

2.2 Chloroalkanes

2.2.1 Chloroalkanes, C₁ - C₂

Tetrachloromethane

[56-23-5]

CCl₄

MW = 153.82

192

 $T_c = 556.30 \text{ K}$ [1969-cam/cha] $\rho_c = 557.00 \text{ kg}\cdot\text{m}^{-3}$ [1969-cam/cha]

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_l = 3.3156 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 3.6940 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 9.3692 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 243.15 \text{ to } 390.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 390.00 \text{ to } 556.30 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$2.09861 \cdot 10^3$	$9.27084 \cdot 10^{-1}$
<i>B</i>	-1.49976	$-1.26426 \cdot 10^{-2}$
<i>C</i>	$-7.54874 \cdot 10^{-4}$	$7.62277 \cdot 10^{-5}$
<i>D</i>		$-1.67180 \cdot 10^{-7}$

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg}\cdot\text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg}\cdot\text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg}\cdot\text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg}\cdot\text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
<i>crystal</i>				323.15	1536.07 ± 0.70	0.93	1910-you-1 ¹⁾
193.15	1828.0 ± 3.0		1930-mor/low	333.15	1516.30 ± 0.80	1.12	1910-you-1 ¹⁾
213.15	1823.0 ± 3.0		1930-mor/low	343.15	1496.30 ± 0.80	1.22	1910-you-1 ¹⁾
233.15	1818.0 ± 2.5		1930-mor/low	353.15	1476.50 ± 0.80	1.67	1910-you-1 ¹⁾
243.15	1815.0 ± 2.0		1930-mor/low	363.15	1455.40 ± 0.80	0.98	1910-you-1 ¹⁾
78.15	2026.0 ± 6.0		1932-bil/sap	373.15	1434.30 ± 0.80	0.43	1910-you-1(X)
194.15	1825.0 ± 5.0		1932-bil/sap	383.15	1412.40 ± 0.80	-0.76	1910-you-1 ¹⁾
<i>liquid</i>				393.15	1390.20 ± 0.90	-2.03	1910-you-1(X)
273.15	1632.53 ± 0.40	-0.10	1910-you-1(X)	403.15	1368.00 ± 0.90	-2.13	1910-you-1(X)
283.15	1613.16 ± 0.40	-0.27	1910-you-1(X)	413.15	1345.00 ± 0.90	-1.86	1910-you-1(X)
290.85	1598.48 ± 0.40	-0.07	1910-you-1 ¹⁾	433.15	1298.20 ± 0.90	0.44	1910-you-1(X)
293.15	1593.90 ± 0.70	-0.19	1910-you-1 ¹⁾	443.15	1273.40 ± 1.00	1.33	1910-you-1(X)
298.15	1584.30 ± 0.70	-0.05	1910-you-1 ¹⁾	453.15	1247.00 ± 1.00	1.47	1910-you-1(X)
303.15	1574.80 ± 0.70	0.21	1910-you-1 ¹⁾	463.15	1219.20 ± 1.00	1.31	1910-you-1(X)
313.15	1555.70 ± 0.70	0.76	1910-you-1 ¹⁾	473.15	1188.80 ± 1.00	-0.00	1910-you-1(X)

¹⁾ Not included in Fig. 1.

cont.

Tetrachloromethane (cont).**Table 2.** (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
483.15	1156.60 ± 1.00	-1.15	1910-you-1(×)	349.68	1481.88 ± 0.30	0.01	1967-den/smi(Δ)
493.15	1122.70 ± 1.00	-1.36	1910-you-1(×)	355.38	1470.14 ± 0.30	-0.15	1967-den/smi(Δ)
503.15	1085.70 ± 1.00	-1.13	1910-you-1(×)	361.18	1458.09 ± 0.30	-0.36	1967-den/smi(Δ)
513.15	1044.40 ± 1.20	-0.42	1910-you-1(×)	298.15	1584.30 ± 0.50	-0.05	1971-san/fel ¹⁾
523.15	998.00 ± 1.40	1.82	1910-you-1(×)	313.15	1555.00 ± 0.50	0.06	1971-san/fel ¹⁾
533.15	940.90 ± 2.00	3.21	1910-you-1(×)	328.15	1525.40 ± 0.50	0.22	1971-san/fel(×)
543.15	866.60 ± 3.00	4.51	1910-you-1(×)	281.35	1617.02 ± 0.30	0.12	1972-rei/eis(○)
553.15	763.40 ± 5.00	26.62	1910-you-1 ¹⁾	284.77	1610.11 ± 0.30	-0.20	1972-rei/eis(○)
273.15	1632.51 ± 0.40	-0.12	1923-tim/van(◆)	285.77	1608.18 ± 0.30	-0.20	1972-rei/eis(○)
273.15	1632.51 ± 0.40	-0.12	1926-tim/mar(×)	288.97	1602.02 ± 0.30	-0.17	1972-rei/eis ¹⁾
288.15	1603.66 ± 0.40	-0.12	1926-tim/mar ¹⁾	289.88	1600.27 ± 0.30	-0.16	1972-rei/eis ¹⁾
303.15	1574.76 ± 0.40	0.17	1926-tim/mar ¹⁾	292.63	1594.96 ± 0.30	-0.14	1972-rei/eis ¹⁾
243.15	1690.00 ± 2.00	0.68	1930-mor/low(×)	293.57	1593.14 ± 0.30	-0.13	1972-rei/eis ¹⁾
253.15	1671.00 ± 2.00	0.43	1930-mor/low(×)	296.43	1587.63 ± 0.30	-0.08	1972-rei/eis ¹⁾
263.15	1651.00 ± 2.00	-0.68	1930-mor/low ¹⁾	297.35	1585.83 ± 0.30	-0.08	1972-rei/eis ¹⁾
273.15	1632.00 ± 2.00	-0.63	1930-mor/low ¹⁾	300.10	1580.50 ± 0.30	-0.05	1972-rei/eis ¹⁾
283.15	1612.00 ± 2.00	-1.43	1930-mor/low ¹⁾	300.92	1578.90 ± 0.30	-0.05	1972-rei/eis ¹⁾
293.15	1592.00 ± 2.00	-2.09	1930-mor/low ¹⁾	303.95	1572.99 ± 0.30	-0.03	1972-rei/eis ¹⁾
303.15	1572.00 ± 2.00	-2.59	1930-mor/low ¹⁾	304.85	1571.24 ± 0.30	-0.02	1972-rei/eis ¹⁾
313.15	1552.00 ± 2.00	-2.94	1930-mor/low ¹⁾	307.88	1565.31 ± 0.30	-0.00	1972-rei/eis ¹⁾
323.15	1533.00 ± 2.00	-2.14	1930-mor/low ¹⁾	308.79	1563.53 ± 0.30	0.01	1972-rei/eis ¹⁾
333.15	1513.00 ± 2.50	-2.18	1930-mor/low ¹⁾	312.58	1556.06 ± 0.30	-0.00	1972-rei/eis(○)
343.15	1494.00 ± 2.50	-1.08	1930-mor/low ¹⁾	313.02	1555.18 ± 0.30	-0.01	1972-rei/eis(○)
298.07	1584.57 ± 0.60	0.06	1934-pes/hoe ¹⁾	316.66	1547.94 ± 0.30	-0.06	1972-rei/eis(○)
318.01	1545.62 ± 0.60	0.29	1934-pes/hoe ¹⁾	317.50	1546.28 ± 0.30	-0.06	1972-rei/eis(○)
338.03	1505.58 ± 0.60	0.19	1934-pes/hoe(×)	320.40	1540.51 ± 0.30	-0.09	1972-rei/eis(○)
293.15	1594.20 ± 0.40	0.11	1949-lag/mcm ¹⁾	321.23	1538.87 ± 0.30	-0.08	1972-rei/eis(○)
303.15	1574.80 ± 0.40	0.21	1949-lag/mcm ¹⁾	273.15	1632.70 ± 0.20	0.07	1974-her/win(□)
313.15	1555.00 ± 0.40	0.06	1949-lag/mcm ¹⁾	283.15	1613.44 ± 0.20	0.01	1974-her/win(□)
323.15	1535.20 ± 0.40	0.06	1949-lag/mcm(∇)	293.15	1594.05 ± 0.20	-0.04	1974-her/win(□)
353.00	1476.50 ± 0.70	1.37	1954-kor-1 ¹⁾	298.15	1584.31 ± 0.20	-0.04	1974-her/win(□)
373.00	1434.30 ± 0.70	0.12	1954-kor-1(×)	303.15	1574.55 ± 0.20	-0.04	1974-her/win(□)
403.00	1368.00 ± 0.70	-2.47	1954-kor-1(×)	308.15	1564.76 ± 0.20	-0.02	1974-her/win(□)
433.00	1298.30 ± 0.80	0.16	1954-kor-1(×)	313.15	1554.94 ± 0.20	0.00	1974-her/win(□)
453.00	1247.00 ± 0.80	1.06	1954-kor-1(×)	318.15	1545.08 ± 0.25	0.03	1974-her/win(□)
483.00	1156.60 ± 1.00	-1.63	1954-kor-1(×)	328.15	1525.24 ± 0.25	0.06	1974-her/win(□)
523.00	998.00 ± 2.00	1.03	1954-kor-1(×)	333.15	1515.29 ± 0.25	0.11	1974-her/win(□)
533.00	940.90 ± 3.00	2.23	1954-kor-1(×)	291.00	1597.50 ± 0.60	-0.76	1998-val/lis ¹⁾
543.00	866.60 ± 4.00	3.18	1954-kor-1(×)	293.14	1593.20 ± 0.60	-0.90	1998-val/lis ¹⁾
553.00	763.40 ± 5.00	23.61	1954-kor-1 ¹⁾	296.07	1587.80 ± 0.60	-0.61	1998-val/lis ¹⁾
342.98	1495.58 ± 0.30	0.16	1967-den/smi(Δ)	299.14	1581.80 ± 0.60	-0.62	1998-val/lis ¹⁾

¹⁾ Not included in Fig. 1.

cont.

Table 2. (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
302.10	1576.00 ± 0.60	-0.64	1998-val/lis ¹⁾	326.37	1528.70 ± 0.60	-0.03	1998-val/lis ¹⁾
305.25	1570.60 ± 0.60	0.13	1998-val/lis ¹⁾	329.45	1522.60 ± 0.60	0.02	1998-val/lis ¹⁾
308.22	1564.60 ± 0.60	-0.04	1998-val/lis ¹⁾	332.24	1516.90 ± 0.60	-0.11	1998-val/lis ¹⁾
311.19	1558.80 ± 0.60	0.00	1998-val/lis ¹⁾	335.25	1510.90 ± 0.60	-0.07	1998-val/lis(×)
314.30	1552.60 ± 0.60	-0.07	1998-val/lis ¹⁾	338.17	1504.90 ± 0.60	-0.21	1998-val/lis(×)
317.24	1546.60 ± 0.60	-0.26	1998-val/lis ¹⁾	341.16	1498.60 ± 0.60	-0.49	1998-val/lis(×)
320.36	1540.40 ± 0.60	-0.28	1998-val/lis ¹⁾	293.15	1593.98 ± 0.30	-0.11	2000-nat/nat ¹⁾
323.40	1534.40 ± 0.60	-0.24	1998-val/lis ¹⁾				

¹⁾ Not included in Fig. 1.

Further references: [1880-tho, 1883-sch-3, 1884-per, 1884-sch-6, 1890-gar, 1891-gla, 1891-you-1, 1896-lin, 1896-lin-1, 1898-kah, 1907-lum, 1908-gor/kop, 1908-liv/mor, 1908-pat/tho, 1909-bir, 1910-bir, 1910-daw, 1910-hub, 1910-tim, 1912-dob, 1912-her/rat, 1916-har-2, 1918-her-2, 1920-har/cia, 1922-tim/van, 1923-ege/lee, 1924-kin/sme, 1924-mil, 1925-lew, 1926-mat, 1927-mor, 1927-sug-1, 1928-dam, 1928-tim/mar, 1929-gri-1, 1929-ham/and, 1929-von/har, 1931-tre/spe, 1932-you/nel, 1933-azi/bha, 1933-deb/dav, 1933-mor, 1935-des, 1935-ear/gla, 1936-cow/par, 1936-lef/lef, 1936-ram, 1936-rao, 1936-zma, 1936-zma-1, 1938-eft, 1938-mic, 1939-dan/dev, 1939-lew/smy, 1939-sca/woo, 1940-sca/woo, 1941-bat/haz, 1941-gib/loe, 1942-mil, 1943-mcg, 1943-woo/bru, 1944-sch, 1946-sca/woo, 1948-jon/bow, 1948-lag/eva, 1948-vog-5, 1949-dre/mar, 1949-few/smi-1, 1950-hil/fis, 1950-mum/phi, 1952-sca/tic, 1953-bar/bro, 1953-mat/des, 1953-par/cha, 1954-mcg/pru, 1955-bro/foc, 1955-bro/smi, 1955-ham/sto, 1957-moe/mis, 1957-pri/hun, 1958-lin/van, 1959-yen/ree, 1960-fro/shr, 1960-mue/ign, 1961-lar/mcg, 1961-nyv/erd, 1962-bro/smi, 1962-par/mis, 1963-aga/men, 1963-sub/rao-1, 1965-bus/bal, 1965-des/pan, 1965-fin/kid, 1965-for/moo, 1965-shr/pec, 1965-shr/pec-1, 1965-vij/des-1, 1966-kat/cha, 1966-kat/pra-1, 1966-kat/shi, 1966-lut/kov, 1966-sub/rao-1, 1967-fin/ken, 1967-gol/per, 1967-gun/wet, 1967-her/bre, 1967-loi/mer, 1967-ras/gan, 1967-vij/des, 1968-des/bha, 1968-fri/fra, 1968-kem/buc, 1969-bou/lam, 1969-cam/cha, 1969-fro/shr, 1969-gor/hos, 1969-mik/rat, 1969-mye/cle, 1969-rod/hsu, 1970-kon/lya, 1970-lam/ben, 1970-nag, 1971-arm/aro, 1971-bra/joh, 1971-des/bha, 1971-her/bre, 1971-nag/oht, 1972-bou/aim, 1973-jae, 1973-san/hut, 1973-sub/kon, 1974-jai/nor, 1974-lie/mis, 1975-gro/ben, 1975-wis/tam, 1976-ezh/gol, 1976-for/ben, 1976-pau, 1977-sch/pla, 1978-hie/pon, 1978-kiy/hal, 1978-nat/yad, 1979-ern/gli, 1979-gro/ham, 1979-hoe/hoe, 1979-mah/sur, 1979-wil/far, 1980-sid/goe, 1981-ino/ara, 1981-kor/kov, 1982-ami/pat, 1982-ami/pat-1, 1982-dig/jad, 1982-nat/nar, 1983-lin, 1983-lin-1, 1984-bau/mee, 1985-mar/bha, 1985-sin/mah, 1986-gou/tom, 1986-pan/jan, 1987-ami, 1987-hne/doh, 1987-man/ami, 1988-gar/cob-1, 1988-osw-3, 1988-osw-8, 1988-rat-1, 1989-der/pol, 1989-lai/rod, 1989-nar/swa, 1989-pan/shu, 1990-jos/ami-2, 1990-kat/yam, 1990-mun/ber, 1991-mat/ber, 1995-art/mun, 1995-art/mun-3, 2000-wan/sun, 2001-vit/red].

cont.

Tetrachloromethane (cont.)

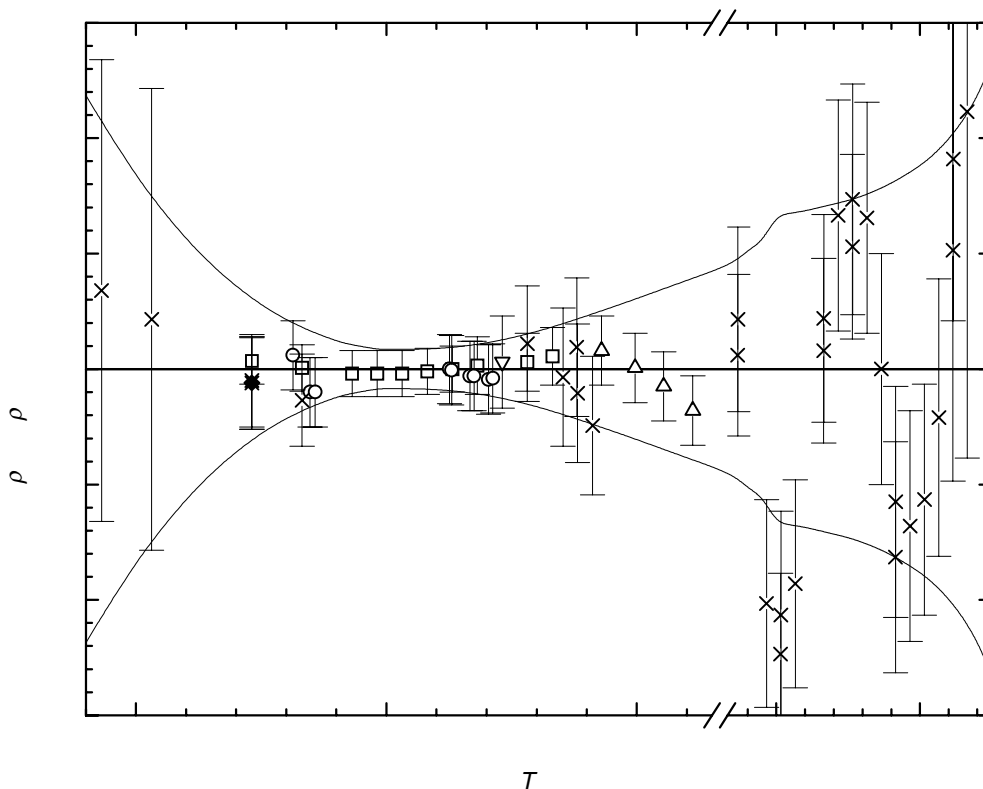


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

Table 3. Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ or $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$).

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
240.00	1695.19 ± 2.37	340.00	1501.43 ± 0.46	460.00	1226.74 ± 1.50
250.00	1676.49 ± 1.66	350.00	1481.22 ± 0.61	470.00	1198.15 ± 1.55
260.00	1657.64 ± 1.11	360.00	1460.87 ± 0.77	480.00	1167.78 ± 1.61
270.00	1638.65 ± 0.70	370.00	1440.36 ± 0.91	490.00	1135.00 ± 1.68
280.00	1619.50 ± 0.41	380.00	1419.70 ± 1.03	500.00	1099.01 ± 1.76
290.00	1600.20 ± 0.24	390.00	1398.89 ± 1.10	510.00	1058.67 ± 1.86
293.15	1594.09 ± 0.21	400.00	1377.23 ± 1.33	520.00	1012.37 ± 1.99
298.15	1584.35 ± 0.17	410.00	1354.30 ± 1.35	530.00	957.48 ± 2.15
300.00	1580.74 ± 0.17	420.00	1330.39 ± 1.37	540.00	888.59 ± 2.36
310.00	1561.14 ± 0.17	430.00	1305.69 ± 1.40	550.00	788.14 ± 2.65
320.00	1541.39 ± 0.22	440.00	1280.25 ± 1.43		
330.00	1521.48 ± 0.32	450.00	1254.00 ± 1.46		

Trichloromethane**[67-66-3]****CHCl₃****MW = 119.38****193**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 6.4936 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.2537 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 203.15 \text{ to } 333.18 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.99846 \cdot 10^3$
<i>B</i>	-1.58055
<i>C</i>	$-5.41542 \cdot 10^{-4}$

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
<i>crystal</i>				223.15	1618.50 ± 1.50	-0.29	1930-mor/low(X)
87.15	1832.0 ± 8.0		1922-isn	233.15	1600.00 ± 1.50	-0.52	1930-mor/low(X)
193.15	1789.0 ± 6.0		1922-isn	243.15	1581.50 ± 1.20	-0.63	1930-mor/low(X)
173.15	1847.0 ± 3.0		1930-mor/low	253.15	1563.50 ± 1.20	-0.14	1930-mor/low(X)
183.15	1844.0 ± 2.5		1930-mor/low	263.15	1544.50 ± 1.00	-0.54	1930-mor/low(X)
193.15	1840.0 ± 2.5		1930-mor/low	273.15	1526.00 ± 1.00	-0.33	1930-mor/low ¹⁾
203.15	1837.0 ± 2.0		1930-mor/low	283.15	1508.00 ± 1.00	0.49	1930-mor/low ¹⁾
<i>liquid</i>				293.15	1489.50 ± 1.00	0.92	1930-mor/low ¹⁾
273.15	1526.10 ± 0.60	-0.23	1885-cha/par(X)	303.15	1470.50 ± 1.00	0.95	1930-mor/low ¹⁾
278.15	1516.80 ± 0.60	-0.13	1885-cha/par(X)	313.15	1451.50 ± 1.00	1.09	1930-mor/low ¹⁾
283.15	1507.50 ± 0.60	-0.01	1885-cha/par ¹⁾	323.15	1431.50 ± 1.00	0.35	1930-mor/low ¹⁾
288.15	1498.10 ± 0.60	0.04	1885-cha/par ¹⁾	333.15	1410.50 ± 1.20	-1.29	1930-mor/low ¹⁾
293.15	1488.80 ± 0.60	0.22	1885-cha/par ¹⁾	203.15	1655.90 ± 1.00	0.88	1965-mal/hil(X)
298.15	1479.30 ± 0.60	0.22	1885-cha/par ¹⁾	213.15	1637.73 ± 1.00	0.77	1965-mal/hil(X)
303.15	1469.80 ± 0.60	0.25	1885-cha/par ¹⁾	223.15	1620.22 ± 1.00	1.43	1965-mal/hil(X)
308.15	1460.30 ± 0.60	0.31	1885-cha/par ¹⁾	233.50	1601.79 ± 1.00	1.91	1965-mal/hil ¹⁾
204.30	1653.49 ± 0.60	0.54	1907-tim(X)	243.15	1582.03 ± 1.00	-0.10	1965-mal/hil(X)
273.55	1526.05 ± 0.30	0.47	1907-tim(X)	253.15	1564.21 ± 1.00	0.57	1965-mal/hil(X)
273.15	1526.31 ± 0.40	-0.02	1910-tim-4(X)	263.15	1544.88 ± 1.00	-0.16	1965-mal/hil(X)
288.15	1498.41 ± 0.40	0.35	1910-tim-4 ¹⁾	273.15	1525.79 ± 1.00	-0.54	1965-mal/hil ¹⁾
273.15	1526.33 ± 0.40	0.00	1912-tim-2(O)	283.15	1507.39 ± 1.00	-0.12	1965-mal/hil ¹⁾
288.15	1498.45 ± 0.40	0.39	1912-tim-2 ¹⁾	293.15	1489.43 ± 1.00	0.85	1965-mal/hil ¹⁾
273.15	1526.45 ± 0.40	0.12	1914-tyr(Δ)	303.15	1472.10 ± 1.00	2.55	1965-mal/hil ¹⁾
273.15	1526.31 ± 0.40	-0.02	1923-tim/van(\blacklozenge)	298.15	1479.12 ± 0.30	0.04	1969-fin/ken(X)
273.15	1526.34 ± 0.40	0.01	1926-tim/mar-1(V)	298.15	1479.50 ± 0.50	0.42	1973-san/hut ¹⁾
288.15	1498.41 ± 0.40	0.35	1926-tim/mar-1 ¹⁾	313.15	1450.80 ± 0.50	0.39	1973-san/hut ¹⁾
303.15	1470.56 ± 0.40	1.01	1926-tim/mar-1 ¹⁾	328.15	1421.30 ± 0.50	-0.19	1973-san/hut(X)
213.15	1637.50 ± 1.50	0.54	1930-mor/low(X)	293.15	1488.52 ± 0.20	-0.06	1977-han(\square)

¹⁾ Not included in Fig. 1.

cont.

Trichloromethane (cont.)**Table 2.** (cont.)

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
313.15	1450.87 ± 0.20	0.46	1977-han(□)	309.16	1457.30 ± 0.80	-0.76	1998-val/lis ¹⁾
290.27	1493.40 ± 0.80	-0.64	1998-val/lis ¹⁾	313.21	1449.50 ± 0.80	-0.79	1998-val/lis ¹⁾
291.23	1491.60 ± 0.80	-0.63	1998-val/lis ¹⁾	315.22	1445.60 ± 0.80	-0.83	1998-val/lis ¹⁾
293.25	1487.90 ± 0.80	-0.49	1998-val/lis ¹⁾	317.15	1441.80 ± 0.80	-0.92	1998-val/lis ¹⁾
295.23	1484.00 ± 0.80	-0.63	1998-val/lis ¹⁾	319.26	1437.60 ± 0.80	-1.06	1998-val/lis ¹⁾
297.24	1480.20 ± 0.80	-0.61	1998-val/lis ¹⁾	323.25	1430.10 ± 0.80	-0.86	1998-val/lis ¹⁾
299.21	1476.40 ± 0.80	-0.66	1998-val/lis ¹⁾	325.22	1426.00 ± 0.80	-1.16	1998-val/lis ¹⁾
301.23	1472.60 ± 0.80	-0.61	1998-val/lis ¹⁾	327.23	1422.10 ± 0.80	-1.17	1998-val/lis ¹⁾
303.25	1468.70 ± 0.80	-0.66	1998-val/lis ¹⁾	331.17	1414.30 ± 0.80	-1.34	1998-val/lis(X)
305.65	1465.10 ± 0.80	0.33	1998-val/lis ¹⁾	333.18	1410.30 ± 0.80	-1.44	1998-val/lis(X)

¹⁾ Not included in Fig. 1.

Further references: [1832-lie, 1848-pie-1, 1849-gre, 1858-sch, 1866-flu, 1879-ram, 1880-kan, 1880-tho, 1881-sch-2, 1882-sch-1, 1883-dre, 1883-nas, 1883-sch, 1883-sch-3, 1884-per, 1885-per-2, 1890-gar, 1891-gla, 1896-lin, 1896-lin-1, 1904-wad/fin, 1905-bru/sch, 1907-buc/gar, 1907-lum, 1908-gor/kop, 1908-ste, 1909-buc/gar, 1910-tim, 1912-bas/ham, 1912-fau, 1912-fre, 1912-her/rat, 1912-rem, 1912-sch, 1912-tim, 1913-dol/sch, 1913-hol-1, 1914-sac/rja, 1919-pau/sch, 1920-har/cla, 1920-wil-1, 1921-cli, 1922-dri/fir, 1922-isn, 1922-tim/van, 1923-her/neu, 1924-mil, 1925-joa, 1925-lew, 1925-rak, 1925-sch, 1925-yaj/bha, 1926-mat, 1926-new, 1926-pou, 1927-arb-2, 1927-gra, 1927-mor, 1929-ham/and, 1930-zma, 1930-zma-1, 1931-tre/spe, 1933-chu, 1934-ste/smy, 1935-ear/gla, 1936-mcl/ada, 1936-ram, 1936-sen/abo, 1937-coo-2, 1937-fru/may, 1937-ste, 1938-sca/ray, 1939-bow/but, 1939-dav/eva, 1940-mor/yag, 1940-rei/dem, 1941-bat/haz, 1943-mcg, 1947-wil, 1948-lag/eva, 1948-vog-5, 1949-lag/mcm, 1949-tsc/ric-1, 1950-fai/key, 1950-hil/fis, 1950-mum/phi, 1950-par-1, 1951-ama, 1951-kar/bow, 1952-sch/dol, 1953-ano-8, 1953-old, 1954-mar-1, 1954-mcg/pru, 1954-tal/can, 1955-wei/pro, 1956-moo/sty, 1957-moe/mis, 1958-mue/kea, 1960-fro/shr, 1962-nag-3, 1962-nag-4, 1963-kud/sus-1, 1963-kud/sus-2, 1963-plu/dow, 1967-fin/ken, 1967-mat/san, 1968-cam/cha, 1969-vys/kir, 1971-san/fel, 1972-abr/mir, 1972-bou/aim, 1973-lut/nik, 1976-ezh/gol, 1978-nat/yad, 1978-sev/bou, 1981-asf/dul, 1981-ino/ara, 1981-lut/leb, 1984-bau/mee, 1985-sin/mah, 1987-aka/oga, 1987-hne/doh, 1988-aww/all, 1988-nag-4, 1989-pan/shu, 1991-gro/rou, 1991-mat/ber, 1995-nin/ste, 1996-fra/lun, 2000-nat/nat, 2000-wan/sun, 2001-vit/red].

Table 3. Recommended values (fit to the reliable experimental values according to the equations

$$\rho = A + BT + CT^2 + DT^3 + \dots \text{ or } \rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4].$$

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
200.00	1660.69 ± 1.03	260.00	1550.91 ± 0.78	300.00	1475.56 ± 0.16
210.00	1642.66 ± 1.26	270.00	1532.23 ± 0.55	310.00	1456.45 ± 0.21
220.00	1624.53 ± 1.35	280.00	1513.45 ± 0.35	320.00	1437.23 ± 0.41
230.00	1606.29 ± 1.32	290.00	1494.56 ± 0.21	330.00	1417.90 ± 0.78
240.00	1587.94 ± 1.20	293.15	1488.58 ± 0.18	340.00	1398.47 ± 1.37
250.00	1569.48 ± 1.01	298.15	1479.08 ± 0.16		

cont.

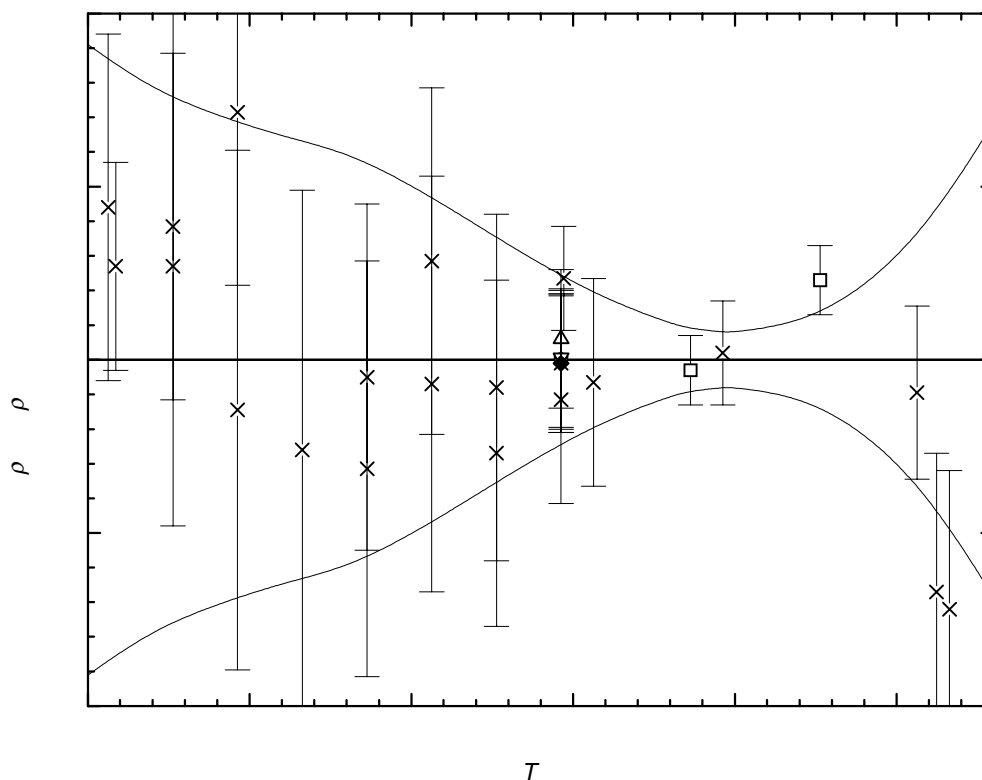


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

Dichloromethane

[75-09-2]

CH₂Cl₂

MW = 84.93

194

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction):

$\sigma_{c,w} = 1.5537$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.9274 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 173.15 \text{ to } 373.93 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.78669 \cdot 10^3$
B	-1.25525
C	$-1.08374 \cdot 10^{-3}$

cont.

Dichloromethane (cont.)**Table 2.** Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{ca}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
<i>crystal</i>				333.15	1249.00 ± 2.00	0.78	1954-rie ¹⁾
83.15	1710.0 ± 20.0		1930-mor/low	373.15	1167.00 ± 3.00	-0.39	1954-rie ¹⁾
143.15	1661.0 ± 8.0		1930-mor/low	303.15	1305.42 ± 0.40	-1.14	1966-hey/sch(×)
153.15	1653.0 ± 8.0		1930-mor/low	303.15	1307.20 ± 0.30	0.64	1968-sch/cle(∇)
163.15	1645.0 ± 8.0		1930-mor/low	208.38	1479.20 ± 0.40	1.14	1970-phi/mur(◆)
173.15	1637.0 ± 8.0		1930-mor/low	221.89	1455.70 ± 0.40	0.90	1970-phi/mur(◆)
79.15	1761.0 ± 6.0		1932-bil/sap	249.64	1406.30 ± 0.40	0.51	1970-phi/mur(◆)
<i>liquid</i>				265.81	1376.70 ± 0.40	0.24	1970-phi/mur(◆)
173.15	1539.00 ± 2.00	2.15	1930-mor/low(×)	277.26	1355.40 ± 0.40	0.06	1970-phi/mur(◆)
183.15	1522.00 ± 2.00	1.57	1930-mor/low(×)	288.45	1334.40 ± 0.40	-0.04	1970-phi/mur(◆)
193.15	1504.00 ± 2.00	0.20	1930-mor/low(×)	300.76	1311.00 ± 0.40	-0.12	1970-phi/mur ¹⁾
203.15	1487.00 ± 2.00	0.04	1930-mor/low(×)	313.21	1287.00 ± 0.40	-0.21	1970-phi/mur(◆)
213.15	1469.00 ± 2.00	-0.89	1930-mor/low(×)	328.22	1257.70 ± 0.40	-0.24	1970-phi/mur(◆)
223.15	1451.00 ± 2.00	-1.61	1930-mor/low(×)	343.22	1228.00 ± 0.40	-0.19	1970-phi/mur(◆)
233.15	1433.00 ± 2.00	-2.11	1930-mor/low(×)	358.16	1198.00 ± 0.40	-0.08	1970-phi/mur(◆)
243.15	1415.00 ± 2.00	-2.40	1930-mor/low(×)	373.93	1165.90 ± 0.40	0.12	1970-phi/mur(◆)
253.15	1398.00 ± 2.00	-1.47	1930-mor/low(×)	293.15	1325.64 ± 0.30	0.06	1972-bou/aim(Δ)
263.15	1380.00 ± 2.00	-1.32	1930-mor/low ¹⁾	303.15	1307.71 ± 0.40	1.15	1978-nat/yad(×)
273.15	1362.00 ± 2.00	-0.95	1930-mor/low ¹⁾	293.15	1325.60 ± 0.30	0.02	1984-bau/mee(□)
283.15	1344.00 ± 2.00	-0.37	1930-mor/low ¹⁾	298.15	1316.40 ± 0.30	0.30	1984-bau/mee(□)
293.15	1326.00 ± 2.00	0.42	1930-mor/low ¹⁾	298.15	1316.20 ± 0.30	0.10	1991-mat/ber(○)
303.15	1309.00 ± 2.00	2.44	1930-mor/low ¹⁾	291.41	1328.90 ± 0.50	0.04	1998-val/lis ¹⁾
313.15	1291.00 ± 2.00	3.67	1930-mor/low ¹⁾	293.25	1325.30 ± 0.50	-0.09	1998-val/lis ¹⁾
273.15	1361.70 ± 0.40	-1.25	1932-tim/hen(×)	295.96	1320.50 ± 0.50	0.25	1998-val/lis ¹⁾
288.15	1334.25 ± 0.40	-0.75	1932-tim/hen(×)	298.40	1316.10 ± 0.50	0.48	1998-val/lis ¹⁾
303.15	1307.72 ± 0.40	1.16	1932-tim/hen(×)	300.59	1311.50 ± 0.50	0.05	1998-val/lis ¹⁾
273.15	1362.00 ± 0.80	-0.95	1939-dav/eva(×)	303.10	1307.40 ± 0.50	0.74	1998-val/lis ¹⁾
298.15	1318.10 ± 0.80	2.00	1939-dav/eva ¹⁾	305.65	1302.60 ± 0.50	0.83	1998-val/lis ¹⁾
173.15	1539.00 ± 2.00	2.15	1954-rie(×)	308.42	1297.40 ± 0.50	0.95	1998-val/lis(×)
243.15	1415.00 ± 2.00	-2.40	1954-rie(×)	311.03	1292.50 ± 0.50	1.08	1998-val/lis(×)
288.15	1335.80 ± 1.00	0.80	1954-rie ¹⁾				

¹⁾ Not included in Fig. 1.

Further references: [1880-tho, 1890-gar, 1891-gla, 1908-gor/kop, 1920-har/cla, 1932-wat, 1936-ram, 1937-ste, 1943-mcg, 1947-mer/ric, 1948-vog-5, 1950-bar/lef, 1950-mum/phi, 1954-gri/car, 1956-dre, 1957-moe/mis, 1960-mue/ign, 1961-shi/hil, 1971-bra/joh, 1981-kor/kov, 1985-ped/dav, 1986-zur/des, 1987-sal/ped, 1991-ace/ped-1, 1994-kri/vis-1, 1995-com/fra-1, 1998-par/aco].

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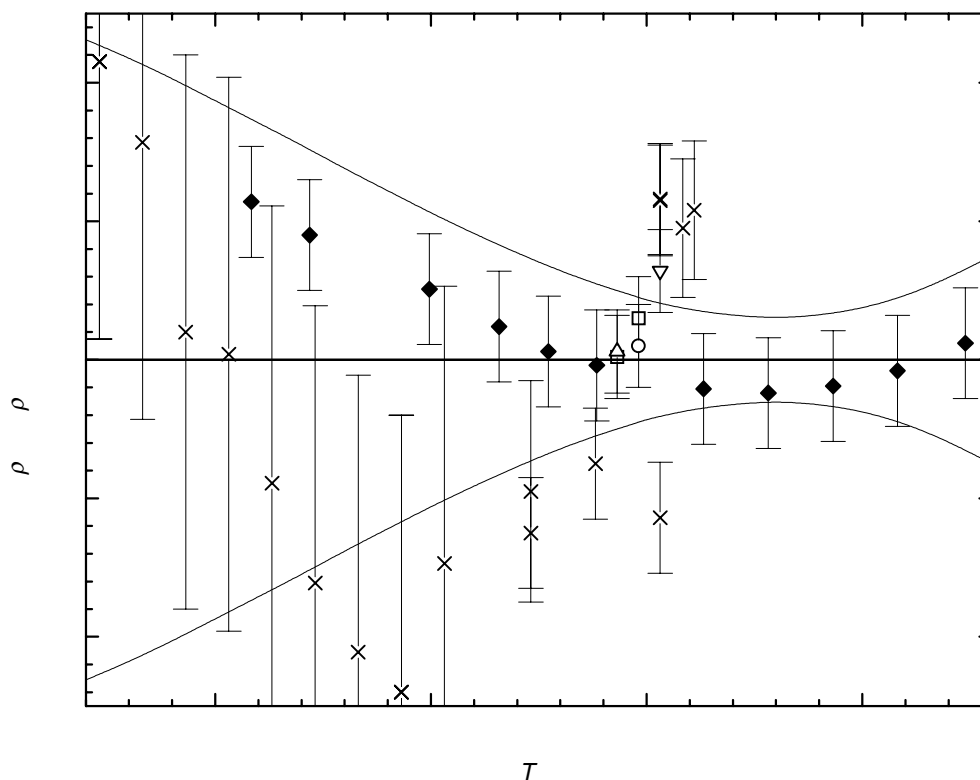


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

Table 3. Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ or $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$).

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
170.00	1541.97 ± 2.31	250.00	1405.14 ± 1.06	310.00	1293.41 ± 0.36
180.00	1525.63 ± 2.18	260.00	1387.06 ± 0.91	320.00	1274.03 ± 0.32
190.00	1509.07 ± 2.03	270.00	1368.76 ± 0.77	330.00	1254.43 ± 0.30
200.00	1492.29 ± 1.87	280.00	1350.25 ± 0.64	340.00	1234.62 ± 0.32
210.00	1475.29 ± 1.71	290.00	1331.52 ± 0.53	350.00	1214.59 ± 0.37
220.00	1458.08 ± 1.55	293.15	1325.58 ± 0.50	360.00	1194.34 ± 0.46
230.00	1440.65 ± 1.38	298.15	1316.10 ± 0.45	370.00	1173.88 ± 0.59
240.00	1423.00 ± 1.22	300.00	1312.57 ± 0.43	380.00	1153.20 ± 0.75

Chloromethane**[74-87-3]****CH₃Cl****MW = 50.49****195**

$$T_c = 416.30 \text{ K [1964-hsu/mck]}$$

$$\rho_c = 363.00 \text{ kg} \cdot \text{m}^{-3} \text{ [1964-hsu/mck]}$$

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_t = 2.4564 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 4.8672 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.0430 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 203.15 \text{ to } 340.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 340.00 \text{ to } 416.30 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$1.26642 \cdot 10^3$	1.18084
<i>B</i>	$-2.80573 \cdot 10^{-1}$	$-3.49458 \cdot 10^{-2}$
<i>C</i>	$-3.04377 \cdot 10^{-3}$	$5.00286 \cdot 10^{-4}$
<i>D</i>		$-2.58378 \cdot 10^{-6}$

Table 2. Experimental values with uncertainties and deviation from calculated values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	$\rho_{\text{exp}} - \rho_{\text{calc}}$ kg · m ⁻³	Ref. (Symbol in Fig. 1)	T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	$\rho_{\text{exp}} - \rho_{\text{calc}}$ kg · m ⁻³	Ref. (Symbol in Fig. 1)
			<i>crystal</i>	333.15	835.20 ± 2.00	0.08	1964-hsu/mck(○)
83.15	1240.0 ± 20.0		1930-mor/low	338.15	823.60 ± 2.00	0.10	1964-hsu/mck(○)
173.15	1200.0 ± 20.0		1930-mor/low	343.15	811.50 ± 2.00	0.02	1964-hsu/mck(○)
78.15	1393.0 ± 5.0		1932-bil/sap	348.15	798.80 ± 2.00	0.48	1964-hsu/mck(○)
			<i>liquid</i>	353.15	785.30 ± 2.00	1.04	1964-hsu/mck(○)
183.15	1119.00 ± 1.50	6.07	1930-mor/low ¹⁾	358.15	770.70 ± 2.00	1.17	1964-hsu/mck(○)
193.15	1102.00 ± 1.50	3.33	1930-mor/low ¹⁾	363.15	753.70 ± 2.00	-0.58	1964-hsu/mck(○)
203.15	1084.00 ± 1.50	0.20	1930-mor/low(□)	368.15	737.40 ± 2.00	-1.12	1964-hsu/mck(○)
213.15	1068.00 ± 1.50	-0.33	1930-mor/low(□)	373.15	722.60 ± 2.00	0.45	1964-hsu/mck(○)
223.15	1052.00 ± 1.50	-0.24	1930-mor/low(□)	378.15	704.90 ± 2.00	-0.09	1964-hsu/mck(○)
233.15	1036.00 ± 1.50	0.45	1930-mor/low(□)	383.15	686.60 ± 2.00	-0.10	1964-hsu/mck(○)
243.15	1020.00 ± 1.50	1.76	1930-mor/low ¹⁾	388.15	667.40 ± 2.00	0.58	1964-hsu/mck(○)
253.15	1005.00 ± 1.50	4.67	1930-mor/low ¹⁾	393.15	644.20 ± 2.00	-0.47	1964-hsu/mck(○)
308.15	891.00 ± 2.00	0.07	1964-hsu/mck(○)	398.15	619.20 ± 2.00	-0.07	1964-hsu/mck(○)
313.15	879.60 ± 2.00	-0.48	1964-hsu/mck(○)	403.15	588.90 ± 2.00	-0.14	1964-hsu/mck(○)
318.15	869.20 ± 2.00	0.14	1964-hsu/mck(○)	408.15	551.80 ± 3.00	1.02	1964-hsu/mck(○)
323.15	857.90 ± 2.00	-0.00	1964-hsu/mck(○)	413.15	498.10 ± 4.00	3.76	1964-hsu/mck ¹⁾
328.15	846.60 ± 2.00	0.01	1964-hsu/mck(○)				

¹⁾ Not included in Fig. 1.

Further references: [1879-vin/del, 1943-mcg, 1978-kum/iwa].

cont.

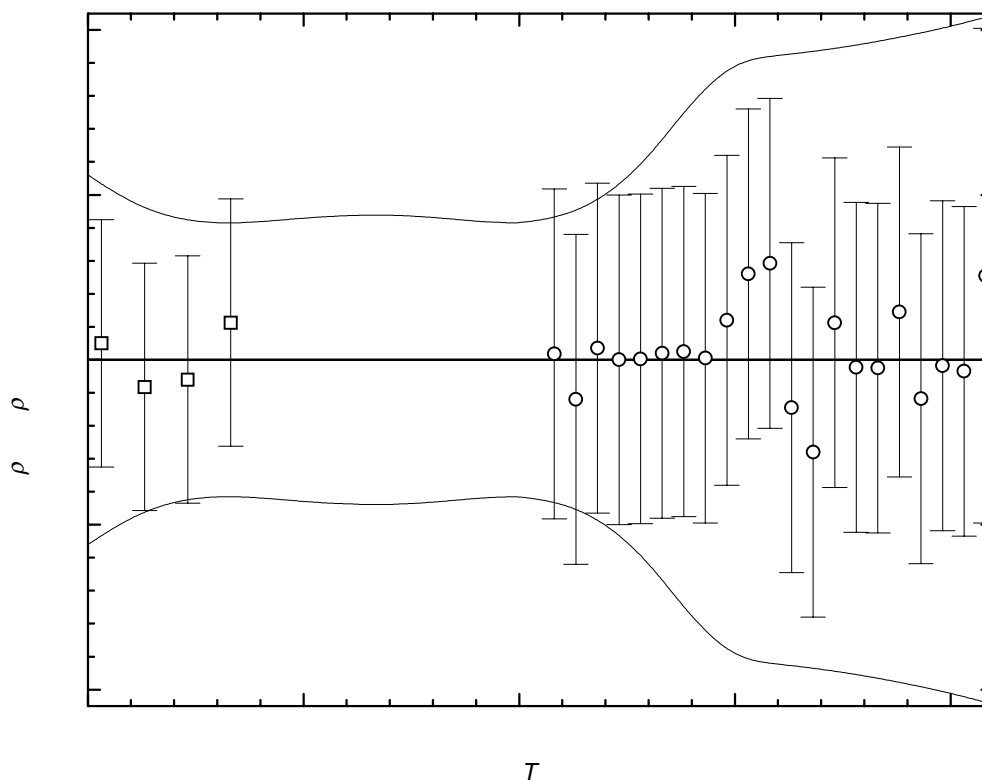


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

Table 3. Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ or $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$).

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
200.00	1088.55 ± 2.24	280.00	949.23 ± 1.73	340.00	819.16 ± 3.14
210.00	1073.27 ± 1.90	290.00	929.07 ± 1.68	350.00	793.20 ± 3.63
220.00	1057.37 ± 1.71	293.15	922.60 ± 1.67	360.00	763.95 ± 3.69
230.00	1040.87 ± 1.65	298.15	912.19 ± 1.66	370.00	732.54 ± 3.75
240.00	1023.76 ± 1.67	300.00	908.31 ± 1.66	380.00	698.38 ± 3.83
250.00	1006.04 ± 1.72	310.00	886.93 ± 1.73	390.00	658.93 ± 3.93
260.00	987.71 ± 1.75	320.00	864.95 ± 1.97	400.00	608.77 ± 4.04
270.00	968.77 ± 1.76	330.00	842.36 ± 2.44	410.00	533.16 ± 4.18

Hexachloroethane**[67-72-1]****MW = 236.74****196****Table 1.** Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
<i>crystal</i>		
293.15	2000.0 ± 30.0	1821-far
293.15	1900.0 ± 20.0	1934-wes
<i>liquid</i>		
293.15	2091.00 ± 10.00	1943-mcg

Pentachloroethane**[76-01-7]****MW = 202.29****197****Table 1.** Fit with estimated B coefficient for 7 accepted points. Deviation $\sigma_w = 1.261$.

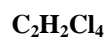
Coefficient	$\rho = A + BT$
A	2119.62
B	-1.500

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
283.30	1692.60 ± 2.00	-2.09	1880-tho	293.15	1681.00 ± 1.50	1.11	1943-mcg
298.15	1671.20 ± 2.00	-1.19	1912-her/rat	293.15	1681.30 ± 1.50	1.41	1950-mum/phi
298.15	1671.10 ± 2.00	-1.27	1918-her-2	298.15	1674.00 ± 1.50	1.61	1950-mum/phi
293.15	1679.20 ± 1.00	-0.69	1935-ear/gla				

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	1699.6 ± 2.3
290.00	1684.6 ± 2.0
293.15	1679.9 ± 1.9
298.15	1672.4 ± 2.0

1,1,1,2-Tetrachloroethane**[630-20-6]****MW = 167.85****198****Table 1.** Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.036$.

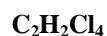
Coefficient	$\rho = A + BT$
A	1997.89
B	-1.560

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	1546.60 \pm 4.00	6.03	1885-kan-2 ¹⁾	298.15	1532.80 \pm 0.80	-0.00	1949-dre/mar
293.15	1553.20 \pm 5.00	12.63	1936-hen/hub ¹⁾	298.25	1543.70 \pm 4.00	11.13	1952-bra/sch ¹⁾
298.15	1545.00 \pm 4.00	12.23	1941-hou ¹⁾	293.15	1540.60 \pm 0.50	0.03	1985-kov/svo-1
293.15	1540.50 \pm 0.80	-0.06	1949-dre/mar				

¹⁾ Not included in calculation of linear coefficients.**Table 3.** Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1545.5 \pm 0.5
293.15	1540.6 \pm 0.3
298.15	1532.8 \pm 0.5

1,1,2,2-Tetrachloroethane**[79-34-5]****MW = 167.85****199****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 4.3722 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 9.5399 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 373.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$2.02518 \cdot 10^3$
B	-1.39487
C	$-2.57412 \cdot 10^{-4}$

cont.

1,1,2,2-Tetrachloroethane (cont.)**Table 2.** Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
273.15	1626.36 ± 0.60	1.39	1926-tim/mar(×)	313.15	1563.09 ± 0.37	-0.05	1958-afe(×)
288.15	1602.51 ± 0.60	0.63	1926-tim/mar ¹⁾	323.15	1547.56 ± 0.36	0.01	1958-afe(×)
303.15	1578.56 ± 0.60	-0.11	1926-tim/mar ¹⁾	333.15	1531.93 ± 0.35	0.02	1958-afe(×)
283.15	1610.10 ± 0.40	0.51	1949-lag/mcm(×)	343.15	1516.30 ± 0.46	0.08	1958-afe(×)
293.15	1594.70 ± 0.40	0.54	1949-lag/mcm(×)	353.15	1500.26 ± 0.45	-0.22	1958-afe(×)
303.15	1578.90 ± 0.40	0.23	1949-lag/mcm ¹⁾	363.15	1484.58 ± 0.44	-0.11	1958-afe(×)
313.15	1563.21 ± 0.40	0.07	1949-lag/mcm(×)	373.15	1468.82 ± 0.43	-0.02	1958-afe(×)
323.15	1547.30 ± 0.40	-0.25	1949-lag/mcm(×)	303.15	1578.51 ± 0.30	-0.16	1985-cho/nai(Δ)
273.15	1624.04 ± 0.40	-0.93	1958-afe(×)	303.15	1578.66 ± 0.30	-0.01	1989-bha/nai(∇)
283.15	1609.17 ± 0.39	-0.42	1958-afe(×)	298.15	1586.28 ± 0.30	-0.14	1995-kum/rao(◆)
293.15	1593.88 ± 0.38	-0.28	1958-afe(×)	298.15	1586.28 ± 0.30	-0.14	1995-kum/rao-1(○)
293.15	1593.97 ± 0.30	-0.19	1958-afe(×)	303.15	1578.57 ± 0.30	-0.10	1996-kri/sur(□)
303.15	1578.58 ± 0.37	-0.09	1958-afe ¹⁾	293.15	1594.54 ± 0.40	0.38	2000-nat/nat(×)

¹⁾ Not included in Fig. 1.

Further references: [1908-pat/tho, 1909-vel, 1912-her/rat, 1912-wal/swi, 1913-wal/swi, 1922-dep, 1922-how, 1923-coh/dem, 1926-mat, 1928-ano, 1929-wal/glo, 1936-bre, 1941-bat/haz, 1941-hou, 1941-suh/kle, 1943-mcg, 1944-sch, 1946-fri/sto, 1948-lag/eva, 1948-vog-5, 1950-mum/phi, 1951-jet/roe, 1955-ger/har, 1965-for/moo, 1977-rao/vis, 1979-pat/sun, 1982-rao/vis-1, 1983-nat/tri, 1985-kov/svo-1, 1985-red/rao-2, 1986-ash/sri, 1988-sur/ram-1, 1989-agn/pra, 1990-siv/rao, 1991-com/fra, 1995-com/fra-1, 1995-com/fra-5, 1999-sas/geo].

Table 3. Recommended values (fit to the reliable experimental values according to the equations

$$\rho = A + BT + CT^2 + DT^3 + \dots \text{ or } \rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4].$$

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1629.80 ± 0.61	300.00	1583.55 ± 0.35	350.00	1505.45 ± 0.44
280.00	1614.44 ± 0.48	310.00	1568.04 ± 0.33	360.00	1489.67 ± 0.54
290.00	1599.02 ± 0.40	320.00	1552.47 ± 0.33	370.00	1473.84 ± 0.66
293.15	1594.16 ± 0.38	330.00	1536.84 ± 0.34	380.00	1457.96 ± 0.82
298.15	1586.42 ± 0.35	340.00	1521.17 ± 0.38		

cont.

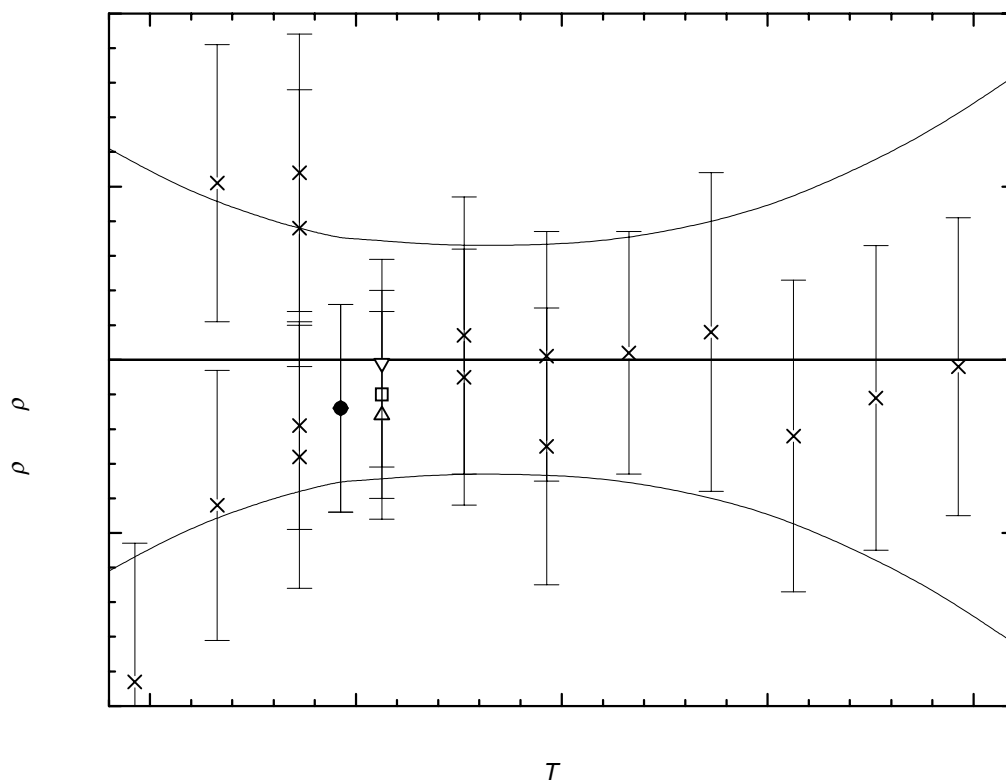


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

1,1,1-Trichloroethane

[71-55-6]

C₂H₃Cl₃

MW = 133.40

200

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 2.6091 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 9.7484 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 335.45 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.77796 \cdot 10^3$
<i>B</i>	-1.34557
<i>C</i>	$-5.31632 \cdot 10^{-4}$

cont.

1,1,1-Trichloroethane (cont.)**Table 2.** Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
<i>crystal</i>				298.15	1329.85 ± 0.30	0.33	1986-pau/kru(∇)
128.15	1687.0 ± 20.0		1972-sil/rud	298.15	1329.94 ± 0.30	0.42	1987-hne/doh(Δ)
213.15	1634.0 ± 20.0		1972-sil/rud	303.15	1320.90 ± 0.40	-0.30	1988-cha/sur(×)
<i>liquid</i>				303.15	1320.92 ± 0.70	-0.28	1988-sur/ram-1(×)
293.15	1337.60 ± 2.00	-0.22	1948-vog-5 ¹⁾	303.15	1320.89 ± 0.46	-0.31	1989-bha/nai(×)
301.45	1323.90 ± 2.00	-0.13	1948-vog-5 ¹⁾	298.15	1329.90 ± 0.40	0.38	1990-fer/lap(×)
313.95	1303.10 ± 2.00	-0.02	1948-vog-5 ¹⁾	303.15	1321.02 ± 0.40	-0.18	1990-sri/nai(◆)
335.45	1268.40 ± 2.00	1.63	1948-vog-5(×)	298.15	1329.78 ± 0.40	0.26	1994-com/fra-1(×)
273.15	1370.68 ± 0.30	-0.07	1955-tim/hen(□)	298.15	1329.32 ± 0.30	-0.20	1994-del/fer(○)
288.15	1345.87 ± 0.30	-0.22	1955-tim/hen(□)	298.15	1329.72 ± 0.50	0.20	1995-com/fra-1(×)
303.15	1320.96 ± 0.30	-0.24	1955-tim/hen(□)	298.15	1329.73 ± 0.60	0.21	1995-com/fra-5(×)
303.15	1320.60 ± 0.50	-0.60	1977-rao/vis(×)	298.15	1329.50 ± 0.50	-0.02	1995-kum/rao(×)
303.15	1320.60 ± 0.50	-0.60	1979-pat/sun(×)	298.15	1329.50 ± 0.50	-0.02	1995-kum/rao-1(×)
293.15	1338.05 ± 0.60	0.23	1982-dig/jad(×)	303.15	1320.92 ± 0.50	-0.28	1996-kri/sur(×)
303.15	1321.10 ± 0.70	-0.10	1982-vis/rao(×)	293.15	1337.57 ± 0.76	-0.25	2000-nat/nat(×)

¹⁾ Not included in Fig. 1.

Further references: [1884-per, 1885-per-2, 1935-ear/gla, 1936-hen/hub, 1954-leb, 1956-ano, 1965-mal/hil, 1971-bra/joh, 1985-red/rao-2, 1990-siv/rao].

Table 3. Recommended values (fit to the reliable experimental values according to the equations

$$\rho = A + BT + CT^2 + DT^3 + \dots \text{ or } \rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4].$$

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1375.90 ± 0.54	298.15	1329.52 ± 0.46	330.00	1276.03 ± 1.77
280.00	1359.52 ± 0.46	300.00	1326.44 ± 0.47	340.00	1259.01 ± 2.79
290.00	1343.04 ± 0.44	310.00	1309.75 ± 0.65	350.00	1241.89 ± 4.15
293.15	1337.82 ± 0.44	320.00	1292.94 ± 1.08		

cont.

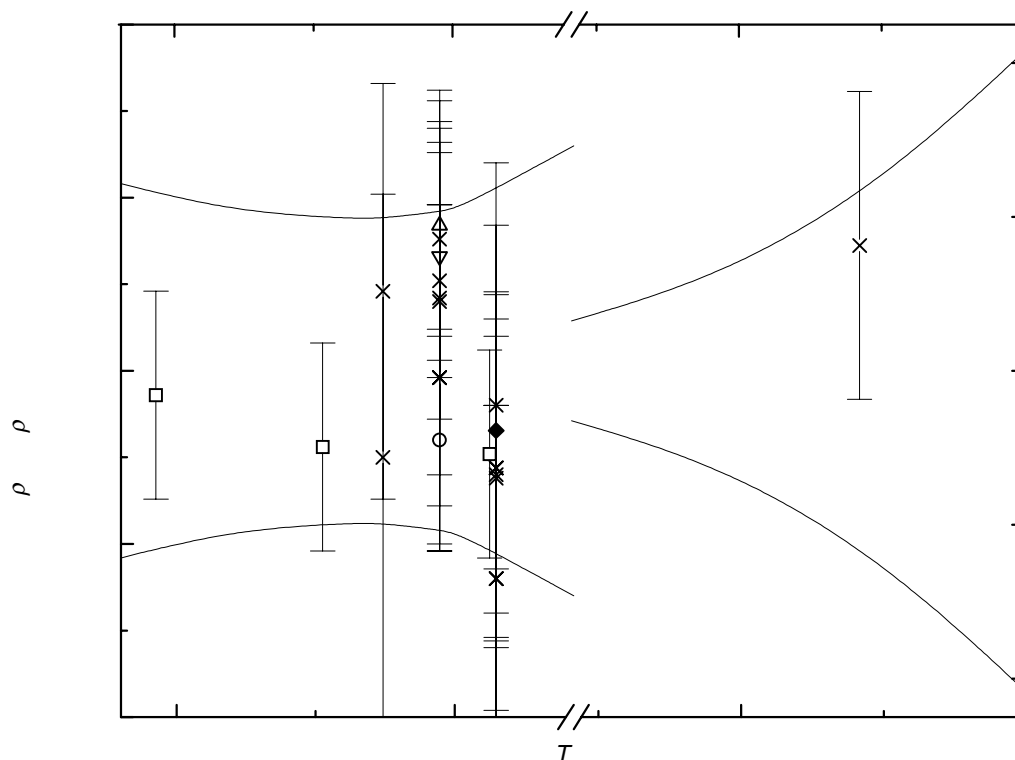


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

1,1,2-Trichloroethane

[79-00-5]

C₂H₃Cl₃

MW = 133.40

201

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 5.8999 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.3155 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 303.15 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.70243 \cdot 10^3$
<i>B</i>	$-2.37475 \cdot 10^{-1}$
<i>C</i>	$-2.23726 \cdot 10^{-3}$

cont.

1,1,2-Trichloroethane (cont.)

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{cal}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
293.15	1440.50 ± 1.00	-0.05	1935-des-1(×)	293.15	1440.76 ± 1.00	0.21	1954-mar-1(×)
293.15	1441.10 ± 1.00	0.55	1936-hen/hub(×)	273.15	1470.57 ± 0.30	-0.07	1955-tim/hen(□)
293.15	1441.20 ± 1.50	0.65	1946-tre/web(×)	289.00	1446.17 ± 0.30	-0.77	1955-tim/hen(□)
293.15	1439.50 ± 0.50	-1.05	1949-dre/mar(Δ)	293.15	1439.82 ± 0.30	-0.73	1955-tim/hen(□)
298.15	1431.83 ± 0.50	-0.92	1949-dre/mar(Δ)	303.15	1424.55 ± 0.30	-0.28	1955-tim/hen(□)
293.15	1442.40 ± 1.00	1.85	1950-mum/phi(×)	293.15	1440.76 ± 1.00	0.21	1957-ano(×)
298.15	1435.50 ± 1.00	2.75	1950-mum/phi(×)	293.15	1440.70 ± 1.00	0.15	1968-ano(×)
293.15	1439.64 ± 0.60	-0.91	1952-ano(∇)	293.15	1440.10 ± 0.60	-0.45	1980-coc/dia(◆)
298.15	1431.90 ± 0.60	-0.85	1952-ano(∇)	293.15	1440.90 ± 0.40	0.35	1985-kov/svo-1(○)
303.15	1424.16 ± 0.60	-0.67	1952-ano(∇)				

Further references: [1851-pie, 1880-kan, 1883-sch-3, 1885-kan-2, 1925-pri, 1928-mum/phi, 1935-por/sef, 1941-bat/haz, 1943-mcg, 1944-mcc, 1949-yak/lem].

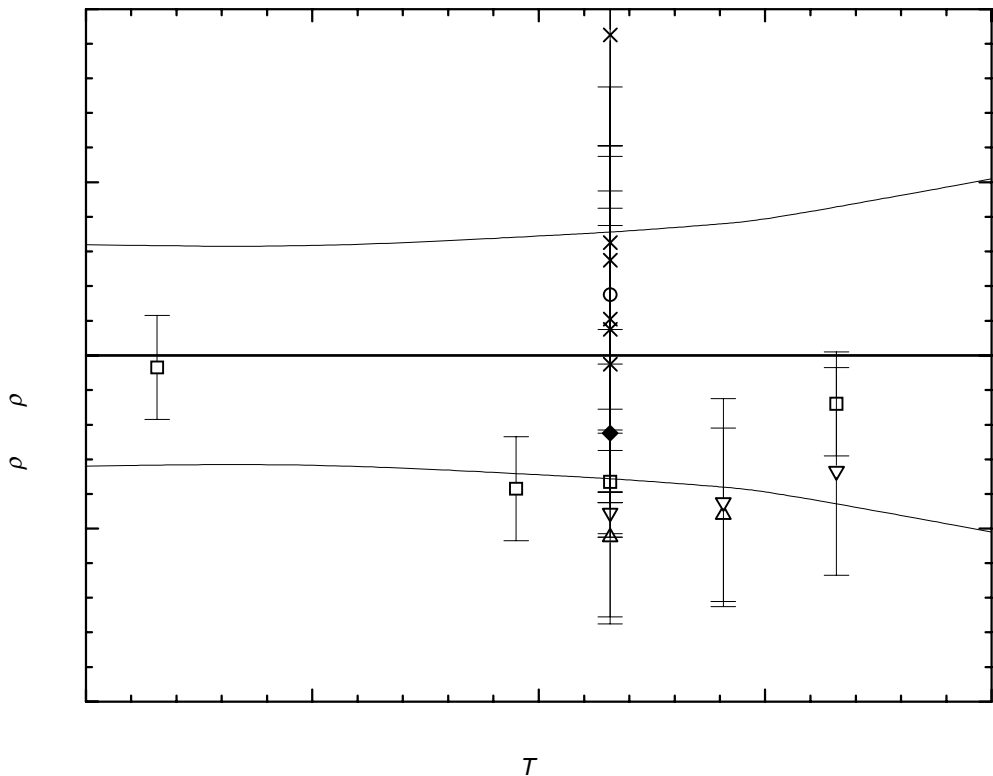


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

cont.

Table 3. Recommended values (fit to the reliable experimental values according to the equations

$$\rho = A + BT + CT^2 + DT^3 + \dots \text{ or } \rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$$

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1475.21 ± 0.64	293.15	1440.55 ± 0.71	310.00	1413.81 ± 1.02
280.00	1460.53 ± 0.62	298.15	1432.75 ± 0.76		
290.00	1445.41 ± 0.69	300.00	1429.83 ± 0.78		

1,1-Dichloroethane

[75-34-3]



MW = 98.96

202

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction):

$\sigma_{c,w} = 9.8056 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 4.8580 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 282.95 \text{ to } 330.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.12841 \cdot 10^3$
<i>B</i>	1.77713
<i>C</i>	$-5.51433 \cdot 10^{-3}$

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
293.15	1174.30 ± 2.00	-1.19	1880-bru-1(◆)	330.15	1114.10 ± 2.00	0.03	1884-sch-6(Δ)
283.20	1189.70 ± 2.00	0.27	1880-tho(∇)	293.15	1175.00 ± 0.50	-0.49	1888-wee(×)
285.39	1186.30 ± 2.00	-0.16	1880-tho(∇)	290.25	1180.90 ± 2.00	1.23	1948-vog-5(○)
289.78	1178.10 ± 2.00	-2.23	1880-tho(∇)	293.15	1177.60 ± 2.00	2.11	1948-vog-5(○)
289.98	1177.90 ± 2.00	-2.15	1880-tho(∇)	296.45	1173.90 ± 2.00	3.27	1948-vog-5(○)
282.95	1189.50 ± 1.00	-0.27	1883-sch-3(□)	314.55	1153.50 ± 3.00	11.69	1948-vog-5 ¹⁾
329.85	1114.20 ± 1.00	-0.43	1883-sch-3(□)				

¹⁾ Not included in Fig. 1.**Further references:** [1884-gla, 1955-ste/mar, 1985-kov/svo-1].

cont.

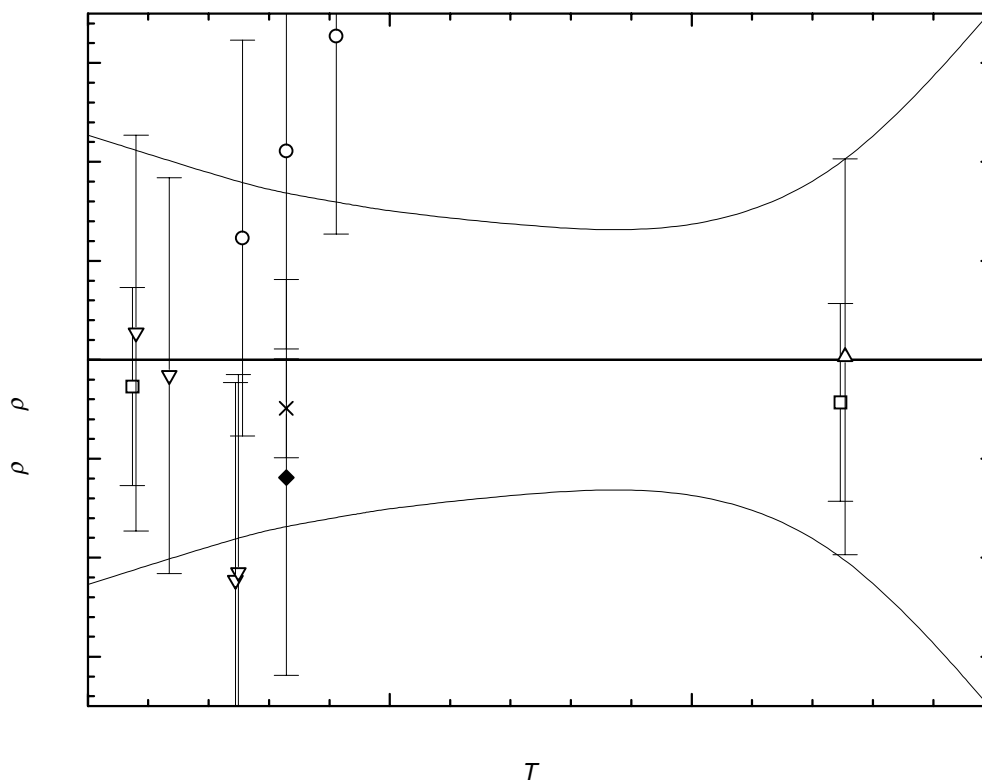
1,1-Dichloroethane (cont.)

Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

Table 3. Recommended values (fit to the reliable experimental values according to the equations

$$\rho = A + BT + CT^2 + DT^3 + \dots \text{ or } \rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$$

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	1193.68 ± 2.27	298.15	1168.07 ± 1.55	320.00	1132.42 ± 1.27
290.00	1180.02 ± 1.79	300.00	1165.26 ± 1.50	330.00	1114.35 ± 1.81
293.15	1175.49 ± 1.68	310.00	1149.39 ± 1.33	340.00	1095.18 ± 3.55

1,2-Dichloroethane**[107-06-2]****MW = 98.96****203**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 3.5525 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 8.2194 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 356.45 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.59111 \cdot 10^3$
<i>B</i>	$-8.61460 \cdot 10^{-1}$
<i>C</i>	$-9.97901 \cdot 10^{-4}$

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
273.15	1280.78 ± 0.50	-0.57	1880-tho(×)	303.15	1238.32 ± 0.30	0.07	1985-ven/ram(×)
282.95	1265.60 ± 1.00	-1.87	1883-sch-3 ¹⁾	298.15	1245.90 ± 0.30	0.34	1986-pau/kru(∇)
356.45	1157.60 ± 1.00	0.35	1883-sch-3(×)	303.15	1238.30 ± 0.30	0.05	1987-kri/cho(×)
287.55	1259.51 ± 0.60	-1.38	1896-per ¹⁾	298.15	1245.80 ± 0.30	0.24	1990-cha/kat-1(Δ)
335.65	1188.47 ± 0.60	-1.07	1896-per(×)	298.15	1245.50 ± 0.50	-0.06	1990-jos/ami-2 ¹⁾
273.15	1281.61 ± 0.40	0.26	1928-tim/mar(×)	303.15	1238.20 ± 0.50	-0.05	1990-jos/ami-2 ¹⁾
288.15	1259.97 ± 0.40	-0.05	1928-tim/mar(×)	308.15	1230.40 ± 0.50	-0.49	1990-jos/ami-2(×)
303.15	1238.27 ± 0.40	0.02	1928-tim/mar ¹⁾	313.15	1223.40 ± 0.50	-0.09	1990-jos/ami-2(×)
288.15	1259.60 ± 0.50	-0.42	1931-tre/spe(×)	278.15	1274.89 ± 0.60	0.60	1990-mal/pri(×)
293.15	1252.40 ± 0.40	-0.42	1949-lag/mcm(×)	298.15	1245.98 ± 0.60	0.42	1990-mal/pri ¹⁾
303.15	1237.90 ± 0.40	-0.35	1949-lag/mcm ¹⁾	323.15	1208.91 ± 0.60	0.39	1990-mal/pri(×)
313.15	1223.00 ± 0.40	-0.49	1949-lag/mcm(×)	338.15	1186.31 ± 0.60	0.61	1990-mal/pri(×)
323.15	1209.00 ± 0.40	0.48	1949-lag/mcm(×)	298.15	1245.58 ± 0.30	0.02	1990-mun/ber(□)
293.15	1252.92 ± 0.30	0.10	1984-nig/sin(◆)	298.15	1245.67 ± 0.30	0.11	1994-com/fra-1(×)
303.15	1238.25 ± 0.30	-0.00	1985-red/rao-2(×)	298.15	1245.56 ± 0.30	0.00	2000-mus/pos(×)
298.15	1245.35 ± 0.30	-0.21	1985-sin/sha(○)	293.15	1253.00 ± 0.40	0.18	2001-vit/red(×)

¹⁾ Not included in Fig. 1.

Further references: [1880-bru-1, 1884-gla, 1884-sch-6, 1888-wee, 1894-jah/mol, 1908-ric/mat, 1910-tim, 1912-fau, 1926-mat, 1944-sch, 1948-lag/eva, 1949-dre/mar, 1955-ste/mar, 1965-for/moo, 1967-han/hac, 1968-ano, 1969-sub/nag, 1972-kum/raj, 1973-jag/vis, 1976-sun/vis, 1979-pat/sun, 1979-wil/far, 1980-coc/dia, 1980-kri/nai, 1982-rao/vis, 1984-sin/nig, 1988-sur/ram-1, 1989-mat/gon, 1990-cha/kat, 1990-siv/rao, 1993-bla/ort-1, 1993-jan/xie, 1995-com/fra-5, 1995-kum/rao, 1995-kum/rao-1, 1995-sen/say, 1996-kri/sur].

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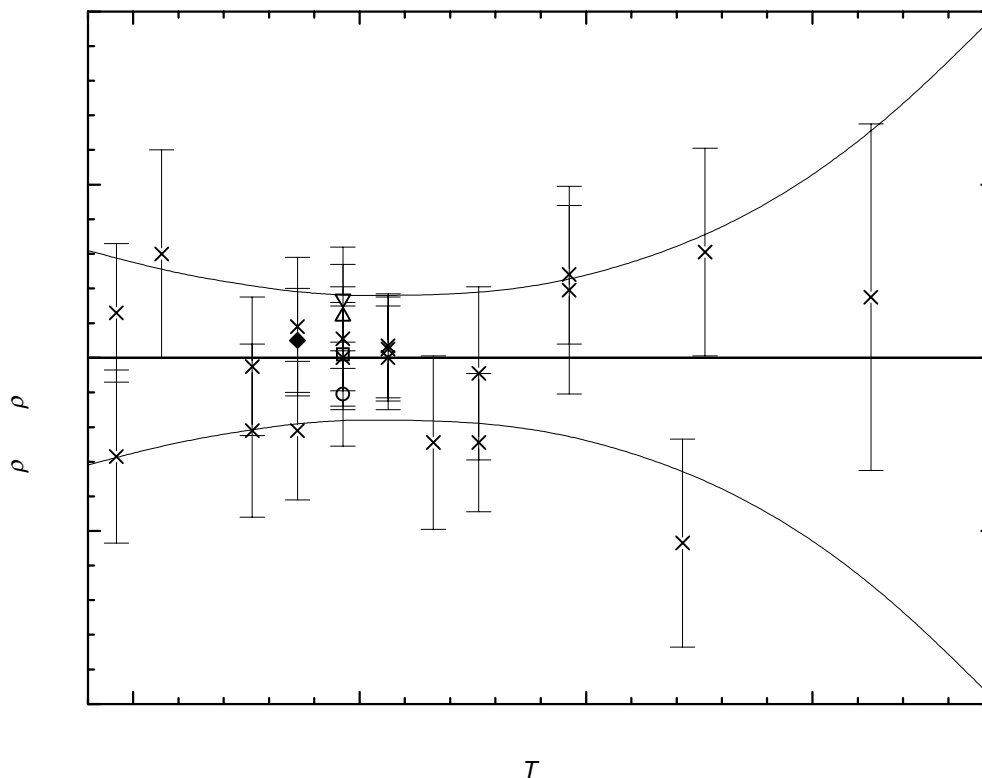
1,2-Dichloroethane (cont.)

Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

Table 3. Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ or $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$).

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1285.77 ± 0.62	300.00	1242.86 ± 0.36	350.00	1167.36 ± 1.04
280.00	1271.67 ± 0.48	310.00	1228.16 ± 0.36	360.00	1151.66 ± 1.45
290.00	1257.36 ± 0.40	320.00	1213.26 ± 0.41	370.00	1135.76 ± 1.97
293.15	1252.82 ± 0.38	330.00	1198.16 ± 0.54		
298.15	1245.56 ± 0.36	340.00	1182.86 ± 0.74		

Chloroethane

[75-00-3]



MW = 64.51

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Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 5.4552 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.5031 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 118.45 \text{ to } 363.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.32818 \cdot 10^3$
<i>B</i>	-2.05748
<i>C</i>	$3.96165 \cdot 10^{-3}$
<i>D</i>	$-6.77043 \cdot 10^{-6}$

Table 2. Experimental values with uncertainties and deviation from calculated values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
243.15	966.18 ± 2.00	1.38	1923-jen(×)	128.15	1115.40 ± 1.00	0.07	1968-mcm/cro(Δ)
303.15	877.96 ± 2.00	-1.95	1923-jen(×)	134.75	1106.30 ± 1.00	-0.01	1968-mcm/cro(Δ)
273.15	923.88 ± 0.40	0.10	1937-tim/hen(○)	140.15	1100.00 ± 1.00	1.00	1968-mcm/cro(Δ)
288.15	902.78 ± 0.40	0.51	1937-tim/hen(○)	160.95	1071.80 ± 1.00	0.37	1968-mcm/cro(Δ)
293.15	897.00 ± 2.00	2.08	1943-mcg(×)	174.55	1054.20 ± 1.00	0.45	1968-mcm/cro(Δ)
285.45	906.20 ± 1.00	-0.00	1953-nod/gro(∇)	182.85	1042.90 ± 1.00	-0.14	1968-mcm/cro(Δ)
259.15	943.40 ± 0.40	0.19	1956-gil/lag(□)	194.75	1027.00 ± 1.00	-0.73	1968-mcm/cro(Δ)
261.15	940.70 ± 0.40	0.23	1956-gil/lag(□)	203.15	1016.00 ± 1.00	-0.94	1968-mcm/cro(Δ)
264.15	936.40 ± 0.40	0.06	1956-gil/lag(□)	216.65	998.50 ± 1.00	-1.03	1968-mcm/cro(Δ)
267.15	932.10 ± 0.40	-0.08	1956-gil/lag(□)	261.15	938.00 ± 1.00	-2.47	1968-mcm/cro ¹⁾
270.15	927.80 ± 0.40	-0.20	1956-gil/lag(□)	273.15	921.40 ± 1.00	-2.38	1968-mcm/cro ¹⁾
273.15	923.70 ± 0.40	-0.08	1956-gil/lag(□)	293.15	896.40 ± 1.50	1.48	1988-rut(◆)
276.15	919.30 ± 0.40	-0.24	1956-gil/lag(□)	313.15	864.80 ± 1.50	0.34	1988-rut(◆)
279.15	915.00 ± 0.40	-0.27	1956-gil/lag(□)	333.15	832.70 ± 1.50	0.61	1988-rut(◆)
282.15	910.70 ± 0.40	-0.27	1956-gil/lag(□)	363.15	778.10 ± 1.50	-1.12	1988-rut(◆)
285.15	906.30 ± 0.40	-0.34	1956-gil/lag(□)	393.15	714.30 ± 1.50	-5.90	1988-rut ¹⁾
118.45	1128.10 ± 1.00	-0.71	1968-mcm/cro(Δ)	423.15	633.60 ± 1.50	-20.34	1988-rut ¹⁾
122.85	1121.90 ± 1.00	-0.76	1968-mcm/cro(Δ)				

¹⁾ Not included in Fig. 1.

Further references: [1848-pie-1, 1871-lin-1, 1879-ram, 1885-per-1, 1898-dar, 1902-eve].

cont.

Chloroethane (cont.)

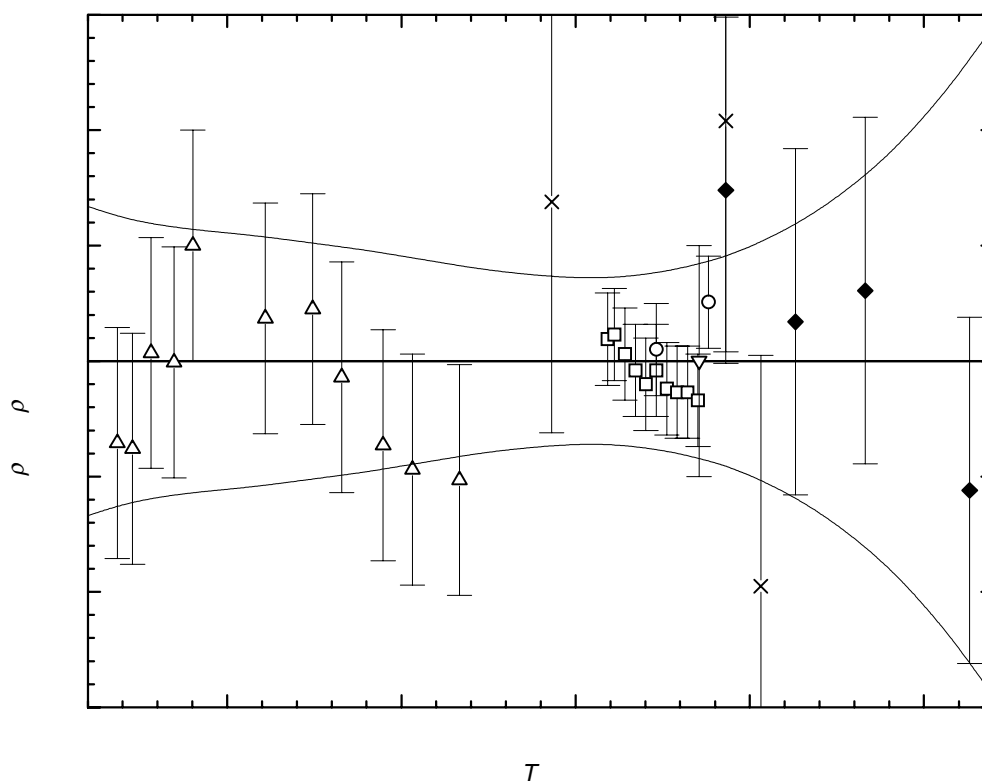


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the symbols are omitted for clarity of the figure.)

Table 3. Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ or $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$).

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
110.00	1140.78 ± 1.34	210.00	1008.12 ± 0.86	298.15	887.47 ± 0.97
120.00	1126.63 ± 1.24	220.00	995.19 ± 0.81	300.00	884.69 ± 0.99
130.00	1112.79 ± 1.18	230.00	982.16 ± 0.77	310.00	869.38 ± 1.13
140.00	1099.21 ± 1.14	240.00	968.98 ± 0.74	320.00	853.61 ± 1.31
150.00	1085.85 ± 1.11	250.00	955.63 ± 0.72	330.00	837.33 ± 1.53
160.00	1072.67 ± 1.08	260.00	942.05 ± 0.72	340.00	820.50 ± 1.79
170.00	1059.64 ± 1.04	270.00	928.20 ± 0.75	350.00	803.08 ± 2.11
180.00	1046.71 ± 1.00	280.00	914.06 ± 0.80	360.00	785.04 ± 2.48
190.00	1033.84 ± 0.96	290.00	899.56 ± 0.88	370.00	766.32 ± 2.91
200.00	1020.99 ± 0.91	293.15	894.92 ± 0.91		