).⁶² Also in 1963 Hust and Stewart tabulated properties along isobars by corresponding states with nitrogen.⁴⁷ Some more recent data are mentioned in sections below, including our recent $P\rho T$ measurements.³⁶

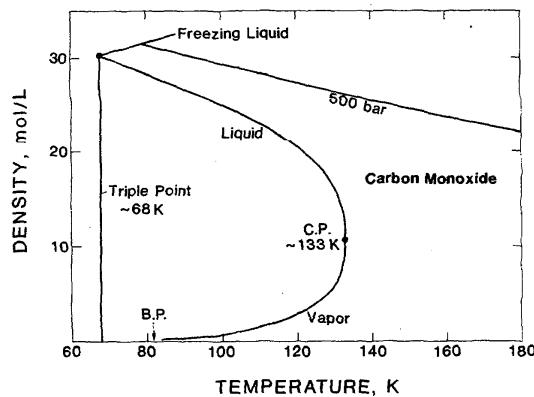


FIG. 1. Density-temperature phase diagram of carbon monoxide.

In the present report we give a significantly improved version of the nonanalytic equation of state that has been used for the light hydrocarbons and for hydrogen sulfide.^{37-39,44} The density-temperature phase diagram is outlined in Fig. 1. Selected fixed-point values are in Table 1.

The triple-point temperature is from Mullins *et al.*⁶²; the normal boiling-point temperature is from vapor-pressure Eq. (2). Our selected critical-point temperature, $T_c = 132.85 \text{ K}$, is lower than 132.92 K reported by Mathias and Crommelin.^{52,53}

Densities of liquid and of vapor at the triple and at the boiling-point temperatures are from Eqs. (3) and (4). Our selected critical density is $\rho_c = 10.85 \text{ mol/L}$, as compared with the 10.65 mol/L value reported by Mathias and Crommelin.⁵³ Rectilinear diameter data in Ref. 53 extrapolate linearly to about 10.9 mol/L at $T = T_c$, as plotted in Ref. 36.

Our fixed-point pressures are from vapor-pressure Eq. (2). Our $P_c = 3.4935 \text{ MPa}$ agrees with Mathias and Crommelin, 3.4987 MPa. Critical constants given by Cardoso¹³ were $T_c = 134.45 \text{ K}$, $\rho_c = 11.10 \text{ mol/L}$, and $P_c = 3.506 \text{ MPa}$.

2. Developing the Equation of State

This isochoric equation of state (EOS) originates on a given, liquid-vapor coexistence boundary.³⁵ Hence we first formulate the melting line, the vapor pressures, and the orthobaric densities.

2.1. Melting and Vapor Pressures

a. The Melting Line

Data of Verschoyle⁸¹ and of Clusius *et al.*¹⁸ from 1.0 to 25 MPa are formulated by the Simon equation

TABLE I. Fixed-point values used for carbon monoxide

| | Triple point | Boiling point | Critical point |
|----------------|--------------|---------------|----------------|
| Temperature, K | 68.127 | 81.6375 | 132.85 |
| Pressure, MPa | 0.015 40 | 0.101 325 | 3.4935 |
| Density, mol/L | | | |
| vapor | 0.027 45 | 0.155 79 | 10.85 |
| liquid | 30.2497 | 28.2544 | 10.85 |

$$P = P_t + P_0 \cdot [(T/T_t)^\epsilon - 1], \quad (1)$$

where $P_0 = 169.065$ MPa and $\epsilon = 1.79$. For the 16 data points used, the rms of relative pressure deviations is 1.0%. This formulation is used only as a low-temperature limit for the isobar tabulations in Table 15, where it is extrapolated to 100 MPa.

b. The Vapor Pressures

Table 2 presents experimental and formulated data. Temperatures of Clayton and Giauque¹⁶ are increased by 0.025 K,⁴⁶ and those of Michels *et al.*⁶⁰ are adjusted to the IPTS-68.³ The exponent p in Eq. (2) was adjusted such that, at the critical point, the slope is approximately equal to that of the critical isochore from the EOS. Let $x \equiv T/T_c$ then, for P in MPa,

$$\ln(10 \cdot P) = a/x + b + c \cdot x + d \cdot x^2 + e \cdot x^3 + f \cdot (1-x)^p, \quad (2)$$

where $p = 1.25$, and

$$a = -7.461\,267\,899,$$

$$b = 16.516\,128\,685,$$

$$c = -12.217\,914\,523,$$

$$d = 9.048\,182\,735,$$

$$e = -2.331\,639\,377,$$

$$f = 0.892\,713\,142.$$

For the 56 vapor-pressure data used, the rms relative deviation is 0.06%. The experimental residual in the last column of Table 2 is derived from the elementary vapor-pressure equation, $\ln(P_\sigma) = a - b/T$, by constraint to the end points. It is

$$\ln(P/P_t)/\ln(P_c/P_t) - (1 - T_c/T)/(1 - T_c/T_c).$$

Its cubic behavior versus T dictates the number of terms needed for Eq. (2).

2.2. The Orthobaric Densities

a. Saturated Liquid Densities

Table 3 presents experimental and formulated data. Densities of Terry *et al.*⁷⁴ are increased by 0.35%; see Refs. 1, 42, and 43. Recent data at ID = 92 were derived by Goodwin as detailed in Ref. 36. For Eq. (3) the argument is $u(T) \equiv (1 - T/T_c)$, and the coefficient b is constrained to a rectilinear diameter determined by the average of liquid and vapor densities at 110.0 K. With $\beta = 0.35$,

$$(\rho_l/\rho_c - 1) = a \cdot u^\beta + b \cdot u + c \cdot u^2 + d \cdot u^3, \quad (3)$$

$$a = 1.858\,874\,11,$$

$$b = 0.786\,203\,43,$$

$$c = -0.340\,489\,76,$$

$$d = 0.350\,409\,79.$$

The rms relative deviation is 0.036% for the 33 selected liquid density data. Excluded data, with zero least-squares weights, appear at the bottom of Table 3.

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

| ID | Wt | T, K | T/T _c | P, MPa | Calc. P MPa | % dev. | dP _σ /dT MPa/K | Resid. MPa/K |
|----|------|---------|------------------|---------|----------------|-----------|------------------------------|-----------------|
| 3 | 1.00 | 68.127 | .51281 | .01540 | .01540 | -.01 | .00263 | -.00002 |
| 4 | .50 | 68.296 | .51408 | .01584 | .01585 | -.07 | .00269 | .00010 |
| 4 | .50 | 68.681 | .51698 | .01691 | .01691 | -.02 | .00283 | .00067 |
| 3 | 1.00 | 69.000 | .51938 | .01784 | .01784 | -.02 | .00296 | .00113 |
| 4 | .50 | 68.292 | .51405 | .01586 | .01584 | .13 | .00269 | .00045 |
| 6 | .50 | 69.125 | .52033 | .01820 | .01821 | -.04 | .00301 | .00117 |
| 4 | .50 | 69.590 | .52382 | .01962 | .01965 | -.16 | .00320 | .00148 |
| 6 | .50 | 69.916 | .52628 | .02074 | .02072 | .12 | .00333 | .00235 |
| 3 | 1.00 | 70.000 | .52691 | .02100 | .02100 | .01 | .00337 | .00224 |
| 4 | .50 | 70.490 | .53060 | .02264 | .02270 | -.27 | .00359 | .00222 |
| 6 | .50 | 70.715 | .53229 | .02352 | .02352 | -.00 | .00369 | .00294 |
| 3 | 1.00 | 71.000 | .53444 | .02460 | .02459 | .04 | .00382 | .00328 |
| 4 | .50 | 71.523 | .53837 | .02658 | .02666 | -.29 | .00408 | .00315 |
| 3 | 1.00 | 72.000 | .54196 | .02867 | .02866 | .04 | .00432 | .00415 |
| 6 | .50 | 72.252 | .54386 | .02982 | .02976 | .17 | .00445 | .00459 |
| 3 | 1.00 | 73.000 | .54949 | .03325 | .03324 | .02 | .00486 | .00487 |
| 6 | .50 | 73.272 | .55154 | .03463 | .03458 | .12 | .00501 | .00523 |
| 6 | .50 | 73.886 | .55616 | .03776 | .03777 | -.02 | .00537 | .00537 |
| 3 | 1.00 | 74.000 | .55702 | .03840 | .03839 | .03 | .00544 | .00553 |
| 6 | .50 | 74.612 | .56163 | .04179 | .04183 | -.10 | .00582 | .00563 |
| 3 | 1.00 | 75.000 | .56455 | .04415 | .04414 | .02 | .00607 | .00606 |
| 6 | .50 | 75.460 | .56801 | .04697 | .04700 | -.08 | .00638 | .00609 |
| 3 | 1.00 | 76.000 | .57207 | .05056 | .05055 | .03 | .00675 | .00652 |
| 6 | .50 | 76.378 | .57492 | .05304 | .05315 | -.20 | .00702 | .00625 |
| 3 | 1.00 | 77.000 | .57960 | .05767 | .05766 | .02 | .00748 | .00688 |
| 6 | .50 | 77.294 | .58181 | .05981 | .05989 | -.14 | .00770 | .00668 |
| 3 | 1.00 | 78.000 | .58713 | .06553 | .06552 | .01 | .00826 | .00715 |
| 6 | .50 | 78.137 | .58816 | .06657 | .06666 | -.13 | .00837 | .00691 |
| 6 | .50 | 78.976 | .59447 | .07387 | .07397 | -.14 | .00907 | .00709 |
| 3 | 1.00 | 79.000 | .59466 | .07420 | .07419 | .01 | .00909 | .00736 |
| 6 | .50 | 79.886 | .60132 | .08249 | .08259 | -.12 | .00987 | .00725 |
| 3 | 1.00 | 80.000 | .60218 | .08373 | .08372 | .01 | .00998 | .00752 |
| 3 | 1.00 | 81.000 | .60971 | .09416 | .09416 | -.01 | .01092 | .00758 |
| 6 | .50 | 81.130 | .61069 | .09558 | .09560 | -.02 | .01105 | .00756 |
| 3 | 1.00 | 81.638 | .61451 | .10133 | .10133 | -.00 | .01155 | .00762 |
| 6 | .50 | 82.061 | .61769 | .10632 | .10630 | .02 | .01198 | .00766 |
| 6 | .10 | 83.161 | .62598 | .12027 | .12012 | .12 | .01314 | .00783 |
| 5 | 1.50 | 93.253 | .70194 | .31878 | .31862 | .05 | .02724 | .00557 |
| 5 | 1.50 | 94.801 | .71359 | .36298 | .36287 | .03 | .02996 | .00502 |
| 5 | 1.50 | 96.238 | .72441 | .40770 | .40783 | -.03 | .03263 | .00441 |
| 5 | 1.50 | 101.273 | .76231 | .59754 | .59769 | -.03 | .04307 | .00265 |
| 5 | 1.50 | 103.078 | .77590 | .67904 | .67915 | -.02 | .04723 | .00204 |
| 5 | 1.50 | 105.130 | .79134 | .78113 | .78113 | -.00 | .05223 | .00139 |
| 5 | 1.50 | 108.807 | .81902 | .99057 | .99074 | -.02 | .06195 | .00023 |
| 5 | 1.50 | 108.810 | .81904 | .99085 | .99093 | -.01 | .06195 | .00025 |
| 5 | 1.50 | 112.470 | .84659 | 1.23712 | 1.23690 | .02 | .07263 | .00065 |
| 5 | 1.50 | 116.307 | .87548 | 1.53911 | 1.53887 | .02 | .08497 | -.00140 |
| 5 | 1.50 | 116.309 | .87549 | 1.53922 | 1.53904 | .01 | .08498 | -.00141 |
| 5 | 1.50 | 119.363 | .89848 | 1.81486 | 1.81475 | .01 | .09572 | -.00180 |
| 5 | 1.50 | 122.686 | .92349 | 2.15378 | 2.15367 | .01 | .10846 | -.00197 |
| 5 | 1.50 | 124.966 | .94065 | 2.41080 | 2.41163 | -.03 | .11794 | -.00198 |
| 5 | 1.50 | 127.557 | .96016 | 2.73207 | 2.73212 | -.00 | .12964 | -.00165 |
| 5 | 1.50 | 129.851 | .97743 | 3.04295 | 3.04247 | .02 | .14118 | -.00115 |
| 5 | 1.50 | 131.117 | .98696 | 3.22624 | 3.22567 | .02 | .14839 | -.00076 |
| 5 | 1.50 | 131.880 | .99270 | 3.34073 | 3.34074 | -.00 | .15336 | -.00050 |
| 5 | 1.50 | 132.572 | .99791 | 3.44808 | 3.44872 | -.02 | .15910 | -.00021 |

56 data points, rms deviation .063%.

ID code: (3) Mullins, (4) Shimoda, (5) Michels, (6) Clayton.

b. Saturated Vapor Densities

Table 4 presents experimental and formulated data. At ID = 10, the heat of vaporization of Clayton and Giauque,¹⁶ 1640 J/mol, has been used in the Clapeyron equation with Eqs. (2) and (3) to derive the vapor density at the normal boiling point. Data at ID = 91,92 were derived by Good-

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

| ID | Wt. | T, K | T/T _c | d kg/m ³ | ρ mol/L | Calc. ρ mol/L | % dev | dρ ₁ /dT mol L ⁻¹ K ⁻¹ |
|----|------|---------|------------------|------------------------|------------|------------------|----------|--|
| 4 | 1.00 | 68.130 | .51283 | 847.1 | 30.244 | 30.249 | -.02 | -.1423 |
| 4 | 1.00 | 73.560 | .55371 | 825.5 | 29.473 | 29.466 | .02 | -.1463 |
| 3 | 1.00 | 77.729 | .58509 | 808.3 | 28.857 | 28.849 | .03 | -.1500 |
| 4 | 1.00 | 78.030 | .58735 | 806.4 | 28.790 | 28.804 | -.05 | -.1503 |
| 3 | 1.00 | 79.995 | .60215 | 798.3 | 28.500 | 28.506 | -.02 | -.1524 |
| 81 | 1.00 | 81.650 | .61460 | 791.8 | 28.270 | 28.252 | .06 | -.1543 |
| 3 | 1.00 | 82.415 | .62036 | 788.1 | 28.136 | 28.134 | .01 | -.1552 |
| 3 | 1.00 | 84.953 | .63947 | 776.7 | 27.728 | 27.736 | -.03 | -.1584 |
| 3 | 1.00 | 87.788 | .66081 | 764.2 | 27.282 | 27.281 | .00 | -.1625 |
| 81 | 1.00 | 90.000 | .67746 | 754.0 | 26.919 | 26.918 | .00 | -.1661 |
| 3 | 1.00 | 90.067 | .67796 | 753.5 | 26.901 | 26.907 | -.02 | -.1662 |
| 3 | 1.00 | 92.865 | .69902 | 740.5 | 26.439 | 26.435 | .01 | -.1712 |
| 4 | 1.00 | 94.160 | .70877 | 734.1 | 26.208 | 26.212 | -.01 | -.1738 |
| 3 | 1.00 | 94.678 | .71267 | 731.5 | 26.115 | 26.121 | -.02 | -.1748 |
| 81 | 1.00 | 95.000 | .71509 | 730.4 | 26.075 | 26.065 | .04 | -.1755 |
| 92 | 1.00 | 95.933 | .72212 | 725.5 | 25.900 | 25.900 | .00 | -.1775 |
| 3 | 1.00 | 96.399 | .72562 | 723.4 | 25.825 | 25.817 | .03 | -.1786 |
| 3 | 1.00 | 98.153 | .73883 | 714.1 | 25.495 | 25.500 | -.02 | -.1827 |
| 3 | 1.00 | 99.859 | .75167 | 705.9 | 25.200 | 25.185 | .06 | -.1871 |
| 81 | 1.00 | 100.000 | .75273 | 704.9 | 25.165 | 25.159 | .03 | -.1875 |
| 4 | 1.00 | 100.930 | .75973 | 699.5 | 24.974 | 24.983 | -.04 | -.1901 |
| 3 | 1.00 | 101.645 | .76511 | 695.9 | 24.846 | 24.846 | -.00 | -.1921 |
| 4 | 1.00 | 103.500 | .77907 | 685.6 | 24.477 | 24.485 | -.03 | -.1979 |
| 81 | 1.00 | 105.000 | .79037 | 677.5 | 24.187 | 24.184 | .01 | -.2030 |
| 3 | 1.00 | 105.374 | .79318 | 675.3 | 24.111 | 24.108 | .01 | -.2044 |
| 92 | 1.00 | 106.319 | .80029 | 669.4 | 23.900 | 23.913 | -.06 | -.2079 |
| 4 | 1.00 | 107.610 | .81001 | 661.7 | 23.623 | 23.641 | -.08 | -.2131 |
| 81 | 1.00 | 110.000 | .82800 | 647.9 | 23.131 | 23.119 | .05 | -.2240 |
| 92 | 1.00 | 115.658 | .87059 | 609.2 | 21.750 | 21.760 | -.05 | -.2592 |
| 92 | 1.00 | 121.801 | .91683 | 560.2 | 20.000 | 19.982 | .09 | -.3277 |
| 4 | 1.00 | 125.600 | .94543 | 520.8 | 18.594 | 18.593 | .01 | -.4133 |
| 92 | 1.00 | 127.378 | .95881 | 498.6 | 17.800 | 17.800 | -.00 | -.4845 |
| 92 | 1.00 | 129.839 | .97734 | 459.4 | 16.400 | 16.400 | -.00 | -.6859 |
| 81 | 0.00 | 80.000 | .60218 | 800.0 | 28.560 | 28.505 | .19 | -.1524 |
| 4 | 0.00 | 82.250 | .61912 | 790.9 | 28.235 | 28.160 | .27 | -.1550 |
| 4 | 0.00 | 87.150 | .65600 | 769.0 | 27.456 | 27.385 | .26 | -.1616 |
| 4 | 0.00 | 90.280 | .67956 | 754.5 | 26.935 | 26.871 | .24 | -.1665 |
| 3 | 0.00 | 102.887 | .77446 | 690.2 | 24.641 | 24.606 | .14 | -.1959 |
| 3 | 0.00 | 106.735 | .80342 | 668.8 | 23.879 | 23.826 | .22 | -.2096 |
| 3 | 0.00 | 108.171 | .81423 | 659.4 | 23.542 | 23.521 | .09 | -.2155 |
| 4 | 0.00 | 109.050 | .82085 | 652.6 | 23.300 | 23.330 | -.13 | -.2195 |
| 3 | 0.00 | 109.578 | .82482 | 651.7 | 23.268 | 23.213 | .23 | -.2220 |
| 3 | 0.00 | 111.044 | .83586 | 641.9 | 22.916 | 22.883 | .14 | -.2294 |
| 81 | 0.00 | 115.000 | .86564 | 615.3 | 21.966 | 21.929 | .17 | -.2542 |
| 81 | 0.00 | 120.000 | .90327 | 577.3 | 20.609 | 20.549 | .29 | -.3022 |
| 4 | 0.00 | 120.900 | .91005 | 565.8 | 20.201 | 20.271 | -.35 | -.3142 |
| 81 | 0.00 | 125.000 | .94091 | 526.7 | 18.805 | 18.836 | -.16 | -.3953 |
| 4 | 0.00 | 127.820 | .96214 | 491.9 | 17.562 | 17.581 | -.11 | -.5085 |
| 4 | 0.00 | 129.810 | .97712 | 456.4 | 16.294 | 16.420 | -.77 | -.6820 |
| 4 | 0.00 | 130.560 | .98276 | 440.3 | 15.718 | 15.865 | -.93 | -.8075 |
| 4 | 0.00 | 130.860 | .98502 | 433.7 | 15.482 | 15.613 | -.84 | -.8787 |
| 4 | 0.00 | 131.390 | .98901 | 422.0 | 15.066 | 15.103 | -.24 | -.1067 |

33 data points, rms deviation 0.036%.

ID code: (3) Terry, (4) Mathias, (81) Barreiros, (92) Isochores/EOS/vapor pressure.

win.³⁶ Equation (4) has been developed to yield a compressibility factor for saturated vapor which approaches unity in the limit of low densities.³⁴ Thus $Z_\sigma(T)$ is formulated by using vapor-pressure Eq. (2), the reduced vapor pressure,

$$\Pi(T) = P_\sigma(T)/P_c,$$

and

$$x(T) = T/T_c, \quad u(T) = (1 - x),$$

when

$$Z_\sigma(T) = 1 + (Z_c - 1) \cdot \Pi \cdot x^{-2} \cdot f(x), \quad (4)$$

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$$f(x) = 1 + A_1 \cdot u^\beta + A_2 \cdot u^\gamma + \sum_{i=3}^5 A_i \cdot u^{i-2},$$

where $\beta = 0.35$, $\gamma = 0.70$, and

$$A_1 = -0.7647888,$$

$$A_2 = -0.5183665,$$

$$A_3 = 2.0294681,$$

$$A_4 = -2.0400452,$$

$$A_5 = 1.7965991.$$

The first coefficient in Eq. (4) is constrained, for symmetry of orthobaric densities near T_c , in terms of the first coefficient in Eq. (3),

$$A_1 = a \cdot Z_c / (Z_c - 1),$$

as reported in Ref. 36. The experimental residual in the last column of Table 4 is

$$F(Z) = [(Z - 1)/(Z_c - 1)] \cdot x^2 / \Pi. \quad (5)$$

The rms relative deviation is 0.47% for the 26 selected vapor density data. Excluded data appear at the bottom of Table 4. Clearly, the precision (or accuracy) of available data is less than desired to derive accurate heats of vaporization.

2.3. The Equation of State

Table 5 summarizes sources of $P_\rho T$ data, their ranges, and deviations from the following EOS. Results of Deming and Schupe are weighted (Wt.) zero because they were smoothed from data of Bartlett et al. Data of Robertson and Babb at extreme pressures are weighted zero in deference to the precise data of Michels et al. Data of Barreiros et al. have a low weight because they are for the compressed liquid where derivatives $\partial P / \partial \rho$, $\partial P / \partial T$ are extremely large. Plots of data of Michels et al. at extreme pressures show strong, negative isochores curvatures at high densities and temperatures. This behavior has been the key for developing the following EOS where, for any density (isochores), the coexistence temperature $T_\sigma(\rho)$ is obtained by iteration from Eqs. (3) or (4), and thus the vapor pressure $P_\sigma[T_\sigma(\rho)]$ is a function of density,

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

$$F(\rho, T) = A_1 \cdot F_1(\rho, T) + A_2 \cdot \sigma \cdot F_2(\rho, T)$$

$$+ A_3 \cdot \sigma^2 \cdot F_3(\rho, T) + A_4 \cdot f(\rho) \cdot F_4(\rho, T), \quad (6a)$$

$$f(\rho) = (\sigma - 1) \cdot (\sigma - \sigma_0) \cdot (\sigma - \sigma_t). \quad (6b)$$

Here, R is the gas constant; σ is the reduced density; σ_0 is a constant near 2.0; and $\sigma_t = \rho_t / \rho_c$ is the reduced density of liquid at the triple point.

The first three temperature-dependent functions in Eq. (6a) are designed to give isochores whose curvatures become increasingly negative with increase of the density,

$$F_1(\rho, T) = x(T) - x_\sigma(\rho), \quad (6c)$$

$$F_2(\rho, T) = x^\epsilon \cdot \exp[b \cdot \{1 - T_\sigma(\rho)/T\}] - x_\sigma^\epsilon, \quad (6d)$$

where

$$\epsilon = 1/2,$$

and

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

| ID | Wt | T, K | T/T _c | d, kg/m ³ | ρ , mol/L | Calc. ρ , mol/L | % dev. | $d\rho_g/dT$, mol L ⁻¹ K ⁻¹ | F(Z) |
|----|------|---------|------------------|----------------------|----------------|----------------------|--------|--|-------|
| 91 | .02 | 70.000 | .52691 | 1.026 | .03663 | .03652 | .30 | .00540 | .9917 |
| 91 | .06 | 75.000 | .56455 | 2.035 | .07265 | .07238 | .38 | .00917 | .9169 |
| 81 | .49 | 80.000 | .60218 | 3.663 | .13079 | .13059 | .16 | .01438 | .8040 |
| 91 | .10 | 80.000 | .60218 | 3.674 | .13118 | .13059 | .46 | .01438 | .8651 |
| 10 | .54 | 81.638 | .61451 | 4.347 | .15521 | .15580 | -.38 | .01644 | .7017 |
| 81 | .54 | 81.650 | .61460 | 4.375 | .15621 | .15599 | .14 | .01645 | .7925 |
| 91 | .12 | 85.000 | .63982 | 6.162 | .22000 | .21894 | .48 | .02127 | .8245 |
| 81 | .71 | 90.000 | .67746 | 9.709 | .34662 | .34652 | .03 | .03013 | .7556 |
| 91 | .14 | 90.000 | .67746 | 9.749 | .34806 | .34652 | .44 | .03013 | .7917 |
| 81 | .78 | 95.000 | .71509 | 14.679 | .52405 | .52421 | -.03 | .04140 | .7442 |
| 91 | .16 | 95.000 | .71509 | 14.730 | .52588 | .52421 | .32 | .04140 | .7654 |
| 81 | .83 | 100.000 | .75273 | 21.429 | .76505 | .76557 | -.07 | .05573 | .7374 |
| 91 | .83 | 100.000 | .75273 | 21.470 | .76652 | .76557 | .12 | .05573 | .7458 |
| 81 | .87 | 105.000 | .79037 | 30.469 | 1.08778 | 1.08840 | -.06 | .07421 | .7342 |
| 91 | .87 | 105.000 | .79037 | 30.455 | 1.08730 | 1.08840 | -.10 | .07421 | .7328 |
| 81 | .90 | 110.000 | .82800 | 42.530 | 1.51837 | 1.51753 | .06 | .09866 | .7350 |
| 81 | .93 | 115.000 | .86564 | 58.795 | 2.09908 | 2.09059 | .41 | .13260 | .7417 |
| 91 | .95 | 120.000 | .90327 | 80.551 | 2.87580 | 2.87229 | .12 | .18422 | .7418 |
| 92 | .98 | 125.513 | .94477 | 115.401 | 4.12000 | 4.14857 | -.69 | .29444 | .7533 |
| 4 | .98 | 125.600 | .94543 | 116.070 | 4.14388 | 4.17430 | -.73 | .29717 | .7535 |
| 4 | .99 | 129.810 | .97712 | 163.570 | 5.83970 | 5.85000 | -.18 | .55848 | .8034 |
| 92 | .99 | 129.883 | .97767 | 165.259 | 5.90000 | 5.89111 | .15 | .56796 | .8071 |
| 4 | .99 | 130.560 | .98276 | 177.670 | 6.34309 | 6.31037 | .52 | .67830 | .8231 |
| 4 | .99 | 130.860 | .98502 | 184.620 | 6.59122 | 6.52362 | 1.04 | .74596 | .8337 |
| 4 | 1.00 | 131.390 | .98901 | 193.920 | 6.92324 | 6.96072 | -.54 | .91783 | .8389 |
| 92 | 1.00 | 131.914 | .99295 | 212.316 | 7.58000 | 7.51382 | .88 | 1.23086 | .8682 |
| 92 | 0.00 | 94.460 | .71103 | 14.005 | .50000 | .50222 | -.44 | .04004 | .7187 |
| 4 | 0.00 | 100.930 | .75973 | 23.890 | .85291 | .81882 | 4.16 | .05882 | .9050 |
| 92 | 0.00 | 103.319 | .77771 | 26.890 | .96000 | .96943 | -.97 | .06744 | .7022 |
| 4 | 0.00 | 103.500 | .77907 | 28.240 | 1.00821 | .98170 | 2.70 | .06814 | .8303 |
| 92 | 0.00 | 107.456 | .80885 | 35.573 | 1.27000 | 1.28397 | -1.09 | .08531 | .7037 |
| 4 | 0.00 | 107.610 | .81001 | 36.810 | 1.31417 | 1.29717 | 1.31 | .08606 | .7706 |
| 4 | 0.00 | 109.050 | .82085 | 40.140 | 1.43306 | 1.42632 | .47 | .09343 | .7460 |
| 91 | 0.00 | 110.000 | .82800 | 42.382 | 1.51310 | 1.51753 | -.29 | .09866 | .7265 |
| 92 | 0.00 | 112.339 | .84561 | 48.737 | 1.74000 | 1.76465 | -1.40 | .11303 | .7031 |
| 91 | 0.00 | 115.000 | .86564 | 58.376 | 2.08410 | 2.09059 | -.31 | .13260 | .7285 |
| 92 | 0.00 | 118.596 | .89271 | 72.546 | 2.59000 | 2.62600 | -1.37 | .16706 | .7166 |
| 81 | 0.00 | 120.000 | .90327 | 81.495 | 2.90951 | 2.87229 | 1.30 | .18422 | .7581 |
| 4 | 0.00 | 120.900 | .91005 | 82.020 | 2.92824 | 3.04362 | -3.79 | .19675 | .6895 |
| 81 | 0.00 | 125.000 | .94091 | 116.562 | 4.16146 | 4.00147 | 4.00 | .27931 | .7978 |
| 91 | 0.00 | 125.000 | .94091 | 114.438 | 4.08560 | 4.00147 | 2.10 | .27931 | .7791 |
| 4 | 0.00 | 127.820 | .96214 | 136.010 | 4.85577 | 4.92791 | -1.46 | .39077 | .7655 |

26 data points, rms deviation 0.465%.

ID code: (4) Mathias, (10) Claypeyron equation, (81) Barreiros, (91) Virial/vapor pressure, (92) Isochores/EOS/vapor pressure.

$$b \equiv (1 - \epsilon) + (1 - \epsilon)^{1/2}, \quad (6e)$$

$$F_3(\rho, T) \equiv \exp\{2 \cdot [1 - T_\sigma(\rho)/T]\} - 1. \quad (6f)$$

and the following function is designed to give nonanalytic behavior approaching the critical point [an infinity in $C_v(\rho, T)$],

$$F_4(\rho, T) \equiv \psi(\rho, T)/\psi_\sigma(\rho) - 1, \quad (6g)$$

where $\psi_\sigma(\rho)$ is obtained from $\psi(\rho, T)$ merely by replacing T with $T_\sigma(\rho)$, and

$$\psi(\rho, T) \equiv 1 - (\omega - \omega^\eta/\eta)/(1 - 1/\eta). \quad (6h)$$

Here, $\omega(\rho, T) \equiv [1 - \Theta(\rho)/T]$, and $\Theta(\rho)$ is a locus of temperatures inside the coexistence envelope of Fig. 1,

$$\Theta(\rho) \equiv T_\sigma(\rho) \cdot \exp[-\alpha \cdot g(\rho)], \quad (6i)$$

$$g(\rho) \equiv |\sigma - 1|^3 / (\sigma - 1)^3. \quad (6j)$$

Parameters and least-squares coefficients for carbon monoxide are $\alpha = 1.0$, $\eta = 1.10$, $\sigma_0 = 1.90$, and

$$A_1 = 0.490\ 725\ 120\ 28,$$

$$A_2 = 0.166\ 134\ 648\ 74,$$

$$A_3 = 0.037\ 576\ 577\ 50,$$

$$A_4 = 0.138\ 101\ 467\ 46.$$

A value for η cannot be established by fitting $P\rho T$ data due to lack of accuracy near the critical point. The present value is selected to be reasonable for specific heats, as discussed in

TABLE 5. Summary of $P\rho T$ data used for carbon monoxide

| ID | Authors | Wt. | T, K | Range of the data | | NP ^a | Relative deviations in percent | | |
|------------------|----------------------|-----|----------|----------------------|-----------------|-----------------|--------------------------------|--------------|-------------------|
| | | | | $\rho, \text{mol/L}$ | P, MPa | | $\Delta\rho/\rho$ | $\Delta P/P$ | Mean ^c |
| 81 | Barreiros (Ref. 6) | 0.2 | 80–125 | 19–32 | 2–140 | 125 | 0.14 | + 0.07 | 1.19 |
| 2 | Bartlett (Ref. 7) | 1.0 | 203–473 | 0.06–25 | 0.1–101 | 126 | 0.27 | – 0.13 | 0.43 |
| 3 | Deming (Ref. 23) | 0.0 | 203–673 | 0.5–25 | 2.5–122 | 143 | 0.33 | – 0.07 | 0.43 |
| 100 ⁺ | Goodwin (Ref. 36) | 1.0 | 100–300 | 0.5–25 | 0.4–36 | 159 | 0.73 | + 0.42 | 0.53 |
| 564 | Hilsenrath (Ref. 45) | 1.0 | 200–1000 | 0.01–4.1 | 0.01–10.1 | 69 | 0.13 | – 0.08 | 0.09 |
| 4 | Michels (Ref. 57) | 1.0 | 273–423 | 0.04–27 | 0.1–345 | 112 | 0.15 | + 0.07 | 0.19 |
| 5 | Robertson (Ref. 65) | 0.0 | 308–573 | 21–30 | 117–655 | 36 | 0.17 | + 0.06 | 0.34 |
| | | | | | | 591 | 0.46 | + 0.11 | 0.40 |

^aNumber of $P\rho T$ data.^bTrend = average of signed relative density deviations.^cMean = average of absolute relative pressure deviations.

Ref. 37. The slope of the critical isochore from Eq. (6) at the critical point is constrained to equal the slope of the vapor-pressure equation [Eq. (2)] at the critical point via the least-squares program of McCarty.⁵⁶

Table 6 presents deviations of experimental densities and pressures from the EOS. Pressures of our recent data³⁶ at ID = 103–1807 are several percent lower than calculated in the critical region due possibly to an impurity or to an inaccurate coexistence boundary. Osugi,⁶³ with a 14-term BWR type of EOS, found large, systematic deviations from data of Michels *et al.* at extreme pressures.

Pressures and derivatives of the $P(\rho, T)$ surface along the critical isotherm, computed by the EOS, Eq. (6), are presented in Table 7 at reduced densities from 0.5 to 1.5.

3. Thermal Properties and Computations

3.1. Functions for Ideal Gas States

The following type of formulation was developed for polyatomic hydrocarbons, and is applied here to the tabulated data of Hilsenrath *et al.*⁴⁵ Define $x \equiv T/100$, when

$$C_p^o/R = 3.5 + \exp(-\epsilon/x) \cdot \sum_{i=1}^5 A_i \cdot x^{2-i}, \quad (7)$$

$$\epsilon = 17.80,$$

$$A_1 = 0.059485855,$$

$$A_2 = -1.70764679,$$

$$A_3 = 67.483204,$$

$$A_4 = -315.657869,$$

$$A_5 = 432.946687.$$

The enthalpy and entropy are obtained by numerical integration, starting with values at 300 K. Data and calculated values are in Table 8.

3.2. Derived Saturated Liquid Properties

a. Heats of Vaporization

The Clapeyron equation,

$$Q_{\text{vap}} = 100 \cdot T \cdot (dP_\sigma/dT) \cdot (v_g - v_l) \quad \text{J/mol}, \quad (8)$$

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

b. Enthalpies of Saturated Liquid

Data for $H_\sigma(T)$ along the saturated liquid boundary were derived by using the ideal gas functions, the EOS, and heats of vaporization. They are represented in J/mol using the argument

$$u(T) \equiv (T_c - T)/(T_c - T_t),$$

$$\frac{(H_\sigma - H_c)}{(H_t - H_c)} = u + (u^\beta - u) \cdot \sum_{i=1}^5 A_i \cdot u^{i-1}, \quad (9)$$

where now $\beta = 0.340$, $H_t = 0.510 \text{ J/mol}$, $H_c = 5271.879 \text{ J/mol}$, and

$$A_1 = 0.458005588,$$

$$A_2 = -0.115257944,$$

$$A_3 = -0.176519530,$$

$$A_4 = 0.485799407,$$

$$A_5 = -0.249044812.$$

For 16 data at $T_t < T < T_c$, the rms relative deviation is 0.03%, and the maximum deviation is 3.7 J/mol at 132.5 K.

c. Entropies of Saturated Liquid

Data for $S_\sigma(T)$ along the saturated liquid boundary, derived as for $H_\sigma(T)$ above, are represented in $\text{J mol}^{-1} \text{K}^{-1}$ with a minimum of coefficients because the formula is used to derive specific heats on this path. The arguments are $x(T) \equiv T/T_c$,

$$u(T) \equiv (T_c - T)/(T_c - T_t),$$

and we use the constant $k \equiv \ln(T_t/T_c)$, when

$$(S_\sigma - S_c)/(S_t - S_c) = u^\beta + A_1 \cdot [\ln(x)/k - u^\beta]$$

$$+ A_2 \cdot (u - u^\beta) + A_3 \cdot (u^2 - u^\beta), \quad (10)$$

where $\beta = 0.35$, $S_t = 74.48266 \text{ J mol}^{-1} \text{K}^{-1}$, $S_c = 124.21963 \text{ J mol}^{-1} \text{K}^{-1}$, and

$$\begin{aligned}A_1 &= 0.171\ 865\ 846, \\A_2 &= 0.135\ 372\ 195, \\A_3 &= 0.308\ 872\ 376.\end{aligned}$$

For the 16 data $T_t < T < T_c$, the rms deviation is 0.015%, and the maximum deviation is $0.05\text{ J mol}^{-1}\text{ K}^{-1}$ at 132.5 K .

d. Specific Heats of Saturated Liquid

Specific heats, $C_\sigma(T)$ in $\text{J mol}^{-1}\text{ K}^{-1}$, along the liquid coexistence path, are derived from Eq. (10) via $C_\sigma = T \cdot (dS_\sigma/dT)$. Let

$$S_n \equiv (S_t - S_c), \quad A_4 \equiv 1 - A_1 - A_2 - A_3,$$

and

$$\text{sum} \equiv A_2 + 2 \cdot A_3 \cdot u + A_4 \cdot \beta/u^c,$$

then,

$$C_\sigma(T) = S_n \cdot [A_1/k + x \cdot \text{sum} \cdot (du/dx)], \quad (11)$$

where $\beta = 0.35$, $c = 0.660$, and $(du/dx) = -T_c/(T_c - T_t)$. The exponent $c = 0.660$ is selected different from $(1 - \beta)$ to obtain an acceptable behavior for derived single-phase specific heats $C_v(T)_\sigma$ at the liquid boundary via Eq. (20), approaching T_c .

3.3. Computational Methods

The numerical values for E and H in this report are based on the assigned value $E = 0$ for saturated liquid at the triple point, obtained by adding the arbitrary value $H_0^\circ = E_0^\circ = 4555.006\text{ J/mol}$ to the ideal gas state values of $(E^\circ - E_0^\circ)$ and $(H^\circ - H_0^\circ)$ from Eq. (7). Leah⁵⁰ refers to the perfect crystal at $T = 0$, obtaining $H_{\text{nbp}} = 4212.76\text{ J/mol}$ for enthalpy of saturated liquid at the normal boiling point, whereas our corresponding value is $H_{\text{nbp}} = 822.5\text{ J/mol}$.

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 technique¹⁵ along isotherms by using Eq. (6) in the following relations,

$$\Delta E = \int [P - T \cdot (\partial P / \partial T)] \cdot d\rho / \rho^2, \quad (12)$$

$$\Delta C_v = -T \cdot \int (\partial^2 P / \partial T^2) \cdot d\rho / \rho^2, \quad (13)$$

$$\begin{aligned}\Delta S &= R \cdot \ln [P^\circ / (\rho RT)] \\&+ \int_0^\rho [R - (\partial P / \partial T) / \rho] \cdot d\rho / \rho.\end{aligned} \quad (14)$$

Equation (14) is for use with initial entropies in hypothetical ideal gas states at $P^\circ = 1\text{ atm}$ ($0.101\ 325\text{ MPa}$). For all other initial states we use

$$\Delta S = - \int (\partial P / \partial T) \cdot d\rho / \rho^2. \quad (14a)$$

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

$$H = E + P / \rho, \quad (15)$$

$$C_p = C_v + T \cdot [(\partial P / \partial T)^2 / (\partial P / \partial \rho)] / \rho^2, \quad (16)$$

$$W^2 = C_p \cdot (\partial P / \partial \rho) / C_v. \quad (17)$$

The fugacity/pressure coefficient f/P for any state is computed by reference to the hypothetical ideal gas state at the same temperature and at $P^\circ = 1\text{ atm}$ ($0.101\ 325\text{ MPa}$),

$$\begin{aligned}f/P &= (P^\circ / P) \cdot \exp(\Delta G / RT), \\ \Delta G &= (H - E_0^\circ) - H^\circ - T \cdot (S - S_0^\circ),\end{aligned} \quad (18)$$

where ΔG is the isothermal Gibbs free energy change, and the arbitrary value E_0° was added to our tabulated values for $H(\rho, T)$ relative to $(H^\circ - H_0^\circ)$ from Eq. (7).

b. The Saturated Liquid

At temperatures from the triple point to the critical point, thermofunctions for the saturated vapor are obtained via Eqs. (12)–(15). Then Eq. (8) for the heat of vaporization Q_{vap} is used to compute

$$\Delta H = -Q_{\text{vap}}, \quad \Delta S = \Delta H / T, \quad (19)$$

such that the free energy of vaporization, $\Delta G = \Delta H - T \cdot \Delta S$, is zero. See Sec. 3.2 for consistency of the formulations. Having obtained H and S for the saturated liquid, $E = H - P \cdot v$ 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 thermodynamic relation,

$$C_v(T)_\sigma = C_\sigma(T) + T \cdot (\partial P / \partial T) \cdot (d\rho_1 / dT) / \rho_1^2, \quad (20)$$

where ρ_1 is density of the saturated liquid. Values for $C_p(\rho, T)$ and $W(\rho, T)$ on this boundary follow from Eqs. (16) and (17).

c. The Compressed Liquid

Starting with above values for E , 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 for liquid along the coexistence path, computed here as

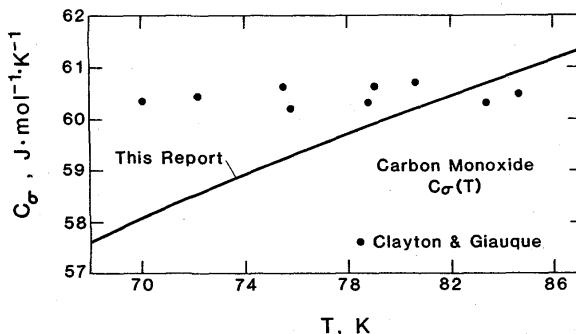
$$C_\sigma(T) = T \cdot dS_\sigma(T) / dT$$

via Eq. (11), are compared with the measurements of Clayton and Giauque in Fig. 2. Maximum differences of only about 3% are well within the accuracy expected from the computational methods via available data for saturated vapor densities, etc., used in the Clapeyron equation.

Our derived $P\rho T$ locus of the Joule-Thomson inversion, $(\partial T / \partial P)_H = 0$, is given in Table 9, obtained from Eq. (6) under the condition

$$T \cdot (\partial P / \partial T) = \rho \cdot (\partial P / \partial \rho).$$

In Fig. 3 the pressures are compared with Leah. He used graphical methods, and did not have the later compressibili-

FIG. 2. Comparison of $C_o(T)$ with Clayton and Giauque.

ty data of Barreiros *et al.*, Michels *et al.*, and of Robertson and Babb. Behavior of this locus is an exacting test of any equation of state, and the agreement is reasonable for the very different computational methods.

To validate thermodynamic results, some comparisons are made with derived properties of earlier authors. Table 10 compares $(C_p - C_v)$ data of Deming and Shupe at $P = 50$ atm with the computation

$$(C_p - C_v) = T \cdot (\partial P / \partial T)^2 / (\partial P / \partial \rho) / \rho^2$$

using the EOS [Eq. (6)]. Maximum differences are about 3%. Their $P\rho T$ data from Bartlett *et al.* terminated at T below 203.15 K, and were extrapolated above 500 K.

Tables 11 and 12 compare densities, enthalpies, and entropies at $P = 50$ atm for data of Leah, and of Hust and Stewart. We adjusted their enthalpies to agree with our enthalpy of liquid at nbp. Enthalpy deviations are roughly constant at higher temperatures, i.e., the changes of enthalpy at 50 atm agree fairly well.

Table 13 compares densities, enthalpies, and entropies of Michels *et al.*^{58,59} along isobars at $P = 50$, and at $P = 600$ atm. Their reference point (zero) for enthalpy and entropy was standard conditions (STP), $T = 273.15$ K and $P = 1$ atm. We adjusted their values to our values at STP by adding 12 488.6 J/mol to their enthalpies, and 194.978 J mol⁻¹ K⁻¹ to their entropies. The differences in Table 13 are smaller than in Tables 11 and 12.

4. Tables of Thermophysical Properties

All of the following tabulated properties are interpolated or extrapolated in ranges for which no $P\rho T$ compressibilities exist (Table 5). This includes temperatures above about 473 K.

4.1. Properties of the Saturated Liquid

Table 14 gives properties at the saturated liquid coexistence boundary, computed as described in Secs. 3.2 and 3.3. The single-phase, isochoric specific heats $C_v(T)_o$ at this boundary (derived via the Clapeyron equation, etc.) may be too small as $T \rightarrow T_c$, and this will affect derived values for $C_p(\rho, T)$ and $W(\rho, T)$ for the compressed liquid at $T < T_c$ via Eqs. (16) and (17). The heat of vaporization at the nbp, 81.638 K in Table 14, is 6018 J/mol as compared with 6040 \pm 6 J/mol measured by Clayton and Giauque.¹⁶ The derivatives, $\partial P / \partial T$ and $\partial P / \partial \rho$ in Table 14, are for the single-phase domain, taken at the liquid coexistence boundary. Similarly, the specific heats, C_v and C_p in Table 14, refer to the single-phase domain.

4.2. Properties Along Selected Isobars

Table 15 gives thermophysical properties along selected isobars, computed as described in Sec. 3.3 via the EOS of Eq. (6). Each isobar starts with 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)–(11) and (20).

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 presumed inaccurate values for $C_v(T)_o$, derived via Eq. (20).

5. Comments

The critical density for carbon monoxide is quite uncertain, as are saturated liquid densities near T_c , and saturated vapor densities over the entire range. The classic Amsterdam technique for measuring $P\rho T$ data, with mercury in a glass pipet, cannot be applied for carbon monoxide because the mercury would be solid at $T_c = 133$ K. Hence other methods, such as the magnetic suspension densimeter⁴³ might be used to obtain the urgently needed definition of coexisting densities near T_c . Dielectric constant measurements in domains where ρ is known accurately as a function of P and T permit extrapolation via the Clausius-Mossotti function to estimate densities in other domains. Specific heat measurements for $C_o(T)$ and for $C_v(\rho, T)$ would add to the store of useful data on carbon monoxide, including especially the need for $C_o(T)$ data in Eq. (20). Speed of sound data also clearly would be useful to confirm computations from the EOS. It should be noted that Bartlett *et al.* and Robertson and Babb experienced difficulties with the formation of iron carbonyl in their high-temperature experiments, and that Crommelin, Bijveld, and Brown stored their purified sample in a steel cylinder.

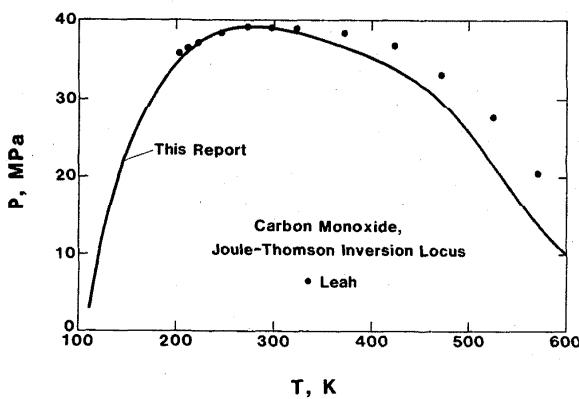


FIG. 3. The Joule-Thomson inversion locus for carbon monoxide.

THERMOPHYSICAL PROPERTIES OF CARBON MONOXIDE

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TABLE 6a. Comparison of ID code (564) Hilsenrath $P\rho T$ compressibility data with values calculated from Eq. (6)

| Wt | T,K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|------|---------|-----------------|-----------------------|------------------------|---------|----------------|-------------------|
| 1.00 | 200.000 | .0061 | .0061 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 200.000 | .0611 | .0611 | -.01 | .1013 | .1013 | .01 |
| 1.00 | 200.000 | .2464 | .2464 | .01 | .4053 | .4053 | -.01 |
| 1.00 | 200.000 | .4347 | .4343 | .08 | .7093 | .7098 | -.07 |
| 1.00 | 200.000 | .6260 | .6249 | .17 | 1.0133 | 1.0149 | -.16 |
| 1.00 | 300.000 | .0041 | .0041 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 300.000 | .0406 | .0406 | -.02 | .1013 | .1013 | .02 |
| 1.00 | 300.000 | .1627 | .1628 | -.06 | .4053 | .4051 | .06 |
| 1.00 | 300.000 | .2850 | .2852 | -.08 | .7093 | .7087 | .08 |
| 1.00 | 300.000 | .4075 | .4078 | -.08 | 1.0133 | 1.0125 | .08 |
| 1.00 | 300.000 | 1.6402 | 1.6363 | .24 | 4.0530 | 4.0627 | -.24 |
| 0.00 | 300.000 | 2.8735 | 2.8572 | .57 | 7.0928 | 7.1335 | -.57 |
| 0.00 | 300.000 | 4.0889 | 4.0613 | .68 | 10.1325 | 10.2030 | -.69 |
| 1.00 | 400.000 | .0030 | .0030 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 400.000 | .0305 | .0305 | -.02 | .1013 | .1013 | .02 |
| 1.00 | 400.000 | .1218 | .1218 | -.06 | .4053 | .4050 | .06 |
| 1.00 | 400.000 | .2129 | .2131 | -.10 | .7093 | .7086 | .10 |
| 1.00 | 400.000 | .3039 | .3043 | -.12 | 1.0133 | 1.0121 | .12 |
| 1.00 | 400.000 | 1.2051 | 1.2065 | -.12 | 4.0530 | 4.0483 | .12 |
| 1.00 | 400.000 | 2.0858 | 2.0864 | -.03 | 7.0928 | 7.0906 | .03 |
| 1.00 | 400.000 | 2.9412 | 2.9414 | -.01 | 10.1325 | 10.1316 | .01 |
| 1.00 | 500.000 | .0024 | .0024 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 500.000 | .0244 | .0244 | -.01 | .1013 | .1013 | .01 |
| 1.00 | 500.000 | .0973 | .0974 | -.05 | .4053 | .4051 | .05 |
| 1.00 | 500.000 | .1701 | .1703 | -.09 | .7093 | .7087 | .09 |
| 1.00 | 500.000 | .2427 | .2430 | -.11 | 1.0133 | 1.0121 | .11 |
| 1.00 | 500.000 | .9585 | .9605 | -.21 | 4.0530 | 4.0442 | .22 |
| 1.00 | 500.000 | 1.6542 | 1.6579 | -.22 | 7.0928 | 7.0766 | .23 |
| 1.00 | 500.000 | 2.3282 | 2.3342 | -.26 | 10.1325 | 10.1051 | .27 |
| 1.00 | 600.000 | .0020 | .0020 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 600.000 | .0203 | .0203 | -.01 | .1013 | .1013 | .01 |
| 1.00 | 600.000 | .0811 | .0811 | -.04 | .4053 | .4051 | .04 |
| 1.00 | 600.000 | .1417 | .1418 | -.07 | .7093 | .7088 | .07 |
| 1.00 | 600.000 | .2022 | .2024 | -.09 | 1.0133 | 1.0123 | .09 |
| 1.00 | 600.000 | .7976 | .7994 | -.22 | 4.0530 | 4.0437 | .23 |

TABLE 6a. Comparison of ID code (564) Hilsenrath $P\rho T$ compressibility data with values calculated from Eq. (6) — Continued

| Wt | T,K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|------|----------|-----------------|-----------------------|------------------------|---------|----------------|-------------------|
| 1.00 | 600.000 | 1.3761 | 1.3798 | -.27 | 7.0928 | 7.0730 | .28 |
| 1.00 | 600.000 | 1.9372 | 1.9433 | -.31 | 10.1325 | 10.0990 | .33 |
| 1.00 | 700.000 | .0017 | .0017 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 700.000 | .0174 | .0174 | -.01 | .1013 | .1013 | .01 |
| 1.00 | 700.000 | .0695 | .0695 | -.03 | .4053 | .4052 | .03 |
| 1.00 | 700.000 | .1215 | .1216 | -.06 | .7093 | .7089 | .06 |
| 1.00 | 700.000 | .1733 | .1735 | -.08 | 1.0133 | 1.0125 | .08 |
| 1.00 | 700.000 | .6839 | .6852 | -.20 | 4.0530 | 4.0449 | .20 |
| 1.00 | 700.000 | 1.1803 | 1.1834 | -.26 | 7.0928 | 7.0738 | .27 |
| 1.00 | 700.000 | 1.6629 | 1.6679 | -.30 | 10.1325 | 10.1004 | .32 |
| 1.00 | 800.000 | .0015 | .0015 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 800.000 | .0152 | .0152 | -.00 | .1013 | .1013 | .00 |
| 1.00 | 800.000 | .0608 | .0608 | -.03 | .4053 | .4052 | .03 |
| 1.00 | 800.000 | .1063 | .1064 | -.05 | .7093 | .7090 | .05 |
| 1.00 | 800.000 | .1517 | .1518 | -.06 | 1.0133 | 1.0126 | .06 |
| 1.00 | 800.000 | .5989 | .5999 | -.17 | 4.0530 | 4.0461 | .17 |
| 1.00 | 800.000 | 1.0344 | 1.0367 | -.23 | 7.0928 | 7.0763 | .23 |
| 1.00 | 800.000 | 1.4585 | 1.4624 | -.27 | 10.1325 | 10.1042 | .28 |
| 1.00 | 900.000 | .0014 | .0014 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 900.000 | .0135 | .0135 | -.00 | .1013 | .1013 | .00 |
| 1.00 | 900.000 | .0541 | .0541 | -.02 | .4053 | .4052 | .02 |
| 1.00 | 900.000 | .0945 | .0945 | -.04 | .7093 | .7090 | .04 |
| 1.00 | 900.000 | .1349 | .1349 | -.05 | 1.0133 | 1.0127 | .05 |
| 1.00 | 900.000 | .5328 | .5336 | -.15 | 4.0530 | 4.0470 | .15 |
| 1.00 | 900.000 | .9211 | .9228 | -.19 | 7.0928 | 7.0788 | .20 |
| 1.00 | 900.000 | 1.2998 | 1.3028 | -.23 | 10.1325 | 10.1083 | .24 |
| 1.00 | 1000.000 | .0012 | .0012 | .00 | .0101 | .0101 | -.00 |
| 1.00 | 1000.000 | .0122 | .0122 | -.00 | .1013 | .1013 | .00 |
| 1.00 | 1000.000 | .0487 | .0487 | -.02 | .4053 | .4052 | .02 |
| 1.00 | 1000.000 | .0851 | .0851 | -.03 | .7093 | .7091 | .03 |
| 1.00 | 1000.000 | .1214 | .1214 | -.04 | 1.0133 | 1.0128 | .04 |
| 1.00 | 1000.000 | .4800 | .4806 | -.12 | 4.0530 | 4.0481 | .12 |
| 1.00 | 1000.000 | .8304 | .8317 | -.16 | 7.0928 | 7.0813 | .16 |
| 1.00 | 1000.000 | 1.1728 | 1.1750 | -.18 | 10.1325 | 10.1130 | .19 |

69 data points, $|\Delta\rho/\rho|$, rms % = 0.129, $\Delta\rho/\rho$, av. % = 0.076,
 $|\Delta P/P|$, av. % = 0.094.

TABLE 6b. Comparison of ID code (4) Michels $P\rho T$ compressibility data with values calculated from Eq. (6)

| Wt | T,K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|------|---------|-----------------|-----------------------|------------------------|----------|----------------|-------------------|
| 1.00 | 273.150 | .0446 | .0447 | -.03 | .1013 | .1013 | -.03 |
| 1.00 | 273.150 | 1.7857 | 1.7810 | .26 | 3.9759 | 3.9863 | -.26 |
| 1.00 | 273.150 | 3.5714 | 3.5483 | .65 | 7.8784 | 7.9296 | -.65 |
| 1.00 | 273.150 | 5.3572 | 5.3309 | .49 | 11.8512 | 11.9105 | -.50 |
| 1.00 | 273.150 | 7.1429 | 7.1351 | .11 | 16.0590 | 16.0780 | -.12 |
| 1.00 | 273.150 | 8.9286 | 8.9376 | -.10 | 20.7062 | 20.6814 | .12 |
| 1.00 | 273.150 | 10.7143 | 10.7179 | -.03 | 26.0499 | 26.0381 | .05 |
| 1.00 | 273.150 | 12.5000 | 12.4867 | .11 | 32.4213 | 32.4740 | -.16 |
| 1.00 | 273.150 | 14.2858 | 14.2625 | .16 | 40.2596 | 40.3740 | -.28 |
| 1.00 | 273.150 | 16.0715 | 16.0462 | .16 | 50.1431 | 50.3011 | -.31 |
| 1.00 | 273.150 | 17.8572 | 17.8328 | .14 | 62.8170 | 63.0137 | -.31 |
| 1.00 | 273.150 | 19.6429 | 19.6204 | .11 | 79.2396 | 79.4754 | -.30 |
| 1.00 | 273.150 | 21.4286 | 21.4075 | .10 | 100.5871 | 100.8741 | -.28 |
| 1.00 | 273.150 | 23.2144 | 23.1948 | .08 | 128.3129 | 128.6586 | -.27 |
| 1.00 | 273.150 | 25.0001 | 24.9824 | .07 | 164.1830 | 164.5841 | -.24 |
| 1.00 | 273.150 | 26.7858 | 26.7694 | .06 | 210.2818 | 210.7589 | -.23 |
| 1.00 | 298.150 | .0446 | .0447 | -.03 | .1106 | .1106 | .03 |
| 1.00 | 298.150 | 1.7857 | 1.7822 | .19 | 4.3849 | 4.3934 | -.19 |
| 1.00 | 298.150 | 3.5714 | 3.5528 | .52 | 8.7765 | 8.8232 | -.53 |
| 1.00 | 298.150 | 5.3572 | 5.3369 | .38 | 13.3271 | 13.3800 | -.40 |
| 1.00 | 298.150 | 7.1429 | 7.1389 | .06 | 18.2164 | 18.2277 | -.06 |
| 1.00 | 298.150 | 8.9286 | 8.9381 | -.11 | 23.6665 | 23.6355 | .13 |
| 1.00 | 298.150 | 10.7143 | 10.7173 | -.03 | 29.9566 | 29.9452 | .04 |
| 1.00 | 298.150 | 12.5000 | 12.4872 | .10 | 37.4500 | 37.5096 | -.16 |
| 1.00 | 298.150 | 14.2858 | 14.2636 | .16 | 46.1613 | 46.7431 | -.27 |
| 1.00 | 298.150 | 16.0715 | 16.0470 | .15 | 58.0641 | 58.2403 | -.30 |
| 1.00 | 298.150 | 17.8572 | 17.8326 | .14 | 72.5661 | 72.7916 | -.31 |
| 1.00 | 298.150 | 19.6429 | 19.6202 | .12 | 91.1236 | 91.3900 | -.29 |
| 1.00 | 298.150 | 21.4286 | 21.4077 | .10 | 114.9319 | 115.2479 | -.27 |
| 1.00 | 298.150 | 23.2144 | 23.1959 | .08 | 145.4713 | 145.8278 | -.24 |
| 1.00 | 298.150 | 25.0001 | 24.9839 | .06 | 184.4855 | 184.8840 | -.22 |
| 1.00 | 298.150 | 26.7858 | 26.7692 | .06 | 233.9837 | 234.5006 | -.22 |
| 1.00 | 323.150 | .0446 | .0447 | -.03 | .1199 | .1199 | .03 |
| 1.00 | 323.150 | 1.7857 | 1.7833 | .14 | 4.7930 | 4.7996 | -.14 |
| 1.00 | 323.150 | 3.5714 | 3.5566 | .42 | 9.6717 | 9.7131 | -.43 |
| 1.00 | 323.150 | 5.3572 | 5.3420 | .28 | 14.7974 | 14.8423 | -.30 |
| 1.00 | 323.150 | 7.1429 | 7.1425 | .00 | 20.3644 | 20.3655 | -.01 |
| 1.00 | 323.150 | 8.9286 | 8.9390 | -.12 | 26.6100 | 26.5712 | .15 |
| 1.00 | 323.150 | 10.7143 | 10.7180 | -.03 | 33.8395 | 33.8234 | .05 |
| 1.00 | 323.150 | 12.5000 | 12.4883 | .09 | 42.4370 | 42.4998 | -.15 |
| 1.00 | 323.150 | 14.2858 | 14.2650 | .15 | 52.9065 | 53.0419 | -.26 |
| 1.00 | 323.150 | 16.0715 | 16.0480 | .15 | 65.8818 | 66.0723 | -.29 |
| 1.00 | 323.150 | 17.8572 | 17.8343 | .13 | 82.1754 | 82.4098 | -.28 |
| 1.00 | 323.150 | 19.6429 | 19.6220 | .11 | 102.8023 | 103.0735 | -.26 |
| 1.00 | 323.150 | 21.4286 | 21.4102 | .09 | 128.9928 | 129.2962 | -.23 |
| 1.00 | 323.150 | 23.2144 | 23.2015 | .06 | 162.2831 | 162.5522 | -.17 |
| 1.00 | 323.150 | 25.0001 | 24.9928 | .03 | 204.3999 | 204.5927 | -.09 |
| 1.00 | 323.150 | 26.7858 | 26.7817 | .02 | 257.3442 | 257.4783 | -.05 |
| 1.00 | 348.150 | .0446 | .0447 | -.03 | .1292 | .1292 | .03 |
| 1.00 | 348.150 | 1.7857 | 1.7845 | .07 | 5.2013 | 5.2051 | -.07 |
| 1.00 | 348.150 | 3.5714 | 3.5597 | .33 | 10.5640 | 10.6003 | -.34 |
| 1.00 | 348.150 | 5.3572 | 5.3463 | .20 | 16.2629 | 16.2987 | -.22 |
| 1.00 | 348.150 | 7.1429 | 7.1452 | -.03 | 22.5016 | 22.4933 | .04 |
| 1.00 | 348.150 | 8.9286 | 8.9398 | -.13 | 29.5379 | 29.4904 | .16 |
| 1.00 | 348.150 | 10.7143 | 10.7185 | -.04 | 37.6958 | 37.6751 | .06 |
| 1.00 | 348.150 | 12.5000 | 12.4894 | .08 | 47.3846 | 47.4482 | -.13 |
| 1.00 | 348.150 | 14.2858 | 14.2662 | .14 | 59.1330 | 59.2755 | -.24 |
| 1.00 | 348.150 | 16.0715 | 16.0498 | .13 | 73.6102 | 73.8055 | -.26 |
| 1.00 | 348.150 | 17.8572 | 17.8365 | .12 | 91.6485 | 91.8823 | -.25 |
| 1.00 | 348.150 | 19.6429 | 19.6248 | .09 | 114.2905 | 114.5480 | -.22 |
| 1.00 | 348.150 | 21.4286 | 21.4148 | .06 | 142.8075 | 143.0536 | -.17 |

TABLE 6b. Comparison of ID code (4) Michels $P\rho T$ compressibility data with values calculated from Eq. (6) — Continued

| Wt | T,K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|------|---------|-----------------|-----------------------|------------------------|----------|----------------|-------------------|
| 1.00 | 348.150 | 23.2144 | 23.2068 | .03 | 178.7130 | 178.8825 | -.09 |
| 1.00 | 348.150 | 25.0001 | 25.0010 | -.00 | 223.8087 | 223.7825 | .01 |
| 1.00 | 348.150 | 26.7858 | 26.7978 | -.04 | 280.2092 | 279.7912 | .15 |
| 1.00 | 373.150 | .0446 | .0447 | -.03 | .1385 | .1385 | .03 |
| 1.00 | 373.150 | 1.7857 | 1.7851 | .03 | 5.6082 | 5.6101 | -.03 |
| 1.00 | 373.150 | 3.5714 | 3.5619 | .27 | 11.4532 | 11.4853 | -.28 |
| 1.00 | 373.150 | 5.3572 | 5.3488 | .16 | 17.7197 | 17.7504 | -.17 |
| 1.00 | 373.150 | 7.1429 | 7.1458 | -.04 | 24.6244 | 24.6125 | .05 |
| 1.00 | 373.150 | 8.9286 | 8.9386 | -.11 | 32.4420 | 32.3951 | .14 |
| 1.00 | 373.150 | 10.7143 | 10.7175 | -.03 | 41.5204 | 41.5027 | .04 |
| 1.00 | 373.150 | 12.5000 | 12.4894 | .09 | 52.2869 | 52.3578 | -.14 |
| 1.00 | 373.150 | 14.2858 | 14.2667 | .13 | 65.2948 | 65.4489 | -.24 |
| 1.00 | 373.150 | 16.0715 | 16.0500 | .13 | 81.2354 | 81.4480 | -.26 |
| 1.00 | 373.150 | 17.8572 | 17.8369 | .11 | 100.9728 | 101.2220 | -.25 |
| 1.00 | 373.150 | 19.6429 | 19.6254 | .09 | 125.5650 | 125.8338 | -.21 |
| 1.00 | 373.150 | 21.4286 | 21.4178 | .05 | 156.3435 | 156.5504 | -.13 |
| 1.00 | 373.150 | 23.2144 | 23.2131 | .01 | 194.8318 | 194.8629 | -.02 |
| 1.00 | 373.150 | 25.0001 | 25.0119 | -.05 | 242.8659 | 242.5147 | .14 |
| 1.00 | 373.150 | 26.7858 | 26.8148 | -.11 | 302.5879 | 301.5219 | .35 |
| 1.00 | 398.150 | .0446 | .0447 | -.03 | .1478 | .1478 | .03 |
| 1.00 | 398.150 | 1.7857 | 1.7857 | .00 | 6.0144 | 6.0146 | -.00 |
| 1.00 | 398.150 | 3.5714 | 3.5634 | .23 | 12.3390 | 12.3686 | -.24 |
| 1.00 | 398.150 | 5.3572 | 5.3501 | .13 | 19.1698 | 19.1981 | -.15 |
| 1.00 | 398.150 | 7.1429 | 7.1456 | -.04 | 26.7365 | 26.7242 | .05 |
| 1.00 | 398.150 | 8.9286 | 8.9369 | -.09 | 35.3296 | 35.2866 | .12 |
| 1.00 | 398.150 | 10.7143 | 10.7152 | -.01 | 45.3135 | 45.3083 | .01 |
| 1.00 | 398.150 | 12.5000 | 12.4873 | .10 | 57.1386 | 57.2318 | -.16 |
| 1.00 | 398.150 | 14.2858 | 14.2645 | .15 | 71.3795 | 71.5671 | -.26 |
| 1.00 | 398.150 | 16.0715 | 16.0482 | .15 | 88.7565 | 89.0075 | -.28 |
| 1.00 | 398.150 | 17.8572 | 17.8358 | .12 | 110.1565 | 110.4410 | -.26 |
| 1.00 | 398.150 | 19.6429 | 19.6261 | .09 | 136.6722 | 136.9493 | -.20 |
| 1.00 | 398.150 | 21.4286 | 21.4202 | .04 | 169.6414 | 169.8133 | -.10 |
| 1.00 | 398.150 | 23.2144 | 23.2194 | -.02 | 210.6577 | 210.5310 | .06 |
| 1.00 | 398.150 | 25.0001 | 25.0219 | -.09 | 261.5219 | 260.8413 | .26 |
| 1.00 | 398.150 | 26.7858 | 26.8311 | -.17 | 324.4791 | 322.7399 | .54 |
| 1.00 | 423.150 | .0446 | .0447 | -.03 | .1571 | .1571 | .03 |
| 1.00 | 423.150 | 1.7857 | 1.7861 | -.02 | 6.4204 | 6.4189 | .02 |
| 1.00 | 423.150 | 3.5714 | 3.5648 | .19 | 13.2243 | 13.2505 | -.20 |
| 1.00 | 423.150 | 5.3572 | 5.3515 | .11 | 20.6179 | 20.6425 | -.12 |
| 1.00 | 423.150 | 7.1429 | 7.1458 | -.04 | 28.8433 | 28.8293 | .05 |
| 1.00 | 423.150 | 8.9286 | 8.9361 | -.08 | 38.2084 | 38.1663 | .11 |
| 1.00 | 423.150 | 10.7143 | 10.7143 | .00 | 49.0937 | 49.0938 | -.00 |
| 1.00 | 423.150 | 12.5000 | 12.4876 | .10 | 61.9744 | 62.0733 | -.16 |
| 1.00 | 423.150 | 14.2858 | 14.2662 | .14 | 77.4474 | 77.6346 | -.24 |
| 1.00 | 423.150 | 16.0715 | 16.0504 | .13 | 96.2464 | 96.4911 | -.25 |
| 1.00 | 423.150 | 17.8572 | 17.8382 | .11 | 119.2788 | 119.5502 | -.23 |
| 1.00 | 423.150 | 19.6429 | 19.6295 | .07 | 147.6741 | 147.9104 | -.16 |
| 1.00 | 423.150 | 21.4286 | 21.4253 | .02 | 182.7923 | 182.8657 | -.04 |
| 1.00 | 423.150 | 23.2144 | 23.2253 | -.05 | 226.2131 | 225.9197 | .13 |
| 1.00 | 423.150 | 25.0001 | 25.0284 | -.11 | 279.7360 | 278.8066 | .33 |
| 1.00 | 423.150 | 26.7858 | 26.8382 | -.20 | 345.6013 | 343.5033 | .61 |

112 data points, $|\Delta\rho/\rho|$, rms % = 0.154, $\Delta\rho/\rho$, av.% = 0.074, $|\Delta P/P|$, av.% = 0.188.

TABLE 6c. Comparison of ID code (81) Barreiros $P\rho T$ compressibility data with values calculated from Eq. (6)

| Wt | T,K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|-----|---------|-----------------|-----------------------|------------------------|----------|----------------|-------------------|
| .20 | 81.640 | 28.4382 | 28.4389 | -.00 | 2.1600 | 2.1513 | -.40 |
| .20 | 81.640 | 28.6238 | 28.6161 | .03 | 4.2400 | 4.3328 | -2.14 |
| .20 | 81.640 | 28.7068 | 28.7086 | -.01 | 5.3700 | 5.3469 | .43 |
| .20 | 81.640 | 28.8850 | 28.8959 | -.04 | 7.7500 | 7.6087 | 1.86 |
| .20 | 81.640 | 29.1104 | 29.1358 | -.09 | 10.9900 | 10.6360 | 3.33 |
| .20 | 81.640 | 29.8757 | 29.8927 | -.06 | 22.7300 | 22.4387 | 1.30 |
| .20 | 81.640 | 30.2691 | 30.2952 | -.09 | 30.0100 | 29.5144 | 1.68 |
| .20 | 81.640 | 30.8814 | 30.9151 | -.11 | 42.8300 | 42.0779 | 1.79 |
| .20 | 81.640 | 31.3273 | 31.3408 | -.04 | 52.8900 | 52.5543 | .64 |
| .20 | 81.640 | 31.8137 | 31.8193 | -.02 | 65.5700 | 65.4116 | .24 |
| .20 | 90.240 | 27.1843 | 27.1924 | -.03 | 3.0000 | 2.9248 | 2.57 |
| .20 | 90.240 | 27.3650 | 27.3733 | -.03 | 4.7100 | 4.6298 | 1.73 |
| .20 | 90.240 | 27.6449 | 27.6432 | .01 | 7.4400 | 7.4584 | -.25 |
| .20 | 90.240 | 27.9580 | 27.9652 | -.03 | 10.9900 | 10.9067 | .76 |
| .20 | 90.240 | 28.8027 | 28.8320 | -.10 | 22.2900 | 21.8627 | 1.95 |
| .20 | 90.240 | 29.5037 | 29.5127 | -.03 | 33.1800 | 33.0232 | .47 |
| .20 | 90.240 | 30.4405 | 30.4458 | -.02 | 51.5100 | 51.3937 | .23 |
| .20 | 90.240 | 30.9857 | 30.9688 | .05 | 63.7800 | 64.2016 | -.66 |
| .20 | 90.240 | 31.7390 | 31.6685 | .22 | 82.8000 | 84.8987 | -2.47 |
| .20 | 90.240 | 32.1368 | 32.0480 | .28 | 94.5200 | 97.4144 | -2.97 |
| .20 | 90.240 | 32.6968 | 32.5699 | .39 | 112.4400 | 117.1411 | -4.01 |
| .20 | 95.210 | 26.2419 | 26.2486 | -.03 | 1.9800 | 1.9296 | 2.61 |
| .20 | 95.210 | 26.3950 | 26.4089 | -.05 | 3.2200 | 3.1096 | 3.55 |
| .20 | 95.210 | 26.6553 | 26.6680 | -.05 | 5.3600 | 5.2512 | 2.07 |
| .20 | 95.210 | 26.9020 | 26.9059 | -.01 | 7.4800 | 7.4441 | .48 |
| .20 | 95.210 | 27.1857 | 27.1913 | -.02 | 10.2300 | 10.1737 | .55 |
| .20 | 95.210 | 27.9830 | 28.0145 | -.11 | 19.5300 | 19.1333 | 2.07 |
| .20 | 95.210 | 28.7323 | 28.7652 | -.11 | 30.0100 | 29.5066 | 1.71 |
| .20 | 95.210 | 29.3910 | 29.4096 | -.06 | 40.7600 | 40.4250 | .83 |
| .20 | 95.210 | 30.4609 | 30.4434 | .06 | 61.9800 | 62.3846 | -.65 |
| .20 | 95.210 | 30.9339 | 30.8896 | .14 | 72.8800 | 74.0251 | -1.55 |
| .20 | 95.210 | 31.4238 | 31.3705 | .17 | 85.9700 | 87.5135 | -1.76 |
| .20 | 95.210 | 31.7591 | 31.6804 | .25 | 95.2100 | 97.6645 | -2.51 |
| .20 | 95.210 | 31.9122 | 31.8253 | .27 | 99.7600 | 102.5629 | -2.73 |
| .20 | 95.210 | 32.4055 | 32.2721 | .41 | 114.7800 | 119.5657 | -4.00 |
| .20 | 95.210 | 32.7033 | 32.5482 | .48 | 124.8500 | 130.7896 | -4.54 |
| .20 | 100.180 | 25.5232 | 25.5241 | -.00 | 3.0200 | 3.0144 | .19 |
| .20 | 100.180 | 25.8652 | 25.8663 | -.00 | 5.4100 | 5.4021 | -.15 |
| .20 | 100.180 | 26.1657 | 26.1640 | .01 | 7.7100 | 7.7235 | -.17 |
| .20 | 100.180 | 26.4816 | 26.4733 | .03 | 10.3300 | 10.4040 | -.71 |
| .20 | 100.180 | 26.4957 | 26.4936 | .01 | 10.5100 | 10.5290 | -.18 |
| .20 | 100.180 | 27.6174 | 27.6274 | -.04 | 22.4300 | 22.3085 | .54 |
| .20 | 100.180 | 28.2478 | 28.2601 | -.04 | 30.8400 | 30.6628 | .58 |
| .20 | 100.180 | 29.4733 | 29.4672 | .02 | 51.1000 | 51.2181 | -.23 |
| .20 | 100.180 | 30.4804 | 30.4487 | .10 | 72.4600 | 73.2344 | -1.06 |
| .20 | 100.180 | 30.9157 | 30.8543 | .20 | 82.8000 | 84.4507 | -1.95 |
| .20 | 100.180 | 31.9295 | 31.8129 | .37 | 111.3400 | 115.2456 | -3.39 |
| .20 | 105.140 | 24.5152 | 24.5241 | -.04 | 2.6000 | 2.5532 | 1.83 |
| .20 | 105.140 | 25.0238 | 25.0320 | -.03 | 5.5200 | 5.4686 | .94 |
| .20 | 105.140 | 25.3949 | 25.3943 | .00 | 7.9200 | 7.9244 | -.06 |
| .20 | 105.140 | 25.7632 | 25.7697 | -.03 | 10.7100 | 10.6590 | .48 |
| .20 | 105.140 | 26.1904 | 26.1983 | -.03 | 14.3000 | 14.2291 | .50 |
| .20 | 105.140 | 26.7594 | 26.7822 | -.09 | 19.9500 | 19.7123 | 1.21 |
| .20 | 105.140 | 27.6068 | 27.6272 | -.07 | 29.8700 | 29.6035 | .90 |
| .20 | 105.140 | 28.3648 | 28.3840 | -.07 | 40.7600 | 40.4568 | .75 |
| .20 | 105.140 | 29.0588 | 29.0681 | -.03 | 52.4800 | 52.3081 | .33 |
| .20 | 105.140 | 29.5299 | 29.5252 | .02 | 61.4300 | 61.5276 | -.16 |
| .20 | 105.140 | 30.0824 | 30.0473 | .12 | 72.8700 | 73.6890 | -1.11 |
| .20 | 105.140 | 30.4146 | 30.3846 | .10 | 81.0100 | 81.7618 | -.92 |
| .20 | 105.140 | 30.8995 | 30.8345 | .21 | 92.8600 | 94.6713 | -1.91 |
| .20 | 105.140 | 31.4475 | 31.3745 | .23 | 108.7200 | 111.0120 | -2.06 |
| .20 | 105.140 | 32.1388 | 32.0222 | .36 | 130.3600 | 134.5885 | -3.14 |
| .20 | 105.140 | 32.3457 | 32.2405 | .33 | 138.3600 | 142.3496 | -2.80 |
| .20 | 110.190 | 23.5466 | 23.5380 | .04 | 2.8600 | 2.8961 | -1.25 |

TABLE 6c. Comparison of ID code (81) Barreiros $P\rho T$ compressibility data with values calculated from Eq. (6) — Continued

| Wt | T,K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|-----|---------|-----------------|-----------------------|------------------------|-------------|----------------|-------------------|
| .20 | 110.190 | 24.0981 | 24.0826 | .06 | 5.3900 | 5.4693 | -1.45 |
| .20 | 110.190 | 24.4882 | 24.4822 | .02 | 7.5700 | 7.6052 | -.46 |
| .20 | 110.190 | 24.9538 | 24.9551 | -.00 | 10.5400 | 10.5316 | .08 |
| .20 | 110.190 | 26.0940 | 26.0939 | .00 | 19.6700 | 19.6705 | -.00 |
| .20 | 110.190 | 27.8327 | 27.8456 | -.05 | 40.4800 | 40.2911 | .47 |
| .20 | 110.190 | 29.2269 | 29.2156 | .04 | 64.1900 | 64.4194 | -.36 |
| .20 | 110.190 | 29.5875 | 29.5452 | .14 | 71.0900 | 72.0149 | -1.28 |
| .20 | 110.190 | 30.4210 | 30.3569 | .21 | 90.3900 | 92.0656 | -1.82 |
| .20 | 110.190 | 31.0965 | 31.0147 | .26 | 108.7200 | 111.1838 | -2.22 |
| .20 | 110.190 | 31.4080 | 31.3444 | .20 | 118.9200 | 120.9712 | -1.70 |
| .20 | 110.190 | 31.7712 | 31.7169 | .17 | 131.3300 | 133.2216 | -1.42 |
| .20 | 110.190 | 32.0020 | 31.9160 | .27 | 138.3700 | 141.5030 | -2.21 |
| .20 | 114.880 | 22.5657 | 22.5490 | .07 | 3.1600 | 3.2155 | -1.73 |
| .20 | 114.880 | 23.0601 | 23.0528 | .03 | 5.0000 | 5.0290 | -.58 |
| .20 | 114.880 | 24.3339 | 24.3219 | .05 | 11.3500 | 11.4228 | -.64 |
| .20 | 114.880 | 25.6134 | 25.6044 | .04 | 20.8400 | 20.9199 | -.38 |
| .20 | 114.880 | 26.5682 | 26.5658 | .01 | 30.4900 | 30.5166 | -.09 |
| .20 | 114.880 | 27.4529 | 27.4622 | -.03 | 41.8600 | 41.7293 | .31 |
| .20 | 114.880 | 28.1770 | 28.1714 | .02 | 52.7500 | 52.8433 | -.18 |
| .20 | 114.880 | 28.7687 | 28.7590 | .03 | 63.2200 | 63.4043 | -.29 |
| .20 | 114.880 | 29.2252 | 29.2009 | .08 | 72.0500 | 72.5617 | -.71 |
| .20 | 114.880 | 29.6209 | 29.5946 | .09 | 80.6700 | 81.2722 | -.74 |
| .20 | 114.880 | 30.1114 | 30.0564 | .18 | 91.7600 | 93.1568 | -1.50 |
| .20 | 114.880 | 30.4340 | 30.3838 | .17 | 100.3100 | 101.6748 | -1.34 |
| .20 | 114.880 | 30.7768 | 30.7043 | .24 | 109.2700 | 111.3828 | -1.90 |
| .20 | 114.880 | 31.1313 | 31.0936 | .12 | 120.9900 | 122.1775 | -.97 |
| .20 | 114.880 | 31.4990 | 31.4128 | .27 | 131.3300 | 134.2410 | -2.17 |
| .20 | 114.880 | 31.7138 | 31.6579 | .18 | 139.7400 | 141.7186 | -1.40 |
| .20 | 120.040 | 21.1488 | 21.0969 | .25 | 2.9600 | 3.0746 | -3.73 |
| .20 | 120.040 | 22.3060 | 22.2565 | .22 | 6.2000 | 6.3728 | -2.71 |
| .20 | 120.040 | 23.3345 | 23.2979 | .16 | 10.5400 | 10.7215 | -1.69 |
| .20 | 120.040 | 23.3465 | 23.3120 | .15 | 10.6100 | 10.7814 | -1.59 |
| .20 | 120.040 | 24.9283 | 24.9126 | .06 | 20.7800 | 20.9048 | -.60 |
| .20 | 120.040 | 25.9047 | 25.9028 | .01 | 29.7400 | 29.7596 | -.07 |
| .20 | 120.040 | 26.8327 | 26.8450 | -.05 | 40.6200 | 40.4613 | .39 |
| .20 | 120.040 | 27.6457 | 27.6416 | .01 | 51.9300 | 51.9943 | -.12 |
| .20 | 120.040 | 28.1611 | 28.1595 | .01 | 60.4700 | 60.4971 | -.04 |
| .20 | 120.040 | 28.8193 | 28.7990 | .07 | 72.4600 | 72.8671 | -.56 |
| .20 | 120.040 | 29.2398 | 29.2251 | .05 | 81.4200 | 81.7440 | -.40 |
| .20 | 120.040 | 29.7380 | 29.7015 | .12 | 92.4500 | 93.3406 | -.95 |
| .20 | 120.040 | 30.0625 | 30.0407 | .07 | 101.0000 | 101.5702 | -.56 |
| .20 | 120.040 | 30.5120 | 30.4558 | .18 | 112.3100 | 113.9177 | -1.41 |
| .20 | 120.040 | 30.7324 | 30.7201 | .04 | 120.0300 | 120.3985 | -.31 |
| .20 | 120.040 | 30.9550 | 30.9579 | -.01 | 127.3400 | 127.2460 | .07 |
| .20 | 125.020 | 19.3558 | 19.3673 | -.06 | 2.9900 | 2.9760 | .47 |
| .20 | 125.020 | 20.5255 | 20.5151 | .05 | 4.8600 | 4.8816 | -.44 |
| .20 | 125.020 | 21.5592 | 21.5605 | -.01 | 7.5500 | 7.5457 | .06 |
| .20 | 125.020 | 22.4507 | 22.4555 | -.02 | 10.8100 | 10.7898 | .19 |
| .20 | 125.020 | 24.1937 | 24.1713 | .09 | 20.2900 | 20.4477 | -.77 |
| .20 | 125.020 | 25.3646 | 25.3534 | .04 | 30.0100 | 30.1171 | -.36 |
| .20 | 125.020 | 26.3692 | 26.3598 | .04 | 40.9000 | 41.0147 | -.28 |
| .20 | 125.020 | 27.1069 | 27.0966 | .04 | 50.6900 | 50.8385 | -.29 |
| .20 | 125.020 | 27.8660 | 27.8500 | .06 | 62.5400 | 62.8139 | -.44 |
| .20 | 125.020 | 28.3897 | 28.3617 | .10 | 71.7800 | 72.3159 | -.74 |
| .20 | 125.020 | 28.8317 | 28.7962 | .12 | 80.4600 | 81.2055 | -.92 |
| .20 | 125.020 | 29.3979 | 29.3558 | .14 | 92.8700</td | | |

TABLE 6d. Comparison of ID code (103-1807) Goodwin $P\rho T$ compressibility data with values calculated from Eq. (6).

| ID | Wt | T,K | ρ , mol/L | Calc. ρ mol/L | $\Delta\rho/P$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|-----|------|---------|-------------------|-----------------------|---------------------|---------|----------------|-------------------|
| 202 | 1.00 | 100.000 | .5054 | .5067 | -.26 | .3819 | .3810 | .23 |
| 203 | 1.00 | 120.000 | .5046 | .5042 | .08 | .4715 | .4718 | -.08 |
| 204 | 1.00 | 140.000 | .5038 | .5032 | -.12 | .5591 | .5597 | -.12 |
| 205 | 1.00 | 160.000 | .5030 | .5025 | .10 | .6456 | .6462 | -.09 |
| 206 | 1.00 | 180.000 | .5022 | .5019 | -.05 | .7314 | .7318 | -.05 |
| 207 | 1.00 | 200.000 | .5013 | .5013 | -.00 | .8166 | .8165 | .00 |
| 208 | 1.00 | 220.000 | .5005 | .5006 | -.02 | .9011 | .9010 | .02 |
| 209 | 1.00 | 240.000 | .4996 | .4999 | -.05 | .9853 | .9848 | .05 |
| 210 | 1.00 | 260.000 | .4986 | .4991 | -.10 | 1.0690 | 1.0679 | .10 |
| 211 | 1.00 | 280.000 | .4977 | .4983 | -.12 | 1.1523 | 1.1509 | .12 |
| 212 | 1.00 | 300.000 | .4967 | .4974 | -.15 | 1.2351 | 1.2333 | .15 |
| 103 | 1.00 | 120.000 | .9699 | .9695 | .04 | .8506 | .8509 | -.04 |
| 104 | 1.00 | 140.000 | .9684 | .9649 | .36 | 1.0272 | 1.0306 | -.33 |
| 105 | 1.00 | 160.000 | .9668 | .9634 | .35 | 1.2005 | 1.2044 | -.33 |
| 106 | 1.00 | 180.000 | .9652 | .9624 | .29 | 1.3713 | 1.3751 | -.28 |
| 107 | 1.00 | 200.000 | .9635 | .9615 | .21 | 1.5403 | 1.5435 | -.20 |
| 108 | 1.00 | 220.000 | .9618 | .9605 | .14 | 1.7080 | 1.7103 | -.13 |
| 109 | 1.00 | 240.000 | .9600 | .9593 | .07 | 1.8744 | 1.8757 | -.07 |
| 110 | 1.00 | 260.000 | .9582 | .9580 | -.02 | 2.0397 | 2.0401 | -.02 |
| 111 | 1.00 | 280.000 | .9564 | .9567 | -.03 | 2.2041 | 2.2035 | .03 |
| 112 | 1.00 | 300.000 | .9545 | .9553 | -.08 | 2.3676 | 2.3658 | .08 |
| 302 | 1.00 | 120.000 | 1.2806 | 1.2805 | .01 | 1.0747 | 1.0747 | -.00 |
| 303 | 1.00 | 140.000 | 1.2785 | 1.2719 | .52 | 1.3158 | 1.3218 | -.46 |
| 304 | 1.00 | 160.000 | 1.2763 | 1.2694 | .55 | 1.5505 | 1.5583 | -.50 |
| 305 | 1.00 | 180.000 | 1.2742 | 1.2682 | .47 | 1.7813 | 1.7892 | -.44 |
| 306 | 1.00 | 200.000 | 1.2719 | 1.2672 | .37 | 2.0093 | 2.0163 | -.35 |
| 307 | 1.00 | 220.000 | 1.2697 | 1.2661 | .28 | 2.2349 | 2.2411 | -.27 |
| 308 | 1.00 | 240.002 | 1.2673 | 1.2648 | .20 | 2.4587 | 2.4635 | -.19 |
| 309 | 1.00 | 240.000 | 1.2673 | 1.2648 | .20 | 2.4587 | 2.4635 | -.20 |
| 310 | 1.00 | 260.000 | 1.2649 | 1.2634 | .12 | 2.6810 | 2.6842 | -.12 |
| 311 | 1.00 | 280.000 | 1.2625 | 1.2617 | .07 | 2.9017 | 2.9035 | -.07 |
| 312 | 1.00 | 300.000 | 1.2600 | 1.2599 | .01 | 3.1210 | 3.1213 | -.01 |
| 402 | 1.00 | 120.000 | 1.7489 | 1.7531 | -.24 | 1.3715 | 1.3691 | .18 |
| 403 | 1.00 | 140.000 | 1.7460 | 1.7327 | .77 | 1.7166 | 1.7276 | -.64 |
| 404 | 1.00 | 160.000 | 1.7430 | 1.7280 | .87 | 2.0492 | 2.0651 | -.77 |
| 405 | 1.00 | 180.000 | 1.7400 | 1.7266 | .78 | 2.3749 | 2.3920 | -.71 |
| 406 | 1.00 | 200.000 | 1.7369 | 1.7259 | .64 | 2.6960 | 2.7123 | -.60 |
| 407 | 1.00 | 220.000 | 1.7337 | 1.7250 | .50 | 3.0134 | 3.0280 | -.48 |
| 408 | 1.00 | 240.000 | 1.7305 | 1.7237 | .39 | 3.3275 | 3.3403 | -.38 |
| 409 | 1.00 | 260.003 | 1.7272 | 1.7221 | .30 | 3.6391 | 3.6498 | -.29 |
| 410 | 1.00 | 260.000 | 1.7272 | 1.7220 | .30 | 3.6390 | 3.6498 | -.29 |
| 411 | 1.00 | 280.000 | 1.7238 | 1.7202 | .21 | 3.9484 | 3.9567 | -.21 |
| 412 | 1.00 | 300.000 | 1.7204 | 1.7180 | .14 | 4.2555 | 4.2615 | -.14 |
| 502 | 1.00 | 140.000 | 2.6006 | 2.5683 | 1.26 | 2.3489 | 2.3710 | -.93 |
| 503 | 1.00 | 160.000 | 2.5959 | 2.5586 | 1.46 | 2.8771 | 2.9120 | -.20 |
| 504 | 1.00 | 180.000 | 2.5913 | 2.5580 | 1.30 | 3.3908 | 3.4299 | -.14 |
| 505 | 1.00 | 200.000 | 2.5865 | 2.5586 | 1.09 | 3.8949 | 3.9341 | -.00 |
| 506 | 1.00 | 220.000 | 2.5817 | 2.5589 | .89 | 4.3922 | 4.4292 | -.84 |
| 507 | 1.00 | 240.000 | 2.5768 | 2.5584 | .72 | 4.8836 | 4.9176 | -.69 |
| 508 | 1.00 | 260.000 | 2.5717 | 2.5569 | .58 | 5.3699 | 5.4004 | -.56 |
| 509 | 1.00 | 280.000 | 2.5666 | 2.5550 | .45 | 5.8523 | 5.8788 | -.45 |
| 510 | 1.00 | 300.000 | 2.5614 | 2.5523 | .36 | 6.3304 | 6.3532 | -.36 |
| 601 | 1.00 | 130.000 | 4.1453 | 4.1102 | .85 | 2.7150 | 2.7255 | -.39 |
| 602 | 1.00 | 140.000 | 4.1413 | 4.0580 | 2.05 | 3.2048 | 3.2434 | -.19 |
| 603 | 1.00 | 160.000 | 4.1335 | 4.0449 | 2.19 | 4.1359 | 4.2027 | -.59 |
| 604 | 1.00 | 180.000 | 4.1256 | 4.0510 | 1.84 | 5.0336 | 5.1101 | -.50 |
| 605 | 1.00 | 200.000 | 4.1176 | 4.0573 | 1.49 | 5.9109 | 5.9886 | -.30 |
| 606 | 1.00 | 220.000 | 4.1096 | 4.0611 | 1.19 | 6.7733 | 6.8482 | -.09 |
| 607 | 1.00 | 240.000 | 4.1014 | 4.0627 | .95 | 7.6241 | 7.6937 | -.90 |
| 608 | 1.00 | 260.000 | 4.0931 | 4.0621 | .76 | 8.4645 | 8.5282 | -.75 |
| 609 | 1.00 | 280.000 | 4.0847 | 4.0598 | .61 | 9.2962 | 9.3535 | -.61 |
| 610 | 1.00 | 300.000 | 4.0761 | 4.0561 | .49 | 10.1194 | 10.1703 | -.50 |
| 702 | 1.00 | 140.000 | 5.9447 | 5.7985 | 2.52 | 3.8468 | 3.8870 | -.03 |

TABLE 6d. Comparison of ID code (103-1807) Goodwin $P\rho T$ compressibility data with values calculated from Eq. (6) — Continued

| ID | Wt | T,K | ρ , mol/L | Calc. ρ mol/L | $\Delta\rho/P$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|------|------|---------|-------------------|-----------------------|---------------------|---------|----------------|-------------------|
| 703 | 1.00 | 160.000 | 5.9327 | 5.8050 | 2.20 | 5.3191 | 5.3947 | -.140 |
| 704 | 1.00 | 180.000 | 5.9207 | 5.8245 | 1.65 | 6.7362 | 6.8227 | -.127 |
| 705 | 1.00 | 200.000 | 5.9087 | 5.8369 | 1.23 | 8.1207 | 8.2072 | -.105 |
| 706 | 1.00 | 220.000 | 5.8966 | 5.8429 | .92 | 9.4814 | 9.5623 | -.85 |
| 707 | 1.00 | 240.000 | 5.8843 | 5.8434 | .70 | 10.8210 | 10.8948 | -.68 |
| 708 | 1.00 | 260.000 | 5.8719 | 5.8404 | .54 | 12.1430 | 12.2091 | -.54 |
| 709 | 1.00 | 280.000 | 5.8594 | 5.8357 | .41 | 13.4508 | 13.5077 | -.42 |
| 710 | 1.00 | 300.000 | 5.8468 | 5.8285 | .31 | 14.7428 | 14.7921 | -.33 |
| 801 | 1.00 | 140.000 | 7.6328 | 7.4630 | 2.28 | 4.2149 | 4.2436 | -.68 |
| 802 | 1.00 | 160.000 | 7.6165 | 7.5141 | 1.36 | 6.2559 | 6.3083 | -.83 |
| 803 | 1.00 | 180.000 | 7.6004 | 7.5363 | .85 | 8.2328 | 8.2880 | -.67 |
| 804 | 1.00 | 200.000 | 7.5841 | 7.5440 | .53 | 10.1697 | 10.2184 | -.48 |
| 805 | 1.00 | 220.000 | 7.5678 | 7.5429 | .33 | 12.0738 | 12.1128 | -.32 |
| 806 | 1.00 | 240.000 | 7.5515 | 7.5369 | .19 | 13.9499 | 13.9779 | -.20 |
| 807 | 1.00 | 260.000 | 7.5351 | 7.5277 | .10 | 15.8008 | 15.8175 | -.11 |
| 808 | 1.00 | 280.000 | 7.5186 | 7.5165 | .03 | 17.6288 | 17.6342 | -.03 |
| 809 | 1.00 | 300.000 | 7.5021 | 7.5039 | -.02 | 19.4354 | 19.4300 | .03 |
| 901 | 1.00 | 140.000 | 9.1109 | 8.9427 | 1.88 | 4.4345 | 4.4565 | -.49 |
| 902 | 1.00 | 160.000 | 9.0907 | 9.0193 | .79 | 7.0176 | 7.0541 | -.52 |
| 903 | 1.00 | 180.000 | 9.0705 | 9.0325 | .42 | 9.5468 | 9.5814 | -.36 |
| 904 | 1.00 | 200.000 | 9.0503 | 9.0316 | .21 | 12.0359 | 12.0605 | -.20 |
| 905 | 1.00 | 220.000 | 9.0301 | 9.0232 | .08 | 14.4874 | 14.4993 | -.08 |
| 906 | 1.00 | 240.000 | 9.0100 | 9.0101 | -.00 | 16.9027 | 16.9025 | .00 |
| 907 | 1.00 | 260.000 | 8.9900 | 8.9944 | -.05 | 19.2840 | 19.2729 | .06 |
| 908 | 1.00 | 280.000 | 8.9701 | 8.9778 | -.09 | 21.6355 | 21.6130 | .10 |
| 1001 | 1.00 | 140.000 | 10.8894 | 10.6401 | 2.34 | 4.6570 | 4.6919 | -.74 |
| 1002 | 1.00 | 160.000 | 10.8640 | 10.7761 | .82 | 7.9735 | 8.0257 | -.65 |
| 1003 | 1.00 | 180.000 | 10.8384 | 10.7949 | .40 | 11.2738 | 11.3204 | -.41 |
| 1004 | 1.00 | 200.000 | 10.8130 | 10.7898 | .22 | 14.5341 | 14.5702 | -.25 |
| 1005 | 1.00 | 220.000 | 10.7879 | 10.7753 | .12 | 17.7478 | 17.7733 | -.14 |
| 1006 | 1.00 | 240.000 | 10.7632 | 10.7570 | .06 | 20.9150 | 20.9306 | -.07 |
| 1007 | 1.00 | 260.000 | 10.7390 | 10.7366 | .02 | 24.0367 | 24.0438 | -.03 |
| 1008 | 1.00 | 280.000 | 10.7153 | 10.7155 | -.00 | 27.1157 | 27.1150 | .00 |
| 1009 | 1.00 | 300.000 | 10.6920 | 10.6941 | -.02 | 30.1546 | 30.1463 | .03 |
| 1101 | 1.00 | 140.000 | 12.2219 | 11.8970 | 2.73 | 4.8457 | 4.9013 | -.14 |
| 1102 | 1.00 | 160.000 | 12.1921 | 12.0745 | .97 | 8.8047 | 8.8874 | -.93 |
| 1103 | 1.00 | 180.000 | 12.1621 | 12.0984 | .53 | 12.7774 | 12.8573 | -.62 |
| 1104 | 1.00 | 200.000 | 12.1325 | 12.0940 | .32 | 16.7119 | 16.7814 | -.41 |
| 1105 | 1.00 | 220.000 | 12.1035 | 12.0776 | .21 | 20.5894 | 20.6505 | -.30 |
| 1106 | 1.00 | 240.000 | 12.0755 | 12.0563 | .16 | 24.4076 | 24.4630 | -.23 |
| 1107 | 1.00 | 260.000 | 12.0485 | 12.0339 | .12 | 28.1701 | 28.2201 | -.18 |
| 1108 | 1.00 | 280.000 | 12.0222 | 12.0104 | .10 | 31.8766 | 31.9232 | -.15 |
| 1109 | 1.00 | 300.000 | 11.9964 | 11.9863 | .08 | 35.5291 | 35.5741 | -.13 |
| 1201 | 1.00 | 140.000 | 14.2041 | 13.9600 | 1.75 | 5.2986 | 5.3753 | -.14 |
| 1202 | 1.00 | 160.000 | 14.1665 | 14.0533 | .81 | 10.4414 | 10.5551 | -.08 |
| 1203 | 1.00 | 180.000 | 14.1291 | 14.0619 | .48 | 15.6165 | 15.7303 | -.72 |
| 1204 | 1.00 | 200.000 | 14.0929 | 14.0453 | .34 | 20.7321 | 20.8446 | -.34 |
| 1205 | 1.00 | 220.000 | 14.0585 | 14.0218 | .26 | 25.7699 | 25.8814 | -.43 |
| 1206 | 1.00 | 24 | | | | | | |

TABLE 6d. Comparison of ID code (103-1807) Goodwin $P\rho T$ compressibility data with values calculated from Eq. (6) — Continued

| ID | Wt | T/K | ρ , mol/L | Calc. ρ , mol/L | $\Delta\rho/\rho$, % | P, MPa | Calc. P MPa | $\Delta P/P$, % |
|------|------|---------|-------------------|-------------------------|--------------------------|---------|----------------|---------------------|
| 1405 | 1.00 | 170.000 | 17.7725 | 17.7242 | .27 | 20.3832 | 20.5255 | -.69 |
| 1406 | 1.00 | 180.000 | 17.7470 | 17.7045 | .24 | 24.4687 | 24.6155 | -.60 |
| 1407 | 1.00 | 190.000 | 17.7229 | 17.6831 | .23 | 28.5060 | 28.6633 | -.55 |
| 1408 | 1.00 | 200.000 | 17.7001 | 17.6619 | .22 | 32.4983 | 32.6677 | -.52 |
| 1409 | 1.00 | 210.000 | 17.6783 | 17.6412 | .21 | 36.4456 | 36.6276 | -.50 |
| 1502 | 1.00 | 130.000 | 20.0986 | 20.0565 | .21 | 6.8259 | 6.9147 | -1.28 |
| 1503 | 1.00 | 140.000 | 20.0618 | 20.0180 | .22 | 12.3991 | 12.5231 | -.99 |
| 1504 | 1.00 | 150.000 | 20.0264 | 19.9877 | .19 | 17.9247 | 18.0610 | -.75 |
| 1505 | 1.00 | 160.000 | 19.9933 | 19.9595 | .17 | 23.3836 | 23.5251 | -.60 |
| 1506 | 1.00 | 170.000 | 19.9628 | 19.9289 | .17 | 28.7514 | 28.9152 | -.57 |
| 1507 | 1.00 | 180.000 | 19.9347 | 19.9008 | .17 | 34.0471 | 34.2318 | -.54 |
| 1601 | 1.00 | 116.000 | 21.8526 | 21.8615 | -.04 | 1.9882 | 1.9652 | 1.17 |
| 1602 | 1.00 | 120.000 | 21.8344 | 21.8184 | .07 | 4.7709 | 4.8180 | -.98 |
| 1603 | 1.00 | 130.000 | 21.7891 | 21.7661 | .11 | 11.7640 | 11.8516 | -.74 |
| 1604 | 1.00 | 140.000 | 21.7462 | 21.7258 | .09 | 18.6576 | 18.7522 | -.50 |
| 1605 | 1.00 | 150.000 | 21.7071 | 21.6868 | .09 | 25.4191 | 25.5296 | -.43 |
| 1606 | 1.00 | 160.000 | 21.6722 | 21.6493 | .11 | 32.0506 | 32.1927 | -.44 |
| 1607 | 1.00 | 165.000 | 21.6560 | 21.6320 | .11 | 35.3236 | 35.4820 | -.45 |
| 1701 | 1.00 | 108.000 | 23.9498 | 23.9580 | -.03 | 2.6624 | 2.6245 | 1.44 |
| 1702 | 1.00 | 110.000 | 23.9382 | 23.9352 | .01 | 4.4750 | 4.4893 | -.32 |
| 1703 | 1.00 | 115.000 | 23.9088 | 23.9093 | -.00 | 9.1035 | 9.1008 | .03 |
| 1704 | 1.00 | 120.000 | 23.8805 | 23.8828 | -.01 | 13.6642 | 13.6504 | .10 |
| 1705 | 1.00 | 125.000 | 23.8534 | 23.8574 | -.02 | 18.1667 | 18.1414 | -.14 |
| 1706 | 1.00 | 130.000 | 23.8280 | 23.8326 | -.02 | 22.6112 | 22.5796 | .14 |
| 1707 | 1.00 | 135.000 | 23.8046 | 23.8072 | -.01 | 26.9895 | 26.9705 | .07 |
| 1708 | 1.00 | 140.000 | 23.7828 | 23.7820 | .00 | 31.3077 | 31.3142 | -.02 |
| 1709 | 1.00 | 145.000 | 23.7626 | 23.7587 | .02 | 35.5807 | 35.6135 | -.09 |
| 1801 | 1.00 | 97.000 | 25.9642 | 25.9697 | -.02 | 2.2153 | 2.1761 | 1.80 |
| 1802 | 1.00 | 100.000 | 25.9414 | 25.9554 | -.05 | 5.8528 | 5.7472 | 1.84 |
| 1803 | 1.00 | 105.000 | 25.9046 | 25.9291 | -.09 | 11.8205 | 11.6203 | 1.72 |
| 1804 | 1.00 | 110.000 | 25.8699 | 25.9000 | -.12 | 17.6693 | 17.4036 | 1.53 |
| 1805 | 1.00 | 115.000 | 25.8381 | 25.8700 | -.12 | 23.4106 | 23.1095 | 1.30 |
| 1806 | 1.00 | 120.000 | 25.8094 | 25.8392 | -.12 | 29.0455 | 28.7462 | 1.04 |
| 1807 | 1.00 | 125.000 | 25.7834 | 25.8099 | -.10 | 34.5974 | 34.3158 | .82 |

159 data points, $|\Delta\rho/\rho|$, rms % = 0.726, $\Delta\rho/\rho$, av. % = 0.424, $|\Delta P/P|$, av. % = 0.532.

TABLE 6e. Comparison of ID code (2) Bartlett $P\rho T$ compressibility data with values calculated from Eq. (6).

| Wt | T/K | ρ , mol/L | Calc. ρ , mol/L | $\Delta\rho/\rho$, % | P, MPa | Calc. P MPa | $\Delta P/P$, % |
|------|---------|-------------------|-------------------------|--------------------------|----------|----------------|---------------------|
| 1.00 | 203.250 | .0601 | .0601 | -.02 | .1013 | .1013 | .02 |
| 1.00 | 203.250 | 1.5876 | 1.5841 | .22 | 2.5331 | 2.5384 | -.21 |
| 1.00 | 203.250 | 3.3637 | 3.3314 | .97 | 5.0663 | 5.1108 | -.87 |
| 1.00 | 203.250 | 5.2953 | 5.2489 | .88 | 7.5994 | 7.6584 | -.77 |
| 1.00 | 203.250 | 7.2626 | 7.2685 | -.08 | 10.1325 | 10.1251 | .07 |
| 1.00 | 203.250 | 9.1362 | 9.1956 | -.65 | 12.6656 | 12.5828 | .66 |
| 1.00 | 203.250 | 10.8182 | 10.8730 | -.50 | 15.1988 | 15.1090 | .59 |
| 1.00 | 203.250 | 13.4650 | 13.4983 | -.25 | 20.2650 | 20.1890 | .38 |
| 1.00 | 203.250 | 16.8358 | 16.8590 | -.14 | 30.3975 | 30.3060 | .30 |
| 1.00 | 203.250 | 18.9286 | 18.9616 | -.17 | 40.5300 | 40.3387 | .47 |
| 1.00 | 203.250 | 20.4410 | 20.4761 | -.17 | 50.6625 | 50.3945 | .53 |
| 1.00 | 203.250 | 21.6259 | 21.6617 | -.17 | 60.7950 | 60.4566 | .56 |
| 1.00 | 203.250 | 23.4408 | 23.4716 | -.13 | 81.0600 | 80.6594 | .50 |
| 1.00 | 203.250 | 24.8127 | 24.8457 | -.13 | 101.3250 | 100.7817 | .54 |
| 1.00 | 223.220 | .0547 | .0547 | -.01 | .1013 | .1013 | .01 |
| 1.00 | 223.220 | 1.4122 | 1.4167 | -.31 | 2.5331 | 2.5254 | .30 |
| 1.00 | 223.220 | 2.9286 | 2.9187 | .34 | 5.0663 | 5.0825 | -.32 |
| 1.00 | 223.220 | 4.5320 | 4.4972 | .77 | 7.5994 | 7.6541 | -.72 |
| 1.00 | 223.220 | 6.1458 | 6.1224 | .38 | 10.1325 | 10.1690 | -.36 |
| 1.00 | 223.220 | 7.7003 | 7.7193 | -.25 | 12.6656 | 12.6346 | .25 |
| 1.00 | 223.220 | 9.1682 | 9.1998 | -.34 | 15.1988 | 15.1418 | .38 |
| 1.00 | 223.220 | 11.6622 | 11.6782 | -.14 | 20.2650 | 20.2280 | .18 |
| 1.00 | 223.220 | 15.0957 | 15.1409 | -.30 | 30.3975 | 30.2311 | .55 |
| 1.00 | 223.220 | 17.3624 | 17.4179 | -.32 | 40.5300 | 40.2359 | .73 |
| 1.00 | 223.220 | 18.9890 | 19.0695 | -.42 | 50.6625 | 50.1002 | 1.12 |
| 1.00 | 223.220 | 20.2539 | 20.3594 | -.52 | 60.7950 | 59.8811 | 1.53 |
| 1.00 | 223.220 | 22.1829 | 22.3169 | -.60 | 81.0600 | 79.4515 | 2.02 |
| 1.00 | 223.220 | 23.6570 | 23.7926 | -.57 | 101.3250 | 99.2527 | 2.09 |
| 1.00 | 248.160 | .0492 | .0492 | -.04 | .1013 | .1013 | .04 |
| 1.00 | 248.160 | 1.2487 | 1.2559 | -.58 | 2.5331 | 2.5188 | .57 |
| 1.00 | 248.160 | 2.5458 | 2.5494 | -.14 | 5.0663 | 5.0592 | .14 |
| 1.00 | 248.160 | 3.8789 | 3.8691 | .25 | 7.5994 | 7.6180 | -.24 |
| 1.00 | 248.160 | 5.2509 | 5.2003 | .97 | 10.1325 | 10.2291 | -.94 |
| 1.00 | 248.160 | 6.4903 | 6.5137 | -.36 | 12.6656 | 12.6197 | .36 |
| 1.00 | 248.160 | 7.7300 | 7.7708 | -.53 | 15.1988 | 15.1137 | .56 |
| 1.00 | 248.160 | 9.8965 | 10.0053 | -.09 | 20.2650 | 19.9946 | 1.35 |
| 1.00 | 248.160 | 13.2774 | 13.3708 | -.70 | 30.3975 | 30.0597 | 1.12 |
| 1.00 | 248.160 | 15.6601 | 15.7376 | -.49 | 40.5300 | 40.1426 | .97 |
| 1.00 | 248.160 | 17.3966 | 17.5001 | -.59 | 50.6625 | 49.9899 | 1.35 |
| 1.00 | 248.160 | 18.7550 | 18.8871 | -.70 | 60.7950 | 59.7328 | 1.78 |
| 1.00 | 248.160 | 20.8211 | 20.9936 | -.82 | 81.0600 | 79.1384 | 2.43 |
| 1.00 | 248.160 | 22.3943 | 22.5766 | -.81 | 101.3250 | 98.7304 | 2.63 |
| 1.00 | 273.150 | .0446 | .0447 | -.03 | .1013 | .1013 | .03 |
| 1.00 | 273.150 | 1.1280 | 1.1303 | -.20 | 2.5331 | 2.5281 | .20 |
| 1.00 | 273.150 | 2.2786 | 2.2743 | .19 | 5.0663 | 5.0758 | -.19 |
| 1.00 | 273.150 | 3.4376 | 3.4220 | .46 | 7.5994 | 7.6339 | -.45 |
| 1.00 | 273.150 | 4.5811 | 4.5649 | .36 | 10.1325 | 10.1687 | -.36 |
| 1.00 | 273.150 | 5.6960 | 5.6894 | .12 | 12.6656 | 12.6807 | -.12 |
| 1.00 | 273.150 | 6.7716 | 6.7773 | -.08 | 15.1988 | 15.1853 | .09 |
| 1.00 | 273.150 | 8.7535 | 8.7766 | -.26 | 20.2650 | 20.2022 | .31 |
| 1.00 | 273.150 | 11.9462 | 11.9609 | -.12 | 30.3975 | 30.3425 | .18 |
| 1.00 | 273.150 | 14.3006 | 14.3173 | -.12 | 40.5300 | 40.4475 | .20 |
| 1.00 | 273.150 | 16.1248 | 16.1290 | -.03 | 50.6625 | 50.6359 | .05 |
| 1.00 | 273.150 | 17.5576 | 17.5766 | -.11 | 60.7950 | 60.6478 | .24 |
| 1.00 | 273.150 | 19.7711 | 19.7925 | -.11 | 81.0600 | 80.8308 | .28 |
| 1.00 | 273.150 | 21.4352 | 21.4617 | -.12 | 101.3250 | 100.9633 | .36 |
| 1.00 | 298.150 | .0409 | .0409 | -.02 | .1013 | .1013 | .02 |
| 1.00 | 298.150 | 1.0271 | 1.0289 | -.17 | 2.5331 | 2.5287 | .17 |
| 1.00 | 298.150 | 2.0609 | 2.0588 | .10 | 5.0663 | 5.0715 | -.10 |
| 1.00 | 298.150 | 3.0911 | 3.0814 | .31 | 7.5994 | 7.6233 | -.31 |
| 1.00 | 298.150 | 4.1093 | 4.0917 | .43 | 10.1325 | 10.1769 | -.44 |
| 1.00 | 298.150 | 5.0962 | 5.0825 | .27 | 12.6656 | 12.7012 | -.28 |
| 1.00 | 298.150 | 6.0410 | 6.0444 | -.06 | 15.1988 | 15.1896 | .06 |
| 1.00 | 298.150 | 7.8218 | 7.8436 | -.28 | 20.2650 | 20.2003 | .32 |

TABLE 6e. Comparison of ID code (2) Bartlett $P\rho T$ compressibility data with values calculated from Eq. (6) — Continued

| Wt | T/K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P , MPa | Calc. P MPa | $\Delta P/P$ % |
|------|---------|-----------------|-----------------------|------------------------|-----------|------------------|-------------------|
| 1.00 | 298.150 | 10.7955 | 10.8310 | -.33 | 30.3975 | 30.2593 | .46 |
| 1.00 | 298.150 | 13.1062 | 13.1260 | -.15 | 40.5300 | 40.4311 | .24 |
| 1.00 | 298.150 | 14.9408 | 14.9412 | -.00 | 50.6625 | 50.6599 | .01 |
| 1.00 | 298.150 | 16.4159 | 16.4177 | -.01 | 60.7950 | 60.7813 | .02 |
| 1.00 | 298.150 | 18.6840 | 18.7062 | -.12 | 81.0600 | 80.8314 | .28 |
| 1.00 | 298.150 | 20.4251 | 20.4413 | -.08 | 101.3250 | 101.1123 | .21 |
| 1.00 | 323.150 | .0377 | .0377 | -.02 | 1013 | .1013 | .02 |
| 1.00 | 323.150 | .9441 | .9451 | -.11 | 2.5331 | 2.5304 | .11 |
| 1.00 | 323.150 | 1.8875 | 1.8840 | -.18 | 5.0663 | 5.0756 | -.19 |
| 1.00 | 323.150 | 2.8179 | 2.8105 | -.26 | 7.5994 | 7.6199 | -.27 |
| 1.00 | 323.150 | 3.7343 | 3.7209 | -.36 | 10.1325 | 10.1700 | -.37 |
| 1.00 | 323.150 | 4.6237 | 4.6116 | -.26 | 12.6656 | 12.7007 | -.28 |
| 1.00 | 323.150 | 5.4925 | 5.4773 | -.28 | 15.1988 | 15.2441 | -.30 |
| 1.00 | 323.150 | 7.1082 | 7.1120 | -.05 | 20.2650 | 20.2528 | .06 |
| 1.00 | 323.150 | 9.9053 | 9.9087 | -.03 | 30.3975 | 30.3834 | .05 |
| 1.00 | 323.150 | 12.1346 | 12.1230 | .10 | 40.5300 | 40.5891 | -.15 |
| 1.00 | 323.150 | 13.9309 | 13.9135 | .13 | 50.6625 | 50.7717 | -.22 |
| 1.00 | 323.150 | 15.4136 | 15.3949 | .12 | 60.7950 | 60.9351 | -.23 |
| 1.00 | 323.150 | 17.7296 | 17.7244 | -.03 | 81.0600 | 81.1118 | -.06 |
| 1.00 | 323.150 | 19.5127 | 19.5072 | -.03 | 101.3250 | 101.3947 | -.07 |
| 1.00 | 373.150 | .0327 | .0327 | -.02 | 1013 | .1013 | .02 |
| 1.00 | 373.150 | .8116 | .8139 | -.28 | 2.5331 | 2.5259 | .28 |
| 1.00 | 373.150 | 1.6132 | 1.6156 | -.15 | 5.0663 | 5.0584 | .16 |
| 1.00 | 373.150 | 2.4009 | 2.4012 | -.02 | 7.5994 | 7.5981 | .02 |
| 1.00 | 373.150 | 3.1747 | 3.1691 | -.18 | 10.1325 | 10.1514 | -.19 |
| 1.00 | 373.150 | 3.9243 | 3.9179 | -.16 | 12.6656 | 12.6876 | -.17 |
| 1.00 | 373.150 | 4.6542 | 4.6462 | -.17 | 15.1988 | 15.2270 | -.19 |
| 1.00 | 373.150 | 6.0353 | 6.0338 | -.03 | 20.2650 | 20.2708 | -.03 |
| 1.00 | 373.150 | 8.4776 | 8.4945 | -.20 | 30.3975 | 30.3213 | .25 |
| 1.00 | 373.150 | 10.5272 | 10.5376 | -.10 | 40.5300 | 40.4733 | .14 |
| 1.00 | 373.150 | 12.2410 | 12.2417 | -.01 | 50.6625 | 50.6581 | .01 |
| 1.00 | 373.150 | 13.6963 | 13.6899 | .05 | 60.7950 | 60.8429 | -.08 |
| 1.00 | 373.150 | 15.9839 | 16.0323 | -.30 | 81.0600 | 80.5832 | .59 |
| 1.00 | 373.150 | 17.9038 | 17.8656 | .21 | 101.3250 | 101.7974 | -.46 |
| 1.00 | 423.150 | .0288 | .0288 | -.01 | 1013 | .1013 | .01 |
| 1.00 | 423.150 | .7111 | .7133 | -.62 | 2.3331 | 2.3172 | .63 |
| 1.00 | 423.150 | 1.4107 | 1.4175 | -.48 | 5.0663 | 5.0416 | .49 |
| 1.00 | 423.150 | 2.0957 | 2.1032 | -.36 | 7.5994 | 7.5711 | .37 |
| 1.00 | 423.150 | 2.7634 | 2.7720 | -.31 | 10.1325 | 10.0995 | .33 |
| 1.00 | 423.150 | 3.4202 | 3.4235 | -.10 | 12.6656 | 12.6526 | .10 |
| 1.00 | 423.150 | 4.0494 | 4.0573 | -.20 | 15.1988 | 15.1666 | .21 |
| 1.00 | 423.150 | 5.2561 | 5.2698 | -.26 | 20.2650 | 20.2060 | .29 |
| 1.00 | 423.150 | 7.4183 | 7.4612 | -.58 | 30.3975 | 30.1838 | .71 |
| 1.00 | 423.150 | 9.3113 | 9.3407 | -.31 | 40.5300 | 40.3584 | .43 |
| 1.00 | 423.150 | 10.9152 | 10.9475 | -.30 | 50.6625 | 50.4427 | .44 |
| 1.00 | 423.150 | 12.3114 | 12.3376 | -.21 | 60.7950 | 60.5905 | .34 |
| 1.00 | 423.150 | 14.6119 | 14.6373 | -.17 | 81.0600 | 80.8086 | .31 |
| 1.00 | 423.150 | 16.4480 | 16.4772 | -.18 | 101.3250 | 100.9690 | .35 |
| 1.00 | 473.150 | .0258 | .0258 | -.00 | 1013 | .1013 | -.00 |
| 1.00 | 473.150 | .6350 | .6388 | -.60 | 2.5331 | 2.5178 | .61 |
| 1.00 | 473.150 | 1.2570 | 1.2642 | -.57 | 5.0663 | 5.0365 | .59 |
| 1.00 | 473.150 | 1.8655 | 1.8746 | -.48 | 7.5994 | 7.5613 | .50 |
| 1.00 | 473.150 | 2.4602 | 2.4694 | -.37 | 10.1325 | 10.0928 | .39 |
| 1.00 | 473.150 | 3.0399 | 3.0488 | -.29 | 12.6656 | 12.6264 | .31 |
| 1.00 | 473.150 | 3.6006 | 3.6127 | -.33 | 15.1988 | 15.1438 | .36 |
| 1.00 | 473.150 | 4.6771 | 4.6943 | -.37 | 20.2650 | 20.1819 | .41 |
| 1.00 | 473.150 | 6.6357 | 6.6712 | -.53 | 30.3975 | 30.2039 | .64 |
| 1.00 | 473.150 | 8.3523 | 8.4038 | -.61 | 40.5300 | 40.2080 | .80 |
| 1.00 | 473.150 | 9.8650 | 9.9155 | -.51 | 50.6625 | 50.3010 | .72 |
| 1.00 | 473.150 | 11.1967 | 11.2421 | -.40 | 60.7950 | 60.4269 | .61 |
| 1.00 | 473.150 | 13.4255 | 13.4736 | -.36 | 81.0600 | 80.5734 | .60 |
| 1.00 | 473.150 | 15.2553 | 15.2931 | -.25 | 101.3250 | 100.8638 | .46 |

126 data points, $|\Delta\rho/\rho|$, rms % = 0.370, $\Delta\rho/\rho$, av. % = 0.134,
 $|\Delta P/P|$, av. % = 0.432.

TABLE 6f. Comparison of ID code (3) Deming $P\rho T$ compressibility data with values calculated from Eq. (6)

| Wt | T/K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P , MPa | Calc. P MPa | $\Delta P/P$ % |
|-----|---------|-----------------|-----------------------|------------------------|-----------|------------------|-------------------|
| .00 | 203.150 | 1.3900 | 1.3851 | -.31 | 2.5331 | 2.5406 | -.29 |
| .00 | 203.150 | 3.3546 | 3.3339 | -.62 | 5.0663 | 5.0949 | -.56 |
| .00 | 203.150 | 5.2667 | 5.2535 | -.25 | 7.5994 | 7.6161 | -.22 |
| .00 | 203.150 | 7.2306 | 7.2757 | -.62 | 10.1325 | 10.0758 | .56 |
| .00 | 203.150 | 10.8227 | 10.8830 | -.55 | 15.1988 | 15.1000 | .65 |
| .00 | 203.150 | 13.5221 | 13.5088 | -.10 | 20.2650 | 20.2955 | -.15 |
| .00 | 203.150 | 16.8571 | 16.8683 | -.07 | 30.3975 | 30.3532 | .15 |
| .00 | 203.150 | 18.9495 | 18.9698 | -.11 | 40.5300 | 40.4124 | .29 |
| .00 | 203.150 | 20.4456 | 20.4834 | -.18 | 50.6625 | 50.3737 | .57 |
| .00 | 203.150 | 21.6311 | 21.6684 | -.17 | 60.7950 | 60.4413 | .59 |
| .00 | 203.150 | 23.4271 | 23.4776 | -.21 | 81.0600 | 80.4034 | .82 |
| .00 | 203.150 | 24.7840 | 24.8511 | -.27 | 101.3250 | 100.2201 | 1.10 |
| .00 | 203.150 | 25.8945 | 25.9648 | -.27 | 121.5900 | 120.1960 | 1.16 |
| .00 | 223.150 | 1.4211 | 1.4172 | -.28 | 2.5331 | 2.5400 | -.27 |
| .00 | 223.150 | 2.9419 | 2.9199 | -.75 | 5.0663 | 5.1023 | -.71 |
| .00 | 223.150 | 4.5312 | 4.4993 | .71 | 7.5994 | 7.6494 | -.65 |
| .00 | 223.150 | 6.1380 | 6.1256 | .20 | 10.1325 | 10.1518 | -.19 |
| .00 | 223.150 | 9.1445 | 9.2047 | -.65 | 15.1988 | 15.0903 | .72 |
| .00 | 223.150 | 11.6261 | 11.6837 | -.49 | 20.2650 | 20.1314 | .66 |
| .00 | 223.150 | 15.1075 | 15.1464 | -.26 | 30.3975 | 30.2539 | .47 |
| .00 | 223.150 | 17.2320 | 17.4230 | -.10 | 40.5300 | 39.5289 | .25 |
| .00 | 223.150 | 19.0138 | 19.0742 | -.32 | 50.6625 | 50.2398 | .84 |
| .00 | 223.150 | 20.4385 | 20.3638 | .37 | 60.7950 | 61.4526 | -.107 |
| .00 | 223.150 | 22.2238 | 22.3208 | -.43 | 81.0600 | 79.8921 | 1.46 |
| .00 | 223.150 | 23.7199 | 23.7961 | -.32 | 101.3250 | 100.1545 | 1.17 |
| .00 | 223.150 | 24.9197 | 24.9858 | -.26 | 121.5900 | 120.3586 | 1.02 |
| .00 | 248.150 | 1.2583 | 1.2560 | .18 | 2.5331 | 2.5377 | -.18 |
| .00 | 248.150 | 2.5659 | 2.5496 | .64 | 5.0663 | 5.0978 | -.62 |
| .00 | 248.150 | 3.8992 | 3.8693 | .77 | 7.5994 | 7.6563 | -.74 |
| .00 | 248.150 | 5.2275 | 5.2006 | .52 | 10.1325 | 10.1838 | -.50 |
| .00 | 248.150 | 7.7591 | 7.7713 | -.16 | 15.1988 | 15.1732 | .17 |
| .00 | 248.150 | 9.9657 | 10.0059 | -.40 | 20.2650 | 20.1649 | .50 |
| .00 | 248.150 | 13.3793 | 13.3714 | .06 | 30.3975 | 30.4263 | -.09 |
| .00 | 248.150 | 15.7216 | 15.7382 | -.11 | 40.5300 | 40.4468 | .21 |
| .00 | 248.150 | 17.4353 | 17.5007 | -.37 | 50.6625 | 50.2381 | .84 |
| .00 | 248.150 | 18.7743 | 18.8877 | -.60 | 60.7950 | 59.8845 | 1.32 |
| .00 | 248.150 | 20.8955 | 20.9941 | -.47 | 81.0600 | 79.9555 | 1.38 |
| .00 | 248.150 | 22.4988 | 22.5771 | -.35 | 101.3250 | 100.2011 | 1.12 |
| .00 | 248.150 | 23.8020 | 23.8491 | -.20 | 121.5900 | 120.7679 | .68 |
| .00 | 273.150 | 1.1312 | 1.1303 | .08 | 2.5331 | 2.5351 | -.08 |
| .00 | 273.150 | 2.2852 | 2.2743 | .48 | 5.0663 | 5.0904 | -.47 |
| .00 | 273.150 | 3.4453 | 3.4220 | .68 | 7.5994 | 7.6510 | -.67 |
| .00 | 273.150 | 4.5919 | 4.5649 | .59 | 10.1325 | 10.1927 | -.59 |
| .00 | 273.150 | 6.7843 | 6.7773 | .10 | 15.1988 | 15.2154 | -.11 |
| .00 | 273.150 | 8.7588 | 8.7766 | .20 | 20.2650 | 20.2166 | .24 |
| .00 | 273.150 | 11.9474 | 11.9609 | -.11 | 30.3975 | 30.3471 | .17 |
| .00 | 273.150 | 14.2934 | 14.3173 | -.17 | 40.5300 | 40.4115 | .29 |
| .00 | 273.150 | 16.0823 | 16.1290 | -.29 | 50.6625 | 50.3686 | .58 |
| .00 | 273.150 | 17.5034 | 17.5766 | -.42 | 60.7950 | 60.2308 | .94 |
| .00 | 273.150 | 19.7136 | 19.7925 | -.40 | 81.0600 | 80.2202 | 1.05 |
| .00 | 273.150 | 21.4061 | 21.4617 | -.26 | 101.3250 | 100.5679 | .75 |
| .00 | 273.150 | 22.7808 | 22.8021 | -.09 | 121.5900 | 121.2373 | .29 |
| .00 | 298.150 | 1.0291 | 1.0289 | .01 | 2.5331 | 2.5335 | -.01 |
| .00 | 298.150 | 2.0653 | 2.0588 | .32 | 5.0663 | 5.0823 | -.32 |
| .00 | 298.150 | 3.0976 | 3.0814 | .52 | 7.5994 | 7.6395 | -.53 |
| .00 | 298.150 | 4.1134 | 4.0917 | .53 | 10.1325 | 10.1874 | -.54 |
| .00 | 298.150 | 6.0558 | 6.0444 | .19 | 15.1988 | 15.2294 | -.20 |
| .00 | | | | | | | |

TABLE 6f. Comparison of ID code (3) Deming P_{pT} compressibility data with values calculated from Eq. (6) — Continued

| Wt | T/K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|-----|---------|-----------------|-----------------------|------------------------|----------|----------------|-------------------|
| .00 | 298.150 | 21.8489 | 21.8370 | -.05 | 121.5900 | 121.7798 | -.16 |
| .00 | 323.150 | .9444 | .9451 | -.07 | 2.5331 | 2.5314 | .07 |
| .00 | 323.150 | 1.8875 | 1.8840 | .18 | 5.0663 | 5.0755 | -.18 |
| .00 | 323.150 | 2.8205 | 2.8105 | .36 | 7.5994 | 7.6270 | -.36 |
| .00 | 323.150 | 3.7349 | 3.7209 | .38 | 10.1325 | 10.1718 | -.39 |
| .00 | 323.150 | 5.4881 | 5.4773 | .20 | 15.1988 | 15.2310 | -.21 |
| .00 | 323.150 | 7.1128 | 7.1120 | .01 | 20.2650 | 20.2676 | -.01 |
| .00 | 323.150 | 9.9014 | 9.9087 | -.07 | 30.3975 | 30.3678 | .10 |
| .00 | 323.150 | 12.1260 | 12.1230 | .02 | 40.5300 | 40.5451 | -.04 |
| .00 | 323.150 | 13.9113 | 13.9135 | -.02 | 50.6625 | 50.6489 | .03 |
| .00 | 323.150 | 15.4038 | 15.3949 | .06 | 60.7950 | 60.8617 | -.11 |
| .00 | 323.150 | 17.6926 | 17.7244 | -.18 | 81.0600 | 80.7403 | .40 |
| .00 | 323.150 | 19.5030 | 19.5072 | -.02 | 101.3250 | 101.2706 | .05 |
| .00 | 323.150 | 20.9848 | 20.9463 | -.18 | 121.5900 | 122.1833 | -.49 |
| .00 | 373.150 | .8127 | .8139 | -.15 | 2.5331 | 2.5294 | .15 |
| .00 | 373.150 | 1.6147 | 1.6156 | -.06 | 5.0663 | 5.0631 | .06 |
| .00 | 373.150 | 2.4031 | 2.4012 | -.08 | 7.5994 | 7.6053 | -.08 |
| .00 | 373.150 | 3.1740 | 3.1691 | .15 | 10.1325 | 10.1488 | -.16 |
| .00 | 373.150 | 4.6526 | 4.6462 | .14 | 15.1988 | 15.2213 | -.15 |
| .00 | 373.150 | 6.0344 | 6.0338 | .01 | 20.2650 | 20.2675 | -.01 |
| .00 | 373.150 | 8.4803 | 8.4945 | -.17 | 30.3975 | 30.3335 | .21 |
| .00 | 373.150 | 10.5227 | 10.5376 | -.14 | 40.5300 | 40.4493 | .20 |
| .00 | 373.150 | 12.2402 | 12.2417 | -.01 | 50.6625 | 50.6529 | .02 |
| .00 | 373.150 | 13.6935 | 13.6899 | .03 | 60.7950 | 60.8218 | -.04 |
| .00 | 373.150 | 16.0144 | 16.0323 | -.11 | 81.0600 | 80.8836 | .22 |
| .00 | 373.150 | 17.8855 | 17.8656 | .11 | 101.3250 | 101.5707 | -.24 |
| .00 | 373.150 | 19.3923 | 19.3618 | .16 | 121.5900 | 122.0423 | -.37 |
| .00 | 423.150 | .7141 | .7155 | -.19 | 2.5331 | 2.5282 | .19 |
| .00 | 423.150 | 1.4143 | 1.4175 | -.22 | 5.0663 | 5.0548 | .23 |
| .00 | 423.150 | 2.0999 | 2.1032 | -.16 | 7.5994 | 7.5870 | .16 |
| .00 | 423.150 | 2.7690 | 2.7720 | -.11 | 10.1325 | 10.1211 | .11 |
| .00 | 423.150 | 4.0527 | 4.0573 | -.11 | 15.1988 | 15.1801 | .12 |
| .00 | 423.150 | 5.2596 | 5.2698 | -.19 | 20.2650 | 20.2208 | .22 |
| .00 | 423.150 | 7.4341 | 7.4612 | -.36 | 30.3975 | 30.2627 | .45 |
| .00 | 423.150 | 9.3087 | 9.3407 | -.34 | 40.5300 | 40.3433 | .46 |
| .00 | 423.150 | 10.9155 | 10.9475 | -.29 | 50.6625 | 50.4451 | .43 |
| .00 | 423.150 | 12.3152 | 12.3376 | -.18 | 60.7950 | 60.6205 | .29 |
| .00 | 423.150 | 14.6147 | 14.6373 | -.15 | 81.0600 | 80.8364 | .28 |
| .00 | 423.150 | 16.4679 | 16.4772 | -.06 | 101.3250 | 101.2115 | .11 |
| .00 | 423.150 | 18.0176 | 17.9988 | .10 | 121.5900 | 121.8626 | -.22 |
| .00 | 473.150 | .6370 | .6388 | -.28 | 2.5331 | 2.5260 | .28 |
| .00 | 473.150 | 1.2601 | 1.2642 | -.33 | 5.0663 | 5.0492 | .34 |
| .00 | 473.150 | 1.8685 | 1.8746 | -.32 | 7.5994 | 7.5740 | .34 |
| .00 | 473.150 | 2.4613 | 2.4694 | -.33 | 10.1325 | 10.0973 | .35 |
| .00 | 473.150 | 3.5992 | 3.6127 | -.37 | 15.1988 | 15.1374 | .41 |
| .00 | 473.150 | 4.6740 | 4.6943 | -.43 | 20.2650 | 20.1669 | .49 |
| .00 | 473.150 | 6.6343 | 6.6712 | -.55 | 30.3975 | 30.1960 | .67 |
| .00 | 473.150 | 8.3554 | 8.4038 | -.58 | 40.5300 | 40.2271 | .75 |
| .00 | 473.150 | 9.8657 | 9.9155 | -.50 | 50.6625 | 50.3063 | .71 |
| .00 | 473.150 | 11.2012 | 11.2421 | -.36 | 60.7950 | 60.4632 | .55 |
| .00 | 473.150 | 13.4435 | 13.4736 | -.22 | 81.0600 | 80.7557 | .38 |
| .00 | 473.150 | 15.2682 | 15.2931 | -.16 | 101.3250 | 101.0208 | .30 |
| .00 | 473.150 | 16.8035 | 16.8175 | -.08 | 121.5900 | 121.3892 | .17 |
| .00 | 573.150 | .5249 | .5266 | -.32 | 2.5331 | 2.5250 | .32 |
| .00 | 573.150 | 1.0373 | 1.0415 | -.41 | 5.0663 | 5.0451 | .42 |
| .00 | 573.150 | 1.5361 | 1.5441 | -.52 | 7.5994 | 7.5585 | .54 |
| .00 | 573.150 | 2.0224 | 2.0342 | -.58 | 10.1325 | 10.0708 | .61 |
| .00 | 573.150 | 2.9583 | 2.9779 | -.66 | 15.1988 | 15.0908 | .72 |
| .00 | 573.150 | 3.8670 | 3.8748 | -.20 | 20.2650 | 20.2202 | .22 |
| .00 | 573.150 | 5.4881 | 5.5353 | -.85 | 30.3975 | 30.0945 | 1.01 |
| .00 | 573.150 | 6.9664 | 7.0283 | -.88 | 40.5300 | 40.0870 | 1.11 |
| .00 | 573.150 | 8.2911 | 8.3680 | -.92 | 50.6625 | 50.0500 | 1.22 |
| .00 | 573.150 | 9.4944 | 9.5720 | -.81 | 60.7950 | 60.1092 | 1.14 |
| .00 | 573.150 | 11.5725 | 11.6480 | -.65 | 81.0600 | 80.2538 | 1.00 |
| .00 | 573.150 | 13.3293 | 13.3876 | -.44 | 101.3250 | 100.5903 | .73 |
| .00 | 573.150 | 14.8361 | 14.8778 | -.28 | 121.5900 | 120.9818 | .50 |
| .00 | 673.150 | .4470 | .4482 | -.26 | 2.5331 | 2.5266 | .26 |

TABLE 6f. Comparison of ID code (3) Deming P_{pT} compressibility data with values calculated from Eq. (6) — Continued

| Wt | T/K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|------|---------|-----------------|-----------------------|------------------------|----------|----------------|-------------------|
| 0.00 | 673.150 | .8827 | .8867 | -.46 | 5.0663 | 5.0426 | .47 |
| 0.00 | 673.150 | 1.3072 | 1.3152 | -.61 | 7.5994 | 7.5517 | .63 |
| 0.00 | 673.150 | 1.7214 | 1.7336 | -.70 | 10.1325 | 10.0577 | .74 |
| 0.00 | 673.150 | 2.5198 | 2.5413 | -.85 | 15.1988 | 15.0607 | .92 |
| 0.00 | 673.150 | 3.2800 | 3.3120 | -.96 | 20.2650 | 20.0502 | 1.07 |
| 0.00 | 673.150 | 4.6990 | 4.7503 | -.108 | 30.3975 | 30.0198 | 1.26 |
| 0.00 | 673.150 | 5.9916 | 6.0623 | -.17 | 40.5300 | 39.9594 | 1.43 |
| 0.00 | 673.150 | 7.1735 | 7.2597 | -.19 | 50.6625 | 49.9014 | 1.53 |
| 0.00 | 673.150 | 8.2625 | 8.3538 | -.109 | 60.7950 | 59.9144 | 1.47 |
| 0.00 | 673.150 | 10.1835 | 10.2787 | -.93 | 81.0600 | 79.9762 | 1.36 |
| 0.00 | 673.150 | 11.8475 | 11.9233 | -.64 | 101.3250 | 100.3236 | 1.00 |
| 0.00 | 673.150 | 13.2900 | 13.3550 | -.49 | 121.5900 | 120.6114 | .81 |

143 data points, $|\Delta\rho/\rho|$, rms % = 0.334, $\Delta\rho/\rho$, av. % = -0.069, $|\Delta P/P|$, av. % = 0.429.

TABLE 6g. Comparison of ID code (2) Robertson P_{pT} compressibility data with values calculated from Eq. (6)

| Wt | T/K | ρ mol/L | Calc. ρ mol/L | $\Delta\rho/\rho$ % | P, MPa | Calc. P MPa | $\Delta P/P$ % |
|-----|---------|-----------------|-----------------------|------------------------|----------|----------------|-------------------|
| .00 | 308.150 | 21.2054 | 21.1817 | .11 | 117.1000 | 117.4606 | -.31 |
| .00 | 308.150 | 22.3215 | 22.3001 | .10 | 135.4000 | 135.7775 | -.28 |
| .00 | 308.150 | 23.4376 | 23.4185 | .08 | 156.7000 | 157.0914 | -.25 |
| .00 | 308.150 | 24.5537 | 24.5430 | .04 | 181.6000 | 181.8533 | -.14 |
| .00 | 308.150 | 25.6697 | 25.6565 | .05 | 210.2000 | 210.5644 | -.17 |
| .00 | 308.150 | 26.7858 | 26.7708 | .06 | 243.3000 | 243.7774 | -.20 |
| .00 | 308.150 | 27.9019 | 27.8829 | .07 | 281.4000 | 282.0961 | -.25 |
| .00 | 308.150 | 29.0180 | 28.9949 | .08 | 325.2000 | 326.1727 | -.30 |
| .00 | 308.150 | 30.1340 | 30.1029 | .10 | 375.2000 | 376.7032 | -.40 |
| .00 | 373.150 | 21.2054 | 21.1932 | .06 | 152.1000 | 152.3283 | -.15 |
| .00 | 373.150 | 22.3215 | 22.2956 | .12 | 174.1000 | 174.6544 | -.32 |
| .00 | 373.150 | 23.4376 | 23.4184 | .08 | 199.8000 | 200.2699 | -.23 |
| .00 | 373.150 | 24.5537 | 24.5494 | .02 | 229.5000 | 229.6207 | -.05 |
| .00 | 373.150 | 25.6697 | 25.6761 | -.02 | 263.4000 | 263.1946 | .08 |
| .00 | 373.150 | 26.7858 | 26.8016 | -.06 | 302.1000 | 301.5219 | .19 |
| .00 | 373.150 | 27.9019 | 27.9241 | -.08 | 346.1000 | 345.1723 | .27 |
| .00 | 373.150 | 29.0180 | 29.0444 | -.09 | 396.0000 | 394.7502 | .32 |
| .00 | 373.150 | 30.1340 | 30.1623 | -.09 | 452.4000 | 450.8879 | .34 |
| .00 | 473.150 | 21.2054 | 21.1880 | .08 | 202.7000 | 203.1089 | -.20 |
| .00 | 473.150 | 22.3215 | 22.2641 | .26 | 229.5000 | 231.0203 | -.66 |
| .00 | 473.150 | 23.4376 | 23.4044 | .14 | 261.6000 | 262.5964 | -.38 |
| .00 | 473.150 | 24.5537 | 24.5955 | -.17 | 299.7000 | 298.2750 | .48 |
| .00 | 473.150 | 25.6697 | 25.6664 | .01 | 338.4000 | 338.5276 | -.04 |
| .00 | 473.150 | 26.7858 | 26.7961 | -.04 | 384.3000 | 383.8572 | .12 |
| .00 | 473.150 | 27.9019 | 27.9227 | -.07 | 435.8000 | 434.7942 | .23 |
| .00 | 473.150 | 29.0180 | 29.0495 | -.11 | 493.6000 | 491.8898 | .35 |
| .00 | 473.150 | 30.1340 | 30.1752 | -.14 | 558.2000 | 555.7082 | .45 |
| .00 | 573.150 | 21.2054 | 21.0744 | .62 | 247.8000 | 251.4335 | -1.45 |
| .00 | 573.150 | 22.3215 | 22.2201 | .46 | 281.3000 | 284.4579 | -1.11 |
| .00 | 573.150 | 23.4376 | 23.3583 | .34 | 318.7000 | 321.4679 | -.86 |
| .00 | 573.150 | 24.5537 | 24.4950 | .24 | 360.6000 | 362.8953 | -.63 |
| .00 | 573.150 | 25.6697 | 25.6309 | .15 | 407.5000 | 409.1988 | -.42 |
| .00 | 573.150 | 26.7858 | 26.7661 | .07 | 459.9000 | 460.8620 | -.21 |
| .00 | 573.150 | 27.9019 | 27.9003 | .01 | 518.3000 | 518.3872 | -.02 |
| .00 | 573 | | | | | | |

TABLE 7. The critical isotherm for carbon monoxide

| ρ/ρ_c | P MPa | Z | $\partial P/\partial \rho$ MPa·L/mol | $\partial \rho/\partial T$ mol L ⁻¹ K ⁻¹ | $\partial P/\partial T$ MPa/K | $\partial^2 P/\partial T^2$ MPa K ⁻² |
|---------------|------------|--------|---|---|----------------------------------|--|
| .50 | 3.2182 | .53706 | .19492 | -.3831E+00 | .07468 | -.0008300 |
| .52 | 3.2582 | .52282 | .17411 | -.4510E+00 | .07853 | -.0009204 |
| .54 | 3.2939 | .50897 | .15466 | -.5328E+00 | .08240 | -.0010200 |
| .56 | 3.3255 | .49549 | .13656 | -.6319E+00 | .08630 | -.0011303 |
| .58 | 3.3533 | .48240 | .11980 | -.7530E+00 | .09021 | -.0012531 |
| .60 | 3.3776 | .46970 | .10434 | -.9022E+00 | .09413 | -.0013909 |
| .62 | 3.3986 | .45739 | .09016 | -.1088E+01 | .09807 | -.0015464 |
| .64 | 3.4168 | .44546 | .07723 | -.1321E+01 | .10200 | -.0017235 |
| .66 | 3.4322 | .43392 | .06552 | -.1617E+01 | .10593 | -.0019270 |
| .68 | 3.4453 | .42276 | .05498 | -.1998E+01 | .10986 | -.0021633 |
| .70 | 3.4562 | .41198 | .04557 | -.2497E+01 | .11378 | -.0024408 |
| .72 | 3.4652 | .40157 | .03724 | -.3160E+01 | .11769 | -.0027708 |
| .74 | 3.4724 | .39154 | .02994 | -.4060E+01 | .12158 | -.0031688 |
| .76 | 3.4782 | .38187 | .02362 | -.5310E+01 | .12544 | -.0036568 |
| .78 | 3.4827 | .37256 | .01822 | -.7095E+01 | .12929 | -.0042664 |
| .80 | 3.4862 | .36361 | .01369 | -.9725E+01 | .13310 | -.0050443 |
| .82 | 3.4887 | .35500 | .00995 | -.1376E+02 | .13687 | -.0060629 |
| .84 | 3.4906 | .34673 | .00695 | -.2024E+02 | .14060 | -.0074385 |
| .86 | 3.4918 | .33878 | .00461 | -.3132E+02 | .14428 | -.0093683 |
| .88 | 3.4926 | .33116 | .00286 | -.5176E+02 | .14790 | -.0122113 |
| .90 | 3.4931 | .32385 | .00162 | -.9363E+02 | .15144 | -.0166807 |
| .92 | 3.4933 | .31683 | .00080 | -.1931E+03 | .15489 | -.0243796 |
| .94 | 3.4935 | .31010 | .00032 | -.4907E+03 | .15823 | -.0396594 |
| .96 | 3.4935 | .30364 | .00009 | -.1820E+04 | .16142 | -.0781779 |
| .98 | 3.4935 | .29745 | .00001 | -.1722E+05 | .16438 | -.2460439 |
| 1.00 | 3.4935 | .29150 | 0.00000 | -. ∞ | .16685 | -.0000000 |
| 1.02 | 3.4935 | .28578 | .00002 | -.8718E+04 | .16940 | .2538247 |
| 1.04 | 3.4935 | .28029 | .00015 | -.1155E+04 | .17263 | .0830016 |
| 1.06 | 3.4936 | .27500 | .00050 | -.3507E+03 | .17628 | .0432148 |
| 1.08 | 3.4938 | .26992 | .00120 | -.1502E+03 | .18030 | .0272252 |
| 1.10 | 3.4941 | .26505 | .00238 | -.7769E+02 | .18465 | .0190361 |
| 1.12 | 3.4948 | .26036 | .00417 | -.4539E+02 | .18931 | .0142263 |
| 1.14 | 3.4960 | .25588 | .00673 | -.2885E+02 | .19428 | .0111288 |
| 1.16 | 3.4978 | .25160 | .01023 | -.1951E+02 | .19955 | .0090015 |
| 1.18 | 3.5005 | .24753 | .01483 | -.1384E+02 | .20511 | .0074687 |
| 1.20 | 3.5044 | .24367 | .02070 | -.1019E+02 | .21097 | .0063221 |
| 1.22 | 3.5096 | .24003 | .02804 | -.7742E+01 | .21712 | .0054381 |
| 1.24 | 3.5166 | .23664 | .03705 | -.6035E+01 | .22356 | .0047394 |
| 1.26 | 3.5258 | .23349 | .04791 | -.4807E+01 | .23030 | .0041754 |
| 1.28 | 3.5376 | .23061 | .06085 | -.3900E+01 | .23733 | .0037117 |
| 1.30 | 3.5524 | .22801 | .07607 | -.3216E+01 | .24466 | .0033244 |
| 1.32 | 3.5708 | .22572 | .09380 | -.2690E+01 | .25228 | .0029962 |
| 1.34 | 3.5933 | .22375 | .11425 | -.2278E+01 | .26021 | .0027145 |
| 1.36 | 3.6206 | .22213 | .13766 | -.1950E+01 | .26843 | .0024699 |
| 1.38 | 3.6533 | .22089 | .16426 | -.1686E+01 | .27696 | .0022550 |
| 1.40 | 3.6921 | .22005 | .19428 | -.1471E+01 | .28580 | .0020644 |
| 1.42 | 3.7379 | .21964 | .22797 | -.1294E+01 | .29493 | .0018937 |
| 1.44 | 3.7913 | .21969 | .26557 | -.1146E+01 | .30438 | .0017395 |
| 1.46 | 3.8534 | .22022 | .30732 | -.1022E+01 | .31414 | .0015989 |
| 1.48 | 3.9250 | .22129 | .35347 | -.9172E+00 | .32421 | .0014697 |
| 1.50 | 4.0072 | .22290 | .40428 | -.8276E+00 | .33460 | .0013502 |

TABLE 8. Ideal gas state functions for carbon monoxide

| T/K | $H^\circ(T) - H_0^\circ$, J/mol | | % $S^\circ(T)$, J mol ⁻¹ K ⁻¹ | | % $C_p^\circ(T)$, J mol ⁻¹ K ⁻¹ | | % $C_v^\circ(T)$, J mol ⁻¹ K ⁻¹ | | |
|--------|----------------------------------|---------|--|----------|--|------|--|-------|------|
| | Reported | Calc. | dev. | Reported | Calc. | dev. | Reported | Calc. | dev. |
| 60.0 | 1738.4 | 1738.8 | -.02 | 150.883 | 150.895 | -.01 | 29.10 | 29.10 | -.00 |
| 80.0 | 2320.5 | 2320.8 | -.01 | 159.256 | 159.265 | -.01 | 29.10 | 29.10 | -.00 |
| 100.0 | 2902.6 | 2902.8 | -.01 | 165.750 | 165.757 | -.00 | 29.10 | 29.10 | -.00 |
| 120.0 | 3484.7 | 3484.8 | -.00 | 171.054 | 171.062 | -.00 | 29.11 | 29.10 | .03 |
| 140.0 | 4066.8 | 4066.8 | -.00 | 175.544 | 175.548 | -.00 | 29.11 | 29.10 | .02 |
| 160.0 | 4648.9 | 4648.9 | -.00 | 179.427 | 179.434 | -.00 | 29.11 | 29.10 | .02 |
| 180.0 | 5231.0 | 5231.0 | -.00 | 182.861 | 182.862 | -.00 | 29.11 | 29.11 | .01 |
| 200.0 | 5813.3 | 5813.1 | .00 | 185.929 | 185.929 | .00 | 29.11 | 29.11 | -.00 |
| 220.0 | 6395.4 | 6395.3 | .00 | 188.698 | 188.703 | -.00 | 29.11 | 29.11 | -.01 |
| 250.0 | 7268.9 | 7268.8 | .00 | 192.422 | 192.425 | -.00 | 29.12 | 29.12 | -.00 |
| 300.0 | 8725.2 | 8725.2 | -.00 | 197.735 | 197.735 | 0.00 | 29.14 | 29.14 | -.00 |
| 350.0 | 10183.8 | 10183.8 | -.00 | 202.225 | 202.232 | -.00 | 29.21 | 29.21 | -.00 |
| 400.0 | 11647.3 | 11647.2 | .00 | 206.133 | 206.140 | -.00 | 29.34 | 29.34 | .02 |
| 450.0 | 13119.1 | 13118.7 | .00 | 209.600 | 209.606 | -.00 | 29.53 | 29.53 | -.00 |
| 500.0 | 14601.9 | 14601.6 | .00 | 212.726 | 212.731 | -.00 | 29.79 | 29.79 | -.00 |
| 550.0 | 16099.1 | 16098.7 | .00 | 215.578 | 215.584 | -.00 | 30.10 | 30.10 | -.00 |
| 600.0 | 17612.6 | 17612.1 | .00 | 218.214 | 218.218 | -.00 | 30.44 | 30.44 | -.01 |
| 650.0 | 19143.9 | 19143.2 | .00 | 220.667 | 220.669 | -.00 | 30.81 | 30.80 | .01 |
| 700.0 | 20693.3 | 20692.6 | .00 | 222.962 | 222.965 | -.00 | 31.17 | 31.17 | -.01 |
| 750.0 | 22261.1 | 22260.5 | .00 | 225.123 | 225.128 | -.00 | 31.55 | 31.54 | .01 |
| 800.0 | 23847.5 | 23846.6 | .00 | 227.177 | 227.175 | .00 | 31.90 | 31.90 | .00 |
| 900.0 | 27072.6 | 27071.2 | .01 | 230.968 | 230.972 | -.00 | 32.58 | 32.58 | -.01 |
| 1000.0 | 30361.3 | 30359.9 | .00 | 234.436 | 234.437 | -.00 | 33.18 | 33.18 | -.00 |
| 1200.0 | 37099.9 | 37100.2 | -.00 | 240.572 | 240.579 | -.00 | 34.17 | 34.17 | .00 |
| 1400.0 | 44013.4 | 44012.1 | .00 | 245.901 | 245.905 | -.00 | 34.91 | 34.91 | -.00 |

TABLE 9. The Joule-Thomson inversion locus for carbon monoxide

| T/K | ρ , mol/L | P, MPa | T/K | ρ , mol/L | P, MPa |
|-----|----------------|--------|-----|----------------|--------|
| 100 | 25.159 | .545 | 360 | 10.241 | 37.061 |
| 110 | 23.598 | 2.941 | 370 | 9.863 | 36.545 |
| 120 | 22.922 | 8.762 | 380 | 9.496 | 35.996 |
| 130 | 22.254 | 13.766 | 390 | 9.138 | 35.403 |
| 140 | 21.598 | 18.077 | 400 | 8.785 | 34.757 |
| 150 | 20.958 | 21.799 | 410 | 8.435 | 34.053 |
| 160 | 20.334 | 25.019 | 420 | 8.088 | 33.285 |
| 170 | 19.728 | 27.806 | 430 | 7.740 | 32.446 |
| 180 | 19.139 | 30.215 | 440 | 7.391 | 31.529 |
| 190 | 18.565 | 32.290 | 450 | 7.037 | 30.527 |
| 200 | 18.005 | 34.064 | 460 | 6.679 | 29.432 |
| 210 | 17.459 | 35.567 | 470 | 6.312 | 28.234 |
| 220 | 16.923 | 36.819 | 480 | 5.935 | 26.922 |
| 230 | 16.396 | 37.840 | 490 | 5.545 | 25.483 |
| 240 | 15.876 | 38.644 | 500 | 5.140 | 23.906 |
| 250 | 15.363 | 39.245 | 510 | 4.718 | 22.184 |
| 260 | 14.856 | 39.657 | 520 | 4.278 | 20.322 |
| 270 | 14.353 | 39.893 | 530 | 3.827 | 18.348 |
| 280 | 13.855 | 39.967 | 540 | 3.376 | 16.324 |
| 290 | 13.363 | 39.895 | 550 | 2.942 | 14.350 |
| 300 | 12.877 | 39.694 | 560 | 2.544 | 12.523 |
| 310 | 12.400 | 39.386 | 570 | 2.193 | 10.906 |
| 320 | 11.934 | 38.993 | 580 | 1.892 | 9.509 |
| 330 | 11.482 | 38.540 | 590 | 1.635 | 8.313 |
| 340 | 11.048 | 38.053 | 600 | 1.416 | 7.287 |
| 350 | 10.634 | 37.558 | 610 | 1.228 | 6.399 |

TABLE 10. Comparison of reported ($C_p - C_v$) of Deming and Shupe with calculated values along the 50 atm isobar

| T/K | Reported | Calc. | Calc. | | $(C_p - C_v)$ | | % |
|--------|----------|-------|----------------|---------------------------------|------------------------------------|-----------------------------------|-------|
| | | | ρ , mol/L | $\frac{\partial P}{\partial T}$ | $\frac{\partial P}{\partial \rho}$ | $J \text{ mol}^{-1}\text{K}^{-1}$ | |
| 203.15 | 3.355 | 3.334 | .33969 | 13.803 | 14.48 | 15.28 | -5.20 |
| 223.15 | 2.942 | 2.920 | .28742 | 16.419 | 13.27 | 13.17 | .77 |
| 248.15 | 2.566 | 2.550 | .24380 | 19.364 | 11.93 | 11.72 | 1.82 |
| 273.15 | 2.285 | 2.274 | .21318 | 22.085 | 11.22 | 10.87 | 3.25 |
| 298.15 | 2.065 | 2.059 | .19018 | 24.663 | 10.63 | 10.32 | 3.07 |
| 323.15 | 1.888 | 1.884 | .17211 | 27.141 | 10.26 | 9.94 | 3.22 |
| 373.15 | 1.615 | 1.616 | .14526 | 31.902 | 9.75 | 9.45 | 3.16 |
| 423.15 | 1.414 | 1.417 | .12605 | 36.497 | 9.21 | 9.17 | .45 |
| 473.15 | 1.260 | 1.264 | .11152 | 40.988 | 9.17 | 8.98 | 2.06 |
| 573.15 | 1.037 | 1.042 | .09086 | 49.784 | 8.92 | 8.76 | 1.78 |
| 673.15 | .885 | .887 | .07678 | 58.432 | 8.75 | 8.64 | 1.31 |

TABLE 11. Comparisons of values of properties reported by Leah with calculated values along the 50 atm isobar

| T/K | ρ , mol/L | | | H , J/mol | | | S , J mol $^{-1}$ K $^{-1}$ | | |
|--------|----------------|---------|---------|-------------|---------|-------|-------------------------------|---------|-------|
| | Reported | Calc. | Diff. | Reported | Calc. | Diff. | Reported | Calc. | Diff. |
| 143.15 | 9.0090 | 10.1288 | -1.1198 | 6400.4 | 5995.4 | 405.0 | 130.997 | 128.388 | 2.609 |
| 153.15 | 6.2893 | 6.3135 | -.0241 | 7327.7 | 7270.4 | 57.3 | 137.256 | 137.041 | .214 |
| 163.15 | 5.1151 | 5.0957 | .0194 | 8000.1 | 7954.9 | 45.3 | 141.505 | 141.380 | .126 |
| 173.15 | 4.4170 | 4.4151 | .0018 | 8533.1 | 8480.3 | 52.9 | 144.679 | 144.508 | .171 |
| 183.15 | 3.9683 | 3.9528 | .0154 | 9011.3 | 8933.3 | 77.9 | 147.333 | 147.053 | .281 |
| 193.15 | 3.6284 | 3.6073 | .0212 | 9445.4 | 9345.2 | 100.2 | 149.657 | 149.243 | .414 |
| 203.15 | 3.3568 | 3.3339 | .0230 | 9846.1 | 9730.9 | 115.2 | 151.688 | 151.190 | .498 |
| 213.15 | 3.1328 | 3.1093 | .0235 | 10223.8 | 10098.4 | 125.4 | 153.501 | 152.956 | .545 |
| 223.15 | 2.9429 | 2.9199 | .0230 | 10583.0 | 10452.8 | 130.2 | 155.150 | 154.581 | .569 |
| 248.15 | 2.5661 | 2.5496 | .0165 | 11433.7 | 11300.7 | 133.1 | 158.763 | 158.184 | .580 |
| 273.15 | 2.2852 | 2.2743 | .0109 | 12243.5 | 12114.0 | 129.5 | 161.870 | 161.307 | .563 |
| 298.15 | 2.0653 | 2.0588 | .0065 | 13031.8 | 12906.6 | 125.2 | 164.629 | 164.084 | .545 |
| 323.15 | 1.8875 | 1.8840 | .0035 | 13806.0 | 13685.9 | 120.1 | 167.120 | 166.594 | .526 |
| 373.15 | 1.6145 | 1.6156 | -.0012 | 15335.4 | 15221.0 | 114.4 | 171.512 | 171.012 | .500 |
| 423.15 | 1.4142 | 1.4175 | -.0032 | 16857.3 | 16740.9 | 116.4 | 175.335 | 174.835 | .500 |
| 473.15 | 1.2601 | 1.2642 | -.0042 | 18379.2 | 18257.5 | 121.8 | 178.730 | 178.222 | .508 |
| 573.15 | 1.0370 | 1.0415 | -.0045 | 21435.2 | 21308.2 | 127.0 | 184.571 | 184.070 | .501 |
| 673.15 | .8826 | .8867 | -.0041 | 24558.9 | 24408.4 | 150.6 | 189.587 | 189.055 | .532 |

TABLE 12. Comparisons of values of properties reported by Hust and Stewart with calculated values along the 50 atm isobar

| T/K | ρ , mol/L | | | H , J/mol | | | S , J mol $^{-1}$ K $^{-1}$ | | |
|-----|----------------|---------|--------|-------------|---------|-------|-------------------------------|---------|--------|
| | Reported | Calc. | Diff. | Reported | Calc. | Diff. | Reported | Calc. | Diff. |
| 70 | 30.1107 | 30.3120 | -.2013 | 189.0 | 225.6 | -36.6 | 73.896 | 75.319 | -1.423 |
| 80 | 28.7590 | 28.9191 | -.1601 | 799.6 | 823.2 | -23.6 | 82.055 | 83.308 | -1.252 |
| 90 | 27.3063 | 27.4464 | -.1401 | 1404.4 | 1431.4 | -27.1 | 89.178 | 90.471 | -1.293 |
| 100 | 25.7333 | 25.8496 | -.1163 | 2007.1 | 2042.8 | -35.6 | 95.531 | 96.899 | -1.368 |
| 110 | 23.9764 | 24.0552 | -.0788 | 2620.8 | 2651.6 | -30.7 | 101.379 | 102.708 | -1.328 |
| 120 | 21.8904 | 21.9171 | -.0267 | 3275.7 | 3270.5 | 5.2 | 107.077 | 108.105 | -1.028 |
| 130 | 19.0628 | 19.0298 | .0330 | 4045.4 | 3966.8 | 78.6 | 113.244 | 113.644 | -.400 |
| 140 | 13.1846 | 13.0576 | .1270 | 5354.6 | 5313.1 | 41.5 | 122.899 | 123.567 | -.668 |
| 150 | 7.1121 | 6.9810 | .1311 | 6939.1 | 6980.5 | -41.3 | 133.888 | 135.128 | -1.240 |
| 160 | 5.5116 | 5.3920 | .1196 | 7682.5 | 7763.9 | -81.4 | 138.697 | 140.198 | -1.501 |
| 170 | 4.6908 | 4.5982 | .0927 | 8231.5 | 8324.9 | -93.3 | 142.028 | 143.602 | -1.575 |
| 180 | 4.1539 | 4.0828 | .0711 | 8700.7 | 8796.0 | -95.4 | 144.711 | 146.297 | -1.586 |
| 190 | 3.7619 | 3.7068 | .0551 | 9125.9 | 9218.8 | -93.0 | 147.010 | 148.583 | -1.573 |
| 200 | 3.4571 | 3.4139 | .0432 | 9523.3 | 9611.6 | -88.3 | 149.050 | 150.598 | -1.549 |
| 220 | 3.0037 | 2.9764 | .0274 | 10265.6 | 10342.4 | -76.8 | 152.590 | 154.083 | -1.493 |
| 240 | 2.6753 | 2.6574 | .0180 | 10964.2 | 11029.0 | -64.8 | 155.629 | 157.071 | -1.442 |
| 260 | 2.4222 | 2.4100 | .0122 | 11635.0 | 11689.4 | -54.4 | 158.315 | 159.714 | -1.399 |
| 280 | 2.2189 | 2.2103 | .0086 | 12287.6 | 12332.9 | -45.2 | 160.733 | 162.099 | -1.366 |
| 300 | 2.0509 | 2.0446 | .0063 | 12927.1 | 12964.7 | -37.5 | 162.937 | 164.278 | -1.341 |

TABLE 13. Comparisons of values of properties reported by Michels et al. with calculated values

| T/K | ρ , mol/L | | | H , J/mol | | | S , J mol ⁻¹ K ⁻¹ | | |
|----------------|----------------|---------|--------|-------------|---------|--------|---|---------|-------|
| | Reported | Calc. | Diff. | Reported | Calc. | Diff. | Reported | Calc. | Diff. |
| 50 atm isobar | | | | | | | | | |
| 273.15 | 2.2836 | 2.2743 | .0092 | 12088.9 | 12114.0 | -.25.1 | 161.193 | 161.307 | -.114 |
| 298.15 | 2.0643 | 2.0588 | .0055 | 12880.4 | 12906.6 | -.26.2 | 163.985 | 164.084 | -.100 |
| 323.15 | 1.8870 | 1.8840 | .0030 | 13663.9 | 13685.9 | -.22.0 | 166.509 | 166.594 | -.086 |
| 348.15 | 1.7399 | 1.7388 | .0011 | 14439.5 | 14456.4 | -.16.9 | 168.819 | 168.891 | -.072 |
| 373.15 | 1.6156 | 1.6156 | -.0001 | 15210.1 | 15221.0 | -.11.0 | 170.958 | 171.012 | -.054 |
| 398.15 | 1.5089 | 1.5097 | -.0008 | 15976.4 | 15982.0 | -.5.6 | 172.946 | 172.986 | -.040 |
| 423.15 | 1.4163 | 1.4175 | -.0012 | 16739.9 | 16740.9 | -.1.1 | 174.808 | 174.835 | -.026 |
| 600 atm isobar | | | | | | | | | |
| 273.15 | 17.6020 | 17.5766 | .0254 | 11057.6 | 11117.0 | -.59.3 | 135.134 | 135.292 | -.158 |
| 298.15 | 16.4426 | 16.4177 | .0249 | 12038.7 | 12103.7 | -.65.0 | 138.566 | 138.750 | -.184 |
| 323.15 | 15.4185 | 15.3949 | .0236 | 12996.8 | 13060.3 | -.63.6 | 141.647 | 141.831 | -.185 |
| 348.15 | 14.5114 | 14.4912 | .0202 | 13934.7 | 13991.0 | -.56.3 | 144.443 | 144.606 | -.163 |
| 373.15 | 13.7075 | 13.6899 | .0175 | 14853.4 | 14899.8 | -.46.4 | 146.996 | 147.127 | -.131 |
| 398.15 | 12.9925 | 12.9764 | .0161 | 15753.3 | 15790.4 | -.37.1 | 149.331 | 149.437 | -.106 |
| 423.15 | 12.3495 | 12.3376 | .0119 | 16640.2 | 16666.1 | -.25.9 | 151.499 | 151.570 | -.071 |

TABLE 14. Properties of saturated liquid carbon monoxide

| T/K | P, MPa | ρ_1 mol/L | ρ_2 mol/L | Z_1 | Z_2 | dP_σ/dT MPa/K | $d\rho_1/dT$ mol/L ⁻¹ K ⁻¹ | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol |
|---------|---------|-------------------|-------------------|--------|--------|-------------------------|---|----------------------------------|---|
| 68.127 | .01540 | 30.250 | .02745 | .00090 | .99045 | .002627 | -.1423 | 2.1686 | 15.22241 |
| 70.000 | .02100 | 29.982 | .03652 | .00120 | .98776 | .003370 | -.1435 | 2.0959 | 14.57743 |
| 72.000 | .02866 | 29.693 | .04863 | .00161 | .98432 | .004319 | -.1450 | 2.0203 | 13.90176 |
| 74.000 | .03839 | 29.402 | .06365 | .00212 | .98026 | .005441 | -.1466 | 1.9467 | 13.23938 |
| 76.000 | .05055 | 29.107 | .08200 | .00275 | .97553 | .006750 | -.1484 | 1.8750 | 12.59012 |
| 78.000 | .06552 | 28.808 | .10415 | .00351 | .97007 | .008259 | -.1503 | 1.8051 | 11.95388 |
| 80.000 | .08372 | 28.505 | .13059 | .00442 | .96386 | .009978 | -.1524 | 1.7369 | 11.33059 |
| 81.638 | .10133 | 28.254 | .15579 | .00528 | .95819 | .011548 | -.1543 | 1.6822 | 10.82988 |
| 84.000 | .13153 | 27.887 | .19844 | .00675 | .94905 | .014081 | -.1572 | 1.6052 | 10.12274 |
| 86.000 | .16206 | 27.570 | .24100 | .00822 | .94041 | .016481 | -.1599 | 1.5416 | 9.53818 |
| 88.000 | .19762 | 27.247 | .29013 | .00991 | .93091 | .019121 | -.1628 | 1.4793 | 8.96659 |
| 90.000 | .23870 | 26.918 | .34652 | .01185 | .92055 | .022007 | -.1661 | 1.4183 | 8.40804 |
| 92.000 | .28581 | 26.582 | .41090 | .01406 | .90933 | .025143 | -.1696 | 1.3586 | 7.86261 |
| 94.000 | .33944 | 26.239 | .48406 | .01655 | .89723 | .028533 | -.1734 | 1.3000 | 7.33039 |
| 96.000 | .40011 | 25.888 | .56689 | .01936 | .88425 | .032181 | -.1777 | 1.2424 | 6.81151 |
| 98.000 | .46834 | 25.528 | .66036 | .02252 | .87040 | .036092 | -.1823 | 1.1859 | 6.30608 |
| 100.000 | .54466 | 25.159 | .76557 | .02604 | .85567 | .040268 | -.1875 | 1.1303 | 5.81426 |
| 102.000 | .62960 | 24.778 | .88373 | .02996 | .84005 | .044715 | -.1932 | 1.0756 | 5.33619 |
| 104.000 | .72370 | 24.385 | 1.01626 | .03432 | .82354 | .049437 | -.1996 | 1.0217 | 4.87205 |
| 106.000 | .82753 | 23.979 | 1.16476 | .03916 | .80613 | .054439 | -.2067 | .9685 | 4.42201 |
| 108.000 | .94165 | 23.558 | 1.33111 | .04451 | .78780 | .059729 | -.2148 | .9160 | 3.98628 |
| 110.000 | 1.06664 | 23.119 | 1.51753 | .05044 | .76851 | .065313 | -.2240 | .8640 | 3.56509 |
| 112.000 | 1.20310 | 22.661 | 1.72672 | .05701 | .74822 | .071201 | -.2347 | .8125 | 3.15872 |
| 114.000 | 1.35166 | 22.180 | 1.96195 | .06429 | .72684 | .077405 | -.2471 | .7613 | 2.76747 |
| 116.000 | 1.51294 | 21.671 | 2.22738 | .07239 | .70426 | .083938 | -.2619 | .7103 | 2.39173 |
| 118.000 | 1.68764 | 21.130 | 2.52840 | .08141 | .68033 | .090820 | -.2798 | .6594 | 2.03197 |
| 120.000 | 1.87647 | 20.549 | 2.87229 | .09153 | .65478 | .098073 | -.3022 | .6084 | 1.68878 |
| 122.000 | 2.08020 | 19.917 | 3.26938 | .10296 | .62726 | .105730 | -.3310 | .5568 | 1.36297 |
| 124.000 | 2.29969 | 19.218 | 3.73529 | .11607 | .59716 | .113839 | -.3700 | .5044 | 1.05562 |
| 126.000 | 2.53591 | 18.425 | 4.29578 | .13137 | .56349 | .122473 | -.4266 | .4503 | .76830 |
| 128.000 | 2.79002 | 17.488 | 4.99918 | .14990 | .52440 | .131760 | -.5192 | .3932 | .50346 |
| 130.000 | 3.06356 | 16.288 | 5.95849 | .17401 | .47568 | .141986 | -.7086 | .3301 | .26547 |
| 131.000 | 3.20835 | 15.487 | 6.63063 | .19020 | .44424 | .147682 | -.9183 | .2938 | .15916 |
| 132.000 | 3.35920 | 14.346 | 7.62303 | .21335 | .40151 | .154218 | -.14811 | .2498 | .06451 |
| 132.500 | 3.43729 | 13.396 | 8.47378 | .23292 | .36820 | .158361 | -.25871 | .2194 | .02361 |
| 132.850 | 3.49350 | 10.850 | 10.85000 | .29150 | .29150 | .166847 | -.infinity | .1668 | 0.00000 |

TABLE 14. Properties of saturated liquid carbon monoxide — Continued

| T,K | Q_{vap} J/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_v | C_σ J mol ⁻¹ K ⁻¹ | C_p J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|---------|---------------------------|------------|------------|--|----------|---|--|--------|----------|
| 68.127 | 6514.2 | .0 | .5 | 74.483 | 36.29 | 59.26 | 59.29 | .99099 | 942 |
| 70.000 | 6451.5 | 112.0 | 112.7 | 76.096 | 36.29 | 59.72 | 59.76 | .98944 | 925 |
| 72.000 | 6382.8 | 232.0 | 233.0 | 77.785 | 36.24 | 60.17 | 60.22 | .98652 | 908 |
| 74.000 | 6312.0 | 352.6 | 353.9 | 79.439 | 36.14 | 60.57 | 60.64 | .98260 | 890 |
| 76.000 | 6238.8 | 473.8 | 475.6 | 81.059 | 35.98 | 60.94 | 61.03 | .97787 | 873 |
| 78.000 | 6163.1 | 595.7 | 598.0 | 82.646 | 35.78 | 61.28 | 61.39 | .97251 | 855 |
| 80.000 | 6084.5 | 718.2 | 721.1 | 84.201 | 35.51 | 61.57 | 61.72 | .96659 | 838 |
| 81.638 | 6017.8 | 819.0 | 822.5 | 85.450 | 35.26 | 61.79 | 61.98 | .96138 | 824 |
| 84.000 | 5917.9 | 965.0 | 969.7 | 87.216 | 34.82 | 62.08 | 62.32 | .95332 | 804 |
| 86.000 | 5829.6 | 1089.3 | 1095.2 | 88.679 | 34.40 | 62.29 | 62.59 | .94602 | 787 |
| 88.000 | 5737.7 | 1214.0 | 1221.3 | 90.112 | 33.92 | 62.48 | 62.85 | .93826 | 770 |
| 90.000 | 5642.0 | 1339.2 | 1348.0 | 91.517 | 33.39 | 62.65 | 63.11 | .93005 | 753 |
| 92.000 | 5542.4 | 1464.6 | 1475.4 | 92.895 | 32.81 | 62.81 | 63.37 | .92135 | 736 |
| 94.000 | 5438.6 | 1590.4 | 1603.4 | 94.246 | 32.17 | 62.96 | 63.65 | .91218 | 719 |
| 96.000 | 5330.4 | 1716.4 | 1731.9 | 95.571 | 31.49 | 63.11 | 63.95 | .90249 | 702 |
| 98.000 | 5217.6 | 1842.7 | 1861.0 | 96.872 | 30.75 | 63.27 | 64.29 | .89233 | 686 |
| 100.000 | 5099.9 | 1969.1 | 1990.7 | 98.150 | 29.97 | 63.45 | 64.69 | .88166 | 669 |
| 102.000 | 4976.9 | 2095.6 | 2121.1 | 99.406 | 29.14 | 63.66 | 65.16 | .87054 | 652 |
| 104.000 | 4848.3 | 2222.5 | 2252.2 | 100.642 | 28.27 | 63.93 | 65.74 | .85898 | 635 |
| 106.000 | 4713.7 | 2349.7 | 2384.2 | 101.860 | 27.36 | 64.26 | 66.46 | .84704 | 619 |
| 108.000 | 4572.3 | 2477.3 | 2517.3 | 103.062 | 26.41 | 64.69 | 67.36 | .83476 | 602 |
| 110.000 | 4423.5 | 2605.6 | 2651.7 | 104.250 | 25.43 | 65.26 | 68.52 | .82221 | 585 |
| 112.000 | 4266.4 | 2734.9 | 2788.0 | 105.427 | 24.42 | 66.00 | 70.00 | .80946 | 568 |
| 114.000 | 4099.8 | 2865.6 | 2926.5 | 106.598 | 23.39 | 66.99 | 71.92 | .79659 | 551 |
| 116.000 | 3922.1 | 2998.2 | 3068.1 | 107.768 | 22.36 | 68.32 | 74.47 | .78367 | 533 |
| 118.000 | 3731.4 | 3133.6 | 3213.5 | 108.943 | 21.35 | 70.12 | 77.91 | .77079 | 514 |
| 120.000 | 3524.6 | 3272.7 | 3364.0 | 110.133 | 20.36 | 72.61 | 82.65 | .75801 | 494 |
| 122.000 | 3297.8 | 3417.1 | 3521.6 | 111.350 | 19.46 | 76.14 | 89.43 | .74538 | 472 |
| 124.000 | 3044.6 | 3569.2 | 3688.9 | 112.614 | 18.70 | 81.35 | 99.61 | .73292 | 448 |
| 126.000 | 2754.7 | 3732.7 | 3870.3 | 113.958 | 18.22 | 89.52 | 116.16 | .72057 | 418 |
| 128.000 | 2409.2 | 3914.7 | 4074.2 | 115.443 | 18.32 | 103.75 | 146.81 | .70815 | 379 |
| 130.000 | 1964.5 | 4131.5 | 4319.6 | 117.215 | 19.85 | 134.46 | 220.98 | .69517 | 324 |
| 131.000 | 1668.5 | 4267.0 | 4474.2 | 118.333 | 22.11 | 169.50 | 318.42 | .68806 | 286 |
| 132.000 | 1251.5 | 4448.6 | 4682.7 | 119.855 | 27.97 | 265.23 | 648.15 | .67990 | 231 |
| 132.500 | 909.8 | 4591.1 | 4847.7 | 121.077 | 36.58 | 455.79 | 1542.65 | .67492 | 188 |
| 132.850 | 0.0 | 4949.9 | 5271.9 | 124.220 | ∞ | ∞ | ∞ | .67379 | 0 |

TABLE 15. Properties of carbon monoxide along isobars

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 0.020000 MPa | | | | | | | | | | | |
| 68.128 | 30.24981 | .00117 | 2.168664 | 15.2234 | .0 | .7 | 74.483 | 36.29 | 59.29 | .76347 | 942 |
| 69.698 | 30.02526 | .00115 | 2.107484 | 14.6805 | 94.0 | 94.6 | 75.846 | 36.29 | 59.68 | .98894 | 928 |
| 69.698 | .03492 | .98822 | .000294 | .5653 | 5983.7 | 6556.4 | 168.556 | 21.11 | 29.87 | .98894 | 168 |
| 70.000 | .03477 | .98839 | .000293 | .5680 | 5990.1 | 6565.4 | 168.685 | 21.10 | 29.85 | .98908 | 169 |
| 80.000 | .03030 | .99233 | .000254 | .6547 | 6201.8 | 6861.8 | 172.643 | 20.93 | 29.49 | .99259 | 181 |
| 90.000 | .02687 | .99455 | .000224 | .7400 | 6411.7 | 7155.9 | 176.107 | 20.86 | 29.34 | .99463 | 192 |
| 100.000 | .02415 | .99594 | .000201 | .8247 | 6620.8 | 7448.9 | 179.194 | 20.83 | 29.26 | .99591 | 203 |
| 110.000 | .02194 | .99687 | .000183 | .9089 | 6829.5 | 7741.3 | 181.980 | 20.81 | 29.22 | .99681 | 213 |
| 120.000 | .02010 | .99753 | .000167 | .9928 | 7038.0 | 8033.3 | 184.520 | 20.80 | 29.19 | .99745 | 223 |
| 130.000 | .01854 | .99801 | .000154 | 1.0766 | 7246.3 | 8325.1 | 186.856 | 20.80 | 29.17 | .99793 | 232 |
| 140.000 | .01721 | .99837 | .000143 | 1.1603 | 7454.6 | 8616.7 | 189.017 | 20.80 | 29.16 | .99830 | 240 |
| 150.000 | .01606 | .99865 | .000134 | 1.2438 | 7662.7 | 8908.2 | 191.028 | 20.79 | 29.15 | .99858 | 249 |
| 160.000 | .01505 | .99887 | .000125 | 1.3273 | 7870.8 | 9199.7 | 192.909 | 20.79 | 29.14 | .99881 | 257 |
| 170.000 | .01416 | .99905 | .000118 | 1.4108 | 8078.9 | 9491.1 | 194.675 | 20.79 | 29.14 | .99899 | 265 |
| 180.000 | .01337 | .99919 | .000111 | 1.4942 | 8287.0 | 9782.4 | 196.340 | 20.79 | 29.13 | .99914 | 273 |
| 190.000 | .01267 | .99931 | .000105 | 1.5776 | 8495.1 | 10073.8 | 197.915 | 20.80 | 29.13 | .99926 | 280 |
| 200.000 | .01203 | .99941 | .000100 | 1.6610 | 8703.2 | 10365.1 | 199.410 | 20.80 | 29.13 | .99936 | 288 |
| 210.000 | .01146 | .99949 | .000095 | 1.7443 | 8911.2 | 10656.4 | 200.831 | 20.80 | 29.13 | .99945 | 295 |
| 220.000 | .01094 | .99956 | .000091 | 1.8276 | 9119.3 | 10947.7 | 202.186 | 20.80 | 29.13 | .99952 | 302 |
| 230.000 | .01046 | .99962 | .000087 | 1.9109 | 9327.4 | 11239.0 | 203.481 | 20.80 | 29.13 | .99958 | 309 |
| 240.000 | .01003 | .99967 | .000083 | 1.9942 | 9535.5 | 11530.3 | 204.721 | 20.80 | 29.13 | .99964 | 315 |
| 250.000 | .00962 | .99971 | .000080 | 2.0775 | 9743.6 | 11821.6 | 205.910 | 20.80 | 29.13 | .99968 | 322 |
| 260.000 | .00925 | .99975 | .000077 | 2.1607 | 9951.7 | 12112.9 | 207.052 | 20.81 | 29.13 | .99972 | 328 |
| 270.000 | .00891 | .99978 | .000074 | 2.2440 | 10159.8 | 12404.3 | 208.152 | 20.81 | 29.14 | .99976 | 334 |
| 280.000 | .00859 | .99981 | .000071 | 2.3272 | 10368.0 | 12695.6 | 209.211 | 20.82 | 29.14 | .99979 | 341 |
| 290.000 | .00830 | .99984 | .000069 | 2.4105 | 10576.3 | 12987.1 | 210.234 | 20.82 | 29.15 | .99982 | 347 |
| 300.000 | .00802 | .99986 | .000067 | 2.4937 | 10784.6 | 13278.6 | 211.222 | 20.83 | 29.15 | .99984 | 352 |
| 310.000 | .00776 | .99988 | .000065 | 2.5769 | 10992.9 | 13570.1 | 212.178 | 20.84 | 29.16 | .99986 | 358 |
| 320.000 | .00752 | .99990 | .000063 | 2.6601 | 11201.4 | 13861.8 | 213.104 | 20.85 | 29.17 | .99988 | 364 |
| 330.000 | .00729 | .99992 | .000061 | 2.7434 | 11410.0 | 14153.5 | 214.002 | 20.86 | 29.18 | .99990 | 370 |
| 340.000 | .00708 | .99993 | .000059 | 2.8266 | 11618.7 | 14445.5 | 214.874 | 20.88 | 29.20 | .99991 | 375 |
| 350.000 | .00687 | .99994 | .000057 | 2.9098 | 11827.6 | 14737.5 | 215.720 | 20.89 | 29.22 | .99993 | 381 |
| 360.000 | .00668 | .99995 | .000056 | 2.9930 | 12036.7 | 15029.8 | 216.543 | 20.92 | 29.24 | .99994 | 386 |
| 370.000 | .00650 | .99997 | .000054 | 3.0762 | 12246.0 | 15322.2 | 217.345 | 20.94 | 29.26 | .99995 | 391 |
| 380.000 | .00633 | .99997 | .000053 | 3.1594 | 12455.5 | 15614.9 | 218.125 | 20.96 | 29.28 | .99996 | 396 |
| 390.000 | .00617 | .99998 | .000051 | 3.2426 | 12665.3 | 15907.9 | 218.886 | 20.99 | 29.31 | .99997 | 402 |
| 400.000 | .00601 | .99999 | .000050 | 3.3258 | 12875.4 | 16201.2 | 219.629 | 21.02 | 29.34 | .99998 | 407 |
| 410.000 | .00587 | 1.00000 | .000049 | 3.4089 | 13085.8 | 16494.8 | 220.354 | 21.06 | 29.38 | .99999 | 412 |
| 420.000 | .00573 | 1.00000 | .000048 | 3.4921 | 13296.6 | 16788.7 | 221.062 | 21.09 | 29.41 | .99999 | 416 |
| 430.000 | .00559 | 1.00001 | .000047 | 3.5753 | 13507.8 | 17083.0 | 221.755 | 21.13 | 29.45 | 1.00000 | 421 |
| 440.000 | .00547 | 1.00001 | .000045 | 3.6585 | 13719.3 | 17377.7 | 222.432 | 21.17 | 29.49 | 1.00000 | 426 |
| 450.000 | .00535 | 1.00002 | .000044 | 3.7417 | 13931.3 | 17672.9 | 223.095 | 21.22 | 29.54 | 1.00001 | 431 |
| 470.000 | .00512 | 1.00003 | .000043 | 3.9080 | 14356.7 | 18264.6 | 224.382 | 21.32 | 29.63 | 1.00002 | 440 |
| 500.000 | .00481 | 1.00004 | .000040 | 4.1576 | 14998.6 | 19156.0 | 226.220 | 21.48 | 29.80 | 1.00003 | 453 |
| 550.000 | .00437 | 1.00005 | .000036 | 4.5734 | 16080.0 | 20653.2 | 229.074 | 21.79 | 30.10 | 1.00004 | 474 |
| 600.000 | .00401 | 1.00006 | .000033 | 4.9893 | 17177.8 | 22166.8 | 231.708 | 22.13 | 30.44 | 1.00005 | 495 |
| 650.000 | .00370 | 1.00006 | .000031 | 5.4051 | 18293.2 | 23697.9 | 234.159 | 22.49 | 30.81 | 1.00006 | 514 |
| 700.000 | .00344 | 1.00006 | .000029 | 5.8209 | 19426.9 | 25247.4 | 236.455 | 22.86 | 31.17 | 1.00006 | 532 |
| 750.000 | .00321 | 1.00006 | .000027 | 6.2367 | 20579.1 | 26815.4 | 238.619 | 23.23 | 31.54 | 1.00006 | 549 |
| 800.000 | .00301 | 1.00006 | .000025 | 6.6525 | 21749.5 | 28401.6 | 240.666 | 23.59 | 31.90 | 1.00006 | 566 |
| 850.000 | .00283 | 1.00006 | .000024 | 7.0683 | 22937.6 | 30005.4 | 242.610 | 23.93 | 32.25 | 1.00006 | 583 |
| 900.000 | .00267 | 1.00006 | .000022 | 7.4840 | 24142.7 | 31626.2 | 244.463 | 24.26 | 32.58 | 1.00006 | 598 |
| 950.000 | .00253 | 1.00006 | .000021 | 7.8998 | 25363.8 | 33263.1 | 246.233 | 24.58 | 32.89 | 1.00006 | 614 |
| 1000.000 | .00241 | 1.00006 | .000020 | 8.3156 | 26600.0 | 34915.0 | 247.928 | 24.87 | 33.18 | 1.00006 | 629 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|--|--|---------|----------|
| 0.050000 MPa | | | | | | | | | | | |
| 68.135 | 30.25081 | .00292 | 2.168943 | 15.2297 | .1 | 1.8 | 74.484 | 36.29 | 59.29 | .30627 | 942 |
| 70.000 | 29.98397 | .00287 | 2.096421 | 14.5858 | 111.7 | 113.3 | 76.092 | 36.29 | 59.75 | .41620 | 925 |
| 75.919 | 29.11889 | .00272 | 1.877857 | 12.6162 | 469.0 | 470.7 | 81.000 | 35.99 | 61.02 | .97757 | 873 |
| 75.919 | .08118 | .97573 | .000695 | .5993 | 6096.7 | 6712.6 | 163.217 | 21.47 | 30.75 | .97757 | 175 |
| 80.000 | .07674 | .97959 | .000652 | .6371 | 6185.6 | 6837.2 | 164.815 | 21.27 | 30.34 | .98089 | 180 |
| 90.000 | .06778 | .98585 | .000571 | .7267 | 6399.9 | 7137.6 | 168.354 | 21.03 | 29.81 | .98641 | 191 |
| 100.000 | .06077 | .98962 | .000510 | .8140 | 6611.6 | 7434.4 | 171.481 | 20.92 | 29.56 | .98983 | 202 |
| 110.000 | .05510 | .99209 | .000461 | .9000 | 6821.9 | 7729.3 | 174.291 | 20.87 | 29.42 | .99215 | 212 |
| 120.000 | .05043 | .99380 | .000421 | .9854 | 7031.5 | 8023.1 | 176.848 | 20.84 | 29.34 | .99379 | 222 |
| 130.000 | .04649 | .99504 | .000388 | 1.0702 | 7240.7 | 8316.2 | 179.194 | 20.82 | 29.29 | .99500 | 231 |
| 140.000 | .04313 | .99596 | .000360 | 1.1547 | 7449.6 | 8608.9 | 181.362 | 20.81 | 29.25 | .99591 | 240 |
| 150.000 | .04022 | .99667 | .000335 | 1.2389 | 7658.2 | 8901.2 | 183.379 | 20.81 | 29.22 | .99661 | 249 |
| 160.000 | .03769 | .99722 | .000314 | 1.3230 | 7866.7 | 9193.4 | 185.264 | 20.80 | 29.20 | .99717 | 257 |
| 170.000 | .03546 | .99767 | .000295 | 1.4070 | 8075.2 | 9485.3 | 187.034 | 20.80 | 29.19 | .99761 | 265 |
| 180.000 | .03347 | .99802 | .000279 | 1.4908 | 8283.5 | 9777.2 | 188.702 | 20.80 | 29.18 | .99798 | 273 |
| 190.000 | .03170 | .99832 | .000264 | 1.5745 | 8491.8 | 10068.9 | 190.280 | 20.80 | 29.17 | .99828 | 280 |
| 200.000 | .03011 | .99856 | .000251 | 1.6582 | 8700.1 | 10360.6 | 191.776 | 20.80 | 29.16 | .99852 | 288 |
| 210.000 | .02867 | .99876 | .000239 | 1.7418 | 8908.4 | 10652.2 | 193.199 | 20.80 | 29.16 | .99873 | 295 |
| 220.000 | .02736 | .99894 | .000228 | 1.8254 | 9116.6 | 10943.8 | 194.555 | 20.80 | 29.16 | .99891 | 302 |
| 230.000 | .02617 | .99908 | .000218 | 1.9089 | 9324.8 | 11235.4 | 195.851 | 20.80 | 29.15 | .99906 | 309 |
| 240.000 | .02508 | .99921 | .000209 | 1.9924 | 9533.0 | 11526.9 | 197.092 | 20.80 | 29.15 | .99919 | 315 |
| 250.000 | .02407 | .99932 | .000200 | 2.0759 | 9741.2 | 11818.4 | 198.282 | 20.81 | 29.15 | .99930 | 322 |
| 260.000 | .02314 | .99941 | .000193 | 2.1593 | 9949.4 | 12109.9 | 199.425 | 20.81 | 29.15 | .99940 | 328 |
| 270.000 | .02228 | .99949 | .000185 | 2.2427 | 10157.7 | 12401.5 | 200.525 | 20.81 | 29.15 | .99948 | 334 |
| 280.000 | .02149 | .99956 | .000179 | 2.3261 | 10366.0 | 12693.0 | 201.585 | 20.82 | 29.16 | .99956 | 341 |
| 290.000 | .02074 | .99963 | .000173 | 2.4095 | 10574.3 | 12984.6 | 202.609 | 20.82 | 29.16 | .99962 | 347 |
| 300.000 | .02005 | .99968 | .000167 | 2.4928 | 10782.6 | 13276.2 | 203.597 | 20.83 | 29.17 | .99968 | 353 |
| 310.000 | .01940 | .99973 | .000161 | 2.5762 | 10991.1 | 13567.9 | 204.554 | 20.84 | 29.17 | .99973 | 358 |
| 320.000 | .01880 | .99977 | .000156 | 2.6595 | 11199.6 | 13859.7 | 205.480 | 20.85 | 29.18 | .99978 | 364 |
| 330.000 | .01823 | .99981 | .000152 | 2.7428 | 11408.3 | 14151.5 | 206.378 | 20.86 | 29.19 | .99982 | 370 |
| 340.000 | .01769 | .99985 | .000147 | 2.8261 | 11617.0 | 14443.5 | 207.250 | 20.88 | 29.21 | .99986 | 375 |
| 350.000 | .01718 | .99988 | .000143 | 2.9094 | 11826.0 | 14735.7 | 208.097 | 20.90 | 29.22 | .99989 | 381 |
| 360.000 | .01671 | .99991 | .000139 | 2.9927 | 12035.1 | 15028.1 | 208.920 | 20.92 | 29.24 | .99992 | 386 |
| 370.000 | .01625 | .99993 | .000135 | 3.0760 | 12244.5 | 15320.6 | 209.722 | 20.94 | 29.27 | .99994 | 391 |
| 380.000 | .01583 | .99995 | .000132 | 3.1593 | 12454.0 | 15613.4 | 210.503 | 20.96 | 29.29 | .99997 | 396 |
| 390.000 | .01542 | .99997 | .000128 | 3.2425 | 12663.9 | 15906.4 | 211.264 | 20.99 | 29.32 | .99999 | 402 |
| 400.000 | .01503 | .99999 | .000125 | 3.3258 | 12874.0 | 16199.8 | 212.007 | 21.02 | 29.35 | 1.00001 | 407 |
| 410.000 | .01467 | 1.00001 | .000122 | 3.4091 | 13084.5 | 16493.4 | 212.732 | 21.06 | 29.38 | 1.00003 | 412 |
| 420.000 | .01432 | 1.00002 | .000119 | 3.4923 | 13295.3 | 16787.4 | 213.440 | 21.09 | 29.42 | 1.00004 | 416 |
| 430.000 | .01398 | 1.00004 | .000116 | 3.5755 | 13506.5 | 17081.8 | 214.133 | 21.13 | 29.46 | 1.00006 | 421 |
| 440.000 | .01367 | 1.00005 | .000114 | 3.6588 | 13718.0 | 17376.6 | 214.810 | 21.17 | 29.50 | 1.00007 | 426 |
| 450.000 | .01336 | 1.00006 | .000111 | 3.7420 | 13930.1 | 17671.8 | 215.474 | 21.22 | 29.54 | 1.00008 | 431 |
| 470.000 | .01279 | 1.00008 | .000106 | 3.9085 | 14355.5 | 18263.6 | 216.761 | 21.32 | 29.64 | 1.00010 | 440 |
| 500.000 | .01203 | 1.00010 | .000100 | 4.1581 | 14997.5 | 19155.1 | 218.599 | 21.48 | 29.80 | 1.00013 | 453 |
| 550.000 | .01093 | 1.00013 | .000091 | 4.5742 | 16079.0 | 20652.6 | 221.453 | 21.79 | 30.11 | 1.00016 | 475 |
| 600.000 | .01002 | 1.00015 | .000083 | 4.9902 | 17176.9 | 22166.3 | 224.087 | 22.13 | 30.45 | 1.00017 | 495 |
| 650.000 | .00925 | 1.00016 | .000077 | 5.4061 | 18292.3 | 23697.6 | 226.539 | 22.49 | 30.81 | 1.00019 | 514 |
| 700.000 | .00859 | 1.00016 | .000071 | 5.8221 | 19426.1 | 25247.2 | 228.835 | 22.86 | 31.18 | 1.00019 | 532 |
| 750.000 | .00802 | 1.00016 | .000067 | 6.2380 | 20578.3 | 26815.3 | 230.999 | 23.23 | 31.54 | 1.00020 | 549 |
| 800.000 | .00752 | 1.00017 | .000063 | 6.6538 | 21748.8 | 28401.5 | 233.046 | 23.59 | 31.90 | 1.00020 | 566 |
| 850.000 | .00707 | 1.00017 | .000059 | 7.0697 | 22937.0 | 30005.5 | 234.991 | 23.93 | 32.25 | 1.00020 | 583 |
| 900.000 | .00668 | 1.00016 | .000056 | 7.4855 | 24142.1 | 31626.3 | 236.844 | 24.26 | 32.58 | 1.00020 | 599 |
| 950.000 | .00633 | 1.00016 | .000053 | 7.9014 | 25363.2 | 33263.2 | 238.614 | 24.58 | 32.89 | 1.00020 | 614 |
| 1000.000 | .00601 | 1.00016 | .000050 | 8.3172 | 26599.5 | 34915.3 | 240.308 | 24.87 | 33.19 | 1.00020 | 629 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 0.101325 MPa | | | | | | | | | | | |
| 68.146 | 30.25254 | .00591 | 2.169421 | 15.2404 | .2 | 3.6 | 74.486 | 36.29 | 59.28 | .15189 | 942 |
| 70.000 | 29.98749 | .00581 | 2.097344 | 14.6006 | 111.1 | 114.5 | 76.083 | 36.29 | 59.74 | .20598 | 926 |
| 80.000 | 28.50703 | .00534 | 1.737181 | 11.3358 | 717.9 | 721.5 | 84.197 | 35.51 | 61.72 | .79940 | 838 |
| 81.638 | 28.25440 | .00528 | 1.682220 | 10.8299 | 819.0 | 822.5 | 85.444 | 35.26 | 61.98 | .96211 | 824 |
| 81.638 | .15579 | .95819 | .001363 | .6196 | 6190.0 | 6840.4 | 159.158 | 21.98 | 32.07 | .96211 | 179 |
| 90.000 | .13962 | .96984 | .001198 | .7019 | 6377.1 | 7102.8 | 162.218 | 21.42 | 30.86 | .97187 | 190 |
| 100.000 | .12457 | .97829 | .001057 | .7948 | 6594.3 | 7407.7 | 165.431 | 21.13 | 30.19 | .97924 | 201 |
| 110.000 | .11263 | .98367 | .000950 | .8845 | 6808.0 | 7707.7 | 168.290 | 21.00 | 29.84 | .98412 | 211 |
| 120.000 | .10286 | .98732 | .000864 | .9724 | 7019.9 | 8005.0 | 170.877 | 20.92 | 29.64 | .98753 | 221 |
| 130.000 | .09470 | .98992 | .000794 | 1.0591 | 7230.7 | 8300.7 | 173.243 | 20.88 | 29.51 | .99000 | 231 |
| 140.000 | .08776 | .99185 | .000735 | 1.1452 | 7440.8 | 8595.3 | 175.426 | 20.85 | 29.42 | .99186 | 240 |
| 150.000 | .08179 | .99331 | .000684 | 1.2306 | 7650.4 | 8889.2 | 177.454 | 20.84 | 29.36 | .99329 | 248 |
| 160.000 | .07659 | .99445 | .000640 | 1.3157 | 7859.6 | 9182.6 | 179.347 | 20.82 | 29.32 | .99442 | 257 |
| 170.000 | .07202 | .99535 | .000601 | 1.4005 | 8068.7 | 9475.5 | 181.123 | 20.82 | 29.28 | .99531 | 265 |
| 180.000 | .06797 | .99608 | .000567 | 1.4851 | 8277.5 | 9768.3 | 182.796 | 20.81 | 29.26 | .99604 | 273 |
| 190.000 | .06435 | .99667 | .000537 | 1.5694 | 8486.2 | 10060.7 | 184.378 | 20.81 | 29.24 | .99664 | 280 |
| 200.000 | .06111 | .99716 | .000510 | 1.6537 | 8694.9 | 10353.1 | 185.877 | 20.81 | 29.22 | .99714 | 287 |
| 210.000 | .05817 | .99757 | .000485 | 1.7378 | 8903.4 | 10645.2 | 187.303 | 20.81 | 29.21 | .99755 | 295 |
| 220.000 | .05551 | .99792 | .000463 | 1.8218 | 9112.0 | 10937.3 | 188.661 | 20.81 | 29.20 | .99791 | 302 |
| 230.000 | .05308 | .99821 | .000443 | 1.9057 | 9320.4 | 11229.3 | 189.959 | 20.81 | 29.20 | .99820 | 308 |
| 240.000 | .05086 | .99846 | .000424 | 1.9895 | 9528.8 | 11521.2 | 191.202 | 20.81 | 29.19 | .99846 | 315 |
| 250.000 | .04881 | .99867 | .000407 | 2.0733 | 9737.3 | 11813.1 | 192.393 | 20.81 | 29.19 | .99868 | 322 |
| 260.000 | .04692 | .99886 | .000391 | 2.1570 | 9945.7 | 12105.0 | 193.538 | 20.81 | 29.18 | .99888 | 328 |
| 270.000 | .04518 | .99902 | .000376 | 2.2407 | 10154.1 | 12396.8 | 194.639 | 20.81 | 29.18 | .99904 | 334 |
| 280.000 | .04356 | .99916 | .000363 | 2.3243 | 10362.5 | 12688.6 | 195.700 | 20.82 | 29.18 | .99919 | 341 |
| 290.000 | .04205 | .99929 | .000350 | 2.4079 | 10570.9 | 12980.4 | 196.724 | 20.82 | 29.18 | .99932 | 347 |
| 300.000 | .04065 | .99940 | .000339 | 2.4915 | 10779.4 | 13272.3 | 197.714 | 20.83 | 29.19 | .99943 | 353 |
| 310.000 | .03933 | .99950 | .000328 | 2.5750 | 10988.0 | 13564.2 | 198.671 | 20.84 | 29.19 | .99953 | 358 |
| 320.000 | .03810 | .99958 | .000317 | 2.6586 | 11196.6 | 13856.1 | 199.598 | 20.85 | 29.20 | .99962 | 364 |
| 330.000 | .03694 | .99966 | .000308 | 2.7420 | 11405.4 | 14148.2 | 200.496 | 20.86 | 29.21 | .99970 | 370 |
| 340.000 | .03585 | .99972 | .000299 | 2.8255 | 11614.2 | 14440.4 | 201.369 | 20.88 | 29.23 | .99977 | 375 |
| 350.000 | .03483 | .99979 | .000290 | 2.9090 | 11823.3 | 14732.7 | 202.216 | 20.90 | 29.24 | .99984 | 381 |
| 360.000 | .03386 | .99984 | .000282 | 2.9924 | 12032.5 | 15025.2 | 203.040 | 20.92 | 29.26 | .99989 | 386 |
| 370.000 | .03294 | .99989 | .000274 | 3.0758 | 12241.9 | 15317.9 | 203.842 | 20.94 | 29.28 | .99995 | 391 |
| 380.000 | .03207 | .99993 | .000267 | 3.1592 | 12451.5 | 15610.8 | 204.623 | 20.96 | 29.30 | .99999 | 397 |
| 390.000 | .03125 | .99997 | .000260 | 3.2426 | 12661.4 | 15904.0 | 205.385 | 20.99 | 29.33 | 1.00003 | 402 |
| 400.000 | .03047 | 1.00001 | .000254 | 3.3260 | 12871.6 | 16197.5 | 206.128 | 21.02 | 29.36 | 1.00007 | 407 |
| 410.000 | .02972 | 1.00004 | .000247 | 3.4093 | 13082.1 | 16491.2 | 206.853 | 21.06 | 29.39 | 1.00011 | 412 |
| 420.000 | .02901 | 1.00007 | .000242 | 3.4927 | 13293.0 | 16785.3 | 207.562 | 21.09 | 29.43 | 1.00014 | 417 |
| 430.000 | .02834 | 1.00010 | .000236 | 3.5760 | 13504.2 | 17079.8 | 208.255 | 21.13 | 29.47 | 1.00016 | 421 |
| 440.000 | .02769 | 1.00012 | .000231 | 3.6594 | 13715.9 | 17374.7 | 208.933 | 21.18 | 29.51 | 1.00019 | 426 |
| 450.000 | .02708 | 1.00014 | .000225 | 3.7427 | 13927.9 | 17670.0 | 209.596 | 21.22 | 29.55 | 1.00021 | 431 |
| 470.000 | .02592 | 1.00018 | .000216 | 3.9093 | 14353.5 | 18262.0 | 210.883 | 21.32 | 29.65 | 1.00025 | 440 |
| 500.000 | .02437 | 1.00022 | .000203 | 4.1592 | 14995.6 | 19153.7 | 212.722 | 21.48 | 29.81 | 1.00030 | 453 |
| 550.000 | .02215 | 1.00027 | .000184 | 4.5756 | 16077.3 | 20651.5 | 215.577 | 21.79 | 30.11 | 1.00036 | 475 |
| 600.000 | .02030 | 1.00031 | .000169 | 4.9918 | 17175.3 | 22165.5 | 218.212 | 22.13 | 30.45 | 1.00039 | 495 |
| 650.000 | .01874 | 1.00033 | .000156 | 5.4080 | 18290.9 | 23697.0 | 220.663 | 22.49 | 30.81 | 1.00041 | 514 |
| 700.000 | .01740 | 1.00034 | .000145 | 5.8241 | 19424.7 | 25246.9 | 222.960 | 22.86 | 31.18 | 1.00043 | 532 |
| 750.000 | .01624 | 1.00034 | .000135 | 6.2402 | 20577.1 | 26815.1 | 225.124 | 23.23 | 31.55 | 1.00043 | 550 |
| 800.000 | .01523 | 1.00034 | .000127 | 6.6562 | 21747.6 | 28401.5 | 227.172 | 23.59 | 31.91 | 1.00044 | 566 |
| 850.000 | .01433 | 1.00034 | .000119 | 7.0722 | 22935.9 | 30005.6 | 229.116 | 23.93 | 32.25 | 1.00044 | 583 |
| 900.000 | .01354 | 1.00034 | .000113 | 7.4882 | 24141.0 | 31626.6 | 230.969 | 24.26 | 32.58 | 1.00043 | 599 |
| 950.000 | .01282 | 1.00033 | .000107 | 7.9041 | 25362.2 | 33263.6 | 232.739 | 24.58 | 32.89 | 1.00043 | 614 |
| 1000.000 | .01218 | 1.00033 | .000101 | 8.3200 | 26598.5 | 34915.7 | 234.434 | 24.87 | 33.19 | 1.00043 | 629 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\delta P/\delta T$ MPa/K | $\delta P/\delta \rho$ MPa-L/mol | E J/mol | H | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|------------------------------|-------------------------------------|------------|---------|--|-------|-------|---------|----------|
| 0.150000 MPa | | | | | | | | | | | |
| 68.157 | 30.25417 | .00875 | 2.169872 | 15.2506 | .4 | 5.3 | 74.488 | 36.29 | 59.28 | .10308 | 943 |
| 70.000 | 29.99082 | .00859 | 2.098219 | 14.6146 | 110.5 | 115.5 | 76.076 | 36.29 | 59.74 | .13953 | 926 |
| 80.000 | 28.51132 | .00791 | 1.738059 | 11.3503 | 717.2 | 722.4 | 84.188 | 35.51 | 61.71 | .54138 | 839 |
| 85.247 | 27.68952 | .00764 | 1.565359 | 9.7567 | 1042.4 | 1047.8 | 88.123 | 34.57 | 62.49 | .94977 | 793 |
| 85.247 | .22424 | .94376 | .001999 | .6258 | 6242.2 | 6911.1 | 156.903 | 22.40 | 33.23 | .94977 | 182 |
| 90.000 | .21023 | .95347 | .001842 | .6764 | 6352.7 | 7066.2 | 158.672 | 21.90 | 32.12 | .95764 | 188 |
| 100.000 | .18656 | .96703 | .001603 | .7756 | 6576.4 | 7380.5 | 161.984 | 21.38 | 30.90 | .96899 | 200 |
| 110.000 | .16814 | .97544 | .001430 | .8692 | 6794.0 | 7686.1 | 164.897 | 21.14 | 30.29 | .97641 | 210 |
| 120.000 | .15324 | .98106 | .001296 | .9598 | 7008.3 | 7987.2 | 167.517 | 21.01 | 29.95 | .98155 | 221 |
| 130.000 | .14088 | .98503 | .001187 | 1.0486 | 7220.8 | 8285.5 | 169.905 | 20.94 | 29.74 | .98526 | 230 |
| 140.000 | .13044 | .98794 | .001096 | 1.1361 | 7432.2 | 8582.1 | 172.103 | 20.89 | 29.60 | .98803 | 239 |
| 150.000 | .12147 | .99013 | .001019 | 1.2228 | 7642.7 | 8877.6 | 174.141 | 20.86 | 29.50 | .99015 | 248 |
| 160.000 | .11368 | .99183 | .000953 | 1.3089 | 7852.7 | 9172.2 | 176.042 | 20.85 | 29.43 | .99182 | 256 |
| 170.000 | .10685 | .99318 | .000894 | 1.3945 | 8062.4 | 9466.2 | 177.825 | 20.83 | 29.38 | .99314 | 264 |
| 180.000 | .10081 | .99426 | .000843 | 1.4797 | 8271.8 | 9759.8 | 179.503 | 20.82 | 29.34 | .99422 | 272 |
| 190.000 | .09542 | .99514 | .000798 | 1.5647 | 8480.9 | 10053.0 | 181.088 | 20.82 | 29.31 | .99510 | 280 |
| 200.000 | .09058 | .99586 | .000757 | 1.6495 | 8689.9 | 10345.9 | 182.590 | 20.82 | 29.28 | .99583 | 287 |
| 210.000 | .08621 | .99647 | .000720 | 1.7340 | 8898.8 | 10638.7 | 184.019 | 20.81 | 29.26 | .99644 | 295 |
| 220.000 | .08225 | .99697 | .000687 | 1.8184 | 9107.6 | 10931.2 | 185.380 | 20.81 | 29.25 | .99696 | 302 |
| 230.000 | .07864 | .99741 | .000657 | 1.9027 | 9316.3 | 11223.6 | 186.679 | 20.81 | 29.24 | .99740 | 308 |
| 240.000 | .07534 | .99777 | .000629 | 1.9869 | 9524.9 | 11515.9 | 187.923 | 20.81 | 29.23 | .99777 | 315 |
| 250.000 | .07230 | .99809 | .000603 | 2.0710 | 9733.5 | 11808.2 | 189.116 | 20.81 | 29.22 | .99810 | 322 |
| 260.000 | .06950 | .99836 | .000580 | 2.1550 | 9942.1 | 12100.3 | 190.262 | 20.81 | 29.21 | .99838 | 328 |
| 270.000 | .06691 | .99860 | .000558 | 2.2389 | 10150.6 | 12392.4 | 191.364 | 20.82 | 29.21 | .99862 | 334 |
| 280.000 | .06451 | .99881 | .000538 | 2.3228 | 10359.2 | 12684.5 | 192.427 | 20.82 | 29.21 | .99884 | 341 |
| 290.000 | .06227 | .99899 | .000519 | 2.4066 | 10567.8 | 12976.5 | 193.451 | 20.83 | 29.21 | .99903 | 347 |
| 300.000 | .06019 | .99915 | .000502 | 2.4904 | 10776.4 | 13268.6 | 194.442 | 20.83 | 29.21 | .99919 | 353 |
| 310.000 | .05824 | .99929 | .000486 | 2.5741 | 10985.0 | 13560.7 | 195.399 | 20.84 | 29.21 | .99934 | 358 |
| 320.000 | .05641 | .99941 | .000470 | 2.6578 | 11193.8 | 13852.9 | 196.327 | 20.85 | 29.22 | .99947 | 364 |
| 330.000 | .05470 | .99952 | .000456 | 2.7414 | 11402.6 | 14145.1 | 197.226 | 20.86 | 29.23 | .99958 | 370 |
| 340.000 | .05308 | .99962 | .000442 | 2.8250 | 11611.6 | 14437.4 | 198.099 | 20.88 | 29.24 | .99969 | 375 |
| 350.000 | .05156 | .99971 | .000430 | 2.9086 | 11820.7 | 14729.9 | 198.947 | 20.90 | 29.26 | .99978 | 381 |
| 360.000 | .05012 | .99979 | .000418 | 2.9922 | 12030.0 | 15022.6 | 199.771 | 20.92 | 29.27 | .99986 | 386 |
| 370.000 | .04877 | .99986 | .000406 | 3.0757 | 12239.5 | 15315.4 | 200.573 | 20.94 | 29.29 | .99994 | 391 |
| 380.000 | .04748 | .99993 | .000396 | 3.1592 | 12449.2 | 15608.4 | 201.355 | 20.96 | 29.32 | 1.00000 | 397 |
| 390.000 | .04626 | .99998 | .000385 | 3.2427 | 12659.1 | 15901.7 | 202.117 | 20.99 | 29.34 | 1.00007 | 402 |
| 400.000 | .04510 | 1.00003 | .000376 | 3.3262 | 12869.4 | 16195.3 | 202.860 | 21.02 | 29.37 | 1.00012 | 407 |
| 410.000 | .04400 | 1.00008 | .000367 | 3.4097 | 13080.0 | 16489.2 | 203.586 | 21.06 | 29.40 | 1.00017 | 412 |
| 420.000 | .04295 | 1.00012 | .000358 | 3.4931 | 13290.9 | 16783.4 | 204.295 | 21.09 | 29.44 | 1.00021 | 417 |
| 430.000 | .04195 | 1.00016 | .000349 | 3.5766 | 13502.2 | 17078.0 | 204.988 | 21.13 | 29.48 | 1.00025 | 422 |
| 440.000 | .04099 | 1.00020 | .000341 | 3.6600 | 13713.9 | 17373.0 | 205.666 | 21.18 | 29.52 | 1.00029 | 426 |
| 450.000 | .04008 | 1.00023 | .000334 | 3.7434 | 13926.0 | 17668.4 | 206.330 | 21.22 | 29.56 | 1.00032 | 431 |
| 470.000 | .03837 | 1.00028 | .000320 | 3.9102 | 14351.6 | 18260.5 | 207.617 | 21.32 | 29.65 | 1.00038 | 440 |
| 500.000 | .03607 | 1.00035 | .000300 | 4.1603 | 14993.8 | 19152.5 | 209.457 | 21.48 | 29.81 | 1.00045 | 454 |
| 550.000 | .03279 | 1.00042 | .000273 | 4.5769 | 16075.7 | 20650.6 | 212.312 | 21.79 | 30.12 | 1.00053 | 475 |
| 600.000 | .03005 | 1.00046 | .000250 | 4.9935 | 17173.8 | 22164.8 | 214.947 | 22.13 | 30.46 | 1.00058 | 495 |
| 650.000 | .02774 | 1.00049 | .000231 | 5.4098 | 18289.5 | 23696.6 | 217.399 | 22.49 | 30.82 | 1.00061 | 514 |
| 700.000 | .02576 | 1.00051 | .000214 | 5.8261 | 19423.5 | 25246.6 | 219.696 | 22.86 | 31.18 | 1.00063 | 532 |
| 750.000 | .02404 | 1.00051 | .000200 | 6.2424 | 20575.9 | 26815.0 | 221.860 | 23.23 | 31.55 | 1.00064 | 550 |
| 800.000 | .02254 | 1.00051 | .000188 | 6.6585 | 21746.5 | 28401.5 | 223.908 | 23.59 | 31.91 | 1.00064 | 567 |
| 850.000 | .02121 | 1.00051 | .000177 | 7.0746 | 22934.8 | 30005.8 | 225.853 | 23.93 | 32.26 | 1.00064 | 583 |
| 900.000 | .02004 | 1.00050 | .000167 | 7.4907 | 24140.0 | 31626.8 | 227.706 | 24.26 | 32.59 | 1.00064 | 599 |
| 950.000 | .01898 | 1.00050 | .000158 | 7.9067 | 25361.3 | 33264.0 | 229.476 | 24.58 | 32.90 | 1.00063 | 614 |
| 1000.000 | .01803 | 1.00049 | .000150 | 8.3227 | 26597.6 | 34916.2 | 231.171 | 24.87 | 33.19 | 1.00062 | 629 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 0.200000 MPa | | | | | | | | | | | |
| 68.169 | 30.25585 | .01166 | 2.170336 | 15.2611 | .5 | 7.1 | 74.490 | 36.29 | 59.27 | .07769 | 943 |
| 70.000 | 29.99424 | .01146 | 2.099117 | 14.6290 | 110.0 | 116.7 | 76.068 | 36.29 | 59.73 | .10495 | 927 |
| 80.000 | 28.51572 | .01054 | 1.738961 | 11.3651 | 716.4 | 723.4 | 84.179 | 35.51 | 61.69 | .40711 | 839 |
| 88.124 | 27.22662 | .01003 | 1.475488 | 8.9316 | 1221.7 | 1229.0 | 90.192 | 33.89 | 62.87 | .93853 | 769 |
| 88.124 | .29341 | .93029 | .002662 | .6265 | 6279.3 | 6960.9 | 155.236 | 22.80 | 34.38 | .93853 | 183 |
| 90.000 | .28572 | .93543 | .002568 | .6482 | 6324.8 | 7024.8 | 155.951 | 22.52 | 33.74 | .94268 | 186 |
| 100.000 | .25189 | .95495 | .002196 | .7550 | 6556.7 | 7350.7 | 159.387 | 21.67 | 31.74 | .95834 | 198 |
| 110.000 | .22620 | .96675 | .001942 | .8531 | 6778.8 | 7662.9 | 162.363 | 21.31 | 30.81 | .96845 | 209 |
| 120.000 | .20569 | .97453 | .001751 | .9467 | 6995.9 | 7968.3 | 165.019 | 21.12 | 30.30 | .97541 | 220 |
| 130.000 | .18882 | .97995 | .001599 | 1.0376 | 7210.4 | 8269.6 | 167.431 | 21.01 | 29.99 | .98041 | 229 |
| 140.000 | .17463 | .98391 | .001473 | 1.1268 | 7423.1 | 8568.4 | 169.646 | 20.94 | 29.79 | .98413 | 239 |
| 150.000 | .16250 | .98688 | .001368 | 1.2148 | 7634.7 | 8865.5 | 171.696 | 20.90 | 29.65 | .98697 | 248 |
| 160.000 | .15199 | .98917 | .001277 | 1.3019 | 7845.6 | 9161.5 | 173.606 | 20.87 | 29.55 | .98919 | 256 |
| 170.000 | .14279 | .99097 | .001198 | 1.3884 | 8055.9 | 9456.6 | 175.395 | 20.85 | 29.47 | .99096 | 264 |
| 180.000 | .13466 | .99241 | .001129 | 1.4743 | 8265.8 | 9751.1 | 177.078 | 20.84 | 29.42 | .99239 | 272 |
| 190.000 | .12742 | .99359 | .001067 | 1.5599 | 8475.4 | 10045.0 | 178.667 | 20.83 | 29.38 | .99356 | 280 |
| 200.000 | .12093 | .99455 | .001012 | 1.6452 | 8684.8 | 10338.6 | 180.173 | 20.82 | 29.34 | .99453 | 287 |
| 210.000 | .11508 | .99536 | .000963 | 1.7303 | 8894.0 | 10631.9 | 181.604 | 20.82 | 29.32 | .99534 | 294 |
| 220.000 | .10977 | .99603 | .000918 | 1.8151 | 9103.0 | 10925.0 | 182.967 | 20.82 | 29.29 | .99602 | 301 |
| 230.000 | .10494 | .99660 | .000877 | 1.8998 | 9312.0 | 11217.8 | 184.269 | 20.82 | 29.28 | .99661 | 308 |
| 240.000 | .10052 | .99709 | .000840 | 1.9843 | 9520.9 | 11510.5 | 185.514 | 20.81 | 29.26 | .99710 | 315 |
| 250.000 | .09646 | .99751 | .000806 | 2.0687 | 9729.7 | 11803.1 | 186.709 | 20.81 | 29.25 | .99753 | 322 |
| 260.000 | .09271 | .99787 | .000774 | 2.1530 | 9938.4 | 12095.6 | 187.856 | 20.82 | 29.24 | .99790 | 328 |
| 270.000 | .08925 | .99818 | .000745 | 2.2371 | 10147.1 | 12387.9 | 188.959 | 20.82 | 29.24 | .99823 | 334 |
| 280.000 | .08604 | .99845 | .000718 | 2.3212 | 10355.8 | 12680.3 | 190.022 | 20.82 | 29.23 | .99851 | 341 |
| 290.000 | .08305 | .99869 | .000693 | 2.4053 | 10564.5 | 12972.6 | 191.048 | 20.83 | 29.23 | .99876 | 347 |
| 300.000 | .08027 | .99890 | .000670 | 2.4892 | 10773.3 | 13264.9 | 192.039 | 20.83 | 29.23 | .99898 | 353 |
| 310.000 | .07767 | .99909 | .000648 | 2.5732 | 10982.0 | 13557.2 | 192.998 | 20.84 | 29.23 | .99917 | 358 |
| 320.000 | .07523 | .99925 | .000628 | 2.6570 | 11190.9 | 13849.5 | 193.926 | 20.85 | 29.24 | .99934 | 364 |
| 330.000 | .07294 | .99940 | .000609 | 2.7408 | 11399.8 | 14142.0 | 194.826 | 20.87 | 29.25 | .99949 | 370 |
| 340.000 | .07078 | .99953 | .000590 | 2.8246 | 11608.9 | 14434.5 | 195.699 | 20.88 | 29.26 | .99963 | 375 |
| 350.000 | .06875 | .99965 | .000573 | 2.9083 | 11818.1 | 14727.1 | 196.547 | 20.90 | 29.27 | .99975 | 381 |
| 360.000 | .06683 | .99975 | .000557 | 2.9920 | 12027.4 | 15019.9 | 197.372 | 20.92 | 29.29 | .99986 | 386 |
| 370.000 | .06502 | .99984 | .000542 | 3.0757 | 12237.0 | 15312.9 | 198.175 | 20.94 | 29.31 | .99996 | 392 |
| 380.000 | .06331 | .99993 | .000528 | 3.1593 | 12446.8 | 15606.1 | 198.956 | 20.97 | 29.33 | 1.00005 | 397 |
| 390.000 | .06168 | 1.00000 | .000514 | 3.2429 | 12656.8 | 15899.5 | 199.719 | 20.99 | 29.35 | 1.00013 | 402 |
| 400.000 | .06013 | 1.00007 | .000501 | 3.3265 | 12867.1 | 16193.2 | 200.462 | 21.02 | 29.38 | 1.00020 | 407 |
| 410.000 | .05866 | 1.00013 | .000489 | 3.4101 | 13077.8 | 16487.2 | 201.188 | 21.06 | 29.41 | 1.00026 | 412 |
| 420.000 | .05726 | 1.00018 | .000477 | 3.4936 | 13288.7 | 16781.5 | 201.897 | 21.09 | 29.45 | 1.00032 | 417 |
| 430.000 | .05593 | 1.00023 | .000466 | 3.5772 | 13500.1 | 17076.2 | 202.591 | 21.13 | 29.49 | 1.00037 | 422 |
| 440.000 | .05465 | 1.00028 | .000456 | 3.6607 | 13711.8 | 17371.2 | 203.269 | 21.18 | 29.53 | 1.00042 | 426 |
| 450.000 | .05344 | 1.00032 | .000445 | 3.7442 | 13924.0 | 17666.7 | 203.933 | 21.22 | 29.57 | 1.00047 | 431 |
| 470.000 | .05116 | 1.00039 | .000426 | 3.9111 | 14349.7 | 18259.0 | 205.221 | 21.32 | 29.66 | 1.00054 | 440 |
| 500.000 | .04809 | 1.00048 | .000401 | 4.1614 | 14992.0 | 19151.2 | 207.061 | 21.48 | 29.82 | 1.00063 | 454 |
| 550.000 | .04371 | 1.00057 | .000364 | 4.5784 | 16074.1 | 20649.6 | 209.917 | 21.79 | 30.12 | 1.00074 | 475 |
| 600.000 | .04007 | 1.00063 | .000334 | 4.9951 | 17172.3 | 22164.1 | 212.552 | 22.13 | 30.46 | 1.00080 | 495 |
| 650.000 | .03698 | 1.00066 | .000308 | 5.4117 | 18288.1 | 23696.1 | 215.005 | 22.49 | 30.82 | 1.00084 | 514 |
| 700.000 | .03434 | 1.00068 | .000286 | 5.8282 | 19422.2 | 25246.3 | 217.302 | 22.86 | 31.19 | 1.00086 | 532 |
| 750.000 | .03205 | 1.00069 | .000267 | 6.2446 | 20574.7 | 26814.9 | 219.466 | 23.23 | 31.55 | 1.00087 | 550 |
| 800.000 | .03005 | 1.00069 | .000250 | 6.6609 | 21745.4 | 28401.6 | 221.514 | 23.59 | 31.91 | 1.00088 | 567 |
| 850.000 | .02828 | 1.00068 | .000235 | 7.0771 | 22933.8 | 30005.9 | 223.459 | 23.93 | 32.26 | 1.00088 | 583 |
| 900.000 | .02671 | 1.00068 | .000222 | 7.4933 | 24139.0 | 31627.1 | 225.313 | 24.26 | 32.59 | 1.00087 | 599 |
| 950.000 | .02530 | 1.00067 | .000211 | 7.9094 | 25360.3 | 33264.4 | 227.083 | 24.58 | 32.90 | 1.00086 | 614 |
| 1000.000 | .02404 | 1.00066 | .000200 | 8.3255 | 26596.7 | 34916.7 | 228.778 | 24.87 | 33.19 | 1.00085 | 629 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 0.300000 MPa | | | | | | | | | | | |
| 68.191 | 30.25920 | .01749 | 2.171262 | 15.2821 | .8 | 10.7 | 74.494 | 36.29 | 59.26 | .05229 | 943 |
| 70.000 | 30.00107 | .01718 | 2.100913 | 14.6578 | 108.9 | 118.9 | 76.052 | 36.29 | 59.71 | .07037 | 927 |
| 80.000 | 28.52451 | .01581 | 1.740762 | 11.3948 | 714.9 | 725.5 | 84.160 | 35.52 | 61.66 | .27284 | 840 |
| 90.000 | 26.92524 | .01489 | 1.419541 | 8.4274 | 1337.9 | 1349.0 | 91.503 | 33.39 | 63.08 | .74228 | 753 |
| 92.554 | 26.48806 | .01472 | 1.342222 | 7.7138 | 1499.3 | 1510.6 | 93.269 | 32.64 | 63.45 | .91898 | 731 |
| 92.554 | .43026 | .90606 | .004029 | .6196 | 6327.4 | 7024.7 | 152.845 | 23.55 | 36.65 | .91898 | 185 |
| 100.000 | .38830 | .92923 | .003498 | .7110 | 6513.1 | 7285.7 | 155.557 | 22.40 | 33.81 | .93654 | 195 |
| 110.000 | .34576 | .94869 | .003031 | .8196 | 6746.1 | 7613.7 | 158.684 | 21.70 | 32.01 | .95231 | 207 |
| 120.000 | .31284 | .96114 | .002702 | .9199 | 6969.8 | 7928.8 | 161.426 | 21.35 | 31.09 | .96301 | 218 |
| 130.000 | .28623 | .96967 | .002450 | 1.0155 | 7188.6 | 8236.7 | 163.891 | 21.16 | 30.54 | .97064 | 228 |
| 140.000 | .26412 | .97580 | .002248 | 1.1081 | 7404.5 | 8540.3 | 166.140 | 21.05 | 30.20 | .97628 | 238 |
| 150.000 | .24536 | .98037 | .002080 | 1.1988 | 7618.4 | 8841.1 | 168.215 | 20.97 | 29.96 | .98057 | 247 |
| 160.000 | .22921 | .98386 | .001937 | 1.2881 | 7831.0 | 9139.8 | 170.143 | 20.93 | 29.80 | .98391 | 255 |
| 170.000 | .21513 | .98659 | .001815 | 1.3763 | 8042.7 | 9437.2 | 171.946 | 20.89 | 29.68 | .98657 | 264 |
| 180.000 | .20273 | .98877 | .001707 | 1.4638 | 8253.7 | 9733.5 | 173.640 | 20.87 | 29.59 | .98871 | 272 |
| 190.000 | .19172 | .99054 | .001612 | 1.5506 | 8464.3 | 10029.1 | 175.238 | 20.85 | 29.52 | .99045 | 279 |
| 200.000 | .18187 | .99199 | .001528 | 1.6370 | 8674.5 | 10324.0 | 176.751 | 20.84 | 29.47 | .99190 | 287 |
| 210.000 | .17300 | .99319 | .001452 | 1.7230 | 8884.3 | 10618.5 | 178.187 | 20.84 | 29.42 | .99310 | 294 |
| 220.000 | .16497 | .99419 | .001384 | 1.8087 | 9094.0 | 10912.6 | 179.555 | 20.83 | 29.39 | .99412 | 301 |
| 230.000 | .15766 | .99504 | .001322 | 1.8941 | 9303.5 | 11206.3 | 180.861 | 20.83 | 29.36 | .99498 | 308 |
| 240.000 | .15098 | .99576 | .001265 | 1.9793 | 9512.8 | 11499.8 | 182.110 | 20.82 | 29.34 | .99572 | 315 |
| 250.000 | .14485 | .99638 | .001213 | 2.0643 | 9722.0 | 11793.1 | 183.307 | 20.82 | 29.32 | .99636 | 322 |
| 260.000 | .13920 | .99692 | .001166 | 2.1491 | 9931.1 | 12086.2 | 184.457 | 20.82 | 29.30 | .99691 | 328 |
| 270.000 | .13399 | .99738 | .001121 | 2.2338 | 10140.1 | 12379.2 | 185.563 | 20.82 | 29.29 | .99738 | 334 |
| 280.000 | .12915 | .99779 | .001081 | 2.3184 | 10349.1 | 12672.0 | 186.628 | 20.83 | 29.28 | .99780 | 341 |
| 290.000 | .12465 | .99814 | .001043 | 2.4029 | 10558.1 | 12964.8 | 187.655 | 20.83 | 29.28 | .99817 | 347 |
| 300.000 | .12046 | .99845 | .001007 | 2.4872 | 10767.1 | 13257.6 | 188.647 | 20.84 | 29.27 | .99849 | 353 |
| 310.000 | .11654 | .99872 | .000974 | 2.5715 | 10976.1 | 13550.3 | 189.607 | 20.84 | 29.27 | .99877 | 359 |
| 320.000 | .11287 | .99896 | .000944 | 2.6557 | 11185.1 | 13843.0 | 190.537 | 20.85 | 29.28 | .99903 | 364 |
| 330.000 | .10943 | .99918 | .000915 | 2.7398 | 11394.3 | 14135.8 | 191.438 | 20.87 | 29.28 | .99925 | 370 |
| 340.000 | .10619 | .99937 | .000887 | 2.8239 | 11603.5 | 14428.7 | 192.312 | 20.88 | 29.29 | .99945 | 376 |
| 350.000 | .10314 | .99954 | .000862 | 2.9079 | 11812.9 | 14721.6 | 193.161 | 20.90 | 29.30 | .99963 | 381 |
| 360.000 | .10026 | .99969 | .000838 | 2.9919 | 12022.4 | 15014.7 | 193.987 | 20.92 | 29.32 | .99979 | 386 |
| 370.000 | .09753 | .99983 | .000815 | 3.0758 | 12232.1 | 15307.9 | 194.790 | 20.94 | 29.33 | .99994 | 392 |
| 380.000 | .09496 | .99995 | .000793 | 3.1597 | 12442.0 | 15601.4 | 195.573 | 20.97 | 29.35 | 1.00006 | 397 |
| 390.000 | .09251 | 1.00006 | .000773 | 3.2435 | 12652.2 | 15895.0 | 196.335 | 20.99 | 29.38 | 1.00018 | 402 |
| 400.000 | .09019 | 1.00016 | .000753 | 3.3273 | 12862.6 | 16189.0 | 197.080 | 21.03 | 29.41 | 1.00029 | 407 |
| 410.000 | .08798 | 1.00024 | .000735 | 3.4111 | 13073.4 | 16483.2 | 197.806 | 21.06 | 29.44 | 1.00038 | 412 |
| 420.000 | .08588 | 1.00033 | .000717 | 3.4948 | 13284.5 | 16777.7 | 198.516 | 21.10 | 29.47 | 1.00047 | 417 |
| 430.000 | .08388 | 1.00040 | .000700 | 3.5785 | 13495.9 | 17072.6 | 199.210 | 21.13 | 29.51 | 1.00054 | 422 |
| 440.000 | .08197 | 1.00046 | .000684 | 3.6622 | 13707.7 | 17367.8 | 199.888 | 21.18 | 29.55 | 1.00062 | 427 |
| 450.000 | .08014 | 1.00052 | .000669 | 3.7458 | 13920.0 | 17663.5 | 200.553 | 21.22 | 29.59 | 1.00068 | 431 |
| 470.000 | .07672 | 1.00063 | .000640 | 3.9131 | 14345.9 | 18256.1 | 201.841 | 21.32 | 29.68 | 1.00079 | 441 |
| 500.000 | .07211 | 1.00075 | .000602 | 4.1638 | 14988.4 | 19148.8 | 203.682 | 21.48 | 29.83 | 1.00092 | 454 |
| 550.000 | .06554 | 1.00088 | .000547 | 4.5814 | 16070.8 | 20647.8 | 206.540 | 21.79 | 30.13 | 1.00107 | 475 |
| 600.000 | .06008 | 1.00097 | .000501 | 4.9986 | 17169.3 | 22162.9 | 209.176 | 22.13 | 30.47 | 1.00116 | 495 |
| 650.000 | .05545 | 1.00101 | .000462 | 5.4156 | 18285.4 | 23695.3 | 211.629 | 22.49 | 30.83 | 1.00122 | 514 |
| 700.000 | .05149 | 1.00104 | .000429 | 5.8325 | 19419.7 | 25245.8 | 213.927 | 22.86 | 31.19 | 1.00125 | 533 |
| 750.000 | .04806 | 1.00105 | .000400 | 6.2492 | 20572.3 | 26814.7 | 216.092 | 23.23 | 31.56 | 1.00127 | 550 |
| 800.000 | .04505 | 1.00105 | .000375 | 6.6657 | 21743.2 | 28401.7 | 218.140 | 23.59 | 31.92 | 1.00127 | 567 |
| 850.000 | .04240 | 1.00104 | .000353 | 7.0822 | 22931.7 | 30006.3 | 220.085 | 23.93 | 32.26 | 1.00127 | 583 |
| 900.000 | .04005 | 1.00103 | .000334 | 7.4986 | 24137.0 | 31627.8 | 221.939 | 24.26 | 32.59 | 1.00126 | 599 |
| 950.000 | .03794 | 1.00101 | .000316 | 7.9149 | 25358.4 | 33265.2 | 223.709 | 24.58 | 32.90 | 1.00124 | 615 |
| 1000.000 | .03605 | 1.00099 | .000300 | 8.3312 | 26594.9 | 34917.7 | 225.405 | 24.87 | 33.19 | 1.00123 | 630 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 0.400000 MPa | | | | | | | | | | | |
| 68.214 | 30.26254 | .02330 | 2.172188 | 15.3030 | 1.1 | 14.3 | 74.498 | 36.29 | 59.25 | .03960 | 944 |
| 70.000 | 30.00789 | .02290 | 2.102707 | 14.6866 | 107.8 | 121.1 | 76.036 | 36.29 | 59.69 | .05308 | 928 |
| 80.000 | 28.53327 | .02108 | 1.742561 | 11.4244 | 713.4 | 727.5 | 84.141 | 35.52 | 61.64 | .20571 | 841 |
| 90.000 | 26.93708 | .01984 | 1.421507 | 8.4590 | 1335.8 | 1350.6 | 91.480 | 33.40 | 63.03 | .55948 | 754 |
| 95.996 | 25.88894 | .01936 | 1.242536 | 6.8124 | 1716.1 | 1731.6 | 95.572 | 31.49 | 63.95 | .90206 | 702 |
| 95.996 | .56674 | .88428 | .005462 | .6074 | 6356.4 | 7062.2 | 151.101 | 24.24 | 38.92 | .90206 | 186 |
| 100.000 | .53383 | .90120 | .004997 | .6631 | 6463.6 | 7212.9 | 152.637 | 23.33 | 36.55 | .91423 | 192 |
| 110.000 | .47043 | .92968 | .004222 | .7845 | 6710.5 | 7560.8 | 155.954 | 22.17 | 33.46 | .93601 | 205 |
| 120.000 | .42320 | .94733 | .003714 | .8924 | 6942.1 | 7887.2 | 158.795 | 21.63 | 31.99 | .95058 | 217 |
| 130.000 | .38581 | .95920 | .003342 | .9931 | 7165.8 | 8202.6 | 161.320 | 21.34 | 31.16 | .96090 | 227 |
| 140.000 | .35513 | .96763 | .003050 | 1.0894 | 7385.1 | 8511.5 | 163.609 | 21.16 | 30.65 | .96849 | 237 |
| 150.000 | .32934 | .97385 | .002813 | 1.1829 | 7601.5 | 8816.1 | 165.711 | 21.06 | 30.30 | .97425 | 246 |
| 160.000 | .30726 | .97858 | .002613 | 1.2744 | 7816.1 | 9117.9 | 167.658 | 20.99 | 30.07 | .97871 | 255 |
| 170.000 | .28810 | .98227 | .002443 | 1.3645 | 8029.3 | 9417.7 | 169.476 | 20.94 | 29.90 | .98225 | 263 |
| 180.000 | .27129 | .98519 | .002295 | 1.4534 | 8241.5 | 9716.0 | 171.181 | 20.90 | 29.77 | .98510 | 271 |
| 190.000 | .25640 | .98755 | .002165 | 1.5416 | 8453.1 | 10013.2 | 172.788 | 20.88 | 29.67 | .98742 | 279 |
| 200.000 | .24310 | .98948 | .002050 | 1.6291 | 8664.1 | 10309.5 | 174.308 | 20.86 | 29.60 | .98934 | 287 |
| 210.000 | .23115 | .99108 | .001947 | 1.7160 | 8874.7 | 10605.1 | 175.750 | 20.85 | 29.54 | .99094 | 294 |
| 220.000 | .22035 | .99241 | .001854 | 1.8025 | 9084.9 | 10900.2 | 177.123 | 20.84 | 29.49 | .99228 | 301 |
| 230.000 | .21053 | .99354 | .001770 | 1.8887 | 9294.9 | 11194.9 | 178.433 | 20.84 | 29.45 | .99342 | 308 |
| 240.000 | .20156 | .99449 | .001694 | 1.9746 | 9504.7 | 11489.2 | 179.685 | 20.83 | 29.41 | .99440 | 315 |
| 250.000 | .19334 | .99531 | .001624 | 2.0602 | 9714.3 | 11783.2 | 180.885 | 20.83 | 29.39 | .99524 | 322 |
| 260.000 | .18577 | .99602 | .001559 | 2.1456 | 9923.8 | 12076.9 | 182.037 | 20.83 | 29.36 | .99596 | 328 |
| 270.000 | .17878 | .99663 | .001500 | 2.2307 | 10133.2 | 12370.5 | 183.145 | 20.83 | 29.35 | .99659 | 334 |
| 280.000 | .17231 | .99716 | .001445 | 2.3158 | 10342.5 | 12663.9 | 184.212 | 20.83 | 29.33 | .99714 | 341 |
| 290.000 | .16629 | .99762 | .001394 | 2.4007 | 10551.7 | 12957.2 | 185.241 | 20.83 | 29.32 | .99762 | 347 |
| 300.000 | .16068 | .99803 | .001346 | 2.4854 | 10760.9 | 13250.4 | 186.235 | 20.84 | 29.32 | .99805 | 353 |
| 310.000 | .15544 | .99839 | .001302 | 2.5700 | 10970.2 | 13543.5 | 187.196 | 20.85 | 29.31 | .99842 | 359 |
| 320.000 | .15053 | .99870 | .001261 | 2.6546 | 11179.4 | 13836.6 | 188.127 | 20.86 | 29.31 | .99876 | 364 |
| 330.000 | .14593 | .99898 | .001222 | 2.7390 | 11388.8 | 14129.8 | 189.029 | 20.87 | 29.32 | .99905 | 370 |
| 340.000 | .14160 | .99923 | .001185 | 2.8234 | 11598.2 | 14422.9 | 189.904 | 20.88 | 29.32 | .99931 | 376 |
| 350.000 | .13753 | .99946 | .001151 | 2.9077 | 11807.7 | 14716.2 | 190.754 | 20.90 | 29.33 | .99955 | 381 |
| 360.000 | .13368 | .99965 | .001119 | 2.9919 | 12017.4 | 15009.6 | 191.581 | 20.92 | 29.34 | .99976 | 387 |
| 370.000 | .13005 | .99983 | .001088 | 3.0761 | 12227.2 | 15303.1 | 192.385 | 20.94 | 29.36 | .99995 | 392 |
| 380.000 | .12660 | .99999 | .001059 | 3.1602 | 12437.3 | 15596.8 | 193.168 | 20.97 | 29.38 | 1.00012 | 397 |
| 390.000 | .12334 | 1.00013 | .001031 | 3.2442 | 12647.6 | 15890.7 | 193.932 | 21.00 | 29.40 | 1.00027 | 402 |
| 400.000 | .12024 | 1.00026 | .001005 | 3.3282 | 12858.2 | 16184.8 | 194.676 | 21.03 | 29.43 | 1.00041 | 407 |
| 410.000 | .11729 | 1.00038 | .000981 | 3.4122 | 13069.0 | 16479.3 | 195.403 | 21.06 | 29.46 | 1.00053 | 412 |
| 420.000 | .11449 | 1.00048 | .000957 | 3.4961 | 13280.2 | 16774.0 | 196.114 | 21.10 | 29.49 | 1.00065 | 417 |
| 430.000 | .11182 | 1.00058 | .000935 | 3.5800 | 13491.8 | 17069.1 | 196.808 | 21.14 | 29.52 | 1.00075 | 422 |
| 440.000 | .10927 | 1.00066 | .000913 | 3.6638 | 13703.7 | 17364.5 | 197.487 | 21.18 | 29.56 | 1.00084 | 427 |
| 450.000 | .10683 | 1.00074 | .000893 | 3.7477 | 13916.1 | 17660.3 | 198.152 | 21.22 | 29.60 | 1.00092 | 432 |
| 470.000 | .10227 | 1.00087 | .000854 | 3.9152 | 14342.1 | 18253.3 | 199.441 | 21.32 | 29.69 | 1.00107 | 441 |
| 500.000 | .09612 | 1.00103 | .000803 | 4.1663 | 14984.9 | 19146.4 | 201.283 | 21.48 | 29.85 | 1.00124 | 454 |
| 550.000 | .08737 | 1.00120 | .000729 | 4.5845 | 16067.6 | 20646.1 | 204.142 | 21.79 | 30.15 | 1.00143 | 475 |
| 600.000 | .08008 | 1.00131 | .000668 | 5.0022 | 17166.4 | 22161.6 | 206.779 | 22.13 | 30.48 | 1.00155 | 495 |
| 650.000 | .07391 | 1.00137 | .000617 | 5.4196 | 18282.7 | 23694.5 | 209.232 | 22.49 | 30.84 | 1.00162 | 515 |
| 700.000 | .06863 | 1.00140 | .000572 | 5.8368 | 19417.1 | 25245.4 | 211.531 | 22.86 | 31.20 | 1.00166 | 533 |
| 750.000 | .06405 | 1.00141 | .000534 | 6.2538 | 20570.0 | 26814.7 | 213.696 | 23.23 | 31.57 | 1.00168 | 550 |
| 800.000 | .06005 | 1.00141 | .000501 | 6.6706 | 21741.0 | 28401.9 | 215.745 | 23.59 | 31.92 | 1.00168 | 567 |
| 850.000 | .05652 | 1.00139 | .000471 | 7.0873 | 22929.6 | 30006.8 | 217.691 | 23.93 | 32.27 | 1.00168 | 584 |
| 900.000 | .05338 | 1.00138 | .000445 | 7.5039 | 24135.1 | 31628.4 | 219.544 | 24.26 | 32.60 | 1.00166 | 599 |
| 950.000 | .05057 | 1.00135 | .000421 | 7.9204 | 25356.6 | 33266.0 | 221.315 | 24.58 | 32.91 | 1.00164 | 615 |
| 1000.000 | .04804 | 1.00133 | .000400 | 8.3369 | 26593.2 | 34918.7 | 223.010 | 24.87 | 33.20 | 1.00162 | 630 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|-------|---------|----------|
| 0.500000 MPa | | | | | | | | | | | |
| 68.236 | 30.26589 | .02912 | 2.173112 | 15.3240 | 1.4 | 17.9 | 74.502 | 36.29 | 59.25 | .03199 | 945 |
| 70.000 | 30.01469 | .02862 | 2.104500 | 14.7154 | 106.6 | 123.3 | 76.020 | 36.29 | 59.68 | .04271 | 929 |
| 80.000 | 28.54201 | .02634 | 1.744357 | 11.4540 | 711.9 | 729.5 | 84.123 | 35.52 | 61.61 | .16544 | 842 |
| 90.000 | 26.94888 | .02479 | 1.423468 | 8.4905 | 1333.7 | 1352.3 | 91.457 | 33.40 | 62.98 | .44981 | 755 |
| 98.856 | 25.37131 | .02398 | 1.161996 | 6.0938 | 1896.8 | 1916.5 | 97.430 | 30.42 | 64.45 | .88700 | 678 |
| 98.856 | .70391 | .86420 | .006966 | .5923 | 6374.0 | 7084.3 | 149.706 | 24.89 | 41.24 | .88700 | 187 |
| 100.000 | .69086 | .87045 | .006762 | .6104 | 6407.1 | 7130.8 | 150.171 | 24.53 | 40.22 | .89143 | 189 |
| 110.000 | .60098 | .90966 | .005533 | .7475 | 6671.8 | 7503.8 | 153.729 | 22.72 | 35.19 | .91951 | 203 |
| 120.000 | .53707 | .93309 | .004795 | .8640 | 6912.6 | 7843.6 | 156.687 | 21.94 | 33.01 | .93808 | 215 |
| 130.000 | .48768 | .94855 | .004277 | .9703 | 7142.0 | 8167.3 | 159.278 | 21.53 | 31.84 | .95114 | 226 |
| 140.000 | .44772 | .95939 | .003883 | 1.0706 | 7365.1 | 8481.9 | 161.609 | 21.29 | 31.13 | .96070 | 236 |
| 150.000 | .41445 | .96733 | .003567 | 1.1670 | 7584.3 | 8790.7 | 163.740 | 21.15 | 30.67 | .96793 | 245 |
| 160.000 | .38615 | .97333 | .003305 | 1.2608 | 7800.8 | 9095.7 | 165.709 | 21.05 | 30.35 | .97353 | 254 |
| 170.000 | .36171 | .97798 | .003084 | 1.3528 | 8015.6 | 9398.0 | 167.541 | 20.99 | 30.12 | .97795 | 263 |
| 180.000 | .34033 | .98165 | .002893 | 1.4433 | 8229.2 | 9698.3 | 169.258 | 20.94 | 29.95 | .98150 | 271 |
| 190.000 | .32145 | .98461 | .002726 | 1.5327 | 8441.8 | 9997.2 | 170.874 | 20.91 | 29.83 | .98440 | 279 |
| 200.000 | .30463 | .98702 | .002579 | 1.6213 | 8653.6 | 10294.9 | 172.401 | 20.89 | 29.73 | .98679 | 287 |
| 210.000 | .28954 | .98902 | .002447 | 1.7092 | 8864.9 | 10591.8 | 173.849 | 20.87 | 29.65 | .98877 | 294 |
| 220.000 | .27592 | .99068 | .002329 | 1.7966 | 9075.8 | 10888.0 | 175.227 | 20.86 | 29.58 | .99045 | 301 |
| 230.000 | .26355 | .99208 | .002223 | 1.8835 | 9286.4 | 11183.5 | 176.541 | 20.85 | 29.53 | .99186 | 308 |
| 240.000 | .25227 | .99326 | .002126 | 1.9701 | 9496.6 | 11478.7 | 177.797 | 20.84 | 29.49 | .99307 | 315 |
| 250.000 | .24193 | .99428 | .002037 | 2.0563 | 9706.6 | 11773.4 | 179.000 | 20.84 | 29.46 | .99411 | 322 |
| 260.000 | .23242 | .99515 | .001955 | 2.1422 | 9916.5 | 12067.8 | 180.155 | 20.84 | 29.43 | .99501 | 328 |
| 270.000 | .22364 | .99591 | .001880 | 2.2279 | 10126.2 | 12361.9 | 181.265 | 20.83 | 29.40 | .99579 | 335 |
| 280.000 | .21551 | .99656 | .001811 | 2.3133 | 10335.8 | 12655.9 | 182.334 | 20.84 | 29.38 | .99648 | 341 |
| 290.000 | .20796 | .99714 | .001747 | 2.3986 | 10545.3 | 12949.6 | 183.365 | 20.84 | 29.37 | .99707 | 347 |
| 300.000 | .20093 | .99764 | .001687 | 2.4838 | 10754.8 | 13243.3 | 184.360 | 20.84 | 29.36 | .99760 | 353 |
| 310.000 | .19436 | .99808 | .001631 | 2.5688 | 10964.3 | 13536.8 | 185.323 | 20.85 | 29.35 | .99806 | 359 |
| 320.000 | .18821 | .99847 | .001579 | 2.6536 | 11173.8 | 13830.3 | 186.254 | 20.86 | 29.35 | .99847 | 365 |
| 330.000 | .18245 | .99882 | .001530 | 2.7384 | 11383.3 | 14123.8 | 187.158 | 20.87 | 29.35 | .99884 | 370 |
| 340.000 | .17703 | .99912 | .001484 | 2.8230 | 11592.9 | 14417.3 | 188.034 | 20.89 | 29.35 | .99916 | 376 |
| 350.000 | .17192 | .99940 | .001441 | 2.9076 | 11802.6 | 14710.9 | 188.885 | 20.90 | 29.36 | .99945 | 381 |
| 360.000 | .16710 | .99964 | .001400 | 2.9921 | 12012.4 | 15004.6 | 189.712 | 20.92 | 29.37 | .99971 | 387 |
| 370.000 | .16255 | .99986 | .001362 | 3.0765 | 12222.4 | 15298.4 | 190.517 | 20.94 | 29.39 | .99994 | 392 |
| 380.000 | .15824 | 1.00005 | .001326 | 3.1608 | 12432.6 | 15592.3 | 191.301 | 20.97 | 29.40 | 1.00015 | 397 |
| 390.000 | .15416 | 1.00003 | .001291 | 3.2451 | 12643.1 | 15886.5 | 192.065 | 21.00 | 29.43 | 1.00034 | 402 |
| 400.000 | .15028 | 1.00009 | .001258 | 3.3293 | 12853.7 | 16180.8 | 192.810 | 21.03 | 29.45 | 1.00051 | 408 |
| 410.000 | .14660 | 1.00003 | .001227 | 3.4134 | 13064.7 | 16475.5 | 193.538 | 21.06 | 29.48 | 1.00066 | 413 |
| 420.000 | .14309 | 1.00006 | .001198 | 3.4975 | 13276.0 | 16770.4 | 194.248 | 21.10 | 29.51 | 1.00080 | 417 |
| 430.000 | .13974 | 1.00077 | .001169 | 3.5816 | 13487.7 | 17065.7 | 194.943 | 21.14 | 29.54 | 1.00093 | 422 |
| 440.000 | .13655 | 1.00088 | .001143 | 3.6656 | 13699.7 | 17361.3 | 195.623 | 21.18 | 29.58 | 1.00104 | 427 |
| 450.000 | .13351 | 1.00097 | .001117 | 3.7496 | 13912.1 | 17657.3 | 196.288 | 21.22 | 29.62 | 1.00114 | 432 |
| 470.000 | .12780 | 1.00113 | .001069 | 3.9174 | 14338.4 | 18250.6 | 197.578 | 21.32 | 29.71 | 1.00132 | 441 |
| 500.000 | .12011 | 1.00132 | .001004 | 4.1690 | 14981.4 | 19144.1 | 199.421 | 21.48 | 29.86 | 1.00153 | 454 |
| 550.000 | .10917 | 1.00154 | .000912 | 4.5877 | 16064.4 | 20644.4 | 202.280 | 21.79 | 30.16 | 1.00177 | 476 |
| 600.000 | .10006 | 1.00166 | .000836 | 5.0059 | 17163.5 | 22160.5 | 204.918 | 22.13 | 30.49 | 1.00191 | 496 |
| 650.000 | .09236 | 1.00173 | .000771 | 5.4237 | 18280.0 | 23693.8 | 207.373 | 22.49 | 30.84 | 1.00200 | 515 |
| 700.000 | .08576 | 1.00177 | .000716 | 5.8412 | 19414.6 | 25245.1 | 209.672 | 22.86 | 31.21 | 1.00204 | 533 |
| 750.000 | .08004 | 1.00178 | .000668 | 6.2585 | 20567.7 | 26814.6 | 211.838 | 23.23 | 31.57 | 1.00206 | 551 |
| 800.000 | .07504 | 1.00177 | .000626 | 6.6756 | 21738.8 | 28402.2 | 213.887 | 23.59 | 31.93 | 1.00207 | 567 |
| 850.000 | .07062 | 1.00175 | .000589 | 7.0925 | 22927.5 | 30007.3 | 215.833 | 23.93 | 32.27 | 1.00206 | 584 |
| 900.000 | .06670 | 1.00173 | .000556 | 7.5093 | 24133.1 | 31629.1 | 217.687 | 24.26 | 32.60 | 1.00204 | 600 |
| 950.000 | .06319 | 1.00170 | .000527 | 7.9260 | 25354.7 | 32366.9 | 219.458 | 24.58 | 32.91 | 1.00201 | 615 |
| 1000.000 | .06004 | 1.00167 | .000501 | 8.3426 | 26591.4 | 34919.8 | 221.153 | 24.87 | 33.20 | 1.00198 | 630 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 0.600000 MPa | | | | | | | | | | | |
| 68.259 | 30.26922 | .03493 | 2.174035 | 15.3449 | 1.7 | 21.5 | 74.506 | 36.29 | 59.24 | .02691 | 945 |
| 70.000 | 30.02148 | .03434 | 2.106292 | 14.7442 | 105.5 | 125.5 | 76.004 | 36.29 | 59.66 | .03579 | 930 |
| 80.000 | 28.55073 | .03159 | 1.746151 | 11.4836 | 710.5 | 731.5 | 84.104 | 35.52 | 61.58 | .13859 | 843 |
| 90.000 | 26.96064 | .02974 | 1.425424 | 8.5220 | 1331.7 | 1353.9 | 91.433 | 33.40 | 62.93 | .37670 | 757 |
| 100.000 | 25.16815 | .02867 | 1.131616 | 5.8335 | 1967.4 | 1991.2 | 98.133 | 29.97 | 64.63 | .80246 | 670 |
| 101.327 | 24.90750 | .02859 | 1.093936 | 5.4956 | 2053.1 | 2077.2 | 98.996 | 29.43 | 64.99 | .87337 | 658 |
| 101.327 | .84242 | .84541 | .008546 | .5757 | 6383.9 | 7096.1 | 148.528 | 25.52 | 43.63 | .87337 | 187 |
| 110.000 | .73833 | .88853 | .006990 | .7086 | 6629.9 | 7442.6 | 151.808 | 23.36 | 37.27 | .90284 | 200 |
| 120.000 | .65480 | .91839 | .005953 | .8348 | 6881.5 | 7797.8 | 154.901 | 22.29 | 34.17 | .92553 | 213 |
| 130.000 | .59199 | .93769 | .005260 | .9472 | 7117.3 | 8130.8 | 157.567 | 21.74 | 32.58 | .94143 | 225 |
| 140.000 | .54197 | .95107 | .004747 | 1.0516 | 7344.5 | 8451.6 | 159.944 | 21.43 | 31.65 | .95298 | 235 |
| 150.000 | .50072 | .96079 | .004344 | 1.1512 | 7566.6 | 8764.9 | 162.106 | 21.24 | 31.05 | .96169 | 245 |
| 160.000 | .46589 | .96808 | .004014 | 1.2474 | 7785.4 | 9073.2 | 164.096 | 21.12 | 30.64 | .96842 | 254 |
| 170.000 | .43595 | .97372 | .003738 | 1.3412 | 8001.8 | 9378.1 | 165.945 | 21.04 | 30.36 | .97373 | 262 |
| 180.000 | .40986 | .97815 | .003501 | 1.4333 | 8216.7 | 9680.6 | 167.673 | 20.98 | 30.14 | .97799 | 271 |
| 190.000 | .38688 | .98171 | .003295 | 1.5241 | 8430.3 | 9981.2 | 169.299 | 20.94 | 29.98 | .98145 | 279 |
| 200.000 | .36646 | .98461 | .003114 | 1.6138 | 8643.1 | 10280.4 | 170.833 | 20.91 | 29.86 | .98431 | 286 |
| 210.000 | .34816 | .98700 | .002953 | 1.7027 | 8855.2 | 10578.5 | 172.288 | 20.89 | 29.76 | .98668 | 294 |
| 220.000 | .33167 | .98899 | .002809 | 1.7909 | 9066.7 | 10875.7 | 173.670 | 20.87 | 29.68 | .98868 | 301 |
| 230.000 | .31671 | .99066 | .002679 | 1.8785 | 9277.8 | 11172.3 | 174.988 | 20.86 | 29.62 | .99037 | 308 |
| 240.000 | .30308 | .99207 | .002561 | 1.9657 | 9488.5 | 11468.2 | 176.248 | 20.85 | 29.57 | .99182 | 315 |
| 250.000 | .29060 | .99328 | .002453 | 2.0525 | 9699.0 | 11763.7 | 177.454 | 20.85 | 29.52 | .99305 | 322 |
| 260.000 | .27914 | .99432 | .002354 | 2.1390 | 9909.2 | 12058.7 | 178.611 | 20.84 | 29.49 | .99413 | 328 |
| 270.000 | .26855 | .99522 | .002263 | 2.2252 | 10119.3 | 12353.5 | 179.724 | 20.84 | 29.46 | .99505 | 335 |
| 280.000 | .25876 | .99600 | .002179 | 2.3111 | 10329.2 | 12647.9 | 180.795 | 20.84 | 29.44 | .99586 | 341 |
| 290.000 | .24967 | .99668 | .002102 | 2.3968 | 10539.0 | 12942.2 | 181.827 | 20.84 | 29.42 | .99657 | 347 |
| 300.000 | .24120 | .99728 | .002029 | 2.4823 | 10748.7 | 13236.3 | 182.824 | 20.85 | 29.40 | .99720 | 353 |
| 310.000 | .23330 | .99780 | .001962 | 2.5677 | 10958.4 | 13530.2 | 183.788 | 20.85 | 29.39 | .99775 | 359 |
| 320.000 | .22590 | .99826 | .001899 | 2.6529 | 11168.1 | 13824.1 | 184.721 | 20.86 | 29.39 | .99824 | 365 |
| 330.000 | .21897 | .99867 | .001840 | 2.7379 | 11377.8 | 14118.0 | 185.625 | 20.87 | 29.38 | .99867 | 370 |
| 340.000 | .21245 | .99903 | .001784 | 2.8228 | 11587.6 | 14411.8 | 186.502 | 20.89 | 29.39 | .99906 | 376 |
| 350.000 | .20631 | .99936 | .001732 | 2.9077 | 11797.5 | 14705.7 | 187.354 | 20.90 | 29.39 | .99940 | 382 |
| 360.000 | .20052 | .99965 | .001683 | 2.9924 | 12007.5 | 14999.6 | 188.182 | 20.92 | 29.40 | .99971 | 387 |
| 370.000 | .19505 | .99990 | .001637 | 3.0770 | 12217.6 | 15293.7 | 188.988 | 20.95 | 29.41 | .99998 | 392 |
| 380.000 | .18988 | 1.00013 | .001593 | 3.1616 | 12428.0 | 15587.9 | 189.773 | 20.97 | 29.43 | 1.00023 | 397 |
| 390.000 | .18497 | 1.00034 | .001551 | 3.2461 | 12638.5 | 15882.3 | 190.537 | 21.00 | 29.45 | 1.00046 | 403 |
| 400.000 | .18031 | 1.00053 | .001512 | 3.3305 | 12849.3 | 16176.9 | 191.283 | 21.03 | 29.47 | 1.00066 | 408 |
| 410.000 | .17589 | 1.00069 | .001474 | 3.4148 | 13060.4 | 16471.7 | 192.011 | 21.06 | 29.50 | 1.00084 | 413 |
| 420.000 | .17167 | 1.00084 | .001439 | 3.4991 | 13271.8 | 16766.9 | 192.722 | 21.10 | 29.53 | 1.00100 | 418 |
| 430.000 | .16766 | 1.00098 | .001405 | 3.5833 | 13483.6 | 17062.3 | 193.418 | 21.14 | 29.56 | 1.00115 | 422 |
| 440.000 | .16383 | 1.00110 | .001373 | 3.6675 | 13695.7 | 17358.1 | 194.098 | 21.18 | 29.60 | 1.00128 | 427 |
| 450.000 | .16017 | 1.00121 | .001342 | 3.7516 | 13908.3 | 17654.3 | 194.763 | 21.22 | 29.64 | 1.00140 | 432 |
| 470.000 | .15332 | 1.00140 | .001284 | 3.9198 | 14334.6 | 18247.9 | 196.054 | 21.32 | 29.73 | 1.00161 | 441 |
| 500.000 | .14409 | 1.00163 | .001206 | 4.1717 | 14977.9 | 19141.9 | 197.898 | 21.48 | 29.88 | 1.00186 | 455 |
| 550.000 | .13096 | 1.00187 | .001095 | 4.5909 | 16061.3 | 20642.8 | 200.758 | 21.79 | 30.17 | 1.00214 | 476 |
| 600.000 | .12003 | 1.00202 | .001003 | 5.0096 | 17160.6 | 22159.4 | 203.397 | 22.13 | 30.50 | 1.00231 | 496 |
| 650.000 | .11079 | 1.00210 | .000926 | 5.4278 | 18277.3 | 23693.1 | 205.852 | 22.49 | 30.85 | 1.00241 | 515 |
| 700.000 | .10287 | 1.00214 | .000859 | 5.8456 | 19412.2 | 25244.8 | 208.152 | 22.86 | 31.22 | 1.00246 | 533 |
| 750.000 | .09601 | 1.00215 | .000802 | 6.2632 | 20565.3 | 26814.6 | 210.318 | 23.23 | 31.58 | 1.00249 | 551 |
| 800.000 | .09001 | 1.00214 | .000751 | 6.6806 | 21736.6 | 28402.4 | 212.368 | 23.59 | 31.93 | 1.00249 | 568 |
| 850.000 | .08472 | 1.00212 | .000707 | 7.0977 | 22925.5 | 30007.8 | 214.314 | 23.93 | 32.28 | 1.00247 | 584 |
| 900.000 | .08001 | 1.00209 | .000668 | 7.5147 | 24131.2 | 31629.9 | 216.168 | 24.26 | 32.60 | 1.00245 | 600 |
| 950.000 | .07581 | 1.00205 | .000632 | 7.9316 | 25352.9 | 33267.9 | 217.939 | 24.58 | 32.91 | 1.00242 | 615 |
| 1000.000 | .07202 | 1.00201 | .000601 | 8.3483 | 26589.7 | 34920.9 | 219.635 | 24.87 | 33.20 | 1.00238 | 630 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 0.700000 MPa | | | | | | | | | | | |
| 68.281 | 30.27255 | .04073 | 2.174957 | 15.3658 | 2.0 | 25.1 | 74.510 | 36.29 | 59.23 | .02329 | 946 |
| 70.000 | 30.02825 | .04005 | 2.108082 | 14.7730 | 104.4 | 127.8 | 75.988 | 36.29 | 59.65 | .03086 | 931 |
| 80.000 | 28.55943 | .03685 | 1.747942 | 11.5132 | 709.0 | 733.5 | 84.085 | 35.53 | 61.55 | .11942 | 843 |
| 90.000 | 26.97235 | .03468 | 1.427376 | 8.5535 | 1329.6 | 1355.6 | 91.411 | 33.41 | 62.88 | .32449 | 758 |
| 100.000 | 25.18524 | .03343 | 1.133946 | 5.8681 | 1964.3 | 1992.1 | 98.102 | 29.98 | 64.52 | .69112 | 671 |
| 103.515 | 24.48189 | .03322 | 1.034700 | 4.9834 | 2191.9 | 2220.5 | 100.355 | 28.49 | 65.59 | .86090 | 640 |
| 103.515 | .98271 | .82763 | .010203 | .5581 | 6388.2 | 7100.5 | 147.499 | 26.13 | 46.12 | .86090 | 187 |
| 110.000 | .88366 | .86613 | .008622 | .6675 | 6584.3 | 7376.4 | 150.082 | 24.11 | 39.80 | .88603 | 198 |
| 120.000 | .77678 | .90320 | .007199 | .8048 | 6848.7 | 7749.8 | 153.333 | 22.67 | 35.48 | .91297 | 212 |
| 130.000 | .69889 | .92663 | .006295 | .9237 | 7091.5 | 8093.1 | 156.082 | 21.98 | 33.39 | .93170 | 223 |
| 140.000 | .63793 | .94267 | .005645 | 1.0326 | 7323.3 | 8420.6 | 158.509 | 21.58 | 32.20 | .94527 | 234 |
| 150.000 | .58820 | .95422 | .005144 | 1.1353 | 7548.5 | 8738.6 | 160.703 | 21.35 | 31.45 | .95547 | 244 |
| 160.000 | .54649 | .96285 | .004741 | 1.2340 | 7769.6 | 9050.5 | 162.716 | 21.19 | 30.95 | .96333 | 253 |
| 170.000 | .51083 | .96948 | .004405 | 1.3298 | 7987.8 | 9358.2 | 164.581 | 21.09 | 30.60 | .96953 | 262 |
| 180.000 | .47987 | .97469 | .004120 | 1.4235 | 8204.1 | 9662.8 | 166.323 | 21.02 | 30.34 | .97449 | 270 |
| 190.000 | .45268 | .97885 | .003873 | 1.5155 | 8418.8 | 9965.2 | 167.958 | 20.97 | 30.15 | .97852 | 278 |
| 200.000 | .42856 | .98224 | .003656 | 1.6064 | 8632.5 | 10265.9 | 169.500 | 20.93 | 30.00 | .98184 | 286 |
| 210.000 | .40700 | .98502 | .003465 | 1.6962 | 8845.4 | 10565.3 | 170.960 | 20.91 | 29.88 | .98460 | 294 |
| 220.000 | .38759 | .98733 | .003293 | 1.7853 | 9057.6 | 10863.6 | 172.348 | 20.89 | 29.79 | .98692 | 301 |
| 230.000 | .37001 | .98927 | .003139 | 1.8737 | 9269.2 | 11161.0 | 173.670 | 20.87 | 29.71 | .98888 | 308 |
| 240.000 | .35401 | .99092 | .003000 | 1.9616 | 9480.4 | 11457.8 | 174.933 | 20.86 | 29.65 | .99056 | 315 |
| 250.000 | .33937 | .99232 | .002872 | 2.0490 | 9691.3 | 11754.0 | 176.143 | 20.85 | 29.59 | .99199 | 322 |
| 260.000 | .32592 | .99352 | .002756 | 2.1360 | 9902.0 | 12049.7 | 177.302 | 20.85 | 29.55 | .99323 | 328 |
| 270.000 | .31352 | .99456 | .002649 | 2.2226 | 10112.4 | 12345.1 | 178.417 | 20.85 | 29.52 | .99431 | 335 |
| 280.000 | .30205 | .99546 | .002550 | 2.3090 | 10322.6 | 12640.1 | 179.490 | 20.85 | 29.49 | .99525 | 341 |
| 290.000 | .29140 | .99625 | .002458 | 2.3951 | 10532.7 | 12934.8 | 180.524 | 20.85 | 29.46 | .99607 | 347 |
| 300.000 | .28150 | .99694 | .002373 | 2.4810 | 10742.7 | 13229.4 | 181.523 | 20.85 | 29.45 | .99679 | 353 |
| 310.000 | .27225 | .99754 | .002294 | 2.5667 | 10952.6 | 13523.7 | 182.488 | 20.86 | 29.43 | .99743 | 359 |
| 320.000 | .26360 | .99807 | .002220 | 2.6522 | 11162.5 | 13818.0 | 183.422 | 20.87 | 29.42 | .99799 | 365 |
| 330.000 | .25549 | .99855 | .002151 | 2.7376 | 11372.4 | 14112.2 | 184.328 | 20.88 | 29.42 | .99850 | 371 |
| 340.000 | .24788 | .99896 | .002086 | 2.8228 | 11582.4 | 14406.4 | 185.206 | 20.89 | 29.42 | .99894 | 376 |
| 350.000 | .24070 | .99934 | .002024 | 2.9079 | 11792.4 | 14700.6 | 186.058 | 20.91 | 29.42 | .99934 | 382 |
| 360.000 | .23394 | .99967 | .001967 | 2.9928 | 12002.6 | 14994.8 | 186.887 | 20.93 | 29.43 | .99969 | 387 |
| 370.000 | .22755 | .99996 | .001912 | 3.0777 | 12212.9 | 15289.1 | 187.694 | 20.95 | 29.44 | 1.00001 | 392 |
| 380.000 | .22150 | 1.00023 | .001861 | 3.1625 | 12423.3 | 15583.6 | 188.479 | 20.97 | 29.45 | 1.00030 | 398 |
| 390.000 | .21577 | 1.00047 | .001812 | 3.2472 | 12634.0 | 15878.2 | 189.244 | 21.00 | 29.47 | 1.00056 | 403 |
| 400.000 | .21033 | 1.00068 | .001766 | 3.3318 | 12845.0 | 16173.0 | 189.991 | 21.03 | 29.49 | 1.00079 | 408 |
| 410.000 | .20516 | 1.00087 | .001722 | 3.4163 | 13056.2 | 16468.1 | 190.719 | 21.06 | 29.52 | 1.00100 | 413 |
| 420.000 | .20024 | 1.00104 | .001681 | 3.5007 | 13267.7 | 16763.4 | 191.431 | 21.10 | 29.55 | 1.00118 | 418 |
| 430.000 | .19556 | 1.00120 | .001641 | 3.5851 | 13479.5 | 17059.1 | 192.127 | 21.14 | 29.58 | 1.00135 | 423 |
| 440.000 | .19109 | 1.00134 | .001603 | 3.6695 | 13691.8 | 17355.0 | 192.807 | 21.18 | 29.62 | 1.00151 | 428 |
| 450.000 | .18682 | 1.00147 | .001567 | 3.7538 | 13904.4 | 17651.4 | 193.473 | 21.22 | 29.66 | 1.00165 | 432 |
| 470.000 | .17883 | 1.00168 | .001499 | 3.9222 | 14331.0 | 18245.3 | 194.764 | 21.32 | 29.74 | 1.00189 | 441 |
| 500.000 | .16806 | 1.00194 | .001408 | 4.1745 | 14974.4 | 19139.7 | 196.609 | 21.48 | 29.89 | 1.00217 | 455 |
| 550.000 | .15273 | 1.00222 | .001279 | 4.5943 | 16058.1 | 20641.3 | 199.471 | 21.79 | 30.18 | 1.00249 | 476 |
| 600.000 | .13998 | 1.00238 | .001171 | 5.0134 | 17157.7 | 22158.3 | 202.111 | 22.13 | 30.51 | 1.00269 | 496 |
| 650.000 | .12920 | 1.00247 | .001081 | 5.4320 | 18274.7 | 23692.5 | 204.567 | 22.49 | 30.86 | 1.00280 | 515 |
| 700.000 | .11997 | 1.00251 | .001003 | 5.8501 | 19409.7 | 25244.5 | 206.867 | 22.86 | 31.22 | 1.00286 | 534 |
| 750.000 | .11197 | 1.00252 | .000936 | 6.2680 | 20563.0 | 26814.6 | 209.033 | 23.23 | 31.58 | 1.00288 | 551 |
| 800.000 | .10497 | 1.00251 | .000877 | 6.6856 | 21734.5 | 28402.8 | 211.083 | 23.59 | 31.94 | 1.00288 | 568 |
| 850.000 | .09880 | 1.00248 | .000825 | 7.1030 | 22923.5 | 30008.3 | 213.030 | 23.93 | 32.28 | 1.00286 | 584 |
| 900.000 | .09332 | 1.00244 | .000779 | 7.5202 | 24129.3 | 31630.6 | 214.884 | 24.26 | 32.61 | 1.00284 | 600 |
| 950.000 | .08841 | 1.00240 | .000738 | 7.9372 | 25351.1 | 33268.8 | 216.655 | 24.58 | 32.92 | 1.00280 | 616 |
| 1000.000 | .08399 | 1.00235 | .000701 | 8.3541 | 26587.9 | 34922.0 | 218.351 | 24.87 | 33.21 | 1.00276 | 631 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H | S $J \text{ mol}^{-1}\text{K}^{-1}$ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|---------|--|-------|-------|---------|----------|
| 0.800000 MPa | | | | | | | | | | | |
| 68.303 | 30.27587 | .04653 | 2.175877 | 15.3868 | 2.2 | 28.7 | 74.514 | 36.29 | 59.22 | .02058 | 946 |
| 70.000 | 30.03502 | .04576 | 2.109871 | 14.8017 | 103.3 | 130.0 | 75.972 | 36.29 | 59.63 | .02715 | 931 |
| 80.000 | 28.56810 | .04210 | 1.749731 | 11.5427 | 707.5 | 735.5 | 84.067 | 35.53 | 61.53 | .10505 | 844 |
| 90.000 | 26.98402 | .03962 | 1.429323 | 8.5849 | 1327.5 | 1357.2 | 91.388 | 33.41 | 62.83 | .28534 | 759 |
| 100.000 | 25.20223 | .03818 | 1.136266 | 5.9027 | 1961.3 | 1993.1 | 98.072 | 29.98 | 64.42 | .60762 | 672 |
| 105.488 | 24.08465 | .03787 | .982047 | 4.5358 | 2317.3 | 2350.5 | 101.560 | 27.59 | 66.26 | .84934 | 623 |
| 105.488 | 1.12513 | .81068 | .011941 | .5399 | 6388.2 | 7099.3 | 146.577 | 26.73 | 48.74 | .84934 | 187 |
| 110.000 | 1.03854 | .84224 | .010471 | .6238 | 6534.4 | 7304.7 | 148.480 | 24.98 | 42.91 | .86903 | 195 |
| 120.000 | .90347 | .88748 | .008543 | .7739 | 6814.0 | 7699.5 | 151.919 | 23.10 | 36.96 | .90036 | 210 |
| 130.000 | .80857 | .91536 | .007386 | .8998 | 7064.8 | 8054.2 | 154.759 | 22.23 | 34.28 | .92197 | 222 |
| 140.000 | .73569 | .93418 | .006579 | 1.0134 | 7301.5 | 8388.9 | 157.240 | 21.74 | 32.79 | .93757 | 233 |
| 150.000 | .67690 | .94763 | .005970 | 1.1194 | 7530.1 | 8712.0 | 159.469 | 21.46 | 31.88 | .94927 | 243 |
| 160.000 | .62797 | .95762 | .005485 | 1.2206 | 7753.6 | 9027.5 | 161.506 | 21.27 | 31.27 | .95827 | 253 |
| 170.000 | .58635 | .96527 | .005086 | 1.3184 | 7973.7 | 9338.0 | 163.389 | 21.15 | 30.85 | .96534 | 262 |
| 180.000 | .55036 | .97125 | .004749 | 1.4137 | 8191.3 | 9644.9 | 165.143 | 21.06 | 30.54 | .97101 | 270 |
| 190.000 | .51885 | .97603 | .004459 | 1.5072 | 8407.3 | 9949.2 | 166.788 | 21.00 | 30.31 | .97561 | 278 |
| 200.000 | .49096 | .97990 | .004205 | 1.5991 | 8621.9 | 10251.4 | 168.338 | 20.96 | 30.14 | .97939 | 286 |
| 210.000 | .46607 | .98307 | .003982 | 1.6900 | 8835.5 | 10552.0 | 169.805 | 20.93 | 30.00 | .98253 | 294 |
| 220.000 | .44369 | .98571 | .003783 | 1.7799 | 9048.4 | 10851.4 | 171.198 | 20.90 | 29.89 | .98517 | 301 |
| 230.000 | .42345 | .98792 | .003604 | 1.8690 | 9260.6 | 11149.9 | 172.524 | 20.89 | 29.80 | .98741 | 308 |
| 240.000 | .40504 | .98979 | .003442 | 1.9575 | 9472.4 | 11447.5 | 173.791 | 20.87 | 29.73 | .98931 | 315 |
| 250.000 | .38821 | .99139 | .003294 | 2.0455 | 9683.7 | 11744.4 | 175.003 | 20.86 | 29.66 | .99094 | 322 |
| 260.000 | .37277 | .99275 | .003160 | 2.1331 | 9894.7 | 12040.8 | 176.165 | 20.86 | 29.61 | .99235 | 328 |
| 270.000 | .35854 | .99393 | .003036 | 2.2202 | 10105.4 | 12336.7 | 177.282 | 20.85 | 29.57 | .99357 | 335 |
| 280.000 | .34538 | .99495 | .002922 | 2.3070 | 10316.0 | 12632.3 | 178.357 | 20.85 | 29.54 | .99464 | 341 |
| 290.000 | .33317 | .99584 | .002816 | 2.3935 | 10526.3 | 12927.5 | 179.393 | 20.85 | 29.51 | .99557 | 347 |
| 300.000 | .32181 | .99662 | .002718 | 2.4798 | 10736.6 | 13222.5 | 180.393 | 20.86 | 29.49 | .99639 | 353 |
| 310.000 | .31122 | .99730 | .002627 | 2.5658 | 10946.8 | 13517.3 | 181.360 | 20.86 | 29.47 | .99711 | 359 |
| 320.000 | .30131 | .99791 | .002542 | 2.6517 | 11156.9 | 13811.9 | 182.295 | 20.87 | 29.46 | .99775 | 365 |
| 330.000 | .29202 | .99844 | .002462 | 2.7373 | 11367.0 | 14106.5 | 183.201 | 20.88 | 29.45 | .99832 | 371 |
| 340.000 | .28330 | .99891 | .002388 | 2.8228 | 11577.1 | 14401.0 | 184.081 | 20.89 | 29.45 | .99882 | 376 |
| 350.000 | .27509 | .99933 | .002317 | 2.9082 | 11787.4 | 14695.5 | 184.934 | 20.91 | 29.45 | .99927 | 382 |
| 360.000 | .26735 | .99970 | .002251 | 2.9934 | 11997.7 | 14990.0 | 185.764 | 20.93 | 29.45 | .99968 | 387 |
| 370.000 | .26004 | 1.00004 | .002189 | 3.0785 | 12208.1 | 15284.6 | 186.571 | 20.95 | 29.46 | 1.00004 | 393 |
| 380.000 | .25312 | 1.00034 | .002130 | 3.1635 | 12418.7 | 15579.3 | 187.357 | 20.97 | 29.48 | 1.00036 | 398 |
| 390.000 | .24656 | 1.00060 | .002074 | 3.2483 | 12629.5 | 15874.2 | 188.123 | 21.00 | 29.49 | 1.00065 | 403 |
| 400.000 | .24034 | 1.00084 | .002021 | 3.3331 | 12840.6 | 16169.2 | 188.870 | 21.03 | 29.52 | 1.00091 | 408 |
| 410.000 | .23443 | 1.00106 | .001971 | 3.4179 | 13051.9 | 16464.5 | 189.599 | 21.06 | 29.54 | 1.00115 | 413 |
| 420.000 | .22880 | 1.00125 | .001923 | 3.5025 | 13263.6 | 16760.0 | 190.311 | 21.10 | 29.57 | 1.00136 | 418 |
| 430.000 | .22344 | 1.00143 | .001877 | 3.5870 | 13475.5 | 17055.9 | 191.007 | 21.14 | 29.60 | 1.00155 | 423 |
| 440.000 | .21833 | 1.00158 | .001834 | 3.6715 | 13687.8 | 17352.0 | 191.688 | 21.18 | 29.63 | 1.00173 | 428 |
| 450.000 | .21345 | 1.00173 | .001792 | 3.7560 | 13900.6 | 17648.5 | 192.354 | 21.22 | 29.67 | 1.00189 | 432 |
| 470.000 | .20432 | 1.00197 | .001715 | 3.9247 | 14327.3 | 18242.8 | 193.647 | 21.32 | 29.76 | 1.00216 | 442 |
| 500.000 | .19200 | 1.00225 | .001611 | 4.1773 | 14971.0 | 19137.6 | 195.492 | 21.48 | 29.90 | 1.00248 | 455 |
| 550.000 | .17449 | 1.00257 | .001462 | 4.5977 | 16055.0 | 20639.7 | 198.355 | 21.79 | 30.19 | 1.00284 | 476 |
| 600.000 | .15992 | 1.00275 | .001339 | 5.0172 | 17154.9 | 22157.3 | 200.996 | 22.13 | 30.52 | 1.00306 | 497 |
| 650.000 | .14761 | 1.00285 | .001236 | 5.4362 | 18272.0 | 23691.9 | 203.452 | 22.49 | 30.87 | 1.00318 | 516 |
| 700.000 | .13706 | 1.00289 | .001147 | 5.8547 | 19407.3 | 25244.2 | 205.753 | 22.86 | 31.23 | 1.00325 | 534 |
| 750.000 | .12792 | 1.00290 | .001070 | 6.2728 | 20560.8 | 26814.7 | 207.920 | 23.23 | 31.59 | 1.00327 | 551 |
| 800.000 | .11993 | 1.00288 | .001003 | 6.6907 | 21732.3 | 28403.1 | 209.970 | 23.59 | 31.94 | 1.00327 | 568 |
| 850.000 | .11288 | 1.00285 | .000943 | 7.1083 | 22921.4 | 30008.9 | 211.917 | 23.93 | 32.29 | 1.00325 | 585 |
| 900.000 | .10661 | 1.00280 | .000891 | 7.5257 | 24127.4 | 31631.4 | 213.772 | 24.26 | 32.61 | 1.00321 | 600 |
| 950.000 | .10100 | 1.00275 | .000844 | 7.9429 | 25349.3 | 33269.8 | 215.543 | 24.58 | 32.92 | 1.00317 | 616 |
| 1000.000 | .09596 | 1.00270 | .000801 | 8.3600 | 26586.2 | 34923.2 | 217.239 | 24.87 | 33.21 | 1.00312 | 631 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 1.000000 MPa | | | | | | | | | | | |
| 68.348 | 30.28251 | .05811 | 2.177714 | 15.4286 | 2.8 | 35.8 | 74.522 | 36.29 | 59.20 | .01678 | 947 |
| 70.000 | 30.04850 | .05718 | 2.113445 | 14.8592 | 101.1 | 134.4 | 75.941 | 36.29 | 59.60 | .02197 | 933 |
| 80.000 | 28.58539 | .05259 | 1.753302 | 11.6018 | 704.5 | 739.5 | 84.030 | 35.53 | 61.47 | .08492 | 846 |
| 90.000 | 27.00723 | .04948 | 1.433203 | 8.6476 | 1323.5 | 1360.5 | 91.342 | 33.42 | 62.73 | .23054 | 761 |
| 100.000 | 25.23592 | .04766 | 1.140876 | 5.9715 | 1955.3 | 1995.0 | 98.012 | 30.00 | 64.22 | .49076 | 675 |
| 108.956 | 23.35066 | .04727 | .891044 | 3.7831 | 2538.8 | 2581.7 | 103.637 | 25.94 | 67.88 | .82845 | 594 |
| 108.956 | 1.41756 | .77870 | .015672 | .5024 | 6378.4 | 7083.8 | 144.958 | 27.90 | 54.40 | .82845 | 187 |
| 110.000 | 1.38636 | .78867 | .015077 | .5263 | 6418.0 | 7139.3 | 145.460 | 27.28 | 51.99 | .83435 | 189 |
| 120.000 | 1.17328 | .85425 | .011581 | .7089 | 6738.5 | 7590.8 | 149.396 | 24.09 | 40.58 | .87499 | 206 |
| 130.000 | 1.03708 | .89209 | .009755 | .8509 | 7008.3 | 7972.6 | 152.453 | 22.78 | 36.30 | .90252 | 220 |
| 140.000 | .93693 | .91692 | .008565 | .9745 | 7256.2 | 8323.5 | 155.055 | 22.09 | 34.10 | .92223 | 231 |
| 150.000 | .85814 | .93436 | .007700 | 1.0876 | 7492.1 | 8657.4 | 157.359 | 21.69 | 32.79 | .93694 | 242 |
| 160.000 | .79363 | .94717 | .007031 | 1.1941 | 7720.9 | 8980.9 | 159.447 | 21.44 | 31.95 | .94821 | 252 |
| 170.000 | .73936 | .95689 | .006490 | 1.2960 | 7944.8 | 9297.4 | 161.366 | 21.27 | 31.38 | .95706 | 261 |
| 180.000 | .69280 | .96445 | .006039 | 1.3946 | 8165.5 | 9608.9 | 163.147 | 21.15 | 30.96 | .96412 | 269 |
| 190.000 | .65228 | .97046 | .005656 | 1.4907 | 8383.9 | 9917.0 | 164.812 | 21.07 | 30.66 | .96985 | 278 |
| 200.000 | .61658 | .97531 | .005324 | 1.5850 | 8600.5 | 10222.3 | 166.378 | 21.01 | 30.42 | .97455 | 286 |
| 210.000 | .58484 | .97928 | .005033 | 1.6778 | 8815.7 | 10525.6 | 167.858 | 20.97 | 30.24 | .97846 | 293 |
| 220.000 | .55639 | .98256 | .004775 | 1.7694 | 9030.0 | 10827.3 | 169.261 | 20.94 | 30.10 | .98173 | 301 |
| 230.000 | .53072 | .98531 | .004544 | 1.8601 | 9243.4 | 11127.6 | 170.597 | 20.91 | 29.98 | .98450 | 308 |
| 240.000 | .50741 | .98763 | .004336 | 1.9499 | 9456.2 | 11427.0 | 171.870 | 20.90 | 29.89 | .98686 | 315 |
| 250.000 | .48614 | .98960 | .004147 | 2.0391 | 9668.4 | 11725.4 | 173.089 | 20.88 | 29.81 | .98888 | 322 |
| 260.000 | .46665 | .99128 | .003975 | 2.1277 | 9880.2 | 12023.1 | 174.256 | 20.87 | 29.74 | .99062 | 328 |
| 270.000 | .44871 | .99274 | .003818 | 2.2158 | 10091.7 | 12320.3 | 175.378 | 20.87 | 29.69 | .99213 | 335 |
| 280.000 | .43214 | .99399 | .003672 | 2.3035 | 10302.8 | 12616.9 | 176.457 | 20.86 | 29.64 | .99344 | 341 |
| 290.000 | .41678 | .99509 | .003538 | 2.3908 | 10513.8 | 12913.1 | 177.496 | 20.86 | 29.60 | .99459 | 348 |
| 300.000 | .40250 | .99604 | .003414 | 2.4778 | 10724.5 | 13209.0 | 178.499 | 20.86 | 29.57 | .99560 | 354 |
| 310.000 | .38919 | .99688 | .003298 | 2.5645 | 10935.2 | 13504.6 | 179.469 | 20.87 | 29.55 | .99650 | 360 |
| 320.000 | .37675 | .99762 | .003190 | 2.6510 | 11145.7 | 13800.0 | 180.406 | 20.88 | 29.53 | .99728 | 365 |
| 330.000 | .36509 | .99827 | .003090 | 2.7372 | 11356.2 | 14095.3 | 181.315 | 20.89 | 29.52 | .99798 | 371 |
| 340.000 | .35415 | .99885 | .002995 | 2.8232 | 11566.8 | 14390.4 | 182.196 | 20.90 | 29.51 | .99860 | 377 |
| 350.000 | .34385 | .99936 | .002906 | 2.9091 | 11777.3 | 14685.5 | 183.051 | 20.91 | 29.51 | .99916 | 382 |
| 360.000 | .33415 | .99982 | .002823 | 2.9948 | 11987.9 | 14980.6 | 183.883 | 20.93 | 29.51 | .99965 | 388 |
| 370.000 | .32499 | 1.00023 | .002744 | 3.0803 | 12198.7 | 15275.7 | 184.691 | 20.95 | 29.52 | 1.00009 | 393 |
| 380.000 | .31632 | 1.00059 | .002670 | 3.1657 | 12409.6 | 15570.9 | 185.479 | 20.98 | 29.53 | 1.00049 | 398 |
| 390.000 | .30811 | 1.00091 | .002599 | 3.2510 | 12620.6 | 15866.3 | 186.246 | 21.00 | 29.54 | 1.00085 | 404 |
| 400.000 | .30032 | 1.00121 | .002532 | 3.3362 | 12831.9 | 16161.8 | 186.994 | 21.03 | 29.56 | 1.00117 | 409 |
| 410.000 | .29292 | 1.00147 | .002469 | 3.4213 | 13043.5 | 16457.4 | 187.724 | 21.07 | 29.58 | 1.00146 | 414 |
| 420.000 | .28587 | 1.00170 | .002409 | 3.5062 | 13255.3 | 16753.4 | 188.437 | 21.10 | 29.61 | 1.00172 | 419 |
| 430.000 | .27917 | 1.00191 | .002352 | 3.5911 | 13467.5 | 17049.6 | 189.134 | 21.14 | 29.64 | 1.00195 | 423 |
| 440.000 | .27277 | 1.00210 | .002297 | 3.6759 | 13680.0 | 17346.1 | 189.816 | 21.18 | 29.67 | 1.00217 | 428 |
| 450.000 | .26666 | 1.00228 | .002245 | 3.7606 | 13892.9 | 17643.0 | 190.483 | 21.23 | 29.70 | 1.00236 | 433 |
| 470.000 | .25524 | 1.00257 | .002147 | 3.9299 | 14320.0 | 18237.9 | 191.776 | 21.32 | 29.79 | 1.00269 | 442 |
| 500.000 | .23985 | 1.00291 | .002016 | 4.1833 | 14964.2 | 19133.5 | 193.624 | 21.48 | 29.93 | 1.00308 | 456 |
| 550.000 | .21796 | 1.00328 | .001830 | 4.6047 | 16048.8 | 20636.8 | 196.489 | 21.79 | 30.21 | 1.00352 | 477 |
| 600.000 | .19975 | 1.00350 | .001676 | 5.0251 | 17149.2 | 22155.4 | 199.131 | 22.13 | 30.54 | 1.00378 | 497 |
| 650.000 | .18437 | 1.00361 | .001546 | 5.4448 | 18266.8 | 23690.7 | 201.589 | 22.49 | 30.88 | 1.00393 | 516 |
| 700.000 | .17119 | 1.00366 | .001434 | 5.8639 | 19402.4 | 25243.8 | 203.891 | 22.86 | 31.24 | 1.00401 | 534 |
| 750.000 | .15978 | 1.00366 | .001338 | 6.2826 | 20556.2 | 26814.9 | 206.058 | 23.23 | 31.60 | 1.00403 | 552 |
| 800.000 | .14980 | 1.00363 | .001254 | 6.7010 | 21728.1 | 28403.8 | 208.109 | 23.59 | 31.95 | 1.00402 | 569 |
| 850.000 | .14099 | 1.00359 | .001180 | 7.1190 | 22917.4 | 30010.1 | 210.057 | 23.93 | 32.29 | 1.00399 | 585 |
| 900.000 | .13317 | 1.00353 | .001114 | 7.5368 | 24123.6 | 31633.0 | 211.912 | 24.26 | 32.62 | 1.00395 | 601 |
| 950.000 | .12617 | 1.00346 | .001055 | 7.9543 | 25345.7 | 33271.8 | 213.684 | 24.58 | 32.93 | 1.00389 | 616 |
| 1000.000 | .11987 | 1.00339 | .001002 | 8.3717 | 26582.8 | 34925.5 | 215.380 | 24.87 | 33.22 | 1.00383 | 631 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 1.200000 MPa | | | | | | | | | | | |
| 68.393 | 30.28912 | .06967 | 2.179547 | 15.4705 | 3.4 | 43.0 | 74.531 | 36.29 | 59.18 | .01425 | 949 |
| 70.000 | 30.06193 | .06859 | 2.117013 | 14.9167 | 99.0 | 138.9 | 75.909 | 36.29 | 59.57 | .01852 | 934 |
| 80.000 | 28.60258 | .06307 | 1.756863 | 11.6607 | 701.6 | 743.6 | 83.993 | 35.54 | 61.42 | .07152 | 848 |
| 90.000 | 27.03028 | .05933 | 1.437065 | 8.7101 | 1319.4 | 1363.8 | 91.297 | 33.43 | 62.63 | .19403 | 763 |
| 100.000 | 25.26922 | .05712 | 1.145448 | 6.0400 | 1949.4 | 1996.9 | 97.952 | 30.01 | 64.03 | .41288 | 678 |
| 110.000 | 23.15653 | .05666 | .868079 | 3.6179 | 2599.1 | 2650.9 | 104.189 | 25.43 | 68.16 | .73546 | 588 |
| 111.956 | 22.67121 | .05686 | .813574 | 3.1674 | 2732.3 | 2785.2 | 105.402 | 24.44 | 69.96 | .80993 | 568 |
| 111.956 | 1.72189 | .74867 | .019762 | .4643 | 6358.3 | 7055.2 | 143.541 | 29.05 | 60.81 | .80993 | 186 |
| 120.000 | 1.47014 | .81810 | .015210 | .6389 | 6653.5 | 7469.8 | 147.118 | 25.30 | 45.40 | .84939 | 202 |
| 130.000 | 1.27940 | .86775 | .012413 | .8000 | 6947.5 | 7885.4 | 150.448 | 23.41 | 38.70 | .88307 | 217 |
| 140.000 | 1.14644 | .89922 | .010721 | .9349 | 7208.4 | 8255.1 | 153.189 | 22.48 | 35.57 | .90697 | 229 |
| 150.000 | 1.04479 | .92092 | .009543 | 1.0556 | 7452.7 | 8601.2 | 155.577 | 21.94 | 33.80 | .92477 | 240 |
| 160.000 | .96301 | .93669 | .008656 | 1.1676 | 7687.2 | 8933.3 | 157.721 | 21.61 | 32.68 | .93833 | 251 |
| 170.000 | .89502 | .94856 | .007952 | 1.2737 | 7915.4 | 9256.1 | 159.678 | 21.40 | 31.93 | .94894 | 260 |
| 180.000 | .83719 | .95774 | .007375 | 1.3758 | 8139.3 | 9572.7 | 161.487 | 21.25 | 31.40 | .95739 | 269 |
| 190.000 | .78717 | .96499 | .006889 | 1.4747 | 8360.2 | 9884.6 | 163.174 | 21.15 | 31.01 | .96424 | 277 |
| 200.000 | .74331 | .97083 | .006471 | 1.5713 | 8578.8 | 10193.2 | 164.757 | 21.07 | 30.72 | .96986 | 285 |
| 210.000 | .70447 | .97559 | .006108 | 1.6661 | 8795.8 | 10499.2 | 166.250 | 21.02 | 30.49 | .97452 | 293 |
| 220.000 | .66975 | .97952 | .005787 | 1.7594 | 9011.5 | 10803.2 | 167.664 | 20.98 | 30.31 | .97842 | 301 |
| 230.000 | .63849 | .98280 | .005501 | 1.8516 | 9226.1 | 11105.6 | 169.008 | 20.94 | 30.17 | .98171 | 308 |
| 240.000 | .61017 | .98556 | .005244 | 1.9427 | 9440.0 | 11406.6 | 170.290 | 20.92 | 30.05 | .98452 | 315 |
| 250.000 | .58437 | .98790 | .005012 | 2.0331 | 9653.1 | 11706.6 | 171.514 | 20.90 | 29.95 | .98692 | 322 |
| 260.000 | .56076 | .98990 | .004801 | 2.1227 | 9865.7 | 12005.7 | 172.687 | 20.89 | 29.87 | .98899 | 329 |
| 270.000 | .53906 | .99163 | .004608 | 2.2118 | 10077.9 | 12304.0 | 173.813 | 20.88 | 29.80 | .99078 | 335 |
| 280.000 | .51902 | .99312 | .004431 | 2.3003 | 10289.7 | 12601.7 | 174.896 | 20.88 | 29.75 | .99234 | 342 |
| 290.000 | .50047 | .99441 | .004267 | 2.3885 | 10501.2 | 12898.9 | 175.939 | 20.87 | 29.70 | .99371 | 348 |
| 300.000 | .48324 | .99554 | .004116 | 2.4762 | 10712.5 | 13195.7 | 176.945 | 20.87 | 29.66 | .99491 | 354 |
| 310.000 | .46719 | .99653 | .003975 | 2.5636 | 10923.6 | 13492.2 | 177.917 | 20.88 | 29.63 | .99596 | 360 |
| 320.000 | .45220 | .99740 | .003844 | 2.6506 | 11134.6 | 13788.3 | 178.857 | 20.88 | 29.60 | .99689 | 366 |
| 330.000 | .43816 | .99817 | .003721 | 2.7374 | 11345.5 | 14084.3 | 179.768 | 20.89 | 29.59 | .99772 | 372 |
| 340.000 | .42498 | .99884 | .003607 | 2.8240 | 11556.4 | 14380.1 | 180.651 | 20.90 | 29.57 | .99846 | 377 |
| 350.000 | .41259 | .99945 | .003499 | 2.9104 | 11767.3 | 14675.8 | 181.508 | 20.92 | 29.57 | .99911 | 383 |
| 360.000 | .40091 | .99998 | .003398 | 2.9965 | 11978.3 | 14971.4 | 182.341 | 20.94 | 29.56 | .99970 | 388 |
| 370.000 | .38989 | 1.00046 | .003302 | 3.0825 | 12189.3 | 15267.1 | 183.151 | 20.96 | 29.57 | 1.00022 | 394 |
| 380.000 | .37947 | 1.00089 | .003212 | 3.1683 | 12400.5 | 15562.8 | 183.940 | 20.98 | 29.57 | 1.00069 | 399 |
| 390.000 | .36960 | 1.00127 | .003127 | 3.2540 | 12611.8 | 15858.6 | 184.708 | 21.01 | 29.59 | 1.00111 | 404 |
| 400.000 | .36024 | 1.00161 | .003046 | 3.3396 | 12823.4 | 16154.5 | 185.457 | 21.04 | 29.60 | 1.00149 | 409 |
| 410.000 | .35134 | 1.00191 | .002970 | 3.4250 | 13035.1 | 16450.6 | 186.188 | 21.07 | 29.62 | 1.00183 | 414 |
| 420.000 | .34288 | 1.00219 | .002897 | 3.5103 | 13247.2 | 16746.9 | 186.902 | 21.10 | 29.64 | 1.00214 | 419 |
| 430.000 | .33483 | 1.00243 | .002828 | 3.5955 | 13459.6 | 17043.5 | 187.600 | 21.14 | 29.67 | 1.00241 | 424 |
| 440.000 | .32715 | 1.00266 | .002762 | 3.6806 | 13672.3 | 17340.4 | 188.283 | 21.18 | 29.70 | 1.00266 | 429 |
| 450.000 | .31981 | 1.00285 | .002699 | 3.7656 | 13885.4 | 17637.6 | 188.951 | 21.23 | 29.74 | 1.00289 | 433 |
| 470.000 | .30610 | 1.00320 | .002581 | 3.9354 | 14312.8 | 18233.1 | 190.245 | 21.32 | 29.82 | 1.00328 | 443 |
| 500.000 | .28762 | 1.00359 | .002423 | 4.1895 | 14957.4 | 19129.6 | 192.094 | 21.48 | 29.95 | 1.00374 | 456 |
| 550.000 | .26136 | 1.00402 | .002199 | 4.6119 | 16042.7 | 20634.1 | 194.962 | 21.79 | 30.23 | 1.00425 | 477 |
| 600.000 | .23952 | 1.00426 | .002013 | 5.0331 | 17143.6 | 22153.6 | 197.606 | 22.13 | 30.55 | 1.00455 | 498 |
| 650.000 | .22107 | 1.00438 | .001857 | 5.4536 | 18261.6 | 23689.8 | 200.065 | 22.49 | 30.90 | 1.00472 | 517 |
| 700.000 | .20527 | 1.00443 | .001723 | 5.8733 | 19397.6 | 25243.5 | 202.368 | 22.86 | 31.25 | 1.00481 | 535 |
| 750.000 | .19159 | 1.00443 | .001607 | 6.2926 | 20551.7 | 26815.2 | 204.536 | 23.23 | 31.61 | 1.00483 | 552 |
| 800.000 | .17962 | 1.00439 | .001506 | 6.7114 | 21723.9 | 28404.7 | 206.588 | 23.59 | 31.96 | 1.00482 | 569 |
| 850.000 | .16906 | 1.00433 | .001416 | 7.1298 | 22913.5 | 30011.4 | 208.536 | 23.93 | 32.30 | 1.00478 | 586 |
| 900.000 | .15968 | 1.00426 | .001337 | 7.5479 | 24119.8 | 31634.7 | 210.392 | 24.26 | 32.63 | 1.00472 | 601 |
| 950.000 | .15129 | 1.00418 | .001267 | 7.9658 | 25342.1 | 33273.9 | 212.164 | 24.58 | 32.93 | 1.00465 | 617 |
| 1000.000 | .14374 | 1.00409 | .001203 | 8.3835 | 26579.4 | 34927.9 | 213.861 | 24.87 | 33.22 | 1.00458 | 632 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|--|--|---------|----------|
| 1.400000 MPa | | | | | | | | | | | |
| 68.438 | 30.29572 | .08121 | 2.181375 | 15.5123 | 4.0 | 50.2 | 74.539 | 36.29 | 59.17 | .01245 | 950 |
| 70.000 | 30.07532 | .07998 | 2.120576 | 14.9741 | 96.8 | 143.3 | 75.878 | 36.30 | 59.54 | .01606 | 936 |
| 80.000 | 28.61969 | .07354 | 1.760414 | 11.7195 | 698.7 | 747.6 | 83.956 | 35.54 | 61.37 | .06195 | 849 |
| 90.000 | 27.05316 | .06916 | 1.440909 | 8.7724 | 1315.4 | 1367.2 | 91.252 | 33.43 | 62.54 | .16796 | 765 |
| 100.000 | 25.30215 | .06655 | 1.149983 | 6.1082 | 1943.6 | 1998.9 | 97.893 | 30.02 | 63.84 | .35728 | 680 |
| 110.000 | 23.21122 | .06595 | .874151 | 3.6965 | 2589.5 | 2649.8 | 104.101 | 25.45 | 67.65 | .63637 | 592 |
| 114.617 | 22.02582 | .06670 | .745564 | 2.6499 | 2906.3 | 2969.8 | 106.952 | 23.08 | 72.63 | .79326 | 545 |
| 114.617 | 2.04035 | .72001 | .024240 | .4237 | 6330.0 | 7016.1 | 142.235 | 30.19 | 68.19 | .79326 | 185 |
| 120.000 | 1.80322 | .77815 | .019647 | .5624 | 6556.3 | 7332.7 | 144.951 | 26.80 | 52.13 | .82349 | 197 |
| 130.000 | 1.53798 | .84217 | .015413 | .7471 | 6881.8 | 7792.0 | 148.633 | 24.12 | 41.60 | .86366 | 214 |
| 140.000 | 1.36512 | .88103 | .013068 | .8944 | 7158.2 | 8183.7 | 151.537 | 22.90 | 37.24 | .89183 | 227 |
| 150.000 | 1.23722 | .90731 | .011508 | 1.0233 | 7411.8 | 8543.4 | 154.019 | 22.22 | 34.90 | .91268 | 239 |
| 160.000 | 1.13628 | .92617 | .010365 | 1.1411 | 7652.6 | 8884.7 | 156.222 | 21.80 | 33.47 | .92852 | 250 |
| 170.000 | 1.05341 | .94025 | .009476 | 1.2517 | 7885.3 | 9214.3 | 158.221 | 21.53 | 32.52 | .94090 | 259 |
| 180.000 | .98356 | .95108 | .008757 | 1.3572 | 8112.6 | 9536.0 | 160.060 | 21.35 | 31.86 | .95074 | 268 |
| 190.000 | .92352 | .95961 | .008158 | 1.4590 | 8336.2 | 9852.2 | 161.770 | 21.22 | 31.38 | .95870 | 277 |
| 200.000 | .87114 | .96644 | .007647 | 1.5580 | 8557.0 | 10164.1 | 163.370 | 21.13 | 31.02 | .96523 | 285 |
| 210.000 | .82492 | .97199 | .007206 | 1.6548 | 8775.8 | 10472.9 | 164.876 | 21.06 | 30.75 | .97063 | 293 |
| 220.000 | .78373 | .97657 | .006818 | 1.7498 | 8992.9 | 10779.2 | 166.301 | 21.01 | 30.53 | .97515 | 301 |
| 230.000 | .74674 | .98037 | .006474 | 1.8435 | 9208.8 | 11083.6 | 167.655 | 20.97 | 30.35 | .97897 | 308 |
| 240.000 | .71330 | .98358 | .006167 | 1.9360 | 9423.7 | 11386.4 | 168.943 | 20.95 | 30.21 | .98222 | 315 |
| 250.000 | .68289 | .98629 | .005889 | 2.0275 | 9637.8 | 11687.9 | 170.174 | 20.92 | 30.09 | .98500 | 322 |
| 260.000 | .65508 | .98860 | .005637 | 2.1182 | 9851.3 | 11988.4 | 171.352 | 20.91 | 30.00 | .98739 | 329 |
| 270.000 | .62955 | .99059 | .005408 | 2.2082 | 10064.2 | 12288.0 | 172.483 | 20.90 | 29.92 | .98946 | 335 |
| 280.000 | .60602 | .99231 | .005197 | 2.2976 | 10276.6 | 12586.8 | 173.570 | 20.89 | 29.85 | .99127 | 342 |
| 290.000 | .58425 | .99380 | .005003 | 2.3865 | 10488.7 | 12885.0 | 174.616 | 20.88 | 29.79 | .99284 | 348 |
| 300.000 | .56403 | .99510 | .004823 | 2.4749 | 10700.5 | 13182.7 | 175.625 | 20.88 | 29.75 | .99423 | 354 |
| 310.000 | .54522 | .99623 | .004657 | 2.5630 | 10912.1 | 13479.9 | 176.600 | 20.88 | 29.71 | .99544 | 360 |
| 320.000 | .52765 | .99723 | .004502 | 2.6507 | 11123.6 | 13776.9 | 177.543 | 20.89 | 29.68 | .99652 | 366 |
| 330.000 | .51121 | .99811 | .004357 | 2.7380 | 11334.9 | 14073.5 | 178.456 | 20.90 | 29.65 | .99747 | 372 |
| 340.000 | .49579 | .99889 | .004222 | 2.8251 | 11546.2 | 14370.0 | 179.341 | 20.91 | 29.64 | .99832 | 378 |
| 350.000 | .48129 | .99958 | .004095 | 2.9120 | 11757.4 | 14666.3 | 180.199 | 20.92 | 29.62 | .99907 | 383 |
| 360.000 | .46763 | 1.00019 | .003976 | 2.9986 | 11968.7 | 14962.5 | 181.034 | 20.94 | 29.62 | .99975 | 389 |
| 370.000 | .45475 | 1.00074 | .003864 | 3.0850 | 12180.0 | 15258.6 | 181.845 | 20.96 | 29.62 | 1.00035 | 394 |
| 380.000 | .44257 | 1.00122 | .003758 | 3.1712 | 12391.5 | 15554.8 | 182.635 | 20.98 | 29.62 | 1.00089 | 399 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 1.600000 MPa | | | | | | | | | | | |
| 68.483 | 30.30229 | .09273 | 2.183197 | 15.5541 | 4.6 | 57.4 | 74.547 | 36.29 | 59.15 | .01111 | 951 |
| 70.000 | 30.08865 | .09137 | 2.124134 | 15.0314 | 94.6 | 147.8 | 75.847 | 36.30 | 59.51 | .01421 | 937 |
| 80.000 | 28.63671 | .08400 | 1.763956 | 11.7783 | 695.8 | 751.7 | 83.919 | 35.54 | 61.32 | .05478 | 851 |
| 90.000 | 27.07588 | .07897 | 1.444736 | 8.8345 | 1311.4 | 1370.5 | 91.207 | 33.44 | 62.45 | .14843 | 767 |
| 100.000 | 25.33471 | .07596 | 1.154481 | 6.1760 | 1937.8 | 2000.9 | 97.834 | 30.03 | 63.65 | .31560 | 683 |
| 110.000 | 23.26476 | .07520 | .880123 | 3.7742 | 2580.0 | 2648.8 | 104.014 | 25.46 | 67.17 | .56208 | 596 |
| 117.016 | 21.40044 | .07684 | .684485 | 2.2069 | 3066.4 | 3141.1 | 108.352 | 21.84 | 76.09 | .77807 | 523 |
| 117.016 | 2.37550 | .69228 | .029145 | .3870 | 6294.6 | 6968.1 | 141.057 | 31.35 | 76.87 | .77807 | 184 |
| 120.000 | 2.18827 | .73283 | .025276 | .4770 | 6441.9 | 7173.1 | 142.781 | 28.76 | 62.33 | .79721 | 192 |
| 130.000 | 1.81604 | .81511 | .018827 | .6917 | 6810.5 | 7691.6 | 146.939 | 24.94 | 45.14 | .84421 | 211 |
| 140.000 | 1.59405 | .86229 | .015631 | .8530 | 7105.3 | 8109.0 | 150.035 | 23.35 | 39.13 | .87674 | 225 |
| 150.000 | 1.43586 | .89347 | .013605 | .9906 | 7369.4 | 8483.7 | 152.621 | 22.51 | 36.10 | .90067 | 238 |
| 160.000 | 1.31362 | .91558 | .012163 | 1.1145 | 7617.0 | 8835.0 | 154.889 | 22.00 | 34.31 | .91881 | 249 |
| 170.000 | 1.21462 | .93195 | .011064 | 1.2297 | 7854.6 | 9171.9 | 156.932 | 21.67 | 33.14 | .93294 | 259 |
| 180.000 | 1.13193 | .94448 | .010187 | 1.3388 | 8085.6 | 9499.1 | 158.803 | 21.45 | 32.34 | .94417 | 268 |
| 190.000 | 1.06133 | .95429 | .009464 | 1.4435 | 8312.0 | 9819.5 | 160.535 | 21.30 | 31.77 | .95324 | 277 |
| 200.000 | 1.00006 | .96212 | .008853 | 1.5449 | 8535.0 | 10134.9 | 162.153 | 21.19 | 31.34 | .96067 | 285 |
| 210.000 | .94619 | .96847 | .008328 | 1.6437 | 8755.6 | 10446.6 | 163.674 | 21.11 | 31.01 | .96681 | 293 |
| 220.000 | .89834 | .97369 | .007869 | 1.7405 | 8974.3 | 10755.4 | 165.110 | 21.05 | 30.75 | .97195 | 301 |
| 230.000 | .85547 | .97803 | .007464 | 1.8357 | 9191.5 | 11061.8 | 166.472 | 21.01 | 30.54 | .97629 | 308 |
| 240.000 | .81678 | .98167 | .007103 | 1.9295 | 9407.5 | 11366.4 | 167.768 | 20.97 | 30.38 | .97997 | 315 |
| 250.000 | .78166 | .98475 | .006778 | 2.0222 | 9622.5 | 11669.5 | 169.006 | 20.95 | 30.24 | .98312 | 322 |
| 260.000 | .74960 | .98737 | .006484 | 2.1139 | 9836.8 | 11971.3 | 170.189 | 20.93 | 30.13 | .98583 | 329 |
| 270.000 | .72020 | .98962 | .006216 | 2.2049 | 10050.4 | 12272.1 | 171.325 | 20.91 | 30.03 | .98818 | 336 |
| 280.000 | .69312 | .99156 | .005971 | 2.2952 | 10263.6 | 12572.0 | 172.415 | 20.90 | 29.95 | .99023 | 342 |
| 290.000 | .66808 | .99325 | .005745 | 2.3848 | 10476.3 | 12871.2 | 173.465 | 20.89 | 29.89 | .99201 | 348 |
| 300.000 | .64486 | .99471 | .005537 | 2.4740 | 10688.6 | 13169.8 | 174.478 | 20.89 | 29.83 | .99357 | 355 |
| 310.000 | .62326 | .99599 | .005344 | 2.5627 | 10900.7 | 13467.9 | 175.455 | 20.89 | 29.79 | .99495 | 361 |
| 320.000 | .60310 | .99712 | .005165 | 2.6510 | 11112.6 | 13765.6 | 176.400 | 20.90 | 29.75 | .99617 | 367 |
| 330.000 | .58424 | .99811 | .004998 | 2.7389 | 11324.3 | 14062.9 | 177.315 | 20.90 | 29.72 | .99724 | 372 |
| 340.000 | .56656 | .99898 | .004842 | 2.8265 | 11536.0 | 14360.0 | 178.202 | 20.91 | 29.70 | .99820 | 378 |
| 350.000 | .54995 | .99975 | .004695 | 2.9139 | 11747.5 | 14656.9 | 179.063 | 20.93 | 29.68 | .99905 | 384 |
| 360.000 | .53431 | 1.00044 | .004558 | 3.0009 | 11959.1 | 14953.7 | 179.899 | 20.94 | 29.67 | .99981 | 389 |
| 370.000 | .51955 | 1.00105 | .004428 | 3.0878 | 12170.8 | 15250.4 | 180.712 | 20.96 | 29.67 | 1.00049 | 394 |
| 380.000 | .50560 | 1.00159 | .004306 | 3.1744 | 12382.5 | 15547.0 | 181.503 | 20.99 | 29.67 | 1.00110 | 400 |
| 390.000 | .49240 | 1.00208 | .004191 | 3.2608 | 12594.3 | 15843.7 | 182.273 | 21.01 | 29.67 | 1.00164 | 405 |
| 400.000 | .47988 | 1.00251 | .004081 | 3.3471 | 12806.4 | 16140.5 | 183.025 | 21.04 | 29.68 | 1.00213 | 410 |
| 410.000 | .46800 | 1.00290 | .003978 | 3.4332 | 13018.6 | 16437.5 | 183.758 | 21.07 | 29.70 | 1.00258 | 415 |
| 420.000 | .45669 | 1.00325 | .003879 | 3.5191 | 13231.1 | 16734.6 | 184.474 | 21.11 | 29.72 | 1.00297 | 420 |
| 430.000 | .44593 | 1.00356 | .003786 | 3.6049 | 13443.9 | 17031.9 | 185.174 | 21.15 | 29.74 | 1.00333 | 425 |
| 440.000 | .43568 | 1.00384 | .003697 | 3.6906 | 13657.0 | 17329.4 | 185.858 | 21.19 | 29.77 | 1.00365 | 430 |
| 450.000 | .42589 | 1.00409 | .003612 | 3.7762 | 13870.4 | 17627.3 | 186.527 | 21.23 | 29.80 | 1.00394 | 435 |
| 470.000 | .40759 | 1.00452 | .003454 | 3.9470 | 14298.5 | 18224.0 | 187.824 | 21.32 | 29.87 | 1.00444 | 444 |
| 500.000 | .38295 | 1.00501 | .003241 | 4.2025 | 14944.1 | 19122.2 | 189.677 | 21.48 | 30.01 | 1.00503 | 457 |
| 550.000 | .34795 | 1.00554 | .002940 | 4.6269 | 16030.6 | 20628.9 | 192.549 | 21.79 | 30.27 | 1.00568 | 479 |
| 600.000 | .31887 | 1.00583 | .002690 | 5.0498 | 17132.5 | 22150.3 | 195.196 | 22.13 | 30.59 | 1.00606 | 499 |
| 650.000 | .29430 | 1.00597 | .002480 | 5.4716 | 18251.4 | 23688.1 | 197.658 | 22.49 | 30.93 | 1.00627 | 518 |
| 700.000 | .27326 | 1.00601 | .002301 | 5.8925 | 19388.1 | 25243.2 | 199.963 | 22.86 | 31.28 | 1.00637 | 536 |
| 750.000 | .25505 | 1.00599 | .002145 | 6.3128 | 20542.9 | 26816.1 | 202.133 | 23.23 | 31.63 | 1.00639 | 554 |
| 800.000 | .23913 | 1.00593 | .002010 | 6.7325 | 21715.6 | 28406.6 | 204.186 | 23.59 | 31.98 | 1.00636 | 570 |
| 850.000 | .22508 | 1.00584 | .001891 | 7.1517 | 22905.6 | 30014.2 | 206.135 | 23.93 | 32.32 | 1.00630 | 587 |
| 900.000 | .21260 | 1.00573 | .001785 | 7.5706 | 24112.4 | 31638.4 | 207.991 | 24.26 | 32.64 | 1.00622 | 602 |
| 950.000 | .20143 | 1.00562 | .001690 | 7.9892 | 25335.1 | 33278.2 | 209.764 | 24.58 | 32.95 | 1.00612 | 618 |
| 1000.000 | .19138 | 1.00550 | .001605 | 8.4074 | 26572.7 | 34932.9 | 211.462 | 24.87 | 33.24 | 1.00601 | 633 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|--|-------|---------|----------|
| 1.800000 MPa | | | | | | | | | | | |
| 68.528 | 30.30884 | .10423 | 2.185015 | 15.5958 | 5.2 | 64.6 | 74.555 | 36.29 | 59.13 | .01006 | 952 |
| 70.000 | 30.10193 | .10274 | 2.127686 | 15.0888 | 92.5 | 152.3 | 75.816 | 36.30 | 59.47 | .01278 | 939 |
| 80.000 | 28.65365 | .09444 | 1.767489 | 11.8369 | 692.9 | 755.7 | 83.883 | 35.55 | 61.27 | .04921 | 853 |
| 90.000 | 27.09844 | .08877 | 1.448545 | 8.8965 | 1307.5 | 1373.9 | 91.162 | 33.45 | 62.36 | .13324 | 769 |
| 100.000 | 25.36692 | .08534 | 1.158943 | 6.2435 | 1932.1 | 2003.0 | 97.776 | 30.04 | 63.47 | .28321 | 686 |
| 110.000 | 23.31722 | .08440 | .886001 | 3.8513 | 2570.8 | 2648.0 | 103.929 | 25.47 | 66.71 | .50434 | 600 |
| 119.208 | 20.78405 | .08738 | .628628 | 1.8226 | 3216.5 | 3303.2 | 109.643 | 20.75 | 80.58 | .76416 | 502 |
| 119.208 | 2.73049 | .66510 | .034526 | .3480 | 6252.5 | 6911.7 | 139.914 | 32.54 | 87.31 | .76416 | 182 |
| 120.000 | 2.65694 | .67901 | .032900 | .3773 | 6300.5 | 6977.9 | 140.461 | 31.53 | 80.30 | .77026 | 185 |
| 130.000 | 2.11802 | .78626 | .022747 | .6333 | 6732.8 | 7582.6 | 145.316 | 25.86 | 49.54 | .82470 | 208 |
| 140.000 | 1.83453 | .84291 | .018435 | .8105 | 7049.5 | 8030.7 | 148.641 | 23.85 | 41.29 | .86170 | 223 |
| 150.000 | 1.64120 | .87939 | .015844 | .9575 | 7325.5 | 8422.2 | 151.343 | 22.81 | 37.41 | .88874 | 236 |
| 160.000 | 1.49525 | .90490 | .014056 | 1.0878 | 7580.6 | 8784.4 | 153.681 | 22.21 | 35.20 | .90918 | 248 |
| 170.000 | 1.37873 | .92365 | .012718 | 1.2077 | 7823.4 | 9128.9 | 155.770 | 21.82 | 33.80 | .92507 | 258 |
| 180.000 | 1.28235 | .93790 | .011666 | 1.3205 | 8058.2 | 9461.8 | 157.674 | 21.56 | 32.84 | .93768 | 267 |
| 190.000 | 1.20063 | .94902 | .010808 | 1.4282 | 8287.5 | 9786.7 | 159.430 | 21.38 | 32.16 | .94791 | 276 |
| 200.000 | 1.13006 | .95787 | .010089 | 1.5321 | 8512.9 | 10105.7 | 161.066 | 21.26 | 31.66 | .95623 | 285 |
| 210.000 | 1.06826 | .96502 | .009474 | 1.6329 | 8735.3 | 10420.3 | 162.601 | 21.16 | 31.28 | .96311 | 293 |
| 220.000 | 1.01354 | .97089 | .008940 | 1.7315 | 8955.6 | 10731.5 | 164.049 | 21.09 | 30.98 | .96886 | 301 |
| 230.000 | .96464 | .97576 | .008470 | 1.8282 | 9174.1 | 11040.1 | 165.420 | 21.04 | 30.74 | .97370 | 308 |
| 240.000 | .92060 | .97983 | .008053 | 1.9233 | 9391.2 | 11346.4 | 166.724 | 21.00 | 30.55 | .97782 | 316 |
| 250.000 | .88069 | .98328 | .007678 | 2.0172 | 9607.2 | 11651.1 | 167.968 | 20.97 | 30.39 | .98134 | 323 |
| 260.000 | .84430 | .98620 | .007341 | 2.1100 | 9822.4 | 11954.3 | 169.157 | 20.94 | 30.26 | .98437 | 329 |
| 270.000 | .81097 | .98871 | .007033 | 2.2019 | 10036.8 | 12256.3 | 170.297 | 20.93 | 30.15 | .98699 | 336 |
| 280.000 | .78030 | .99087 | .006753 | 2.2930 | 10250.6 | 12557.4 | 171.392 | 20.91 | 30.06 | .98927 | 343 |
| 290.000 | .75197 | .99275 | .006495 | 2.3835 | 10463.9 | 12857.6 | 172.445 | 20.91 | 29.98 | .99126 | 349 |
| 300.000 | .72571 | .99437 | .006257 | 2.4733 | 10676.8 | 13157.1 | 173.461 | 20.90 | 29.92 | .99300 | 355 |
| 310.000 | .70130 | .99580 | .006037 | 2.5627 | 10889.3 | 13456.0 | 174.441 | 20.90 | 29.87 | .99454 | 361 |
| 320.000 | .67853 | .99704 | .005833 | 2.6516 | 11101.7 | 13754.4 | 175.388 | 20.90 | 29.82 | .99589 | 367 |
| 330.000 | .65725 | .99814 | .005643 | 2.7401 | 11313.8 | 14052.5 | 176.306 | 20.91 | 29.79 | .99709 | 373 |
| 340.000 | .63730 | .99911 | .005465 | 2.8282 | 11525.8 | 14350.2 | 177.194 | 20.92 | 29.76 | .99816 | 379 |
| 350.000 | .61856 | .99996 | .005299 | 2.9160 | 11737.7 | 14647.7 | 178.057 | 20.93 | 29.74 | .99910 | 384 |
| 360.000 | .60092 | 1.00072 | .005143 | 3.0035 | 11949.6 | 14945.0 | 178.894 | 20.95 | 29.73 | .99995 | 390 |
| 370.000 | .58429 | 1.00140 | .004996 | 3.0908 | 12161.6 | 15242.2 | 179.709 | 20.97 | 29.72 | 1.00070 | 395 |
| 380.000 | .56857 | 1.00200 | .004857 | 3.1778 | 12373.6 | 15539.4 | 180.501 | 20.99 | 29.72 | 1.00138 | 400 |
| 390.000 | .55370 | 1.00253 | .004726 | 3.2646 | 12585.7 | 15836.6 | 181.273 | 21.02 | 29.72 | 1.00198 | 405 |
| 400.000 | .53960 | 1.00301 | .004602 | 3.3512 | 12798.0 | 16133.8 | 182.025 | 21.04 | 29.73 | 1.00253 | 411 |
| 410.000 | .52621 | 1.00344 | .004485 | 3.4376 | 13010.4 | 16431.1 | 182.760 | 21.08 | 29.74 | 1.00302 | 416 |
| 420.000 | .51349 | 1.00382 | .004374 | 3.5239 | 13223.2 | 16728.6 | 183.476 | 21.11 | 29.76 | 1.00346 | 421 |
| 430.000 | .50138 | 1.00416 | .004268 | 3.6100 | 13436.1 | 17026.3 | 184.177 | 21.15 | 29.78 | 1.00385 | 426 |
| 440.000 | .48983 | 1.00447 | .004167 | 3.6960 | 13649.4 | 17324.2 | 184.862 | 21.19 | 29.80 | 1.00421 | 430 |
| 450.000 | .47881 | 1.00475 | .004071 | 3.7818 | 13863.1 | 17622.4 | 185.532 | 21.23 | 29.83 | 1.00453 | 435 |
| 470.000 | .45823 | 1.00521 | .003892 | 3.9531 | 14291.5 | 18219.7 | 186.831 | 21.33 | 29.90 | 1.00509 | 444 |
| 500.000 | .43050 | 1.00575 | .003651 | 4.2093 | 14937.5 | 19118.6 | 188.685 | 21.49 | 30.03 | 1.00573 | 458 |
| 550.000 | .39114 | 1.00632 | .003311 | 4.6346 | 16024.6 | 20265.5 | 191.559 | 21.79 | 30.29 | 1.00645 | 479 |
| 600.000 | .35844 | 1.00663 | .003030 | 5.0583 | 17127.1 | 22148.9 | 194.208 | 22.13 | 30.60 | 1.00687 | 499 |
| 650.000 | .33082 | 1.00677 | .002792 | 5.4808 | 18246.4 | 23687.4 | 196.671 | 22.49 | 30.94 | 1.00709 | 518 |
| 700.000 | .30718 | 1.00681 | .002590 | 5.9023 | 19383.4 | 25243.2 | 198.976 | 22.86 | 31.29 | 1.00719 | 537 |
| 750.000 | .28671 | 1.00678 | .002415 | 6.3231 | 20538.5 | 26816.7 | 201.147 | 23.23 | 31.65 | 1.00721 | 554 |
| 800.000 | .26881 | 1.00670 | .002262 | 6.7432 | 21711.4 | 28407.6 | 203.201 | 23.59 | 31.99 | 1.00718 | 571 |
| 850.000 | .25302 | 1.00660 | .002128 | 7.1629 | 22901.8 | 30015.7 | 205.151 | 23.93 | 32.33 | 1.00710 | 587 |
| 900.000 | .23900 | 1.00648 | .002009 | 7.5821 | 24108.8 | 31640.3 | 207.008 | 24.26 | 32.65 | 1.00701 | 603 |
| 950.000 | .22645 | 1.00634 | .001902 | 8.0009 | 25331.6 | 33280.5 | 208.781 | 24.58 | 32.96 | 1.00690 | 618 |
| 1000.000 | .21515 | 1.00620 | .001806 | 8.4195 | 26569.4 | 34935.5 | 210.479 | 24.87 | 33.24 | 1.00677 | 633 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 2.000000 MPa | | | | | | | | | | | |
| 68.573 | 30.31538 | .11571 | 2.186828 | 15.6376 | 5.8 | 71.7 | 74.563 | 36.29 | 59.11 | .00923 | 953 |
| 70.000 | 30.11516 | .11411 | 2.131233 | 15.1461 | 90.3 | 156.7 | 75.784 | 36.30 | 59.44 | .01163 | 941 |
| 80.000 | 28.67051 | .10487 | 1.771013 | 11.8955 | 690.1 | 759.8 | 83.847 | 35.55 | 61.21 | .04475 | 855 |
| 90.000 | 27.12084 | .09855 | 1.452338 | 8.9584 | 1303.6 | 1377.3 | 91.118 | 33.46 | 62.27 | .12111 | 771 |
| 100.000 | 25.39878 | .09471 | 1.163371 | 6.3108 | 1926.4 | 2005.2 | 97.719 | 30.05 | 63.29 | .25732 | 688 |
| 110.000 | 23.36864 | .09358 | .891788 | 3.9277 | 2561.8 | 2647.4 | 103.845 | 25.49 | 66.27 | .45818 | 603 |
| 120.000 | 20.62054 | .09721 | .614499 | 1.7493 | 3260.6 | 3357.6 | 110.029 | 20.36 | 81.28 | .71548 | 499 |
| 121.230 | 20.16682 | .09839 | .576750 | 1.4862 | 3360.0 | 3459.2 | 110.860 | 19.80 | 86.51 | .75122 | 481 |
| 121.230 | 3.10946 | .63811 | .040451 | .3088 | 6203.8 | 6847.0 | 138.804 | 33.77 | 100.22 | .75122 | 180 |
| 130.000 | 2.45018 | .75518 | .027306 | .5713 | 6647.0 | 7463.3 | 143.722 | 26.93 | 55.19 | .80508 | 204 |
| 140.000 | 2.08816 | .82228 | .021513 | .7668 | 6990.7 | 7948.4 | 147.323 | 24.38 | 43.76 | .84670 | 221 |
| 150.000 | 1.85384 | .86503 | .018239 | .9238 | 7279.9 | 8358.8 | 150.155 | 23.14 | 38.85 | .87694 | 235 |
| 160.000 | 1.68141 | .89413 | .016048 | 1.0609 | 7543.2 | 8732.7 | 152.569 | 22.42 | 36.16 | .89967 | 247 |
| 170.000 | 1.54586 | .91533 | .014443 | 1.1858 | 7791.5 | 9085.3 | 154.708 | 21.97 | 34.49 | .91732 | 257 |
| 180.000 | 1.43486 | .93135 | .013197 | 1.3024 | 8030.4 | 9424.2 | 156.645 | 21.67 | 33.37 | .93130 | 267 |
| 190.000 | 1.34141 | .94380 | .012191 | 1.4131 | 8262.7 | 9753.7 | 158.426 | 21.47 | 32.57 | .94263 | 276 |
| 200.000 | 1.26115 | .95367 | .011355 | 1.5194 | 8490.5 | 10076.4 | 160.082 | 21.32 | 31.99 | .95184 | 285 |
| 210.000 | 1.19114 | .96164 | .010644 | 1.6224 | 8714.9 | 10394.0 | 161.631 | 21.21 | 31.55 | .95945 | 293 |
| 220.000 | 1.12935 | .96815 | .010031 | 1.7227 | 8936.8 | 10707.7 | 163.091 | 21.13 | 31.21 | .96580 | 301 |
| 230.000 | 1.07426 | .97355 | .009493 | 1.8209 | 9156.6 | 11018.4 | 164.472 | 21.07 | 30.94 | .97116 | 308 |
| 240.000 | 1.02475 | .97806 | .009017 | 1.9174 | 9374.9 | 11326.6 | 165.784 | 21.03 | 30.72 | .97571 | 316 |
| 250.000 | .97995 | .98186 | .008591 | 2.0125 | 9591.9 | 11632.9 | 167.034 | 20.99 | 30.54 | .97959 | 323 |
| 260.000 | .93917 | .98509 | .008208 | 2.1063 | 9807.9 | 11937.5 | 168.229 | 20.96 | 30.39 | .98293 | 330 |
| 270.000 | .90185 | .98786 | .007860 | 2.1992 | 10023.1 | 12240.8 | 169.373 | 20.94 | 30.27 | .98582 | 336 |
| 280.000 | .86755 | .99024 | .007542 | 2.2911 | 10237.6 | 12542.9 | 170.472 | 20.93 | 30.16 | .98834 | 343 |
| 290.000 | .83590 | .99230 | .007251 | 2.3823 | 10451.5 | 12844.1 | 171.529 | 20.92 | 30.08 | .99053 | 349 |
| 300.000 | .80658 | .99408 | .006984 | 2.4729 | 10664.9 | 13144.5 | 172.547 | 20.91 | 30.01 | .99245 | 355 |
| 310.000 | .77934 | .99565 | .006736 | 2.5629 | 10878.0 | 13444.3 | 173.530 | 20.91 | 29.95 | .99414 | 361 |
| 320.000 | .75395 | .99701 | .006506 | 2.6524 | 11090.8 | 13743.5 | 174.480 | 20.91 | 29.90 | .99563 | 367 |
| 330.000 | .73022 | .99822 | .006292 | 2.7414 | 11303.3 | 14042.2 | 175.400 | 20.92 | 29.85 | .99695 | 373 |
| 340.000 | .70799 | .99928 | .006093 | 2.8301 | 11515.7 | 14340.6 | 176.290 | 20.93 | 29.82 | .99812 | 379 |
| 350.000 | .68712 | 1.00021 | .005906 | 2.9184 | 11728.0 | 14638.7 | 177.154 | 20.94 | 29.80 | .99916 | 385 |
| 360.000 | .66748 | 1.00104 | .005731 | 3.0063 | 11940.2 | 14936.5 | 177.994 | 20.95 | 29.78 | 1.00009 | 390 |
| 370.000 | .64896 | 1.00178 | .005566 | 3.0940 | 12152.4 | 15234.3 | 178.809 | 20.97 | 29.77 | 1.00092 | 395 |
| 380.000 | .63147 | 1.00243 | .005411 | 3.1814 | 12364.7 | 15531.9 | 179.603 | 20.99 | 29.76 | 1.00166 | 401 |
| 390.000 | .61492 | 1.00302 | .005264 | 3.2686 | 12577.1 | 15829.5 | 180.376 | 21.02 | 29.76 | 1.00232 | 406 |
| 400.000 | .59924 | 1.00354 | .005125 | 3.3556 | 12789.6 | 16127.2 | 181.130 | 21.05 | 29.77 | 1.00292 | 411 |
| 410.000 | .58435 | 1.00400 | .004994 | 3.4423 | 13002.3 | 16424.9 | 181.865 | 21.08 | 29.78 | 1.00346 | 416 |
| 420.000 | .57020 | 1.00442 | .004870 | 3.5289 | 13215.2 | 16722.8 | 182.583 | 21.11 | 29.79 | 1.00394 | 421 |
| 430.000 | .55674 | 1.00479 | .004751 | 3.6153 | 13428.4 | 17020.8 | 183.284 | 21.15 | 29.81 | 1.00437 | 426 |
| 440.000 | .54390 | 1.00512 | .004639 | 3.7015 | 13641.9 | 17319.0 | 183.969 | 21.19 | 29.84 | 1.00477 | 431 |
| 450.000 | .53166 | 1.00542 | .004531 | 3.7876 | 13855.7 | 17617.5 | 184.640 | 21.23 | 29.86 | 1.00512 | 436 |
| 470.000 | .50878 | 1.00593 | .004331 | 3.9594 | 14284.5 | 18215.5 | 185.940 | 21.33 | 29.93 | 1.00572 | 445 |
| 500.000 | .47798 | 1.00651 | .004063 | 4.2163 | 14930.9 | 19115.2 | 187.796 | 21.49 | 30.06 | 1.00643 | 458 |
| 550.000 | .43426 | 1.00712 | .003683 | 4.6425 | 16018.7 | 20624.2 | 190.672 | 21.79 | 30.31 | 1.00721 | 480 |
| 600.000 | .39794 | 1.00744 | .003370 | 5.0670 | 17121.6 | 22147.5 | 193.323 | 22.13 | 30.62 | 1.00766 | 500 |
| 650.000 | .36728 | 1.00759 | .003105 | 5.4901 | 18241.4 | 23686.8 | 195.787 | 22.49 | 30.96 | 1.00790 | 519 |
| 700.000 | .34103 | 1.00762 | .002880 | 5.9122 | 19378.8 | 25243.3 | 198.094 | 22.86 | 31.30 | 1.00801 | 537 |
| 750.000 | .31831 | 1.00758 | .002685 | 6.3335 | 20534.2 | 26817.3 | 200.265 | 23.23 | 31.66 | 1.00802 | 555 |
| 800.000 | .29845 | 1.00749 | .002515 | 6.7540 | 21707.4 | 28408.8 | 202.320 | 23.59 | 32.00 | 1.00798 | 571 |
| 850.000 | .28092 | 1.00737 | .002366 | 7.1741 | 22897.9 | 30017.3 | 204.270 | 23.93 | 32.34 | 1.00789 | 588 |
| 900.000 | .26535 | 1.00722 | .002233 | 7.5936 | 24105.1 | 31642.2 | 206.127 | 24.26 | 32.66 | 1.00778 | 604 |
| 950.000 | .25143 | 1.00707 | .002114 | 8.0128 | 25328.2 | 33282.8 | 207.901 | 24.58 | 32.96 | 1.00765 | 619 |
| 1000.000 | .23889 | 1.00691 | .002008 | 8.4316 | 26566.1 | 34938.1 | 209.599 | 24.87 | 33.25 | 1.00752 | 634 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|---------|--|-------|--------|---------|----------|
| 2.200000 MPa | | | | | | | | | | | |
| 68.617 | 30.32190 | .12717 | 2.188636 | 15.6793 | 6.3 | 78.9 | 74.571 | 36.30 | 59.10 | .00855 | 954 |
| 70.000 | 30.12834 | .12546 | 2.134775 | 15.2033 | 88.2 | 161.2 | 75.753 | 36.30 | 59.41 | .01070 | 942 |
| 80.000 | 28.68728 | .11529 | 1.774528 | 11.9540 | 687.2 | 763.9 | 83.810 | 35.56 | 61.16 | .04111 | 856 |
| 90.000 | 27.14309 | .10831 | 1.456114 | 9.0200 | 1299.7 | 1380.7 | 91.074 | 33.46 | 62.18 | .11119 | 773 |
| 100.000 | 25.43030 | .10405 | 1.167765 | 6.3777 | 1920.8 | 2007.4 | 97.662 | 30.06 | 63.12 | .23615 | 691 |
| 110.000 | 23.41907 | .10271 | .897489 | 4.0035 | 2552.9 | 2646.8 | 103.762 | 25.50 | 65.85 | .42044 | 607 |
| 120.000 | 20.73183 | .10636 | .624049 | 1.8453 | 3241.8 | 3347.9 | 109.868 | 20.36 | 79.29 | .65677 | 506 |
| 123.110 | 19.53872 | .11000 | .527876 | 1.1900 | 3499.6 | 3612.2 | 112.029 | 19.02 | 94.52 | .73914 | 459 |
| 123.110 | 3.51811 | .61092 | .047017 | .2692 | 6147.9 | 6773.2 | 137.706 | 35.08 | 116.77 | .73914 | 178 |
| 130.000 | 2.82201 | .72125 | .032701 | .5050 | 6551.1 | 7330.7 | 142.117 | 28.19 | 62.76 | .78530 | 200 |
| 140.000 | 2.35691 | .80189 | .024905 | .7218 | 6928.3 | 7861.8 | 146.060 | 24.96 | 46.62 | .83177 | 219 |
| 150.000 | 2.07441 | .85035 | .020802 | .8897 | 7232.7 | 8293.3 | 149.038 | 23.48 | 40.43 | .86519 | 233 |
| 160.000 | 1.87237 | .88323 | .018146 | 1.0338 | 7504.9 | 8679.8 | 151.534 | 22.65 | 37.18 | .89023 | 246 |
| 170.000 | 1.71611 | .90697 | .016239 | 1.1638 | 7759.1 | 9041.1 | 153.725 | 22.13 | 35.21 | .90963 | 257 |
| 180.000 | 1.58950 | .92481 | .014780 | 1.2842 | 8002.2 | 9386.2 | 155.698 | 21.79 | 33.91 | .92499 | 267 |
| 190.000 | 1.48371 | .93861 | .013614 | 1.3980 | 8237.7 | 9720.5 | 157.505 | 21.55 | 33.00 | .93740 | 276 |
| 200.000 | 1.39332 | .94952 | .012652 | 1.5069 | 8468.0 | 10047.0 | 159.180 | 21.39 | 32.33 | .94750 | 285 |
| 210.000 | 1.31482 | .95830 | .011840 | 1.6120 | 8694.4 | 10367.7 | 160.745 | 21.27 | 31.83 | .95583 | 293 |
| 220.000 | 1.24574 | .96547 | .011142 | 1.7141 | 8917.9 | 10684.0 | 162.216 | 21.17 | 31.44 | .96279 | 301 |
| 230.000 | 1.18431 | .97139 | .010533 | 1.8138 | 9139.2 | 10996.8 | 163.607 | 21.11 | 31.14 | .96865 | 309 |
| 240.000 | 1.12922 | .97633 | .009995 | 1.9117 | 9358.6 | 11306.9 | 164.927 | 21.05 | 30.89 | .97363 | 316 |
| 250.000 | 1.07945 | .98050 | .009516 | 2.0079 | 9576.6 | 11614.7 | 166.184 | 21.01 | 30.69 | .97787 | 323 |
| 260.000 | 1.03420 | .98403 | .009085 | 2.1028 | 9793.5 | 11920.8 | 167.384 | 20.98 | 30.52 | .98153 | 330 |
| 270.000 | .99285 | .98705 | .008695 | 2.1966 | 10009.5 | 12225.3 | 168.533 | 20.96 | 30.39 | .98468 | 337 |
| 280.000 | .95488 | .98965 | .008340 | 2.2895 | 10224.6 | 12528.6 | 169.636 | 20.94 | 30.27 | .98743 | 343 |
| 290.000 | .91987 | .99189 | .008015 | 2.3815 | 10439.1 | 12830.8 | 170.697 | 20.93 | 30.17 | .98982 | 350 |
| 300.000 | .88746 | .99384 | .007716 | 2.4727 | 10653.1 | 13132.1 | 171.718 | 20.92 | 30.09 | .99191 | 356 |
| 310.000 | .85737 | .99553 | .007440 | 2.5634 | 10866.7 | 13432.7 | 172.704 | 20.92 | 30.02 | .99376 | 362 |
| 320.000 | .82934 | .99702 | .007184 | 2.6534 | 11079.9 | 13732.6 | 173.656 | 20.92 | 29.97 | .99538 | 368 |
| 330.000 | .80316 | .99833 | .006946 | 2.7430 | 11292.9 | 14032.1 | 174.577 | 20.92 | 29.92 | .99682 | 374 |
| 340.000 | .77864 | .99948 | .006724 | 2.8322 | 11505.6 | 14331.1 | 175.470 | 20.93 | 29.88 | .99809 | 379 |
| 350.000 | .75562 | 1.00049 | .006517 | 2.9209 | 11718.3 | 14629.8 | 176.336 | 20.94 | 29.85 | .99923 | 385 |
| 360.000 | .73397 | 1.00139 | .006322 | 3.0094 | 11930.8 | 14928.2 | 177.177 | 20.96 | 29.83 | 1.00024 | 391 |
| 370.000 | .71357 | 1.00219 | .006139 | 3.0974 | 12143.3 | 15226.4 | 177.994 | 20.98 | 29.82 | 1.00114 | 396 |
| 380.000 | .69430 | 1.00289 | .005967 | 3.1852 | 12355.9 | 15524.6 | 178.789 | 21.00 | 29.81 | 1.00195 | 401 |
| 390.000 | .67607 | 1.00353 | .005805 | 3.2728 | 12568.5 | 15822.6 | 179.563 | 21.02 | 29.81 | 1.00267 | 407 |
| 400.000 | .65880 | 1.00409 | .005651 | 3.3601 | 12781.3 | 16120.7 | 180.318 | 21.05 | 29.81 | 1.00332 | 412 |
| 410.000 | .64241 | 1.00459 | .005506 | 3.4471 | 12994.2 | 16418.8 | 181.054 | 21.08 | 29.82 | 1.00390 | 417 |
| 420.000 | .62684 | 1.00504 | .005368 | 3.5340 | 13207.4 | 16717.1 | 181.773 | 21.12 | 29.83 | 1.00443 | 422 |
| 430.000 | .61202 | 1.00544 | .005237 | 3.6207 | 13420.8 | 17015.4 | 182.475 | 21.15 | 29.85 | 1.00490 | 427 |
| 440.000 | .59789 | 1.00580 | .005112 | 3.7072 | 13634.4 | 17314.0 | 183.161 | 21.19 | 29.87 | 1.00532 | 431 |
| 450.000 | .58442 | 1.00612 | .004994 | 3.7936 | 13848.4 | 17612.8 | 183.833 | 21.24 | 29.90 | 1.00571 | 436 |
| 470.000 | .55925 | 1.00666 | .004772 | 3.9659 | 14277.5 | 18211.4 | 185.134 | 21.33 | 29.96 | 1.00636 | 445 |
| 500.000 | .52537 | 1.00728 | .004476 | 4.2234 | 14924.4 | 19111.9 | 186.991 | 21.49 | 30.08 | 1.00713 | 459 |
| 550.000 | .47730 | 1.00793 | .004057 | 4.6505 | 16012.8 | 20622.0 | 189.870 | 21.79 | 30.33 | 1.00797 | 480 |
| 600.000 | .43738 | 1.00827 | .003710 | 5.0758 | 17116.2 | 22146.2 | 192.522 | 22.13 | 30.64 | 1.00845 | 500 |
| 650.000 | .40368 | 1.00841 | .003419 | 5.4996 | 18236.4 | 23686.3 | 194.987 | 22.49 | 30.97 | 1.00871 | 519 |
| 700.000 | .37483 | 1.00844 | .003170 | 5.9222 | 19374.2 | 25243.4 | 197.295 | 22.86 | 31.32 | 1.00881 | 538 |
| 750.000 | .34986 | 1.00838 | .002956 | 6.3439 | 20529.8 | 26818.0 | 199.467 | 23.23 | 31.67 | 1.00882 | 555 |
| 800.000 | .32803 | 1.00827 | .002768 | 6.7649 | 21703.3 | 28410.0 | 201.522 | 23.59 | 32.01 | 1.00877 | 572 |
| 850.000 | .30878 | 1.00814 | .002604 | 7.1853 | 22894.1 | 30018.9 | 203.473 | 23.93 | 32.35 | 1.00867 | 588 |
| 900.000 | .29167 | 1.00798 | .002457 | 7.6052 | 24101.5 | 31644.2 | 205.331 | 24.26 | 32.67 | 1.00855 | 604 |
| 950.000 | .27637 | 1.00780 | .002327 | 8.0247 | 25324.7 | 33285.2 | 207.105 | 24.58 | 32.97 | 1.00840 | 619 |
| 1000.000 | .26259 | 1.00763 | .002209 | 8.4438 | 26562.9 | 34940.8 | 208.803 | 24.87 | 33.25 | 1.00825 | 634 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|-------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 2.40000 MPa | | | | | | | | | | | |
| 68.662 | 30.32839 | .13861 | 2.190440 | 15.7210 | 6.9 | 86.1 | 74.580 | 36.30 | 59.08 | .00799 | 955 |
| 70.000 | 30.14147 | .13681 | 2.138311 | 15.2605 | 86.0 | 165.7 | 75.723 | 36.30 | 59.39 | .00992 | 944 |
| 80.000 | 28.70397 | .12570 | 1.778033 | 12.0124 | 684.4 | 768.0 | 83.774 | 35.56 | 61.12 | .03808 | 858 |
| 90.000 | 27.16519 | .11806 | 1.459874 | 9.0815 | 1295.8 | 1384.2 | 91.031 | 33.47 | 62.09 | .10293 | 775 |
| 100.000 | 25.46150 | .11337 | 1.172127 | 6.4443 | 1915.3 | 2009.6 | 97.606 | 30.07 | 62.96 | .21853 | 694 |
| 110.000 | 23.46857 | .11181 | .903107 | 4.0786 | 2544.2 | 2646.5 | 103.681 | 25.51 | 65.45 | .38902 | 611 |
| 120.000 | 20.83754 | .11544 | .633205 | 1.9390 | 3223.9 | 3339.1 | 109.714 | 20.37 | 77.51 | .60788 | 513 |
| 124.867 | 18.88808 | .12239 | .481169 | .9285 | 3637.8 | 3764.8 | 113.176 | 18.45 | 105.73 | .72778 | 435 |
| 124.867 | 3.96462 | .58308 | .054363 | .2291 | 6083.7 | 6689.1 | 136.595 | 36.49 | 138.96 | .72778 | 176 |
| 130.000 | 3.24885 | .68344 | .039250 | .4329 | 6441.5 | 7180.2 | 140.450 | 29.71 | 73.54 | .76529 | 195 |
| 140.000 | 2.64329 | .78001 | .028658 | .6752 | 6862.1 | 7770.1 | 144.832 | 25.59 | 49.96 | .81685 | 216 |
| 150.000 | 2.30370 | .83533 | .023548 | .8550 | 7183.7 | 8225.5 | 147.976 | 23.84 | 42.17 | .85349 | 232 |
| 160.000 | 2.06842 | .87220 | .020356 | 1.0065 | 7465.6 | 8625.9 | 150.562 | 22.88 | 38.27 | .88085 | 245 |
| 170.000 | 1.88961 | .89857 | .018112 | 1.1417 | 7726.1 | 8996.2 | 152.808 | 22.29 | 35.97 | .90201 | 256 |
| 180.000 | 1.74635 | .91827 | .016418 | 1.2661 | 7973.6 | 9347.9 | 154.818 | 21.90 | 34.47 | .91873 | 266 |
| 190.000 | 1.62754 | .93345 | .015078 | 1.3831 | 8212.5 | 9687.1 | 156.652 | 21.64 | 33.43 | .93224 | 276 |
| 200.000 | 1.52660 | .94541 | .013981 | 1.4945 | 8445.4 | 10017.5 | 158.347 | 21.45 | 32.68 | .94321 | 285 |
| 210.000 | 1.43929 | .95501 | .013061 | 1.6017 | 8673.8 | 10341.3 | 159.927 | 21.32 | 32.12 | .95227 | 293 |
| 220.000 | 1.36271 | .96283 | .012274 | 1.7056 | 8899.0 | 10660.2 | 161.411 | 21.22 | 31.68 | .95982 | 301 |
| 230.000 | 1.29478 | .96928 | .011590 | 1.8070 | 9121.6 | 10975.2 | 162.811 | 21.14 | 31.34 | .96619 | 309 |
| 240.000 | 1.23399 | .97466 | .010988 | 1.9062 | 9342.3 | 11287.2 | 164.139 | 21.08 | 31.06 | .97158 | 316 |
| 250.000 | 1.17916 | .97918 | .010452 | 2.0036 | 9561.3 | 11596.7 | 165.402 | 21.04 | 30.84 | .97619 | 323 |
| 260.000 | 1.12938 | .98301 | .009973 | 2.0996 | 9779.1 | 11904.2 | 166.608 | 21.00 | 30.66 | .98015 | 330 |
| 270.000 | 1.08395 | .98629 | .009539 | 2.1943 | 9995.8 | 12210.0 | 167.762 | 20.98 | 30.50 | .98357 | 337 |
| 280.000 | 1.04227 | .98910 | .009145 | 2.2880 | 10211.7 | 12514.3 | 168.869 | 20.96 | 30.38 | .98654 | 344 |
| 290.000 | 1.00386 | .99152 | .008785 | 2.3808 | 10426.8 | 12817.6 | 169.933 | 20.94 | 30.27 | .98913 | 350 |
| 300.000 | .96835 | .99363 | .008454 | 2.4727 | 10641.3 | 13119.8 | 170.958 | 20.93 | 30.18 | .99140 | 356 |
| 310.000 | .93538 | .99546 | .008149 | 2.5640 | 10855.4 | 13421.2 | 171.946 | 20.93 | 30.10 | .99339 | 362 |
| 320.000 | .90470 | .99706 | .007866 | 2.6547 | 11069.1 | 13721.9 | 172.901 | 20.93 | 30.04 | .99515 | 368 |
| 330.000 | .87605 | .99847 | .007604 | 2.7448 | 11282.5 | 14022.1 | 173.825 | 20.93 | 29.99 | .99671 | 374 |
| 340.000 | .84923 | .99971 | .007359 | 2.8345 | 11495.6 | 14321.7 | 174.719 | 20.94 | 29.95 | .99809 | 380 |
| 350.000 | .82406 | 1.00080 | .007131 | 2.9237 | 11708.6 | 14621.0 | 175.587 | 20.95 | 29.91 | .99931 | 386 |
| 360.000 | .80040 | 1.00177 | .006917 | 3.0126 | 11921.5 | 14920.0 | 176.429 | 20.96 | 29.89 | 1.00040 | 391 |
| 370.000 | .77810 | 1.00262 | .006715 | 3.1010 | 12134.3 | 15218.7 | 177.248 | 20.98 | 29.87 | 1.00138 | 397 |
| 380.000 | .75705 | 1.00338 | .006526 | 3.1892 | 12347.1 | 15517.3 | 178.044 | 21.00 | 29.86 | 1.00225 | 402 |
| 390.000 | .73714 | 1.00406 | .006348 | 3.2771 | 12560.0 | 15815.9 | 178.819 | 21.03 | 29.85 | 1.00303 | 407 |
| 400.000 | .71828 | 1.00466 | .006179 | 3.3648 | 12773.0 | 16114.3 | 179.575 | 21.05 | 29.85 | 1.00373 | 412 |
| 410.000 | .70039 | 1.00520 | .006019 | 3.4522 | 12986.2 | 16412.9 | 180.312 | 21.08 | 29.86 | 1.00436 | 417 |
| 420.000 | .68339 | 1.00568 | .005868 | 3.5393 | 13199.6 | 16711.5 | 181.032 | 21.12 | 29.87 | 1.00492 | 422 |
| 430.000 | .66721 | 1.00610 | .005724 | 3.6263 | 13413.1 | 17010.2 | 181.735 | 21.15 | 29.88 | 1.00543 | 427 |
| 440.000 | .65180 | 1.00649 | .005587 | 3.7131 | 13627.0 | 17309.1 | 182.422 | 21.19 | 29.90 | 1.00589 | 432 |
| 450.000 | .63710 | 1.00683 | .005457 | 3.7997 | 13841.2 | 17608.3 | 183.094 | 21.24 | 29.93 | 1.00630 | 437 |
| 470.000 | .60964 | 1.00741 | .005215 | 3.9725 | 14270.6 | 18207.4 | 184.397 | 21.33 | 29.99 | 1.00701 | 446 |
| 500.000 | .57269 | 1.00806 | .004890 | 4.2306 | 14917.9 | 19108.7 | 186.256 | 21.49 | 30.10 | 1.00782 | 459 |
| 550.000 | .52027 | 1.00875 | .004431 | 4.6587 | 16006.9 | 20619.9 | 189.136 | 21.79 | 30.35 | 1.00872 | 481 |
| 600.000 | .47675 | 1.00910 | .004051 | 5.0847 | 17110.9 | 22145.0 | 191.790 | 22.13 | 30.65 | 1.00924 | 501 |
| 650.000 | .44001 | 1.00925 | .003733 | 5.5091 | 18231.4 | 23685.8 | 194.256 | 22.49 | 30.98 | 1.00951 | 520 |
| 700.000 | .40858 | 1.00926 | .003461 | 5.9323 | 19369.6 | 25243.6 | 196.565 | 22.86 | 31.33 | 1.00962 | 538 |
| 750.000 | .38136 | 1.00919 | .003226 | 6.3545 | 20525.6 | 26818.7 | 198.738 | 23.23 | 31.68 | 1.00962 | 556 |
| 800.000 | .35757 | 1.00907 | .003022 | 6.7759 | 21699.3 | 28411.2 | 200.794 | 23.59 | 32.02 | 1.00956 | 573 |
| 850.000 | .33659 | 1.00891 | .002842 | 7.1967 | 22890.3 | 30020.6 | 202.745 | 23.94 | 32.35 | 1.00945 | 589 |
| 900.000 | .31795 | 1.00873 | .002682 | 7.6169 | 24097.9 | 31646.3 | 204.603 | 24.27 | 32.67 | 1.00931 | 605 |
| 950.000 | .30127 | 1.00854 | .002539 | 8.0367 | 25321.3 | 33287.6 | 206.378 | 24.58 | 32.97 | 1.00915 | 620 |
| 1000.000 | .28626 | 1.00834 | .002411 | 8.4561 | 26559.6 | 34943.5 | 208.077 | 24.87 | 33.26 | 1.00898 | 635 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 2.600000 MPa | | | | | | | | | | | |
| 68.707 | 30.33487 | .15004 | 2.192238 | 15.7627 | 7.5 | 93.2 | 74.588 | 36.30 | 59.06 | .00752 | 956 |
| 70.000 | 30.15455 | .14814 | 2.141843 | 15.3177 | 83.9 | 170.1 | 75.692 | 36.30 | 59.36 | .00926 | 945 |
| 80.000 | 28.72058 | .13610 | 1.781530 | 12.0707 | 681.6 | 772.1 | 83.739 | 35.57 | 61.07 | .03552 | 860 |
| 90.000 | 27.18713 | .12780 | 1.463617 | 9.1429 | 1292.0 | 1387.6 | 90.987 | 33.48 | 62.01 | .09595 | 777 |
| 100.000 | 25.49238 | .12267 | 1.176456 | 6.5107 | 1909.9 | 2011.8 | 97.550 | 30.08 | 62.79 | .20363 | 696 |
| 110.000 | 23.51716 | .12088 | .908647 | 4.1531 | 2535.6 | 2646.2 | 103.601 | 25.52 | 65.06 | .36245 | 614 |
| 120.000 | 20.93831 | .12446 | .642011 | 2.0307 | 3206.8 | 3331.0 | 109.567 | 20.37 | 75.93 | .56653 | 519 |
| 126.518 | 18.19935 | .13581 | .435822 | .6974 | 3777.6 | 3920.4 | 114.328 | 18.17 | 122.21 | .71703 | 409 |
| 126.518 | 4.46155 | .55398 | .062705 | .1885 | 6009.3 | 6592.1 | 135.445 | 38.06 | 170.67 | .71703 | 173 |
| 130.000 | 3.75863 | .63998 | .047527 | .3529 | 6311.6 | 7003.4 | 138.649 | 31.65 | 90.54 | .74492 | 189 |
| 140.000 | 2.95053 | .75702 | .032833 | .6270 | 6791.5 | 7672.6 | 143.624 | 26.27 | 53.91 | .80191 | 214 |
| 150.000 | 2.54259 | .81992 | .026495 | .8196 | 7132.9 | 8155.4 | 146.958 | 24.21 | 44.08 | .84183 | 230 |
| 160.000 | 2.26989 | .86102 | .022685 | .9789 | 7425.3 | 8570.7 | 149.640 | 23.12 | 39.44 | .87154 | 244 |
| 170.000 | 2.06652 | .89012 | .020063 | 1.1195 | 7692.5 | 8950.6 | 151.944 | 22.45 | 36.77 | .89445 | 255 |
| 180.000 | 1.90545 | .91173 | .018111 | 1.2480 | 7944.7 | 9309.2 | 153.994 | 22.02 | 35.05 | .91253 | 266 |
| 190.000 | 1.77293 | .92831 | .016583 | 1.3682 | 8187.0 | 9653.5 | 155.855 | 21.73 | 33.88 | .92712 | 275 |
| 200.000 | 1.66098 | .94133 | .015342 | 1.4822 | 8422.5 | 9987.9 | 157.571 | 21.52 | 33.04 | .93897 | 284 |
| 210.000 | 1.56455 | .95176 | .014307 | 1.5916 | 8653.1 | 10314.9 | 159.167 | 21.37 | 32.41 | .94874 | 293 |
| 220.000 | 1.48025 | .96024 | .013426 | 1.6973 | 8880.0 | 10636.5 | 160.663 | 21.26 | 31.92 | .95690 | 301 |
| 230.000 | 1.40567 | .96722 | .012663 | 1.8002 | 9104.1 | 10953.7 | 162.073 | 21.18 | 31.54 | .96376 | 309 |
| 240.000 | 1.33906 | .97303 | .011994 | 1.9008 | 9326.0 | 11267.6 | 163.409 | 21.11 | 31.24 | .96957 | 316 |
| 250.000 | 1.27908 | .97791 | .011401 | 1.9994 | 9546.0 | 11578.8 | 164.679 | 21.06 | 30.99 | .97454 | 324 |
| 260.000 | 1.22471 | .98204 | .010871 | 2.0965 | 9764.7 | 11887.7 | 165.891 | 21.02 | 30.79 | .97880 | 331 |
| 270.000 | 1.17514 | .98556 | .010392 | 2.1922 | 9982.2 | 12194.7 | 167.050 | 20.99 | 30.62 | .98248 | 337 |
| 280.000 | 1.12970 | .98859 | .009958 | 2.2867 | 10198.8 | 12500.2 | 168.161 | 20.97 | 30.48 | .98568 | 344 |
| 290.000 | 1.08788 | .99119 | .009562 | 2.3802 | 10414.5 | 12804.5 | 169.228 | 20.95 | 30.37 | .98847 | 350 |
| 300.000 | 1.04923 | .99345 | .009198 | 2.4729 | 10629.6 | 13107.6 | 170.256 | 20.94 | 30.27 | .99091 | 357 |
| 310.000 | 1.01337 | .99542 | .008864 | 2.5648 | 10844.2 | 13409.9 | 171.247 | 20.94 | 30.18 | .99305 | 363 |
| 320.000 | .98001 | .99714 | .008554 | 2.6561 | 11058.3 | 13711.3 | 172.204 | 20.93 | 30.11 | .99494 | 369 |
| 330.000 | .94888 | .99864 | .008266 | 2.7468 | 11272.1 | 14012.2 | 173.130 | 20.94 | 30.05 | .99661 | 375 |
| 340.000 | .91976 | .99997 | .007999 | 2.8369 | 11485.6 | 14312.5 | 174.026 | 20.94 | 30.01 | .99809 | 380 |
| 350.000 | .89244 | 1.00113 | .007749 | 2.9266 | 11699.0 | 14612.3 | 174.896 | 20.95 | 29.97 | .99941 | 386 |
| 360.000 | .86675 | 1.00217 | .007514 | 3.0159 | 11912.2 | 14911.9 | 175.739 | 20.97 | 29.94 | 1.00058 | 392 |
| 370.000 | .84256 | 1.00308 | .007295 | 3.1048 | 12125.3 | 15211.1 | 176.559 | 20.98 | 29.92 | 1.00163 | 397 |
| 380.000 | .81972 | 1.00389 | .007088 | 3.1934 | 12338.4 | 15510.2 | 177.357 | 21.00 | 29.90 | 1.00256 | 402 |
| 390.000 | .79813 | 1.00461 | .006893 | 3.2816 | 12551.6 | 15809.2 | 178.134 | 21.03 | 29.89 | 1.00340 | 408 |
| 400.000 | .77768 | 1.00525 | .006709 | 3.3696 | 12764.8 | 16108.1 | 178.890 | 21.06 | 29.89 | 1.00415 | 413 |
| 410.000 | .75828 | 1.00583 | .006535 | 3.4573 | 12978.2 | 16407.0 | 179.628 | 21.09 | 29.89 | 1.00482 | 418 |
| 420.000 | .73985 | 1.00634 | .006370 | 3.5448 | 13191.8 | 16706.0 | 180.349 | 21.12 | 29.90 | 1.00543 | 423 |
| 430.000 | .72232 | 1.00679 | .006213 | 3.6321 | 13405.6 | 17005.1 | 181.053 | 21.16 | 29.92 | 1.00597 | 428 |
| 440.000 | .70562 | 1.00720 | .006064 | 3.7191 | 13619.6 | 17304.3 | 181.741 | 21.20 | 29.93 | 1.00646 | 433 |
| 450.000 | .68969 | 1.00756 | .005922 | 3.8060 | 13834.0 | 17603.8 | 182.414 | 21.24 | 29.96 | 1.00690 | 437 |
| 470.000 | .65994 | 1.00817 | .005658 | 3.9792 | 14263.8 | 18203.5 | 183.717 | 21.33 | 30.02 | 1.00765 | 447 |
| 500.000 | .61992 | 1.00886 | .005304 | 4.2380 | 14911.5 | 19105.6 | 185.578 | 21.49 | 30.13 | 1.00853 | 460 |
| 550.000 | .56316 | 1.00958 | .004805 | 4.6670 | 16001.1 | 20617.9 | 188.461 | 21.79 | 30.37 | 1.00948 | 481 |
| 600.000 | .51605 | 1.00994 | .004393 | 5.0937 | 17105.6 | 22143.9 | 191.116 | 22.13 | 30.67 | 1.01003 | 501 |
| 650.000 | .47628 | 1.01008 | .004047 | 5.5188 | 18226.5 | 23685.5 | 193.584 | 22.49 | 31.00 | 1.01031 | 521 |
| 700.000 | .44226 | 1.01009 | .003752 | 5.9425 | 19365.0 | 25243.9 | 195.893 | 22.86 | 31.34 | 1.01042 | 539 |
| 750.000 | .41281 | 1.01000 | .003497 | 6.3652 | 20521.3 | 26819.6 | 198.067 | 23.23 | 31.69 | 1.01042 | 556 |
| 800.000 | .38707 | 1.00986 | .003275 | 6.7870 | 21695.3 | 28412.5 | 200.123 | 23.59 | 32.03 | 1.01034 | 573 |
| 850.000 | .36436 | 1.00969 | .003080 | 7.2081 | 22886.5 | 30022.3 | 202.075 | 23.94 | 32.36 | 1.01022 | 589 |
| 900.000 | .34419 | 1.00949 | .002907 | 7.6287 | 24094.4 | 31648.4 | 203.934 | 24.27 | 32.68 | 1.01006 | 605 |
| 950.000 | .32614 | 1.00928 | .002752 | 8.0487 | 25317.9 | 33290.0 | 205.709 | 24.58 | 32.98 | 1.00989 | 620 |
| 1000.000 | .30990 | 1.00906 | .002613 | 8.4684 | 26556.4 | 34946.3 | 207.408 | 24.87 | 33.27 | 1.00970 | 635 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 2.800000 MPa | | | | | | | | | | | |
| 68.752 | 30.34133 | .16144 | 2.194032 | 15.8044 | 8.1 | 100.4 | 74.596 | 36.30 | 59.04 | .00711 | 958 |
| 70.000 | 30.16758 | .15947 | 2.145369 | 15.3748 | 81.8 | 174.6 | 75.661 | 36.30 | 59.33 | .00870 | 947 |
| 80.000 | 28.73711 | .14648 | 1.785018 | 12.1289 | 678.8 | 776.2 | 83.703 | 35.57 | 61.02 | .03333 | 861 |
| 90.000 | 27.20894 | .13752 | 1.467345 | 9.2041 | 1288.2 | 1391.1 | 90.944 | 33.49 | 61.92 | .08998 | 779 |
| 100.000 | 25.52294 | .13194 | 1.180754 | 6.5768 | 1904.4 | 2014.1 | 97.495 | 30.09 | 62.63 | .19088 | 699 |
| 110.000 | 23.56489 | .12992 | .914111 | 4.2271 | 2527.2 | 2646.1 | 103.523 | 25.54 | 64.69 | .33970 | 618 |
| 120.000 | 21.03468 | .13342 | .650504 | 2.1206 | 3190.4 | 3323.5 | 109.425 | 20.38 | 74.50 | .53111 | 526 |
| 128.076 | 17.44881 | .15069 | .390917 | .4939 | 3922.8 | 4083.2 | 115.519 | 18.34 | 148.49 | .70680 | 377 |
| 128.076 | 5.02972 | .52277 | .072401 | .1472 | 5921.2 | 6477.9 | 134.216 | 39.90 | 220.24 | .70680 | 170 |
| 130.000 | 4.41261 | .58706 | .058807 | .2607 | 6147.4 | 6781.9 | 136.566 | 34.36 | 122.92 | .72400 | 182 |
| 140.000 | 3.28285 | .73273 | .037507 | .5770 | 6715.5 | 7568.5 | 142.420 | 27.00 | 58.68 | .78695 | 211 |
| 150.000 | 2.79212 | .80408 | .029661 | .7836 | 7079.9 | 8082.8 | 145.973 | 24.60 | 46.20 | .83022 | 229 |
| 160.000 | 2.47716 | .84967 | .025140 | .9511 | 7383.9 | 8514.2 | 148.759 | 23.36 | 40.69 | .86227 | 243 |
| 170.000 | 2.24696 | .88161 | .022096 | 1.0972 | 7658.3 | 8904.4 | 151.126 | 22.62 | 37.60 | .88694 | 255 |
| 180.000 | 2.06687 | .90518 | .019863 | 1.2299 | 7915.3 | 9270.0 | 153.217 | 22.14 | 35.66 | .90638 | 265 |
| 190.000 | 1.91991 | .92318 | .018132 | 1.3533 | 8161.3 | 9619.7 | 155.107 | 21.82 | 34.34 | .92205 | 275 |
| 200.000 | 1.79647 | .93728 | .016737 | 1.4700 | 8399.5 | 9958.1 | 156.843 | 21.59 | 33.40 | .93477 | 284 |
| 210.000 | 1.69061 | .94855 | .015580 | 1.5815 | 8632.3 | 10288.5 | 158.455 | 21.43 | 32.70 | .94527 | 293 |
| 220.000 | 1.59837 | .95768 | .014600 | 1.6892 | 8861.0 | 10612.7 | 159.964 | 21.30 | 32.17 | .95401 | 301 |
| 230.000 | 1.51698 | .96520 | .013755 | 1.7936 | 9086.5 | 10932.3 | 161.384 | 21.21 | 31.75 | .96136 | 309 |
| 240.000 | 1.44443 | .97144 | .013016 | 1.8956 | 9309.6 | 11248.1 | 162.728 | 21.14 | 31.42 | .96760 | 317 |
| 250.000 | 1.37921 | .97668 | .012362 | 1.9954 | 9530.7 | 11560.9 | 164.005 | 21.08 | 31.15 | .97291 | 324 |
| 260.000 | 1.32018 | .98111 | .011779 | 2.0935 | 9750.3 | 11871.2 | 165.223 | 21.04 | 30.93 | .97748 | 331 |
| 270.000 | 1.26641 | .98488 | .011254 | 2.1902 | 9968.6 | 12179.6 | 166.386 | 21.01 | 30.75 | .98143 | 338 |
| 280.000 | 1.21719 | .98811 | .010779 | 2.2856 | 10185.9 | 12486.2 | 167.502 | 20.98 | 30.59 | .98485 | 344 |
| 290.000 | 1.17191 | .99090 | .010346 | 2.3799 | 10402.2 | 12791.5 | 168.573 | 20.97 | 30.46 | .98783 | 351 |
| 300.000 | 1.13010 | .99331 | .009949 | 2.4732 | 10617.9 | 13095.6 | 169.604 | 20.95 | 30.35 | .99044 | 357 |
| 310.000 | 1.09134 | .99541 | .009584 | 2.5658 | 10833.0 | 13398.6 | 170.597 | 20.95 | 30.26 | .99273 | 363 |
| 320.000 | 1.05529 | .99724 | .009246 | 2.6577 | 11047.6 | 13700.9 | 171.557 | 20.94 | 30.19 | .99475 | 369 |
| 330.000 | 1.02167 | .99884 | .008933 | 2.7489 | 11261.8 | 14002.4 | 172.485 | 20.94 | 30.12 | .99654 | 375 |
| 340.000 | .99022 | 1.00025 | .008642 | 2.8396 | 11475.7 | 14303.3 | 173.383 | 20.95 | 30.07 | .99812 | 381 |
| 350.000 | .96074 | 1.00150 | .008370 | 2.9297 | 11689.4 | 14603.8 | 174.254 | 20.96 | 30.03 | .99952 | 387 |
| 360.000 | .93303 | 1.00259 | .008115 | 3.0194 | 11902.9 | 14903.9 | 175.099 | 20.97 | 29.99 | 1.00077 | 392 |
| 370.000 | .90693 | 1.00356 | .007877 | 3.1087 | 12116.3 | 15203.7 | 175.921 | 20.99 | 29.97 | 1.00189 | 398 |
| 380.000 | .88231 | 1.00442 | .007652 | 3.1977 | 12329.7 | 15503.2 | 176.720 | 21.01 | 29.95 | 1.00289 | 403 |
| 390.000 | .85903 | 1.00519 | .007441 | 3.2863 | 12543.2 | 15802.6 | 177.497 | 21.03 | 29.94 | 1.00378 | 408 |
| 400.000 | .83699 | 1.00587 | .007241 | 3.3746 | 12756.6 | 16102.0 | 178.255 | 21.06 | 29.93 | 1.00458 | 413 |
| 410.000 | .81609 | 1.00647 | .007052 | 3.4626 | 12970.3 | 16401.3 | 178.994 | 21.09 | 29.93 | 1.00529 | 418 |
| 420.000 | .79623 | 1.00701 | .006873 | 3.5504 | 13184.0 | 16700.6 | 179.716 | 21.12 | 29.94 | 1.00594 | 423 |
| 430.000 | .77734 | 1.00749 | .006704 | 3.6379 | 13398.0 | 17000.1 | 180.420 | 21.16 | 29.95 | 1.00652 | 428 |
| 440.000 | .75935 | 1.00792 | .006542 | 3.7253 | 13612.3 | 17299.6 | 181.109 | 21.20 | 29.97 | 1.00704 | 433 |
| 450.000 | .74220 | 1.00830 | .006389 | 3.8124 | 13826.8 | 17599.4 | 181.783 | 21.24 | 29.99 | 1.00751 | 438 |
| 470.000 | .71016 | 1.00895 | .006103 | 3.9861 | 14256.9 | 18199.7 | 183.088 | 21.33 | 30.04 | 1.00831 | 447 |
| 500.000 | .66707 | 1.00967 | .005720 | 4.2455 | 14905.1 | 19102.5 | 184.950 | 21.49 | 30.15 | 1.00924 | 461 |
| 550.000 | .60598 | 1.01042 | .005181 | 4.6754 | 15995.3 | 20615.9 | 187.835 | 21.79 | 30.39 | 1.01025 | 482 |
| 600.000 | .55528 | 1.01079 | .004736 | 5.1028 | 17100.3 | 22142.8 | 190.491 | 22.13 | 30.69 | 1.01082 | 502 |
| 650.000 | .51249 | 1.01093 | .004362 | 5.5285 | 18221.7 | 23685.2 | 192.960 | 22.49 | 31.01 | 1.01111 | 521 |
| 700.000 | .47589 | 1.01092 | .004044 | 5.9528 | 19360.5 | 25244.2 | 195.271 | 22.86 | 31.35 | 1.01122 | 539 |
| 750.000 | .44421 | 1.01082 | .003769 | 6.3759 | 20517.1 | 26820.4 | 197.446 | 23.23 | 31.70 | 1.01121 | 557 |
| 800.000 | .41651 | 1.01066 | .003529 | 6.7981 | 21691.3 | 28413.8 | 199.502 | 23.59 | 32.04 | 1.01113 | 574 |
| 850.000 | .39209 | 1.01047 | .003319 | 7.2196 | 22882.8 | 30024.1 | 201.455 | 23.94 | 32.37 | 1.01099 | 590 |
| 900.000 | .37038 | 1.01025 | .003132 | 7.6405 | 24090.8 | 31650.6 | 203.314 | 24.27 | 32.69 | 1.01082 | 606 |
| 950.000 | .35097 | 1.01002 | .002965 | 8.0608 | 25314.6 | 33292.5 | 205.089 | 24.58 | 32.99 | 1.01063 | 621 |
| 1000.000 | .33350 | 1.00978 | .002815 | 8.4808 | 26553.2 | 34949.1 | 206.789 | 24.87 | 33.27 | 1.01042 | 636 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 3.000000 MPa | | | | | | | | | | | |
| 68.796 | 30.34777 | .17282 | 2.195821 | 15.8460 | 8.7 | 107.6 | 74.604 | 36.30 | 59.03 | .00676 | 959 |
| 70.000 | 30.18057 | .17079 | 2.148890 | 15.4319 | 79.7 | 179.1 | 75.630 | 36.30 | 59.30 | .00821 | 948 |
| 80.000 | 28.75356 | .15686 | 1.788497 | 12.1870 | 676.0 | 780.3 | 83.667 | 35.57 | 60.97 | .03144 | 863 |
| 90.000 | 27.23059 | .14723 | 1.471057 | 9.2651 | 1284.4 | 1394.6 | 90.901 | 33.49 | 61.84 | .08481 | 781 |
| 100.000 | 25.55320 | .14120 | 1.185021 | 6.6426 | 1899.1 | 2016.5 | 97.440 | 30.10 | 62.48 | .17984 | 701 |
| 110.000 | 23.61180 | .13892 | .919502 | 4.3005 | 2519.0 | 2646.0 | 103.446 | 25.55 | 64.34 | .32001 | 621 |
| 120.000 | 21.12708 | .14232 | .658714 | 2.2087 | 3174.7 | 3316.7 | 109.289 | 20.38 | 73.20 | .50044 | 532 |
| 129.548 | 16.59396 | .16784 | .345155 | .3165 | 4079.4 | 4260.2 | 116.802 | 19.27 | 196.36 | .69698 | 339 |
| 129.548 | 5.70809 | .48793 | .084119 | .1051 | 5812.6 | 6338.2 | 132.842 | 42.23 | 309.80 | .69698 | 165 |
| 130.000 | 5.41453 | .51260 | .077451 | .1434 | 5902.0 | 6456.0 | 133.742 | 39.41 | 224.92 | .70204 | 170 |
| 140.000 | 3.64597 | .70688 | .042785 | .5250 | 6633.4 | 7456.2 | 141.205 | 27.81 | 64.53 | .77194 | 208 |
| 150.000 | 3.05350 | .78776 | .033069 | .7469 | 7024.8 | 8007.3 | 145.013 | 25.01 | 48.56 | .81865 | 227 |
| 160.000 | 2.69062 | .83813 | .027728 | .9229 | 7341.5 | 8456.4 | 147.914 | 23.61 | 42.03 | .85306 | 242 |
| 170.000 | 2.43112 | .87303 | .024215 | 1.0749 | 7623.4 | 8857.4 | 150.346 | 22.79 | 38.48 | .87948 | 254 |
| 180.000 | 2.23069 | .89861 | .021674 | 1.2118 | 7885.6 | 9230.5 | 152.479 | 22.27 | 36.29 | .90029 | 265 |
| 190.000 | 2.06851 | .91807 | .019724 | 1.3385 | 8135.3 | 9585.6 | 154.399 | 21.91 | 34.82 | .91703 | 275 |
| 200.000 | 1.93310 | .93326 | .018164 | 1.4578 | 8376.4 | 9928.3 | 156.157 | 21.66 | 33.78 | .93062 | 284 |
| 210.000 | 1.81747 | .94536 | .016879 | 1.5716 | 8611.4 | 10262.0 | 157.786 | 21.48 | 33.01 | .94183 | 293 |
| 220.000 | 1.71706 | .95516 | .015794 | 1.6811 | 8841.8 | 10589.0 | 159.307 | 21.35 | 32.42 | .95116 | 301 |
| 230.000 | 1.62868 | .96321 | .014863 | 1.7872 | 9068.9 | 10910.8 | 160.738 | 21.25 | 31.96 | .95901 | 309 |
| 240.000 | 1.55008 | .96989 | .014051 | 1.8905 | 9293.2 | 11228.6 | 162.090 | 21.17 | 31.60 | .96565 | 317 |
| 250.000 | 1.47954 | .97548 | .013336 | 1.9915 | 9515.4 | 11543.1 | 163.374 | 21.11 | 31.31 | .97132 | 324 |
| 260.000 | 1.41578 | .98021 | .012698 | 2.0907 | 9735.9 | 11854.9 | 164.597 | 21.06 | 31.07 | .97619 | 331 |
| 270.000 | 1.35777 | .98423 | .012126 | 2.1883 | 9955.0 | 12164.5 | 165.766 | 21.03 | 30.87 | .98039 | 338 |
| 280.000 | 1.30471 | .98767 | .011608 | 2.2846 | 10173.0 | 12472.3 | 166.885 | 21.00 | 30.70 | .98404 | 345 |
| 290.000 | 1.25596 | .99063 | .011136 | 2.3796 | 10390.0 | 12778.6 | 167.960 | 20.98 | 30.56 | .98721 | 351 |
| 300.000 | 1.21096 | .99320 | .010705 | 2.4737 | 10606.2 | 13083.6 | 168.994 | 20.96 | 30.44 | .98999 | 358 |
| 310.000 | 1.16927 | .99543 | .010309 | 2.5669 | 10821.8 | 13387.5 | 169.990 | 20.96 | 30.34 | .99243 | 364 |
| 320.000 | 1.13052 | .99737 | .009943 | 2.6594 | 11036.9 | 13690.5 | 170.952 | 20.95 | 30.26 | .99458 | 370 |
| 330.000 | 1.09440 | .99907 | .009604 | 2.7512 | 11251.5 | 13992.7 | 171.882 | 20.95 | 30.19 | .99648 | 376 |
| 340.000 | 1.06062 | 1.00057 | .009288 | 2.8423 | 11465.8 | 14294.3 | 172.783 | 20.96 | 30.13 | .99816 | 381 |
| 350.000 | 1.02897 | 1.00188 | .008994 | 2.9329 | 11679.8 | 14595.4 | 173.655 | 20.96 | 30.08 | .99965 | 387 |
| 360.000 | .99923 | 1.00304 | .008719 | 3.0231 | 11893.7 | 14896.0 | 174.502 | 20.98 | 30.04 | 1.00098 | 393 |
| 370.000 | .97123 | 1.00407 | .008462 | 3.1128 | 12107.4 | 15196.3 | 175.325 | 20.99 | 30.01 | 1.00217 | 398 |
| 380.000 | .94481 | 1.00498 | .008219 | 3.2021 | 12321.1 | 15496.3 | 176.125 | 21.01 | 29.99 | 1.00322 | 403 |
| 390.000 | .91985 | 1.00578 | .007991 | 3.2911 | 12534.8 | 15796.2 | 176.904 | 21.04 | 29.98 | 1.00417 | 409 |
| 400.000 | .89621 | 1.00650 | .007776 | 3.3797 | 12748.5 | 16095.9 | 177.663 | 21.06 | 29.97 | 1.00502 | 414 |
| 410.000 | .87380 | 1.00714 | .007572 | 3.4681 | 12962.3 | 16395.6 | 178.403 | 21.09 | 29.97 | 1.00578 | 419 |
| 420.000 | .85252 | 1.00771 | .007379 | 3.5561 | 13176.3 | 16695.3 | 179.125 | 21.13 | 29.97 | 1.00646 | 424 |
| 430.000 | .83227 | 1.00821 | .007196 | 3.6440 | 13390.5 | 16995.1 | 179.831 | 21.16 | 29.98 | 1.00708 | 429 |
| 440.000 | .81299 | 1.00866 | .007022 | 3.7315 | 13605.0 | 17295.0 | 180.520 | 21.20 | 30.00 | 1.00763 | 434 |
| 450.000 | .79461 | 1.00906 | .006857 | 3.8189 | 13819.7 | 17595.1 | 181.194 | 21.24 | 30.02 | 1.00812 | 438 |
| 470.000 | .76029 | 1.00974 | .006549 | 3.9931 | 14250.1 | 18196.0 | 182.501 | 21.34 | 30.07 | 1.00897 | 448 |
| 500.000 | .71414 | 1.01049 | .006138 | 4.2531 | 14898.7 | 19099.6 | 184.365 | 21.49 | 30.18 | 1.00995 | 461 |
| 550.000 | .64872 | 1.01127 | .005557 | 4.6839 | 15989.6 | 20614.1 | 187.251 | 21.80 | 30.41 | 1.01102 | 483 |
| 600.000 | .59444 | 1.01165 | .005079 | 5.1121 | 17095.0 | 22141.8 | 189.910 | 22.13 | 30.70 | 1.01162 | 503 |
| 650.000 | .54864 | 1.01178 | .004677 | 5.5383 | 18216.8 | 23684.9 | 192.380 | 22.49 | 31.02 | 1.01192 | 522 |
| 700.000 | .50946 | 1.01176 | .004335 | 5.9631 | 19356.0 | 25244.6 | 194.691 | 22.86 | 31.36 | 1.01203 | 540 |
| 750.000 | .47555 | 1.01165 | .004040 | 6.3867 | 20512.8 | 26821.3 | 196.867 | 23.23 | 31.71 | 1.01201 | 557 |
| 800.000 | .44591 | 1.01147 | .003783 | 6.8093 | 21687.4 | 28415.2 | 198.924 | 23.59 | 32.05 | 1.01191 | 574 |
| 850.000 | .41977 | 1.01125 | .003557 | 7.2312 | 22879.1 | 30025.9 | 200.877 | 23.94 | 32.38 | 1.01176 | 590 |
| 900.000 | .39654 | 1.01101 | .003357 | 7.6524 | 24087.3 | 31652.7 | 202.737 | 24.27 | 32.69 | 1.01157 | 606 |
| 950.000 | .37576 | 1.01076 | .003178 | 8.0730 | 25311.2 | 33295.0 | 204.512 | 24.58 | 32.99 | 1.01137 | 622 |
| 1000.000 | .35706 | 1.01051 | .003017 | 8.4932 | 26550.0 | 34951.9 | 206.212 | 24.87 | 33.28 | 1.01114 | 636 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 3.200000 MPa | | | | | | | | | | | |
| 68.841 | 30.35419 | .18418 | 2.197605 | 15.8877 | 9.3 | 114.8 | 74.612 | 36.30 | 59.01 | .00646 | 960 |
| 70.000 | 30.19350 | .18210 | 2.152406 | 15.4890 | 77.6 | 183.6 | 75.600 | 36.30 | 59.27 | .00778 | 950 |
| 80.000 | 28.76993 | .16722 | 1.791967 | 12.2451 | 673.2 | 784.4 | 83.632 | 35.58 | 60.92 | .02978 | 865 |
| 90.000 | 27.25211 | .15692 | 1.474753 | 9.3260 | 1280.6 | 1398.1 | 90.858 | 33.50 | 61.76 | .08029 | 783 |
| 100.000 | 25.58316 | .15044 | 1.189258 | 6.7081 | 1893.8 | 2018.9 | 97.385 | 30.11 | 62.32 | .17019 | 704 |
| 110.000 | 23.65792 | .14789 | .924824 | 4.3733 | 2510.9 | 2646.1 | 103.369 | 25.56 | 64.00 | .30280 | 625 |
| 120.000 | 21.21589 | .15117 | .666668 | 2.2954 | 3159.6 | 3310.4 | 109.158 | 20.39 | 72.01 | .47362 | 537 |
| 130.000 | 16.71702 | .17710 | .352667 | .3736 | 4066.6 | 4258.0 | 116.678 | 19.41 | 174.25 | .67064 | 346 |
| 130.943 | 15.53831 | .18916 | .296045 | .1649 | 4260.3 | 4466.3 | 118.288 | 21.93 | 310.16 | .68748 | 288 |
| 130.943 | 6.58671 | .44623 | .099379 | .0625 | 5667.9 | 6153.8 | 131.176 | 45.60 | 522.75 | .68748 | 159 |
| 140.000 | 4.04788 | .67914 | .048809 | .4709 | 6543.6 | 7334.2 | 139.960 | 28.70 | 71.93 | .75684 | 205 |
| 150.000 | 3.32818 | .77093 | .036746 | .7096 | 6967.3 | 7928.8 | 144.071 | 25.43 | 51.20 | .80710 | 225 |
| 160.000 | 2.91072 | .82640 | .030460 | .8945 | 7297.9 | 8397.3 | 147.097 | 23.87 | 43.46 | .84390 | 241 |
| 170.000 | 2.61917 | .86437 | .026423 | 1.0524 | 7588.0 | 8809.7 | 149.599 | 22.97 | 39.41 | .87208 | 253 |
| 180.000 | 2.39699 | .89202 | .023546 | 1.1936 | 7855.5 | 9190.6 | 151.777 | 22.39 | 36.94 | .89424 | 265 |
| 190.000 | 2.21876 | .91296 | .021361 | 1.3237 | 8109.0 | 9551.3 | 153.727 | 22.00 | 35.31 | .91206 | 275 |
| 200.000 | 2.07086 | .92925 | .019626 | 1.4457 | 8353.1 | 9898.3 | 155.508 | 21.73 | 34.16 | .92652 | 284 |
| 210.000 | 1.94513 | .94221 | .018204 | 1.5617 | 8590.3 | 10235.5 | 157.153 | 21.54 | 33.31 | .93843 | 293 |
| 220.000 | 1.83631 | .95268 | .017010 | 1.6731 | 8822.6 | 10565.3 | 158.687 | 21.39 | 32.67 | .94835 | 302 |
| 230.000 | 1.74079 | .96126 | .015989 | 1.7808 | 9051.2 | 10889.4 | 160.128 | 21.28 | 32.18 | .95668 | 310 |
| 240.000 | 1.65601 | .96837 | .015102 | 1.8855 | 9276.8 | 11209.2 | 161.489 | 21.20 | 31.78 | .96374 | 317 |
| 250.000 | 1.58006 | .97432 | .014321 | 1.9878 | 9500.1 | 11525.3 | 162.780 | 21.13 | 31.46 | .96976 | 325 |
| 260.000 | 1.51150 | .97934 | .013627 | 2.0880 | 9721.5 | 11838.6 | 164.009 | 21.08 | 31.20 | .97493 | 332 |
| 270.000 | 1.44920 | .98361 | .013006 | 2.1866 | 9941.5 | 12149.6 | 165.182 | 21.04 | 30.99 | .97939 | 339 |
| 280.000 | 1.39228 | .98726 | .012444 | 2.2837 | 10160.1 | 12458.5 | 166.306 | 21.01 | 30.81 | .98325 | 345 |
| 290.000 | 1.34000 | .99040 | .011934 | 2.3796 | 10377.8 | 12765.8 | 167.384 | 20.99 | 30.66 | .98662 | 352 |
| 300.000 | 1.29179 | .99311 | .011468 | 2.4744 | 10594.6 | 13071.8 | 168.421 | 20.97 | 30.53 | .98957 | 358 |
| 310.000 | 1.24716 | .99547 | .011039 | 2.5682 | 10810.7 | 13376.5 | 169.421 | 20.96 | 30.42 | .99215 | 364 |
| 320.000 | 1.20570 | .99753 | .010644 | 2.6612 | 11026.2 | 13680.2 | 170.385 | 20.96 | 30.33 | .99443 | 370 |
| 330.000 | 1.16706 | .99932 | .010279 | 2.7535 | 11241.2 | 13983.2 | 171.317 | 20.96 | 30.25 | .99644 | 376 |
| 340.000 | 1.13095 | 1.00090 | .009939 | 2.8452 | 11455.9 | 14285.4 | 172.219 | 20.96 | 30.19 | .99822 | 382 |
| 350.000 | 1.09712 | 1.00229 | .009622 | 2.9363 | 11670.3 | 14587.0 | 173.094 | 20.97 | 30.14 | .99980 | 388 |
| 360.000 | 1.06534 | 1.00351 | .009327 | 3.0269 | 11884.5 | 14888.2 | 173.942 | 20.98 | 30.10 | 1.00120 | 393 |
| 370.000 | 1.03543 | 1.00459 | .009049 | 3.1170 | 12098.5 | 15189.0 | 174.766 | 21.00 | 30.06 | 1.00246 | 399 |
| 380.000 | 1.00723 | 1.00555 | .008789 | 3.2067 | 12312.5 | 15489.5 | 175.568 | 21.02 | 30.04 | 1.00358 | 404 |
| 390.000 | .98057 | 1.00640 | .008544 | 3.2960 | 12526.4 | 15789.8 | 176.348 | 21.04 | 30.02 | 1.00458 | 409 |
| 400.000 | .95534 | 1.00715 | .008312 | 3.3850 | 12740.4 | 16090.0 | 177.108 | 21.07 | 30.01 | 1.00547 | 414 |
| 410.000 | .93142 | 1.00782 | .008094 | 3.4736 | 12954.5 | 16390.1 | 177.849 | 21.10 | 30.01 | 1.00628 | 420 |
| 420.000 | .90871 | 1.00841 | .007887 | 3.5620 | 13168.7 | 16690.2 | 178.572 | 21.13 | 30.01 | 1.00700 | 425 |
| 430.000 | .88711 | 1.00894 | .007690 | 3.6501 | 13383.1 | 16990.3 | 179.278 | 21.16 | 30.02 | 1.00764 | 429 |
| 440.000 | .86655 | 1.00942 | .007504 | 3.7379 | 13597.7 | 17290.5 | 179.968 | 21.20 | 30.03 | 1.00823 | 434 |
| 450.000 | .84694 | 1.00983 | .007327 | 3.8256 | 13812.6 | 17590.9 | 180.643 | 21.25 | 30.05 | 1.00875 | 439 |
| 470.000 | .81033 | 1.01054 | .006997 | 4.0002 | 14243.4 | 18192.4 | 181.951 | 21.34 | 30.10 | 1.00964 | 448 |
| 500.000 | .76112 | 1.01133 | .006556 | 4.2609 | 14892.4 | 19096.7 | 183.816 | 21.49 | 30.20 | 1.01067 | 462 |
| 550.000 | .69138 | 1.01213 | .005935 | 4.6925 | 15983.9 | 20612.3 | 186.705 | 21.80 | 30.43 | 1.01179 | 483 |
| 600.000 | .63352 | 1.01251 | .005423 | 5.1214 | 17089.8 | 22140.9 | 189.365 | 22.14 | 30.72 | 1.01242 | 503 |
| 650.000 | .58472 | 1.01264 | .004993 | 5.5482 | 18212.0 | 23684.7 | 191.836 | 22.49 | 31.04 | 1.01273 | 522 |
| 700.000 | .54297 | 1.01261 | .004628 | 5.9735 | 19351.5 | 25245.0 | 194.149 | 22.86 | 31.38 | 1.01283 | 540 |
| 750.000 | .50684 | 1.01247 | .004312 | 6.3976 | 20508.7 | 26822.3 | 196.325 | 23.23 | 31.72 | 1.01281 | 558 |
| 800.000 | .47525 | 1.01228 | .004038 | 6.8206 | 21683.4 | 28416.7 | 198.383 | 23.59 | 32.06 | 1.01270 | 575 |
| 850.000 | .44740 | 1.01204 | .003796 | 7.2428 | 22875.3 | 30027.8 | 200.336 | 23.94 | 32.39 | 1.01253 | 591 |
| 900.000 | .42265 | 1.01178 | .003582 | 7.6643 | 24083.8 | 31655.0 | 202.196 | 24.27 | 32.70 | 1.01233 | 607 |
| 950.000 | .40052 | 1.01151 | .003391 | 8.0852 | 25307.9 | 33297.6 | 203.972 | 24.58 | 33.00 | 1.01210 | 622 |
| 1000.000 | .38059 | 1.01123 | .003219 | 8.5056 | 26546.8 | 34954.7 | 205.672 | 24.87 | 33.28 | 1.01187 | 637 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 3.400000 MPa | | | | | | | | | | | |
| 68.886 | 30.36059 | .19553 | 2.199384 | 15.9293 | 9.9 | 121.9 | 74.621 | 36.30 | 58.99 | .00620 | 961 |
| 70.000 | 30.20639 | .19340 | 2.155917 | 15.5460 | 75.5 | 188.1 | 75.569 | 36.30 | 59.24 | .00741 | 951 |
| 80.000 | 28.78622 | .17757 | 1.795429 | 12.3031 | 670.4 | 788.5 | 83.597 | 35.58 | 60.88 | .02833 | 866 |
| 90.000 | 27.27349 | .16659 | 1.478434 | 9.3868 | 1276.9 | 1401.6 | 90.816 | 33.51 | 61.68 | .07631 | 785 |
| 100.000 | 25.61283 | .15966 | 1.193466 | 6.7734 | 1888.5 | 2021.3 | 97.331 | 30.12 | 62.18 | .16169 | 706 |
| 110.000 | 23.70328 | .15683 | .930079 | 4.4456 | 2502.9 | 2646.3 | 103.294 | 25.57 | 63.67 | .28763 | 628 |
| 120.000 | 21.30144 | .15998 | .674389 | 2.3807 | 3144.9 | 3304.6 | 109.031 | 20.40 | 70.92 | .44999 | 543 |
| 130.000 | 17.17133 | .18319 | .377656 | .5109 | 3996.7 | 4194.7 | 116.100 | 19.08 | 142.16 | .63811 | 368 |
| 132.263 | 13.91146 | .22225 | .235193 | .0423 | 4512.9 | 4757.3 | 120.396 | 31.38 | 925.23 | .67822 | 210 |
| 132.263 | 8.01003 | .38599 | .123843 | .0194 | 5427.3 | 5851.8 | 128.671 | 52.93 | 1681.50 | .67822 | 148 |
| 140.000 | 4.50011 | .64907 | .055779 | .4145 | 6444.3 | 7199.8 | 138.665 | 29.68 | 81.58 | .74164 | 201 |
| 150.000 | 3.61784 | .75353 | .040720 | .6716 | 6907.1 | 7846.9 | 143.140 | 25.87 | 54.17 | .79558 | 224 |
| 160.000 | 3.13797 | .81447 | .033343 | .8658 | 7253.1 | 8336.6 | 146.304 | 24.13 | 45.00 | .83478 | 240 |
| 170.000 | 2.81128 | .85564 | .028724 | 1.0298 | 7551.8 | 8761.3 | 148.881 | 23.14 | 40.38 | .86472 | 253 |
| 180.000 | 2.56583 | .88541 | .025482 | 1.1755 | 7825.1 | 9150.2 | 151.104 | 22.52 | 37.62 | .88824 | 264 |
| 190.000 | 2.37070 | .90785 | .023044 | 1.3089 | 8082.6 | 9516.7 | 153.086 | 22.10 | 35.81 | .90713 | 275 |
| 200.000 | 2.20978 | .92526 | .021122 | 1.4337 | 8329.6 | 9868.2 | 154.890 | 21.80 | 34.55 | .92245 | 284 |
| 210.000 | 2.07360 | .93907 | .019557 | 1.5520 | 8569.2 | 10208.9 | 156.552 | 21.59 | 33.63 | .93507 | 293 |
| 220.000 | 1.95613 | .95022 | .018248 | 1.6652 | 8803.4 | 10541.5 | 158.099 | 21.44 | 32.93 | .94557 | 302 |
| 230.000 | 1.85330 | .95933 | .017133 | 1.7745 | 9033.5 | 10868.0 | 159.551 | 21.32 | 32.39 | .95439 | 310 |
| 240.000 | 1.76222 | .96688 | .016166 | 1.8806 | 9260.4 | 11189.8 | 160.920 | 21.23 | 31.97 | .96186 | 317 |
| 250.000 | 1.68077 | .97318 | .015319 | 1.9841 | 9484.8 | 11507.7 | 162.218 | 21.16 | 31.62 | .96823 | 325 |
| 260.000 | 1.60734 | .97850 | .014567 | 2.0855 | 9707.2 | 11822.4 | 163.453 | 21.10 | 31.34 | .97369 | 332 |
| 270.000 | 1.54070 | .98302 | .013895 | 2.1850 | 9927.9 | 12134.7 | 164.631 | 21.06 | 31.11 | .97841 | 339 |
| 280.000 | 1.47987 | .98687 | .013288 | 2.2830 | 10147.3 | 12444.8 | 165.759 | 21.03 | 30.92 | .98249 | 346 |
| 290.000 | 1.42405 | .99019 | .012738 | 2.3796 | 10365.6 | 12753.1 | 166.841 | 21.00 | 30.75 | .98605 | 352 |
| 300.000 | 1.37261 | .99306 | .012236 | 2.4751 | 10583.0 | 13060.0 | 167.881 | 20.99 | 30.62 | .98916 | 359 |
| 310.000 | 1.32502 | .99554 | .011775 | 2.5696 | 10799.6 | 13365.6 | 168.883 | 20.97 | 30.50 | .99189 | 365 |
| 320.000 | 1.28083 | .99771 | .011351 | 2.6632 | 11015.5 | 13670.1 | 169.850 | 20.97 | 30.40 | .99429 | 371 |
| 330.000 | 1.23966 | .99960 | .010958 | 2.7561 | 11231.0 | 13973.7 | 170.785 | 20.97 | 30.32 | .99641 | 377 |
| 340.000 | 1.20121 | 1.00126 | .010594 | 2.8482 | 11446.1 | 14276.6 | 171.689 | 20.97 | 30.25 | .99829 | 383 |
| 350.000 | 1.16519 | 1.00272 | .010254 | 2.9398 | 11660.8 | 14578.8 | 172.565 | 20.98 | 30.20 | .99996 | 388 |
| 360.000 | 1.13137 | 1.00400 | .009937 | 3.0308 | 11875.3 | 14880.5 | 173.415 | 20.99 | 30.15 | 1.00144 | 394 |
| 370.000 | 1.09955 | 1.00513 | .009640 | 3.1213 | 12089.7 | 15181.8 | 174.240 | 21.00 | 30.11 | 1.00276 | 399 |
| 380.000 | 1.06955 | 1.00614 | .009361 | 3.2114 | 12303.9 | 15482.8 | 175.043 | 21.02 | 30.08 | 1.00394 | 405 |
| 390.000 | 1.04121 | 1.00703 | .009099 | 3.3010 | 12518.1 | 15783.5 | 175.824 | 21.04 | 30.06 | 1.00499 | 410 |
| 400.000 | 1.01438 | 1.00782 | .008851 | 3.3903 | 12732.3 | 16084.1 | 176.585 | 21.07 | 30.05 | 1.00594 | 415 |
| 410.000 | .98895 | 1.00852 | .008617 | 3.4793 | 12946.6 | 16384.6 | 177.327 | 21.10 | 30.05 | 1.00678 | 420 |
| 420.000 | .96481 | 1.00914 | .008396 | 3.5679 | 13161.1 | 16685.1 | 178.051 | 21.13 | 30.05 | 1.00754 | 425 |
| 430.000 | .94186 | 1.00969 | .008186 | 3.6563 | 13375.7 | 16985.5 | 178.758 | 21.17 | 30.05 | 1.00822 | 430 |
| 440.000 | .92000 | 1.01018 | .007987 | 3.7444 | 13590.5 | 17286.1 | 179.449 | 21.21 | 30.06 | 1.00883 | 435 |
| 450.000 | .89917 | 1.01062 | .007798 | 3.8323 | 13805.5 | 17586.8 | 180.125 | 21.25 | 30.08 | 1.00938 | 440 |
| 470.000 | .86028 | 1.01135 | .007446 | 4.0074 | 14236.6 | 18188.8 | 181.434 | 21.34 | 30.12 | 1.01032 | 449 |
| 500.000 | .80802 | 1.01217 | .006975 | 4.2687 | 14886.1 | 19094.0 | 183.301 | 21.50 | 30.22 | 1.01140 | 462 |
| 550.000 | .73396 | 1.01299 | .006313 | 4.7012 | 15978.2 | 20610.6 | 186.191 | 21.80 | 30.45 | 1.01257 | 484 |
| 600.000 | .67254 | 1.01338 | .005767 | 5.1308 | 17084.6 | 22140.0 | 188.853 | 22.14 | 30.73 | 1.01322 | 504 |
| 650.000 | .62073 | 1.01350 | .005310 | 5.5582 | 18207.2 | 23684.6 | 191.325 | 22.50 | 31.05 | 1.01354 | 523 |
| 700.000 | .57642 | 1.01346 | .004920 | 5.9840 | 19347.0 | 25245.5 | 193.639 | 22.86 | 31.39 | 1.01364 | 541 |
| 750.000 | .53807 | 1.01331 | .004585 | 6.4085 | 20504.5 | 26823.3 | 195.816 | 23.23 | 31.73 | 1.01361 | 558 |
| 800.000 | .50455 | 1.01309 | .004292 | 6.8319 | 21679.5 | 28418.2 | 197.874 | 23.59 | 32.06 | 1.01349 | 575 |
| 850.000 | .47499 | 1.01283 | .004035 | 7.2545 | 22871.7 | 30029.7 | 199.828 | 23.94 | 32.39 | 1.01330 | 592 |
| 900.000 | .44873 | 1.01255 | .003808 | 7.6763 | 24080.3 | 31657.2 | 201.688 | 24.27 | 32.71 | 1.01308 | 607 |
| 950.000 | .42523 | 1.01226 | .003604 | 8.0975 | 25304.6 | 33300.2 | 203.465 | 24.58 | 33.01 | 1.01284 | 623 |
| 1000.000 | .40409 | 1.01196 | .003422 | 8.5181 | 26543.7 | 34957.6 | 205.165 | 24.87 | 33.29 | 1.01259 | 638 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 3.493501 MPa | | | | | | | | | | | |
| 68.906 | 30.36358 | .20082 | 2.200214 | 15.9487 | 10.2 | 125.3 | 74.625 | 36.30 | 58.99 | .00609 | 961 |
| 70.000 | 30.21240 | .19867 | 2.157557 | 15.5727 | 74.6 | 190.2 | 75.555 | 36.30 | 59.23 | .00725 | 952 |
| 80.000 | 28.79382 | .18240 | 1.797045 | 12.3302 | 669.2 | 790.5 | 83.580 | 35.58 | 60.86 | .02770 | 867 |
| 90.000 | 27.28343 | .17111 | 1.480150 | 9.4152 | 1275.2 | 1403.2 | 90.796 | 33.51 | 61.65 | .07461 | 786 |
| 100.000 | 25.62660 | .16396 | 1.195423 | 6.8038 | 1886.1 | 2022.4 | 97.306 | 30.13 | 62.11 | .15806 | 707 |
| 110.000 | 23.72423 | .16101 | .932514 | 4.4793 | 2499.2 | 2646.4 | 103.260 | 25.58 | 63.52 | .28114 | 630 |
| 120.000 | 21.34039 | .16407 | .677923 | 2.4201 | 3138.3 | 3302.0 | 108.973 | 20.40 | 70.44 | .43987 | 546 |
| 130.000 | 17.34446 | .18635 | .387509 | .5699 | 3969.8 | 4171.2 | 115.878 | 18.98 | 132.85 | .62416 | 377 |
| 140.000 | 4.73341 | .63405 | .059442 | .3873 | 6393.7 | 7131.8 | 138.035 | 30.18 | 87.19 | .73447 | 199 |
| 150.000 | 3.75895 | .74519 | .042691 | .6537 | 6877.9 | 7807.3 | 142.707 | 26.08 | 55.68 | .79019 | 223 |
| 160.000 | 3.24680 | .80881 | .034746 | .8524 | 7231.7 | 8307.7 | 145.941 | 24.26 | 45.75 | .83052 | 239 |
| 170.000 | 2.90255 | .85152 | .029834 | 1.0192 | 7534.7 | 8738.3 | 148.553 | 23.22 | 40.84 | .86130 | 252 |
| 180.000 | 2.64566 | .88230 | .026410 | 1.1670 | 7810.7 | 9131.2 | 150.799 | 22.57 | 37.94 | .88545 | 264 |
| 190.000 | 2.44232 | .90546 | .023847 | 1.3020 | 8070.1 | 9500.5 | 152.797 | 22.14 | 36.05 | .90484 | 275 |
| 200.000 | 2.27512 | .92340 | .021834 | 1.4281 | 8318.6 | 9854.1 | 154.610 | 21.84 | 34.73 | .92056 | 284 |
| 210.000 | 2.13393 | .93762 | .020198 | 1.5474 | 8559.3 | 10196.4 | 156.281 | 21.62 | 33.78 | .93351 | 293 |
| 220.000 | 2.01234 | .94907 | .018834 | 1.6615 | 8794.4 | 10530.4 | 157.835 | 21.46 | 33.05 | .94428 | 302 |
| 230.000 | 1.90604 | .95844 | .017673 | 1.7716 | 9025.2 | 10858.0 | 159.291 | 21.33 | 32.50 | .95333 | 310 |
| 240.000 | 1.81197 | .96619 | .016669 | 1.8784 | 9252.7 | 11180.7 | 160.665 | 21.24 | 32.05 | .96099 | 318 |
| 250.000 | 1.72791 | .97266 | .015789 | 1.9825 | 9477.6 | 11499.4 | 161.966 | 21.17 | 31.70 | .96752 | 325 |
| 260.000 | 1.65219 | .97812 | .015010 | 2.0843 | 9700.4 | 11814.9 | 163.203 | 21.11 | 31.41 | .97312 | 332 |
| 270.000 | 1.38330 | .98273 | .014313 | 2.1843 | 9921.6 | 12127.7 | 164.384 | 21.07 | 31.17 | .97793 | 339 |
| 280.000 | 1.52083 | .98670 | .013686 | 2.2826 | 10141.3 | 12438.4 | 165.514 | 21.04 | 30.97 | .98214 | 346 |
| 290.000 | 1.46334 | .99010 | .013117 | 2.3796 | 10359.9 | 12747.2 | 166.597 | 21.01 | 30.80 | .98579 | 352 |
| 300.000 | 1.41039 | .99304 | .012597 | 2.4755 | 10577.5 | 13054.5 | 167.639 | 20.99 | 30.66 | .98898 | 359 |
| 310.000 | 1.36140 | .99558 | .012121 | 2.5703 | 10794.4 | 13360.5 | 168.642 | 20.98 | 30.54 | .99177 | 365 |
| 320.000 | 1.31593 | .99780 | .011683 | 2.6642 | 11010.6 | 13665.4 | 169.610 | 20.97 | 30.44 | .99423 | 371 |
| 330.000 | 1.27358 | .99973 | .011277 | 2.7573 | 11226.2 | 13969.3 | 170.546 | 20.97 | 30.35 | .99641 | 377 |
| 340.000 | 1.23403 | 1.00143 | .010901 | 2.8497 | 11441.5 | 14272.5 | 171.451 | 20.97 | 30.28 | .99833 | 383 |
| 350.000 | 1.19699 | 1.00292 | .010550 | 2.9414 | 11656.4 | 14575.0 | 172.328 | 20.98 | 30.22 | 1.00004 | 388 |
| 360.000 | 1.16222 | 1.00424 | .010223 | 3.0326 | 11871.1 | 14877.0 | 173.178 | 20.99 | 30.17 | 1.00155 | 394 |
| 370.000 | 1.12950 | 1.00539 | .009917 | 3.1233 | 12085.5 | 15178.5 | 174.005 | 21.00 | 30.14 | 1.00291 | 399 |
| 380.000 | 1.09866 | 1.00642 | .009629 | 3.2136 | 12299.9 | 15479.7 | 174.808 | 21.02 | 30.11 | 1.00411 | 405 |
| 390.000 | 1.06952 | 1.00733 | .009359 | 3.3034 | 12514.2 | 15780.6 | 175.590 | 21.04 | 30.08 | 1.00519 | 410 |
| 400.000 | 1.04195 | 1.00813 | .009104 | 3.3929 | 12728.6 | 16081.4 | 176.351 | 21.07 | 30.07 | 1.00616 | 415 |
| 410.000 | 1.01582 | 1.00885 | .008863 | 3.4820 | 12943.0 | 16382.1 | 177.093 | 21.10 | 30.06 | 1.00702 | 420 |
| 420.000 | .99101 | 1.00948 | .008635 | 3.5708 | 13157.5 | 16682.7 | 177.818 | 21.13 | 30.06 | 1.00780 | 425 |
| 430.000 | .96742 | 1.01005 | .008419 | 3.6593 | 13372.2 | 16983.3 | 178.525 | 21.17 | 30.07 | 1.00849 | 430 |
| 440.000 | .94497 | 1.01055 | .008214 | 3.7475 | 13587.1 | 17284.1 | 179.217 | 21.21 | 30.08 | 1.00912 | 435 |
| 450.000 | .92356 | 1.01099 | .008019 | 3.8355 | 13802.3 | 17584.9 | 179.893 | 21.25 | 30.09 | 1.00968 | 440 |
| 470.000 | .88361 | 1.01174 | .007656 | 4.0108 | 14233.5 | 18187.2 | 181.202 | 21.34 | 30.14 | 1.01064 | 449 |
| 500.000 | .82991 | 1.01257 | .007171 | 4.2724 | 14883.2 | 19092.7 | 183.070 | 21.50 | 30.23 | 1.01174 | 463 |
| 550.000 | .75384 | 1.01340 | .006489 | 4.7052 | 15975.5 | 20609.8 | 185.961 | 21.80 | 30.46 | 1.01293 | 484 |
| 600.000 | .69076 | 1.01379 | .005928 | 5.1352 | 17082.1 | 22139.7 | 188.624 | 22.14 | 30.74 | 1.01359 | 504 |
| 650.000 | .63755 | 1.01391 | .005458 | 5.5629 | 18204.9 | 23684.5 | 191.097 | 22.50 | 31.06 | 1.01392 | 523 |
| 700.000 | .59204 | 1.01386 | .005057 | 5.9890 | 19344.9 | 25245.7 | 193.410 | 22.86 | 31.39 | 1.01402 | 541 |
| 750.000 | .55266 | 1.01370 | .004712 | 6.4136 | 20502.6 | 26823.8 | 195.588 | 23.23 | 31.73 | 1.01398 | 559 |
| 800.000 | .51823 | 1.01347 | .004412 | 6.8372 | 21677.7 | 28418.9 | 197.646 | 23.59 | 32.07 | 1.01385 | 576 |
| 850.000 | .48788 | 1.01320 | .004147 | 7.2599 | 22869.9 | 30030.6 | 199.600 | 23.94 | 32.40 | 1.01366 | 592 |
| 900.000 | .46090 | 1.01291 | .003913 | 7.6819 | 24078.7 | 31658.3 | 201.461 | 24.27 | 32.71 | 1.01344 | 608 |
| 950.000 | .43678 | 1.01261 | .003704 | 8.1032 | 25303.0 | 33301.4 | 203.238 | 24.58 | 33.01 | 1.01318 | 623 |
| 1000.000 | .41506 | 1.01230 | .003517 | 8.5240 | 26542.2 | 34959.0 | 204.938 | 24.87 | 33.29 | 1.01292 | 638 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|-------|--------|---------|----------|
| 3.600000 MPa | | | | | | | | | | | |
| 68.930 | 30.36698 | .20685 | 2.201159 | 15.9709 | 10.6 | 129.1 | 74.629 | 36.30 | 58.98 | .00596 | 962 |
| 70.000 | 30.21923 | .20468 | 2.159423 | 15.6030 | 73.5 | 192.6 | 75.539 | 36.30 | 59.21 | .00708 | 953 |
| 80.000 | 28.80244 | .18791 | 1.798882 | 12.3610 | 667.7 | 792.7 | 83.561 | 35.59 | 60.83 | .02703 | 868 |
| 90.000 | 27.29472 | .17626 | 1.482101 | 9.4474 | 1273.2 | 1405.1 | 90.774 | 33.52 | 61.60 | .07278 | 787 |
| 100.000 | 25.64222 | .16885 | 1.197645 | 6.8384 | 1883.4 | 2023.7 | 97.278 | 30.13 | 62.03 | .15415 | 708 |
| 110.000 | 23.74791 | .16575 | .935270 | 4.5175 | 2495.0 | 2646.6 | 103.220 | 25.58 | 63.35 | .27416 | 631 |
| 120.000 | 21.38400 | .16873 | .681894 | 2.4646 | 3130.8 | 3299.2 | 108.908 | 20.40 | 69.91 | .42900 | 549 |
| 130.000 | 17.52146 | .19009 | .397778 | .6342 | 3942.1 | 4147.6 | 115.649 | 18.89 | 124.54 | .60912 | 386 |
| 140.000 | 5.02018 | .61605 | .063998 | .3558 | 6332.3 | 7049.4 | 137.290 | 30.79 | 94.73 | .72626 | 197 |
| 150.000 | 3.92449 | .73552 | .045030 | .6331 | 6843.9 | 7761.3 | 142.216 | 26.33 | 57.52 | .78405 | 222 |
| 160.000 | 3.37289 | .80231 | .036389 | .8370 | 7207.1 | 8274.4 | 145.532 | 24.40 | 46.65 | .82569 | 239 |
| 170.000 | 3.00767 | .84681 | .031124 | 1.0071 | 7515.1 | 8712.0 | 148.186 | 23.32 | 41.39 | .85741 | 252 |
| 180.000 | 2.73731 | .87876 | .027484 | 1.1573 | 7794.2 | 9109.4 | 150.458 | 22.64 | 38.32 | .88228 | 264 |
| 190.000 | 2.52436 | .90274 | .024774 | 1.2942 | 8055.9 | 9482.0 | 152.473 | 22.19 | 36.33 | .90224 | 275 |
| 200.000 | 2.34986 | .92128 | .022654 | 1.4217 | 8305.9 | 9838.0 | 154.299 | 21.87 | 34.95 | .91842 | 284 |
| 210.000 | 2.20287 | .93596 | .020937 | 1.5422 | 8548.0 | 10182.2 | 155.979 | 21.65 | 33.95 | .93174 | 293 |
| 220.000 | 2.07652 | .94778 | .019508 | 1.6574 | 8784.1 | 10517.7 | 157.540 | 21.48 | 33.19 | .94282 | 302 |
| 230.000 | 1.96621 | .95743 | .018294 | 1.7683 | 9015.7 | 10846.7 | 159.003 | 21.35 | 32.61 | .95213 | 310 |
| 240.000 | 1.86871 | .96542 | .017246 | 1.8758 | 9243.9 | 11170.4 | 160.381 | 21.26 | 32.15 | .96001 | 318 |
| 250.000 | 1.78166 | .97208 | .016329 | 1.9806 | 9469.4 | 11490.0 | 161.685 | 21.18 | 31.78 | .96672 | 325 |
| 260.000 | 1.70330 | .97769 | .015517 | 2.0830 | 9692.8 | 11806.3 | 162.926 | 21.12 | 31.48 | .97248 | 332 |
| 270.000 | 1.63227 | .98243 | .014793 | 2.1833 | 9914.3 | 12119.9 | 164.109 | 21.08 | 31.23 | .97744 | 339 |
| 280.000 | 1.56749 | .98652 | .014140 | 2.2823 | 10134.5 | 12431.1 | 165.241 | 21.04 | 31.03 | .98175 | 346 |
| 290.000 | 1.50810 | .99001 | .013549 | 2.3797 | 10353.4 | 12740.5 | 166.327 | 21.02 | 30.85 | .98549 | 353 |
| 300.000 | 1.45340 | .99302 | .013010 | 2.4759 | 10571.4 | 13048.3 | 167.370 | 21.00 | 30.71 | .98877 | 359 |
| 310.000 | 1.40283 | .99563 | .012516 | 2.5711 | 10788.5 | 13354.7 | 168.375 | 20.98 | 30.58 | .99164 | 365 |
| 320.000 | 1.35589 | .99791 | .012062 | 2.6653 | 11004.9 | 13660.0 | 169.345 | 20.98 | 30.48 | .99417 | 371 |
| 330.000 | 1.31220 | .99989 | .011642 | 2.7587 | 11220.8 | 13964.3 | 170.281 | 20.97 | 30.39 | .99640 | 377 |
| 340.000 | 1.27139 | 1.00163 | .011252 | 2.8513 | 11436.3 | 14267.8 | 171.187 | 20.98 | 30.31 | .99838 | 383 |
| 350.000 | 1.23318 | 1.00316 | .010889 | 2.9434 | 11651.4 | 14570.7 | 172.065 | 20.98 | 30.25 | 1.00013 | 389 |
| 360.000 | 1.19732 | 1.00451 | .010550 | 3.0348 | 11866.2 | 14872.9 | 172.916 | 20.99 | 30.20 | 1.00169 | 394 |
| 370.000 | 1.16359 | 1.00570 | .010233 | 3.1257 | 12080.8 | 15174.7 | 173.743 | 21.01 | 30.16 | 1.00307 | 400 |
| 380.000 | 1.13178 | 1.00675 | .009936 | 3.2162 | 12295.4 | 15476.2 | 174.547 | 21.02 | 30.13 | 1.00431 | 405 |
| 390.000 | 1.10175 | 1.00767 | .009656 | 3.3062 | 12509.8 | 15777.4 | 175.330 | 21.05 | 30.11 | 1.00542 | 410 |
| 400.000 | 1.07333 | 1.00850 | .009392 | 3.3958 | 12724.3 | 16078.4 | 176.092 | 21.07 | 30.09 | 1.00641 | 416 |
| 410.000 | 1.04639 | 1.00923 | .009143 | 3.4851 | 12938.8 | 16379.2 | 176.834 | 21.10 | 30.08 | 1.00730 | 421 |
| 420.000 | 1.02082 | 1.00988 | .008907 | 3.5740 | 13153.5 | 16680.0 | 177.559 | 21.13 | 30.08 | 1.00809 | 426 |
| 430.000 | .99651 | 1.01045 | .008684 | 3.6627 | 13368.3 | 16980.9 | 178.267 | 21.17 | 30.08 | 1.00880 | 431 |
| 440.000 | .97337 | 1.01096 | .008472 | 3.7510 | 13583.3 | 17281.8 | 178.959 | 21.21 | 30.09 | 1.00945 | 435 |
| 450.000 | .95131 | 1.01142 | .008271 | 3.8392 | 13798.5 | 17582.8 | 179.635 | 21.25 | 30.11 | 1.01002 | 440 |
| 470.000 | .91015 | 1.01218 | .007896 | 4.0147 | 14229.9 | 18185.3 | 180.946 | 21.34 | 30.15 | 1.01100 | 450 |
| 500.000 | .85482 | 1.01302 | .007395 | 4.2766 | 14879.9 | 19091.2 | 182.814 | 21.50 | 30.25 | 1.01213 | 463 |
| 550.000 | .77646 | 1.01387 | .006691 | 4.7099 | 15972.5 | 20608.9 | 185.707 | 21.80 | 30.47 | 1.01335 | 484 |
| 600.000 | .71148 | 1.01426 | .006112 | 5.1402 | 17079.4 | 22139.2 | 188.370 | 22.14 | 30.75 | 1.01402 | 504 |
| 650.000 | .65668 | 1.01437 | .005626 | 5.5683 | 18202.4 | 23684.5 | 190.843 | 22.50 | 31.06 | 1.01435 | 523 |
| 700.000 | .60981 | 1.01431 | .005213 | 5.9946 | 19342.6 | 25246.0 | 193.158 | 22.86 | 31.40 | 1.01445 | 542 |
| 750.000 | .56923 | 1.01414 | .004857 | 6.4195 | 20500.3 | 26824.4 | 195.335 | 23.23 | 31.74 | 1.01441 | 559 |
| 800.000 | .53380 | 1.01390 | .004547 | 6.8433 | 21675.6 | 28419.7 | 197.394 | 23.59 | 32.07 | 1.01427 | 576 |
| 850.000 | .50254 | 1.01362 | .004275 | 7.2662 | 22868.0 | 30031.6 | 199.349 | 23.94 | 32.40 | 1.01407 | 592 |
| 900.000 | .47476 | 1.01332 | .004033 | 7.6883 | 24076.8 | 31659.5 | 201.210 | 24.27 | 32.71 | 1.01384 | 608 |
| 950.000 | .44991 | 1.01301 | .003818 | 8.1098 | 25301.3 | 33302.8 | 202.986 | 24.58 | 33.01 | 1.01357 | 623 |
| 1000.000 | .42755 | 1.01269 | .003624 | 8.5307 | 26540.6 | 34960.6 | 204.687 | 24.87 | 33.29 | 1.01330 | 638 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|-------|--------|---------|----------|
| 3.800000 MPa | | | | | | | | | | | |
| 68.975 | 30.37334 | .21815 | 2.202927 | 16.0124 | 11.2 | 136.3 | 74.637 | 36.30 | 58.96 | .00576 | 963 |
| 70.000 | 30.23203 | .21596 | 2.162924 | 15.6600 | 71.4 | 197.1 | 75.509 | 36.31 | 59.19 | .00678 | 954 |
| 80.000 | 28.81858 | .19824 | 1.802327 | 12.4188 | 665.0 | 796.8 | 83.526 | 35.59 | 60.79 | .02588 | 870 |
| 90.000 | 27.31583 | .18590 | 1.485752 | 9.5079 | 1269.5 | 1408.6 | 90.732 | 33.52 | 61.53 | .06963 | 789 |
| 100.000 | 25.67133 | .17803 | 1.201796 | 6.9032 | 1878.2 | 2026.2 | 97.225 | 30.14 | 61.89 | .14741 | 711 |
| 110.000 | 23.79183 | .17463 | .940398 | 4.5888 | 2487.3 | 2647.0 | 103.148 | 25.60 | 63.05 | .26213 | 635 |
| 120.000 | 21.46381 | .17744 | .689202 | 2.5474 | 3117.2 | 3294.2 | 108.789 | 20.41 | 68.98 | .41024 | 554 |
| 130.000 | 17.81112 | .19738 | .415026 | .7486 | 3896.5 | 4109.9 | 115.272 | 18.77 | 113.05 | .58314 | 401 |
| 140.000 | 5.63607 | .57922 | .073940 | .2953 | 6203.3 | 6877.5 | 135.793 | 32.03 | 113.64 | .71069 | 193 |
| 150.000 | 4.25052 | .71683 | .049716 | .5941 | 6777.6 | 7671.6 | 141.291 | 26.80 | 61.34 | .77255 | 220 |
| 160.000 | 3.61608 | .78993 | .039609 | .8080 | 7159.7 | 8210.6 | 144.775 | 24.67 | 48.43 | .81666 | 237 |
| 170.000 | 3.20853 | .83790 | .033625 | .9844 | 7477.6 | 8661.9 | 147.513 | 23.50 | 42.46 | .85014 | 252 |
| 180.000 | 2.91150 | .87208 | .029552 | 1.1391 | 7762.9 | 9068.1 | 149.836 | 22.77 | 39.05 | .87637 | 264 |
| 190.000 | 2.67978 | .89762 | .026552 | 1.2795 | 8028.9 | 9446.9 | 151.884 | 22.28 | 36.86 | .89739 | 274 |
| 200.000 | 2.49113 | .91732 | .024222 | 1.4098 | 8282.2 | 9807.6 | 153.734 | 21.95 | 35.36 | .91443 | 284 |
| 210.000 | 2.33296 | .93287 | .022345 | 1.5326 | 8526.6 | 10155.4 | 155.432 | 21.70 | 34.27 | .92845 | 293 |
| 220.000 | 2.19747 | .94537 | .020790 | 1.6497 | 8764.7 | 10493.9 | 157.007 | 21.52 | 33.46 | .94011 | 302 |
| 230.000 | 2.07951 | .95556 | .019473 | 1.7622 | 8997.9 | 10825.3 | 158.480 | 21.39 | 32.83 | .94990 | 310 |
| 240.000 | 1.97546 | .96398 | .018340 | 1.8711 | 9227.5 | 11151.1 | 159.866 | 21.29 | 32.34 | .95818 | 318 |
| 250.000 | 1.88273 | .97100 | .017352 | 1.9771 | 9454.1 | 11472.4 | 161.178 | 21.21 | 31.95 | .96524 | 326 |
| 260.000 | 1.79937 | .97691 | .016478 | 2.0806 | 9678.4 | 11790.2 | 162.425 | 21.14 | 31.62 | .97129 | 333 |
| 270.000 | 1.72389 | .98191 | .015700 | 2.1821 | 9900.8 | 12105.1 | 163.613 | 21.10 | 31.36 | .97651 | 340 |
| 280.000 | 1.65513 | .98618 | .015000 | 2.2818 | 10121.7 | 12417.6 | 164.749 | 21.06 | 31.14 | .98103 | 347 |
| 290.000 | 1.59214 | .98985 | .014367 | 2.3800 | 10341.2 | 12728.0 | 165.839 | 21.03 | 30.95 | .98496 | 353 |
| 300.000 | 1.53417 | .99301 | .013791 | 2.4769 | 10559.8 | 13036.7 | 166.885 | 21.01 | 30.79 | .98840 | 360 |
| 310.000 | 1.48059 | .99575 | .013263 | 2.5727 | 10777.4 | 13444.0 | 167.893 | 20.99 | 30.66 | .99142 | 366 |
| 320.000 | 1.43090 | .99813 | .012778 | 2.6675 | 10994.3 | 13650.0 | 168.865 | 20.98 | 30.55 | .99407 | 372 |
| 330.000 | 1.38466 | 1.00021 | .012329 | 2.7614 | 11210.7 | 13955.0 | 169.803 | 20.98 | 30.46 | .99641 | 378 |
| 340.000 | 1.34149 | 1.00203 | .011914 | 2.8546 | 11426.5 | 14259.2 | 170.711 | 20.98 | 30.38 | .99848 | 384 |
| 350.000 | 1.30109 | 1.00363 | .011527 | 2.9470 | 11642.0 | 14562.6 | 171.591 | 20.99 | 30.31 | 1.00032 | 389 |
| 360.000 | 1.26318 | 1.00503 | .011167 | 3.0389 | 11857.1 | 14865.4 | 172.444 | 21.00 | 30.25 | 1.00195 | 395 |
| 370.000 | 1.22752 | 1.00627 | .010829 | 3.1302 | 12072.1 | 15167.7 | 173.272 | 21.01 | 30.21 | 1.00340 | 400 |
| 380.000 | 1.19392 | 1.00737 | .010513 | 3.2210 | 12286.9 | 15469.6 | 174.077 | 21.03 | 30.18 | 1.00470 | 406 |
| 390.000 | 1.16219 | 1.00834 | .010215 | 3.3114 | 12501.6 | 15771.3 | 174.861 | 21.05 | 30.15 | 1.00586 | 411 |
| 400.000 | 1.13217 | 1.00919 | .009935 | 3.4014 | 12716.3 | 16072.7 | 175.624 | 21.08 | 30.13 | 1.00690 | 416 |
| 410.000 | 1.10373 | 1.00995 | .009671 | 3.4909 | 12931.0 | 16373.9 | 176.368 | 21.10 | 30.12 | 1.00782 | 421 |
| 420.000 | 1.07673 | 1.01063 | .009420 | 3.5802 | 13145.9 | 16675.1 | 177.093 | 21.14 | 30.12 | 1.00866 | 426 |
| 430.000 | 1.05107 | 1.01123 | .009183 | 3.6691 | 13360.9 | 16976.3 | 177.802 | 21.17 | 30.12 | 1.00940 | 431 |
| 440.000 | 1.02664 | 1.01176 | .008958 | 3.7577 | 13576.1 | 17277.5 | 178.495 | 21.21 | 30.13 | 1.01007 | 436 |
| 450.000 | 1.00336 | 1.01223 | .008745 | 3.8461 | 13791.5 | 17578.8 | 179.172 | 21.25 | 30.14 | 1.01067 | 441 |
| 470.000 | .95992 | 1.01301 | .008347 | 4.0221 | 14223.3 | 18181.9 | 180.483 | 21.34 | 30.18 | 1.01170 | 450 |
| 500.000 | .90155 | 1.01389 | .007816 | 4.2846 | 14873.6 | 19088.6 | 182.353 | 21.50 | 30.27 | 1.01287 | 464 |
| 550.000 | .81889 | 1.01475 | .007071 | 4.7188 | 15966.9 | 20607.3 | 185.248 | 21.80 | 30.49 | 1.01414 | 485 |
| 600.000 | .75036 | 1.01515 | .006457 | 5.1498 | 17074.2 | 22138.5 | 187.912 | 22.14 | 30.77 | 1.01483 | 505 |
| 650.000 | .69257 | 1.01525 | .005944 | 5.5784 | 18197.6 | 23684.5 | 190.387 | 22.50 | 31.08 | 1.01517 | 524 |
| 700.000 | .64315 | 1.01517 | .005507 | 6.0052 | 19338.2 | 25246.6 | 192.702 | 22.86 | 31.41 | 1.01527 | 542 |
| 750.000 | .60038 | 1.01498 | .005130 | 6.4306 | 20196.2 | 26825.5 | 194.881 | 23.23 | 31.75 | 1.01521 | 560 |
| 800.000 | .56300 | 1.01472 | .004802 | 6.8547 | 21671.8 | 28421.3 | 196.940 | 23.59 | 32.08 | 1.01506 | 576 |
| 850.000 | .53004 | 1.01442 | .004514 | 7.2780 | 22864.3 | 30033.6 | 198.895 | 23.94 | 32.41 | 1.01485 | 593 |
| 900.000 | .50076 | 1.01410 | .004259 | 7.7004 | 24073.4 | 31661.9 | 200.756 | 24.27 | 32.72 | 1.01459 | 608 |
| 950.000 | .47456 | 1.01376 | .004031 | 8.1221 | 25298.0 | 3305.5 | 202.534 | 24.58 | 33.02 | 1.01431 | 624 |
| 1000.000 | .45098 | 1.01342 | .003827 | 8.5433 | 26537.4 | 34963.5 | 204.235 | 24.87 | 33.30 | 1.01402 | 639 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| | | | | | | | | | | | |
| 4.000000 MPa | | | | | | | | | | | |
| 69.019 | 30.37969 | .22944 | 2.204692 | 16.0540 | 11.8 | 143.4 | 74.646 | 36.30 | 58.95 | .00557 | 964 |
| 70.000 | 30.24478 | .22724 | 2.166419 | 15.7169 | 69.3 | 201.6 | 75.479 | 36.31 | 59.16 | .00652 | 956 |
| 80.000 | 28.83465 | .20855 | 1.805764 | 12.4765 | 662.2 | 801.0 | 83.492 | 35.59 | 60.74 | .02484 | 871 |
| 90.000 | 27.33679 | .19554 | 1.489389 | 9.5682 | 1265.9 | 1412.2 | 90.690 | 33.53 | 61.45 | .06680 | 791 |
| 100.000 | 25.70016 | .18719 | 1.205920 | 6.9677 | 1873.1 | 2028.8 | 97.172 | 30.15 | 61.75 | .14136 | 713 |
| 110.000 | 23.83508 | .18349 | .945467 | 4.6597 | 2479.7 | 2647.5 | 103.076 | 25.61 | 62.75 | .25133 | 638 |
| 120.000 | 21.54109 | .18611 | .696327 | 2.6290 | 3103.9 | 3289.6 | 108.673 | 20.42 | 68.12 | .39338 | 559 |
| 130.000 | 18.06052 | .20490 | .430327 | .8567 | 3857.0 | 4078.4 | 114.944 | 18.68 | 104.82 | .55973 | 414 |
| 140.000 | 6.39509 | .53734 | .086405 | .2342 | 6049.9 | 6675.4 | 134.110 | 33.45 | 142.58 | .69481 | 188 |
| 150.000 | 4.59874 | .69742 | .054831 | .5550 | 6707.5 | 7577.3 | 140.361 | 27.28 | 65.71 | .76105 | 218 |
| 160.000 | 3.86819 | .77731 | .043015 | .7789 | 7111.0 | 8145.1 | 144.031 | 24.94 | 50.35 | .80765 | 236 |
| 170.000 | 3.41408 | .82890 | .036233 | .9617 | 7439.4 | 8611.0 | 146.858 | 23.68 | 43.59 | .84292 | 251 |
| 180.000 | 3.08849 | .86538 | .031691 | 1.1209 | 7731.3 | 9026.4 | 149.233 | 22.89 | 39.80 | .87050 | 263 |
| 190.000 | 2.83700 | .89251 | .028379 | 1.2648 | 8001.7 | 9411.6 | 151.316 | 22.38 | 37.41 | .89258 | 274 |
| 200.000 | 2.63360 | .91336 | .025826 | 1.3979 | 8258.2 | 9777.0 | 153.191 | 22.02 | 35.77 | .91047 | 284 |
| 210.000 | 2.46387 | .92979 | .023780 | 1.5230 | 8505.2 | 10128.6 | 154.907 | 21.76 | 34.60 | .92519 | 294 |
| 220.000 | 2.31899 | .94298 | .022094 | 1.6420 | 8745.2 | 10470.1 | 156.496 | 21.57 | 33.73 | .93743 | 302 |
| 230.000 | 2.19319 | .95372 | .020671 | 1.7562 | 8980.1 | 10803.9 | 157.980 | 21.43 | 33.06 | .94770 | 311 |
| 240.000 | 2.08248 | .96257 | .019450 | 1.8665 | 9211.0 | 11131.8 | 159.375 | 21.32 | 32.53 | .95639 | 318 |
| 250.000 | 1.98397 | .96995 | .018387 | 1.9737 | 9438.7 | 11454.9 | 160.694 | 21.23 | 32.11 | .96379 | 326 |
| 260.000 | 1.89555 | .97615 | .017450 | 2.0783 | 9664.0 | 11774.2 | 161.947 | 21.16 | 31.77 | .97013 | 333 |
| 270.000 | 1.81558 | .98140 | .016616 | 2.1808 | 9887.3 | 12090.4 | 163.140 | 21.11 | 31.48 | .97560 | 340 |
| 280.000 | 1.74279 | .98587 | .015868 | 2.2813 | 10108.9 | 12404.0 | 164.281 | 21.07 | 31.25 | .98033 | 347 |
| 290.000 | 1.67617 | .98971 | .015192 | 2.3803 | 10329.1 | 12715.5 | 165.374 | 21.04 | 31.05 | .98445 | 354 |
| 300.000 | 1.61490 | .99302 | .014577 | 2.4779 | 10548.2 | 13025.2 | 166.423 | 21.02 | 30.88 | .98805 | 360 |
| 310.000 | 1.55831 | .99588 | .014015 | 2.5744 | 10766.4 | 13333.3 | 167.434 | 21.00 | 30.74 | .99121 | 366 |
| 320.000 | 1.50585 | .99837 | .013498 | 2.6698 | 10983.8 | 13640.1 | 168.408 | 20.99 | 30.62 | .99399 | 372 |
| 330.000 | 1.45705 | 1.00054 | .013021 | 2.7642 | 11200.5 | 13945.8 | 169.349 | 20.99 | 30.52 | .99643 | 378 |
| 340.000 | 1.41151 | 1.00244 | .012580 | 2.8579 | 11416.8 | 14250.6 | 170.258 | 20.99 | 30.44 | .99860 | 384 |
| 350.000 | 1.36891 | 1.00411 | .012169 | 2.9508 | 11632.6 | 14554.6 | 171.140 | 20.99 | 30.37 | 1.00052 | 390 |
| 360.000 | 1.32895 | 1.00557 | .011786 | 3.0431 | 11848.1 | 14858.0 | 171.994 | 21.00 | 30.31 | 1.00223 | 395 |
| 370.000 | 1.29137 | 1.00686 | .011428 | 3.1348 | 12063.3 | 15160.8 | 172.824 | 21.02 | 30.26 | 1.00375 | 401 |
| 380.000 | 1.25597 | 1.00800 | .011093 | 3.2260 | 12278.4 | 15463.2 | 173.630 | 21.03 | 30.22 | 1.00510 | 406 |
| 390.000 | 1.22254 | 1.00901 | .010777 | 3.3167 | 12493.4 | 15765.2 | 174.415 | 21.05 | 30.19 | 1.00631 | 412 |
| 400.000 | 1.19093 | 1.00990 | .010480 | 3.4070 | 12708.3 | 16067.1 | 175.179 | 21.08 | 30.17 | 1.00739 | 417 |
| 410.000 | 1.16097 | 1.01069 | .010200 | 3.4969 | 12923.3 | 16368.7 | 175.924 | 21.11 | 30.16 | 1.00836 | 422 |
| 420.000 | 1.13254 | 1.01139 | .009935 | 3.5864 | 13138.4 | 16670.2 | 176.651 | 21.14 | 30.15 | 1.00923 | 427 |
| 430.000 | 1.10553 | 1.01201 | .009684 | 3.6756 | 13353.6 | 16971.7 | 177.360 | 21.17 | 30.15 | 1.01001 | 432 |
| 440.000 | 1.07982 | 1.01256 | .009446 | 3.7645 | 13569.0 | 17273.3 | 178.053 | 21.21 | 30.16 | 1.01071 | 437 |
| 450.000 | 1.05531 | 1.01305 | .009220 | 3.8531 | 13784.6 | 17574.9 | 178.731 | 21.25 | 30.17 | 1.01133 | 441 |
| 470.000 | 1.00960 | 1.01386 | .008800 | 4.0296 | 14216.6 | 18178.6 | 180.044 | 21.34 | 30.21 | 1.01240 | 451 |
| 500.000 | .94818 | 1.01476 | .008239 | 4.2927 | 14867.4 | 19086.0 | 181.915 | 21.50 | 30.29 | 1.01362 | 464 |
| 550.000 | .86123 | 1.01564 | .007451 | 4.7277 | 15961.3 | 20605.8 | 184.812 | 21.80 | 30.51 | 1.01494 | 486 |
| 600.000 | .78916 | 1.01604 | .006804 | 5.1594 | 17069.1 | 22137.8 | 187.478 | 22.14 | 30.78 | 1.01563 | 506 |
| 650.000 | .72839 | 1.01613 | .006261 | 5.5886 | 18192.9 | 23684.5 | 189.954 | 22.50 | 31.09 | 1.01599 | 525 |
| 700.000 | .67642 | 1.01604 | .005800 | 6.0159 | 19333.8 | 25247.3 | 192.270 | 22.86 | 31.42 | 1.01608 | 543 |
| 750.000 | .63146 | 1.01583 | .005403 | 6.4417 | 20492.1 | 26826.7 | 194.449 | 23.23 | 31.76 | 1.01602 | 560 |
| 800.000 | .59215 | 1.01554 | .005038 | 6.8662 | 21667.9 | 28422.9 | 196.509 | 23.59 | 32.09 | 1.01586 | 577 |
| 850.000 | .55750 | 1.01522 | .004754 | 7.2898 | 22860.7 | 30035.6 | 198.465 | 23.94 | 32.42 | 1.01562 | 593 |
| 900.000 | .52671 | 1.01487 | .004485 | 7.7125 | 24069.9 | 31664.3 | 200.326 | 24.27 | 32.73 | 1.01535 | 609 |
| 950.000 | .49916 | 1.01451 | .004245 | 8.1345 | 25294.7 | 33308.2 | 202.104 | 24.58 | 33.03 | 1.01506 | 624 |
| 1000.000 | .47437 | 1.01415 | .004030 | 8.5559 | 26534.3 | 34966.5 | 203.805 | 24.87 | 33.31 | 1.01475 | 639 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|-------|--------|---------|----------|
| 4.200000 MPa | | | | | | | | | | | |
| 69.064 | 30.38602 | .24071 | 2.206452 | 16.0955 | 12.4 | 150.6 | 74.654 | 36.30 | 58.93 | .00541 | 965 |
| 70.000 | 30.25748 | .23850 | 2.169910 | 15.7738 | 67.3 | 206.1 | 75.449 | 36.31 | 59.13 | .00628 | 957 |
| 80.000 | 28.85064 | .21886 | 1.809193 | 12.5342 | 659.5 | 805.1 | 83.457 | 35.60 | 60.70 | .02391 | 873 |
| 90.000 | 27.35763 | .20516 | 1.493012 | 9.6284 | 1262.3 | 1415.8 | 90.648 | 33.54 | 61.38 | .06424 | 793 |
| 100.000 | 25.72873 | .19633 | 1.210017 | 7.0320 | 1868.1 | 2031.3 | 97.120 | 30.16 | 61.61 | .13589 | 716 |
| 110.000 | 23.87768 | .19232 | .950478 | 4.7302 | 2472.2 | 2648.1 | 103.005 | 25.62 | 62.47 | .24156 | 641 |
| 120.000 | 21.61602 | .19474 | .703281 | 2.7096 | 3091.1 | 3285.4 | 108.560 | 20.43 | 67.31 | .37814 | 564 |
| 130.000 | 18.28085 | .21256 | .444199 | .9599 | 3821.8 | 4051.5 | 114.652 | 18.61 | 98.57 | .53853 | 426 |
| 140.000 | 7.37793 | .48905 | .102797 | .1768 | 5860.6 | 6429.9 | 132.148 | 35.01 | 188.76 | .67855 | 184 |
| 150.000 | 4.97247 | .67725 | .060436 | .5159 | 6633.4 | 7478.1 | 139.420 | 27.78 | 70.74 | .74955 | 216 |
| 160.000 | 4.12989 | .76446 | .046622 | .7498 | 7060.8 | 8077.7 | 143.297 | 25.22 | 52.42 | .79869 | 235 |
| 170.000 | 3.62454 | .81981 | .038953 | .9390 | 7400.5 | 8559.3 | 146.219 | 23.85 | 44.77 | .83574 | 250 |
| 180.000 | 3.26837 | .85864 | .033902 | 1.1028 | 7699.2 | 8984.2 | 148.649 | 23.02 | 40.58 | .86466 | 263 |
| 190.000 | 2.99604 | .88738 | .030256 | 1.2502 | 7974.2 | 9376.0 | 150.768 | 22.47 | 37.97 | .88781 | 274 |
| 200.000 | 2.77728 | .90942 | .027467 | 1.3861 | 8234.1 | 9746.4 | 152.668 | 22.09 | 36.20 | .90655 | 284 |
| 210.000 | 2.59560 | .92674 | .025245 | 1.5135 | 8483.6 | 10101.7 | 154.402 | 21.81 | 34.94 | .92197 | 294 |
| 220.000 | 2.44108 | .94061 | .023420 | 1.6344 | 8725.7 | 10446.2 | 156.005 | 21.61 | 34.00 | .93478 | 302 |
| 230.000 | 2.30727 | .95189 | .021887 | 1.7502 | 8962.2 | 10782.5 | 157.500 | 21.46 | 33.29 | .94552 | 311 |
| 240.000 | 2.18976 | .96118 | .020574 | 1.8620 | 9194.5 | 11112.5 | 158.904 | 21.35 | 32.72 | .95461 | 319 |
| 250.000 | 2.08539 | .96892 | .019434 | 1.9705 | 9423.4 | 11437.4 | 160.231 | 21.26 | 32.27 | .96235 | 326 |
| 260.000 | 1.99183 | .97541 | .018432 | 2.0761 | 9649.6 | 11758.2 | 161.489 | 21.19 | 31.91 | .96899 | 334 |
| 270.000 | 1.90732 | .98090 | .017541 | 2.1795 | 9873.7 | 12075.8 | 162.688 | 21.13 | 31.61 | .97470 | 341 |
| 280.000 | 1.83046 | .98559 | .016744 | 2.2810 | 10096.1 | 12390.6 | 163.833 | 21.09 | 31.36 | .97966 | 347 |
| 290.000 | 1.76018 | .98960 | .016023 | 2.3807 | 10317.0 | 12703.1 | 164.929 | 21.05 | 31.15 | .98396 | 354 |
| 300.000 | 1.69559 | .99305 | .015369 | 2.4791 | 10536.7 | 13013.7 | 165.982 | 21.03 | 30.97 | .98772 | 361 |
| 310.000 | 1.63597 | .99604 | .014772 | 2.5762 | 10755.4 | 13322.7 | 166.995 | 21.01 | 30.82 | .99102 | 367 |
| 320.000 | 1.58073 | .99863 | .014223 | 2.6721 | 10973.2 | 13630.2 | 167.972 | 21.00 | 30.70 | .99392 | 373 |
| 330.000 | 1.52936 | 1.00090 | .013717 | 2.7671 | 11190.4 | 13936.7 | 168.915 | 21.00 | 30.59 | .99647 | 379 |
| 340.000 | 1.48145 | 1.00287 | .013249 | 2.8613 | 11407.0 | 14242.1 | 169.827 | 20.99 | 30.50 | .99874 | 385 |
| 350.000 | 1.43664 | 1.00461 | .012814 | 2.9547 | 11623.2 | 14546.7 | 170.710 | 21.00 | 30.42 | 1.00074 | 390 |
| 360.000 | 1.39462 | 1.00613 | .012409 | 3.0474 | 11839.0 | 14850.6 | 171.566 | 21.01 | 30.36 | 1.00252 | 396 |
| 370.000 | 1.35512 | 1.00747 | .012030 | 3.1395 | 12054.6 | 15153.9 | 172.397 | 21.02 | 30.31 | 1.00410 | 402 |
| 380.000 | 1.31791 | 1.00866 | .011675 | 3.2311 | 12269.9 | 15456.8 | 173.205 | 21.04 | 30.27 | 1.00552 | 407 |
| 390.000 | 1.28279 | 1.00970 | .011342 | 3.3222 | 12485.2 | 15759.3 | 173.990 | 21.06 | 30.23 | 1.00678 | 412 |
| 400.000 | 1.24958 | 1.01062 | .011028 | 3.4128 | 12700.4 | 16061.5 | 174.755 | 21.08 | 30.21 | 1.00790 | 417 |
| 410.000 | 1.21811 | 1.01144 | .010732 | 3.5030 | 12915.6 | 16363.5 | 175.501 | 21.11 | 30.20 | 1.00891 | 422 |
| 420.000 | 1.18826 | 1.01217 | .010452 | 3.5928 | 13130.9 | 16665.4 | 176.229 | 21.14 | 30.19 | 1.00982 | 427 |
| 430.000 | 1.15989 | 1.01281 | .010187 | 3.6822 | 13346.3 | 16967.3 | 176.939 | 21.18 | 30.18 | 1.01063 | 432 |
| 440.000 | 1.13290 | 1.01338 | .009936 | 3.7714 | 13561.8 | 17269.2 | 177.633 | 21.21 | 30.19 | 1.01135 | 437 |
| 450.000 | 1.10717 | 1.01388 | .009697 | 3.8603 | 13777.6 | 17571.1 | 178.311 | 21.26 | 30.20 | 1.01200 | 442 |
| 470.000 | 1.05918 | 1.01472 | .009254 | 4.0372 | 14210.0 | 18175.4 | 179.625 | 21.35 | 30.23 | 1.01311 | 451 |
| 500.000 | .99473 | 1.01564 | .008662 | 4.3009 | 14861.3 | 19083.5 | 181.498 | 21.50 | 30.32 | 1.01438 | 465 |
| 550.000 | .90350 | 1.01654 | .007832 | 4.7367 | 15955.7 | 20604.3 | 184.397 | 21.80 | 30.53 | 1.01574 | 486 |
| 600.000 | .82788 | 1.01693 | .007150 | 5.1691 | 17064.0 | 22137.2 | 187.065 | 22.14 | 30.80 | 1.01647 | 506 |
| 650.000 | .76414 | 1.01701 | .006580 | 5.5989 | 18188.2 | 23684.6 | 189.542 | 22.50 | 31.10 | 1.01682 | 525 |
| 700.000 | .70964 | 1.01690 | .006094 | 6.0267 | 19329.4 | 25247.9 | 191.858 | 22.86 | 31.43 | 1.01690 | 543 |
| 750.000 | .66248 | 1.01667 | .005677 | 6.4529 | 20488.0 | 26827.9 | 194.038 | 23.23 | 31.77 | 1.01683 | 561 |
| 800.000 | .62126 | 1.01637 | .005313 | 6.8778 | 21664.1 | 28424.5 | 196.099 | 23.59 | 32.10 | 1.01665 | 578 |
| 850.000 | .58491 | 1.01602 | .004994 | 7.3016 | 22857.1 | 30037.6 | 198.055 | 23.94 | 32.42 | 1.01640 | 594 |
| 900.000 | .55262 | 1.01565 | .004711 | 7.7246 | 24066.5 | 31666.7 | 199.917 | 24.27 | 32.73 | 1.01611 | 609 |
| 950.000 | .52373 | 1.01527 | .004459 | 8.1469 | 25291.5 | 33310.9 | 201.695 | 24.58 | 33.03 | 1.01580 | 625 |
| 1000.000 | .49773 | 1.01489 | .004233 | 8.5686 | 26531.2 | 34969.5 | 203.397 | 24.87 | 33.31 | 1.01547 | 640 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 4.400000 MPa | | | | | | | | | | | |
| 69.108 | 30.39233 | .25195 | 2.208207 | 16.1370 | 13.0 | 157.8 | 74.662 | 36.31 | 58.91 | .00526 | 966 |
| 70.000 | 30.27014 | .24975 | 2.173396 | 15.8307 | 65.2 | 210.6 | 75.419 | 36.31 | 59.10 | .00606 | 959 |
| 80.000 | 28.86656 | .22916 | 1.812613 | 12.5918 | 656.9 | 809.3 | 83.422 | 35.60 | 60.65 | .02306 | 875 |
| 90.000 | 27.37834 | .21477 | 1.496621 | 9.6885 | 1258.7 | 1419.4 | 90.607 | 33.54 | 61.30 | .06192 | 795 |
| 100.000 | 25.75705 | .20546 | 1.214088 | 7.0961 | 1863.1 | 2033.9 | 97.068 | 30.17 | 61.48 | .13093 | 718 |
| 110.000 | 23.91965 | .20113 | .955433 | 4.8002 | 2464.8 | 2648.7 | 102.935 | 25.63 | 62.19 | .23270 | 644 |
| 120.000 | 21.68877 | .20333 | .710077 | 2.7891 | 3078.6 | 3281.5 | 108.451 | 20.44 | 66.55 | .36431 | 569 |
| 130.000 | 18.47906 | .22029 | .456966 | 1.0592 | 3789.9 | 4028.0 | 114.388 | 18.56 | 93.62 | .51925 | 436 |
| 140.000 | 8.68495 | .43523 | .125228 | .1357 | 5624.7 | 6131.3 | 129.836 | 36.49 | 251.01 | .66183 | 182 |
| 150.000 | 5.37549 | .65631 | .066603 | .4773 | 6554.8 | 7373.3 | 138.464 | 28.29 | 76.54 | .73804 | 214 |
| 160.000 | 4.40191 | .75137 | .050445 | .7209 | 7009.0 | 8008.6 | 142.572 | 25.50 | 54.65 | .78976 | 234 |
| 170.000 | 3.84014 | .81063 | .041791 | .9164 | 7360.9 | 8506.7 | 145.594 | 24.03 | 46.00 | .82859 | 250 |
| 180.000 | 3.45122 | .85187 | .036187 | 1.0848 | 7666.7 | 8941.6 | 148.081 | 23.15 | 41.39 | .85887 | 263 |
| 190.000 | 3.15695 | .88226 | .032186 | 1.2357 | 7946.5 | 9340.2 | 150.237 | 22.56 | 38.54 | .88307 | 274 |
| 200.000 | 2.92218 | .90548 | .029147 | 1.3744 | 8209.8 | 9715.5 | 152.163 | 22.16 | 36.64 | .90266 | 284 |
| 210.000 | 2.72816 | .92369 | .026739 | 1.5041 | 8462.0 | 10074.8 | 153.916 | 21.87 | 35.28 | .91877 | 294 |
| 220.000 | 2.56373 | .93826 | .024770 | 1.6269 | 8706.1 | 10422.3 | 155.533 | 21.66 | 34.28 | .93215 | 303 |
| 230.000 | 2.42173 | .95009 | .023121 | 1.7444 | 8944.3 | 10761.2 | 157.039 | 21.50 | 33.52 | .94338 | 311 |
| 240.000 | 2.29730 | .95982 | .021714 | 1.8576 | 9177.9 | 11093.2 | 158.453 | 21.38 | 32.92 | .95287 | 319 |
| 250.000 | 2.18697 | .96791 | .020494 | 1.9672 | 9408.0 | 11419.9 | 159.786 | 21.28 | 32.44 | .96095 | 327 |
| 260.000 | 2.08821 | .97469 | .019424 | 2.0740 | 9635.3 | 11742.3 | 161.051 | 21.21 | 32.05 | .96787 | 334 |
| 270.000 | 1.99910 | .98043 | .018476 | 2.1784 | 9860.2 | 12061.2 | 162.254 | 21.15 | 31.73 | .97383 | 341 |
| 280.000 | 1.91815 | .98532 | .017627 | 2.2807 | 10083.3 | 12377.2 | 163.404 | 21.10 | 31.47 | .97900 | 348 |
| 290.000 | 1.84418 | .98950 | .016862 | 2.3813 | 10304.9 | 12690.8 | 164.504 | 21.07 | 31.25 | .98349 | 355 |
| 300.000 | 1.77625 | .99310 | .016168 | 2.4803 | 10525.2 | 13002.3 | 165.560 | 21.04 | 31.06 | .98741 | 361 |
| 310.000 | 1.71358 | .99621 | .015534 | 2.5780 | 10744.4 | 13312.1 | 166.576 | 21.02 | 30.90 | .99084 | 367 |
| 320.000 | 1.65554 | .99891 | .014953 | 2.6746 | 10962.7 | 13620.5 | 167.555 | 21.01 | 30.77 | .99387 | 373 |
| 330.000 | 1.60160 | 1.00126 | .014418 | 2.7701 | 11180.3 | 13927.6 | 168.500 | 21.00 | 30.66 | .99653 | 379 |
| 340.000 | 1.55131 | 1.00332 | .013922 | 2.8648 | 11397.3 | 14233.7 | 169.414 | 21.00 | 30.56 | .99888 | 385 |
| 350.000 | 1.50429 | 1.00512 | .013463 | 2.9587 | 11613.9 | 14538.8 | 170.299 | 21.00 | 30.48 | 1.00097 | 391 |
| 360.000 | 1.46020 | 1.00670 | .013035 | 3.0518 | 11830.0 | 14843.3 | 171.156 | 21.01 | 30.41 | 1.00282 | 397 |
| 370.000 | 1.41878 | 1.00809 | .012635 | 3.1443 | 12045.9 | 15147.1 | 171.989 | 21.03 | 30.36 | 1.00447 | 402 |
| 380.000 | 1.37976 | 1.00932 | .012260 | 3.2363 | 12261.5 | 15450.5 | 172.798 | 21.04 | 30.31 | 1.00594 | 407 |
| 390.000 | 1.34294 | 1.01040 | .011908 | 3.3277 | 12477.0 | 15753.4 | 173.585 | 21.06 | 30.28 | 1.00725 | 413 |
| 400.000 | 1.30813 | 1.01136 | .011577 | 3.4186 | 12692.5 | 16056.0 | 174.351 | 21.09 | 30.25 | 1.00842 | 418 |
| 410.000 | 1.27516 | 1.01220 | .011265 | 3.5091 | 12907.9 | 16358.5 | 175.097 | 21.11 | 30.23 | 1.00947 | 423 |
| 420.000 | 1.24388 | 1.01295 | .010970 | 3.5992 | 13123.4 | 16660.7 | 175.826 | 21.14 | 30.22 | 1.01041 | 428 |
| 430.000 | 1.21416 | 1.01361 | .010691 | 3.6889 | 13339.0 | 16962.9 | 176.537 | 21.18 | 30.22 | 1.01125 | 433 |
| 440.000 | 1.18588 | 1.01420 | .010427 | 3.7783 | 13554.8 | 17265.1 | 177.232 | 21.22 | 30.22 | 1.01200 | 438 |
| 450.000 | 1.15893 | 1.01472 | .010175 | 3.8675 | 13770.7 | 17567.3 | 177.911 | 21.26 | 30.23 | 1.01268 | 443 |
| 470.000 | 1.10867 | 1.01558 | .009709 | 4.0448 | 14203.5 | 18172.2 | 179.226 | 21.35 | 30.26 | 1.01383 | 452 |
| 500.000 | 1.04119 | 1.01653 | .009086 | 4.3091 | 14855.1 | 19081.1 | 181.100 | 21.50 | 30.34 | 1.01514 | 465 |
| 550.000 | .94568 | 1.01744 | .008214 | 4.7458 | 15950.1 | 20602.9 | 184.001 | 21.80 | 30.55 | 1.01655 | 487 |
| 600.000 | .86654 | 1.01783 | .007497 | 5.1788 | 17058.9 | 22136.6 | 186.670 | 22.14 | 30.81 | 1.01730 | 507 |
| 650.000 | .79983 | 1.01790 | .006898 | 5.6092 | 18183.5 | 23684.7 | 189.148 | 22.50 | 31.12 | 1.01765 | 526 |
| 700.000 | .74279 | 1.01777 | .006389 | 6.0375 | 19325.1 | 25248.7 | 191.466 | 22.87 | 31.44 | 1.01773 | 544 |
| 750.000 | .69344 | 1.01752 | .005951 | 6.4641 | 20484.0 | 26829.1 | 193.647 | 23.23 | 31.78 | 1.01764 | 561 |
| 800.000 | .65031 | 1.01719 | .005569 | 6.8894 | 21660.3 | 28426.2 | 195.708 | 23.59 | 32.11 | 1.01745 | 578 |
| 850.000 | .61228 | 1.01682 | .005234 | 7.3136 | 22853.5 | 30039.7 | 197.664 | 23.94 | 32.43 | 1.01718 | 594 |
| 900.000 | .57849 | 1.01643 | .004938 | 7.7368 | 24063.1 | 31669.1 | 199.527 | 24.27 | 32.74 | 1.01688 | 610 |
| 950.000 | .54826 | 1.01603 | .004673 | 8.1594 | 25288.3 | 33313.6 | 201.305 | 24.58 | 33.04 | 1.01654 | 625 |
| 1000.000 | .52106 | 1.01562 | .004436 | 8.5813 | 26528.2 | 34972.5 | 203.007 | 24.87 | 33.32 | 1.01619 | 640 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|-------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|--|--|---------|----------|
| 4.60000 MPa | | | | | | | | | | | |
| 69.153 | 30.39862 | .26318 | 2.209958 | 16.1785 | 13.6 | 165.0 | 74.671 | 36.31 | 58.90 | .00513 | 967 |
| 70.000 | 30.28275 | .26099 | 2.176877 | 15.8875 | 63.2 | 215.1 | 75.389 | 36.31 | 59.08 | .00586 | 960 |
| 80.000 | 28.88241 | .23944 | 1.816025 | 12.6493 | 654.2 | 813.5 | 83.388 | 35.61 | 60.61 | .02229 | 876 |
| 90.000 | 27.39892 | .22436 | 1.500215 | 9.7484 | 1255.1 | 1423.0 | 90.566 | 33.55 | 61.23 | .05981 | 796 |
| 100.000 | 25.78511 | .21456 | 1.218133 | 7.1599 | 1858.1 | 2036.5 | 97.017 | 30.18 | 61.35 | .12641 | 720 |
| 110.000 | 23.96102 | .20991 | .960335 | 4.8698 | 2457.5 | 2649.5 | 102.866 | 25.64 | 61.93 | .22463 | 647 |
| 120.000 | 21.75948 | .21188 | .716725 | 2.8678 | 3066.4 | 3277.8 | 108.344 | 20.45 | 65.85 | .35170 | 574 |
| 130.000 | 18.65977 | .22807 | .468848 | 1.1552 | 3760.7 | 4007.3 | 114.145 | 18.53 | 89.57 | .50165 | 446 |
| 140.000 | 10.21797 | .38675 | .153780 | .1324 | 5367.5 | 5817.7 | 127.444 | 37.28 | 276.77 | .64472 | 187 |
| 150.000 | 5.81198 | .63461 | .073417 | .4399 | 6471.1 | 7262.6 | 137.487 | 28.80 | 83.21 | .72652 | 213 |
| 160.000 | 4.68500 | .73806 | .054501 | .6924 | 6955.6 | 7937.5 | 141.852 | 25.78 | 57.05 | .78085 | 233 |
| 170.000 | 4.06110 | .80136 | .044751 | .8940 | 7320.5 | 8453.2 | 144.981 | 24.21 | 47.30 | .82148 | 249 |
| 180.000 | 3.63712 | .84507 | .038549 | 1.0669 | 7633.7 | 8898.5 | 147.528 | 23.27 | 42.22 | .85311 | 262 |
| 190.000 | 3.31976 | .87713 | .034168 | 1.2213 | 7918.5 | 9304.1 | 149.722 | 22.65 | 39.13 | .87837 | 274 |
| 200.000 | 3.06833 | .90155 | .030864 | 1.3627 | 8185.4 | 9684.6 | 151.674 | 22.23 | 37.08 | .89881 | 284 |
| 210.000 | 2.86155 | .92066 | .028261 | 1.4947 | 8440.2 | 10047.7 | 153.446 | 21.93 | 35.63 | .91560 | 294 |
| 220.000 | 2.68695 | .93592 | .026142 | 1.6195 | 8686.4 | 10398.4 | 155.078 | 21.70 | 34.56 | .92955 | 303 |
| 230.000 | 2.53658 | .94830 | .024373 | 1.7386 | 8926.3 | 10739.8 | 156.595 | 21.53 | 33.75 | .94125 | 311 |
| 240.000 | 2.40509 | .95847 | .022868 | 1.8532 | 9161.4 | 11074.0 | 158.018 | 21.40 | 33.11 | .95114 | 319 |
| 250.000 | 2.28872 | .96692 | .021567 | 1.9641 | 9392.6 | 11402.5 | 159.359 | 21.30 | 32.61 | .95956 | 327 |
| 260.000 | 2.18469 | .97400 | .020428 | 2.0720 | 9620.9 | 11726.4 | 160.630 | 21.23 | 32.20 | .96677 | 334 |
| 270.000 | 2.09094 | .97998 | .019419 | 2.1773 | 9846.7 | 12046.7 | 161.838 | 21.17 | 31.86 | .97298 | 342 |
| 280.000 | 2.00585 | .98507 | .018518 | 2.2805 | 10070.6 | 12363.9 | 162.992 | 21.12 | 31.58 | .97836 | 348 |
| 290.000 | 1.92816 | .98942 | .017707 | 2.3819 | 10292.8 | 12678.5 | 164.096 | 21.08 | 31.35 | .98303 | 355 |
| 300.000 | 1.85686 | .99316 | .016972 | 2.4816 | 10513.7 | 12991.0 | 165.155 | 21.05 | 31.15 | .98711 | 362 |
| 310.000 | 1.79113 | .99640 | .016302 | 2.5800 | 10733.4 | 13301.6 | 166.174 | 21.03 | 30.99 | .99069 | 368 |
| 320.000 | 1.73028 | .99920 | .015687 | 2.6771 | 10952.2 | 13610.8 | 167.155 | 21.02 | 30.84 | .99383 | 374 |
| 330.000 | 1.67376 | 1.00165 | .015122 | 2.7732 | 11170.3 | 13918.6 | 168.103 | 21.01 | 30.72 | .99660 | 380 |
| 340.000 | 1.62108 | 1.00378 | .014599 | 2.8684 | 11387.7 | 14225.3 | 169.018 | 21.01 | 30.62 | .99904 | 386 |
| 350.000 | 1.57184 | 1.00565 | .014115 | 2.9627 | 11604.6 | 14531.1 | 169.905 | 21.01 | 30.54 | 1.00121 | 392 |
| 360.000 | 1.52569 | 1.00729 | .013663 | 3.0563 | 11821.0 | 14836.1 | 170.764 | 21.02 | 30.46 | 1.00314 | 397 |
| 370.000 | 1.48234 | 1.00873 | .013242 | 3.1492 | 12037.2 | 15140.4 | 171.598 | 21.03 | 30.41 | 1.00485 | 403 |
| 380.000 | 1.44151 | 1.01000 | .012847 | 3.2415 | 12253.1 | 15444.2 | 172.408 | 21.05 | 30.36 | 1.00638 | 408 |
| 390.000 | 1.40300 | 1.01112 | .012477 | 3.3332 | 12468.9 | 15747.6 | 173.196 | 21.07 | 30.32 | 1.00774 | 413 |
| 400.000 | 1.36659 | 1.01210 | .012129 | 3.4245 | 12684.6 | 16050.6 | 173.963 | 21.09 | 30.29 | 1.00895 | 419 |
| 410.000 | 1.33210 | 1.01298 | .011801 | 3.5153 | 12900.3 | 16353.4 | 174.711 | 21.12 | 30.27 | 1.01004 | 424 |
| 420.000 | 1.29940 | 1.01375 | .011491 | 3.6057 | 13116.0 | 16656.1 | 175.440 | 21.15 | 30.26 | 1.01101 | 429 |
| 430.000 | 1.26832 | 1.01443 | .011197 | 3.6957 | 13331.8 | 16958.6 | 176.152 | 21.18 | 30.25 | 1.01188 | 434 |
| 440.000 | 1.23876 | 1.01504 | .010919 | 3.7854 | 13547.7 | 17261.1 | 176.847 | 21.22 | 30.25 | 1.01267 | 438 |
| 450.000 | 1.21060 | 1.01557 | .010655 | 3.8747 | 13763.9 | 17563.6 | 177.527 | 21.26 | 30.26 | 1.01337 | 443 |
| 470.000 | 1.15807 | 1.01645 | .010165 | 4.0525 | 14196.9 | 18169.0 | 178.844 | 21.35 | 30.29 | 1.01455 | 453 |
| 500.000 | 1.08756 | 1.01742 | .009512 | 4.3174 | 14849.0 | 19078.7 | 180.720 | 21.50 | 30.36 | 1.01591 | 466 |
| 550.000 | .98778 | 1.01835 | .008596 | 4.7549 | 15944.6 | 20601.5 | 183.622 | 21.80 | 30.56 | 1.01736 | 487 |
| 600.000 | .90512 | 1.01874 | .007845 | 5.1886 | 17053.9 | 22136.1 | 186.293 | 22.14 | 30.83 | 1.01813 | 507 |
| 650.000 | .83545 | 1.01880 | .007217 | 5.6196 | 18178.9 | 23684.9 | 188.772 | 22.50 | 31.13 | 1.01848 | 526 |
| 700.000 | .77589 | 1.01865 | .006684 | 6.0483 | 19320.7 | 25249.4 | 191.091 | 22.87 | 31.45 | 1.01856 | 545 |
| 750.000 | .72436 | 1.01837 | .006225 | 6.4753 | 20479.9 | 26830.4 | 193.272 | 23.23 | 31.79 | 1.01846 | 562 |
| 800.000 | .67932 | 1.01802 | .005825 | 6.9010 | 21656.5 | 28428.0 | 195.334 | 23.59 | 32.12 | 1.01825 | 579 |
| 850.000 | .63961 | 1.01763 | .005475 | 7.3255 | 22849.9 | 30041.9 | 197.291 | 23.94 | 32.44 | 1.01797 | 595 |
| 900.000 | .60432 | 1.01721 | .005164 | 7.7491 | 24059.7 | 31671.6 | 199.154 | 24.27 | 32.75 | 1.01764 | 611 |
| 950.000 | .57275 | 1.01679 | .004887 | 8.1719 | 25285.1 | 33316.4 | 200.932 | 24.58 | 33.04 | 1.01729 | 626 |
| 1000.000 | .54435 | 1.01636 | .004639 | 8.5940 | 26525.1 | 34975.6 | 202.634 | 24.87 | 33.32 | 1.01692 | 641 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|-------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 4.80000 MPa | | | | | | | | | | | |
| 69.197 | 30.40490 | .27439 | 2.211704 | 16.2200 | 14.3 | 172.1 | 74.679 | 36.31 | 58.88 | .00500 | 969 |
| 70.000 | 30.29531 | .27223 | 2.180352 | 15.9443 | 61.2 | 219.6 | 75.359 | 36.31 | 59.05 | .00568 | 962 |
| 80.000 | 28.89819 | .24971 | 1.819429 | 12.7068 | 651.5 | 817.6 | 83.353 | 35.61 | 60.57 | .02158 | 878 |
| 90.000 | 27.41937 | .23394 | 1.503797 | 9.8082 | 1251.5 | 1426.6 | 90.525 | 33.56 | 61.16 | .05788 | 798 |
| 100.000 | 25.81292 | .22365 | 1.222154 | 7.2235 | 1853.2 | 2039.2 | 96.966 | 30.19 | 61.22 | .12228 | 723 |
| 110.000 | 24.00180 | .21866 | .965184 | 4.9390 | 2450.3 | 2650.3 | 102.797 | 25.65 | 61.67 | .21724 | 651 |
| 120.000 | 21.82829 | .22040 | .723234 | 2.9456 | 3054.6 | 3274.5 | 108.240 | 20.46 | 65.18 | .34016 | 578 |
| 130.000 | 18.82624 | .23588 | .480005 | 1.2484 | 3733.7 | 3988.7 | 113.921 | 18.50 | 86.19 | .48552 | 455 |
| 140.000 | 11.61397 | .35506 | .183855 | .1574 | 5146.4 | 5559.6 | 125.470 | 37.29 | 260.22 | .62767 | 198 |
| 150.000 | 6.28609 | .61226 | .080973 | .4047 | 6382.1 | 7145.6 | 136.486 | 29.31 | 90.80 | .71499 | 211 |
| 160.000 | 4.97989 | .72454 | .058806 | .6644 | 6900.5 | 7864.4 | 141.136 | 26.05 | 59.63 | .77199 | 233 |
| 170.000 | 4.28762 | .79203 | .047840 | .8719 | 7279.3 | 8398.8 | 144.380 | 24.39 | 48.66 | .81441 | 249 |
| 180.000 | 3.82615 | .83824 | .040991 | 1.0492 | 7600.4 | 8854.9 | 146.988 | 23.40 | 43.09 | .84738 | 262 |
| 190.000 | 3.48448 | .87199 | .036204 | 1.2070 | 7890.2 | 9267.8 | 149.221 | 22.75 | 39.74 | .87370 | 274 |
| 200.000 | 3.21571 | .89763 | .032622 | 1.3512 | 8160.8 | 9653.4 | 151.200 | 22.30 | 37.53 | .89498 | 284 |
| 210.000 | 2.99577 | .91765 | .029814 | 1.4855 | 8418.3 | 10020.6 | 152.992 | 21.98 | 35.98 | .91246 | 294 |
| 220.000 | 2.81073 | .93361 | .027538 | 1.6121 | 8666.7 | 10374.4 | 154.638 | 21.75 | 34.84 | .92698 | 303 |
| 230.000 | 2.65180 | .94653 | .025645 | 1.7329 | 8908.3 | 10718.4 | 156.167 | 21.57 | 33.98 | .93915 | 312 |
| 240.000 | 2.51314 | .95714 | .024038 | 1.8489 | 9144.8 | 11054.7 | 157.599 | 21.43 | 33.31 | .94944 | 320 |
| 250.000 | 2.39062 | .96595 | .022653 | 1.9611 | 9377.2 | 11385.1 | 158.947 | 21.33 | 32.78 | .95819 | 328 |
| 260.000 | 2.28126 | .97332 | .021442 | 2.0700 | 9606.5 | 11710.6 | 160.224 | 21.25 | 32.34 | .96569 | 335 |
| 270.000 | 2.18281 | .97955 | .020372 | 2.1764 | 9833.2 | 12032.2 | 161.438 | 21.18 | 31.99 | .97215 | 342 |
| 280.000 | 2.09355 | .98484 | .019417 | 2.2804 | 10057.8 | 12350.6 | 162.596 | 21.13 | 31.70 | .97773 | 349 |
| 290.000 | 2.01211 | .98936 | .018559 | 2.3825 | 10280.7 | 12666.3 | 163.704 | 21.09 | 31.45 | .98259 | 356 |
| 300.000 | 1.93743 | .99325 | .017782 | 2.4830 | 10502.2 | 12979.7 | 164.766 | 21.06 | 31.24 | .98683 | 362 |
| 310.000 | 1.86862 | .99660 | .017074 | 2.5820 | 10722.5 | 13291.2 | 165.788 | 21.04 | 31.07 | .99054 | 368 |
| 320.000 | 1.80495 | .99951 | .016427 | 2.6797 | 10941.8 | 13601.1 | 166.772 | 21.03 | 30.92 | .99380 | 375 |
| 330.000 | 1.74584 | 1.00205 | .015831 | 2.7764 | 11160.2 | 13909.6 | 167.721 | 21.02 | 30.79 | .99668 | 381 |
| 340.000 | 1.69076 | 1.00425 | .015280 | 2.8720 | 11378.0 | 14217.0 | 168.639 | 21.02 | 30.68 | .99922 | 386 |
| 350.000 | 1.63930 | 1.00619 | .014770 | 2.9668 | 11595.3 | 14523.4 | 169.527 | 21.02 | 30.59 | 1.00147 | 392 |
| 360.000 | 1.59108 | 1.00788 | .014295 | 3.0608 | 11812.1 | 14828.9 | 170.387 | 21.02 | 30.52 | 1.00346 | 398 |
| 370.000 | 1.54579 | 1.00937 | .013852 | 3.1541 | 12028.6 | 15133.8 | 171.223 | 21.03 | 30.45 | 1.00524 | 403 |
| 380.000 | 1.50316 | 1.01068 | .013437 | 3.2468 | 12244.8 | 15438.0 | 172.034 | 21.05 | 30.40 | 1.00682 | 409 |
| 390.000 | 1.46295 | 1.01184 | .013048 | 3.3389 | 12460.8 | 15741.9 | 172.823 | 21.07 | 30.36 | 1.00823 | 414 |
| 400.000 | 1.42494 | 1.01286 | .012683 | 3.4305 | 12676.7 | 16045.3 | 173.592 | 21.09 | 30.33 | 1.00949 | 419 |
| 410.000 | 1.38895 | 1.01376 | .012338 | 3.5216 | 12892.6 | 16348.5 | 174.340 | 21.12 | 30.31 | 1.01062 | 424 |
| 420.000 | 1.35481 | 1.01456 | .012013 | 3.6123 | 13108.6 | 16651.5 | 175.070 | 21.15 | 30.29 | 1.01162 | 429 |
| 430.000 | 1.32239 | 1.01526 | .011705 | 3.7025 | 13324.6 | 16954.3 | 175.783 | 21.18 | 30.28 | 1.01253 | 434 |
| 440.000 | 1.29155 | 1.01588 | .011413 | 3.7925 | 13540.7 | 17257.2 | 176.479 | 21.22 | 30.28 | 1.01333 | 439 |
| 450.000 | 1.26217 | 1.01643 | .011136 | 3.8820 | 13757.0 | 17560.0 | 177.160 | 21.26 | 30.29 | 1.01406 | 444 |
| 470.000 | 1.20738 | 1.01734 | .010623 | 4.0603 | 14190.4 | 18165.9 | 178.477 | 21.35 | 30.31 | 1.01529 | 453 |
| 500.000 | 1.13383 | 1.01832 | .009938 | 4.3258 | 14842.9 | 19076.3 | 180.355 | 21.51 | 30.39 | 1.01669 | 467 |
| 550.000 | 1.02980 | 1.01927 | .008980 | 4.7641 | 15939.1 | 20600.2 | 183.259 | 21.80 | 30.58 | 1.01818 | 488 |
| 600.000 | .94363 | 1.01965 | .008194 | 5.1985 | 17048.9 | 22135.6 | 185.931 | 22.14 | 30.84 | 1.01897 | 508 |
| 650.000 | .87101 | 1.01969 | .007537 | 5.6300 | 18174.2 | 23685.1 | 188.412 | 22.50 | 31.14 | 1.01932 | 527 |
| 700.000 | .80893 | 1.01952 | .006979 | 6.0592 | 19316.4 | 25250.2 | 190.731 | 22.87 | 31.46 | 1.01939 | 545 |
| 750.000 | .75522 | 1.01923 | .006499 | 6.4867 | 20475.9 | 26831.7 | 192.913 | 23.23 | 31.80 | 1.01928 | 562 |
| 800.000 | .70828 | 1.01886 | .006082 | 6.9127 | 21652.7 | 28429.7 | 194.976 | 23.59 | 32.12 | 1.01905 | 579 |
| 850.000 | .66689 | 1.01844 | .005715 | 7.3375 | 22846.4 | 30044.0 | 196.933 | 23.94 | 32.45 | 1.01875 | 595 |
| 900.000 | .63011 | 1.01800 | .005391 | 7.7614 | 24056.3 | 31674.1 | 198.796 | 24.27 | 32.75 | 1.01841 | 611 |
| 950.000 | .59721 | 1.01755 | .005102 | 8.1844 | 25281.9 | 33319.2 | 200.575 | 24.58 | 33.05 | 1.01803 | 626 |
| 1000.000 | .56760 | 1.01710 | .004842 | 8.6068 | 26522.0 | 34978.7 | 202.278 | 24.87 | 33.33 | 1.01765 | 641 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 5.000000 MPa | | | | | | | | | | | |
| 69.242 | 30.41115 | .28558 | 2.213445 | 16.2615 | 14.9 | 179.3 | 74.687 | 36.31 | 58.87 | .00489 | 970 |
| 70.000 | 30.30783 | .28345 | 2.183824 | 16.0010 | 59.2 | 224.1 | 75.329 | 36.31 | 59.02 | .00552 | 963 |
| 80.000 | 28.91389 | .25998 | 1.822825 | 12.7641 | 648.9 | 821.8 | 83.319 | 35.61 | 60.52 | .02094 | 880 |
| 90.000 | 27.43970 | .24351 | 1.507364 | 9.8679 | 1248.0 | 1430.2 | 90.484 | 33.56 | 61.09 | .05611 | 800 |
| 100.000 | 25.84048 | .23272 | 1.226149 | 7.2869 | 1848.4 | 2041.9 | 96.915 | 30.20 | 61.10 | .11849 | 725 |
| 110.000 | 24.04201 | .22739 | .969983 | 5.0078 | 2443.2 | 2651.2 | 102.730 | 25.67 | 61.42 | .21046 | 654 |
| 120.000 | 21.89531 | .22888 | .729611 | 3.0226 | 3043.1 | 3271.4 | 108.138 | 20.47 | 64.55 | .32956 | 583 |
| 130.000 | 18.98086 | .24371 | .490536 | 1.3392 | 3708.6 | 3972.0 | 113.711 | 18.47 | 83.31 | .47068 | 464 |
| 140.000 | 12.74418 | .33705 | .212462 | .2021 | 4972.7 | 5365.0 | 123.963 | 36.97 | 229.53 | .61113 | 211 |
| 150.000 | 6.80114 | .58947 | .089370 | .3730 | 6287.4 | 7022.6 | 135.461 | 29.79 | 99.22 | .70345 | 210 |
| 160.000 | 5.28728 | .71086 | .063380 | .6373 | 6843.7 | 7789.4 | 140.424 | 26.33 | 62.40 | .76315 | 232 |
| 170.000 | 4.51991 | .78263 | .051063 | .8502 | 7237.3 | 8343.5 | 143.787 | 24.57 | 50.09 | .80738 | 248 |
| 180.000 | 4.01838 | .83140 | .043514 | 1.0318 | 7566.6 | 8810.9 | 146.460 | 23.52 | 43.98 | .84169 | 262 |
| 190.000 | 3.65116 | .86686 | .038295 | 1.1929 | 7861.7 | 9231.2 | 148.733 | 22.84 | 40.36 | .86905 | 274 |
| 200.000 | 3.36436 | .89372 | .034419 | 1.3398 | 8136.0 | 9622.2 | 150.740 | 22.37 | 37.99 | .89118 | 285 |
| 210.000 | 3.13083 | .91465 | .031397 | 1.4763 | 8396.4 | 9993.4 | 152.551 | 22.04 | 36.34 | .90935 | 294 |
| 220.000 | 2.93506 | .93131 | .028957 | 1.6049 | 8646.9 | 10350.5 | 154.212 | 21.79 | 35.13 | .92443 | 303 |
| 230.000 | 2.76740 | .94479 | .026935 | 1.7273 | 8890.3 | 10697.0 | 155.753 | 21.60 | 34.22 | .93707 | 312 |
| 240.000 | 2.62143 | .95584 | .025224 | 1.8447 | 9128.2 | 11035.5 | 157.194 | 21.46 | 33.51 | .94776 | 320 |
| 250.000 | 2.49269 | .96500 | .023751 | 1.9581 | 9361.8 | 11367.7 | 158.550 | 21.35 | 32.95 | .95685 | 328 |
| 260.000 | 2.37792 | .97266 | .022467 | 2.0682 | 9592.1 | 11694.8 | 159.833 | 21.27 | 32.49 | .96463 | 335 |
| 270.000 | 2.27473 | .97913 | .021333 | 2.1755 | 9819.7 | 12017.8 | 161.052 | 21.20 | 32.12 | .97133 | 343 |
| 280.000 | 2.18125 | .98462 | .020324 | 2.2804 | 10045.1 | 12337.3 | 162.214 | 21.15 | 31.81 | .97713 | 349 |
| 290.000 | 2.09605 | .98932 | .019418 | 2.3833 | 10268.6 | 12654.1 | 163.326 | 21.11 | 31.55 | .98216 | 356 |
| 300.000 | 2.01796 | .99335 | .018598 | 2.4844 | 10490.7 | 12968.5 | 164.392 | 21.08 | 31.33 | .98656 | 363 |
| 310.000 | 1.94605 | .99683 | .017853 | 2.5841 | 10711.5 | 13280.8 | 165.416 | 21.05 | 31.15 | .99041 | 369 |
| 320.000 | 1.87955 | .99984 | .017170 | 2.6824 | 10931.3 | 13591.5 | 166.402 | 21.04 | 30.99 | .99379 | 375 |
| 330.000 | 1.81783 | 1.00246 | .016543 | 2.7796 | 11150.2 | 13900.8 | 167.354 | 21.03 | 30.86 | .99677 | 381 |
| 340.000 | 1.76035 | 1.00474 | .015965 | 2.8758 | 11368.4 | 14208.8 | 168.273 | 21.02 | 30.75 | .99940 | 387 |
| 350.000 | 1.70666 | 1.00674 | .015428 | 2.9710 | 11586.0 | 14515.7 | 169.163 | 21.02 | 30.65 | 1.00173 | 393 |
| 360.000 | 1.65637 | 1.00849 | .014930 | 3.0654 | 11803.2 | 14821.8 | 170.026 | 21.03 | 30.57 | 1.00380 | 398 |
| 370.000 | 1.60915 | 1.01003 | .014465 | 3.1591 | 12019.9 | 15127.2 | 170.862 | 21.04 | 30.50 | 1.00564 | 404 |
| 380.000 | 1.56471 | 1.01138 | .014030 | 3.2522 | 12236.4 | 15431.9 | 171.675 | 21.05 | 30.45 | 1.00728 | 409 |
| 390.000 | 1.52280 | 1.01258 | .013622 | 3.3446 | 12452.7 | 15736.2 | 172.465 | 21.07 | 30.40 | 1.00874 | 415 |
| 400.000 | 1.48319 | 1.01363 | .013238 | 3.4365 | 12668.9 | 16040.0 | 173.234 | 21.10 | 30.37 | 1.01004 | 420 |
| 410.000 | 1.44569 | 1.01455 | .012877 | 3.5279 | 12885.0 | 16343.6 | 173.984 | 21.12 | 30.34 | 1.01120 | 425 |
| 420.000 | 1.41013 | 1.01537 | .012536 | 3.6189 | 13101.2 | 16646.9 | 174.715 | 21.15 | 30.33 | 1.01225 | 430 |
| 430.000 | 1.37636 | 1.01609 | .012214 | 3.7094 | 13317.4 | 16950.1 | 175.428 | 21.19 | 30.32 | 1.01318 | 435 |
| 440.000 | 1.34423 | 1.01673 | .011909 | 3.7996 | 13533.7 | 17253.3 | 176.125 | 21.22 | 30.31 | 1.01401 | 440 |
| 450.000 | 1.31364 | 1.01729 | .011619 | 3.8894 | 13750.2 | 17556.4 | 176.807 | 21.26 | 30.32 | 1.01476 | 444 |
| 470.000 | 1.25659 | 1.01822 | .011081 | 4.0682 | 14183.9 | 18162.9 | 178.125 | 21.35 | 30.34 | 1.01603 | 454 |
| 500.000 | 1.18002 | 1.01923 | .010365 | 4.3342 | 14836.8 | 19074.0 | 180.004 | 21.51 | 30.41 | 1.01747 | 467 |
| 550.000 | 1.07174 | 1.02019 | .009363 | 4.7734 | 15933.6 | 20598.9 | 182.911 | 21.81 | 30.60 | 1.01900 | 489 |
| 600.000 | .98207 | 1.02057 | .008542 | 5.2084 | 17043.9 | 22135.2 | 185.584 | 22.14 | 30.86 | 1.01980 | 509 |
| 650.000 | .90650 | 1.02059 | .007856 | 5.6405 | 18169.6 | 23685.4 | 188.066 | 22.50 | 31.16 | 1.02016 | 528 |
| 700.000 | .84190 | 1.02041 | .007274 | 6.0702 | 19312.2 | 25251.1 | 190.386 | 22.87 | 31.48 | 1.02022 | 546 |
| 750.000 | .78602 | 1.02009 | .006774 | 6.4980 | 20471.9 | 26833.1 | 192.569 | 23.23 | 31.80 | 1.02010 | 563 |
| 800.000 | .73718 | 1.01969 | .006338 | 6.9244 | 21648.9 | 28431.5 | 194.632 | 23.59 | 32.13 | 1.01986 | 580 |
| 850.000 | .69412 | 1.01925 | .005956 | 7.3495 | 22842.8 | 30046.2 | 196.590 | 23.94 | 32.45 | 1.01954 | 596 |
| 900.000 | .65586 | 1.01878 | .005618 | 7.7737 | 24053.0 | 31676.6 | 198.454 | 24.27 | 32.76 | 1.01917 | 612 |
| 950.000 | .62163 | 1.01831 | .005316 | 8.1970 | 25278.7 | 33222.1 | 200.233 | 24.58 | 33.05 | 1.01878 | 627 |
| 1000.000 | .59082 | 1.01784 | .005046 | 8.6196 | 26519.0 | 34981.8 | 201.935 | 24.87 | 33.33 | 1.01838 | 642 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 5.200000 MPa | | | | | | | | | | | |
| 69.286 | 30.41739 | .29675 | 2.215181 | 16.3029 | 15.5 | 186.5 | 74.696 | 36.31 | 58.85 | .00479 | 971 |
| 70.000 | 30.32031 | .29467 | 2.187290 | 16.0578 | 57.2 | 228.7 | 75.299 | 36.31 | 59.00 | .00537 | 965 |
| 80.000 | 28.92952 | .27023 | 1.826214 | 12.8214 | 646.2 | 826.0 | 83.285 | 35.62 | 60.48 | .02034 | 881 |
| 90.000 | 27.45991 | .25306 | 1.510918 | 9.9274 | 1244.5 | 1433.9 | 90.444 | 33.57 | 61.02 | .05448 | 802 |
| 100.000 | 25.86781 | .24177 | 1.230120 | 7.3501 | 1843.6 | 2044.6 | 96.865 | 30.21 | 60.97 | .11500 | 727 |
| 110.000 | 24.08168 | .23610 | .974733 | 5.0762 | 2436.3 | 2652.2 | 102.663 | 25.68 | 61.18 | .20421 | 657 |
| 120.000 | 21.96066 | .23732 | .735866 | 3.0987 | 3031.8 | 3268.6 | 108.038 | 20.48 | 63.96 | .31980 | 587 |
| 130.000 | 19.12545 | .25154 | .500546 | 1.4279 | 3684.9 | 3956.8 | 113.513 | 18.45 | 80.81 | .45699 | 472 |
| 140.000 | 13.61022 | .32823 | .237815 | .2650 | 4841.1 | 5223.2 | 122.841 | 36.61 | 197.94 | .59534 | 226 |
| 150.000 | 7.35799 | .56665 | .098689 | .3467 | 6187.4 | 6894.1 | 134.417 | 30.25 | 108.09 | .69192 | 210 |
| 160.000 | 5.60773 | .69704 | .068241 | .6114 | 6785.1 | 7712.4 | 139.713 | 26.59 | 65.35 | .75435 | 231 |
| 170.000 | 4.75814 | .77318 | .054427 | .8290 | 7194.5 | 8287.4 | 143.203 | 24.74 | 51.57 | .80038 | 248 |
| 180.000 | 4.21386 | .82455 | .046122 | 1.0146 | 7532.4 | 8766.4 | 145.943 | 23.64 | 44.90 | .83604 | 262 |
| 190.000 | 3.81981 | .86173 | .040443 | 1.1790 | 7833.0 | 9194.3 | 148.258 | 22.93 | 40.99 | .86445 | 274 |
| 200.000 | 3.51426 | .88982 | .036256 | 1.3286 | 8111.1 | 9590.8 | 150.292 | 22.44 | 38.46 | .88741 | 285 |
| 210.000 | 3.26672 | .91167 | .033010 | 1.4673 | 8374.3 | 9966.1 | 152.123 | 22.09 | 36.70 | .90626 | 295 |
| 220.000 | 3.05996 | .92903 | .030400 | 1.5978 | 8627.1 | 10326.4 | 153.800 | 21.83 | 35.42 | .92190 | 304 |
| 230.000 | 2.88338 | .94306 | .028244 | 1.7218 | 8872.2 | 10675.6 | 155.352 | 21.64 | 34.46 | .93502 | 312 |
| 240.000 | 2.72997 | .95455 | .026424 | 1.8406 | 9111.5 | 11016.3 | 156.802 | 21.49 | 33.71 | .94609 | 321 |
| 250.000 | 2.59490 | .96407 | .024862 | 1.9552 | 9346.4 | 11350.3 | 158.166 | 21.38 | 33.12 | .95552 | 328 |
| 260.000 | 2.47467 | .97202 | .023502 | 2.0664 | 9577.7 | 11679.0 | 159.455 | 21.29 | 32.64 | .96359 | 336 |
| 270.000 | 2.36668 | .97873 | .022304 | 2.1746 | 9806.2 | 12003.4 | 160.679 | 21.22 | 32.25 | .97053 | 343 |
| 280.000 | 2.26896 | .98443 | .021239 | 2.2804 | 10032.3 | 12324.1 | 161.846 | 21.16 | 31.92 | .97654 | 350 |
| 290.000 | 2.17995 | .98929 | .020284 | 2.3841 | 10256.6 | 12642.0 | 162.961 | 21.12 | 31.65 | .98176 | 357 |
| 300.000 | 2.09843 | .99346 | .019420 | 2.4860 | 10479.3 | 12957.3 | 164.030 | 21.09 | 31.42 | .98631 | 363 |
| 310.000 | 2.02341 | .99706 | .018636 | 2.5863 | 10700.6 | 13270.5 | 165.058 | 21.06 | 31.23 | .99029 | 370 |
| 320.000 | 1.95407 | 1.00018 | .017919 | 2.6852 | 10920.9 | 13582.0 | 166.046 | 21.04 | 31.07 | .99380 | 376 |
| 330.000 | 1.88974 | 1.00288 | .017260 | 2.7829 | 11140.2 | 13891.9 | 167.000 | 21.03 | 30.93 | .99688 | 382 |
| 340.000 | 1.82985 | 1.00524 | .016653 | 2.8796 | 11358.8 | 14200.6 | 167.922 | 21.03 | 30.81 | .99960 | 388 |
| 350.000 | 1.77393 | 1.00731 | .016090 | 2.9753 | 11576.8 | 14508.1 | 168.813 | 21.03 | 30.71 | 1.00201 | 393 |
| 360.000 | 1.72157 | 1.00911 | .015567 | 3.0701 | 11794.3 | 14814.8 | 169.677 | 21.03 | 30.62 | 1.00415 | 399 |
| 370.000 | 1.67241 | 1.01070 | .015080 | 3.1642 | 12011.4 | 15120.6 | 170.515 | 21.04 | 30.55 | 1.00605 | 404 |
| 380.000 | 1.62616 | 1.01209 | .014625 | 3.2576 | 12228.1 | 15425.9 | 171.329 | 21.06 | 30.49 | 1.00774 | 410 |
| 390.000 | 1.58254 | 1.01332 | .014197 | 3.3504 | 12444.7 | 15730.5 | 172.120 | 21.08 | 30.45 | 1.00925 | 415 |
| 400.000 | 1.54133 | 1.01440 | .013796 | 3.4426 | 12661.1 | 16034.8 | 172.891 | 21.10 | 30.41 | 1.01060 | 420 |
| 410.000 | 1.50233 | 1.01536 | .013418 | 3.5343 | 12877.5 | 16338.8 | 173.641 | 21.13 | 30.38 | 1.01180 | 425 |
| 420.000 | 1.46535 | 1.01620 | .013062 | 3.6256 | 13093.8 | 16642.5 | 174.373 | 21.16 | 30.36 | 1.01287 | 430 |
| 430.000 | 1.43022 | 1.01694 | .012725 | 3.7164 | 13310.2 | 16946.0 | 175.087 | 21.19 | 30.35 | 1.01384 | 435 |
| 440.000 | 1.39682 | 1.01759 | .012406 | 3.8068 | 13526.7 | 17249.5 | 175.785 | 21.23 | 30.34 | 1.01470 | 440 |
| 450.000 | 1.36501 | 1.01817 | .012103 | 3.8969 | 13743.4 | 17552.9 | 176.467 | 21.27 | 30.34 | 1.01547 | 445 |
| 470.000 | 1.30570 | 1.01912 | .011541 | 4.0761 | 14177.4 | 18160.0 | 177.787 | 21.36 | 30.36 | 1.01677 | 454 |
| 500.000 | 1.22612 | 1.02015 | .010794 | 4.3427 | 14830.8 | 19071.8 | 179.667 | 21.51 | 30.43 | 1.01826 | 468 |
| 550.000 | 1.11360 | 1.02112 | .009748 | 4.7827 | 15928.2 | 20597.7 | 182.576 | 21.81 | 30.62 | 1.01983 | 489 |
| 600.000 | 1.02043 | 1.02149 | .008892 | 5.2184 | 17038.9 | 22134.8 | 185.251 | 22.14 | 30.87 | 1.02065 | 509 |
| 650.000 | .94192 | 1.02150 | .008177 | 5.6510 | 18165.0 | 23685.6 | 187.733 | 22.50 | 31.17 | 1.02100 | 528 |
| 700.000 | .87482 | 1.02129 | .007570 | 6.0812 | 19307.9 | 25251.9 | 190.055 | 22.87 | 31.49 | 1.02106 | 546 |
| 750.000 | .81677 | 1.02095 | .007048 | 6.5094 | 20467.9 | 26834.4 | 192.238 | 23.23 | 31.81 | 1.02092 | 564 |
| 800.000 | .76604 | 1.02053 | .006595 | 6.9362 | 21645.2 | 28433.3 | 194.302 | 23.59 | 32.14 | 1.02066 | 580 |
| 850.000 | .72131 | 1.02006 | .006197 | 7.3616 | 22839.3 | 30048.4 | 196.260 | 23.94 | 32.46 | 1.02033 | 596 |
| 900.000 | .68157 | 1.01957 | .005845 | 7.7860 | 24049.6 | 31679.1 | 198.124 | 24.27 | 32.77 | 1.01994 | 612 |
| 950.000 | .64601 | 1.01907 | .005531 | 8.2096 | 25275.5 | 33324.9 | 199.904 | 24.58 | 33.06 | 1.01953 | 627 |
| 1000.000 | .61401 | 1.01858 | .005249 | 8.6324 | 26516.0 | 34985.0 | 201.606 | 24.87 | 33.34 | 1.01911 | 642 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 5.500000 MPa | | | | | | | | | | | |
| 69.353 | 30.42672 | .31348 | 2.217776 | 16.3650 | 16.4 | 197.2 | 74.708 | 36.31 | 58.83 | .00466 | 972 |
| 70.000 | 30.33894 | .31148 | 2.192480 | 16.1428 | 54.2 | 235.4 | 75.255 | 36.31 | 58.96 | .00516 | 967 |
| 80.000 | 28.95285 | .28559 | 1.831282 | 12.9073 | 642.3 | 832.3 | 83.234 | 35.62 | 60.42 | .01953 | 884 |
| 90.000 | 27.48999 | .26737 | 1.516224 | 10.0165 | 1239.3 | 1439.4 | 90.383 | 33.58 | 60.92 | .05227 | 805 |
| 100.000 | 25.90837 | .25532 | 1.236033 | 7.4445 | 1836.4 | 2048.7 | 96.790 | 30.22 | 60.80 | .11025 | 731 |
| 110.000 | 24.14019 | .24911 | .981771 | 5.1781 | 2426.0 | 2653.8 | 102.565 | 25.69 | 60.83 | .19571 | 661 |
| 120.000 | 22.05575 | .24993 | .745031 | 3.2116 | 3015.4 | 3264.8 | 107.893 | 20.49 | 63.13 | .30651 | 594 |
| 130.000 | 19.32651 | .26329 | .514721 | 1.5575 | 3652.0 | 3936.5 | 113.237 | 18.43 | 77.64 | .43835 | 483 |
| 140.000 | 14.55873 | .32455 | .269780 | .3762 | 4697.1 | 5074.8 | 121.629 | 36.19 | 163.97 | .57325 | 246 |
| 150.000 | 8.26102 | .53383 | .114449 | .3214 | 6030.2 | 6696.0 | 132.838 | 30.82 | 120.39 | .67473 | 211 |
| 160.000 | 6.11368 | .67624 | .076110 | .5756 | 6693.9 | 7593.5 | 138.649 | 26.98 | 70.06 | .74123 | 231 |
| 170.000 | 5.12690 | .75897 | .059750 | .7986 | 7128.8 | 8201.6 | 142.341 | 25.00 | 53.91 | .78997 | 247 |
| 180.000 | 4.51327 | .81426 | .050197 | .9896 | 7480.2 | 8698.9 | 145.186 | 23.82 | 46.32 | .82763 | 262 |
| 190.000 | 4.07650 | .85405 | .043774 | 1.1586 | 7789.4 | 9138.6 | 147.564 | 23.06 | 41.97 | .85759 | 274 |
| 200.000 | 3.74149 | .88400 | .039090 | 1.3121 | 8073.4 | 9543.4 | 149.641 | 22.54 | 39.18 | .88181 | 285 |
| 210.000 | 3.47210 | .90722 | .035488 | 1.4541 | 8341.0 | 9925.0 | 151.504 | 22.17 | 37.26 | .90167 | 295 |
| 220.000 | 3.24834 | .92564 | .032610 | 1.5873 | 8597.1 | 10290.3 | 153.203 | 21.90 | 35.87 | .91816 | 304 |
| 230.000 | 3.05803 | .94050 | .030244 | 1.7137 | 8845.0 | 10643.3 | 154.773 | 21.69 | 34.82 | .93198 | 313 |
| 240.000 | 2.89323 | .95265 | .028255 | 1.8346 | 9086.5 | 10987.5 | 156.238 | 21.54 | 34.01 | .94364 | 321 |
| 250.000 | 2.74850 | .96270 | .026553 | 1.9511 | 9323.2 | 11324.3 | 157.613 | 21.41 | 33.37 | .95357 | 329 |
| 260.000 | 2.61994 | .97110 | .025076 | 2.0638 | 9556.1 | 11655.4 | 158.911 | 21.32 | 32.86 | .96206 | 336 |
| 270.000 | 2.50467 | .97817 | .023778 | 2.1735 | 9785.9 | 11981.8 | 160.143 | 21.24 | 32.44 | .96936 | 344 |
| 280.000 | 2.40051 | .98416 | .022626 | 2.2806 | 10013.3 | 12304.4 | 161.317 | 21.19 | 32.09 | .97568 | 351 |
| 290.000 | 2.30575 | .98927 | .021595 | 2.3855 | 10238.5 | 12623.9 | 162.438 | 21.14 | 31.80 | .98117 | 357 |
| 300.000 | 2.21905 | .99366 | .020665 | 2.4884 | 10462.1 | 12940.7 | 163.512 | 21.10 | 31.56 | .98596 | 364 |
| 310.000 | 2.13933 | .99744 | .019821 | 2.5896 | 10684.3 | 13255.2 | 164.543 | 21.08 | 31.35 | .99015 | 370 |
| 320.000 | 2.06571 | 1.00071 | .019050 | 2.6894 | 10905.3 | 13567.8 | 165.535 | 21.06 | 31.18 | .99383 | 377 |
| 330.000 | 1.99744 | 1.00355 | .018343 | 2.7880 | 11125.3 | 13878.8 | 166.492 | 21.04 | 31.03 | .99707 | 383 |
| 340.000 | 1.93393 | 1.00602 | .017692 | 2.8854 | 11344.5 | 14188.4 | 167.417 | 21.04 | 30.90 | .99992 | 388 |
| 350.000 | 1.87465 | 1.00818 | .017089 | 2.9818 | 11563.0 | 14496.9 | 168.311 | 21.04 | 30.79 | 1.00245 | 394 |
| 360.000 | 1.81917 | 1.01007 | .016530 | 3.0772 | 11781.0 | 14804.3 | 169.177 | 21.04 | 30.70 | 1.00470 | 400 |
| 370.000 | 1.76711 | 1.01172 | .016008 | 3.1719 | 11998.5 | 15110.9 | 170.017 | 21.05 | 30.62 | 1.00669 | 405 |
| 380.000 | 1.71813 | 1.01318 | .015521 | 3.2659 | 12215.7 | 15416.9 | 170.833 | 21.07 | 30.56 | 1.00846 | 411 |
| 390.000 | 1.67197 | 1.01446 | .015065 | 3.3592 | 12432.7 | 15722.2 | 171.626 | 21.08 | 30.51 | 1.01004 | 416 |
| 400.000 | 1.62836 | 1.01558 | .014637 | 3.4519 | 12649.5 | 16027.1 | 172.398 | 21.11 | 30.47 | 1.01145 | 421 |
| 410.000 | 1.58709 | 1.01658 | .014234 | 3.5441 | 12866.1 | 16331.6 | 173.150 | 21.13 | 30.44 | 1.01271 | 426 |
| 420.000 | 1.54798 | 1.01745 | .013853 | 3.6357 | 13082.8 | 16635.8 | 173.883 | 21.16 | 30.41 | 1.01384 | 431 |
| 430.000 | 1.51083 | 1.01822 | .013494 | 3.7270 | 13299.5 | 16939.9 | 174.599 | 21.19 | 30.40 | 1.01484 | 436 |
| 440.000 | 1.47551 | 1.01890 | .013154 | 3.8178 | 13516.3 | 17243.8 | 175.297 | 21.23 | 30.39 | 1.01574 | 441 |
| 450.000 | 1.44188 | 1.01949 | .012831 | 3.9082 | 13733.2 | 17547.7 | 175.980 | 21.27 | 30.39 | 1.01655 | 446 |
| 470.000 | 1.37920 | 1.02048 | .012233 | 4.0880 | 14167.8 | 18155.6 | 177.302 | 21.36 | 30.40 | 1.01791 | 455 |
| 500.000 | 1.29510 | 1.02153 | .011438 | 4.3555 | 14821.8 | 19068.5 | 179.185 | 21.51 | 30.47 | 1.01946 | 469 |
| 550.000 | 1.17624 | 1.02251 | .010327 | 4.7967 | 15920.0 | 20596.0 | 182.096 | 21.81 | 30.65 | 1.02108 | 490 |
| 600.000 | 1.07784 | 1.02287 | .009417 | 5.2335 | 17031.4 | 22134.2 | 184.773 | 22.14 | 30.89 | 1.02193 | 510 |
| 650.000 | .99494 | 1.02286 | .008658 | 5.6669 | 18158.2 | 23686.2 | 187.257 | 22.50 | 31.19 | 1.02228 | 529 |
| 700.000 | .92409 | 1.02262 | .008014 | 6.0977 | 19301.5 | 25253.3 | 189.580 | 22.87 | 31.50 | 1.02232 | 547 |
| 750.000 | .86280 | 1.02224 | .007461 | 6.5266 | 20462.0 | 26836.6 | 191.764 | 23.23 | 31.83 | 1.02217 | 564 |
| 800.000 | .80924 | 1.02179 | .006981 | 6.9539 | 21639.6 | 28436.1 | 193.829 | 23.59 | 32.15 | 1.02188 | 581 |
| 850.000 | .76201 | 1.02128 | .006559 | 7.3798 | 22834.0 | 30051.7 | 195.788 | 23.94 | 32.47 | 1.02152 | 597 |
| 900.000 | .72005 | 1.02076 | .006186 | 7.8046 | 24044.7 | 31683.0 | 197.652 | 24.27 | 32.78 | 1.02110 | 613 |
| 950.000 | .68251 | 1.02022 | .005853 | 8.2285 | 25270.8 | 33329.3 | 199.433 | 24.58 | 33.07 | 1.02066 | 628 |
| 1000.000 | .64872 | 1.01969 | .005555 | 8.6517 | 26511.5 | 34989.7 | 201.136 | 24.87 | 33.35 | 1.02021 | 643 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 6.000000 MPa | | | | | | | | | | | |
| 69.464 | 30.44218 | .34126 | 2.222079 | 16.4685 | 18.0 | 215.1 | 74.729 | 36.31 | 58.79 | .00447 | 975 |
| 70.000 | 30.36978 | .33945 | 2.201106 | 16.2844 | 49.2 | 246.8 | 75.181 | 36.32 | 58.90 | .00487 | 971 |
| 80.000 | 28.99137 | .31114 | 1.839690 | 13.0500 | 635.8 | 842.8 | 83.150 | 35.63 | 60.32 | .01838 | 888 |
| 90.000 | 27.53955 | .29115 | 1.525003 | 10.1644 | 1230.7 | 1448.6 | 90.284 | 33.60 | 60.75 | .04909 | 810 |
| 100.000 | 25.97483 | .27782 | 1.245774 | 7.6007 | 1824.7 | 2055.7 | 96.668 | 30.25 | 60.51 | .10343 | 736 |
| 110.000 | 24.23522 | .27069 | .993276 | 5.3462 | 2409.3 | 2656.8 | 102.404 | 25.72 | 60.28 | .18351 | 668 |
| 120.000 | 22.20710 | .27080 | .759780 | 3.3964 | 2989.3 | 3259.5 | 107.660 | 20.52 | 61.88 | .28741 | 604 |
| 130.000 | 19.62770 | .28281 | .536515 | 1.7656 | 3602.3 | 3908.0 | 112.820 | 18.41 | 73.43 | .41148 | 501 |
| 140.000 | 15.62699 | .32985 | .311865 | .5748 | 4533.4 | 4917.4 | 120.268 | 35.76 | 132.77 | .54063 | 276 |
| 150.000 | 9.82447 | .48968 | .144379 | .3286 | 5770.1 | 6380.8 | 130.368 | 31.37 | 129.94 | .64664 | 220 |
| 160.000 | 7.02235 | .64226 | .090877 | .5287 | 6534.1 | 7388.5 | 136.891 | 27.56 | 78.25 | .71960 | 231 |
| 170.000 | 5.77218 | .73540 | .069405 | .7528 | 7015.5 | 8055.0 | 140.938 | 25.40 | 58.05 | .77284 | 247 |
| 180.000 | 5.02892 | .79720 | .057445 | .9506 | 7391.2 | 8584.3 | 143.966 | 24.11 | 48.82 | .81380 | 262 |
| 190.000 | 4.51424 | .84135 | .049624 | 1.1264 | 7715.5 | 9044.6 | 146.456 | 23.28 | 43.66 | .84635 | 274 |
| 200.000 | 4.12647 | .87439 | .044025 | 1.2858 | 8009.8 | 9463.8 | 148.607 | 22.71 | 40.41 | .87262 | 285 |
| 210.000 | 3.81851 | .89991 | .039776 | 1.4329 | 8285.0 | 9856.3 | 150.522 | 22.30 | 38.20 | .89418 | 296 |
| 220.000 | 3.56502 | .92009 | .036414 | 1.5706 | 8547.0 | 10230.0 | 152.261 | 22.00 | 36.62 | .91205 | 305 |
| 230.000 | 3.35090 | .93632 | .033673 | 1.7009 | 8799.4 | 10590.0 | 153.861 | 21.78 | 35.43 | .92703 | 314 |
| 240.000 | 3.16648 | .94957 | .031384 | 1.8252 | 9044.7 | 10939.6 | 155.350 | 21.61 | 34.53 | .93967 | 322 |
| 250.000 | 3.00520 | .96051 | .029436 | 1.9446 | 9284.6 | 11281.1 | 156.744 | 21.47 | 33.81 | .95041 | 330 |
| 260.000 | 2.86243 | .96963 | .027753 | 2.0601 | 9520.1 | 11616.2 | 158.058 | 21.37 | 33.23 | .95961 | 338 |
| 270.000 | 2.73479 | .97730 | .026280 | 2.1721 | 9752.2 | 11946.2 | 159.304 | 21.29 | 32.77 | .96751 | 345 |
| 280.000 | 2.61972 | .98379 | .024977 | 2.2813 | 9981.5 | 12271.8 | 160.488 | 21.22 | 32.38 | .97435 | 352 |
| 290.000 | 2.51524 | .98932 | .023815 | 2.3881 | 10208.5 | 12594.0 | 161.619 | 21.17 | 32.06 | .98029 | 359 |
| 300.000 | 2.41981 | .99406 | .022769 | 2.4928 | 10433.6 | 12913.2 | 162.701 | 21.13 | 31.79 | .98546 | 365 |
| 310.000 | 2.33219 | .99814 | .021822 | 2.5956 | 10657.2 | 13229.8 | 163.739 | 21.10 | 31.56 | .98998 | 372 |
| 320.000 | 2.25137 | 1.00166 | .020959 | 2.6969 | 10879.4 | 13544.4 | 164.738 | 21.08 | 31.36 | .99395 | 378 |
| 330.000 | 2.17651 | 1.00471 | .020169 | 2.7967 | 11100.5 | 13857.2 | 165.700 | 21.06 | 31.20 | .99745 | 384 |
| 340.000 | 2.10692 | 1.00737 | .019442 | 2.8954 | 11320.7 | 14168.4 | 166.629 | 21.06 | 31.05 | 1.00053 | 390 |
| 350.000 | 2.04203 | 1.00968 | .018771 | 2.9929 | 11540.1 | 14478.4 | 167.528 | 21.05 | 30.93 | 1.00326 | 396 |
| 360.000 | 1.98134 | 1.01171 | .018148 | 3.0894 | 11758.9 | 14787.2 | 168.398 | 21.06 | 30.83 | 1.00568 | 401 |
| 370.000 | 1.92441 | 1.01348 | .017569 | 3.1851 | 11977.2 | 15095.1 | 169.241 | 21.06 | 30.75 | 1.00782 | 407 |
| 380.000 | 1.87090 | 1.01503 | .017029 | 3.2800 | 12195.1 | 15402.1 | 170.060 | 21.08 | 30.67 | 1.00973 | 412 |
| 390.000 | 1.82048 | 1.01640 | .016523 | 3.3741 | 12412.8 | 15708.6 | 170.856 | 21.09 | 30.61 | 1.01143 | 418 |
| 400.000 | 1.77288 | 1.01760 | .016048 | 3.4677 | 12630.1 | 16014.5 | 171.631 | 21.11 | 30.57 | 1.01294 | 423 |
| 410.000 | 1.72785 | 1.01865 | .015602 | 3.5606 | 12847.4 | 16319.9 | 172.385 | 21.14 | 30.53 | 1.01429 | 428 |
| 420.000 | 1.68517 | 1.01958 | .015181 | 3.6530 | 13064.6 | 16625.1 | 173.120 | 21.17 | 30.50 | 1.01550 | 433 |
| 430.000 | 1.64467 | 1.02039 | .014784 | 3.7449 | 13281.8 | 16930.0 | 173.838 | 21.20 | 30.48 | 1.01657 | 438 |
| 440.000 | 1.60616 | 1.02111 | .014408 | 3.8363 | 13499.1 | 17234.7 | 174.538 | 21.24 | 30.47 | 1.01754 | 443 |
| 450.000 | 1.56951 | 1.02174 | .014052 | 3.9273 | 13716.5 | 17539.3 | 175.223 | 21.28 | 30.46 | 1.01840 | 448 |
| 470.000 | 1.50120 | 1.02277 | .013393 | 4.1082 | 14151.8 | 18148.6 | 176.548 | 21.36 | 30.47 | 1.01985 | 457 |
| 500.000 | 1.40962 | 1.02387 | .012517 | 4.3772 | 14806.8 | 19063.3 | 178.434 | 21.51 | 30.52 | 1.02150 | 470 |
| 550.000 | 1.28022 | 1.02487 | .011294 | 4.8204 | 15906.6 | 20593.3 | 181.351 | 21.81 | 30.69 | 1.02321 | 492 |
| 600.000 | 1.17315 | 1.02521 | .010295 | 5.2588 | 17019.1 | 22133.6 | 184.031 | 22.15 | 30.93 | 1.02409 | 512 |
| 650.000 | 1.08296 | 1.02515 | .009462 | 5.6935 | 18146.9 | 23687.2 | 186.518 | 22.50 | 31.22 | 1.02444 | 531 |
| 700.000 | 1.00590 | 1.02485 | .008757 | 6.1256 | 19291.0 | 25255.8 | 188.843 | 22.87 | 31.53 | 1.02446 | 549 |
| 750.000 | .93924 | 1.02442 | .008151 | 6.5554 | 20452.2 | 26840.3 | 191.029 | 23.23 | 31.85 | 1.02427 | 566 |
| 800.000 | .88099 | 1.02389 | .007624 | 6.9835 | 21630.4 | 28440.9 | 193.095 | 23.59 | 32.17 | 1.02394 | 583 |
| 850.000 | .82963 | 1.02333 | .007163 | 7.4102 | 22825.3 | 30057.5 | 195.055 | 23.94 | 32.49 | 1.02353 | 599 |
| 900.000 | .78399 | 1.02274 | .006754 | 7.8358 | 24036.4 | 31689.6 | 196.920 | 24.27 | 32.79 | 1.02306 | 614 |
| 950.000 | .74316 | 1.02214 | .006391 | 8.2603 | 25262.9 | 33336.6 | 198.701 | 24.58 | 33.08 | 1.02257 | 630 |
| 1000.000 | .70641 | 1.02155 | .006064 | 8.6840 | 26504.0 | 34997.7 | 200.405 | 24.87 | 33.36 | 1.02206 | 644 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 6.500000 MPa | | | | | | | | | | | |
| 69.575 | 30.45753 | .36892 | 2.226352 | 16.5718 | 19.6 | 233.0 | 74.750 | 36.32 | 58.75 | .00432 | 978 |
| 70.000 | 30.40035 | .36737 | 2.209702 | 16.4258 | 44.3 | 258.1 | 75.108 | 36.32 | 58.83 | .00462 | 974 |
| 80.000 | 29.02948 | .33663 | 1.848051 | 13.1922 | 629.5 | 853.4 | 83.066 | 35.64 | 60.22 | .01741 | 892 |
| 90.000 | 27.58838 | .31485 | 1.533704 | 10.3115 | 1222.3 | 1457.9 | 90.186 | 33.61 | 60.59 | .04642 | 814 |
| 100.000 | 26.03995 | .30022 | 1.255377 | 7.7558 | 1813.3 | 2062.9 | 96.547 | 30.27 | 60.23 | .09771 | 742 |
| 110.000 | 24.32731 | .29214 | 1.004519 | 5.5122 | 2393.1 | 2660.3 | 102.248 | 25.75 | 59.77 | .17325 | 675 |
| 120.000 | 22.35052 | .29148 | .773938 | 3.5772 | 2964.5 | 3255.3 | 107.439 | 20.54 | 60.77 | .27133 | 614 |
| 130.000 | 19.89587 | .30225 | .556493 | 1.9657 | 3557.8 | 3884.5 | 112.445 | 18.41 | 70.15 | .38882 | 517 |
| 140.000 | 16.37389 | .34103 | .345499 | .7733 | 4417.5 | 4814.5 | 119.311 | 35.52 | 116.12 | .51261 | 300 |
| 150.000 | 11.24430 | .46350 | .175788 | .3811 | 5543.7 | 6121.8 | 128.324 | 31.49 | 127.68 | .62006 | 234 |
| 160.000 | 7.99440 | .61118 | .107715 | .5048 | 6368.3 | 7181.4 | 135.179 | 28.03 | 85.58 | .69843 | 234 |
| 170.000 | 6.45382 | .71254 | .080093 | .7164 | 6898.0 | 7905.1 | 139.574 | 25.77 | 62.32 | .75600 | 248 |
| 180.000 | 5.56483 | .78046 | .065291 | .9165 | 7299.8 | 8467.9 | 142.794 | 24.39 | 51.42 | .80020 | 262 |
| 190.000 | 4.96411 | .82886 | .055863 | 1.0972 | 7640.1 | 8949.5 | 145.399 | 23.49 | 45.42 | .83528 | 275 |
| 200.000 | 4.51910 | .86496 | .049233 | 1.2616 | 7945.3 | 9383.6 | 147.627 | 22.87 | 41.69 | .86360 | 286 |
| 210.000 | 4.16989 | .89276 | .044265 | 1.4133 | 8228.4 | 9787.2 | 149.596 | 22.43 | 39.17 | .88681 | 296 |
| 220.000 | 3.88497 | .91467 | .040374 | 1.5551 | 8496.4 | 10169.5 | 151.375 | 22.11 | 37.39 | .90607 | 306 |
| 230.000 | 3.64591 | .93227 | .037225 | 1.6890 | 8753.6 | 10536.4 | 153.007 | 21.86 | 36.06 | .92219 | 315 |
| 240.000 | 3.44108 | .94661 | .034612 | 1.8166 | 9002.8 | 10891.7 | 154.519 | 21.68 | 35.05 | .93579 | 323 |
| 250.000 | 3.26271 | .95843 | .032401 | 1.9389 | 9245.8 | 11238.1 | 155.933 | 21.53 | 34.25 | .94736 | 331 |
| 260.000 | 3.10534 | .96827 | .030498 | 2.0569 | 9484.1 | 11577.3 | 157.263 | 21.42 | 33.61 | .95725 | 339 |
| 270.000 | 2.96503 | .97653 | .028840 | 2.1713 | 9718.5 | 11910.7 | 158.522 | 21.33 | 33.10 | .96573 | 346 |
| 280.000 | 2.83883 | .98351 | .027378 | 2.2825 | 9949.8 | 12239.5 | 159.718 | 21.26 | 32.67 | .97310 | 353 |
| 290.000 | 2.72448 | .98945 | .026077 | 2.3912 | 10178.6 | 12564.3 | 160.858 | 21.20 | 32.31 | .97947 | 360 |
| 300.000 | 2.62020 | .99454 | .024910 | 2.4976 | 10405.2 | 12885.9 | 161.948 | 21.16 | 32.02 | .98503 | 367 |
| 310.000 | 2.52459 | .99891 | .023855 | 2.6020 | 10630.1 | 13204.8 | 162.994 | 21.13 | 31.76 | .98989 | 373 |
| 320.000 | 2.43650 | 1.00268 | .022897 | 2.7047 | 10853.6 | 13521.3 | 163.999 | 21.10 | 31.55 | .99415 | 379 |
| 330.000 | 2.35500 | 1.00594 | .022020 | 2.8059 | 11075.8 | 13835.9 | 164.967 | 21.08 | 31.37 | .99789 | 386 |
| 340.000 | 2.27931 | 1.00878 | .021215 | 2.9058 | 11297.0 | 14148.7 | 165.901 | 21.07 | 31.21 | 1.00120 | 391 |
| 350.000 | 2.20877 | 1.01125 | .020473 | 3.0044 | 11517.3 | 14460.2 | 166.803 | 21.07 | 31.08 | 1.00412 | 397 |
| 360.000 | 2.14285 | 1.01340 | .019785 | 3.1020 | 11737.0 | 14770.3 | 167.677 | 21.07 | 30.96 | 1.00671 | 403 |
| 370.000 | 2.08106 | 1.01529 | .019146 | 3.1986 | 11956.1 | 15079.5 | 168.524 | 21.08 | 30.87 | 1.00900 | 408 |
| 380.000 | 2.02301 | 1.01694 | .018551 | 3.2944 | 12174.7 | 15387.7 | 169.346 | 21.09 | 30.79 | 1.01104 | 414 |
| 390.000 | 1.96833 | 1.01839 | .017994 | 3.3894 | 12393.0 | 15695.3 | 170.145 | 21.10 | 30.72 | 1.01285 | 419 |
| 400.000 | 1.91674 | 1.01966 | .017472 | 3.4837 | 12611.0 | 16002.2 | 170.922 | 21.12 | 30.66 | 1.01447 | 424 |
| 410.000 | 1.86794 | 1.02077 | .016982 | 3.5774 | 12828.8 | 16308.6 | 171.679 | 21.15 | 30.62 | 1.01591 | 430 |
| 420.000 | 1.82172 | 1.02175 | .016520 | 3.6705 | 13046.5 | 16614.6 | 172.416 | 21.18 | 30.59 | 1.01720 | 435 |
| 430.000 | 1.77786 | 1.02261 | .016084 | 3.7631 | 13264.2 | 16920.3 | 173.135 | 21.21 | 30.56 | 1.01834 | 439 |
| 440.000 | 1.73618 | 1.02336 | .015672 | 3.8551 | 13482.0 | 17225.8 | 173.838 | 21.24 | 30.54 | 1.01937 | 444 |
| 450.000 | 1.69651 | 1.02402 | .015282 | 3.9467 | 13699.8 | 17531.2 | 174.524 | 21.28 | 30.53 | 1.02028 | 449 |
| 470.000 | 1.62261 | 1.02510 | .014560 | 4.1287 | 14135.9 | 18141.8 | 175.852 | 21.37 | 30.53 | 1.02183 | 458 |
| 500.000 | 1.52356 | 1.02624 | .013601 | 4.3991 | 14792.1 | 19058.4 | 177.742 | 21.52 | 30.58 | 1.02356 | 472 |
| 550.000 | 1.38369 | 1.02725 | .012266 | 4.8443 | 15893.2 | 20590.8 | 180.663 | 21.81 | 30.74 | 1.02537 | 493 |
| 600.000 | 1.26800 | 1.02756 | .011176 | 5.2843 | 17007.0 | 22133.2 | 183.347 | 22.15 | 30.97 | 1.02627 | 513 |
| 650.000 | 1.17058 | 1.02746 | .010269 | 5.7205 | 18135.6 | 23688.5 | 185.837 | 22.50 | 31.25 | 1.02662 | 532 |
| 700.000 | 1.08734 | 1.02710 | .009501 | 6.1536 | 19280.6 | 25258.5 | 188.163 | 22.87 | 31.56 | 1.02661 | 550 |
| 750.000 | 1.01535 | 1.02660 | .008842 | 6.5845 | 20442.4 | 26844.2 | 190.351 | 23.24 | 31.87 | 1.02638 | 567 |
| 800.000 | .95243 | 1.02601 | .008270 | 7.0134 | 21621.2 | 28445.9 | 192.419 | 23.59 | 32.19 | 1.02601 | 584 |
| 850.000 | .89696 | 1.02538 | .007768 | 7.4409 | 22816.7 | 30063.4 | 194.380 | 23.94 | 32.51 | 1.02554 | 600 |
| 900.000 | .84767 | 1.02473 | .007324 | 7.8671 | 24028.3 | 31696.3 | 196.246 | 24.27 | 32.81 | 1.02503 | 616 |
| 950.000 | .80357 | 1.02407 | .006929 | 8.2922 | 25255.2 | 33344.1 | 198.028 | 24.58 | 33.10 | 1.02448 | 631 |
| 1000.000 | .76388 | 1.02342 | .006575 | 8.7164 | 26496.6 | 35005.9 | 199.733 | 24.87 | 33.37 | 1.02392 | 646 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 7.000000 MPa | | | | | | | | | | | |
| 69.685 | 30.47278 | .39647 | 2.230596 | 16.6750 | 21.2 | 250.9 | 74.771 | 36.32 | 58.71 | .00420 | 980 |
| 70.000 | 30.43066 | .39523 | 2.218269 | 16.5670 | 39.4 | 269.5 | 75.036 | 36.32 | 58.77 | .00441 | 978 |
| 80.000 | 29.06718 | .36205 | 1.856366 | 13.3341 | 623.1 | 864.0 | 82.984 | 35.65 | 60.13 | .01659 | 895 |
| 90.000 | 27.63653 | .33848 | 1.542330 | 10.4579 | 1213.9 | 1467.2 | 90.089 | 33.63 | 60.43 | .04416 | 819 |
| 100.000 | 26.10379 | .32232 | 1.264830 | 7.9096 | 1802.1 | 2070.3 | 96.429 | 30.29 | 39.97 | .09283 | 747 |
| 110.000 | 24.41670 | .31346 | 1.015518 | 5.6762 | 2377.4 | 2664.1 | 102.096 | 25.78 | 59.30 | .16452 | 682 |
| 120.000 | 22.48693 | .31200 | .787570 | 3.7546 | 2940.9 | 3252.2 | 107.227 | 20.57 | 59.77 | .25765 | 624 |
| 130.000 | 20.13842 | .32158 | .575035 | 2.1591 | 3517.3 | 3864.9 | 112.102 | 18.41 | 67.50 | .36949 | 531 |
| 140.000 | 16.95047 | .35477 | .373967 | .9674 | 4327.0 | 4740.0 | 118.564 | 35.37 | 105.81 | .48842 | 321 |
| 150.000 | 12.44667 | .45094 | .206688 | .4574 | 5356.3 | 5918.7 | 126.689 | 31.40 | 121.83 | .59559 | 251 |
| 160.000 | 8.98489 | .58564 | .126251 | .5099 | 6204.3 | 6983.3 | 133.573 | 28.35 | 90.31 | .67794 | 240 |
| 170.000 | 7.16481 | .69121 | .091824 | .6927 | 6777.6 | 7754.6 | 138.256 | 26.09 | 66.40 | .73952 | 250 |
| 180.000 | 6.11910 | .76437 | .073754 | .8891 | 7206.4 | 8350.3 | 141.664 | 24.64 | 54.05 | .78685 | 263 |
| 190.000 | 5.42531 | .81674 | .062502 | 1.0720 | 7563.4 | 8853.6 | 144.387 | 23.68 | 47.21 | .82441 | 276 |
| 200.000 | 4.91893 | .85578 | .054720 | 1.2401 | 7880.0 | 9303.0 | 146.693 | 23.02 | 42.98 | .85473 | 287 |
| 210.000 | 4.52595 | .88579 | .048960 | 1.3956 | 8171.2 | 9717.9 | 148.718 | 22.55 | 40.16 | .87959 | 297 |
| 220.000 | 4.20798 | .90942 | .044491 | 1.5411 | 8445.5 | 10109.0 | 150.538 | 22.21 | 38.17 | .90020 | 307 |
| 230.000 | 3.94290 | .92836 | .040901 | 1.6783 | 8707.6 | 10482.9 | 152.201 | 21.95 | 36.69 | .91746 | 316 |
| 240.000 | 3.71692 | .94377 | .037941 | 1.8089 | 8960.7 | 10844.0 | 153.738 | 21.75 | 35.57 | .93202 | 325 |
| 250.000 | 3.52092 | .95646 | .035447 | 1.9339 | 9207.0 | 11195.2 | 155.171 | 21.59 | 34.69 | .94439 | 333 |
| 260.000 | 3.34858 | .96700 | .033312 | 2.0544 | 9448.0 | 11538.5 | 156.518 | 21.47 | 33.99 | .95497 | 340 |
| 270.000 | 3.19533 | .97585 | .031458 | 2.1710 | 9684.8 | 11875.5 | 157.790 | 21.37 | 33.43 | .96406 | 348 |
| 280.000 | 3.05781 | .98332 | .029828 | 2.2843 | 9918.1 | 12207.4 | 158.997 | 21.30 | 32.96 | .97192 | 355 |
| 290.000 | 2.93343 | .98967 | .028382 | 2.3948 | 10148.7 | 12534.9 | 160.147 | 21.23 | 32.57 | .97873 | 362 |
| 300.000 | 2.82019 | .99509 | .027088 | 2.5029 | 10376.9 | 12859.0 | 161.245 | 21.19 | 32.25 | .98467 | 368 |
| 310.000 | 2.71650 | .99975 | .025922 | 2.6089 | 10603.2 | 13180.0 | 162.298 | 21.15 | 31.97 | .98985 | 375 |
| 320.000 | 2.62108 | 1.00376 | .024863 | 2.7130 | 10827.9 | 13498.5 | 163.309 | 21.12 | 31.74 | .99440 | 381 |
| 330.000 | 2.53289 | 1.00724 | .023897 | 2.8155 | 11051.2 | 13814.8 | 164.282 | 21.10 | 31.54 | .99840 | 387 |
| 340.000 | 2.45106 | 1.01025 | .023011 | 2.9165 | 11273.4 | 14129.3 | 165.221 | 21.09 | 31.36 | 1.00192 | 393 |
| 350.000 | 2.37487 | 1.01287 | .022196 | 3.0163 | 11494.7 | 14442.2 | 166.128 | 21.08 | 31.22 | 1.00503 | 399 |
| 360.000 | 2.30370 | 1.01516 | .021441 | 3.1149 | 11715.2 | 14753.8 | 167.006 | 21.08 | 31.09 | 1.00779 | 404 |
| 370.000 | 2.23704 | 1.01715 | .020741 | 3.2125 | 11935.1 | 15064.2 | 167.856 | 21.09 | 30.99 | 1.01023 | 410 |
| 380.000 | 2.17444 | 1.01890 | .020088 | 3.3092 | 12154.8 | 15373.6 | 168.682 | 21.10 | 30.90 | 1.01240 | 415 |
| 390.000 | 2.11551 | 1.02043 | .019479 | 3.4051 | 12373.3 | 15682.2 | 169.483 | 21.11 | 30.82 | 1.01433 | 421 |
| 400.000 | 2.05992 | 1.02176 | .018909 | 3.5001 | 12591.9 | 15990.1 | 170.263 | 21.13 | 30.76 | 1.01604 | 426 |
| 410.000 | 2.00738 | 1.02294 | .018373 | 3.5946 | 12810.4 | 16297.5 | 171.022 | 21.16 | 30.71 | 1.01757 | 431 |
| 420.000 | 1.95762 | 1.02397 | .017869 | 3.6883 | 13028.6 | 16604.4 | 171.761 | 21.18 | 30.67 | 1.01894 | 436 |
| 430.000 | 1.91041 | 1.02487 | .017394 | 3.7815 | 13246.8 | 16911.0 | 172.483 | 21.21 | 30.64 | 1.02015 | 441 |
| 440.000 | 1.86556 | 1.02565 | .016945 | 3.8742 | 13465.0 | 17217.2 | 173.187 | 21.25 | 30.62 | 1.02123 | 446 |
| 450.000 | 1.82288 | 1.02634 | .016520 | 3.9664 | 13683.3 | 17523.4 | 173.875 | 21.29 | 30.61 | 1.02220 | 451 |
| 470.000 | 1.74341 | 1.02746 | .015734 | 4.1495 | 14120.2 | 18135.4 | 175.205 | 21.37 | 30.60 | 1.02383 | 460 |
| 500.000 | 1.63693 | 1.02864 | .014692 | 4.4214 | 14777.4 | 19053.7 | 177.099 | 21.52 | 30.63 | 1.02566 | 473 |
| 550.000 | 1.48664 | 1.02966 | .013242 | 4.8685 | 15880.0 | 20588.6 | 180.025 | 21.82 | 30.78 | 1.02755 | 495 |
| 600.000 | 1.36238 | 1.02994 | .012061 | 5.3101 | 16994.9 | 22133.0 | 182.713 | 22.15 | 31.00 | 1.02848 | 515 |
| 650.000 | 1.25778 | 1.02978 | .011079 | 5.7476 | 18124.5 | 23689.9 | 185.205 | 22.51 | 31.28 | 1.02881 | 534 |
| 700.000 | 1.16841 | 1.02937 | .010247 | 6.1819 | 19270.3 | 25261.3 | 187.534 | 22.87 | 31.58 | 1.02878 | 552 |
| 750.000 | 1.09112 | 1.02880 | .009535 | 6.6137 | 20432.8 | 26848.2 | 189.723 | 23.24 | 31.90 | 1.02850 | 569 |
| 800.000 | 1.02357 | 1.02814 | .008916 | 7.0435 | 21612.2 | 28451.0 | 191.792 | 23.59 | 32.21 | 1.02808 | 585 |
| 850.000 | .96402 | 1.02744 | .008374 | 7.4717 | 22808.2 | 30069.4 | 193.754 | 23.94 | 32.52 | 1.02757 | 601 |
| 900.000 | .91110 | 1.02672 | .007895 | 7.8985 | 24020.2 | 31703.2 | 195.622 | 24.27 | 32.82 | 1.02700 | 617 |
| 950.000 | .86375 | 1.02600 | .007468 | 8.3243 | 25247.5 | 33351.7 | 197.404 | 24.58 | 33.11 | 1.02640 | 632 |
| 1000.000 | .82113 | 1.02530 | .007086 | 8.7490 | 26489.3 | 35014.2 | 199.110 | 24.87 | 33.38 | 1.02579 | 647 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|--------|---------|----------|
| 7.500000 MPa | | | | | | | | | | | |
| 69.796 | 30.48792 | .42390 | 2.234810 | 16.7781 | 22.8 | 268.8 | 74.792 | 36.32 | 58.67 | .00411 | 983 |
| 70.000 | 30.46072 | .42305 | 2.226807 | 16.7080 | 34.6 | 280.9 | 74.964 | 36.32 | 58.71 | .00424 | 981 |
| 80.000 | 29.10448 | .38741 | 1.864636 | 13.4755 | 616.9 | 874.6 | 82.902 | 35.66 | 60.03 | .01589 | 899 |
| 90.000 | 27.68401 | .36204 | 1.550882 | 10.6036 | 1205.7 | 1476.7 | 89.993 | 33.65 | 60.28 | .04223 | 823 |
| 100.000 | 26.16640 | .34473 | 1.274198 | 8.0624 | 1791.1 | 2077.8 | 96.313 | 30.31 | 59.72 | .08868 | 753 |
| 110.000 | 24.50355 | .33466 | 1.026288 | 5.8385 | 2362.1 | 2668.2 | 101.948 | 25.80 | 58.85 | .15702 | 689 |
| 120.000 | 22.61709 | .33236 | .800732 | 3.9289 | 2918.4 | 3250.0 | 107.024 | 20.60 | 58.88 | .24587 | 633 |
| 130.000 | 20.36043 | .34080 | .592403 | 2.3470 | 3480.2 | 3846.8 | 111.786 | 18.41 | 65.31 | .35282 | 545 |
| 140.000 | 17.42237 | .36982 | .398939 | 1.1565 | 4252.2 | 4682.7 | 117.947 | 35.27 | 98.75 | .46739 | 339 |
| 150.000 | 13.43691 | .44754 | .235889 | .5599 | 5203.2 | 5761.3 | 125.382 | 31.25 | 113.82 | .57337 | 269 |
| 160.000 | 9.93892 | .56724 | .145754 | .5427 | 6049.9 | 6804.5 | 132.124 | 28.54 | 91.94 | .65842 | 249 |
| 170.000 | 7.89219 | .67232 | .104519 | .6850 | 6656.7 | 7607.0 | 136.996 | 26.36 | 69.88 | .72348 | 254 |
| 180.000 | 6.68806 | .74929 | .082831 | .8702 | 7111.6 | 8233.0 | 140.578 | 24.87 | 56.59 | .77378 | 265 |
| 190.000 | 5.89637 | .80517 | .069546 | 1.0519 | 7485.6 | 8757.6 | 143.416 | 23.86 | 48.99 | .81375 | 277 |
| 200.000 | 5.32521 | .84695 | .060491 | 1.2220 | 7813.9 | 9222.3 | 145.801 | 23.17 | 44.29 | .84603 | 288 |
| 210.000 | 4.88624 | .87909 | .053863 | 1.3804 | 8113.6 | 9648.6 | 147.882 | 22.67 | 41.16 | .87250 | 299 |
| 220.000 | 4.53376 | .90437 | .048766 | 1.5289 | 8394.2 | 10048.5 | 149.743 | 22.30 | 38.95 | .89445 | 308 |
| 230.000 | 4.24167 | .92461 | .044702 | 1.6691 | 8661.4 | 10429.5 | 151.437 | 22.03 | 37.33 | .91283 | 317 |
| 240.000 | 3.99385 | .94107 | .041369 | 1.8024 | 8918.5 | 10796.4 | 152.999 | 21.81 | 36.10 | .92834 | 326 |
| 250.000 | 3.77974 | .95460 | .038577 | 1.9300 | 9168.2 | 11152.5 | 154.452 | 21.65 | 35.14 | .94151 | 334 |
| 260.000 | 3.59207 | .96585 | .036195 | 2.0527 | 9412.0 | 11499.9 | 155.815 | 21.52 | 34.38 | .95277 | 342 |
| 270.000 | 3.42562 | .97526 | .034134 | 2.1715 | 9651.1 | 11840.5 | 157.101 | 21.41 | 33.76 | .96245 | 349 |
| 280.000 | 3.27658 | .98321 | .032328 | 2.2867 | 9886.5 | 12175.5 | 158.319 | 21.33 | 33.25 | .97081 | 356 |
| 290.000 | 3.14203 | .98996 | .030730 | 2.3990 | 10118.8 | 12505.8 | 159.478 | 21.27 | 32.83 | .97806 | 363 |
| 300.000 | 3.01973 | .99572 | .029304 | 2.5087 | 10348.6 | 12832.3 | 160.585 | 21.21 | 32.48 | .98437 | 370 |
| 310.000 | 2.90789 | 1.00066 | .028020 | 2.6162 | 10576.3 | 13155.5 | 161.645 | 21.17 | 32.18 | .98988 | 376 |
| 320.000 | 2.80509 | 1.00491 | .026858 | 2.7217 | 10802.3 | 13476.0 | 162.662 | 21.14 | 31.92 | .99471 | 383 |
| 330.000 | 2.71017 | 1.00859 | .025799 | 2.8254 | 11026.7 | 13794.1 | 163.641 | 21.12 | 31.71 | .99895 | 389 |
| 340.000 | 2.62217 | 1.01178 | .024830 | 2.9276 | 11250.0 | 14110.2 | 164.585 | 21.11 | 31.52 | 1.00269 | 395 |
| 350.000 | 2.54030 | 1.01455 | .023938 | 3.0285 | 11472.2 | 14424.6 | 165.496 | 21.10 | 31.36 | 1.00599 | 400 |
| 360.000 | 2.46388 | 1.01696 | .023115 | 3.1282 | 11693.5 | 14737.5 | 166.378 | 21.10 | 31.23 | 1.00891 | 406 |
| 370.000 | 2.39234 | 1.01906 | .022351 | 3.2267 | 11914.1 | 15049.2 | 167.232 | 21.10 | 31.11 | 1.01150 | 412 |
| 380.000 | 2.32519 | 1.02090 | .021641 | 3.3243 | 12134.2 | 15359.7 | 168.060 | 21.11 | 31.01 | 1.01380 | 417 |
| 390.000 | 2.26201 | 1.02250 | .020978 | 3.4210 | 12353.8 | 15669.4 | 168.864 | 21.12 | 30.93 | 1.01584 | 422 |
| 400.000 | 2.20244 | 1.02391 | .020358 | 3.5168 | 12573.0 | 15978.4 | 169.647 | 21.14 | 30.86 | 1.01766 | 428 |
| 410.000 | 2.14614 | 1.02514 | .019776 | 3.6120 | 12792.0 | 16286.7 | 170.408 | 21.16 | 30.80 | 1.01927 | 433 |
| 420.000 | 2.09285 | 1.02622 | .019229 | 3.7065 | 13010.8 | 16594.5 | 171.150 | 21.19 | 30.76 | 1.02071 | 438 |
| 430.000 | 2.04231 | 1.02716 | .018713 | 3.8003 | 13229.5 | 16901.8 | 171.873 | 21.22 | 30.72 | 1.02199 | 443 |
| 440.000 | 1.99430 | 1.02798 | .018226 | 3.8936 | 13448.2 | 17208.9 | 172.579 | 21.26 | 30.69 | 1.02314 | 448 |
| 450.000 | 1.94862 | 1.02869 | .017766 | 3.9864 | 13666.9 | 17515.8 | 173.268 | 21.29 | 30.68 | 1.02416 | 452 |
| 470.000 | 1.86360 | 1.02985 | .016915 | 4.1706 | 14104.6 | 18129.1 | 174.602 | 21.38 | 30.66 | 1.02587 | 462 |
| 500.000 | 1.74973 | 1.03106 | .015788 | 4.4438 | 14762.9 | 19049.2 | 176.500 | 21.53 | 30.69 | 1.02779 | 475 |
| 550.000 | 1.58909 | 1.03208 | .014222 | 4.8930 | 15866.9 | 20586.6 | 179.430 | 21.82 | 30.82 | 1.02975 | 496 |
| 600.000 | 1.45631 | 1.03233 | .012949 | 5.3361 | 16983.0 | 22132.9 | 182.121 | 22.15 | 31.04 | 1.03070 | 516 |
| 650.000 | 1.34456 | 1.03212 | .011890 | 5.7749 | 18113.5 | 23691.5 | 184.616 | 22.51 | 31.31 | 1.03103 | 535 |
| 700.000 | 1.24910 | 1.03164 | .010996 | 6.2103 | 19260.1 | 25264.4 | 186.947 | 22.87 | 31.61 | 1.03096 | 553 |
| 750.000 | 1.16655 | 1.03101 | .010229 | 6.6431 | 20423.3 | 26852.5 | 189.138 | 23.24 | 31.92 | 1.03064 | 570 |
| 800.000 | 1.09441 | 1.03028 | .009564 | 7.0737 | 21603.2 | 28456.2 | 191.208 | 23.60 | 32.23 | 1.03017 | 587 |
| 850.000 | 1.03080 | 1.02951 | .008981 | 7.5027 | 22799.7 | 30075.6 | 193.172 | 23.94 | 32.54 | 1.02960 | 603 |
| 900.000 | .97428 | 1.02873 | .008467 | 7.9302 | 24012.2 | 31710.2 | 195.040 | 24.27 | 32.84 | 1.02898 | 618 |
| 950.000 | .92370 | 1.02795 | .008008 | 8.3565 | 25239.9 | 33359.4 | 196.823 | 24.58 | 33.13 | 1.02832 | 634 |
| 1000.000 | .87817 | 1.02718 | .007598 | 8.7818 | 26482.1 | 35022.5 | 198.529 | 24.87 | 33.40 | 1.02766 | 648 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 8.000000 MPa | | | | | | | | | | | |
| 69.906 | 30.50296 | .45123 | 2.238996 | 16.8811 | 24.5 | 286.7 | 74.814 | 36.33 | 58.64 | .00403 | 986 |
| 70.000 | 30.49052 | .45081 | 2.235316 | 16.8489 | 29.9 | 292.3 | 74.892 | 36.33 | 58.66 | .00409 | 985 |
| 80.000 | 29.14139 | .41272 | 1.872861 | 13.6166 | 610.7 | 885.2 | 82.820 | 35.67 | 59.94 | .01528 | 903 |
| 90.000 | 27.73085 | .38552 | 1.559362 | 10.7487 | 1197.7 | 1486.2 | 89.898 | 33.66 | 60.14 | .04055 | 827 |
| 100.000 | 26.22784 | .36685 | 1.283426 | 8.2141 | 1780.4 | 2085.4 | 96.198 | 30.33 | 59.49 | .08506 | 758 |
| 110.000 | 24.58803 | .35574 | 1.036844 | 5.9990 | 2347.3 | 2672.7 | 101.803 | 25.83 | 58.44 | .15053 | 696 |
| 120.000 | 22.74165 | .35257 | .813469 | 4.1003 | 2896.8 | 3248.6 | 106.828 | 20.62 | 58.07 | .23566 | 642 |
| 130.000 | 20.56554 | .35989 | .608791 | 2.5300 | 3445.7 | 3834.7 | 111.492 | 18.43 | 63.45 | .33833 | 557 |
| 140.000 | 17.82344 | .38560 | .421372 | 1.3406 | 4188.1 | 4636.9 | 117.417 | 35.21 | 93.58 | .44899 | 356 |
| 150.000 | 14.24647 | .45025 | .262773 | .6820 | 5078.0 | 5639.6 | 124.330 | 31.11 | 105.94 | .55332 | 287 |
| 160.000 | 10.82082 | .55574 | .165537 | .5940 | 5909.7 | 6649.0 | 130.851 | 28.62 | 91.66 | .64005 | 260 |
| 170.000 | 8.61843 | .65671 | .117997 | .6949 | 6537.9 | 7466.1 | 135.810 | 26.56 | 72.41 | .70799 | 260 |
| 180.000 | 7.26610 | .73567 | .092491 | .8616 | 7016.3 | 8117.3 | 139.537 | 25.06 | 58.91 | .76104 | 268 |
| 190.000 | 6.37506 | .79436 | .076990 | 1.0382 | 7407.3 | 8662.2 | 142.485 | 24.03 | 50.72 | .80332 | 279 |
| 200.000 | 5.73686 | .83859 | .066544 | 1.2081 | 7747.3 | 9141.8 | 144.946 | 23.31 | 45.58 | .83750 | 290 |
| 210.000 | 5.25014 | .87270 | .058975 | 1.3681 | 8055.6 | 9579.4 | 147.082 | 22.78 | 42.15 | .86555 | 300 |
| 220.000 | 4.86191 | .89955 | .053201 | 1.5189 | 8342.8 | 9988.2 | 148.985 | 22.40 | 39.74 | .88883 | 310 |
| 230.000 | 4.54195 | .92105 | .048628 | 1.6615 | 8615.0 | 10376.3 | 150.710 | 22.10 | 37.97 | .90831 | 319 |
| 240.000 | 4.27168 | .93852 | .044899 | 1.7972 | 8876.3 | 10749.1 | 152.297 | 21.88 | 36.63 | .92475 | 327 |
| 250.000 | 4.03902 | .95288 | .041789 | 1.9271 | 9129.3 | 11110.0 | 153.770 | 21.70 | 35.59 | .93872 | 335 |
| 260.000 | 3.83570 | .96480 | .039146 | 2.0520 | 9375.9 | 11461.6 | 155.150 | 21.57 | 34.76 | .95065 | 343 |
| 270.000 | 3.65582 | .97478 | .036867 | 2.1727 | 9617.5 | 11805.7 | 156.449 | 21.46 | 34.09 | .96091 | 351 |
| 280.000 | 3.49509 | .98319 | .034877 | 2.2898 | 9854.9 | 12143.8 | 157.678 | 21.37 | 33.54 | .96977 | 358 |
| 290.000 | 3.35025 | .99033 | .033121 | 2.4038 | 10089.1 | 12476.9 | 158.847 | 21.30 | 33.09 | .97744 | 365 |
| 300.000 | 3.21878 | .99642 | .031556 | 2.5150 | 10320.4 | 12805.8 | 159.962 | 21.24 | 32.71 | .98413 | 371 |
| 310.000 | 3.09873 | 1.00163 | .030151 | 2.6240 | 10549.5 | 13131.3 | 161.029 | 21.20 | 32.38 | .98996 | 378 |
| 320.000 | 2.98850 | 1.00612 | .028882 | 2.7308 | 10776.7 | 13453.7 | 162.053 | 21.16 | 32.11 | .99507 | 384 |
| 330.000 | 2.88681 | 1.01000 | .027727 | 2.8358 | 11002.4 | 13773.6 | 163.037 | 21.14 | 31.88 | .99956 | 390 |
| 340.000 | 2.79263 | 1.01336 | .026671 | 2.9392 | 11226.6 | 14091.3 | 163.986 | 21.12 | 31.67 | 1.00352 | 396 |
| 350.000 | 2.70506 | 1.01627 | .025701 | 3.0411 | 11449.7 | 14407.2 | 164.902 | 21.11 | 31.50 | 1.00700 | 402 |
| 360.000 | 2.62338 | 1.01880 | .024807 | 3.1418 | 11671.9 | 14721.5 | 165.787 | 21.11 | 31.36 | 1.01009 | 408 |
| 370.000 | 2.54695 | 1.02101 | .023978 | 3.2412 | 11893.4 | 15034.4 | 166.644 | 21.11 | 31.23 | 1.01282 | 413 |
| 380.000 | 2.47526 | 1.02294 | .023208 | 3.3397 | 12114.1 | 15346.1 | 167.476 | 21.12 | 31.12 | 1.01524 | 419 |
| 390.000 | 2.40783 | 1.02462 | .022490 | 3.4372 | 12334.4 | 15656.9 | 168.283 | 21.13 | 31.03 | 1.01740 | 424 |
| 400.000 | 2.34427 | 1.02609 | .021819 | 3.5338 | 12554.2 | 15966.8 | 169.068 | 21.15 | 30.96 | 1.01931 | 429 |
| 410.000 | 2.28423 | 1.02738 | .021190 | 3.6297 | 12773.8 | 16276.1 | 169.831 | 21.17 | 30.89 | 1.02101 | 434 |
| 420.000 | 2.22741 | 1.02850 | .020599 | 3.7248 | 12993.1 | 16584.7 | 170.575 | 21.20 | 30.84 | 1.02252 | 439 |
| 430.000 | 2.17355 | 1.02948 | .020042 | 3.8193 | 13212.3 | 16893.0 | 171.300 | 21.23 | 30.80 | 1.02387 | 444 |
| 440.000 | 2.12239 | 1.03033 | .019517 | 3.9133 | 13431.5 | 17200.8 | 172.008 | 21.26 | 30.77 | 1.02507 | 449 |
| 450.000 | 2.07373 | 1.03107 | .019020 | 4.0066 | 13650.6 | 17508.4 | 172.699 | 21.30 | 30.75 | 1.02614 | 454 |
| 470.000 | 1.98318 | 1.03227 | .018103 | 4.1918 | 14089.2 | 18123.1 | 174.036 | 21.38 | 30.73 | 1.02794 | 463 |
| 500.000 | 1.86196 | 1.03351 | .016890 | 4.4665 | 14748.4 | 19045.0 | 175.937 | 21.53 | 30.74 | 1.02994 | 477 |
| 550.000 | 1.69102 | 1.03453 | .015207 | 4.9176 | 15853.9 | 20584.8 | 178.872 | 21.82 | 30.87 | 1.03197 | 498 |
| 600.000 | 1.54979 | 1.03474 | .013840 | 5.3624 | 16971.1 | 22133.1 | 181.567 | 22.15 | 31.08 | 1.03294 | 518 |
| 650.000 | 1.43094 | 1.03447 | .012705 | 5.8024 | 18102.6 | 23693.3 | 184.064 | 22.51 | 31.34 | 1.03325 | 537 |
| 700.000 | 1.32943 | 1.03393 | .011746 | 6.2390 | 19249.9 | 25267.6 | 186.397 | 22.87 | 31.63 | 1.03315 | 555 |
| 750.000 | 1.24165 | 1.03322 | .010925 | 6.6727 | 20413.8 | 26856.8 | 188.590 | 23.24 | 31.94 | 1.03279 | 572 |
| 800.000 | 1.16494 | 1.03243 | .010213 | 7.1041 | 21594.4 | 28461.7 | 190.661 | 23.60 | 32.25 | 1.03226 | 588 |
| 850.000 | 1.09731 | 1.03159 | .009590 | 7.5338 | 22791.3 | 30081.9 | 192.626 | 23.94 | 32.56 | 1.03164 | 604 |
| 900.000 | 1.03720 | 1.03074 | .009039 | 7.9619 | 24004.3 | 31717.3 | 194.495 | 24.27 | 32.86 | 1.03096 | 620 |
| 950.000 | .98342 | 1.02989 | .008549 | 8.3888 | 25232.4 | 33367.3 | 196.279 | 24.58 | 33.14 | 1.03025 | 635 |
| 1000.000 | .93500 | 1.02906 | .008110 | 8.8146 | 26474.9 | 35031.0 | 197.986 | 24.87 | 33.41 | 1.02954 | 650 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 8.500000 MPa | | | | | | | | | | | |
| 70.016 | 30.51790 | .47844 | 2.243153 | 16.9840 | 26.1 | 304.6 | 74.835 | 36.33 | 58.60 | .00397 | 988 |
| 80.000 | 29.17792 | .43796 | 1.881044 | 13.7573 | 604.6 | 895.9 | 82.740 | 35.68 | 59.85 | .01476 | 907 |
| 90.000 | 27.77705 | .40893 | 1.567774 | 10.8931 | 1189.7 | 1495.7 | 89.804 | 33.68 | 60.00 | .03910 | 832 |
| 100.000 | 26.28816 | .38889 | 1.292540 | 8.3647 | 1769.8 | 2093.2 | 96.086 | 30.36 | 59.26 | .08191 | 763 |
| 110.000 | 24.67029 | .37672 | 1.047198 | 6.1579 | 2332.9 | 2677.4 | 101.662 | 25.86 | 58.04 | .14485 | 702 |
| 120.000 | 22.86114 | .37265 | .825820 | 4.2691 | 2876.1 | 3247.9 | 106.640 | 20.65 | 57.33 | .22672 | 650 |
| 130.000 | 20.75647 | .37887 | .624344 | 2.7088 | 3413.6 | 3823.1 | 111.216 | 18.44 | 61.86 | .32564 | 569 |
| 140.000 | 18.17334 | .40181 | .441864 | 1.5204 | 4131.7 | 4599.4 | 116.951 | 35.17 | 89.60 | .43278 | 371 |
| 150.000 | 14.91637 | .45691 | .287348 | .8163 | 4974.1 | 5543.9 | 123.464 | 30.99 | 99.18 | .53529 | 305 |
| 160.000 | 11.62324 | .54971 | .185260 | .6548 | 5783.6 | 6514.9 | 129.734 | 28.65 | 90.73 | .62292 | 272 |
| 170.000 | 9.32562 | .64485 | .132009 | .7220 | 6423.8 | 7335.3 | 134.713 | 26.70 | 73.89 | .69317 | 267 |
| 180.000 | 7.84608 | .72387 | .102670 | .8646 | 6921.8 | 8005.2 | 138.546 | 25.23 | 60.88 | .74869 | 272 |
| 190.000 | 6.85843 | .78452 | .084816 | 1.0319 | 7328.7 | 8568.1 | 141.592 | 24.18 | 52.34 | .79314 | 282 |
| 200.000 | 6.15244 | .83082 | .072875 | 1.1991 | 7680.5 | 9062.0 | 144.127 | 23.43 | 46.83 | .82916 | 292 |
| 210.000 | 5.61687 | .86670 | .064293 | 1.3594 | 7997.4 | 9510.7 | 146.317 | 22.89 | 43.13 | .85875 | 302 |
| 220.000 | 5.19196 | .89501 | .057795 | 1.5115 | 8291.1 | 9928.2 | 148.260 | 22.48 | 40.52 | .88332 | 311 |
| 230.000 | 4.84342 | .91770 | .052679 | 1.6559 | 8568.5 | 10323.4 | 150.017 | 22.18 | 38.61 | .90389 | 320 |
| 240.000 | 4.55019 | .93614 | .048529 | 1.7936 | 8833.9 | 10702.0 | 151.628 | 21.94 | 37.16 | .92125 | 329 |
| 250.000 | 4.29860 | .95130 | .045083 | 1.9255 | 9090.4 | 11067.7 | 153.121 | 21.76 | 36.04 | .93600 | 337 |
| 260.000 | 4.07935 | .96387 | .042166 | 2.0523 | 9339.8 | 11423.5 | 154.517 | 21.61 | 35.15 | .94861 | 345 |
| 270.000 | 3.88585 | .97439 | .039659 | 2.1749 | 9583.8 | 11771.2 | 155.829 | 21.49 | 34.43 | .95944 | 352 |
| 280.000 | 3.71327 | .98326 | .037476 | 2.2937 | 9823.4 | 12112.5 | 157.070 | 21.40 | 33.84 | .96879 | 359 |
| 290.000 | 3.55802 | .99078 | .035554 | 2.4092 | 10059.3 | 12448.3 | 158.249 | 21.33 | 33.35 | .97689 | 366 |
| 300.000 | 3.41732 | .99719 | .033845 | 2.5220 | 10292.3 | 12779.7 | 159.372 | 21.27 | 32.94 | .98394 | 373 |
| 310.000 | 3.28898 | 1.00267 | .032315 | 2.6323 | 10522.9 | 13107.2 | 160.447 | 21.22 | 32.59 | .99010 | 379 |
| 320.000 | 3.17128 | 1.00739 | .030934 | 2.7404 | 10751.3 | 13431.6 | 161.477 | 21.19 | 32.30 | .99549 | 386 |
| 330.000 | 3.06280 | 1.01146 | .029680 | 2.8466 | 10978.1 | 13753.3 | 162.466 | 21.16 | 32.04 | 1.00022 | 392 |
| 340.000 | 2.96240 | 1.01499 | .028535 | 2.9511 | 11203.4 | 14072.7 | 163.420 | 21.14 | 31.83 | 1.00439 | 398 |
| 350.000 | 2.86913 | 1.01804 | .027484 | 3.0541 | 11427.4 | 14390.0 | 164.340 | 21.13 | 31.65 | 1.00806 | 404 |
| 360.000 | 2.78217 | 1.02070 | .026517 | 3.1557 | 11650.5 | 14705.6 | 165.229 | 21.12 | 31.49 | 1.01131 | 409 |
| 370.000 | 2.70086 | 1.02301 | .025621 | 3.2561 | 11872.7 | 15019.8 | 166.090 | 21.13 | 31.35 | 1.01418 | 415 |
| 380.000 | 2.62462 | 1.02502 | .024790 | 3.3554 | 12094.2 | 15332.7 | 166.924 | 21.13 | 31.24 | 1.01673 | 420 |
| 390.000 | 2.55295 | 1.02678 | .024016 | 3.4537 | 12315.1 | 15644.6 | 167.734 | 21.14 | 31.14 | 1.01899 | 426 |
| 400.000 | 2.48541 | 1.02831 | .023293 | 3.5511 | 12535.6 | 15955.5 | 168.522 | 21.16 | 31.05 | 1.02100 | 431 |
| 410.000 | 2.42165 | 1.02965 | .022615 | 3.6477 | 12755.7 | 16265.7 | 169.287 | 21.18 | 30.98 | 1.02278 | 436 |
| 420.000 | 2.36131 | 1.03081 | .021979 | 3.7435 | 12975.6 | 16575.3 | 170.033 | 21.21 | 30.93 | 1.02437 | 441 |
| 430.000 | 2.30413 | 1.03183 | .021380 | 3.8386 | 13195.3 | 16884.3 | 170.761 | 21.24 | 30.88 | 1.02579 | 446 |
| 440.000 | 2.24984 | 1.03271 | .020816 | 3.9331 | 13414.9 | 17192.9 | 171.470 | 21.27 | 30.85 | 1.02704 | 451 |
| 450.000 | 2.19821 | 1.03348 | .020282 | 4.0271 | 13634.4 | 17501.2 | 172.163 | 21.31 | 30.82 | 1.02816 | 456 |
| 470.000 | 2.10216 | 1.03471 | .019298 | 4.2133 | 14073.8 | 18117.3 | 173.502 | 21.39 | 30.79 | 1.03003 | 465 |
| 500.000 | 1.97362 | 1.03597 | .017998 | 4.4894 | 14734.1 | 19040.9 | 175.407 | 21.54 | 30.80 | 1.03212 | 478 |
| 550.000 | 1.79244 | 1.03699 | .016196 | 4.9424 | 15841.0 | 20583.2 | 178.347 | 21.83 | 30.91 | 1.03422 | 499 |
| 600.000 | 1.64280 | 1.03716 | .014734 | 5.3887 | 16959.4 | 22133.4 | 181.045 | 22.16 | 31.11 | 1.03520 | 519 |
| 650.000 | 1.51690 | 1.03684 | .013522 | 5.8301 | 18091.8 | 23695.3 | 183.545 | 22.51 | 31.37 | 1.03550 | 538 |
| 700.000 | 1.40939 | 1.03623 | .012498 | 6.2677 | 19239.9 | 25270.9 | 185.880 | 22.88 | 31.66 | 1.03536 | 556 |
| 750.000 | 1.31641 | 1.03545 | .011622 | 6.7024 | 20404.4 | 26861.4 | 188.075 | 23.24 | 31.96 | 1.03495 | 573 |
| 800.000 | 1.23517 | 1.03458 | .010863 | 7.1347 | 21585.6 | 28467.2 | 190.147 | 23.60 | 32.27 | 1.03437 | 590 |
| 850.000 | 1.16354 | 1.03368 | .010199 | 7.5650 | 22783.0 | 30088.4 | 192.113 | 23.94 | 32.58 | 1.03369 | 606 |
| 900.000 | 1.09987 | 1.03275 | .009613 | 7.9938 | 23996.4 | 31724.6 | 193.983 | 24.27 | 32.87 | 1.03296 | 621 |
| 950.000 | 1.04291 | 1.03184 | .009091 | 8.4212 | 25224.9 | 33375.2 | 195.768 | 24.58 | 33.15 | 1.03219 | 636 |
| 1000.000 | .99162 | 1.03095 | .008623 | 8.8476 | 26467.8 | 35039.6 | 197.475 | 24.87 | 33.42 | 1.03142 | 651 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\delta P/\delta T$ MPa/K | $\delta P/\delta \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|--------------|-----------------|---------|------------------------------|-------------------------------------|------------|------------|--|-------|-------|---------|----------|
| 9.000000 MPa | | | | | | | | | | | |
| 70.126 | 30.53274 | .50554 | 2.247282 | 17.0867 | 27.8 | 322.5 | 74.856 | 36.33 | 58.57 | .00392 | 991 |
| 80.000 | 29.21408 | .46315 | 1.889184 | 13.8976 | 598.6 | 906.7 | 82.660 | 35.69 | 59.77 | .01430 | 911 |
| 90.000 | 27.82265 | .43228 | 1.576119 | 11.0369 | 1181.9 | 1505.4 | 89.711 | 33.70 | 59.86 | .03783 | 836 |
| 100.000 | 26.34740 | .41084 | 1.301543 | 8.5144 | 1759.5 | 2101.1 | 95.975 | 30.38 | 59.04 | .07915 | 768 |
| 110.000 | 24.75046 | .39759 | 1.057363 | 6.3152 | 2318.8 | 2682.5 | 101.524 | 25.88 | 57.67 | .13986 | 708 |
| 120.000 | 22.97603 | .39260 | .837818 | 4.4354 | 2856.2 | 3247.9 | 106.458 | 20.68 | 56.65 | .21886 | 658 |
| 130.000 | 20.93532 | .39773 | .639175 | 2.8838 | 3383.4 | 3813.3 | 110.956 | 18.46 | 60.48 | .31445 | 580 |
| 140.000 | 18.48449 | .41828 | .460818 | 1.6961 | 4081.3 | 4568.2 | 116.533 | 35.14 | 86.44 | .41843 | 385 |
| 150.000 | 15.48154 | .46612 | .309878 | .9577 | 4886.0 | 5467.3 | 122.733 | 30.90 | 93.65 | .51906 | 321 |
| 160.000 | 12.34900 | .54784 | .204719 | .7263 | 5670.3 | 6399.1 | 128.750 | 28.63 | 89.17 | .60706 | 284 |
| 170.000 | 10.00003 | .63673 | .146302 | .7632 | 6316.3 | 7216.3 | 133.708 | 26.80 | 74.48 | .67908 | 275 |
| 180.000 | 8.42015 | .71419 | .113273 | .8794 | 6829.2 | 7898.1 | 137.609 | 25.37 | 62.41 | .73677 | 277 |
| 190.000 | 7.34288 | .77587 | .092993 | 1.0337 | 7250.6 | 8476.3 | 140.737 | 24.31 | 53.79 | .78325 | 285 |
| 200.000 | 6.57017 | .82376 | .079472 | 1.1958 | 7613.6 | 8983.4 | 143.340 | 23.55 | 48.02 | .82103 | 295 |
| 210.000 | 5.98543 | .86118 | .069814 | 1.3546 | 7939.1 | 9442.7 | 145.582 | 22.99 | 44.08 | .85211 | 304 |
| 220.000 | 5.52331 | .89081 | .062545 | 1.5070 | 8239.3 | 9868.8 | 147.565 | 22.57 | 41.29 | .87794 | 313 |
| 230.000 | 5.14570 | .91461 | .056854 | 1.6527 | 8521.9 | 10270.9 | 149.353 | 22.25 | 39.24 | .89958 | 322 |
| 240.000 | 4.82912 | .93396 | .052259 | 1.7919 | 8791.5 | 10655.2 | 150.989 | 22.00 | 37.69 | .91785 | 331 |
| 250.000 | 4.55830 | .94987 | .048459 | 1.9254 | 9051.4 | 11025.8 | 152.502 | 21.81 | 36.48 | .93337 | 339 |
| 260.000 | 4.32290 | .96307 | .045254 | 2.0539 | 9303.8 | 11385.7 | 153.914 | 21.66 | 35.53 | .94664 | 346 |
| 270.000 | 4.11559 | .97412 | .042508 | 2.1781 | 9550.2 | 11737.0 | 155.240 | 21.53 | 34.76 | .95804 | 354 |
| 280.000 | 3.93105 | .98342 | .040123 | 2.2984 | 9791.9 | 12081.4 | 156.492 | 21.44 | 34.13 | .96787 | 361 |
| 290.000 | 3.76530 | .99131 | .038028 | 2.4155 | 10029.7 | 12419.9 | 157.680 | 21.36 | 33.60 | .97640 | 368 |
| 300.000 | 3.61528 | .99803 | .036171 | 2.5296 | 10264.3 | 12753.7 | 158.812 | 21.29 | 33.17 | .98382 | 375 |
| 310.000 | 3.47861 | 1.00378 | .034510 | 2.6412 | 10496.3 | 13083.5 | 159.893 | 21.24 | 32.80 | .99029 | 381 |
| 320.000 | 3.35340 | 1.00872 | .033014 | 2.7505 | 10726.0 | 13409.8 | 160.929 | 21.21 | 32.48 | .99595 | 387 |
| 330.000 | 3.23810 | 1.01298 | .031657 | 2.8579 | 10953.9 | 13733.3 | 161.925 | 21.18 | 32.21 | 1.00093 | 393 |
| 340.000 | 3.13148 | 1.01667 | .030420 | 2.9635 | 11180.2 | 14054.3 | 162.883 | 21.16 | 31.98 | 1.00530 | 399 |
| 350.000 | 3.03248 | 1.01986 | .029287 | 3.0675 | 11405.2 | 14373.1 | 163.807 | 21.14 | 31.79 | 1.00916 | 405 |
| 360.000 | 2.94026 | 1.02263 | .028244 | 3.1700 | 11629.1 | 14690.1 | 164.700 | 21.14 | 31.62 | 1.01257 | 411 |
| 370.000 | 2.85406 | 1.02504 | .027281 | 3.2713 | 11852.1 | 15005.5 | 165.564 | 21.14 | 31.47 | 1.01558 | 416 |
| 380.000 | 2.77328 | 1.02714 | .026387 | 3.3714 | 12074.3 | 15319.6 | 166.402 | 21.14 | 31.35 | 1.01825 | 422 |
| 390.000 | 2.69737 | 1.02897 | .025555 | 3.4705 | 12295.9 | 15632.5 | 167.215 | 21.15 | 31.24 | 1.02062 | 427 |
| 400.000 | 2.62587 | 1.03056 | .024778 | 3.5687 | 12517.0 | 15944.4 | 168.005 | 21.17 | 31.15 | 1.02272 | 432 |
| 410.000 | 2.55838 | 1.03195 | .024052 | 3.6659 | 12737.7 | 16255.6 | 168.773 | 21.19 | 31.07 | 1.02459 | 438 |
| 420.000 | 2.49454 | 1.03316 | .023370 | 3.7624 | 12958.1 | 16566.0 | 169.521 | 21.21 | 31.01 | 1.02625 | 443 |
| 430.000 | 2.43405 | 1.03421 | .022728 | 3.8582 | 13178.3 | 16875.8 | 170.250 | 21.24 | 30.96 | 1.02773 | 448 |
| 440.000 | 2.37664 | 1.03512 | .022124 | 3.9533 | 13398.4 | 17185.2 | 170.961 | 21.28 | 30.92 | 1.02904 | 452 |
| 450.000 | 2.32205 | 1.03591 | .021553 | 4.0478 | 13618.4 | 17494.3 | 171.656 | 21.31 | 30.89 | 1.03021 | 457 |
| 470.000 | 2.22052 | 1.03718 | .020500 | 4.2351 | 14058.5 | 18111.6 | 172.998 | 21.39 | 30.85 | 1.03216 | 466 |
| 500.000 | 2.08471 | 1.03846 | .019111 | 4.5125 | 14719.9 | 19037.1 | 174.907 | 21.54 | 30.85 | 1.03432 | 480 |
| 550.000 | 1.89335 | 1.03947 | .017189 | 4.9674 | 15828.2 | 20581.7 | 177.851 | 21.83 | 30.95 | 1.03649 | 501 |
| 600.000 | 1.73536 | 1.03960 | .015631 | 5.4153 | 16947.7 | 22133.9 | 180.552 | 22.16 | 31.15 | 1.03748 | 521 |
| 650.000 | 1.60246 | 1.03921 | .014341 | 5.8580 | 18081.1 | 23697.4 | 183.055 | 22.51 | 31.40 | 1.03776 | 540 |
| 700.000 | 1.48898 | 1.03853 | .013252 | 6.2966 | 19229.9 | 25274.4 | 185.392 | 22.88 | 31.68 | 1.03758 | 557 |
| 750.000 | 1.39085 | 1.03768 | .012321 | 6.7322 | 20395.1 | 26866.0 | 187.588 | 23.24 | 31.98 | 1.03712 | 575 |
| 800.000 | 1.30510 | 1.03674 | .011515 | 7.1653 | 21576.8 | 28472.8 | 189.662 | 23.60 | 32.29 | 1.03649 | 591 |
| 850.000 | 1.22949 | 1.03577 | .010810 | 7.5964 | 22774.8 | 30094.9 | 191.629 | 23.94 | 32.59 | 1.03575 | 607 |
| 900.000 | 1.16230 | 1.03478 | .010187 | 8.0258 | 23988.6 | 31731.9 | 193.500 | 24.27 | 32.89 | 1.03496 | 623 |
| 950.000 | 1.10217 | 1.03380 | .009633 | 8.4538 | 25217.5 | 33383.2 | 195.286 | 24.58 | 33.17 | 1.03414 | 638 |
| 1000.000 | 1.04803 | 1.03284 | .009137 | 8.8806 | 26460.7 | 35048.3 | 196.994 | 24.87 | 33.43 | 1.03331 | 652 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 10.000000 MPa | | | | | | | | | | | |
| 70.346 | 30.56214 | .55942 | 2.255454 | 17.2919 | 31.1 | 358.3 | 74.899 | 36.34 | 58.50 | .00386 | 996 |
| 80.000 | 29.28532 | .51336 | 1.905339 | 14.1772 | 586.8 | 928.2 | 82.502 | 35.71 | 59.60 | .01355 | 919 |
| 90.000 | 27.91210 | .47877 | 1.592614 | 11.3226 | 1166.6 | 1524.8 | 89.529 | 33.73 | 59.61 | .03571 | 845 |
| 100.000 | 26.46285 | .45449 | 1.319237 | 8.8109 | 1739.4 | 2117.2 | 95.758 | 30.42 | 58.63 | .07456 | 778 |
| 110.000 | 24.90503 | .43902 | 1.077165 | 6.6257 | 2291.8 | 2693.3 | 101.256 | 25.93 | 56.99 | .13155 | 720 |
| 120.000 | 23.19355 | .43213 | .860868 | 4.7616 | 2818.4 | 3249.6 | 106.111 | 20.73 | 55.45 | .20571 | 674 |
| 130.000 | 21.26299 | .43511 | .667016 | 3.2242 | 3327.9 | 3798.2 | 110.476 | 18.49 | 58.17 | .29569 | 601 |
| 140.000 | 19.02142 | .45164 | .495165 | 2.0370 | 3993.7 | 4519.4 | 115.804 | 35.12 | 81.69 | .39424 | 411 |
| 150.000 | 16.39337 | .48911 | .349983 | 1.2500 | 4742.6 | 5352.6 | 121.551 | 30.77 | 85.47 | .49124 | 352 |
| 160.000 | 13.58685 | .55325 | .242050 | .9027 | 5477.7 | 6213.7 | 127.109 | 28.56 | 84.82 | .57895 | 309 |
| 170.000 | 11.22849 | .63008 | .175046 | .8709 | 6122.6 | 7013.2 | 131.959 | 26.90 | 74.34 | .65330 | 293 |
| 180.000 | 9.52249 | .70168 | .135308 | .9425 | 6653.5 | 7703.6 | 135.909 | 25.56 | 64.12 | .71441 | 290 |
| 190.000 | 8.29940 | .76272 | .110216 | 1.0631 | 7097.7 | 8302.7 | 139.150 | 24.53 | 56.05 | .76442 | 294 |
| 200.000 | 7.40376 | .81224 | .093386 | 1.2078 | 7481.1 | 8831.7 | 141.865 | 23.75 | 50.09 | .80548 | 301 |
| 210.000 | 6.72337 | .85184 | .081424 | 1.3589 | 7822.8 | 9310.2 | 144.200 | 23.17 | 45.83 | .83937 | 309 |
| 220.000 | 6.18706 | .88360 | .072495 | 1.5086 | 8136.0 | 9752.3 | 146.258 | 22.72 | 42.74 | .86761 | 318 |
| 230.000 | 5.75087 | .90929 | .065562 | 1.6541 | 8428.9 | 10167.7 | 148.105 | 22.38 | 40.45 | .89132 | 326 |
| 240.000 | 5.38699 | .93026 | .060010 | 1.7947 | 8706.9 | 10563.2 | 149.788 | 22.12 | 38.71 | .91135 | 334 |
| 250.000 | 5.07719 | .94755 | .055451 | 1.9303 | 8973.7 | 10943.3 | 151.340 | 21.91 | 37.36 | .92838 | 342 |
| 260.000 | 4.80903 | .96191 | .051630 | 2.0612 | 9231.8 | 11311.3 | 152.784 | 21.74 | 36.28 | .94295 | 350 |
| 270.000 | 4.57376 | .97393 | .048375 | 2.1879 | 9483.2 | 11669.6 | 154.136 | 21.61 | 35.41 | .95546 | 357 |
| 280.000 | 4.36502 | .98406 | .045562 | 2.3109 | 9729.1 | 12020.1 | 155.411 | 21.50 | 34.70 | .96626 | 364 |
| 290.000 | 4.17807 | .99264 | .043103 | 2.4305 | 9970.6 | 12364.1 | 156.618 | 21.42 | 34.11 | .97562 | 371 |
| 300.000 | 4.00928 | .99995 | .040930 | 2.5471 | 10208.5 | 12702.7 | 157.766 | 21.35 | 33.62 | .98375 | 378 |
| 310.000 | 3.85585 | 1.00620 | .038995 | 2.6610 | 10443.3 | 13036.8 | 158.862 | 21.29 | 33.21 | .99085 | 384 |
| 320.000 | 3.71554 | 1.01156 | .037257 | 2.7726 | 10675.6 | 13367.0 | 159.910 | 21.25 | 32.85 | .99706 | 391 |
| 330.000 | 3.58656 | 1.01618 | .035686 | 2.8821 | 10905.8 | 13694.0 | 160.916 | 21.21 | 32.55 | 1.00250 | 397 |
| 340.000 | 3.46746 | 1.02017 | .034257 | 2.9896 | 11134.2 | 14018.1 | 161.884 | 21.19 | 32.29 | 1.00729 | 403 |
| 350.000 | 3.35702 | 1.02363 | .032952 | 3.0955 | 11361.1 | 14339.9 | 162.817 | 21.17 | 32.07 | 1.01151 | 409 |
| 360.000 | 3.25425 | 1.02662 | .031753 | 3.1999 | 11586.7 | 14659.6 | 163.718 | 21.16 | 31.88 | 1.01524 | 414 |
| 370.000 | 3.15830 | 1.02922 | .030647 | 3.3028 | 11811.3 | 14977.5 | 164.589 | 21.16 | 31.71 | 1.01853 | 420 |
| 380.000 | 3.06845 | 1.03148 | .029623 | 3.4046 | 12034.9 | 15293.9 | 165.432 | 21.17 | 31.57 | 1.02144 | 425 |
| 390.000 | 2.98409 | 1.03344 | .028672 | 3.5051 | 12257.8 | 15608.9 | 166.251 | 21.17 | 31.45 | 1.02402 | 431 |
| 400.000 | 2.90469 | 1.03515 | .027786 | 3.6047 | 12480.2 | 15922.9 | 167.046 | 21.19 | 31.34 | 1.02631 | 436 |
| 410.000 | 2.82978 | 1.03664 | .026957 | 3.7033 | 12702.0 | 16235.8 | 167.818 | 21.21 | 31.25 | 1.02834 | 441 |
| 420.000 | 2.75898 | 1.03793 | .026181 | 3.8011 | 12923.5 | 16548.0 | 168.571 | 21.23 | 31.18 | 1.03014 | 446 |
| 430.000 | 2.69192 | 1.03904 | .025451 | 3.8980 | 13144.7 | 16859.5 | 169.304 | 21.26 | 31.12 | 1.03174 | 451 |
| 440.000 | 2.62830 | 1.04001 | .024765 | 3.9943 | 13365.7 | 17170.4 | 170.018 | 21.29 | 31.07 | 1.03316 | 456 |
| 450.000 | 2.56783 | 1.04084 | .024117 | 4.0898 | 13586.6 | 17480.9 | 170.716 | 21.32 | 31.03 | 1.03442 | 460 |
| 470.000 | 2.45543 | 1.04217 | .022924 | 4.2792 | 14028.3 | 18100.9 | 172.064 | 21.40 | 30.98 | 1.03652 | 470 |
| 500.000 | 2.30518 | 1.04349 | .021354 | 4.5593 | 14691.8 | 19029.8 | 173.980 | 21.55 | 30.96 | 1.03884 | 483 |
| 550.000 | 2.09365 | 1.04447 | .019186 | 5.0179 | 15802.9 | 20579.3 | 176.934 | 21.83 | 31.04 | 1.04112 | 504 |
| 600.000 | 1.91912 | 1.04451 | .017434 | 5.4689 | 16924.7 | 22135.4 | 179.641 | 22.16 | 31.22 | 1.04213 | 524 |
| 650.000 | 1.77236 | 1.04400 | .015986 | 5.9141 | 18059.9 | 23702.1 | 182.149 | 22.52 | 31.46 | 1.04235 | 543 |
| 700.000 | 1.64706 | 1.04317 | .014766 | 6.3549 | 19210.3 | 25281.7 | 184.490 | 22.88 | 31.73 | 1.04209 | 560 |
| 750.000 | 1.53873 | 1.04217 | .013724 | 6.7923 | 20376.8 | 26875.6 | 186.690 | 23.24 | 32.03 | 1.04153 | 578 |
| 800.000 | 1.44407 | 1.04109 | .012822 | 7.2270 | 21559.6 | 28484.5 | 188.766 | 23.60 | 32.33 | 1.04079 | 594 |
| 850.000 | 1.36059 | 1.03996 | .012034 | 7.6594 | 22758.6 | 30108.3 | 190.735 | 23.94 | 32.63 | 1.03993 | 610 |
| 900.000 | 1.28640 | 1.03883 | .011338 | 8.0901 | 23973.2 | 31746.8 | 192.608 | 24.27 | 32.91 | 1.03902 | 625 |
| 950.000 | 1.22000 | 1.03772 | .010720 | 8.5192 | 25202.9 | 33399.6 | 194.395 | 24.58 | 33.19 | 1.03808 | 640 |
| 1000.000 | 1.16022 | 1.03663 | .010166 | 8.9470 | 26446.8 | 35065.9 | 196.105 | 24.88 | 33.46 | 1.03714 | 655 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|--------|-------|---------|----------|
| 11.000000 MPa | | | | | | | | | | | |
| 70.565 | 30.59115 | .61287 | 2.263513 | 17.4966 | 34.5 | 394.1 | 74.942 | 36.35 | 58.43 | .00383 | 1002 |
| 80.000 | 29.35517 | .56335 | 1.921334 | 14.4555 | 575.2 | 949.9 | 82.346 | 35.73 | 59.44 | .01297 | 926 |
| 90.000 | 27.99933 | .52501 | 1.608862 | 11.6061 | 1151.7 | 1544.5 | 89.350 | 33.76 | 59.36 | .03406 | 853 |
| 100.000 | 26.57450 | .49784 | 1.336540 | 9.1039 | 1719.9 | 2133.9 | 95.547 | 30.46 | 58.25 | .07092 | 788 |
| 110.000 | 25.05258 | .48008 | 1.096323 | 6.9308 | 2266.0 | 2705.1 | 100.999 | 25.98 | 56.38 | .12494 | 732 |
| 120.000 | 23.39682 | .47121 | .882809 | 5.0799 | 2783.2 | 3253.3 | 105.785 | 20.78 | 54.41 | .19523 | 689 |
| 130.000 | 21.55823 | .47206 | .692851 | 3.5535 | 3277.7 | 3788.0 | 110.038 | 18.54 | 56.32 | .28068 | 620 |
| 140.000 | 19.47632 | .48520 | .525914 | 2.3660 | 3918.8 | 4483.6 | 115.177 | 35.12 | 78.27 | .37475 | 433 |
| 150.000 | 17.11149 | .51544 | .385058 | 1.5456 | 4628.5 | 5271.3 | 120.611 | 30.70 | 79.85 | .46846 | 378 |
| 160.000 | 14.58484 | .56694 | .276568 | 1.1132 | 5322.1 | 6076.3 | 125.807 | 28.49 | 80.17 | .55515 | 334 |
| 170.000 | 12.30106 | .63265 | .203485 | 1.0009 | 5955.0 | 6849.3 | 130.495 | 26.93 | 73.41 | .63073 | 312 |
| 180.000 | 10.53491 | .69767 | .157794 | 1.0386 | 6494.0 | 7538.1 | 134.435 | 25.68 | 64.56 | .69424 | 305 |
| 190.000 | 9.21561 | .75558 | .128229 | 1.1254 | 6952.9 | 8146.5 | 137.727 | 24.69 | 57.37 | .74708 | 305 |
| 200.000 | 8.22027 | .80471 | .108080 | 1.2462 | 7352.3 | 8690.5 | 140.518 | 23.91 | 51.66 | .79092 | 310 |
| 210.000 | 7.45365 | .84522 | .093702 | 1.3833 | 7708.5 | 9184.2 | 142.928 | 23.32 | 47.31 | .82736 | 316 |
| 220.000 | 6.84680 | .87831 | .082994 | 1.5257 | 8033.7 | 9640.2 | 145.050 | 22.86 | 44.05 | .85785 | 323 |
| 230.000 | 6.35332 | .90537 | .074721 | 1.6678 | 8336.4 | 10067.8 | 146.951 | 22.50 | 41.58 | .88351 | 331 |
| 240.000 | 5.94252 | .92763 | .068132 | 1.8073 | 8622.6 | 10473.7 | 148.679 | 22.22 | 39.68 | .90523 | 339 |
| 250.000 | 5.59372 | .94605 | .062751 | 1.9431 | 8896.3 | 10862.8 | 150.268 | 22.00 | 38.19 | .92372 | 347 |
| 260.000 | 5.29269 | .96141 | .058265 | 2.0751 | 9160.2 | 11238.5 | 151.742 | 21.82 | 37.01 | .93954 | 354 |
| 270.000 | 5.02931 | .97428 | .054462 | 2.2033 | 9416.5 | 11603.7 | 153.120 | 21.68 | 36.05 | .95314 | 361 |
| 280.000 | 4.79624 | .98514 | .051189 | 2.3280 | 9666.7 | 11960.1 | 154.416 | 21.57 | 35.27 | .96487 | 368 |
| 290.000 | 4.58797 | .99435 | .048339 | 2.4495 | 9911.9 | 12309.4 | 155.642 | 21.47 | 34.61 | .97504 | 375 |
| 300.000 | 4.40033 | 1.00219 | .045831 | 2.5680 | 10153.0 | 12652.8 | 156.806 | 21.40 | 34.07 | .98388 | 382 |
| 310.000 | 4.23008 | 1.00890 | .043603 | 2.6839 | 10390.7 | 12991.1 | 157.916 | 21.34 | 33.61 | .99159 | 388 |
| 320.000 | 4.07464 | 1.01465 | .041609 | 2.7973 | 10625.6 | 13325.2 | 158.977 | 21.29 | 33.22 | .99833 | 394 |
| 330.000 | 3.93197 | 1.01961 | .039811 | 2.9086 | 10858.1 | 13655.6 | 159.993 | 21.25 | 32.88 | 1.00424 | 400 |
| 340.000 | 3.80039 | 1.02388 | .038180 | 3.0179 | 11088.5 | 13983.0 | 160.971 | 21.22 | 32.59 | 1.00944 | 406 |
| 350.000 | 3.67853 | 1.02758 | .036693 | 3.1255 | 11317.3 | 14307.6 | 161.912 | 21.20 | 32.35 | 1.01401 | 412 |
| 360.000 | 3.56525 | 1.03078 | .035330 | 3.2315 | 11544.7 | 14630.0 | 162.820 | 21.19 | 32.13 | 1.01804 | 418 |
| 370.000 | 3.45958 | 1.03355 | .034076 | 3.3360 | 11770.8 | 14950.4 | 163.698 | 21.19 | 31.95 | 1.02161 | 423 |
| 380.000 | 3.36070 | 1.03596 | .032916 | 3.4391 | 11995.9 | 15269.0 | 164.548 | 21.19 | 31.79 | 1.02476 | 429 |
| 390.000 | 3.26794 | 1.03805 | .031841 | 3.5411 | 12220.2 | 15586.2 | 165.371 | 21.19 | 31.65 | 1.02754 | 434 |
| 400.000 | 3.18069 | 1.03986 | .030840 | 3.6420 | 12443.7 | 15902.1 | 166.171 | 21.21 | 31.53 | 1.03001 | 439 |
| 410.000 | 3.09842 | 1.04143 | .029906 | 3.7419 | 12666.7 | 16216.9 | 166.949 | 21.22 | 31.43 | 1.03220 | 444 |
| 420.000 | 3.02070 | 1.04280 | .029031 | 3.8408 | 12889.2 | 16530.8 | 167.705 | 21.25 | 31.35 | 1.03414 | 449 |
| 430.000 | 2.94713 | 1.04397 | .028211 | 3.9389 | 13111.4 | 16843.9 | 168.442 | 21.27 | 31.28 | 1.03586 | 454 |
| 440.000 | 2.87735 | 1.04499 | .027439 | 4.0363 | 13333.4 | 17156.3 | 169.160 | 21.30 | 31.22 | 1.03738 | 459 |
| 450.000 | 2.81107 | 1.04586 | .026712 | 4.1329 | 13555.1 | 17468.3 | 169.861 | 21.34 | 31.17 | 1.03873 | 464 |
| 470.000 | 2.68791 | 1.04724 | .025375 | 4.3241 | 13998.5 | 18090.9 | 171.215 | 21.42 | 31.10 | 1.04097 | 473 |
| 500.000 | 2.52338 | 1.04859 | .023618 | 4.6068 | 14664.0 | 19023.3 | 173.138 | 171.56 | 31.07 | 1.04343 | 486 |
| 550.000 | 2.29193 | 1.04953 | .021199 | 5.0691 | 15778.0 | 20577.5 | 176.100 | 21.84 | 31.12 | 1.04583 | 507 |
| 600.000 | 2.10107 | 1.04946 | .019250 | 5.5230 | 16902.0 | 22137.4 | 178.815 | 22.17 | 31.29 | 1.04684 | 527 |
| 650.000 | 1.94064 | 1.04881 | .017640 | 5.9707 | 18039.0 | 23707.2 | 181.328 | 22.52 | 31.51 | 1.04700 | 546 |
| 700.000 | 1.80370 | 1.04784 | .016287 | 6.4136 | 19190.9 | 25289.5 | 183.673 | 22.88 | 31.78 | 1.04665 | 563 |
| 750.000 | 1.68531 | 1.04669 | .015132 | 6.8528 | 20358.7 | 26885.7 | 185.875 | 23.25 | 32.07 | 1.04598 | 580 |
| 800.000 | 1.58185 | 1.04545 | .014134 | 7.2890 | 21542.6 | 28496.5 | 187.954 | 23.60 | 32.36 | 1.04512 | 597 |
| 850.000 | 1.49061 | 1.04417 | .013262 | 7.7228 | 22742.6 | 30122.1 | 189.925 | 23.95 | 32.66 | 1.04414 | 613 |
| 900.000 | 1.40952 | 1.04290 | .012493 | 8.1547 | 23958.1 | 31762.1 | 191.800 | 24.27 | 32.94 | 1.04311 | 628 |
| 950.000 | 1.33693 | 1.04165 | .011810 | 8.5849 | 25188.5 | 33416.3 | 193.589 | 24.58 | 33.22 | 1.04205 | 643 |
| 1000.000 | 1.27157 | 1.04044 | .011198 | 9.0137 | 26433.1 | 35083.8 | 195.299 | 24.88 | 33.48 | 1.04098 | 658 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 12.000000 MPa | | | | | | | | | | | |
| 70.784 | 30.61980 | .66590 | 2.271460 | 17.7009 | 37.9 | 429.8 | 74.985 | 36.35 | 58.36 | .00384 | 1007 |
| 80.000 | 29.42369 | .61314 | 1.937174 | 14.7325 | 563.8 | 971.7 | 82.193 | 35.75 | 59.29 | .01251 | 933 |
| 90.000 | 28.08447 | .57100 | 1.624876 | 11.8875 | 1137.2 | 1564.4 | 89.175 | 33.79 | 59.13 | .03274 | 861 |
| 100.000 | 26.68262 | .54090 | 1.353478 | 9.3937 | 1701.2 | 2150.9 | 95.342 | 30.50 | 57.89 | .06802 | 797 |
| 110.000 | 25.19381 | .52079 | 1.114899 | 7.2312 | 2241.3 | 2717.7 | 100.752 | 26.03 | 55.82 | .11962 | 744 |
| 120.000 | 23.58785 | .50989 | .903788 | 5.3914 | 2750.1 | 3258.8 | 105.475 | 20.84 | 53.51 | .18677 | 703 |
| 130.000 | 21.82763 | .50862 | .717056 | 3.8736 | 3231.8 | 3781.6 | 109.634 | 18.58 | 54.80 | .26850 | 638 |
| 140.000 | 19.87269 | .51875 | .553963 | 2.6849 | 3853.2 | 4457.0 | 114.624 | 35.14 | 75.66 | .35885 | 454 |
| 150.000 | 17.70370 | .54349 | .416426 | 1.8396 | 4533.5 | 5211.3 | 119.828 | 30.67 | 75.78 | .44966 | 402 |
| 160.000 | 15.40189 | .58567 | .308205 | 1.3445 | 5194.0 | 5973.1 | 124.745 | 28.44 | 76.09 | .53504 | 358 |
| 170.000 | 13.23166 | .64163 | .231121 | 1.1560 | 5810.0 | 6716.9 | 129.256 | 26.93 | 71.80 | .61111 | 331 |
| 180.000 | 11.44985 | .70028 | .180264 | 1.1513 | 6350.9 | 7399.0 | 133.157 | 25.75 | 64.50 | .67628 | 320 |
| 190.000 | 10.07224 | .75416 | .146609 | 1.2140 | 6818.6 | 8010.0 | 136.462 | 24.80 | 57.95 | .73131 | 318 |
| 200.000 | 9.00419 | .80144 | .123299 | 1.3095 | 7229.5 | 8562.2 | 139.296 | 24.04 | 52.68 | .77749 | 320 |
| 210.000 | 8.16581 | .84164 | .106504 | 1.4287 | 7597.5 | 9067.0 | 141.760 | 23.44 | 48.45 | .81618 | 324 |
| 220.000 | 7.49562 | .87522 | .093961 | 1.5598 | 7933.4 | 9534.3 | 143.934 | 22.98 | 45.14 | .84872 | 330 |
| 230.000 | 6.94845 | .90309 | .084281 | 1.6952 | 8245.3 | 9972.3 | 145.882 | 22.61 | 42.57 | .87619 | 337 |
| 240.000 | 6.49253 | .92623 | .076593 | 1.8310 | 8539.3 | 10387.6 | 147.650 | 22.32 | 40.56 | .89951 | 344 |
| 250.000 | 6.10568 | .94552 | .070338 | 1.9651 | 8819.6 | 10785.0 | 149.272 | 22.09 | 38.97 | .91939 | 351 |
| 260.000 | 5.77228 | .96167 | .065145 | 2.0966 | 9089.2 | 11168.1 | 150.775 | 21.90 | 37.70 | .93642 | 358 |
| 270.000 | 5.48106 | .97525 | .060757 | 2.2251 | 9350.3 | 11539.7 | 152.177 | 21.75 | 36.66 | .95107 | 365 |
| 280.000 | 5.22381 | .98673 | .056996 | 2.3506 | 9604.7 | 11901.9 | 153.495 | 21.63 | 35.81 | .96371 | 372 |
| 290.000 | 4.99433 | .99648 | .053731 | 2.4731 | 9853.6 | 12256.3 | 154.739 | 21.53 | 35.10 | .97467 | 379 |
| 300.000 | 4.78791 | 1.00480 | .050867 | 2.5930 | 10097.9 | 12604.2 | 155.918 | 21.44 | 34.50 | .98420 | 385 |
| 310.000 | 4.60090 | 1.01191 | .048331 | 2.7102 | 10338.5 | 12946.7 | 157.041 | 21.38 | 34.00 | .99251 | 392 |
| 320.000 | 4.43040 | 1.01801 | .046066 | 2.8251 | 10575.9 | 13284.5 | 158.114 | 21.33 | 33.57 | .99977 | 398 |
| 330.000 | 4.27409 | 1.02326 | .044030 | 2.9379 | 10810.7 | 13618.3 | 159.141 | 21.29 | 33.21 | 1.00614 | 404 |
| 340.000 | 4.13009 | 1.02779 | .042187 | 3.0487 | 11043.3 | 13948.8 | 160.128 | 21.25 | 32.89 | 1.01173 | 410 |
| 350.000 | 3.99687 | 1.03171 | .040509 | 3.1577 | 11273.9 | 14276.3 | 161.077 | 21.23 | 32.62 | 1.01665 | 416 |
| 360.000 | 3.87313 | 1.03510 | .038975 | 3.2650 | 11503.0 | 14601.3 | 161.993 | 21.22 | 32.38 | 1.02099 | 421 |
| 370.000 | 3.75780 | 1.03803 | .037565 | 3.3709 | 11730.7 | 14924.1 | 162.877 | 21.21 | 32.18 | 1.02481 | 427 |
| 380.000 | 3.64997 | 1.04057 | .036264 | 3.4754 | 11957.3 | 15245.0 | 163.733 | 21.21 | 32.00 | 1.02819 | 432 |
| 390.000 | 3.54886 | 1.04278 | .035059 | 3.5786 | 12182.9 | 15564.2 | 164.562 | 21.22 | 31.85 | 1.03118 | 437 |
| 400.000 | 3.45382 | 1.04468 | .033940 | 3.6807 | 12407.6 | 15882.1 | 165.367 | 21.23 | 31.72 | 1.03383 | 443 |
| 410.000 | 3.36427 | 1.04634 | .032896 | 3.7817 | 12631.8 | 16198.7 | 166.149 | 21.24 | 31.61 | 1.03617 | 448 |
| 420.000 | 3.27969 | 1.04776 | .031920 | 3.8818 | 12855.4 | 16514.3 | 166.909 | 21.26 | 31.51 | 1.03824 | 453 |
| 430.000 | 3.19967 | 1.04899 | .031006 | 3.9809 | 13078.6 | 16829.0 | 167.650 | 21.29 | 31.43 | 1.04008 | 458 |
| 440.000 | 3.12380 | 1.05005 | .030146 | 4.0793 | 13301.4 | 17142.9 | 168.371 | 21.32 | 31.36 | 1.04170 | 462 |
| 450.000 | 3.05176 | 1.05095 | .029337 | 4.1769 | 13524.1 | 17456.2 | 169.076 | 21.35 | 31.31 | 1.04313 | 467 |
| 470.000 | 2.91795 | 1.05237 | .027852 | 4.3700 | 13969.0 | 18081.5 | 170.435 | 21.43 | 31.23 | 1.04551 | 476 |
| 500.000 | 2.73932 | 1.05374 | .025904 | 4.6551 | 14636.6 | 19017.3 | 172.365 | 21.57 | 31.17 | 1.04811 | 490 |
| 550.000 | 2.48820 | 1.05462 | .023228 | 5.1209 | 15753.4 | 20576.1 | 175.337 | 21.85 | 31.21 | 1.05060 | 511 |
| 600.000 | 2.28124 | 1.05444 | .021076 | 5.5777 | 16879.6 | 22139.8 | 178.058 | 22.17 | 31.35 | 1.05160 | 530 |
| 650.000 | 2.10734 | 1.05365 | .019304 | 6.0277 | 18018.4 | 23712.8 | 180.576 | 22.52 | 31.57 | 1.05170 | 549 |
| 700.000 | 1.95891 | 1.05253 | .017815 | 6.4727 | 19171.8 | 25297.7 | 182.925 | 22.89 | 31.83 | 1.05125 | 566 |
| 750.000 | 1.83059 | 1.05122 | .016546 | 6.9137 | 20340.9 | 26896.1 | 185.130 | 23.25 | 32.11 | 1.05047 | 583 |
| 800.000 | 1.71846 | 1.04982 | .015450 | 7.3514 | 21525.9 | 28508.9 | 187.212 | 23.60 | 32.40 | 1.04948 | 600 |
| 850.000 | 1.61957 | 1.04840 | .014494 | 7.7866 | 22726.8 | 30136.2 | 189.185 | 23.95 | 32.69 | 1.04838 | 616 |
| 900.000 | 1.53166 | 1.04698 | .013651 | 8.2196 | 23943.1 | 31777.8 | 191.061 | 24.28 | 32.97 | 1.04721 | 631 |
| 950.000 | 1.45297 | 1.04560 | .012902 | 8.6509 | 25174.3 | 33433.2 | 192.851 | 24.59 | 33.24 | 1.04603 | 646 |
| 1000.000 | 1.38210 | 1.04425 | .012233 | 9.0807 | 26419.6 | 35102.0 | 194.563 | 24.88 | 33.50 | 1.04485 | 660 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 13.000000 MPa | | | | | | | | | | | |
| 71.002 | 30.64809 | .71851 | 2.279298 | 17.9047 | 41.4 | 465.5 | 75.028 | 36.36 | 58.29 | .00387 | 1012 |
| 80.000 | 29.49094 | .66272 | 1.952864 | 15.0084 | 552.7 | 993.6 | 82.042 | 35.77 | 59.15 | .01215 | 941 |
| 90.000 | 28.16761 | .61676 | 1.640667 | 12.1668 | 1123.0 | 1584.5 | 89.003 | 33.82 | 58.92 | .03170 | 869 |
| 100.000 | 26.78748 | .58368 | 1.370077 | 9.6804 | 1683.0 | 2168.3 | 95.142 | 30.54 | 57.57 | .06567 | 807 |
| 110.000 | 25.32934 | .56117 | 1.132947 | 7.5272 | 2217.7 | 2731.0 | 100.513 | 26.08 | 55.31 | .11530 | 754 |
| 120.000 | 23.76826 | .54819 | .923924 | 5.6968 | 2718.8 | 3265.7 | 105.181 | 20.89 | 52.72 | .17985 | 716 |
| 130.000 | 22.07588 | .54481 | .739901 | 4.1856 | 3189.5 | 3778.4 | 109.259 | 18.63 | 53.52 | .25851 | 655 |
| 140.000 | 20.22506 | .55219 | .579893 | 2.9954 | 3794.6 | 4437.3 | 114.127 | 35.17 | 73.59 | .34575 | 473 |
| 150.000 | 18.20831 | .57246 | .444964 | 2.1303 | 4452.0 | 5166.0 | 119.155 | 30.66 | 72.71 | .43402 | 424 |
| 160.000 | 16.08595 | .60749 | .337272 | 1.5874 | 5086.1 | 5894.2 | 123.855 | 28.40 | 72.71 | .51803 | 380 |
| 170.000 | 14.03760 | .65519 | .257592 | 1.3330 | 5684.2 | 6610.3 | 128.197 | 26.93 | 69.87 | .59414 | 351 |
| 180.000 | 12.27459 | .70767 | .202507 | 1.2786 | 6222.4 | 7281.5 | 132.036 | 25.79 | 64.11 | .66043 | 336 |
| 190.000 | 10.86283 | .75755 | .165060 | 1.3190 | 6695.3 | 7892.1 | 135.338 | 24.88 | 58.13 | .71715 | 331 |
| 200.000 | 9.74509 | .80222 | .138801 | 1.3938 | 7114.1 | 8448.1 | 138.191 | 24.14 | 53.25 | .76525 | 331 |
| 210.000 | 8.85101 | .84119 | .119671 | 1.4937 | 7491.2 | 8960.0 | 140.690 | 23.55 | 49.25 | .80589 | 333 |
| 220.000 | 8.12703 | .87449 | .105295 | 1.6108 | 7836.0 | 9435.6 | 142.903 | 23.08 | 46.01 | .84026 | 338 |
| 230.000 | 7.53163 | .90259 | .094177 | 1.7368 | 8156.2 | 9882.3 | 144.889 | 22.71 | 43.41 | .86941 | 344 |
| 240.000 | 7.03374 | .92621 | .085352 | 1.8665 | 8457.4 | 10305.6 | 146.692 | 22.41 | 41.34 | .89423 | 350 |
| 250.000 | 6.61070 | .94606 | .078185 | 1.9970 | 8743.9 | 10710.4 | 148.344 | 22.17 | 39.68 | .91542 | 357 |
| 260.000 | 6.24605 | .96278 | .072248 | 2.1264 | 9018.9 | 11100.2 | 149.874 | 21.97 | 38.33 | .93361 | 363 |
| 270.000 | 5.92773 | .97691 | .067247 | 2.2539 | 9284.8 | 11477.9 | 151.299 | 21.81 | 37.23 | .94926 | 370 |
| 280.000 | 5.64676 | .98889 | .062972 | 2.3792 | 9543.3 | 11845.5 | 152.636 | 21.68 | 36.32 | .96279 | 377 |
| 290.000 | 5.39640 | .99909 | .059271 | 2.5020 | 9795.8 | 12204.8 | 153.897 | 21.58 | 35.56 | .97451 | 383 |
| 300.000 | 5.17146 | 1.00780 | .056033 | 2.6224 | 10043.3 | 12557.1 | 155.091 | 21.49 | 34.92 | .98471 | 390 |
| 310.000 | 4.96787 | 1.01525 | .053173 | 2.7405 | 10286.7 | 12903.5 | 156.228 | 21.42 | 34.38 | .99360 | 396 |
| 320.000 | 4.78246 | 1.02166 | .050625 | 2.8564 | 10526.7 | 13245.0 | 157.312 | 21.37 | 33.92 | 1.00138 | 402 |
| 330.000 | 4.61264 | 1.02717 | .048339 | 2.9702 | 10763.8 | 13582.1 | 158.349 | 21.32 | 33.52 | 1.00819 | 408 |
| 340.000 | 4.45634 | 1.03193 | .046274 | 3.0821 | 10998.4 | 13915.6 | 159.345 | 21.29 | 33.18 | 1.01417 | 414 |
| 350.000 | 4.31185 | 1.03604 | .044398 | 3.1923 | 11231.0 | 14245.9 | 160.302 | 21.26 | 32.89 | 1.01942 | 419 |
| 360.000 | 4.17776 | 1.03959 | .042685 | 3.3008 | 11461.7 | 14573.4 | 161.225 | 21.24 | 32.63 | 1.02406 | 425 |
| 370.000 | 4.05286 | 1.04266 | .041114 | 3.4078 | 11691.0 | 14898.6 | 162.116 | 21.23 | 32.41 | 1.02814 | 430 |
| 380.000 | 3.93616 | 1.04532 | .039666 | 3.5134 | 11919.0 | 15221.7 | 162.977 | 21.23 | 32.22 | 1.03175 | 436 |
| 390.000 | 3.82680 | 1.04763 | .038327 | 3.6177 | 12145.9 | 15543.0 | 163.812 | 21.24 | 32.05 | 1.03494 | 441 |
| 400.000 | 3.72405 | 1.04962 | .037084 | 3.7209 | 12371.9 | 15862.8 | 164.622 | 21.24 | 31.90 | 1.03775 | 446 |
| 410.000 | 3.62727 | 1.05134 | .035927 | 3.8230 | 12597.2 | 16181.2 | 165.408 | 21.26 | 31.78 | 1.04024 | 451 |
| 420.000 | 3.53592 | 1.05282 | .034847 | 3.9240 | 12821.9 | 16498.4 | 166.172 | 21.28 | 31.67 | 1.04244 | 456 |
| 430.000 | 3.44952 | 1.05410 | .033835 | 4.0242 | 13046.0 | 16814.7 | 166.917 | 21.30 | 31.58 | 1.04439 | 461 |
| 440.000 | 3.36763 | 1.05519 | .032885 | 4.1234 | 13269.8 | 17130.1 | 167.642 | 21.33 | 31.51 | 1.04611 | 466 |
| 450.000 | 3.28989 | 1.05612 | .031992 | 4.2219 | 13493.4 | 17444.8 | 168.349 | 21.36 | 31.44 | 1.04763 | 471 |
| 470.000 | 3.14558 | 1.05757 | .030354 | 4.4167 | 13939.9 | 18072.7 | 169.714 | 21.44 | 31.35 | 1.05014 | 480 |
| 500.000 | 2.95302 | 1.05894 | .028209 | 4.7042 | 14609.5 | 19011.8 | 171.651 | 21.58 | 31.27 | 1.05286 | 493 |
| 550.000 | 2.68249 | 1.05976 | .025271 | 5.1733 | 15729.1 | 20575.3 | 174.631 | 21.85 | 31.29 | 1.05543 | 514 |
| 600.000 | 2.45965 | 1.05946 | .022914 | 5.6328 | 16857.5 | 22142.8 | 177.359 | 22.18 | 31.42 | 1.05642 | 533 |
| 650.000 | 2.27245 | 1.05852 | .020976 | 6.0853 | 17998.1 | 23718.8 | 179.882 | 22.53 | 31.63 | 1.05645 | 552 |
| 700.000 | 2.11270 | 1.05724 | .019350 | 6.5322 | 19153.0 | 25306.3 | 182.235 | 22.89 | 31.88 | 1.05590 | 569 |
| 750.000 | 1.97459 | 1.05577 | .017966 | 6.9749 | 20323.3 | 26907.0 | 184.443 | 23.25 | 32.15 | 1.05499 | 586 |
| 800.000 | 1.85391 | 1.05421 | .016771 | 7.4142 | 21509.4 | 28521.6 | 186.527 | 23.61 | 32.44 | 1.05388 | 603 |
| 850.000 | 1.74747 | 1.05264 | .015729 | 7.8506 | 22711.3 | 30150.6 | 188.502 | 23.95 | 32.72 | 1.05264 | 618 |
| 900.000 | 1.65284 | 1.05107 | .014812 | 8.2849 | 23928.4 | 31793.7 | 190.381 | 24.28 | 33.00 | 1.05135 | 634 |
| 950.000 | 1.56813 | 1.04955 | .013997 | 8.7172 | 25160.3 | 33450.5 | 192.172 | 24.59 | 33.27 | 1.05004 | 648 |
| 1000.000 | 1.49182 | 1.04807 | .013269 | 9.1479 | 26406.3 | 35120.4 | 193.885 | 24.88 | 33.53 | 1.04873 | 663 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 14.000000 MPa | | | | | | | | | | | |
| 71.220 | 30.67603 | .77071 | 2.287026 | 18.1081 | 44.9 | 501.3 | 75.071 | 36.37 | 58.23 | .00392 | 1017 |
| 80.000 | 29.55697 | .71210 | 1.968410 | 15.2831 | 541.9 | 1015.5 | 81.894 | 35.79 | 59.01 | .01188 | 948 |
| 90.000 | 28.24888 | .66229 | 1.656246 | 12.4442 | 1109.3 | 1604.8 | 88.835 | 33.85 | 58.71 | .03086 | 877 |
| 100.000 | 26.88930 | .62620 | 1.386359 | 9.9643 | 1665.5 | 2186.1 | 94.947 | 30.58 | 57.26 | .06378 | 816 |
| 110.000 | 25.45967 | .60124 | 1.150511 | 7.8192 | 2195.1 | 2745.0 | 100.283 | 26.12 | 54.85 | .11178 | 765 |
| 120.000 | 23.93931 | .58614 | .943313 | 5.9968 | 2689.2 | 3274.0 | 104.901 | 20.94 | 52.01 | .17417 | 729 |
| 130.000 | 22.30646 | .58065 | .761590 | 4.4908 | 3150.1 | 3777.1 | 108.908 | 18.68 | 52.42 | .25027 | 670 |
| 140.000 | 20.54302 | .58546 | .604107 | 3.2984 | 3741.5 | 4423.0 | 113.675 | 35.20 | 71.91 | .33487 | 490 |
| 150.000 | 18.64867 | .60194 | .471265 | 2.4168 | 4380.4 | 5131.1 | 118.561 | 30.67 | 70.30 | .42094 | 444 |
| 160.000 | 16.67127 | .63125 | .364146 | 1.8363 | 4993.1 | 5832.9 | 123.091 | 28.39 | 69.96 | .50361 | 401 |
| 170.000 | 14.73859 | .67203 | .282748 | 1.5268 | 5574.5 | 6524.4 | 127.283 | 26.92 | 67.90 | .57950 | 370 |
| 180.000 | 13.01661 | .71866 | .224321 | 1.4219 | 6106.9 | 7182.5 | 131.046 | 25.82 | 63.42 | .64653 | 353 |
| 190.000 | 11.59037 | .76461 | .183439 | 1.4332 | 6582.3 | 7790.2 | 134.333 | 24.93 | 58.14 | .70456 | 345 |
| 200.000 | 10.43864 | .80652 | .154398 | 1.4930 | 7006.5 | 8347.7 | 137.194 | 24.22 | 53.52 | .75423 | 343 |
| 210.000 | 9.50331 | .84372 | .133054 | 1.5756 | 7390.3 | 8863.5 | 139.711 | 23.64 | 49.76 | .79653 | 344 |
| 220.000 | 8.73578 | .87613 | .116892 | 1.6776 | 7742.5 | 9345.1 | 141.952 | 23.17 | 46.65 | .83253 | 347 |
| 230.000 | 8.09875 | .90395 | .104339 | 1.7924 | 8069.7 | 9798.3 | 143.968 | 22.79 | 44.09 | .86321 | 351 |
| 240.000 | 7.56305 | .92765 | .094359 | 1.9142 | 8377.4 | 10228.5 | 145.799 | 22.49 | 42.00 | .88940 | 357 |
| 250.000 | 7.10646 | .94776 | .086256 | 2.0392 | 8669.7 | 10639.7 | 147.478 | 22.24 | 40.30 | .91184 | 363 |
| 260.000 | 6.71228 | .96483 | .079551 | 2.1650 | 8949.8 | 11035.5 | 149.031 | 22.04 | 38.91 | .93111 | 369 |
| 270.000 | 6.36798 | .97932 | .073913 | 2.2903 | 9220.2 | 11418.7 | 150.477 | 21.87 | 37.76 | .94773 | 375 |
| 280.000 | 6.06411 | .99167 | .069103 | 2.4143 | 9482.6 | 11791.3 | 151.832 | 21.74 | 36.80 | .96210 | 381 |
| 290.000 | 5.79343 | 1.00221 | .064949 | 2.5365 | 9738.6 | 12155.2 | 153.109 | 21.63 | 36.00 | .97457 | 388 |
| 300.000 | 5.55036 | 1.01123 | .061321 | 2.6568 | 9989.3 | 12511.6 | 154.318 | 21.54 | 35.32 | .98541 | 394 |
| 310.000 | 5.33053 | 1.01897 | .058123 | 2.7752 | 10235.5 | 12861.9 | 155.466 | 21.46 | 34.74 | .99487 | 400 |
| 320.000 | 5.13045 | 1.02562 | .055280 | 2.8915 | 10478.0 | 13206.8 | 156.561 | 21.40 | 34.25 | 1.00314 | 406 |
| 330.000 | 4.94734 | 1.03135 | .052733 | 3.0060 | 10717.3 | 13547.1 | 157.609 | 21.35 | 33.83 | 1.01039 | 412 |
| 340.000 | 4.77891 | 1.03630 | .050438 | 3.1186 | 10954.0 | 13883.5 | 158.613 | 21.32 | 33.46 | 1.01674 | 418 |
| 350.000 | 4.62332 | 1.04057 | .048356 | 3.2296 | 11188.4 | 14216.5 | 159.578 | 21.29 | 33.14 | 1.02233 | 423 |
| 360.000 | 4.47899 | 1.04426 | .046458 | 3.3390 | 11420.9 | 14546.6 | 160.508 | 21.27 | 32.87 | 1.02725 | 429 |
| 370.000 | 4.34465 | 1.04746 | .044719 | 3.4469 | 11651.7 | 14874.0 | 161.405 | 21.26 | 32.63 | 1.03159 | 434 |
| 380.000 | 4.21918 | 1.05022 | .043119 | 3.5534 | 11881.1 | 15199.3 | 162.273 | 21.25 | 32.42 | 1.03542 | 439 |
| 390.000 | 4.10167 | 1.05261 | .041641 | 3.6587 | 12109.3 | 15522.6 | 163.113 | 21.26 | 32.24 | 1.03880 | 445 |
| 400.000 | 3.99131 | 1.05467 | .040271 | 3.7628 | 12336.6 | 15844.2 | 163.927 | 21.26 | 32.09 | 1.04178 | 450 |
| 410.000 | 3.88741 | 1.05645 | .038997 | 3.8657 | 12563.0 | 16164.4 | 164.717 | 21.28 | 31.95 | 1.04442 | 455 |
| 420.000 | 3.78936 | 1.05798 | .037809 | 3.9677 | 12788.7 | 16483.3 | 165.486 | 21.29 | 31.83 | 1.04674 | 460 |
| 430.000 | 3.69666 | 1.05929 | .036698 | 4.0687 | 13013.9 | 16801.1 | 166.234 | 21.32 | 31.73 | 1.04880 | 465 |
| 440.000 | 3.60883 | 1.06041 | .035655 | 4.1688 | 13238.6 | 17118.0 | 166.962 | 21.34 | 31.65 | 1.05061 | 469 |
| 450.000 | 3.52547 | 1.06136 | .034675 | 4.2681 | 13463.0 | 17434.1 | 167.673 | 21.38 | 31.58 | 1.05221 | 474 |
| 470.000 | 3.37078 | 1.06283 | .032881 | 4.4644 | 13911.1 | 18064.4 | 169.043 | 21.45 | 31.47 | 1.05485 | 483 |
| 500.000 | 3.16448 | 1.06419 | .030535 | 4.7541 | 14582.8 | 19006.9 | 170.987 | 21.58 | 31.38 | 1.05769 | 496 |
| 550.000 | 2.87481 | 1.06493 | .027329 | 5.2263 | 15705.1 | 20575.0 | 173.976 | 21.86 | 31.37 | 1.06033 | 517 |
| 600.000 | 2.63631 | 1.06450 | .024763 | 5.6885 | 16835.6 | 22146.1 | 176.710 | 22.18 | 31.49 | 1.06129 | 536 |
| 650.000 | 2.43600 | 1.06341 | .022656 | 6.1432 | 17978.0 | 23725.1 | 179.238 | 22.53 | 31.68 | 1.06125 | 555 |
| 700.000 | 2.26509 | 1.06196 | .020892 | 6.5921 | 19134.4 | 25315.2 | 181.594 | 22.89 | 31.92 | 1.06058 | 572 |
| 750.000 | 2.11734 | 1.06033 | .019391 | 7.0365 | 20306.0 | 26918.1 | 183.806 | 23.25 | 32.19 | 1.05955 | 589 |
| 800.000 | 1.98822 | 1.05862 | .018097 | 7.4772 | 21493.2 | 28534.7 | 185.893 | 23.61 | 32.47 | 1.05830 | 605 |
| 850.000 | 1.87433 | 1.05688 | .016969 | 7.9150 | 22695.9 | 30165.3 | 187.870 | 23.95 | 32.75 | 1.05693 | 621 |
| 900.000 | 1.77307 | 1.05517 | .015976 | 8.3503 | 23913.9 | 31809.8 | 189.750 | 24.28 | 33.03 | 1.05551 | 636 |
| 950.000 | 1.68241 | 1.05351 | .015095 | 8.7837 | 25146.6 | 33468.0 | 191.542 | 24.59 | 33.29 | 1.05407 | 651 |
| 1000.000 | 1.60074 | 1.05189 | .014308 | 9.2153 | 26393.1 | 35139.1 | 193.257 | 24.88 | 33.55 | 1.05264 | 666 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|--------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 16.00000 MPa | | | | | | | | | | | |
| 71.654 | 30.73091 | .87392 | 2.302159 | 18.5135 | 52.0 | 572.6 | 75.158 | 36.39 | 58.11 | .00407 | 1027 |
| 80.000 | 29.68555 | .81031 | 1.999083 | 15.8292 | 520.8 | 1059.8 | 81.603 | 35.83 | 58.75 | .01150 | 962 |
| 90.000 | 28.40615 | .75271 | 1.686807 | 12.9938 | 1082.7 | 1646.0 | 88.507 | 33.91 | 58.33 | .02967 | 893 |
| 100.000 | 27.08456 | .71050 | 1.418045 | 10.5243 | 1631.9 | 2222.6 | 94.571 | 30.66 | 56.71 | .06101 | 833 |
| 110.000 | 25.70648 | .68053 | 1.184338 | 8.3925 | 2152.3 | 2774.7 | 99.842 | 26.22 | 54.04 | .10653 | 785 |
| 120.000 | 24.25746 | .66109 | .980152 | 6.5824 | 2634.2 | 3293.8 | 104.374 | 21.04 | 50.80 | .16562 | 753 |
| 130.000 | 22.72463 | .65139 | .802102 | 5.0833 | 3078.7 | 3782.7 | 108.263 | 18.78 | 50.64 | .23774 | 699 |
| 140.000 | 21.10076 | .65141 | .648478 | 3.8856 | 3648.0 | 4406.3 | 112.869 | 35.28 | 69.31 | .31821 | 522 |
| 150.000 | 19.39250 | .66154 | .518730 | 2.9774 | 4258.6 | 5083.7 | 117.544 | 30.71 | 66.76 | .40071 | 480 |
| 160.000 | 17.63377 | .68205 | .412622 | 2.3405 | 4839.1 | 5746.4 | 121.822 | 28.40 | 65.83 | .48100 | 440 |
| 170.000 | 15.89777 | .71203 | .329188 | 1.9464 | 5392.0 | 6398.4 | 125.775 | 26.93 | 64.38 | .55609 | 407 |
| 180.000 | 14.28525 | .74838 | .266084 | 1.7509 | 5909.1 | 7029.1 | 129.381 | 25.86 | 61.53 | .62387 | 385 |
| 190.000 | 12.87561 | .78662 | .219605 | 1.6937 | 6382.8 | 7625.5 | 132.606 | 25.02 | 57.65 | .68371 | 373 |
| 200.000 | 11.68906 | .82314 | .185488 | 1.7155 | 6813.2 | 8182.0 | 135.461 | 24.33 | 53.69 | .73577 | 367 |
| 210.000 | 10.70087 | .85634 | .160016 | 1.7744 | 7205.9 | 8701.1 | 137.995 | 23.77 | 50.24 | .78066 | 365 |
| 220.000 | 9.87295 | .88596 | .140496 | 1.8503 | 7568.2 | 9188.8 | 140.265 | 23.31 | 47.39 | .81935 | 366 |
| 230.000 | 9.17291 | .91211 | .125177 | 1.9412 | 7906.2 | 9650.4 | 142.317 | 22.94 | 45.00 | .85262 | 368 |
| 240.000 | 8.57589 | .93496 | .112914 | 2.0438 | 8224.4 | 10090.1 | 144.189 | 22.63 | 42.98 | .88123 | 372 |
| 250.000 | 8.06208 | .95477 | .102922 | 2.1542 | 8526.6 | 10511.2 | 145.908 | 22.37 | 41.28 | .90588 | 376 |
| 260.000 | 7.61570 | .97185 | .094648 | 2.2693 | 8815.7 | 10916.7 | 147.499 | 22.16 | 39.86 | .92716 | 381 |
| 270.000 | 7.22428 | .98656 | .087693 | 2.3869 | 9094.3 | 11309.0 | 148.980 | 21.99 | 38.65 | .94555 | 387 |
| 280.000 | 6.87803 | .99922 | .081771 | 2.5054 | 9364.1 | 11690.3 | 150.367 | 21.84 | 37.64 | .96150 | 392 |
| 290.000 | 6.56925 | 1.01011 | .076667 | 2.6239 | 9626.7 | 12026.3 | 151.672 | 21.72 | 36.78 | .97536 | 398 |
| 300.000 | 6.29186 | 1.01949 | .072223 | 2.7418 | 9883.3 | 12426.3 | 152.906 | 21.62 | 36.04 | .98743 | 403 |
| 310.000 | 6.04099 | 1.02758 | .068316 | 2.8587 | 10134.9 | 12783.4 | 154.077 | 21.54 | 35.41 | .99796 | 409 |
| 320.000 | 5.81274 | 1.03455 | .064853 | 2.9744 | 10382.2 | 13134.7 | 155.193 | 21.47 | 34.87 | 1.00717 | 415 |
| 330.000 | 5.60396 | 1.04058 | .061761 | 3.0888 | 10625.9 | 13481.0 | 156.258 | 21.42 | 34.40 | 1.01524 | 420 |
| 340.000 | 5.41206 | 1.04579 | .059890 | 3.2018 | 10866.5 | 13822.9 | 157.279 | 21.38 | 33.99 | 1.02233 | 426 |
| 350.000 | 5.23489 | 1.05029 | .056466 | 3.3134 | 11104.6 | 14161.0 | 158.259 | 21.34 | 33.64 | 1.02855 | 431 |
| 360.000 | 5.07068 | 1.05418 | .054179 | 3.4236 | 11340.3 | 14495.7 | 159.202 | 21.32 | 33.33 | 1.03409 | 437 |
| 370.000 | 4.91793 | 1.05755 | .052090 | 3.5325 | 11574.2 | 14827.6 | 160.111 | 21.31 | 33.06 | 1.03891 | 442 |
| 380.000 | 4.77538 | 1.06046 | .050172 | 3.6402 | 11806.5 | 15157.0 | 160.989 | 21.30 | 32.82 | 1.04316 | 447 |
| 390.000 | 4.64195 | 1.06297 | .048404 | 3.7467 | 12037.3 | 15484.1 | 161.839 | 21.30 | 32.61 | 1.04690 | 452 |
| 400.000 | 4.51671 | 1.06513 | .046769 | 3.8521 | 12266.9 | 15809.3 | 162.662 | 21.30 | 32.43 | 1.05021 | 457 |
| 410.000 | 4.39888 | 1.06698 | .045251 | 3.9564 | 12495.6 | 16132.9 | 163.461 | 21.31 | 32.28 | 1.05312 | 462 |
| 420.000 | 4.28775 | 1.06858 | .043838 | 4.0597 | 12723.4 | 16455.0 | 164.238 | 21.33 | 32.14 | 1.05569 | 467 |
| 430.000 | 4.18272 | 1.06993 | .042519 | 4.1621 | 12950.5 | 16775.8 | 164.992 | 21.35 | 32.02 | 1.05795 | 472 |
| 440.000 | 4.08327 | 1.07108 | .041283 | 4.2635 | 13177.0 | 17095.5 | 165.727 | 21.37 | 31.92 | 1.05994 | 476 |
| 450.000 | 3.98892 | 1.07205 | .040124 | 4.3642 | 13403.1 | 17414.2 | 166.444 | 21.40 | 31.83 | 1.06169 | 481 |
| 470.000 | 3.81392 | 1.07353 | .038005 | 4.5631 | 13854.3 | 18049.5 | 167.825 | 21.47 | 31.70 | 1.06456 | 490 |
| 500.000 | 3.58073 | 1.07484 | .035245 | 4.8565 | 14530.1 | 18998.4 | 169.782 | 21.60 | 31.58 | 1.06762 | 503 |
| 550.000 | 3.25360 | 1.07537 | .031487 | 5.3344 | 15657.9 | 20575.5 | 172.788 | 21.88 | 31.53 | 1.07038 | 523 |
| 600.000 | 2.98446 | 1.07465 | .028492 | 5.8015 | 16792.7 | 22153.8 | 175.535 | 22.19 | 31.62 | 1.07127 | 543 |
| 650.000 | 2.75851 | 1.07324 | .026041 | 6.2604 | 17938.6 | 23738.9 | 178.072 | 22.54 | 31.79 | 1.07104 | 561 |
| 700.000 | 2.56574 | 1.07145 | .023994 | 6.7129 | 19098.0 | 25334.0 | 180.437 | 22.90 | 32.02 | 1.07008 | 578 |
| 750.000 | 2.39910 | 1.06948 | .022256 | 7.1605 | 20272.0 | 26941.2 | 182.654 | 23.26 | 32.27 | 1.06878 | 595 |
| 800.000 | 2.25346 | 1.06744 | .020760 | 7.6040 | 21461.3 | 28561.5 | 184.746 | 23.61 | 32.54 | 1.06726 | 611 |
| 850.000 | 2.12497 | 1.06540 | .019458 | 8.0443 | 22665.9 | 30195.4 | 186.727 | 23.95 | 32.81 | 1.06561 | 627 |
| 900.000 | 2.01072 | 1.06338 | .018313 | 8.4819 | 23885.5 | 31842.8 | 188.610 | 24.28 | 33.08 | 1.06391 | 642 |
| 950.000 | 1.90839 | 1.06143 | .017298 | 8.9172 | 25119.5 | 33503.5 | 190.406 | 24.59 | 33.34 | 1.06220 | 657 |
| 1000.000 | 1.81619 | 1.05955 | .016392 | 9.3506 | 26367.4 | 35177.0 | 192.122 | 24.88 | 33.59 | 1.06051 | 671 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 18.000000 MPa | | | | | | | | | | | |
| 72.085 | 30.78451 | .97557 | 2.316871 | 18.9173 | 59.2 | 644.0 | 75.246 | 36.40 | 57.98 | .00429 | 1037 |
| 80.000 | 29.80978 | .90779 | 2.029228 | 16.3716 | 500.6 | 1104.4 | 81.320 | 35.87 | 58.51 | .01131 | 976 |
| 90.000 | 28.55693 | .84233 | 1.716626 | 13.5369 | 1057.4 | 1687.7 | 88.191 | 33.97 | 57.99 | .02897 | 908 |
| 100.000 | 27.26978 | .79388 | 1.448672 | 11.0749 | 1600.2 | 2260.3 | 94.212 | 30.73 | 56.22 | .05925 | 850 |
| 110.000 | 25.93714 | .75879 | 1.216641 | 8.9529 | 2112.5 | 2806.5 | 99.427 | 26.30 | 53.34 | .10306 | 805 |
| 120.000 | 24.54882 | .73489 | 1.014798 | 7.1515 | 2583.9 | 3317.2 | 103.886 | 21.13 | 49.81 | .15982 | 775 |
| 130.000 | 23.09735 | .72099 | .839513 | 5.6560 | 3015.0 | 3794.3 | 107.680 | 18.87 | 49.24 | .22909 | 725 |
| 140.000 | 21.58108 | .71653 | .688662 | 4.4521 | 3567.2 | 4401.3 | 112.164 | 35.37 | 67.39 | .30656 | 550 |
| 150.000 | 20.00912 | .72130 | .561048 | 3.5224 | 4157.0 | 5056.6 | 116.687 | 30.78 | 64.26 | .38638 | 512 |
| 160.000 | 18.40762 | .73505 | .455683 | 2.8442 | 4714.1 | 5692.0 | 120.788 | 28.44 | 62.91 | .46474 | 473 |
| 170.000 | 16.82423 | .75692 | .371090 | 2.3887 | 5245.0 | 6314.8 | 124.564 | 26.96 | 61.58 | .53893 | 441 |
| 180.000 | 15.32306 | .78491 | .304993 | 2.1205 | 5746.5 | 6921.2 | 128.031 | 25.90 | 59.53 | .60691 | 417 |
| 190.000 | 13.96397 | .81597 | .254426 | 1.9961 | 6213.8 | 7502.8 | 131.176 | 25.09 | 56.68 | .66785 | 401 |
| 200.000 | 12.77815 | .84711 | .216085 | 1.9686 | 6645.0 | 8053.7 | 134.002 | 24.42 | 53.48 | .72158 | 392 |
| 210.000 | 11.76354 | .87635 | .186856 | 1.9977 | 7042.7 | 8572.8 | 136.536 | 23.88 | 50.40 | .76844 | 387 |
| 220.000 | 10.89879 | .90289 | .164214 | 2.0562 | 7411.5 | 9063.1 | 138.817 | 23.43 | 47.72 | .80919 | 386 |
| 230.000 | 10.15770 | .92664 | .146310 | 2.1286 | 7756.6 | 9528.7 | 140.888 | 23.05 | 45.47 | .84454 | 387 |
| 240.000 | 9.51744 | .94777 | .131872 | 2.2123 | 8082.4 | 9973.7 | 142.782 | 22.74 | 43.57 | .87516 | 388 |
| 250.000 | 8.96032 | .96643 | .120041 | 2.3062 | 8392.1 | 10401.0 | 144.527 | 22.48 | 41.94 | .90169 | 391 |
| 260.000 | 8.47217 | .98281 | .110206 | 2.4077 | 8688.6 | 10813.2 | 146.144 | 22.27 | 40.54 | .92469 | 395 |
| 270.000 | 8.04141 | .99710 | .101923 | 2.5144 | 8974.0 | 11212.4 | 147.651 | 22.09 | 39.34 | .94465 | 399 |
| 280.000 | 7.65862 | 1.00955 | .094864 | 2.6244 | 9250.2 | 11600.5 | 149.062 | 21.93 | 38.30 | .96201 | 404 |
| 290.000 | 7.31617 | 1.02036 | .088782 | 2.7363 | 9518.7 | 11979.0 | 150.390 | 21.81 | 37.41 | .97713 | 409 |
| 300.000 | 7.00785 | 1.02975 | .083490 | 2.8493 | 9780.7 | 12349.2 | 151.646 | 21.70 | 36.65 | .99031 | 414 |
| 310.000 | 6.72861 | 1.03789 | .078844 | 2.9624 | 10037.2 | 12712.3 | 152.836 | 21.61 | 35.98 | 1.00184 | 419 |
| 320.000 | 6.47432 | 1.04494 | .074732 | 3.0754 | 10289.0 | 13069.2 | 153.969 | 21.54 | 35.41 | 1.01193 | 424 |
| 330.000 | 6.24158 | 1.05106 | .071067 | 3.1878 | 10536.8 | 13420.7 | 155.051 | 21.48 | 34.90 | 1.02077 | 430 |
| 340.000 | 6.02761 | 1.05636 | .067778 | 3.2995 | 10781.2 | 13767.5 | 156.086 | 21.44 | 34.46 | 1.02852 | 435 |
| 350.000 | 5.83004 | 1.06095 | .064809 | 3.4104 | 11022.7 | 14110.1 | 157.080 | 21.40 | 34.08 | 1.03534 | 440 |
| 360.000 | 5.64694 | 1.06493 | .062114 | 3.5202 | 11261.7 | 14449.2 | 158.035 | 21.37 | 33.74 | 1.04140 | 445 |
| 370.000 | 5.47664 | 1.06837 | .059655 | 3.6291 | 11498.5 | 14785.2 | 158.955 | 21.35 | 33.45 | 1.04668 | 450 |
| 380.000 | 5.31775 | 1.07133 | .057403 | 3.7370 | 11733.4 | 15118.3 | 159.843 | 21.34 | 33.19 | 1.05132 | 455 |
| 390.000 | 5.16906 | 1.07389 | .055331 | 3.8438 | 11966.8 | 15449.1 | 160.703 | 21.34 | 32.96 | 1.05541 | 460 |
| 400.000 | 5.02953 | 1.07609 | .053417 | 3.9497 | 12198.8 | 15777.6 | 161.535 | 21.34 | 32.76 | 1.05902 | 465 |
| 410.000 | 4.89829 | 1.07797 | .051644 | 4.0547 | 12429.6 | 16104.4 | 162.341 | 21.35 | 32.59 | 1.06219 | 470 |
| 420.000 | 4.77456 | 1.07958 | .049996 | 4.1587 | 12659.4 | 16429.4 | 163.125 | 21.36 | 32.43 | 1.06498 | 474 |
| 430.000 | 4.65764 | 1.08094 | .048459 | 4.2619 | 12888.5 | 16753.1 | 163.886 | 21.38 | 32.30 | 1.06743 | 479 |
| 440.000 | 4.54696 | 1.08209 | .047022 | 4.3642 | 13116.8 | 17075.5 | 164.627 | 21.40 | 32.18 | 1.06958 | 484 |
| 450.000 | 4.44199 | 1.08304 | .045675 | 4.4658 | 13344.5 | 17396.8 | 165.349 | 21.43 | 32.08 | 1.07147 | 488 |
| 470.000 | 4.24736 | 1.08447 | .043219 | 4.6666 | 13798.8 | 18036.7 | 166.741 | 21.50 | 31.92 | 1.07455 | 497 |
| 500.000 | 3.98813 | 1.08567 | .040026 | 4.9628 | 14478.5 | 18991.9 | 168.711 | 21.62 | 31.77 | 1.07780 | 510 |
| 550.000 | 3.62470 | 1.08593 | .035698 | 5.4453 | 15611.7 | 20577.6 | 171.734 | 21.89 | 31.69 | 1.08063 | 530 |
| 600.000 | 3.32584 | 1.08489 | .032261 | 5.9166 | 16750.8 | 22163.0 | 174.493 | 22.21 | 31.75 | 1.08142 | 549 |
| 650.000 | 3.07499 | 1.08313 | .029457 | 6.3792 | 17900.2 | 23753.9 | 177.039 | 22.55 | 31.90 | 1.08100 | 567 |
| 700.000 | 2.86100 | 1.08099 | .027121 | 6.8351 | 19062.4 | 25353.9 | 179.411 | 22.91 | 32.11 | 1.07978 | 584 |
| 750.000 | 2.67600 | 1.07867 | .025141 | 7.2857 | 20238.8 | 26965.3 | 181.634 | 23.26 | 32.35 | 1.07820 | 601 |
| 800.000 | 2.51429 | 1.07629 | .023440 | 7.7318 | 21430.2 | 28589.2 | 183.730 | 23.62 | 32.61 | 1.07638 | 617 |
| 850.000 | 2.37161 | 1.07393 | .021960 | 8.1745 | 22636.5 | 30226.3 | 185.715 | 23.96 | 32.87 | 1.07444 | 632 |
| 900.000 | 2.24470 | 1.07161 | .020661 | 8.6142 | 23857.7 | 31876.6 | 187.602 | 24.28 | 33.14 | 1.07245 | 647 |
| 950.000 | 2.13101 | 1.06937 | .019511 | 9.0514 | 25093.2 | 33539.9 | 189.400 | 24.59 | 33.39 | 1.07046 | 662 |
| 1000.000 | 2.02854 | 1.06722 | .018484 | 9.4866 | 26342.3 | 35215.6 | 191.119 | 24.88 | 33.64 | 1.06851 | 676 |

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TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | | | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|----------------|-------|---------|----------|
| | | | | | | | C _V | C _P | | | |
| 20.000000 MPa | | | | | | | | | | | |
| 72.515 | 30.83691 | 1.07571 | 2.331171 | 19.3193 | 66.7 | 715.2 | 75.334 | 36.42 | 57.87 | .00456 | 1046 |
| 80.000 | 29.92997 | 1.00461 | 2.058873 | 16.9104 | 481.1 | 1149.4 | 81.045 | 35.91 | 58.29 | .01126 | 990 |
| 90.000 | 28.70181 | .93120 | 1.745763 | 14.0743 | 1033.2 | 1730.0 | 87.885 | 34.03 | 57.68 | .02863 | 922 |
| 100.000 | 27.44608 | .87642 | 1.478350 | 11.6171 | 1570.2 | 2298.9 | 93.867 | 30.81 | 55.78 | .05822 | 866 |
| 110.000 | 26.15392 | .83611 | 1.247618 | 9.5022 | 2075.3 | 2840.0 | 99.033 | 26.39 | 52.73 | .10088 | 823 |
| 120.000 | 24.81812 | .80769 | 1.047610 | 7.7066 | 2337.6 | 3343.5 | 103.430 | 21.23 | 48.97 | .15601 | 796 |
| 130.000 | 23.43456 | .78958 | .874442 | 6.2123 | 2957.4 | 3810.8 | 107.146 | 18.97 | 48.11 | .22325 | 749 |
| 140.000 | 22.00456 | .78082 | .725638 | 5.0015 | 3495.9 | 4404.8 | 111.534 | 35.46 | 65.90 | .29854 | 576 |
| 150.000 | 20.53784 | .78081 | .599536 | 4.0533 | 4069.5 | 5043.3 | 115.940 | 30.86 | 62.39 | .37636 | 540 |
| 160.000 | 19.05547 | .78896 | .494675 | 3.3425 | 4608.8 | 5658.4 | 119.911 | 28.50 | 60.76 | .45321 | 504 |
| 170.000 | 17.59125 | .80436 | .409286 | 2.8402 | 5122.4 | 6259.3 | 123.554 | 27.01 | 59.41 | .52659 | 472 |
| 180.000 | 16.18871 | .82549 | .341113 | 2.5146 | 5610.1 | 6845.5 | 126.906 | 25.96 | 57.74 | .59455 | 446 |
| 190.000 | 14.89117 | .85018 | .287539 | 2.3312 | 6069.2 | 7412.3 | 129.970 | 25.15 | 55.54 | .65617 | 428 |
| 200.000 | 13.72822 | .87609 | .245816 | 2.2529 | 6498.2 | 7955.0 | 132.754 | 24.50 | 52.97 | .71111 | 416 |
| 210.000 | 12.70835 | .90133 | .213320 | 2.2449 | 6897.7 | 8471.4 | 135.275 | 23.97 | 50.33 | .75946 | 410 |
| 220.000 | 11.82281 | .92481 | .187787 | 2.2795 | 7270.6 | 8962.2 | 137.559 | 23.53 | 47.88 | .80186 | 406 |
| 230.000 | 11.05440 | .94609 | .167437 | 2.3378 | 7620.7 | 9430.0 | 139.638 | 23.16 | 45.73 | .83887 | 405 |
| 240.000 | 10.38431 | .96517 | .150944 | 2.4082 | 7951.9 | 9877.8 | 141.545 | 22.84 | 43.90 | .87114 | 406 |
| 250.000 | 9.79588 | .98222 | .137360 | 2.4874 | 8267.2 | 10308.9 | 143.305 | 22.58 | 42.35 | .89924 | 408 |
| 260.000 | 9.27595 | .99738 | .126017 | 2.5749 | 8569.3 | 10725.4 | 144.939 | 22.36 | 41.00 | .92371 | 410 |
| 270.000 | 8.81390 | 1.01079 | .116432 | 2.6695 | 8860.3 | 11129.4 | 146.464 | 22.18 | 39.83 | .94504 | 413 |
| 280.000 | 8.40098 | 1.02260 | .108244 | 2.7692 | 9141.8 | 11522.5 | 147.893 | 22.02 | 38.81 | .96364 | 417 |
| 290.000 | 8.02993 | 1.03296 | .101181 | 2.8727 | 9415.3 | 11906.0 | 149.239 | 21.89 | 37.92 | .97988 | 421 |
| 300.000 | 7.69473 | 1.04203 | .095031 | 2.9787 | 9682.0 | 12281.2 | 150.511 | 21.78 | 37.14 | .99407 | 425 |
| 310.000 | 7.39035 | 1.04995 | .089632 | 3.0864 | 9942.9 | 12649.1 | 151.718 | 21.69 | 36.46 | 1.00649 | 430 |
| 320.000 | 7.11263 | 1.05685 | .084856 | 3.1949 | 10198.8 | 13010.7 | 152.866 | 21.61 | 35.86 | 1.01738 | 435 |
| 330.000 | 6.85809 | 1.06286 | .080602 | 3.3038 | 10450.4 | 13366.7 | 153.961 | 21.54 | 35.34 | 1.02692 | 439 |
| 340.000 | 6.62381 | 1.06809 | .076788 | 3.4128 | 10698.3 | 13717.7 | 155.009 | 21.49 | 34.88 | 1.03531 | 444 |
| 350.000 | 6.40734 | 1.07263 | .073349 | 3.5215 | 10943.0 | 14064.5 | 156.015 | 21.45 | 34.48 | 1.04267 | 449 |
| 360.000 | 6.20660 | 1.07656 | .070231 | 3.6297 | 11185.0 | 14407.4 | 156.980 | 21.42 | 34.12 | 1.04921 | 454 |
| 370.000 | 6.01982 | 1.07996 | .067390 | 3.7375 | 11424.6 | 14747.0 | 157.911 | 21.40 | 33.80 | 1.05491 | 459 |
| 380.000 | 5.84551 | 1.08290 | .064791 | 3.8445 | 11662.2 | 15083.6 | 158.808 | 21.38 | 33.53 | 1.05992 | 463 |
| 390.000 | 5.68237 | 1.08543 | .062403 | 3.9509 | 11897.9 | 15417.6 | 159.676 | 21.38 | 33.28 | 1.06433 | 468 |
| 400.000 | 5.52927 | 1.08759 | .060201 | 4.0565 | 12132.2 | 15749.3 | 160.516 | 21.37 | 33.06 | 1.06821 | 473 |
| 410.000 | 5.38526 | 1.08944 | .058162 | 4.1614 | 12365.1 | 16078.9 | 161.330 | 21.38 | 32.87 | 1.07162 | 477 |
| 420.000 | 5.24948 | 1.09101 | .056269 | 4.2655 | 12596.9 | 16406.8 | 162.120 | 21.39 | 32.70 | 1.07461 | 482 |
| 430.000 | 5.12119 | 1.09233 | .054507 | 4.3689 | 12827.8 | 16733.1 | 162.888 | 21.41 | 32.56 | 1.07724 | 487 |
| 440.000 | 4.99975 | 1.09343 | .052861 | 4.4716 | 13057.8 | 17058.0 | 163.635 | 21.43 | 32.43 | 1.07954 | 491 |
| 450.000 | 4.88458 | 1.09434 | .051320 | 4.5735 | 13212.2 | 17381.7 | 164.362 | 21.45 | 32.32 | 1.08155 | 495 |
| 470.000 | 4.67106 | 1.09567 | .048513 | 4.7754 | 13744.4 | 18026.1 | 165.763 | 21.52 | 32.14 | 1.08482 | 504 |
| 500.000 | 4.38673 | 1.09669 | .044875 | 5.0734 | 14428.1 | 18987.3 | 167.746 | 21.64 | 31.96 | 1.08823 | 517 |
| 550.000 | 3.98821 | 1.09661 | .039959 | 5.5593 | 15566.5 | 20581.3 | 170.784 | 21.90 | 31.84 | 1.09110 | 537 |
| 600.000 | 3.66057 | 1.09520 | .036068 | 6.0340 | 16709.8 | 22173.4 | 173.555 | 22.22 | 31.87 | 1.09176 | 555 |
| 650.000 | 3.38559 | 1.09307 | .032903 | 6.4999 | 17862.5 | 23769.9 | 176.111 | 22.56 | 32.00 | 1.09111 | 573 |
| 700.000 | 3.15099 | 1.09056 | .030271 | 6.9588 | 19027.5 | 25374.7 | 178.489 | 22.91 | 32.20 | 1.08961 | 590 |
| 750.000 | 2.94816 | 1.08788 | .028045 | 7.4120 | 20206.3 | 26990.2 | 180.718 | 23.27 | 32.43 | 1.08773 | 607 |
| 800.000 | 2.77084 | 1.08516 | .026135 | 7.8606 | 21399.7 | 28617.8 | 182.819 | 23.62 | 32.68 | 1.08560 | 623 |
| 850.000 | 2.61434 | 1.08246 | .024476 | 8.3055 | 22607.9 | 30258.0 | 184.808 | 23.96 | 32.93 | 1.08336 | 638 |
| 900.000 | 2.47510 | 1.07984 | .023021 | 8.7471 | 23830.6 | 31911.1 | 186.697 | 24.29 | 33.19 | 1.08107 | 653 |
| 950.000 | 2.35034 | 1.07731 | .021733 | 9.1862 | 25067.4 | 33576.8 | 188.499 | 24.60 | 33.44 | 1.07880 | 667 |
| 1000.000 | 2.23786 | 1.07488 | .020585 | 9.6230 | 26317.7 | 35254.8 | 190.220 | 24.89 | 33.68 | 1.07657 | 681 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 22.000000 MPa | | | | | | | | | | | |
| 72.942 | 30.88815 | 1.17440 | 2.345069 | 19.7197 | 74.2 | 786.4 | 75.423 | 36.44 | 57.76 | .00488 | 1056 |
| 80.000 | 30.04640 | 1.10079 | 2.088043 | 17.4461 | 462.4 | 1194.6 | 80.777 | 35.95 | 58.09 | .01131 | 1003 |
| 90.000 | 28.84129 | 1.01936 | 1.774268 | 14.6063 | 1010.1 | 1772.9 | 87.589 | 34.08 | 57.40 | .02856 | 937 |
| 100.000 | 27.61438 | .95819 | 1.507170 | 12.1519 | 1541.7 | 2338.4 | 93.536 | 30.88 | 55.39 | .05776 | 882 |
| 110.000 | 26.35863 | .91258 | 1.277431 | 10.0418 | 2040.3 | 2874.9 | 98.659 | 26.47 | 52.20 | .09968 | 840 |
| 120.000 | 25.06887 | .87957 | 1.078859 | 8.2497 | 2494.7 | 3372.2 | 103.002 | 21.32 | 48.26 | .15369 | 816 |
| 130.000 | 23.74316 | .85724 | .907326 | 6.7549 | 2904.8 | 3831.4 | 106.652 | 19.07 | 47.17 | .21951 | 772 |
| 140.000 | 22.38438 | .84433 | .760056 | 5.5366 | 3431.9 | 4414.7 | 110.961 | 35.55 | 64.71 | .29324 | 599 |
| 150.000 | 21.00205 | .83991 | .635039 | 4.5719 | 3992.5 | 5040.0 | 115.276 | 30.94 | 60.94 | .36960 | 566 |
| 160.000 | 19.61361 | .84316 | .530495 | 3.8341 | 4517.8 | 5639.4 | 119.146 | 28.57 | 59.10 | .44531 | 532 |
| 170.000 | 18.24452 | .85311 | .444476 | 3.2942 | 5017.5 | 6223.4 | 122.686 | 27.07 | 57.70 | .51805 | 500 |
| 180.000 | 16.92602 | .86848 | .374742 | 2.9224 | 5493.3 | 6793.1 | 125.944 | 26.02 | 56.21 | .58592 | 474 |
| 190.000 | 15.68981 | .88760 | .318875 | 2.6889 | 5944.3 | 7346.4 | 128.935 | 25.22 | 54.40 | .64800 | 455 |
| 200.000 | 14.56056 | .90861 | .274450 | 2.5634 | 6369.2 | 7880.1 | 131.673 | 24.38 | 52.30 | .70382 | 441 |
| 210.000 | 13.55009 | .92988 | .239184 | 2.5162 | 6768.3 | 8391.9 | 134.171 | 24.05 | 50.06 | .75335 | 432 |
| 220.000 | 12.65720 | .95022 | .211063 | 2.5218 | 7143.3 | 8881.5 | 136.449 | 23.61 | 47.87 | .79707 | 427 |
| 230.000 | 11.87196 | .96903 | .188424 | 2.5606 | 7496.9 | 9350.0 | 138.532 | 23.25 | 45.87 | .83547 | 424 |
| 240.000 | 11.18072 | .98607 | .169965 | 2.6190 | 7832.1 | 9799.8 | 140.447 | 22.94 | 44.11 | .86910 | 424 |
| 250.000 | 10.56952 | 1.00136 | .154705 | 2.6881 | 8151.7 | 10233.1 | 142.216 | 22.67 | 42.60 | .89852 | 424 |
| 260.000 | 10.02588 | 1.01506 | .141918 | 2.7641 | 8458.1 | 10652.4 | 143.861 | 22.45 | 41.30 | .92425 | 426 |
| 270.000 | 9.53966 | 1.02728 | .131077 | 2.8472 | 8753.5 | 11059.6 | 145.398 | 22.26 | 40.17 | .94675 | 428 |
| 280.000 | 9.10266 | 1.03815 | .121789 | 2.9364 | 9039.3 | 11456.2 | 146.840 | 22.10 | 39.17 | .96643 | 431 |
| 290.000 | 8.70806 | 1.04777 | .113760 | 3.0305 | 9317.1 | 11843.5 | 148.199 | 21.97 | 38.30 | .98365 | 434 |
| 300.000 | 8.35016 | 1.05626 | .106759 | 3.1285 | 9587.8 | 12222.5 | 149.484 | 21.85 | 37.52 | .99874 | 437 |
| 310.000 | 8.02410 | 1.06372 | .100607 | 3.2294 | 9852.5 | 12594.2 | 150.703 | 21.75 | 36.84 | 1.01196 | 441 |
| 320.000 | 7.72583 | 1.07027 | .095163 | 3.3322 | 10112.0 | 12959.6 | 151.863 | 21.67 | 36.24 | 1.02356 | 446 |
| 330.000 | 7.45187 | 1.07599 | .090313 | 3.4363 | 10367.0 | 13319.3 | 152.970 | 21.60 | 35.71 | 1.03375 | 450 |
| 340.000 | 7.19929 | 1.08098 | .085966 | 3.5413 | 10618.1 | 13674.0 | 154.029 | 21.55 | 35.24 | 1.04269 | 454 |
| 350.000 | 6.96559 | 1.08533 | .082048 | 3.6468 | 10865.8 | 14024.2 | 155.044 | 21.50 | 34.82 | 1.05056 | 459 |
| 360.000 | 6.74865 | 1.08910 | .078498 | 3.7524 | 11110.6 | 14370.5 | 156.020 | 21.47 | 34.45 | 1.05753 | 463 |
| 370.000 | 6.54664 | 1.09236 | .075267 | 3.8580 | 11352.8 | 14713.3 | 156.959 | 21.44 | 34.12 | 1.06361 | 468 |
| 380.000 | 6.35798 | 1.09518 | .072312 | 3.9633 | 11592.8 | 15053.0 | 157.865 | 21.42 | 33.83 | 1.06896 | 472 |
| 390.000 | 6.18131 | 1.09759 | .069600 | 4.0683 | 11830.8 | 15390.0 | 158.740 | 21.41 | 33.57 | 1.07366 | 477 |
| 400.000 | 6.01546 | 1.09966 | .067100 | 4.1729 | 12067.2 | 15724.5 | 159.587 | 21.41 | 33.34 | 1.07780 | 481 |
| 410.000 | 5.85939 | 1.10141 | .064789 | 4.2770 | 12302.1 | 16056.8 | 160.408 | 21.41 | 33.13 | 1.08142 | 486 |
| 420.000 | 5.71222 | 1.10289 | .062645 | 4.3806 | 12535.8 | 16387.2 | 161.204 | 21.42 | 32.95 | 1.08460 | 490 |
| 430.000 | 5.57313 | 1.10413 | .060651 | 4.4836 | 12768.5 | 16716.0 | 161.977 | 21.44 | 32.80 | 1.08739 | 494 |
| 440.000 | 5.44145 | 1.10514 | .058790 | 4.5860 | 13000.2 | 17043.2 | 162.730 | 21.46 | 32.66 | 1.08982 | 499 |
| 450.000 | 5.31656 | 1.10597 | .057049 | 4.6879 | 13231.1 | 17369.1 | 163.462 | 21.48 | 32.53 | 1.09194 | 503 |
| 470.000 | 5.08498 | 1.10713 | .053882 | 4.8899 | 13691.3 | 18017.7 | 164.872 | 21.54 | 32.33 | 1.09537 | 511 |
| 500.000 | 4.77656 | 1.10790 | .049786 | 5.1888 | 14378.6 | 18984.5 | 166.866 | 21.66 | 32.13 | 1.09891 | 524 |
| 550.000 | 4.34424 | 1.10741 | .044266 | 5.6768 | 15522.2 | 20586.4 | 169.920 | 21.92 | 31.98 | 1.10178 | 543 |
| 600.000 | 3.98878 | 1.10559 | .039910 | 6.1541 | 16669.6 | 22185.1 | 172.702 | 22.23 | 31.99 | 1.10228 | 562 |
| 650.000 | 3.69042 | 1.10305 | .036376 | 6.6226 | 17825.7 | 23787.1 | 175.267 | 22.57 | 32.10 | 1.10137 | 579 |
| 700.000 | 3.43585 | 1.10016 | .033443 | 7.0840 | 18993.5 | 25396.5 | 177.652 | 22.92 | 32.28 | 1.09958 | 596 |
| 750.000 | 3.21570 | 1.09711 | .030967 | 7.5396 | 20174.6 | 27016.0 | 179.887 | 23.28 | 32.50 | 1.09738 | 613 |
| 800.000 | 3.02319 | 1.09403 | .028844 | 7.9904 | 21370.0 | 28647.0 | 181.992 | 23.63 | 32.74 | 1.09493 | 628 |
| 850.000 | 2.85325 | 1.09101 | .027003 | 8.4372 | 22579.8 | 30290.3 | 183.985 | 23.97 | 32.99 | 1.09237 | 643 |
| 900.000 | 2.70202 | 1.08807 | .025390 | 8.8808 | 23804.1 | 31946.1 | 185.877 | 24.29 | 33.24 | 1.08978 | 658 |
| 950.000 | 2.56647 | 1.08524 | .023963 | 9.3215 | 25042.2 | 33614.3 | 187.681 | 24.60 | 33.48 | 1.08721 | 673 |
| 1000.000 | 2.44424 | 1.08254 | .022692 | 9.7599 | 26293.7 | 35294.5 | 189.405 | 24.89 | 33.72 | 1.08470 | 687 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|-------|---------|----------|
| 25.000000 MPa | | | | | | | | | | | |
| 73.580 | 30.96300 | 1.31978 | 2.365182 | 20.3172 | 85.7 | 893.1 | 75.555 | 36.46 | 57.59 | .00548 | 1070 |
| 80.000 | 30.21454 | 1.24394 | 2.130955 | 18.2444 | 435.5 | 1262.9 | 80.386 | 36.01 | 57.82 | .01156 | 1022 |
| 90.000 | 29.04131 | 1.15039 | 1.815934 | 15.3956 | 977.1 | 1837.9 | 87.160 | 34.17 | 57.02 | .02886 | 957 |
| 100.000 | 27.85355 | 1.07950 | 1.548956 | 12.9416 | 1501.5 | 2399.1 | 93.061 | 30.98 | 54.88 | .05789 | 904 |
| 110.000 | 26.64612 | 1.02583 | 1.320243 | 10.8351 | 1991.4 | 2929.6 | 98.127 | 26.60 | 51.52 | .09927 | 865 |
| 120.000 | 25.41597 | .98586 | 1.123248 | 9.0450 | 2435.5 | 3419.1 | 102.402 | 21.46 | 47.37 | .15235 | 844 |
| 130.000 | 24.16300 | .95722 | .953503 | 7.5468 | 2833.5 | 3868.1 | 105.972 | 19.21 | 46.03 | .21690 | 803 |
| 140.000 | 22.89111 | .93823 | .807858 | 6.3169 | 3346.6 | 4438.7 | 110.186 | 35.69 | 63.30 | .28916 | 632 |
| 150.000 | 21.60895 | .92764 | .683921 | 5.3299 | 3891.6 | 5048.6 | 114.395 | 31.07 | 59.27 | .36411 | 602 |
| 160.000 | 20.33010 | .92437 | .579592 | 4.5582 | 4400.5 | 5630.2 | 118.150 | 28.69 | 57.22 | .43870 | 569 |
| 170.000 | 19.07246 | .92736 | .492765 | 3.9731 | 4884.0 | 6194.8 | 121.573 | 27.18 | 55.74 | .51078 | 539 |
| 180.000 | 17.85667 | .93547 | .421231 | 3.5463 | 5345.3 | 6745.4 | 124.721 | 26.12 | 54.36 | .57857 | 513 |
| 190.000 | 16.70351 | .94742 | .362752 | 3.2518 | 5785.0 | 7281.7 | 127.620 | 25.32 | 52.88 | .64114 | 492 |
| 200.000 | 15.63059 | .96183 | .315180 | 3.0648 | 6202.9 | 7802.3 | 130.291 | 24.69 | 51.22 | .69795 | 476 |
| 210.000 | 14.64921 | .97740 | .276551 | 2.9616 | 6599.1 | 8305.7 | 132.748 | 24.17 | 49.44 | .74883 | 465 |
| 220.000 | 13.76297 | .99305 | .245126 | 2.9208 | 6974.6 | 8791.1 | 135.006 | 23.74 | 47.63 | .79413 | 457 |
| 230.000 | 12.96875 | 1.00804 | .219424 | 2.9239 | 7330.9 | 9258.6 | 137.084 | 23.37 | 45.89 | .83419 | 452 |
| 240.000 | 12.25908 | 1.02196 | .198231 | 2.9566 | 7670.0 | 9709.3 | 139.003 | 23.06 | 44.29 | .86949 | 450 |
| 250.000 | 11.62453 | 1.03464 | .180580 | 3.0084 | 7994.3 | 10144.9 | 140.781 | 22.80 | 42.85 | .90054 | 449 |
| 260.000 | 11.05545 | 1.04605 | .165721 | 3.0722 | 8305.6 | 10567.0 | 142.437 | 22.57 | 41.59 | .92782 | 449 |
| 270.000 | 10.54288 | 1.05628 | .153077 | 3.1429 | 8606.0 | 10977.2 | 143.986 | 22.38 | 40.49 | .95178 | 450 |
| 280.000 | 10.07897 | 1.06544 | .142208 | 3.2187 | 8896.8 | 11377.2 | 145.440 | 22.21 | 39.53 | .97282 | 452 |
| 290.000 | 9.65731 | 1.07362 | .132780 | 3.2997 | 9179.5 | 11768.2 | 146.813 | 22.07 | 38.69 | .99129 | 454 |
| 300.000 | 9.27255 | 1.08089 | .124537 | 3.3854 | 9455.2 | 12151.3 | 148.111 | 21.95 | 37.94 | 1.00751 | 457 |
| 310.000 | 8.92020 | 1.08735 | .117278 | 3.4751 | 9724.6 | 12527.2 | 149.344 | 21.85 | 37.27 | 1.02177 | 460 |
| 320.000 | 8.59641 | 1.09304 | .110843 | 3.5681 | 9988.7 | 12896.9 | 150.518 | 21.76 | 36.67 | 1.03429 | 463 |
| 330.000 | 8.29787 | 1.09805 | .105104 | 3.6636 | 10248.1 | 13260.9 | 151.638 | 21.69 | 36.14 | 1.04531 | 466 |
| 340.000 | 8.02175 | 1.10244 | .099958 | 3.7612 | 10503.3 | 13619.9 | 152.710 | 21.63 | 35.66 | 1.05499 | 470 |
| 350.000 | 7.76559 | 1.10627 | .095317 | 3.8602 | 10755.0 | 13974.3 | 153.737 | 21.58 | 35.24 | 1.06350 | 474 |
| 360.000 | 7.52725 | 1.10960 | .091113 | 3.9603 | 11003.5 | 14324.8 | 154.724 | 21.54 | 34.86 | 1.07106 | 478 |
| 370.000 | 7.30488 | 1.11247 | .087287 | 4.0612 | 11249.2 | 14671.6 | 155.674 | 21.51 | 34.52 | 1.07764 | 482 |
| 380.000 | 7.09689 | 1.11494 | .083791 | 4.1626 | 11492.5 | 15015.2 | 156.591 | 21.49 | 34.21 | 1.08343 | 486 |
| 390.000 | 6.90185 | 1.11705 | .080583 | 4.2642 | 11733.7 | 15355.9 | 157.476 | 21.47 | 33.94 | 1.08851 | 490 |
| 400.000 | 6.71855 | 1.11884 | .077629 | 4.3659 | 11973.1 | 15694.1 | 158.332 | 21.47 | 33.70 | 1.09297 | 494 |
| 410.000 | 6.54590 | 1.12034 | .074899 | 4.4677 | 12210.8 | 16030.0 | 159.161 | 21.47 | 33.48 | 1.09688 | 498 |
| 420.000 | 6.38296 | 1.12159 | .072369 | 4.5693 | 12447.1 | 16363.8 | 159.966 | 21.47 | 33.29 | 1.10030 | 502 |
| 430.000 | 6.22887 | 1.12260 | .070018 | 4.6707 | 12682.2 | 16695.8 | 160.747 | 21.48 | 33.12 | 1.10329 | 506 |
| 440.000 | 6.08291 | 1.12341 | .067826 | 4.7718 | 12916.3 | 17026.2 | 161.506 | 21.50 | 32.96 | 1.10589 | 511 |
| 450.000 | 5.94439 | 1.12405 | .065777 | 4.8726 | 13149.5 | 17355.1 | 162.246 | 21.52 | 32.83 | 1.10814 | 515 |
| 470.000 | 5.68741 | 1.12484 | .062057 | 5.0732 | 13613.7 | 18009.4 | 163.668 | 21.58 | 32.61 | 1.11177 | 523 |
| 500.000 | 5.34491 | 1.12511 | .057254 | 5.3713 | 14306.5 | 18983.9 | 165.678 | 21.69 | 32.37 | 1.11543 | 534 |
| 550.000 | 4.86443 | 1.12385 | .050804 | 5.8600 | 15457.6 | 20596.9 | 168.753 | 21.94 | 32.18 | 1.11823 | 553 |
| 600.000 | 4.46911 | 1.12133 | .045734 | 6.3394 | 16610.9 | 22204.9 | 171.551 | 22.25 | 32.16 | 1.11842 | 571 |
| 650.000 | 4.13714 | 1.11813 | .041633 | 6.8106 | 17771.8 | 23814.7 | 174.128 | 22.58 | 32.25 | 1.11710 | 589 |
| 700.000 | 3.85375 | 1.11461 | .038240 | 7.2749 | 18943.6 | 25430.8 | 176.524 | 22.93 | 32.41 | 1.11482 | 605 |
| 750.000 | 3.60859 | 1.11098 | .035380 | 7.7334 | 20128.2 | 27056.1 | 178.767 | 23.29 | 32.61 | 1.11212 | 621 |
| 800.000 | 3.39411 | 1.10736 | .032934 | 8.1870 | 21326.5 | 28692.2 | 180.878 | 23.64 | 32.84 | 1.10917 | 637 |
| 850.000 | 3.20469 | 1.10382 | .030816 | 8.6365 | 22538.9 | 30339.9 | 182.876 | 23.97 | 33.07 | 1.10611 | 652 |
| 900.000 | 3.03605 | 1.10040 | .028962 | 9.0825 | 23765.3 | 31999.7 | 184.773 | 24.30 | 33.32 | 1.10304 | 666 |
| 950.000 | 2.88484 | 1.09713 | .027324 | 9.5256 | 25005.4 | 33671.4 | 186.581 | 24.61 | 33.55 | 1.10002 | 680 |
| 1000.000 | 2.74842 | 1.09401 | .025867 | 9.9661 | 26258.6 | 35354.8 | 188.308 | 24.89 | 33.78 | 1.09707 | 694 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa·L/mol | E J/mol | | H | S J mol ⁻¹ K ⁻¹ | C_V | C_p | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|--------------------------------------|------------|---------|---------|--|-------|---------|-------|----------|
| | | | | | E J/mol | H | | | | | | |
| 30.000000 MPa | | | | | | | | | | | | |
| 74.633 | 31.08276 | 1.55537 | 2.396827 | 21.3051 | 105.5 | 1070.7 | 75.777 | 36.51 | 57.34 | .00677 | 1092 | |
| 80.000 | 30.47913 | 1.47976 | 2.200381 | 19.5628 | 393.6 | 1377.9 | 79.764 | 36.11 | 57.42 | .01235 | 1053 | |
| 90.000 | 29.35310 | 1.36580 | 1.882759 | 16.6908 | 926.3 | 1948.3 | 86.484 | 34.31 | 56.49 | .03024 | 990 | |
| 100.000 | 28.22178 | 1.27850 | 1.615248 | 14.2295 | 1440.3 | 2503.3 | 92.320 | 31.16 | 54.18 | .05979 | 939 | |
| 110.000 | 27.08206 | 1.21119 | 1.387312 | 12.1213 | 1918.1 | 3025.8 | 97.309 | 26.79 | 50.61 | .10139 | 904 | |
| 120.000 | 25.93270 | 1.15946 | 1.191837 | 10.3279 | 2348.1 | 3505.0 | 101.495 | 21.67 | 46.21 | .15432 | 886 | |
| 130.000 | 24.77492 | 1.12029 | 1.023853 | 8.8196 | 2730.2 | 3941.1 | 104.962 | 19.44 | 44.61 | .21836 | 850 | |
| 140.000 | 23.61276 | 1.09147 | .879741 | 7.5692 | 3225.6 | 4496.1 | 109.061 | 35.93 | 61.60 | .28984 | 680 | |
| 150.000 | 22.45314 | 1.07131 | .756677 | 6.5492 | 3751.5 | 5087.7 | 113.143 | 31.30 | 57.31 | .36396 | 654 | |
| 160.000 | 21.30554 | 1.05846 | .652246 | 5.7317 | 4240.6 | 5648.7 | 116.766 | 28.91 | 55.07 | .43788 | 624 | |
| 170.000 | 20.18117 | 1.05170 | .564210 | 5.0886 | 4704.7 | 6191.2 | 120.054 | 27.39 | 53.50 | .50964 | 595 | |
| 180.000 | 19.09201 | 1.04993 | .490410 | 4.5936 | 5148.1 | 6719.4 | 123.074 | 26.31 | 52.17 | .57762 | 570 | |
| 190.000 | 18.04968 | 1.05211 | .428787 | 4.2230 | 5572.7 | 7234.8 | 125.860 | 25.51 | 50.90 | .64091 | 548 | |
| 200.000 | 17.06432 | 1.05722 | .377439 | 3.9561 | 5979.3 | 7737.3 | 128.438 | 24.88 | 49.61 | .69895 | 530 | |
| 210.000 | 16.14358 | 1.06430 | .334671 | 3.7744 | 6368.5 | 8226.8 | 130.827 | 24.36 | 48.27 | .75147 | 516 | |
| 220.000 | 15.29182 | 1.07251 | .299003 | 3.6612 | 6740.9 | 8702.7 | 133.041 | 23.93 | 46.91 | .79867 | 506 | |
| 230.000 | 14.50998 | 1.08116 | .269171 | 3.6016 | 7097.4 | 9164.9 | 135.096 | 23.57 | 45.55 | .84079 | 498 | |
| 240.000 | 13.79600 | 1.08973 | .244105 | 3.5828 | 7439.2 | 9613.7 | 137.007 | 23.26 | 44.23 | .87814 | 493 | |
| 250.000 | 13.14568 | 1.09790 | .222920 | 3.5942 | 7767.7 | 10049.8 | 138.787 | 22.99 | 42.99 | .91124 | 489 | |
| 260.000 | 12.55363 | 1.10546 | .204890 | 3.6273 | 8084.2 | 10473.9 | 140.451 | 22.76 | 41.85 | .94049 | 487 | |
| 270.000 | 12.01401 | 1.11233 | .189429 | 3.6757 | 8390.1 | 10887.2 | 142.010 | 22.56 | 40.82 | .96629 | 487 | |
| 280.000 | 11.52105 | 1.11850 | .176067 | 3.7347 | 8686.8 | 11290.7 | 143.478 | 22.39 | 39.90 | .98903 | 487 | |
| 290.000 | 11.06942 | 1.12399 | .164432 | 3.8008 | 8975.3 | 11685.5 | 144.864 | 22.24 | 39.08 | 1.00908 | 488 | |
| 300.000 | 10.65429 | 1.12886 | .154224 | 3.8715 | 9256.8 | 12072.5 | 146.176 | 22.11 | 38.35 | 1.02674 | 489 | |
| 310.000 | 10.27141 | 1.13317 | .145206 | 3.9456 | 9532.0 | 12452.7 | 147.422 | 22.00 | 37.70 | 1.04230 | 491 | |
| 320.000 | 9.91715 | 1.13697 | .137187 | 4.0231 | 9801.7 | 12826.8 | 148.610 | 21.90 | 37.13 | 1.05601 | 493 | |
| 330.000 | 9.58847 | 1.14031 | .130016 | 4.1040 | 10066.7 | 13195.4 | 149.744 | 21.82 | 36.61 | 1.06808 | 495 | |
| 340.000 | 9.28273 | 1.14322 | .123570 | 4.1878 | 10327.3 | 13559.1 | 150.830 | 21.76 | 36.14 | 1.07870 | 498 | |
| 350.000 | 8.99762 | 1.14575 | .117748 | 4.2744 | 10584.2 | 13918.4 | 151.872 | 21.70 | 35.72 | 1.08805 | 501 | |
| 360.000 | 8.73115 | 1.14792 | .112467 | 4.3632 | 10837.7 | 14273.7 | 152.872 | 21.65 | 35.34 | 1.09634 | 504 | |
| 370.000 | 8.48154 | 1.14976 | .107656 | 4.4539 | 11088.3 | 14625.4 | 153.836 | 21.62 | 35.00 | 1.10357 | 507 | |
| 380.000 | 8.24723 | 1.15131 | .103257 | 4.5461 | 11336.2 | 14973.8 | 154.765 | 21.59 | 34.69 | 1.10991 | 510 | |
| 390.000 | 8.02684 | 1.15259 | .099219 | 4.6397 | 11581.9 | 15319.3 | 155.662 | 21.57 | 34.41 | 1.11547 | 514 | |
| 400.000 | 7.81915 | 1.15363 | .095501 | 4.7343 | 11825.4 | 15662.2 | 156.531 | 21.56 | 34.16 | 1.12034 | 517 | |
| 410.000 | 7.62305 | 1.15444 | .092066 | 4.8296 | 12067.2 | 16002.6 | 157.371 | 21.55 | 33.93 | 1.12459 | 521 | |
| 420.000 | 7.43759 | 1.15506 | .088884 | 4.9257 | 12307.4 | 16340.9 | 158.186 | 21.55 | 33.73 | 1.12829 | 524 | |
| 430.000 | 7.26188 | 1.15549 | .085927 | 5.0221 | 12546.1 | 16677.3 | 158.978 | 21.56 | 33.55 | 1.13151 | 528 | |
| 440.000 | 7.09515 | 1.15577 | .083172 | 5.1190 | 12783.7 | 17011.9 | 159.747 | 21.57 | 33.38 | 1.13429 | 531 | |
| 450.000 | 6.93670 | 1.15590 | .080600 | 5.2160 | 13020.2 | 17345.0 | 160.496 | 21.59 | 33.24 | 1.13669 | 535 | |
| 470.000 | 6.64219 | 1.15578 | .075932 | 5.4105 | 13490.7 | 18007.2 | 161.936 | 21.64 | 32.99 | 1.14049 | 542 | |
| 500.000 | 6.24870 | 1.15485 | .069920 | 5.7022 | 14191.7 | 18992.7 | 163.968 | 21.75 | 32.72 | 1.14419 | 553 | |
| 550.000 | 5.69511 | 1.15191 | .061874 | 6.1855 | 15354.3 | 20622.0 | 167.074 | 21.99 | 32.48 | 1.14664 | 571 | |
| 600.000 | 5.23852 | 1.14796 | .055578 | 6.6636 | 16517.0 | 22243.8 | 169.896 | 22.28 | 32.42 | 1.14617 | 588 | |
| 650.000 | 4.85443 | 1.14349 | .050506 | 7.1358 | 17685.6 | 23865.5 | 172.493 | 22.61 | 32.47 | 1.14402 | 604 | |
| 700.000 | 4.52612 | 1.13883 | .046323 | 7.6023 | 18863.8 | 25492.0 | 174.904 | 22.95 | 32.60 | 1.14085 | 620 | |
| 750.000 | 4.24178 | 1.13416 | .042809 | 8.0636 | 20053.8 | 27126.3 | 177.159 | 23.31 | 32.78 | 1.13723 | 636 | |
| 800.000 | 3.99277 | 1.12959 | .039811 | 8.5204 | 21256.7 | 28770.3 | 179.281 | 23.65 | 32.99 | 1.13337 | 651 | |
| 850.000 | 3.77267 | 1.12517 | .037221 | 8.9731 | 22473.2 | 30425.1 | 181.287 | 23.99 | 33.21 | 1.12943 | 665 | |
| 900.000 | 3.57653 | 1.12094 | .034958 | 9.4224 | 23703.2 | 32091.2 | 183.191 | 24.31 | 33.43 | 1.12551 | 680 | |
| 950.000 | 3.40053 | 1.11690 | .032963 | 9.8686 | 24946.4 | 33768.6 | 185.005 | 24.61 | 33.66 | 1.12168 | 694 | |
| 1000.000 | 3.24161 | 1.11307 | .031189 | 10.3122 | 26202.5 | 35457.1 | 186.737 | 24.90 | 33.88 | 1.11797 | 707 | |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|--|-------|---------|----------|
| 35.000000 MPa | | | | | | | | | | | |
| 75.675 | 31.19694 | 1.78307 | 2.426254 | 22.2832 | 125.8 | 1247.7 | 76.000 | 36.55 | 57.09 | .00848 | 1114 |
| 80.000 | 30.72653 | 1.71249 | 2.267392 | 20.8689 | 355.0 | 1494.0 | 79.174 | 36.22 | 57.09 | .01353 | 1083 |
| 90.000 | 29.64176 | 1.57792 | 1.946688 | 17.9650 | 879.9 | 2060.6 | 85.848 | 34.45 | 56.05 | .03251 | 1021 |
| 100.000 | 28.55844 | 1.47400 | 1.677971 | 15.4883 | 1385.1 | 2610.6 | 91.632 | 31.32 | 53.61 | .06333 | 972 |
| 110.000 | 27.47457 | 1.39286 | 1.449981 | 13.3710 | 1852.9 | 3126.8 | 96.561 | 26.98 | 49.90 | .10619 | 939 |
| 120.000 | 26.38976 | 1.32928 | 1.255079 | 11.5682 | 2271.8 | 3598.1 | 100.678 | 21.88 | 45.34 | .16020 | 925 |
| 130.000 | 25.30554 | 1.27960 | 1.087872 | 10.0459 | 2641.5 | 4024.6 | 104.068 | 19.65 | 43.57 | .22513 | 891 |
| 140.000 | 24.22548 | 1.24117 | .944383 | 8.7742 | 3123.6 | 4568.4 | 108.084 | 36.15 | 60.40 | .29730 | 723 |
| 150.000 | 23.15500 | 1.21198 | .821498 | 7.7245 | 3635.6 | 5147.2 | 112.079 | 31.52 | 55.97 | .37191 | 699 |
| 160.000 | 22.10097 | 1.19042 | .716617 | 6.8689 | 4110.6 | 5694.2 | 115.611 | 29.13 | 53.62 | .44626 | 671 |
| 170.000 | 21.07105 | 1.17516 | .627429 | 6.1801 | 4560.8 | 6221.9 | 118.809 | 27.60 | 51.99 | .51852 | 644 |
| 180.000 | 20.07303 | 1.16506 | .551814 | 5.6331 | 4991.3 | 6735.0 | 121.743 | 26.52 | 50.67 | .58715 | 619 |
| 190.000 | 19.11416 | 1.15911 | .487825 | 5.2057 | 5404.5 | 7235.6 | 124.449 | 25.71 | 49.48 | .65130 | 598 |
| 200.000 | 18.20072 | 1.15641 | .433701 | 4.8787 | 5801.7 | 7724.7 | 126.958 | 25.07 | 48.35 | .71042 | 579 |
| 210.000 | 17.33758 | 1.15618 | .387890 | 4.6356 | 6183.9 | 8202.6 | 129.290 | 24.55 | 47.23 | .76420 | 564 |
| 220.000 | 16.52797 | 1.15768 | .349050 | 4.4622 | 6551.7 | 8669.3 | 131.462 | 24.12 | 46.11 | .81282 | 551 |
| 230.000 | 15.77329 | 1.16033 | .316034 | 4.3461 | 6905.9 | 9124.9 | 133.487 | 23.76 | 45.00 | .85644 | 542 |
| 240.000 | 15.07326 | 1.16363 | .287873 | 4.2762 | 7247.4 | 9569.4 | 135.379 | 23.44 | 43.91 | .89531 | 534 |
| 250.000 | 14.42611 | 1.16719 | .263753 | 4.2431 | 7577.1 | 10003.3 | 137.151 | 23.17 | 42.87 | .92991 | 529 |
| 260.000 | 13.82897 | 1.17076 | .242992 | 4.2387 | 7896.0 | 10427.0 | 138.812 | 22.94 | 41.88 | .96059 | 525 |
| 270.000 | 13.27831 | 1.17415 | .225025 | 4.2562 | 8205.2 | 10841.0 | 140.375 | 22.73 | 40.95 | .98773 | 523 |
| 280.000 | 12.77027 | 1.17726 | .209386 | 4.2904 | 8505.5 | 11246.2 | 141.849 | 22.55 | 40.10 | 1.01172 | 521 |
| 290.000 | 12.30095 | 1.18004 | .195692 | 4.3370 | 8797.9 | 11643.3 | 143.242 | 22.40 | 39.32 | 1.03289 | 521 |
| 300.000 | 11.86662 | 1.18245 | .183630 | 4.3928 | 9083.4 | 12032.9 | 144.563 | 22.26 | 38.62 | 1.05157 | 521 |
| 310.000 | 11.46379 | 1.18452 | .172942 | 4.4553 | 9362.7 | 12415.8 | 145.819 | 22.14 | 37.98 | 1.06804 | 522 |
| 320.000 | 11.08927 | 1.18626 | .163418 | 4.5225 | 9636.5 | 12792.7 | 147.015 | 22.04 | 37.41 | 1.08256 | 523 |
| 330.000 | 10.74020 | 1.18770 | .154885 | 4.5931 | 9905.4 | 13164.2 | 148.158 | 21.95 | 36.90 | 1.09534 | 524 |
| 340.000 | 10.41405 | 1.18887 | .147201 | 4.6662 | 10169.9 | 13530.8 | 149.253 | 21.88 | 36.44 | 1.10659 | 526 |
| 350.000 | 10.10859 | 1.18980 | .140248 | 4.7416 | 10430.7 | 13893.1 | 150.303 | 21.82 | 36.03 | 1.11649 | 528 |
| 360.000 | 9.82190 | 1.19051 | .133930 | 4.8196 | 10688.0 | 14251.4 | 151.312 | 21.76 | 35.65 | 1.12525 | 530 |
| 370.000 | 9.55929 | 1.19103 | .128166 | 4.8998 | 10942.2 | 14606.3 | 152.284 | 21.72 | 35.32 | 1.13288 | 533 |
| 380.000 | 9.29829 | 1.19137 | .122888 | 4.9822 | 11193.7 | 14957.9 | 153.222 | 21.69 | 35.01 | 1.13956 | 535 |
| 390.000 | 9.05857 | 1.19154 | .118040 | 5.0665 | 11442.8 | 15306.6 | 154.128 | 21.66 | 34.74 | 1.14541 | 538 |
| 400.000 | 8.83196 | 1.19156 | .113570 | 5.1525 | 11689.8 | 15652.7 | 155.004 | 21.65 | 34.48 | 1.15051 | 541 |
| 410.000 | 8.61740 | 1.19144 | .109439 | 5.2400 | 11934.8 | 15996.3 | 155.853 | 21.64 | 34.26 | 1.15494 | 544 |
| 420.000 | 8.41395 | 1.19119 | .105609 | 5.3288 | 12178.1 | 16337.9 | 156.676 | 21.63 | 34.05 | 1.15879 | 547 |
| 430.000 | 8.22076 | 1.19084 | .102049 | 5.4186 | 12419.9 | 16677.4 | 157.475 | 21.64 | 33.87 | 1.16203 | 550 |
| 440.000 | 8.03704 | 1.19037 | .098732 | 5.5094 | 12660.4 | 17015.2 | 158.252 | 21.65 | 33.70 | 1.16488 | 553 |
| 450.000 | 7.86212 | 1.18982 | .095634 | 5.6009 | 12899.7 | 17351.5 | 159.007 | 21.66 | 33.55 | 1.16731 | 556 |
| 470.000 | 7.53616 | 1.18846 | .090014 | 5.7858 | 13375.5 | 18019.8 | 160.461 | 21.70 | 33.29 | 1.17108 | 562 |
| 500.000 | 7.09909 | 1.18593 | .082778 | 6.0663 | 14083.8 | 19014.0 | 162.511 | 21.80 | 33.01 | 1.17458 | 572 |
| 550.000 | 6.48157 | 1.18083 | .073107 | 6.5373 | 15256.7 | 20656.6 | 165.642 | 22.03 | 32.73 | 1.17637 | 588 |
| 600.000 | 5.97029 | 1.17513 | .065558 | 7.0085 | 16427.8 | 22290.2 | 168.485 | 22.32 | 32.64 | 1.17503 | 604 |
| 650.000 | 5.53901 | 1.16919 | .059491 | 7.4772 | 17603.6 | 23922.4 | 171.098 | 22.64 | 32.67 | 1.17189 | 620 |
| 700.000 | 5.16962 | 1.16325 | .054500 | 7.9425 | 18787.8 | 25558.1 | 173.523 | 22.98 | 32.77 | 1.16769 | 635 |
| 750.000 | 4.84918 | 1.15745 | .050316 | 8.4040 | 19982.9 | 27200.6 | 175.789 | 23.32 | 32.93 | 1.16306 | 650 |
| 800.000 | 4.56820 | 1.15185 | .046754 | 8.8618 | 21190.2 | 28851.9 | 177.921 | 23.67 | 33.12 | 1.15820 | 665 |
| 850.000 | 4.31953 | 1.14651 | .043681 | 9.3162 | 22410.5 | 30513.3 | 179.935 | 24.00 | 33.33 | 1.15331 | 679 |
| 900.000 | 4.09772 | 1.14142 | .041001 | 9.7674 | 23643.9 | 32185.2 | 181.846 | 24.32 | 33.55 | 1.14849 | 693 |
| 950.000 | 3.89850 | 1.13661 | .038641 | 10.2157 | 24890.1 | 33868.0 | 183.666 | 24.63 | 33.76 | 1.14380 | 707 |
| 1000.000 | 3.71846 | 1.13206 | .036546 | 10.6615 | 26148.8 | 35561.3 | 185.403 | 24.91 | 33.97 | 1.13929 | 720 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 40.000000 MPa | | | | | | | | | | | |
| 76.705 | 31.30613 | 2.00341 | 2.453601 | 23.2519 | 146.8 | 1424.5 | 76.221 | 36.60 | 56.86 | .01073 | 1135 |
| 80.000 | 30.95897 | 1.94244 | 2.332176 | 22.1652 | 319.2 | 1611.2 | 78.612 | 36.33 | 56.81 | .01510 | 1112 |
| 90.000 | 29.91075 | 1.78712 | 2.008057 | 19.2221 | 837.3 | 2174.6 | 85.249 | 34.59 | 55.69 | .03560 | 1051 |
| 100.000 | 28.86900 | 1.66645 | 1.737659 | 16.7232 | 1334.9 | 2720.4 | 90.989 | 31.49 | 53.15 | .06833 | 1003 |
| 110.000 | 27.83237 | 1.57138 | 1.509038 | 14.5912 | 1794.3 | 3231.4 | 95.869 | 27.17 | 49.33 | .11323 | 972 |
| 120.000 | 26.80081 | 1.49587 | 1.314075 | 12.7747 | 2204.0 | 3696.5 | 99.932 | 22.08 | 44.66 | .16924 | 960 |
| 130.000 | 25.77580 | 1.43572 | 1.147013 | 11.2357 | 2563.8 | 4115.7 | 103.263 | 19.86 | 42.78 | .23610 | 929 |
| 140.000 | 24.76031 | 1.38784 | 1.003586 | 9.9422 | 3035.5 | 4651.0 | 107.216 | 36.37 | 59.50 | .30999 | 762 |
| 150.000 | 23.75856 | 1.34993 | .880470 | 8.8648 | 3536.7 | 5220.4 | 111.146 | 31.74 | 54.98 | .38606 | 740 |
| 160.000 | 22.77566 | 1.32018 | .774932 | 7.9755 | 4000.9 | 5757.2 | 114.612 | 29.35 | 52.57 | .46166 | 714 |
| 170.000 | 21.81712 | 1.29711 | .684615 | 7.2481 | 4440.7 | 6274.1 | 117.746 | 27.81 | 50.90 | .53505 | 688 |
| 180.000 | 20.88831 | 1.27952 | .607425 | 6.6585 | 4861.4 | 6776.4 | 120.617 | 26.73 | 49.59 | .60475 | 664 |
| 190.000 | 19.99413 | 1.26639 | .541488 | 6.1854 | 5265.8 | 7266.4 | 123.266 | 25.91 | 48.44 | .66997 | 642 |
| 200.000 | 19.13867 | 1.23685 | .485137 | 5.8104 | 5655.4 | 7745.4 | 125.723 | 25.27 | 47.39 | .73019 | 623 |
| 210.000 | 18.32514 | 1.25014 | .436913 | 5.5182 | 6031.4 | 8214.2 | 128.011 | 24.75 | 46.38 | .78511 | 607 |
| 220.000 | 17.55568 | 1.24561 | .395557 | 5.2956 | 6394.7 | 8673.1 | 130.146 | 24.31 | 45.40 | .83489 | 594 |
| 230.000 | 16.83142 | 1.24273 | .359996 | 5.1314 | 6745.8 | 9122.3 | 132.143 | 23.94 | 44.45 | .87968 | 583 |
| 240.000 | 16.15243 | 1.24101 | .329323 | 5.0159 | 7085.7 | 9562.1 | 134.015 | 23.62 | 43.51 | .91971 | 574 |
| 250.000 | 15.51789 | 1.24008 | .302769 | 4.9407 | 7415.1 | 9992.7 | 135.773 | 23.35 | 42.61 | .95543 | 567 |
| 260.000 | 14.92617 | 1.23966 | .279692 | 4.8984 | 7734.6 | 10414.5 | 137.427 | 23.11 | 41.75 | .98717 | 562 |
| 270.000 | 14.37510 | 1.23951 | .259550 | 4.8826 | 8045.2 | 10827.8 | 138.987 | 22.90 | 40.93 | 1.01529 | 558 |
| 280.000 | 13.86211 | 1.23947 | .241889 | 4.8881 | 8347.6 | 11233.2 | 140.461 | 22.71 | 40.16 | 1.04017 | 555 |
| 290.000 | 13.38446 | 1.23944 | .226329 | 4.9104 | 8642.5 | 11631.1 | 141.858 | 22.55 | 39.44 | 1.06214 | 553 |
| 300.000 | 12.93934 | 1.23934 | .212555 | 4.9458 | 8930.8 | 12022.1 | 143.184 | 22.41 | 38.78 | 1.08152 | 552 |
| 310.000 | 12.52403 | 1.23913 | .200301 | 4.9915 | 9212.9 | 12406.8 | 144.445 | 22.28 | 38.17 | 1.09860 | 552 |
| 320.000 | 12.13594 | 1.23880 | .189348 | 5.0452 | 9489.7 | 12785.7 | 145.648 | 22.18 | 37.62 | 1.11364 | 552 |
| 330.000 | 11.77265 | 1.23833 | .179512 | 5.1049 | 9761.6 | 13159.3 | 146.798 | 22.08 | 37.11 | 1.12687 | 553 |
| 340.000 | 11.43195 | 1.23773 | .170638 | 5.1693 | 10029.1 | 13528.1 | 147.899 | 22.00 | 36.66 | 1.13849 | 554 |
| 350.000 | 11.11182 | 1.23700 | .162599 | 5.2372 | 10292.8 | 13892.6 | 148.955 | 21.93 | 36.24 | 1.14869 | 555 |
| 360.000 | 10.81044 | 1.23617 | .155285 | 5.3077 | 10553.0 | 14253.1 | 149.970 | 21.88 | 35.87 | 1.15770 | 557 |
| 370.000 | 10.52617 | 1.23524 | .148605 | 5.3800 | 10810.1 | 14610.1 | 150.948 | 21.83 | 35.54 | 1.16553 | 559 |
| 380.000 | 10.25755 | 1.23423 | .142482 | 5.4542 | 11064.4 | 14963.9 | 151.892 | 21.79 | 35.23 | 1.17236 | 561 |
| 390.000 | 10.00329 | 1.23315 | .136850 | 5.5302 | 11316.2 | 15314.8 | 152.803 | 21.76 | 34.96 | 1.17830 | 563 |
| 400.000 | 9.76227 | 1.23201 | .131654 | 5.6081 | 11565.8 | 15663.2 | 153.685 | 21.74 | 34.71 | 1.18346 | 565 |
| 410.000 | 9.53346 | 1.23081 | .126847 | 5.6877 | 11813.4 | 16009.1 | 154.540 | 21.72 | 34.49 | 1.18792 | 567 |
| 420.000 | 9.31594 | 1.22955 | .122386 | 5.7689 | 12059.2 | 16352.9 | 155.368 | 21.72 | 34.28 | 1.19176 | 570 |
| 430.000 | 9.10890 | 1.22826 | .118237 | 5.8517 | 12303.5 | 16694.8 | 156.173 | 21.72 | 34.10 | 1.19497 | 572 |
| 440.000 | 8.91159 | 1.22692 | .114369 | 5.9357 | 12546.4 | 17034.9 | 156.955 | 21.72 | 33.93 | 1.19776 | 575 |
| 450.000 | 8.72333 | 1.22554 | .110754 | 6.0210 | 12788.1 | 17373.5 | 157.716 | 21.73 | 33.78 | 1.20010 | 578 |
| 470.000 | 8.37154 | 1.22270 | .104193 | 6.1945 | 13268.3 | 18046.4 | 159.179 | 21.77 | 33.52 | 1.20365 | 583 |
| 500.000 | 7.89793 | 1.21826 | .095741 | 6.4607 | 13982.7 | 19047.4 | 161.243 | 21.86 | 33.23 | 1.20670 | 592 |
| 550.000 | 7.22539 | 1.21060 | .084444 | 6.9144 | 15164.6 | 20700.6 | 164.395 | 22.07 | 32.94 | 1.20753 | 606 |
| 600.000 | 6.66589 | 1.20286 | .075631 | 7.3741 | 16343.4 | 22344.1 | 167.255 | 22.35 | 32.83 | 1.20507 | 621 |
| 650.000 | 6.19230 | 1.19525 | .068558 | 7.8356 | 17525.6 | 23985.3 | 169.882 | 22.67 | 32.84 | 1.20078 | 636 |
| 700.000 | 5.78561 | 1.18789 | .062747 | 8.2965 | 18715.4 | 25629.1 | 172.319 | 23.00 | 32.93 | 1.19542 | 651 |
| 750.000 | 5.43209 | 1.18085 | .057884 | 8.7556 | 19915.2 | 27278.9 | 174.595 | 23.35 | 33.07 | 1.18966 | 665 |
| 800.000 | 5.12159 | 1.17417 | .053749 | 9.2123 | 21126.7 | 28936.8 | 176.735 | 23.69 | 33.25 | 1.18372 | 679 |
| 850.000 | 4.84642 | 1.16784 | .050187 | 9.6666 | 22350.7 | 30604.2 | 178.757 | 24.02 | 33.45 | 1.17781 | 693 |
| 900.000 | 4.60068 | 1.16188 | .047084 | 10.1183 | 23587.2 | 32281.6 | 180.674 | 24.33 | 33.65 | 1.17202 | 706 |
| 950.000 | 4.37972 | 1.15626 | .044354 | 10.5676 | 24836.3 | 33969.3 | 182.499 | 24.64 | 33.86 | 1.16643 | 720 |
| 1000.000 | 4.17986 | 1.15097 | .041933 | 11.0145 | 26097.5 | 35667.2 | 184.241 | 24.92 | 34.06 | 1.16106 | 733 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\delta P/\delta T$ MPa/K | $\delta P/\delta \rho$ MPa·L/mol | E J/mol | H | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|---------------|-----------------|---------|------------------------------|-------------------------------------|------------|---------|--|-------|-------|---------|----------|
| 45.000000 MPa | | | | | | | | | | | |
| 77.725 | 31.41086 | 2.21685 | 2.479001 | 24.2114 | 168.2 | 1600.8 | 76.442 | 36.64 | 56.63 | .01362 | 1155 |
| 80.000 | 31.17823 | 2.16988 | 2.394882 | 23.4537 | 285.9 | 1729.2 | 78.075 | 36.44 | 56.57 | .01710 | 1140 |
| 90.000 | 30.16279 | 1.99371 | 2.067126 | 20.4651 | 797.9 | 2289.8 | 84.679 | 34.72 | 55.38 | .03953 | 1079 |
| 100.000 | 29.15760 | 1.85620 | 1.794707 | 17.9385 | 1288.9 | 2832.2 | 90.383 | 31.65 | 52.77 | .07472 | 1033 |
| 110.000 | 28.16168 | 1.74713 | 1.565045 | 15.7870 | 1741.1 | 3339.0 | 95.223 | 27.35 | 48.87 | .12235 | 1003 |
| 120.000 | 27.17513 | 1.65968 | 1.369581 | 13.9534 | 2143.1 | 3799.0 | 99.242 | 22.27 | 44.12 | .18113 | 993 |
| 130.000 | 26.19922 | 1.58908 | 1.202238 | 12.3958 | 2494.7 | 4212.3 | 102.527 | 20.07 | 42.15 | .25075 | 964 |
| 140.000 | 25.23635 | 1.53187 | 1.058508 | 11.0802 | 2957.9 | 4741.0 | 106.431 | 36.58 | 58.80 | .32720 | 797 |
| 150.000 | 24.28981 | 1.48546 | .934899 | 9.9763 | 3450.5 | 5303.2 | 110.311 | 31.95 | 54.23 | .40547 | 777 |
| 160.000 | 23.36345 | 1.44784 | .828577 | 9.0564 | 3906.2 | 5832.2 | 113.727 | 29.56 | 51.78 | .48296 | 752 |
| 170.000 | 22.46133 | 1.41740 | .737147 | 8.2949 | 4337.7 | 6341.2 | 116.812 | 28.02 | 50.09 | .55798 | 727 |
| 180.000 | 21.58733 | 1.39285 | .658532 | 7.6685 | 4750.7 | 6835.3 | 119.637 | 26.93 | 48.77 | .62910 | 704 |
| 190.000 | 20.74488 | 1.37313 | .590906 | 7.1566 | 5148.1 | 7317.3 | 122.242 | 26.11 | 47.65 | .69561 | 682 |
| 200.000 | 19.93679 | 1.35735 | .532669 | 6.7415 | 5531.5 | 7788.6 | 124.660 | 25.46 | 46.64 | .75701 | 663 |
| 210.000 | 19.16520 | 1.34476 | .482426 | 6.4084 | 5902.3 | 8250.3 | 126.913 | 24.94 | 45.70 | .81302 | 647 |
| 220.000 | 18.43153 | 1.33473 | .438978 | 6.1446 | 6261.3 | 8702.8 | 129.018 | 24.50 | 44.81 | .86384 | 633 |
| 230.000 | 17.73651 | 1.32672 | .401301 | 5.9397 | 6609.4 | 9146.5 | 130.991 | 24.12 | 43.95 | .90960 | 621 |
| 240.000 | 17.08020 | 1.32030 | .368526 | 5.7846 | 6947.2 | 9581.8 | 132.844 | 23.80 | 43.12 | .95054 | 611 |
| 250.000 | 16.46208 | 1.31508 | .339920 | 5.6716 | 7275.4 | 10009.0 | 134.588 | 23.52 | 42.32 | .98710 | 603 |
| 260.000 | 15.88111 | 1.31076 | .314865 | 5.5940 | 7594.7 | 10428.2 | 136.232 | 23.28 | 41.55 | 1.01961 | 597 |
| 270.000 | 15.33580 | 1.30709 | .292837 | 5.5458 | 7905.7 | 10840.0 | 137.786 | 23.06 | 40.81 | 1.04842 | 591 |
| 280.000 | 14.82440 | 1.30389 | .273396 | 5.5221 | 8209.1 | 11244.6 | 139.258 | 22.87 | 40.12 | 1.07391 | 588 |
| 290.000 | 14.34493 | 1.30101 | .256169 | 5.5184 | 8505.4 | 11642.4 | 140.654 | 22.70 | 39.46 | 1.09641 | 585 |
| 300.000 | 13.89528 | 1.29834 | .240841 | 5.5311 | 8795.4 | 12033.9 | 141.981 | 22.55 | 38.85 | 1.11624 | 583 |
| 310.000 | 13.47336 | 1.29580 | .227147 | 5.5571 | 9079.6 | 12419.5 | 143.245 | 22.42 | 38.28 | 1.13369 | 581 |
| 320.000 | 13.07710 | 1.29335 | .214863 | 5.5938 | 9358.5 | 12799.7 | 144.452 | 22.31 | 37.75 | 1.14902 | 581 |
| 330.000 | 12.70450 | 1.29094 | .203799 | 5.6392 | 9632.7 | 13174.7 | 145.606 | 22.21 | 37.27 | 1.16248 | 581 |
| 340.000 | 12.35370 | 1.28855 | .193793 | 5.6914 | 9902.5 | 13545.1 | 146.712 | 22.12 | 36.82 | 1.17427 | 581 |
| 350.000 | 12.02295 | 1.28617 | .184711 | 5.7492 | 10168.5 | 13911.3 | 147.774 | 22.05 | 36.42 | 1.18458 | 582 |
| 360.000 | 11.71062 | 1.28379 | .176436 | 5.8113 | 10431.0 | 14273.6 | 148.794 | 21.99 | 36.05 | 1.19365 | 583 |
| 370.000 | 11.41526 | 1.28141 | .168870 | 5.8768 | 10690.3 | 14632.4 | 149.777 | 21.93 | 35.71 | 1.20148 | 584 |
| 380.000 | 11.13549 | 1.27904 | .161928 | 5.9450 | 10946.8 | 14987.9 | 150.725 | 21.89 | 35.41 | 1.20828 | 585 |
| 390.000 | 10.87011 | 1.27667 | .155539 | 6.0153 | 11200.8 | 15340.6 | 151.641 | 21.85 | 35.13 | 1.21417 | 587 |
| 400.000 | 10.61800 | 1.27431 | .149640 | 6.0872 | 11452.5 | 15690.6 | 152.527 | 21.83 | 34.88 | 1.21924 | 589 |
| 410.000 | 10.37814 | 1.27196 | .144178 | 6.1605 | 11702.2 | 16038.3 | 153.385 | 21.81 | 34.66 | 1.22358 | 591 |
| 420.000 | 10.14964 | 1.26963 | .139106 | 6.2353 | 11950.1 | 16383.8 | 154.218 | 21.80 | 34.45 | 1.22728 | 593 |
| 430.000 | 9.93169 | 1.26732 | .134386 | 6.3115 | 12196.4 | 16727.4 | 155.027 | 21.79 | 34.27 | 1.23032 | 595 |
| 440.000 | 9.72357 | 1.26502 | .129982 | 6.3892 | 12441.3 | 17069.2 | 155.813 | 21.80 | 34.10 | 1.23293 | 597 |
| 450.000 | 9.52461 | 1.26275 | .125864 | 6.4683 | 12684.8 | 17409.4 | 156.577 | 21.80 | 33.95 | 1.23508 | 599 |
| 470.000 | 9.15182 | 1.25826 | .118383 | 6.6302 | 13168.8 | 18085.8 | 158.048 | 21.83 | 33.69 | 1.23821 | 604 |
| 500.000 | 8.64792 | 1.25168 | .108736 | 6.8811 | 13888.4 | 19092.0 | 160.123 | 21.91 | 33.40 | 1.24054 | 611 |
| 550.000 | 7.92856 | 1.24114 | .095831 | 7.3144 | 15078.1 | 20753.8 | 163.291 | 22.12 | 33.10 | 1.24007 | 625 |
| 600.000 | 7.32695 | 1.23112 | .085760 | 7.7594 | 16263.7 | 22405.4 | 166.165 | 22.39 | 32.98 | 1.23627 | 638 |
| 650.000 | 6.81572 | 1.22166 | .077679 | 8.2106 | 17451.7 | 24054.1 | 168.805 | 22.70 | 32.98 | 1.23063 | 652 |
| 700.000 | 6.37538 | 1.21275 | .071045 | 8.6643 | 18646.5 | 25704.9 | 171.252 | 23.03 | 33.06 | 1.22397 | 666 |
| 750.000 | 5.99170 | 1.20438 | .065497 | 9.1187 | 19850.7 | 27361.1 | 173.537 | 23.37 | 33.20 | 1.21697 | 680 |
| 800.000 | 5.65405 | 1.19654 | .060784 | 9.5724 | 21066.1 | 29025.0 | 175.685 | 23.70 | 33.36 | 1.20987 | 693 |
| 850.000 | 5.35435 | 1.18919 | .056728 | 10.0248 | 22293.4 | 30697.8 | 177.713 | 24.03 | 33.55 | 1.20286 | 706 |
| 900.000 | 5.08633 | 1.18230 | .053198 | 10.4756 | 23532.9 | 32380.2 | 179.636 | 24.35 | 33.75 | 1.19605 | 719 |
| 950.000 | 4.84506 | 1.17585 | .050095 | 10.9247 | 24784.7 | 34072.5 | 181.466 | 24.65 | 33.95 | 1.18949 | 732 |
| 1000.000 | 4.62661 | 1.16981 | .047345 | 11.3719 | 26048.3 | 35774.6 | 183.212 | 24.93 | 34.14 | 1.18323 | 745 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|------------|--|--|--|---------|----------|
| 50.000000 MPa | | | | | | | | | | | |
| 78.734 | 31.51159 | 2.42383 | 2.502577 | 25.1619 | 190.0 | 1776.7 | 76.661 | 36.67 | 56.41 | .01733 | 1175 |
| 80.000 | 31.38579 | 2.39503 | 2.455630 | 24.7359 | 254.8 | 1847.9 | 77.561 | 36.56 | 56.35 | .01957 | 1166 |
| 90.000 | 30.40003 | 2.19795 | 2.124095 | 21.6963 | 761.4 | 2406.1 | 84.137 | 34.86 | 55.12 | .04436 | 1106 |
| 100.000 | 29.42739 | 2.04354 | 1.849418 | 19.1372 | 1246.5 | 2945.6 | 89.810 | 31.81 | 52.45 | .08258 | 1061 |
| 110.000 | 28.46713 | 1.92043 | 1.618421 | 16.9626 | 1692.5 | 3448.9 | 94.617 | 27.52 | 48.48 | .13356 | 1032 |
| 120.000 | 27.51936 | 1.82102 | 1.422144 | 15.1090 | 2087.8 | 3904.7 | 98.600 | 22.46 | 43.67 | .19580 | 1024 |
| 130.000 | 26.58511 | 1.74001 | 1.254221 | 13.5312 | 2432.6 | 4313.3 | 101.846 | 20.27 | 41.65 | .26890 | 996 |
| 140.000 | 25.66629 | 1.67357 | 1.109939 | 12.1930 | 2888.7 | 4836.8 | 105.712 | 36.78 | 58.25 | .34861 | 830 |
| 150.000 | 24.76543 | 1.61881 | .985664 | 11.0636 | 3374.2 | 5393.1 | 109.552 | 32.16 | 53.64 | .42972 | 811 |
| 160.000 | 23.88549 | 1.57355 | .878477 | 10.1152 | 3822.8 | 5916.2 | 112.929 | 29.76 | 51.16 | .50961 | 787 |
| 170.000 | 23.02950 | 1.53603 | .785951 | 9.3227 | 4247.7 | 6418.8 | 115.976 | 28.22 | 49.46 | .58667 | 763 |
| 180.000 | 22.20030 | 1.50488 | .706015 | 8.6635 | 4654.4 | 6906.6 | 118.764 | 27.13 | 48.14 | .65951 | 740 |
| 190.000 | 21.40037 | 1.47897 | .636880 | 8.1175 | 5046.0 | 7382.4 | 121.337 | 26.31 | 47.04 | .72749 | 719 |
| 200.000 | 20.63171 | 1.45737 | .576988 | 7.6675 | 5424.3 | 7847.8 | 123.723 | 25.66 | 46.06 | .79014 | 701 |
| 210.000 | 19.89575 | 1.43931 | .524995 | 7.2991 | 5790.7 | 8303.8 | 125.949 | 25.13 | 45.16 | .84724 | 684 |
| 220.000 | 19.19341 | 1.42416 | .479745 | 7.0000 | 6146.1 | 8751.1 | 128.030 | 24.68 | 44.32 | .89900 | 669 |
| 230.000 | 18.52511 | 1.41138 | .440248 | 6.7600 | 6491.2 | 9190.2 | 129.982 | 24.30 | 43.52 | .94559 | 657 |
| 240.000 | 17.89082 | 1.40053 | .405667 | 6.5705 | 6826.9 | 9621.6 | 131.818 | 23.98 | 42.76 | .98726 | 646 |
| 250.000 | 17.29008 | 1.39122 | .375292 | 6.4241 | 7153.6 | 10045.5 | 133.549 | 23.69 | 42.03 | 1.02445 | 637 |
| 260.000 | 16.72211 | 1.38315 | .348520 | 6.3145 | 7472.1 | 10462.2 | 135.183 | 23.44 | 41.33 | 1.05750 | 630 |
| 270.000 | 16.18580 | 1.37606 | .324843 | 6.2362 | 7782.9 | 10872.1 | 136.730 | 23.22 | 40.66 | 1.08677 | 624 |
| 280.000 | 15.67984 | 1.36973 | .303830 | 6.1845 | 8086.6 | 11275.4 | 138.197 | 23.02 | 40.02 | 1.11264 | 619 |
| 290.000 | 15.20273 | 1.36400 | .285115 | 6.1551 | 8383.7 | 11672.6 | 139.591 | 22.85 | 39.42 | 1.13544 | 615 |
| 300.000 | 14.75287 | 1.35874 | .268386 | 6.1446 | 8674.8 | 12064.0 | 140.918 | 22.70 | 38.85 | 1.15549 | 612 |
| 310.000 | 14.32860 | 1.35384 | .253379 | 6.1497 | 8960.3 | 12449.8 | 142.183 | 22.56 | 38.32 | 1.17310 | 610 |
| 320.000 | 13.92828 | 1.34923 | .239868 | 6.1679 | 9240.7 | 12830.5 | 143.392 | 22.44 | 37.83 | 1.18853 | 609 |
| 330.000 | 13.55028 | 1.34484 | .227661 | 6.1969 | 9516.5 | 13206.4 | 144.548 | 22.33 | 37.37 | 1.20202 | 608 |
| 340.000 | 13.19302 | 1.34064 | .216593 | 6.2348 | 9788.1 | 13577.9 | 145.657 | 22.24 | 36.94 | 1.21379 | 608 |
| 350.000 | 12.85501 | 1.33657 | .206523 | 6.2801 | 10055.8 | 13945.4 | 146.722 | 22.16 | 36.55 | 1.22403 | 608 |
| 360.000 | 12.53486 | 1.33264 | .197331 | 6.3315 | 10320.1 | 14309.0 | 147.746 | 22.09 | 36.19 | 1.23300 | 608 |
| 370.000 | 12.23126 | 1.32880 | .188913 | 6.3877 | 10581.3 | 14669.2 | 148.733 | 22.04 | 35.85 | 1.24069 | 609 |
| 380.000 | 11.94299 | 1.32507 | .181181 | 6.4481 | 10839.6 | 15026.2 | 149.685 | 21.99 | 35.55 | 1.24731 | 610 |
| 390.000 | 11.66893 | 1.32141 | .174056 | 6.5117 | 11095.4 | 15380.3 | 150.605 | 21.95 | 35.28 | 1.25299 | 611 |
| 400.000 | 11.40806 | 1.31784 | .167473 | 6.5779 | 11348.9 | 15731.8 | 151.495 | 21.92 | 35.02 | 1.25783 | 612 |
| 410.000 | 11.15943 | 1.31434 | .161374 | 6.6464 | 11600.3 | 16080.8 | 152.357 | 21.90 | 34.80 | 1.26192 | 614 |
| 420.000 | 10.92219 | 1.31092 | .155708 | 6.7166 | 11849.9 | 16427.8 | 153.193 | 21.88 | 34.59 | 1.26536 | 615 |
| 430.000 | 10.69553 | 1.30756 | .150432 | 6.7881 | 12097.9 | 16772.7 | 154.005 | 21.87 | 34.40 | 1.26812 | 617 |
| 440.000 | 10.47873 | 1.30429 | .145507 | 6.8608 | 12344.3 | 17115.9 | 154.794 | 21.87 | 34.24 | 1.27044 | 619 |
| 450.000 | 10.27115 | 1.30108 | .140900 | 6.9347 | 12589.5 | 17457.5 | 155.562 | 21.88 | 34.09 | 1.27229 | 621 |
| 470.000 | 9.88129 | 1.29486 | .132524 | 7.0862 | 13076.5 | 18136.6 | 157.038 | 21.90 | 33.83 | 1.27479 | 625 |
| 500.000 | 9.35236 | 1.28600 | .121712 | 7.3221 | 13800.6 | 19146.8 | 159.122 | 21.97 | 33.54 | 1.27616 | 631 |
| 550.000 | 8.59338 | 1.27235 | .107226 | 7.7340 | 14996.9 | 20815.4 | 162.302 | 22.17 | 33.24 | 1.27406 | 643 |
| 600.000 | 7.95526 | 1.25988 | .095912 | 8.1625 | 16188.4 | 22473.6 | 165.188 | 22.43 | 33.11 | 1.26865 | 655 |
| 650.000 | 7.41074 | 1.24841 | .086829 | 8.6011 | 17381.6 | 24128.6 | 167.837 | 22.73 | 33.10 | 1.26148 | 668 |
| 700.000 | 6.94019 | 1.23784 | .079373 | 9.0456 | 18581.0 | 25785.4 | 170.293 | 23.06 | 33.18 | 1.25337 | 681 |
| 750.000 | 6.52911 | 1.22806 | .073140 | 9.4932 | 19789.3 | 27447.3 | 172.586 | 23.39 | 33.30 | 1.24501 | 694 |
| 800.000 | 6.16659 | 1.21899 | .067848 | 9.9421 | 21008.2 | 29116.4 | 174.741 | 23.72 | 33.46 | 1.23665 | 707 |
| 850.000 | 5.84424 | 1.21056 | .063295 | 10.3912 | 22238.6 | 30794.1 | 176.775 | 24.05 | 33.64 | 1.22847 | 720 |
| 900.000 | 5.55554 | 1.20272 | .059335 | 10.8398 | 23481.0 | 32481.0 | 178.703 | 24.36 | 33.83 | 1.22057 | 733 |
| 950.000 | 5.29533 | 1.19541 | .055857 | 11.2875 | 24735.2 | 34177.5 | 180.538 | 24.66 | 34.03 | 1.21300 | 745 |
| 1000.000 | 5.05945 | 1.18859 | .052776 | 11.7339 | 26001.1 | 35883.6 | 182.288 | 24.94 | 34.22 | 1.20580 | 758 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa·L/mol | E J/mol | H | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|---|------------|---------|--|--|-------|---------|----------|
| 60.000000 MPa | | | | | | | | | | | |
| 80.722 | 31.70251 | 2.81987 | 2.544720 | 27.0372 | 234.7 | 2127.3 | 77.094 | 36.73 | 55.97 | .02799 | 1212 |
| 90.000 | 30.83681 | 2.60018 | 2.232359 | 24.1308 | 695.6 | 2641.4 | 83.123 | 35.15 | 54.69 | .05719 | 1157 |
| 100.000 | 29.92007 | 2.41186 | 1.952727 | 21.4948 | 1170.9 | 3176.2 | 88.747 | 32.12 | 51.94 | .10320 | 1113 |
| 110.000 | 29.01980 | 2.26062 | 1.718491 | 19.2640 | 1606.4 | 3674.0 | 93.501 | 27.87 | 47.89 | .16281 | 1087 |
| 120.000 | 28.13603 | 2.13733 | 1.519975 | 17.3639 | 1991.0 | 4123.5 | 97.429 | 22.83 | 42.99 | .23389 | 1080 |
| 130.000 | 27.26936 | 2.03562 | 1.350318 | 15.7418 | 2324.7 | 4524.9 | 100.618 | 20.65 | 40.89 | .31593 | 1055 |
| 140.000 | 26.42089 | 1.95092 | 1.204460 | 14.3577 | 2769.5 | 5040.5 | 104.425 | 37.17 | 57.43 | .40400 | 889 |
| 150.000 | 25.59212 | 1.87983 | 1.078533 | 13.1791 | 3244.0 | 5588.4 | 108.207 | 32.56 | 52.77 | .49233 | 873 |
| 160.000 | 24.78475 | 1.81975 | .969482 | 12.1780 | 3681.8 | 6102.6 | 111.527 | 30.16 | 50.26 | .57830 | 851 |
| 170.000 | 24.00049 | 1.76867 | .874817 | 11.3297 | 4096.3 | 6596.3 | 114.519 | 28.62 | 48.55 | .66041 | 828 |
| 180.000 | 23.24095 | 1.72500 | .792466 | 10.6125 | 4493.3 | 7075.0 | 117.256 | 27.52 | 47.24 | .73739 | 806 |
| 190.000 | 22.50743 | 1.68747 | .720673 | 10.0074 | 4876.0 | 7541.8 | 119.780 | 26.69 | 46.15 | .80872 | 786 |
| 200.000 | 21.80094 | 1.65505 | .657940 | 9.4978 | 5246.3 | 7998.5 | 122.122 | 26.03 | 45.21 | .87406 | 767 |
| 210.000 | 21.12214 | 1.62689 | .602985 | 9.0698 | 5605.7 | 8446.3 | 124.307 | 25.49 | 44.36 | .93331 | 750 |
| 220.000 | 20.47134 | 1.60231 | .554710 | 8.7115 | 5955.0 | 8885.9 | 126.352 | 25.04 | 43.58 | .98676 | 735 |
| 230.000 | 19.84859 | 1.58073 | .512176 | 8.4130 | 6295.2 | 9318.1 | 128.273 | 24.65 | 42.85 | 1.03467 | 722 |
| 240.000 | 19.25364 | 1.56168 | .474585 | 8.1659 | 6626.8 | 9743.1 | 130.083 | 24.31 | 42.17 | 1.07733 | 711 |
| 250.000 | 18.68604 | 1.54475 | .441258 | 7.9632 | 6950.6 | 10161.6 | 131.791 | 24.02 | 41.52 | 1.11526 | 701 |
| 260.000 | 18.14516 | 1.52961 | .411615 | 7.7991 | 7267.1 | 10573.7 | 133.408 | 23.76 | 40.91 | 1.14882 | 692 |
| 270.000 | 17.63021 | 1.51598 | .385166 | 7.6683 | 7576.7 | 10979.9 | 134.941 | 23.53 | 40.33 | 1.17841 | 685 |
| 280.000 | 17.14028 | 1.50362 | .361492 | 7.5666 | 7879.9 | 11380.4 | 136.397 | 23.32 | 39.78 | 1.20442 | 678 |
| 290.000 | 16.67437 | 1.49234 | .340236 | 7.4900 | 8177.2 | 11775.6 | 137.784 | 23.14 | 39.26 | 1.22722 | 673 |
| 300.000 | 16.23140 | 1.48196 | .321091 | 7.4352 | 8469.1 | 12165.6 | 139.106 | 22.97 | 38.76 | 1.24713 | 669 |
| 310.000 | 15.81029 | 1.47236 | .303796 | 7.3993 | 8755.9 | 12550.9 | 140.369 | 22.82 | 38.29 | 1.26448 | 665 |
| 320.000 | 15.40988 | 1.46341 | .288125 | 7.3798 | 9038.0 | 12931.6 | 141.578 | 22.69 | 37.85 | 1.27955 | 662 |
| 330.000 | 15.02906 | 1.45502 | .273882 | 7.3743 | 9315.8 | 13308.0 | 142.736 | 22.58 | 37.44 | 1.29258 | 660 |
| 340.000 | 14.66671 | 1.44712 | .260902 | 7.3809 | 9589.6 | 13680.5 | 143.848 | 22.48 | 37.05 | 1.30381 | 659 |
| 350.000 | 14.32174 | 1.43963 | .249037 | 7.3979 | 9859.7 | 14049.2 | 144.917 | 22.39 | 36.69 | 1.31345 | 657 |
| 360.000 | 13.99311 | 1.43251 | .238163 | 7.4238 | 10126.6 | 14414.4 | 145.945 | 22.31 | 36.36 | 1.32175 | 657 |
| 370.000 | 13.67980 | 1.42372 | .228169 | 7.4574 | 10390.4 | 14776.4 | 146.937 | 22.24 | 36.05 | 1.32872 | 656 |
| 380.000 | 13.38087 | 1.41921 | .218960 | 7.4974 | 10651.4 | 15135.4 | 147.894 | 22.19 | 35.76 | 1.33458 | 656 |
| 390.000 | 13.09542 | 1.41296 | .210452 | 7.5431 | 10909.9 | 15491.6 | 148.820 | 22.14 | 35.49 | 1.33946 | 657 |
| 400.000 | 12.82260 | 1.40695 | .202574 | 7.5935 | 11166.1 | 15845.3 | 149.715 | 22.10 | 35.25 | 1.34347 | 657 |
| 410.000 | 12.56161 | 1.40115 | .195260 | 7.6479 | 11420.2 | 16196.6 | 150.582 | 22.07 | 35.02 | 1.34672 | 658 |
| 420.000 | 12.31173 | 1.39555 | .188456 | 7.7058 | 11672.4 | 16545.8 | 151.424 | 22.05 | 34.82 | 1.34928 | 659 |
| 430.000 | 12.07227 | 1.39014 | .182110 | 7.7666 | 11923.0 | 16893.0 | 152.241 | 22.03 | 34.63 | 1.35116 | 660 |
| 440.000 | 11.84257 | 1.38489 | .176181 | 7.8299 | 12172.0 | 17238.5 | 153.036 | 22.02 | 34.46 | 1.35259 | 661 |
| 450.000 | 11.62205 | 1.37981 | .170630 | 7.8954 | 12419.7 | 17582.3 | 153.809 | 22.02 | 34.31 | 1.35345 | 662 |
| 470.000 | 11.20639 | 1.37010 | .160526 | 8.0314 | 12911.6 | 18265.7 | 155.295 | 22.03 | 34.04 | 1.35416 | 665 |
| 500.000 | 10.63921 | 1.35655 | .147462 | 8.2446 | 13642.6 | 19282.1 | 157.391 | 22.09 | 33.74 | 1.35287 | 670 |
| 550.000 | 9.81829 | 1.33634 | .129918 | 8.6180 | 14849.6 | 20960.7 | 160.591 | 22.26 | 33.44 | 1.34651 | 679 |
| 600.000 | 9.12130 | 1.31858 | .116179 | 9.0121 | 16050.8 | 22628.8 | 163.494 | 22.51 | 33.31 | 1.33714 | 690 |
| 650.000 | 8.52167 | 1.30280 | .105131 | 9.4225 | 17252.7 | 24293.5 | 166.159 | 22.80 | 33.30 | 1.32631 | 700 |
| 700.000 | 8.00001 | 1.28863 | .096054 | 9.8444 | 18459.8 | 25959.8 | 168.629 | 23.11 | 33.36 | 1.31483 | 712 |
| 750.000 | 7.54175 | 1.27580 | .088462 | 10.2744 | 19675.0 | 27630.8 | 170.934 | 23.44 | 33.48 | 1.30339 | 723 |
| 800.000 | 7.13576 | 1.26411 | .082017 | 10.7096 | 20900.2 | 29308.5 | 173.100 | 23.77 | 33.63 | 1.29221 | 735 |
| 850.000 | 6.77338 | 1.25340 | .076473 | 11.1483 | 22136.2 | 30994.4 | 175.144 | 24.09 | 33.80 | 1.28143 | 747 |
| 900.000 | 6.44777 | 1.24355 | .071653 | 11.5890 | 23383.6 | 32689.2 | 177.081 | 24.39 | 33.99 | 1.27115 | 759 |
| 950.000 | 6.15346 | 1.23445 | .067422 | 12.0308 | 24642.4 | 34393.0 | 178.923 | 24.69 | 34.17 | 1.26139 | 770 |
| 1000.000 | 5.88603 | 1.22601 | .063677 | 12.4731 | 25912.4 | 36106.1 | 180.681 | 24.97 | 34.35 | 1.25216 | 782 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V J mol ⁻¹ K ⁻¹ | C_P J mol ⁻¹ K ⁻¹ | f/P | W m/s |
|-------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|--|--|---------|----------|
| 7000000 MPa | | | | | | | | | | | |
| 82.672 | 31.88143 | 3.19421 | 2.580872 | 28.8794 | 280.6 | 2476.2 | 77.517 | 36.76 | 55.52 | .04484 | 1247 |
| 90.000 | 31.23181 | 2.99518 | 2.333833 | 26.5367 | 638.0 | 2879.3 | 82.186 | 35.44 | 54.37 | .07540 | 1205 |
| 100.000 | 30.36184 | 2.77290 | 2.048978 | 23.8108 | 1105.2 | 3410.7 | 87.774 | 32.44 | 51.56 | .13183 | 1162 |
| 110.000 | 29.51067 | 2.59352 | 1.811079 | 21.5136 | 1532.4 | 3904.4 | 92.490 | 28.20 | 47.46 | .20276 | 1136 |
| 120.000 | 28.67821 | 2.44641 | 1.609850 | 19.5594 | 1908.5 | 4349.3 | 96.378 | 23.18 | 42.51 | .28328 | 1131 |
| 130.000 | 27.86470 | 2.32415 | 1.438011 | 17.8888 | 2233.6 | 4745.7 | 99.526 | 21.01 | 40.36 | .37877 | 1107 |
| 140.000 | 27.07072 | 2.22144 | 1.290218 | 16.4577 | 2669.9 | 5255.7 | 103.292 | 37.54 | 56.86 | .47742 | 943 |
| 150.000 | 26.29708 | 2.13434 | 1.162412 | 15.2314 | 3135.9 | 5797.8 | 107.034 | 32.93 | 52.17 | .57477 | 928 |
| 160.000 | 25.54470 | 2.05988 | 1.051420 | 14.1812 | 3565.7 | 6306.0 | 110.315 | 30.54 | 49.65 | .66819 | 907 |
| 170.000 | 24.81454 | 1.99575 | .954695 | 13.2825 | 3972.6 | 6793.5 | 113.270 | 28.99 | 47.94 | .75634 | 885 |
| 180.000 | 24.10744 | 1.94016 | .870145 | 12.5141 | 4362.4 | 7266.1 | 115.972 | 27.89 | 46.63 | .83807 | 864 |
| 190.000 | 23.42407 | 1.89167 | .796028 | 11.8575 | 4738.5 | 7726.9 | 118.463 | 27.05 | 45.56 | .91308 | 844 |
| 200.000 | 22.76490 | 1.84912 | .730875 | 11.2968 | 5102.8 | 8177.7 | 120.775 | 26.39 | 44.64 | .98119 | 825 |
| 210.000 | 22.13016 | 1.81158 | .673437 | 10.8183 | 5456.8 | 8619.9 | 122.933 | 25.84 | 43.82 | 1.04242 | 809 |
| 220.000 | 21.51988 | 1.77828 | .626253 | 10.4104 | 5801.5 | 9054.3 | 124.954 | 25.38 | 43.07 | 1.09723 | 794 |
| 230.000 | 20.93386 | 1.74858 | .577615 | 10.0633 | 6137.7 | 9481.5 | 126.853 | 24.98 | 42.38 | 1.14597 | 780 |
| 240.000 | 20.37177 | 1.72196 | .537550 | 9.7687 | 6466.0 | 9902.1 | 128.643 | 24.64 | 41.74 | 1.18904 | 768 |
| 250.000 | 19.83312 | 1.69797 | .501799 | 9.5197 | 6787.0 | 10316.5 | 130.335 | 24.33 | 41.14 | 1.22704 | 758 |
| 260.000 | 19.31732 | 1.67626 | .469799 | 9.3104 | 7101.4 | 10725.1 | 131.937 | 24.06 | 40.58 | 1.26039 | 748 |
| 270.000 | 18.82369 | 1.65651 | .441068 | 9.1358 | 7409.5 | 11128.2 | 133.459 | 23.82 | 40.05 | 1.28955 | 740 |
| 280.000 | 18.35148 | 1.63845 | .415196 | 8.9916 | 7711.7 | 11526.1 | 134.906 | 23.60 | 39.54 | 1.31493 | 733 |
| 290.000 | 17.89990 | 1.62186 | .391829 | 8.8742 | 8008.5 | 11919.1 | 136.285 | 23.41 | 39.07 | 1.33695 | 727 |
| 300.000 | 17.46813 | 1.60655 | .370664 | 8.7804 | 8300.3 | 12307.6 | 137.602 | 23.24 | 38.62 | 1.35597 | 721 |
| 310.000 | 17.05532 | 1.59236 | .351441 | 8.7073 | 8587.3 | 12691.6 | 138.861 | 23.08 | 38.20 | 1.37233 | 717 |
| 320.000 | 16.66061 | 1.57914 | .333933 | 8.6525 | 8870.1 | 13071.6 | 140.067 | 22.94 | 37.80 | 1.38632 | 713 |
| 330.000 | 16.28316 | 1.56678 | .317946 | 8.6139 | 9148.8 | 13447.7 | 141.225 | 22.82 | 37.42 | 1.39822 | 710 |
| 340.000 | 15.92211 | 1.55519 | .303310 | 8.5894 | 9423.7 | 13820.1 | 142.336 | 22.71 | 37.07 | 1.40826 | 707 |
| 350.000 | 15.57664 | 1.54426 | .289877 | 8.5774 | 9695.2 | 14189.1 | 143.406 | 22.61 | 36.74 | 1.41667 | 705 |
| 360.000 | 15.24594 | 1.53393 | .277517 | 8.5764 | 9963.6 | 14555.0 | 144.436 | 22.52 | 36.43 | 1.42372 | 703 |
| 370.000 | 14.92923 | 1.52413 | .266119 | 8.5851 | 10229.0 | 14917.8 | 145.430 | 22.45 | 36.14 | 1.42940 | 702 |
| 380.000 | 14.62574 | 1.51482 | .255583 | 8.6023 | 10491.7 | 15277.8 | 146.390 | 22.38 | 35.87 | 1.43397 | 701 |
| 390.000 | 14.33477 | 1.50594 | .245823 | 8.6269 | 10752.0 | 15635.3 | 147.319 | 22.33 | 35.62 | 1.43754 | 700 |
| 400.000 | 14.05562 | 1.49745 | .236760 | 8.6580 | 11010.1 | 15990.3 | 148.217 | 22.28 | 35.39 | 1.44025 | 700 |
| 410.000 | 13.78764 | 1.48932 | .228328 | 8.6949 | 11266.1 | 16343.1 | 149.089 | 22.24 | 35.17 | 1.44218 | 700 |
| 420.000 | 13.53021 | 1.48152 | .220468 | 8.7368 | 11520.2 | 16693.8 | 149.934 | 22.21 | 34.98 | 1.44345 | 700 |
| 430.000 | 13.28276 | 1.47403 | .213125 | 8.7830 | 11772.6 | 17042.6 | 150.755 | 22.19 | 34.79 | 1.44402 | 701 |
| 440.000 | 13.04473 | 1.46681 | .206252 | 8.8332 | 12023.6 | 17389.7 | 151.553 | 22.18 | 34.63 | 1.44417 | 701 |
| 450.000 | 12.81560 | 1.45986 | .199808 | 8.8867 | 12273.1 | 17735.2 | 152.330 | 22.17 | 34.48 | 1.44376 | 702 |
| 470.000 | 12.38215 | 1.44667 | .188061 | 9.0022 | 12768.7 | 18422.0 | 153.823 | 22.17 | 34.21 | 1.44199 | 704 |
| 500.000 | 11.78757 | 1.42846 | .172839 | 9.1919 | 13505.1 | 19443.5 | 155.930 | 22.21 | 33.90 | 1.43710 | 707 |
| 550.000 | 10.92108 | 1.40163 | .152357 | 9.5366 | 14720.3 | 21129.9 | 159.145 | 22.36 | 33.59 | 1.42520 | 715 |
| 600.000 | 10.17976 | 1.37839 | .136285 | 9.9023 | 15928.9 | 22805.2 | 162.060 | 22.59 | 33.45 | 1.41084 | 723 |
| 650.000 | 9.53745 | 1.35805 | .123337 | 10.2851 | 17137.5 | 24477.0 | 164.736 | 22.87 | 33.44 | 1.39553 | 732 |
| 700.000 | 8.97513 | 1.34006 | .112683 | 10.6828 | 18350.9 | 26150.2 | 167.216 | 23.17 | 33.50 | 1.38005 | 742 |
| 750.000 | 8.47848 | 1.32398 | .103762 | 11.0922 | 19571.8 | 27828.0 | 169.531 | 23.49 | 33.62 | 1.36502 | 752 |
| 800.000 | 8.03644 | 1.30951 | .096181 | 11.5104 | 20802.1 | 29512.4 | 171.705 | 23.81 | 33.76 | 1.35059 | 763 |
| 850.000 | 7.64031 | 1.29638 | .089660 | 11.9352 | 22042.8 | 31204.8 | 173.757 | 24.12 | 33.93 | 1.33688 | 774 |
| 900.000 | 7.28315 | 1.28440 | .083988 | 12.3646 | 23294.5 | 32905.7 | 175.702 | 24.43 | 34.11 | 1.32393 | 785 |
| 950.000 | 6.95937 | 1.27341 | .079008 | 12.7974 | 24557.2 | 34615.6 | 177.550 | 24.72 | 34.29 | 1.31175 | 796 |
| 1000.000 | 6.66440 | 1.26328 | .074601 | 13.2325 | 25830.8 | 36334.4 | 179.314 | 24.99 | 34.46 | 1.30030 | 807 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\delta P/\delta T$ MPa/K | $\delta P/\rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_p | C_v | f/P | W m/s |
|---------------|-----------------|---------|------------------------------|------------------------------|------------|------------|--|-------|-------|---------|----------|
| 80,000000 MPa | | | | | | | | | | | |
| 84,587 | 32.05029 | 3.54910 | 2.611766 | 30.6901 | 327.4 | 2823.5 | 77.929 | 36.77 | 55.07 | .07096 | 1281 |
| 90,000 | 31.59265 | 3.38396 | 2.429212 | 28.9216 | 587.0 | 3119.3 | 81.316 | 35.73 | 54.13 | .10095 | 1250 |
| 100,000 | 30.76284 | 3.12772 | 2.139114 | 26.0952 | 1047.4 | 3648.0 | 86.875 | 32.75 | 51.28 | .17097 | 1207 |
| 110,000 | 29.95309 | 2.92025 | 1.897389 | 23.7231 | 1467.8 | 4138.7 | 91.562 | 28.53 | 47.14 | .25626 | 1182 |
| 120,000 | 29.16320 | 2.74940 | 1.693226 | 21.7090 | 1837.0 | 4580.2 | 95.420 | 23.52 | 42.15 | .35300 | 1178 |
| 130,000 | 28.39319 | 2.60673 | 1.518899 | 19.9863 | 2155.2 | 4972.8 | 98.539 | 21.36 | 39.98 | .46048 | 1155 |
| 140,000 | 27.64326 | 2.48620 | 1.369090 | 18.5068 | 2584.8 | 5478.0 | 102.275 | 37.90 | 56.45 | .57183 | 992 |
| 150,000 | 26.91377 | 2.38335 | 1.239309 | 17.2334 | 3044.3 | 6016.8 | 105.988 | 33.29 | 51.75 | .67977 | 977 |
| 160,000 | 26.20515 | 2.29481 | 1.126370 | 16.1363 | 3467.8 | 6520.6 | 109.241 | 30.90 | 49.22 | .78172 | 957 |
| 170,000 | 25.51768 | 2.21000 | 1.027667 | 15.1907 | 3060.7 | 7003.7 | 112.170 | 29.35 | 47.30 | .87658 | 936 |
| 180,000 | 24.85524 | 2.15088 | .941086 | 14.3754 | 4253.0 | 7472.0 | 114.847 | 28.25 | 46.20 | .96339 | 916 |
| 190,000 | 24.20862 | 2.09185 | .864881 | 13.6724 | 4623.9 | 7928.5 | 117.315 | 27.40 | 45.14 | 1.04212 | 896 |
| 200,000 | 23.58711 | 2.03962 | .797595 | 13.0659 | 4981.6 | 8375.3 | 119.606 | 26.73 | 44.23 | 1.12280 | 878 |
| 210,000 | 22.98771 | 1.99315 | .737999 | 12.5425 | 5333.4 | 8813.5 | 121.745 | 26.18 | 43.43 | 1.17564 | 861 |
| 220,000 | 22.41024 | 1.95157 | .685052 | 12.0909 | 5674.4 | 9244.2 | 123.748 | 25.71 | 42.71 | 1.23129 | 846 |
| 230,000 | 21.85442 | 1.91420 | .637867 | 11.7013 | 6007.3 | 9667.9 | 125.631 | 25.30 | 42.05 | 1.28026 | 833 |
| 240,000 | 21.31984 | 1.88044 | .595688 | 11.3655 | 6332.9 | 10085.2 | 127.408 | 24.95 | 41.43 | 1.32304 | 820 |
| 250,000 | 20.80600 | 1.84890 | .557869 | 11.0764 | 6651.0 | 10496.6 | 129.088 | 24.63 | 40.86 | 1.36037 | 809 |
| 260,000 | 20.31233 | 1.82188 | .523858 | 10.8282 | 6964.0 | 10902.5 | 130.679 | 24.35 | 40.32 | 1.39273 | 800 |
| 270,000 | 19.83821 | 1.79634 | .493180 | 10.6159 | 7270.6 | 11303.2 | 132.192 | 24.10 | 39.82 | 1.42065 | 791 |
| 280,000 | 19.38298 | 1.77236 | .465429 | 10.4353 | 7571.7 | 11699.1 | 133.631 | 23.88 | 39.35 | 1.44461 | 783 |
| 290,000 | 18.94595 | 1.75122 | .440254 | 10.2825 | 7867.8 | 12090.3 | 135.004 | 23.68 | 38.91 | 1.46506 | 776 |
| 300,000 | 18.52642 | 1.73118 | .417356 | 10.1545 | 8159.1 | 12477.2 | 136.316 | 23.49 | 38.49 | 1.48241 | 770 |
| 310,000 | 18.12370 | 1.71256 | .396471 | 10.0485 | 8446.0 | 12860.1 | 137.571 | 23.33 | 38.09 | 1.49702 | 765 |
| 320,000 | 17.73708 | 1.69520 | .377375 | 9.9621 | 8728.8 | 13239.1 | 138.775 | 23.18 | 37.72 | 1.50920 | 760 |
| 330,000 | 17.36585 | 1.67897 | .359871 | 9.8932 | 9007.8 | 13614.6 | 139.930 | 23.05 | 37.37 | 1.51926 | 756 |
| 340,000 | 17.00934 | 1.66375 | .342768 | 9.8399 | 9283.3 | 13986.6 | 141.040 | 22.93 | 37.04 | 1.52744 | 753 |
| 350,000 | 16.66687 | 1.64942 | .328976 | 9.8005 | 9555.6 | 14355.5 | 142.110 | 22.82 | 36.74 | 1.53398 | 750 |
| 360,000 | 16.33778 | 1.63591 | .315304 | 9.7735 | 9824.8 | 14721.4 | 143.140 | 22.73 | 36.45 | 1.53917 | 748 |
| 370,000 | 16.02144 | 1.62312 | .302657 | 9.7577 | 10091.2 | 15084.5 | 144.135 | 22.64 | 36.18 | 1.54300 | 746 |
| 380,000 | 15.71723 | 1.61100 | .290933 | 9.7517 | 10355.0 | 15444.9 | 145.096 | 22.57 | 35.92 | 1.54572 | 744 |
| 390,000 | 15.42456 | 1.59947 | .280043 | 9.7547 | 10616.5 | 15803.1 | 146.026 | 22.51 | 35.69 | 1.54747 | 743 |
| 400,000 | 15.14287 | 1.58849 | .269908 | 9.7656 | 10875.7 | 16158.8 | 146.927 | 22.46 | 35.47 | 1.54837 | 742 |
| 410,000 | 14.87161 | 1.57802 | .260457 | 9.7835 | 11133.0 | 16512.4 | 147.800 | 22.41 | 35.27 | 1.54853 | 741 |
| 420,000 | 14.61024 | 1.56800 | .251628 | 9.8078 | 11388.5 | 16864.1 | 148.647 | 22.38 | 35.08 | 1.54805 | 740 |
| 430,000 | 14.35833 | 1.55841 | .243635 | 9.8377 | 11642.3 | 17214.0 | 149.471 | 22.35 | 34.90 | 1.54691 | 740 |
| 440,000 | 14.11535 | 1.54921 | .235618 | 9.8726 | 11894.7 | 17562.3 | 150.272 | 22.33 | 34.74 | 1.54538 | 740 |
| 450,000 | 13.88087 | 1.54037 | .228343 | 9.9121 | 12145.6 | 17908.9 | 151.051 | 22.31 | 34.60 | 1.54332 | 740 |
| 470,000 | 13.43576 | 1.52368 | .215053 | 10.0026 | 12644.0 | 18598.3 | 152.550 | 22.30 | 34.34 | 1.53836 | 741 |
| 500,000 | 12.82206 | 1.50081 | .197786 | 10.1617 | 13384.5 | 19623.7 | 154.665 | 22.33 | 34.04 | 1.52897 | 743 |
| 550,000 | 11.92161 | 1.46743 | .174492 | 10.4700 | 34606.2 | 21316.7 | 182.992 | 22.46 | 32.72 | 1.51024 | 749 |
| 600,000 | 11.14598 | 1.43875 | .156155 | 10.8119 | 15820.7 | 22998.1 | 160.818 | 22.68 | 33.57 | 1.48986 | 755 |
| 650,000 | 10.47015 | 1.41380 | .141370 | 11.1733 | 17034.8 | 24675.6 | 163.503 | 22.94 | 33.55 | 1.46926 | 763 |
| 700,000 | 9.87535 | 1.39188 | .129188 | 11.5490 | 18253.1 | 26354.1 | 165.991 | 23.23 | 33.61 | 1.44911 | 772 |
| 750,000 | 9.34745 | 1.37246 | .118974 | 11.9379 | 19478.6 | 28037.1 | 168.314 | 23.54 | 33.72 | 1.42994 | 781 |
| 800,000 | 8.87554 | 1.35509 | .110287 | 12.3381 | 20713.1 | 29726.6 | 170.494 | 23.86 | 33.87 | 1.41183 | 790 |
| 850,000 | 8.45102 | 1.33945 | .102807 | 12.7472 | 21957.8 | 31424.1 | 172.552 | 24.16 | 34.03 | 1.39483 | 800 |
| 900,000 | 8.06697 | 1.32526 | .096297 | 13.1634 | 23213.0 | 33130.0 | 174.502 | 24.46 | 34.21 | 1.37891 | 810 |
| 950,000 | 7.71777 | 1.31232 | .090580 | 13.5850 | 24479.1 | 34844.7 | 176.356 | 24.75 | 34.38 | 1.36405 | 820 |
| 1000,000 | 7.39880 | 1.30045 | .085518 | 14.0107 | 25755.7 | 36568.3 | 178.124 | 25.02 | 34.56 | 1.35017 | 831 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial p$ MPa·L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|---------------|-----------------|---------|----------------------------------|--------------------------------------|------------|------------|--|-------|-------|---------|----------|
| 90.000000 MPa | | | | | | | | | | | |
| 86.468 | 32.21061 | 3.88644 | 2.638038 | 32.4709 | 374.8 | 3168.9 | 78.329 | 36.74 | 54.60 | .11072 | 1312 |
| 90.000 | 31.92496 | 3.76733 | 2.519012 | 31.2908 | 541.7 | 3360.8 | 80.501 | 36.02 | 53.93 | .13668 | 1293 |
| 100.000 | 31.13033 | 3.47714 | 2.223809 | 28.3552 | 996.3 | 3887.4 | 86.038 | 33.06 | 51.06 | .22415 | 1250 |
| 110.000 | 30.35634 | 3.24164 | 1.978258 | 25.9012 | 1411.0 | 4375.8 | 90.703 | 28.85 | 46.89 | .32733 | 1225 |
| 120.000 | 29.60273 | 3.04715 | 1.771096 | 23.8219 | 1774.4 | 4814.7 | 94.538 | 23.85 | 41.88 | .44132 | 1222 |
| 130.000 | 28.86935 | 2.88420 | 1.594381 | 22.0438 | 2087.0 | 5204.5 | 97.635 | 21.70 | 39.69 | .56542 | 1199 |
| 140.000 | 28.15617 | 2.74603 | 1.442315 | 20.5145 | 2511.1 | 5707.6 | 101.349 | 38.24 | 56.15 | .69156 | 1036 |
| 150.000 | 27.46324 | 2.62762 | 1.310539 | 19.1942 | 2965.3 | 6242.4 | 105.041 | 33.64 | 51.43 | .81147 | 1023 |
| 160.000 | 26.79066 | 2.52524 | 1.195685 | 18.0517 | 3383.7 | 6743.1 | 108.273 | 31.24 | 48.90 | .92275 | 1004 |
| 170.000 | 26.13854 | 2.43599 | 1.095093 | 17.0615 | 3779.8 | 7223.0 | 111.182 | 29.69 | 47.18 | 1.02466 | 983 |
| 180.000 | 25.50698 | 2.35763 | 1.006619 | 16.2023 | 4159.7 | 7688.1 | 113.841 | 28.59 | 45.89 | 1.11655 | 963 |
| 190.000 | 24.89597 | 2.28836 | .928508 | 15.4562 | 4526.5 | 8141.6 | 116.293 | 27.74 | 44.84 | 1.19871 | 944 |
| 200.000 | 24.30546 | 2.22676 | .859304 | 14.8076 | 4882.5 | 8585.3 | 118.568 | 27.06 | 43.94 | 1.27147 | 926 |
| 210.000 | 23.73527 | 2.17167 | .797789 | 14.2432 | 5228.9 | 9020.7 | 120.693 | 26.50 | 43.15 | 1.33527 | 910 |
| 220.000 | 23.18512 | 2.12214 | .742933 | 13.7519 | 5566.9 | 9448.7 | 122.684 | 26.02 | 42.45 | 1.39101 | 894 |
| 230.000 | 22.65463 | 2.07740 | .693861 | 13.3238 | 5897.1 | 9869.8 | 124.556 | 25.61 | 41.80 | 1.43936 | 881 |
| 240.000 | 22.14343 | 2.03681 | .649829 | 12.9509 | 6220.4 | 10284.8 | 126.323 | 25.24 | 41.20 | 1.48096 | 868 |
| 250.000 | 21.65095 | 1.99981 | .610200 | 12.6260 | 6537.1 | 10694.0 | 127.993 | 24.92 | 40.65 | 1.51670 | 857 |
| 260.000 | 21.17666 | 1.96596 | .574430 | 12.3432 | 6847.9 | 11097.9 | 129.577 | 24.63 | 40.13 | 1.54715 | 847 |
| 270.000 | 20.71998 | 1.93488 | .542048 | 12.0974 | 7153.1 | 11496.8 | 131.083 | 24.38 | 39.65 | 1.57291 | 838 |
| 280.000 | 20.28032 | 1.90622 | .512652 | 11.8844 | 7453.2 | 11891.0 | 132.516 | 24.14 | 39.20 | 1.59455 | 829 |
| 290.000 | 19.85705 | 1.87972 | .485894 | 11.7003 | 7748.4 | 12280.8 | 133.884 | 23.93 | 38.77 | 1.61256 | 822 |
| 300.000 | 19.44955 | 1.85514 | .461473 | 11.5421 | 8039.1 | 12666.5 | 135.192 | 23.74 | 38.37 | 1.62738 | 816 |
| 310.000 | 19.05720 | 1.83225 | .439128 | 11.4068 | 8325.7 | 13048.3 | 136.444 | 23.57 | 38.00 | 1.63940 | 810 |
| 320.000 | 18.67940 | 1.81090 | .418633 | 11.2921 | 8608.4 | 13426.5 | 137.644 | 23.41 | 37.64 | 1.64899 | 805 |
| 330.000 | 18.31554 | 1.79091 | .399789 | 11.1959 | 8887.4 | 13801.3 | 138.797 | 23.27 | 37.31 | 1.65645 | 800 |
| 340.000 | 17.96504 | 1.77214 | .382424 | 11.1164 | 9163.1 | 14172.8 | 139.907 | 23.14 | 37.00 | 1.66204 | 796 |
| 350.000 | 17.62732 | 1.75449 | .366386 | 11.0517 | 9435.7 | 14541.4 | 140.975 | 23.03 | 36.71 | 1.66602 | 793 |
| 360.000 | 17.30182 | 1.73785 | .351543 | 11.0006 | 9705.3 | 14907.1 | 142.005 | 22.93 | 36.44 | 1.66870 | 790 |
| 370.000 | 16.98801 | 1.72212 | .337778 | 10.9616 | 9972.3 | 15270.2 | 142.999 | 22.84 | 36.18 | 1.67005 | 787 |
| 380.000 | 16.68536 | 1.70721 | .324986 | 10.9337 | 10236.8 | 15630.8 | 143.961 | 22.76 | 35.94 | 1.67033 | 785 |
| 390.000 | 16.39337 | 1.69306 | .313077 | 10.9156 | 10499.1 | 15989.1 | 144.892 | 22.69 | 35.72 | 1.66970 | 783 |
| 400.000 | 16.11157 | 1.67961 | .301970 | 10.9065 | 10759.2 | 16345.2 | 145.793 | 22.63 | 35.51 | 1.66828 | 781 |
| 410.000 | 15.83948 | 1.66679 | .291590 | 10.9056 | 11017.4 | 16699.4 | 146.668 | 22.58 | 35.32 | 1.66618 | 780 |
| 420.000 | 15.57667 | 1.65456 | .281875 | 10.9120 | 11273.8 | 17051.7 | 147.517 | 22.54 | 35.14 | 1.66348 | 779 |
| 430.000 | 15.32271 | 1.64287 | .272767 | 10.9250 | 11528.6 | 17402.3 | 148.342 | 22.50 | 34.98 | 1.66018 | 778 |
| 440.000 | 15.07719 | 1.63167 | .264214 | 10.9440 | 11782.0 | 17751.2 | 149.144 | 22.48 | 34.82 | 1.65655 | 778 |
| 450.000 | 14.83974 | 1.62094 | .256169 | 10.9685 | 12033.9 | 18098.7 | 149.926 | 22.46 | 34.68 | 1.65244 | 777 |
| 470.000 | 14.38755 | 1.60074 | .241443 | 11.0318 | 12534.4 | 18789.8 | 151.428 | 22.44 | 34.44 | 1.64356 | 777 |
| 500.000 | 13.76111 | 1.57320 | .222253 | 11.1562 | 13278.1 | 19818.3 | 153.549 | 22.45 | 34.14 | 1.62869 | 778 |
| 550.000 | 12.83595 | 1.53326 | .196263 | 11.4204 | 14505.0 | 21516.6 | 156.787 | 22.56 | 33.82 | 1.60182 | 781 |
| 600.000 | 12.03372 | 1.49919 | .175762 | 11.7318 | 15724.4 | 23203.4 | 159.722 | 22.76 | 33.67 | 1.57439 | 787 |
| 650.000 | 11.33100 | 1.46969 | .159194 | 12.0723 | 16942.9 | 24885.7 | 162.415 | 23.01 | 33.64 | 1.54767 | 793 |
| 700.000 | 10.70981 | 1.44386 | .145528 | 12.4311 | 18165.3 | 26568.8 | 164.910 | 23.30 | 33.69 | 1.52216 | 801 |
| 750.000 | 10.15625 | 1.42106 | .134060 | 12.8024 | 19394.5 | 28256.0 | 167.238 | 23.60 | 33.80 | 1.49830 | 809 |
| 800.000 | 9.65950 | 1.40075 | .124295 | 13.1855 | 20632.5 | 29949.7 | 169.424 | 23.90 | 33.95 | 1.47606 | 817 |
| 850.000 | 9.21105 | 1.38254 | .115880 | 13.5789 | 21880.4 | 31651.2 | 171.487 | 24.21 | 34.11 | 1.45538 | 826 |
| 900.000 | 8.80407 | 1.36609 | .108551 | 13.9810 | 23138.7 | 33361.2 | 173.441 | 24.50 | 34.29 | 1.43619 | 835 |
| 950.000 | 8.43295 | 1.35115 | .102110 | 14.3904 | 24407.5 | 35079.9 | 175.300 | 24.78 | 34.46 | 1.41838 | 845 |
| 1000.000 | 8.09310 | 1.33749 | .096404 | 14.8055 | 25686.8 | 36807.4 | 177.072 | 25.05 | 34.64 | 1.40184 | 854 |

TABLE 15. Properties of carbon monoxide along isobars — Continued

| T/K | ρ mol/L | Z | $\partial P/\partial T$ MPa/K | $\partial P/\partial \rho$ MPa-L/mol | E J/mol | H J/mol | S J mol ⁻¹ K ⁻¹ | C_V | C_P | f/P | W m/s |
|----------------|-----------------|---------|----------------------------------|---|------------|------------|--|-------|-------|---------|----------|
| 100.000000 MPa | | | | | | | | | | | |
| 88.317 | 32.36359 | 4.20787 | 2.660235 | 34.2231 | 422.7 | 3512.6 | 78.716 | 36.69 | 54.12 | .17026 | 1342 |
| 90.000 | 32.23307 | 4.14591 | 2.603633 | 33.6479 | 501.1 | 3603.5 | 79.734 | 36.32 | 53.77 | .18657 | 1333 |
| 100.000 | 31.46975 | 3.82182 | 2.303569 | 30.5959 | 950.8 | 4128.5 | 85.254 | 33.37 | 50.88 | .29624 | 1290 |
| 110.000 | 30.72718 | 3.55835 | 2.054297 | 28.0540 | 1360.5 | 4615.0 | 89.901 | 29.17 | 46.70 | .42140 | 1266 |
| 120.000 | 30.00512 | 3.34031 | 1.844170 | 25.9049 | 1719.2 | 5051.9 | 93.720 | 24.18 | 41.68 | .55594 | 1262 |
| 130.000 | 29.30331 | 3.15721 | 1.664983 | 24.0686 | 2027.1 | 5439.6 | 96.799 | 22.03 | 39.47 | .60943 | 1240 |
| 140.000 | 28.62154 | 3.00153 | 1.510760 | 22.4880 | 2446.6 | 5940.5 | 100.497 | 38.57 | 55.92 | .84233 | 1078 |
| 150.000 | 27.95965 | 2.86775 | 1.377017 | 21.1206 | 2896.4 | 6473.0 | 104.172 | 33.97 | 51.20 | .97536 | 1066 |
| 160.000 | 27.31754 | 2.75171 | 1.260305 | 19.9334 | 3310.6 | 6971.2 | 107.389 | 31.57 | 48.66 | 1.09643 | 1047 |
| 170.000 | 26.69510 | 2.65023 | 1.157913 | 18.9002 | 3702.8 | 7448.8 | 110.284 | 30.02 | 46.95 | 1.20536 | 1027 |
| 180.000 | 26.09220 | 2.56083 | 1.067667 | 17.9993 | 4079.0 | 7911.6 | 112.930 | 28.91 | 45.66 | 1.30191 | 1007 |
| 190.000 | 25.50869 | 2.48154 | 9.987800 | 17.2125 | 4442.5 | 8362.7 | 115.369 | 28.06 | 44.61 | 1.38683 | 988 |
| 200.000 | 24.94435 | 2.41080 | 0.916851 | 16.5244 | 4795.4 | 8804.3 | 117.633 | 27.37 | 43.73 | 1.46080 | 970 |
| 210.000 | 24.39889 | 2.34733 | 0.853603 | 15.9219 | 5139.0 | 9237.6 | 119.748 | 26.80 | 42.95 | 1.52455 | 954 |
| 220.000 | 23.87199 | 2.29009 | 0.797034 | 15.3937 | 5474.5 | 9663.5 | 121.729 | 26.32 | 42.25 | 1.57930 | 939 |
| 230.000 | 23.36322 | 2.23822 | 0.746276 | 14.9301 | 5802.6 | 10082.8 | 123.593 | 25.90 | 41.62 | 1.62590 | 925 |
| 240.000 | 22.87213 | 2.19102 | 0.700592 | 14.5229 | 6123.9 | 10496.0 | 125.352 | 25.53 | 41.03 | 1.66519 | 912 |
| 250.000 | 22.39823 | 2.14788 | 0.659352 | 14.1651 | 6439.0 | 10903.6 | 127.016 | 25.20 | 40.49 | 1.69819 | 901 |
| 260.000 | 21.94100 | 2.10831 | 0.622016 | 13.8507 | 6748.3 | 11306.0 | 128.594 | 24.90 | 39.99 | 1.72560 | 891 |
| 270.000 | 21.49988 | 2.07188 | 0.588118 | 13.5745 | 7052.3 | 11703.5 | 130.094 | 24.64 | 39.52 | 1.74812 | 881 |
| 280.000 | 21.07431 | 2.03823 | 0.557257 | 13.3321 | 7351.4 | 12096.5 | 131.523 | 24.40 | 39.08 | 1.76637 | 873 |
| 290.000 | 20.66372 | 2.00705 | 0.529088 | 13.1197 | 7645.8 | 12485.2 | 132.887 | 24.18 | 38.67 | 1.78090 | 865 |
| 300.000 | 20.26756 | 1.97807 | 0.503309 | 12.9340 | 7935.9 | 12869.9 | 134.192 | 23.98 | 38.28 | 1.79220 | 858 |
| 310.000 | 19.88527 | 1.95106 | 0.479659 | 12.7723 | 8222.1 | 13250.9 | 135.441 | 23.80 | 37.92 | 1.80072 | 852 |
| 320.000 | 19.51629 | 1.92582 | 0.457912 | 12.6321 | 8504.5 | 13628.4 | 136.639 | 23.63 | 37.58 | 1.80681 | 846 |
| 330.000 | 19.16009 | 1.90218 | 0.437867 | 12.5112 | 8783.4 | 14002.6 | 137.791 | 23.49 | 37.26 | 1.81082 | 841 |
| 340.000 | 18.81615 | 1.87998 | 0.419351 | 12.4077 | 9059.1 | 14373.7 | 138.898 | 23.35 | 36.96 | 1.81303 | 837 |
| 350.000 | 18.48397 | 1.85909 | 0.402211 | 12.3200 | 9331.8 | 14741.9 | 139.966 | 23.23 | 36.68 | 1.81369 | 833 |
| 360.000 | 18.16305 | 1.83938 | 0.386313 | 12.2466 | 9601.7 | 15107.4 | 140.995 | 23.12 | 36.42 | 1.81312 | 829 |
| 370.000 | 17.85293 | 1.82076 | 0.371537 | 12.1862 | 9869.0 | 15470.4 | 141.989 | 23.03 | 36.18 | 1.81131 | 826 |
| 380.000 | 17.55314 | 1.80312 | 0.357778 | 12.1376 | 10134.0 | 15831.0 | 142.951 | 22.94 | 35.95 | 1.80853 | 824 |
| 390.000 | 17.26325 | 1.78639 | 0.344944 | 12.0997 | 10396.7 | 16189.4 | 143.882 | 22.87 | 35.73 | 1.80491 | 821 |
| 400.000 | 16.98283 | 1.77049 | 0.332950 | 12.0717 | 10657.4 | 16545.7 | 144.784 | 22.80 | 35.54 | 1.80059 | 819 |
| 410.000 | 16.71149 | 1.75535 | 0.321722 | 12.0525 | 10916.2 | 16900.1 | 145.659 | 22.74 | 35.35 | 1.79567 | 817 |
| 420.000 | 16.44884 | 1.74092 | 0.311196 | 12.0415 | 11173.3 | 17252.7 | 146.509 | 22.70 | 35.18 | 1.79026 | 816 |
| 430.000 | 16.19450 | 1.72714 | 0.301310 | 12.0379 | 11428.8 | 17603.7 | 147.335 | 22.66 | 35.02 | 1.78431 | 815 |
| 440.000 | 15.94812 | 1.71396 | 0.292013 | 12.0411 | 11682.9 | 17953.2 | 148.138 | 22.62 | 34.88 | 1.77813 | 814 |
| 450.000 | 15.70936 | 1.70135 | 0.283256 | 12.0506 | 11935.6 | 18301.2 | 148.921 | 22.60 | 34.74 | 1.77154 | 813 |
| 470.000 | 15.25343 | 1.67764 | 0.267195 | 12.0860 | 12437.7 | 18993.6 | 150.426 | 22.57 | 34.50 | 1.75796 | 812 |
| 500.000 | 14.61905 | 1.64541 | 0.246205 | 12.1737 | 13183.8 | 20024.2 | 152.552 | 22.57 | 34.22 | 1.73658 | 811 |
| 550.000 | 13.67652 | 1.59892 | 0.217671 | 12.3894 | 14414.9 | 21726.7 | 155.797 | 22.67 | 33.91 | 1.70019 | 813 |
| 600.000 | 12.85398 | 1.55946 | 0.195089 | 12.6648 | 15638.3 | 23417.9 | 158.740 | 22.85 | 33.76 | 1.66462 | 817 |
| 650.000 | 12.12975 | 1.52545 | 0.176797 | 12.9792 | 16860.5 | 25104.7 | 161.440 | 23.09 | 33.73 | 1.63091 | 822 |
| 700.000 | 11.48683 | 1.49577 | 0.161688 | 13.3193 | 18086.2 | 26791.9 | 163.941 | 23.36 | 33.77 | 1.59936 | 829 |
| 750.000 | 10.91187 | 1.46961 | 0.148997 | 13.6765 | 19318.6 | 28482.9 | 166.275 | 23.65 | 33.88 | 1.57024 | 836 |
| 800.000 | 10.39425 | 1.44637 | 0.138183 | 14.0453 | 20559.5 | 30180.2 | 168.465 | 23.95 | 34.02 | 1.54338 | 843 |
| 850.000 | 9.92552 | 1.42558 | 0.128856 | 14.4244 | 21810.0 | 31885.1 | 170.532 | 24.25 | 34.18 | 1.51864 | 851 |
| 900.000 | 9.49890 | 1.40685 | 0.120727 | 14.8130 | 23070.8 | 33598.4 | 172.491 | 24.54 | 34.35 | 1.49585 | 860 |
| 950.000 | 9.10884 | 1.38988 | 0.113577 | 15.2099 | 24342.0 | 35320.4 | 174.352 | 24.82 | 34.53 | 1.47482 | 869 |
| 1000.000 | 8.75077 | 1.37441 | 0.107240 | 15.6138 | 25623.5 | 37051.1 | 176.128 | 25.08 | 34.70 | 1.45539 | 878 |

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