

2.5.2 Bromofluoroalkanes

Bromotrifluoromethane

[75-63-8]

CBrF₃

MW = 148.91

501

$T_c = 340.08 \text{ K}$ [1985-hig/uem]

$\rho_c = 764.00 \text{ kg} \cdot \text{m}^{-3}$ [1985-hig/uem]

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_t = 3.0130 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 1.1339$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.0142 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 175.15 \text{ to } 260.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 260.00 \text{ to } 340.08 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$2.68041 \cdot 10^3$	$8.62706 \cdot 10^{-1}$
<i>B</i>	$-2.43942 \cdot 10^{-4}$	$-1.35131 \cdot 10^{-2}$
<i>C</i>	$-3.49241 \cdot 10^{-2}$	$1.14702 \cdot 10^{-4}$
<i>D</i>	$1.42689 \cdot 10^{-4}$	$-3.97623 \cdot 10^{-7}$
<i>E</i>	$-2.30972 \cdot 10^{-7}$	

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)	T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)
183.43	2125.00 ± 1.00	0.54	1977-gun/kar(□)	203.15	2041.80 ± 1.50	-0.16	1981-sol/sha(Δ)
191.06	2094.00 ± 1.00	1.10	1977-gun/kar(□)	205.15	2033.30 ± 1.50	-0.10	1981-sol/sha(Δ)
200.26	2056.00 ± 1.00	1.74	1977-gun/kar ¹⁾	207.15	2024.70 ± 1.50	-0.10	1981-sol/sha(Δ)
210.51	2013.00 ± 1.00	2.76	1977-gun/kar ¹⁾	209.15	2016.10 ± 1.50	-0.05	1981-sol/sha(Δ)
175.15	2158.20 ± 1.50	-0.11	1981-sol/sha(Δ)	211.15	2007.40 ± 1.50	-0.05	1981-sol/sha(Δ)
177.15	2150.00 ± 1.50	-0.17	1981-sol/sha(Δ)	213.15	1998.70 ± 1.50	-0.00	1981-sol/sha(Δ)
179.15	2141.80 ± 1.50	-0.20	1981-sol/sha(Δ)	215.15	1989.90 ± 1.50	-0.00	1981-sol/sha(Δ)
181.15	2133.70 ± 1.50	-0.12	1981-sol/sha(Δ)	217.15	1981.10 ± 1.50	0.05	1981-sol/sha(Δ)
183.15	2125.40 ± 1.50	-0.21	1981-sol/sha(Δ)	219.15	1972.20 ± 1.50	0.07	1981-sol/sha(Δ)
185.15	2117.20 ± 1.50	-0.18	1981-sol/sha(Δ)	221.15	1963.20 ± 1.50	0.04	1981-sol/sha(Δ)
187.15	2108.90 ± 1.50	-0.22	1981-sol/sha(Δ)	223.15	1954.20 ± 1.50	0.09	1981-sol/sha(Δ)
189.15	2100.60 ± 1.50	-0.24	1981-sol/sha(Δ)	225.15	1945.10 ± 1.50	0.09	1981-sol/sha(Δ)
191.15	2092.30 ± 1.50	-0.23	1981-sol/sha(Δ)	227.15	1935.90 ± 1.50	0.07	1981-sol/sha(Δ)
193.15	2084.00 ± 1.50	-0.18	1981-sol/sha(Δ)	229.15	1926.70 ± 1.50	0.12	1981-sol/sha(Δ)
195.15	2075.60 ± 1.50	-0.21	1981-sol/sha(Δ)	231.15	1917.40 ± 1.50	0.15	1981-sol/sha(Δ)
197.15	2067.20 ± 1.50	-0.20	1981-sol/sha(Δ)	233.15	1908.00 ± 1.50	0.16	1981-sol/sha(Δ)
199.15	2058.80 ± 1.50	-0.16	1981-sol/sha(Δ)	235.15	1898.50 ± 1.50	0.16	1981-sol/sha(Δ)
201.15	2050.30 ± 1.50	-0.18	1981-sol/sha(Δ)	237.15	1888.90 ± 1.50	0.14	1981-sol/sha(Δ)

¹⁾ Not included in Fig. 1.

cont.

Bromotrifluoromethane (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)
239.15	1879.20 \pm 1.50	0.11	1981-sol/sha(Δ)	305.15	1475.40 \pm 1.70	-0.04	1981-sol/sha(Δ)
241.15	1869.40 \pm 1.50	0.07	1981-sol/sha(Δ)	307.15	1458.30 \pm 1.70	-0.25	1981-sol/sha(Δ)
243.15	1859.50 \pm 1.60	0.03	1981-sol/sha(Δ)	309.15	1440.60 \pm 1.70	-0.50	1981-sol/sha(Δ)
245.15	1849.50 \pm 1.60	0.00	1981-sol/sha(Δ)	311.15	1422.40 \pm 1.70	-0.63	1981-sol/sha(Δ)
247.15	1839.40 \pm 1.60	-0.03	1981-sol/sha(Δ)	313.15	1403.60 \pm 1.70	-0.67	1981-sol/sha(Δ)
249.15	1829.20 \pm 1.60	-0.05	1981-sol/sha(Δ)	315.15	1384.10 \pm 1.70	-0.65	1981-sol/sha(Δ)
251.15	1818.90 \pm 1.60	-0.05	1981-sol/sha(Δ)	317.15	1363.90 \pm 1.70	-0.45	1981-sol/sha(Δ)
253.15	1808.50 \pm 1.60	-0.03	1981-sol/sha(Δ)	319.15	1342.90 \pm 1.70	-0.06	1981-sol/sha(Δ)
255.15	1798.00 \pm 1.60	0.00	1981-sol/sha(Δ)	321.15	1320.80 \pm 1.70	0.37	1981-sol/sha(Δ)
257.15	1787.40 \pm 1.60	0.07	1981-sol/sha(Δ)	323.15	1297.00 \pm 1.70	0.44	1981-sol/sha(Δ)
259.15	1776.70 \pm 1.60	0.17	1981-sol/sha(Δ)	324.15	1284.30 \pm 1.70	0.25	1981-sol/sha(Δ)
261.15	1765.80 \pm 1.60	0.20	1981-sol/sha(Δ)	325.15	1271.30 \pm 1.80	0.21	1981-sol/sha(Δ)
263.15	1754.80 \pm 1.60	0.27	1981-sol/sha(Δ)	326.15	1257.80 \pm 1.80	0.15	1981-sol/sha(Δ)
265.15	1743.60 \pm 1.60	0.28	1981-sol/sha(Δ)	327.15	1243.80 \pm 1.80	0.14	1981-sol/sha(Δ)
267.15	1732.20 \pm 1.60	0.24	1981-sol/sha(Δ)	328.15	1229.10 \pm 1.80	0.04	1981-sol/sha(Δ)
269.15	1720.70 \pm 1.60	0.25	1981-sol/sha(Δ)	329.15	1213.50 \pm 1.80	-0.26	1981-sol/sha(Δ)
271.15	1709.00 \pm 1.60	0.22	1981-sol/sha(Δ)	330.15	1197.10 \pm 1.80	-0.55	1981-sol/sha(Δ)
273.15	1697.10 \pm 1.60	0.15	1981-sol/sha(Δ)	331.15	1179.70 \pm 1.80	-0.91	1981-sol/sha(Δ)
275.15	1685.00 \pm 1.60	0.05	1981-sol/sha(Δ)	332.15	1161.10 \pm 1.80	-1.34	1981-sol/sha(Δ)
277.15	1672.80 \pm 1.70	0.03	1981-sol/sha(Δ)	333.15	1141.30 \pm 1.80	-1.60	1981-sol/sha(Δ)
279.15	1660.40 \pm 1.70	0.00	1981-sol/sha(Δ)	334.15	1119.80 \pm 1.80	-1.87	1981-sol/sha(Δ)
281.15	1647.80 \pm 1.70	-0.02	1981-sol/sha(Δ)	335.15	1095.10 \pm 1.80	-3.12	1981-sol/sha(Δ)
283.15	1635.00 \pm 1.70	-0.04	1981-sol/sha(Δ)	336.15	1066.10 \pm 1.80	-5.66	1981-sol/sha(Δ)
285.15	1622.00 \pm 1.70	-0.03	1981-sol/sha(Δ)	337.15	1030.70 \pm 1.80	-10.16	1981-sol/sha ¹⁾
287.15	1608.80 \pm 1.70	0.02	1981-sol/sha(Δ)	338.15	985.80 \pm 1.80	-16.80	1981-sol/sha ¹⁾
289.15	1595.40 \pm 1.70	0.13	1981-sol/sha(Δ)	339.15	925.70 \pm 1.80	-22.83	1981-sol/sha ¹⁾
291.15	1581.70 \pm 1.70	0.21	1981-sol/sha(Δ)	340.31	746.50 \pm 0.00	-12.92	1981-sol/sha ¹⁾
293.15	1567.70 \pm 1.70	0.28	1981-sol/sha(Δ)	334.92	1108.00 \pm 1.00	4.16	1985-hig/uem(\circ)
295.15	1553.40 \pm 1.70	0.37	1981-sol/sha(Δ)	337.68	1024.20 \pm 1.00	2.39	1985-hig/uem(\circ)
297.15	1538.70 \pm 1.70	0.40	1981-sol/sha(Δ)	338.66	975.50 \pm 2.00	-2.59	1985-hig/uem(\circ)
299.15	1523.60 \pm 1.70	0.39	1981-sol/sha(Δ)	339.57	908.60 \pm 2.00	-5.01	1985-hig/uem(\circ)
301.15	1508.00 \pm 1.70	0.27	1981-sol/sha(Δ)	340.01	857.50 \pm 3.00	18.79	1985-hig/uem ¹⁾
303.15	1492.00 \pm 1.70	0.18	1981-sol/sha(Δ)	340.08	793.20 \pm 3.00	33.20	1985-hig/uem ¹⁾

¹⁾ Not included in Fig. 1.**Further references:** [1952-eis, 1969-gel/nik, 1973-jae, 1980-gel/por].

cont.

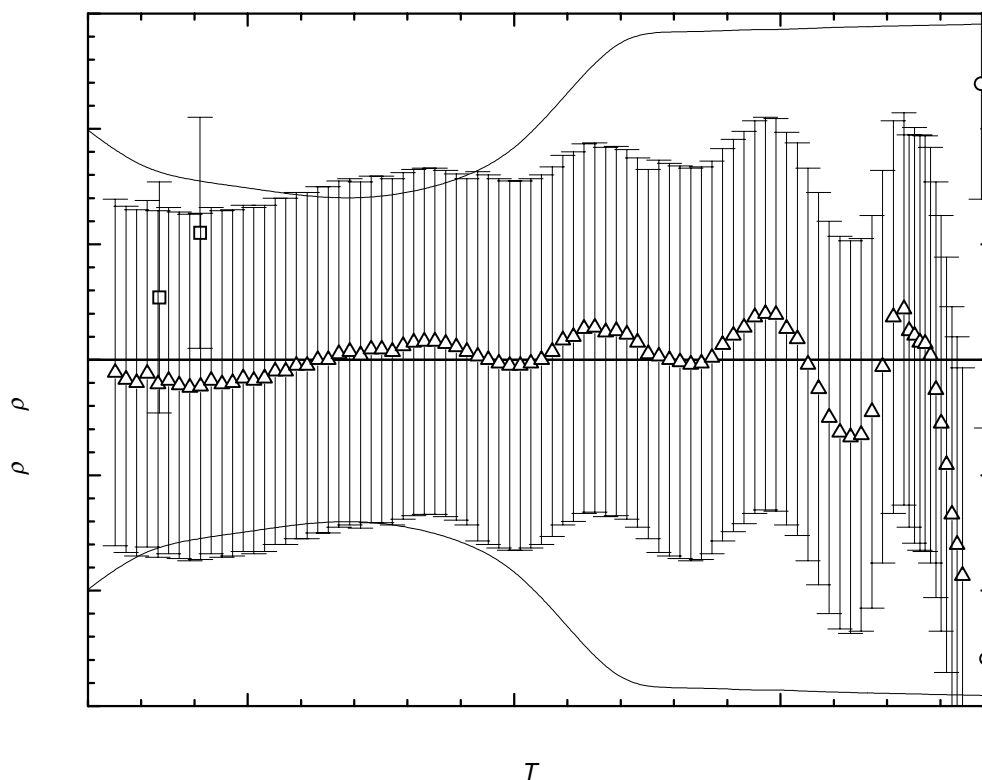


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the 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 $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$).

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
170.00	2179.19 ± 1.99	240.00	1874.96 ± 1.56	298.15	1530.81 ± 2.86
180.00	2138.53 ± 1.65	250.00	1824.88 ± 1.79	300.00	1516.68 ± 2.86
190.00	2097.31 ± 1.55	260.00	1771.90 ± 2.31	310.00	1433.50 ± 2.88
200.00	2055.36 ± 1.49	270.00	1715.51 ± 2.83	320.00	1333.54 ± 2.89
210.00	2012.46 ± 1.42	280.00	1655.08 ± 2.84	330.00	1200.13 ± 2.90
220.00	1968.32 ± 1.39	290.00	1589.45 ± 2.85	340.00	842.31 ± 2.91
230.00	1922.62 ± 1.44	293.15	1567.42 ± 2.86		

Dibromodifluoromethane**[75-61-6]****CB₂F₂****MW = 209.82****502**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 9.8132 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.3275 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 203.15 \text{ to } 371.83 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$3.15811 \cdot 10^3$
<i>B</i>	-2.35411
<i>C</i>	$-2.30621 \cdot 10^{-3}$

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)
371.83	1965.00 ± 2.00	1.06	1952-eis(□)	253.15	2415.30 ± 1.00	0.92	1969-gel/nik(O)
203.15	2584.60 ± 1.00	-0.10	1969-gel/nik(O)	263.15	2379.40 ± 1.00	0.47	1969-gel/nik(O)
213.15	2550.90 ± 1.00	-0.66	1969-gel/nik(O)	273.15	2344.00 ± 1.00	0.98	1969-gel/nik(O)
223.15	2517.60 ± 1.00	-0.35	1969-gel/nik(O)	283.15	2306.70 ± 1.00	0.05	1969-gel/nik(O)
233.15	2483.60 ± 1.00	-0.29	1969-gel/nik(O)	293.15	2267.20 ± 1.00	-2.62	1969-gel/nik(O)
243.15	2449.90 ± 1.00	0.54	1969-gel/nik(O)				

Further references: [1952-eis].

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	2595.04 ± 1.36	270.00	2354.38 ± 0.98	320.00	2168.64 ± 1.31
210.00	2562.05 ± 1.25	280.00	2318.16 ± 0.99	330.00	2130.11 ± 1.51
220.00	2528.59 ± 1.16	290.00	2281.47 ± 1.02	340.00	2091.12 ± 1.76
230.00	2494.67 ± 1.10	293.15	2269.82 ± 1.03	350.00	2051.67 ± 2.07
240.00	2460.29 ± 1.05	298.15	2251.23 ± 1.06	360.00	2011.75 ± 2.45
250.00	2425.45 ± 1.01	300.00	2244.32 ± 1.08	370.00	1971.37 ± 2.89
260.00	2390.15 ± 0.99	310.00	2206.71 ± 1.17	380.00	1930.54 ± 3.39

cont.

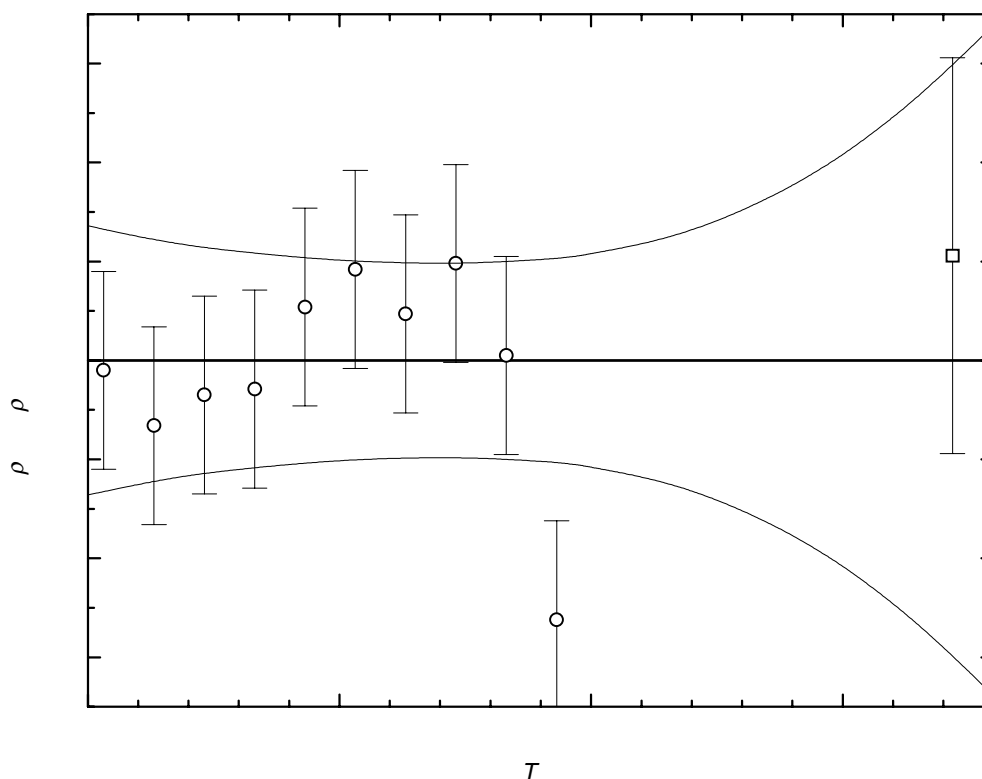


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

Bromodifluoromethane

[1511-62-2]

CHBrF₂

MW = 130.92

503

$T_c = 411.98 \text{ K}$ [1992-sal/wan]

$\rho_c = 784.00 \text{ kg}\cdot\text{m}^{-3}$ [1992-sal/wan]

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_t = 2.1877 \cdot 10^{-2}$ (low temperature range), $\sigma_{c,w} = 3.3526$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 9.9346 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 252.46 \text{ to } 320.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 320.00 \text{ to } 411.98 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$5.02454 \cdot 10^3$	$-3.79557 \cdot 10^{-1}$
<i>B</i>	$-1.74012 \cdot 10^1$	$2.01993 \cdot 10^{-2}$
<i>C</i>	$2.18139 \cdot 10^{-2}$	$-3.92246 \cdot 10^{-4}$
<i>D</i>		$2.00307 \cdot 10^{-6}$

cont.

Bromodifluoromethane (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)
252.46	2021.77 ± 1.50	-0.00	1992-sal/wan(□)	344.52	1604.76 ± 1.50	0.12	1992-sal/wan(□)
273.05	1899.48 ± 1.50	-0.03	1992-sal/wan(□)	374.40	1452.92 ± 1.50	2.42	1992-sal/wan(□)
273.15	1899.00 ± 1.50	0.04	1992-sal/wan(□)	395.88	1269.94 ± 2.50	1.23	1992-sal/wan(□)
303.22	1753.78 ± 1.50	0.00	1992-sal/wan(□)	410.23	1055.04 ± 5.00	47.12	1992-sal/wan ¹⁾

¹⁾ Not included in Fig. 1.

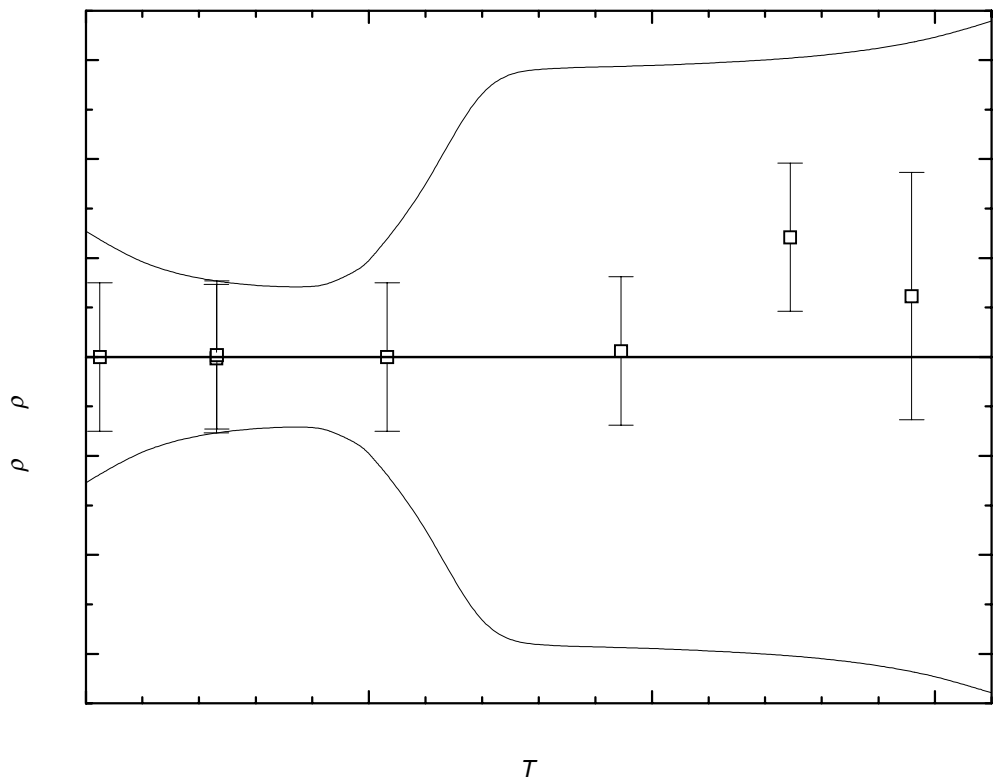


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
250.00	2037.61 ± 2.54	300.00	1767.44 ± 1.92	370.00	1478.81 ± 6.00
260.00	1974.85 ± 1.86	310.00	1726.49 ± 3.34	380.00	1410.92 ± 6.09
270.00	1916.46 ± 1.57	320.00	1689.91 ± 5.68	390.00	1328.00 ± 6.23
280.00	1862.42 ± 1.43	330.00	1656.41 ± 5.83	400.00	1219.44 ± 6.44
290.00	1812.75 ± 1.40	340.00	1621.72 ± 5.86	410.00	1017.48 ± 6.79
293.15	1798.00 ± 1.48	350.00	1582.21 ± 5.89		
298.15	1775.49 ± 1.76	360.00	1535.24 ± 5.94		

Bromopentafluoroethane

[354-55-2]

**MW = 198.92****504****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.
240.95	1949.20 ± 3.00	1953-nod/gro
273.15	1809.80 ± 3.00	1953-nod/gro

1,2-Dibromotetrafluoroethane

[124-73-2]

**MW = 259.82****505**

$T_c = 489.60 \text{ K [1978-amb]}$

$\rho_c = 750.00 \text{ kg} \cdot \text{m}^{-3} \text{ [1979-amb]}$

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_t = 9.4869 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 1.3416$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 4.5873 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 207.54 \text{ to } 390.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 390.00 \text{ to } 489.60 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$3.03254 \cdot 10^3$	6.95428
<i>B</i>	-2.77544	$-1.95985 \cdot 10^{-1}$
<i>C</i>	$7.10413 \cdot 10^{-4}$	$2.19703 \cdot 10^{-3}$
<i>D</i>	$-3.87411 \cdot 10^{-6}$	$-8.44639 \cdot 10^{-6}$

cont.

1,2-Dibromotetrafluoroethane (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>				379.92	1863.93 \pm 3.00	-4.26	1971-shi-1 ¹⁾
161.65	2750.0 \pm 5.0		1933-ruf/bre	404.86	1754.39 \pm 3.00	0.16	1971-shi-1(∇)
<i>liquid</i>				417.84	1690.05 \pm 3.00	7.65	1971-shi-1(∇)
213.15	2433.60 \pm 1.00	-2.12	1969-gel/nik(○)	431.39	1615.77 \pm 3.00	3.19	1971-shi-1(∇)
223.15	2405.10 \pm 1.00	-0.43	1969-gel/nik(○)	441.61	1553.28 \pm 3.00	-8.19	1971-shi-1(∇)
233.15	2375.40 \pm 1.00	0.43	1969-gel/nik(○)	452.04	1504.89 \pm 3.00	2.17	1971-shi-1(∇)
243.15	2345.30 \pm 1.00	1.30	1969-gel/nik(○)	463.54	1410.04 \pm 3.00	-4.77	1971-shi-1(∇)
253.15	2312.50 \pm 1.00	-0.12	1969-gel/nik(○)	472.98	1310.62 \pm 3.00	3.69	1971-shi-1(∇)
263.15	2281.90 \pm 1.00	1.12	1969-gel/nik(○)	480.16	1195.46 \pm 5.00	8.53	1971-shi-1(∇)
273.15	2248.00 \pm 1.00	-0.48	1969-gel/nik(○)	485.22	1062.36 \pm 5.00	-1.96	1971-shi-1(∇)
283.15	2215.80 \pm 1.00	0.11	1969-gel/nik(○)	207.54	2454.00 \pm 1.00	1.51	1977-gun/kar(Δ)
293.15	2180.70 \pm 1.00	-1.67	1969-gel/nik(○)	218.35	2420.00 \pm 1.00	-0.06	1977-gun/kar(Δ)
303.15	2149.10 \pm 1.00	0.58	1969-gel/nik(○)	228.63	2389.00 \pm 1.00	0.17	1977-gun/kar(Δ)
313.15	2115.00 \pm 1.00	0.89	1969-gel/nik(○)	238.14	2360.00 \pm 1.00	0.43	1977-gun/kar(Δ)
323.15	2080.50 \pm 1.00	1.39	1969-gel/nik(○)	248.41	2328.00 \pm 1.00	0.45	1977-gun/kar(Δ)
298.15	2164.00 \pm 1.00	-1.52	1971-bra/joh(□)	253.15	2312.00 \pm 1.00	-0.62	1977-gun/kar(Δ)
290.80	2185.79 \pm 3.00	-4.46	1971-shi-1 ¹⁾	255.95	2304.00 \pm 1.00	0.25	1977-gun/kar(Δ)
303.99	2142.70 \pm 3.00	-2.95	1971-shi-1 ¹⁾	263.15	2284.00 \pm 1.00	3.22	1977-gun/kar ¹⁾
317.94	2096.00 \pm 3.00	-1.42	1971-shi-1 ¹⁾	273.15	2249.00 \pm 1.00	0.52	1977-gun/kar(Δ)
330.46	2052.97 \pm 3.00	-0.17	1971-shi-1(∇)	283.15	2216.00 \pm 1.00	0.31	1977-gun/kar(Δ)
343.77	2005.62 \pm 3.00	0.63	1971-shi-1(∇)	293.15	2181.00 \pm 1.00	-1.37	1977-gun/kar(Δ)
356.03	1958.86 \pm 3.00	-0.76	1971-shi-1(∇)	313.15	2115.00 \pm 1.00	0.89	1977-gun/kar(Δ)
366.43	1918.65 \pm 3.00	-1.67	1971-shi-1(∇)				

¹⁾ Not included in Fig. 1.**Further references:** [1933-ruf/bre, 1934-loc/bro, 1952-eis].**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
200.00	2474.88 \pm 1.45	298.15	2165.52 \pm 1.03	400.00	1780.72 \pm 8.46
210.00	2445.15 \pm 1.28	300.00	2159.25 \pm 1.06	410.00	1725.55 \pm 8.50
220.00	2415.08 \pm 1.20	310.00	2125.01 \pm 1.24	420.00	1670.84 \pm 8.56
230.00	2384.64 \pm 1.15	320.00	2090.20 \pm 1.51	430.00	1619.49 \pm 8.62
240.00	2353.80 \pm 1.09	330.00	2054.79 \pm 1.89	440.00	1569.70 \pm 8.70
250.00	2322.55 \pm 1.03	340.00	2018.75 \pm 2.42	450.00	1515.26 \pm 8.80
260.00	2290.86 \pm 0.96	350.00	1982.06 \pm 3.11	460.00	1445.73 \pm 8.92
270.00	2258.71 \pm 0.92	360.00	1944.70 \pm 4.00	470.00	1345.79 \pm 9.08
280.00	2226.07 \pm 0.91	370.00	1906.65 \pm 5.11	480.00	1190.13 \pm 9.29
290.00	2192.92 \pm 0.95	380.00	1867.88 \pm 6.46		
293.15	2182.37 \pm 0.98	390.00	1828.37 \pm 8.08		

cont.

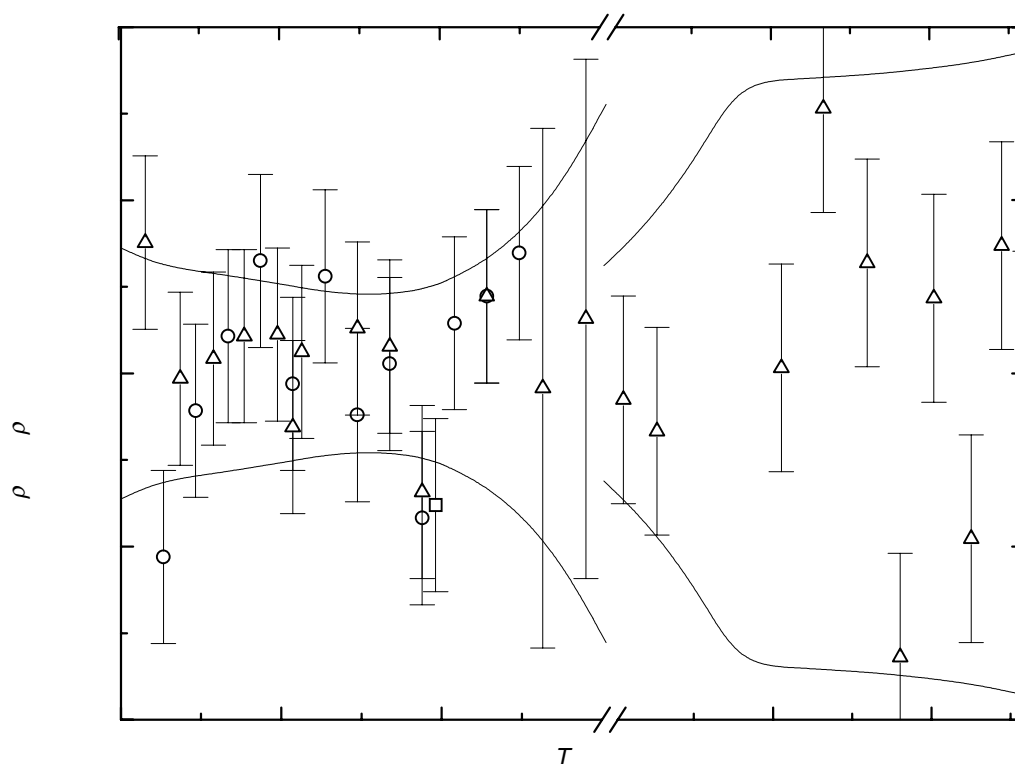


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

1,1-Dibromo-2,2,2-trifluoroethane [354-30-3] $\text{C}_2\text{HBr}_2\text{F}_3$ MW = 241.83 506

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
297.15	2224.00 ± 1.00	1947-mcb/has

1,2-Dibromo-1,1,2-trifluoroethane [354-04-1] $\text{C}_2\text{HBr}_2\text{F}_3$ MW = 241.83 507

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
273.15	2274.00 ± 2.00	1951-par/lyc

1-Bromo-1,2,2-trifluoroethane [430-90-0] $\text{C}_2\text{H}_2\text{BrF}_3$ MW = 162.94 508

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
283.15	1874.00 ± 2.00	1936-hen/ren-1

1-Bromo-2,2,2-trifluoroethane [421-06-7] $\text{C}_2\text{H}_2\text{BrF}_3$ MW = 162.94 509

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1788.10 ± 1.00	1948-hen/ruh

1,2-Dibromo-1,1-difluoroethane [75-82-1] $\text{C}_2\text{H}_2\text{Br}_2\text{F}_2$ MW = 223.84 510

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	2223.80 ± 1.50	1948-hen/ruh

1-Bromo-2-fluoroethane [762-49-2] $\text{C}_2\text{H}_4\text{BrF}$ MW = 126.96 511

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
298.15	1704.40 ± 2.00	1936-hen/ren

1,1-Dibromo-3,3,3-trifluoropropane [500043-67-4] $\text{C}_3\text{H}_3\text{Br}_2\text{F}_3$ MW = 255.86 512

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
299.15	2086.00 ± 1.00	1947-mcb/has

1,2-Dibromo-3,3,3-trifluoropropane [500043-68-5] $\text{C}_3\text{H}_3\text{Br}_2\text{F}_3$ MW = 255.86 513

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
297.15	2121.00 ± 1.00	1947-mcb/has

1-Bromo-3,3,3-trifluoropropane**[500024-13-5]****MW = 176.96****514****Table 1.** Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg·m ⁻³	Ref.
298.15	1653.00 ± 1.00	1947-mcb/has