

2.3 Fluoroalkanes

2.3.1 Fluoroalkanes, C₁ - C₂

Tetrafluoromethane

[75-73-0]

CF₄

MW = 88.00

370

$T_c = 227.50$ K [1987-alt/gel]

$\rho_c = 629.70$ kg·m⁻³ [1987-alt/gel]

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_l = 4.7730 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 6.6327 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 8.4879 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 91.34$ to 145.00 K $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 145.00$ to 227.50 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>	$2.24242 \cdot 10^3$	$6.59215 \cdot 10^{-1}$
<i>B</i>	-3.65978	$-2.25869 \cdot 10^{-2}$
<i>C</i>	$-5.06909 \cdot 10^{-3}$	$3.19569 \cdot 10^{-4}$
<i>D</i>		$-1.57155 \cdot 10^{-6}$

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)
91.34	1866.17 ± 0.60	0.32	1969-ter/lyn(□)	135.14	1655.62 ± 1.00	0.36	1969-ter/lyn(□)
96.19	1842.49 ± 0.60	-1.00	1969-ter/lyn(□)	139.61	1632.98 ± 1.00	0.30	1969-ter/lyn(□)
96.43	1842.91 ± 0.60	0.54	1969-ter/lyn(□)	139.82	1631.23 ± 1.00	-0.38	1969-ter/lyn(□)
98.98	1831.37 ± 0.60	0.86	1969-ter/lyn(□)	144.51	1606.98 ± 1.00	-0.71	1969-ter/lyn(□)
100.11	1825.14 ± 0.60	-0.10	1969-ter/lyn(□)	145.63	1600.75 ± 1.00	-1.18	1969-ter/lyn(□)
103.79	1807.89 ± 0.60	-0.08	1969-ter/lyn(□)	150.63	1574.29 ± 1.50	-1.04	1969-ter/lyn(□)
103.90	1806.89 ± 0.60	-0.56	1969-ter/lyn(□)	150.92	1572.21 ± 1.50	-1.53	1969-ter/lyn(□)
107.57	1789.40 ± 0.60	-0.68	1969-ter/lyn(□)	155.30	1548.12 ± 1.50	-1.18	1969-ter/lyn(□)
112.24	1765.35 ± 0.60	-2.44	1969-ter/lyn ¹⁾	155.84	1544.75 ± 1.50	-1.47	1969-ter/lyn(□)
118.24	1738.81 ± 0.60	-0.01	1969-ter/lyn(□)	160.77	1516.46 ± 1.50	-1.12	1969-ter/lyn(□)
119.06	1735.28 ± 0.60	0.45	1969-ter/lyn(□)	161.33	1512.68 ± 1.50	-1.59	1969-ter/lyn(□)
123.29	1714.09 ± 0.60	-0.06	1969-ter/lyn(□)	165.77	1488.07 ± 1.50	0.51	1969-ter/lyn(□)
124.94	1706.51 ± 1.00	0.47	1969-ter/lyn(□)	167.73	1477.48 ± 1.50	1.95	1969-ter/lyn(□)
128.86	1686.59 ± 1.00	-0.06	1969-ter/lyn(□)	170.85	1458.07 ± 2.00	1.99	1969-ter/lyn(□)
129.36	1684.65 ± 1.00	0.48	1969-ter/lyn(□)	178.05	1409.63 ± 2.00	0.06	1969-ter/lyn(□)
133.92	1661.25 ± 1.00	-0.14	1969-ter/lyn(□)	184.71	1362.98 ± 2.00	-1.12	1969-ter/lyn(□)

¹⁾ Not included in Fig. 1.

Further references: [1931-ruf/kei, 1956-tho/sco, 1958-cro/sco, 1960-cha, 1964-cro/sco, 1965-kno/pin, 1971-str, 1973-tre/rob, 1980-gel/por, 1981-lob/mcc, 1985-shi/gee].

cont.

Tetrafluoromethane (cont.)

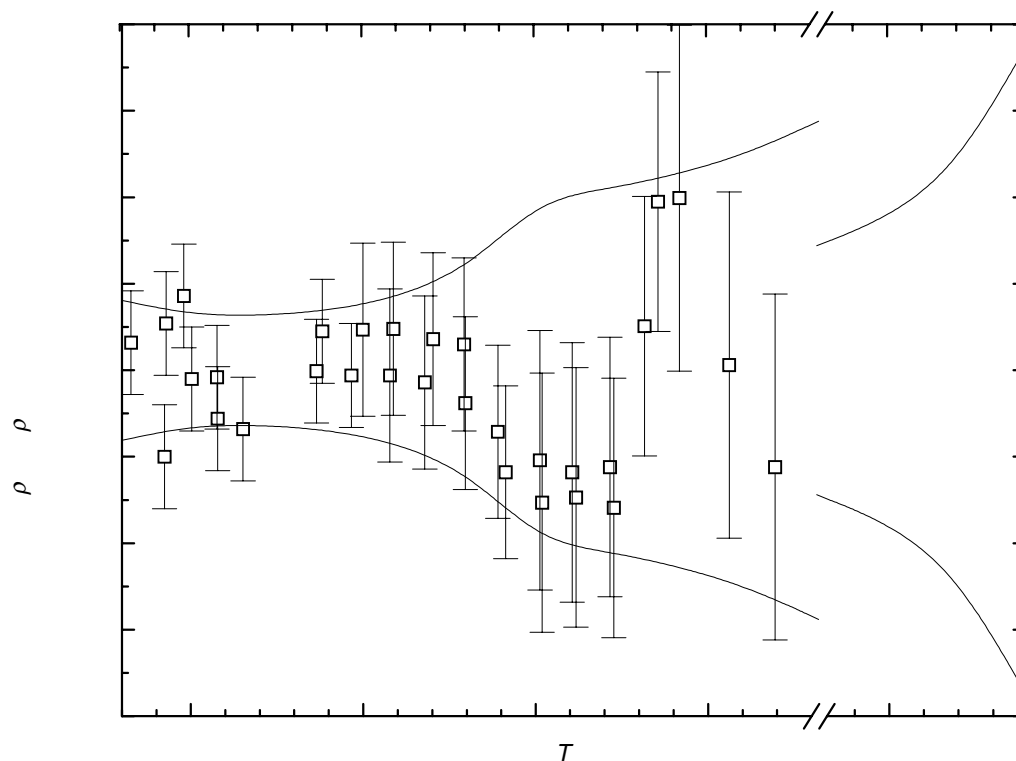


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
90.00	1871.98 ± 0.81	140.00	1630.70 ± 1.20	190.00	1325.72 ± 2.88
100.00	1825.75 ± 0.64	150.00	1578.76 ± 1.98	200.00	1244.94 ± 3.50
110.00	1778.51 ± 0.63	160.00	1522.12 ± 2.10	210.00	1145.83 ± 4.67
120.00	1730.25 ± 0.69	170.00	1461.42 ± 2.27	220.00	1004.65 ± 7.48
130.00	1680.98 ± 0.85	180.00	1396.54 ± 2.51		

Trifluoromethane**[75-46-7]****CHF₃****MW = 70.01****371** $T_c = 299.30 \text{ K}$ [1990-ohg/ume] $\rho_c = 526.50 \text{ kg} \cdot \text{m}^{-3}$ [1990-ohg/ume]**Table 1.** Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_i = 2.5990 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 1.4609$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.0715 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 145.00 \text{ to } 245.00 \text{ K}$	$T = 245.00 \text{ to } 299.30 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$	$\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$2.21401 \cdot 10^3$	3.57652
<i>B</i>	-5.82818	$-1.43745 \cdot 10^{-1}$
<i>C</i>	$1.78875 \cdot 10^{-2}$	$2.67818 \cdot 10^{-3}$
<i>D</i>	$-4.42629 \cdot 10^{-5}$	$-1.80879 \cdot 10^{-5}$

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)
145.00	1609.52 ± 2.00	-0.55	1964-cro/sco(□)	175.15	1501.80 ± 3.00	-2.32	1981-sol/sha ¹⁾
178.00	1499.23 ± 2.00	5.52	1964-cro/sco ¹⁾	177.15	1494.60 ± 3.00	-2.22	1981-sol/sha ¹⁾
150.00	1593.40 ± 2.00	0.54	1980-gel/por(O)	179.15	1487.40 ± 3.00	-2.08	1981-sol/sha ¹⁾
160.00	1558.40 ± 2.00	0.28	1980-gel/por(O)	181.15	1480.10 ± 3.00	-2.00	1981-sol/sha ¹⁾
170.00	1522.70 ± 2.00	-0.00	1980-gel/por(O)	183.15	1472.80 ± 3.00	-1.86	1981-sol/sha ¹⁾
180.00	1486.10 ± 2.00	-0.25	1980-gel/por(O)	185.15	1465.40 ± 3.00	-1.78	1981-sol/sha ¹⁾
190.00	1448.60 ± 2.00	-0.20	1980-gel/por(O)	187.15	1458.00 ± 3.00	-1.64	1981-sol/sha ¹⁾
200.00	1409.70 ± 2.00	-0.07	1980-gel/por(O)	189.15	1450.50 ± 3.00	-1.54	1981-sol/sha ¹⁾
210.00	1369.20 ± 3.00	0.19	1980-gel/por(O)	191.15	1442.90 ± 3.00	-1.49	1981-sol/sha ¹⁾
220.00	1326.70 ± 3.00	0.45	1980-gel/por(O)	193.15	1435.30 ± 3.00	-1.37	1981-sol/sha ¹⁾
230.00	1281.60 ± 3.00	0.37	1980-gel/por(O)	195.15	1427.60 ± 3.00	-1.30	1981-sol/sha ¹⁾
240.00	1233.20 ± 3.00	-0.48	1980-gel/por(O)	197.15	1419.90 ± 3.00	-1.16	1981-sol/sha ¹⁾
250.00	1180.60 ± 3.00	-1.43	1980-gel/por(O)	199.15	1412.10 ± 3.00	-1.05	1981-sol/sha ¹⁾
260.00	1122.40 ± 3.00	0.28	1980-gel/por(O)	201.15	1404.20 ± 3.00	-0.98	1981-sol/sha ¹⁾
270.00	1056.10 ± 3.00	-0.29	1980-gel/por(O)	203.15	1396.30 ± 3.00	-0.83	1981-sol/sha ¹⁾
280.00	976.86 ± 3.00	-0.98	1980-gel/por(O)	205.15	1388.30 ± 3.00	-0.71	1981-sol/sha ¹⁾
290.00	870.00 ± 4.00	5.62	1980-gel/por(O)	207.15	1380.20 ± 3.00	-0.62	1981-sol/sha ¹⁾
157.15	1564.50 ± 3.00	-3.58	1981-sol/sha ¹⁾	209.15	1372.00 ± 3.00	-0.55	1981-sol/sha ¹⁾
159.15	1557.70 ± 3.00	-3.40	1981-sol/sha ¹⁾	211.15	1363.70 ± 3.00	-0.50	1981-sol/sha ¹⁾
161.15	1550.90 ± 3.00	-3.19	1981-sol/sha ¹⁾	213.15	1355.40 ± 3.00	-0.37	1981-sol/sha ¹⁾
163.15	1544.00 ± 3.00	-3.05	1981-sol/sha ¹⁾	215.15	1347.00 ± 3.00	-0.26	1981-sol/sha(Δ)
165.15	1537.10 ± 3.00	-2.88	1981-sol/sha ¹⁾	217.15	1338.50 ± 3.00	-0.16	1981-sol/sha(Δ)
167.15	1530.10 ± 3.00	-2.78	1981-sol/sha ¹⁾	219.15	1329.90 ± 3.00	-0.07	1981-sol/sha(Δ)
169.15	1523.10 ± 3.00	-2.65	1981-sol/sha ¹⁾	221.15	1321.20 ± 3.00	0.00	1981-sol/sha(Δ)
171.15	1516.00 ± 3.00	-2.58	1981-sol/sha ¹⁾	223.15	1312.40 ± 3.00	0.07	1981-sol/sha(Δ)
173.15	1508.90 ± 3.00	-2.47	1981-sol/sha ¹⁾	225.15	1303.50 ± 3.00	0.13	1981-sol/sha(Δ)

¹⁾ Not included in Fig. 1.

cont.

Trifluoromethane (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)
227.15	1294.40 ± 3.00	0.09	1981-sol/sha(Δ)	277.15	996.90 ± 5.00	-5.53	1981-sol/sha ¹⁾
229.15	1285.20 ± 3.00	0.05	1981-sol/sha(Δ)	279.15	979.50 ± 5.00	-5.92	1981-sol/sha ¹⁾
231.15	1275.90 ± 3.00	0.00	1981-sol/sha(Δ)	281.15	960.90 ± 5.00	-6.32	1981-sol/sha ¹⁾
233.15	1266.40 ± 3.00	-0.14	1981-sol/sha(Δ)	283.15	941.20 ± 5.00	-6.37	1981-sol/sha ¹⁾
235.15	1256.80 ± 4.00	-0.27	1981-sol/sha ¹⁾	285.15	920.00 ± 5.00	-6.19	1981-sol/sha ¹⁾
237.15	1247.00 ± 4.00	-0.50	1981-sol/sha ¹⁾	286.15	908.60 ± 5.00	-6.13	1981-sol/sha ¹⁾
239.15	1237.00 ± 4.00	-0.82	1981-sol/sha ¹⁾	287.15	896.50 ± 5.00	-6.17	1981-sol/sha ¹⁾
241.15	1226.80 ± 4.00	-1.23	1981-sol/sha ¹⁾	288.15	883.80 ± 6.00	-6.15	1981-sol/sha ¹⁾
243.15	1216.40 ± 4.00	-1.73	1981-sol/sha ¹⁾	289.15	870.50 ± 6.00	-5.99	1981-sol/sha ¹⁾
245.15	1205.80 ± 4.00	-2.31	1981-sol/sha ¹⁾	290.15	856.40 ± 6.00	-5.78	1981-sol/sha ¹⁾
247.15	1195.00 ± 4.00	-2.70	1981-sol/sha ¹⁾	291.15	841.60 ± 6.00	-5.29	1981-sol/sha ¹⁾
249.15	1184.00 ± 4.00	-2.79	1981-sol/sha ¹⁾	292.15	825.70 ± 6.00	-4.75	1981-sol/sha ¹⁾
251.15	1172.70 ± 4.00	-2.77	1981-sol/sha ¹⁾	293.15	808.80 ± 6.00	-3.82	1981-sol/sha ¹⁾
253.15	1161.20 ± 4.00	-2.62	1981-sol/sha ¹⁾	294.15	790.30 ± 6.00	-2.77	1981-sol/sha ¹⁾
255.15	1149.40 ± 4.00	-2.51	1981-sol/sha ¹⁾	295.15	769.70 ± 6.00	-1.59	1981-sol/sha ¹⁾
257.15	1137.40 ± 4.00	-2.36	1981-sol/sha ¹⁾	296.15	745.70 ± 6.00	-0.68	1981-sol/sha ¹⁾
259.15	1125.10 ± 4.00	-2.32	1981-sol/sha ¹⁾	297.15	716.50 ± 6.00	-0.09	1981-sol/sha ¹⁾
261.15	1112.50 ± 4.00	-2.38	1981-sol/sha ¹⁾	298.15	666.70 ± 6.00	-10.64	1981-sol/sha ¹⁾
263.15	1099.60 ± 4.00	-2.54	1981-sol/sha ¹⁾	298.98	525.50 ± 6.00	-96.97	1981-sol/sha ¹⁾
265.15	1086.40 ± 4.00	-2.76	1981-sol/sha ¹⁾	298.15	670.74 ± 4.00	-6.60	1990-ohg/ume(V)
267.15	1072.80 ± 4.00	-3.11	1981-sol/sha ¹⁾	298.35	663.73 ± 4.00	-3.55	1990-ohg/ume(V)
269.15	1058.70 ± 4.00	-3.60	1981-sol/sha ¹⁾	298.56	650.43 ± 4.00	-4.82	1990-ohg/ume(V)
271.15	1044.20 ± 4.00	-4.07	1981-sol/sha ¹⁾	298.74	639.93 ± 4.00	-3.23	1990-ohg/ume(V)
273.15	1029.10 ± 4.00	-4.60	1981-sol/sha ¹⁾	299.05	611.92 ± 4.00	-2.71	1990-ohg/ume(V)
275.15	1013.40 ± 4.00	-5.07	1981-sol/sha ¹⁾	299.18	593.02 ± 4.00	-2.06	1990-ohg/ume(V)

¹⁾ Not included in Fig. 1.

Further references: [1955-hou-1, 1956-tho/sco, 1959-hou/mar, 1968-doe/loe, 1975-sha/ras, 1982-hor/oka, 1985-shi/gee, 1994-lau/ric-3].

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
140.00	1627.20 ± 3.36	200.00	1409.77 ± 2.34	260.00	1122.12 ± 6.35
150.00	1592.86 ± 2.56	210.00	1369.01 ± 2.66	270.00	1056.39 ± 6.49
160.00	1558.12 ± 2.39	220.00	1326.25 ± 2.98	280.00	977.84 ± 6.66
170.00	1522.70 ± 2.32	230.00	1281.23 ± 3.42	290.00	864.38 ± 6.89
180.00	1486.35 ± 2.21	240.00	1233.68 ± 4.66		
190.00	1448.80 ± 2.15	250.00	1182.03 ± 6.25		

cont.

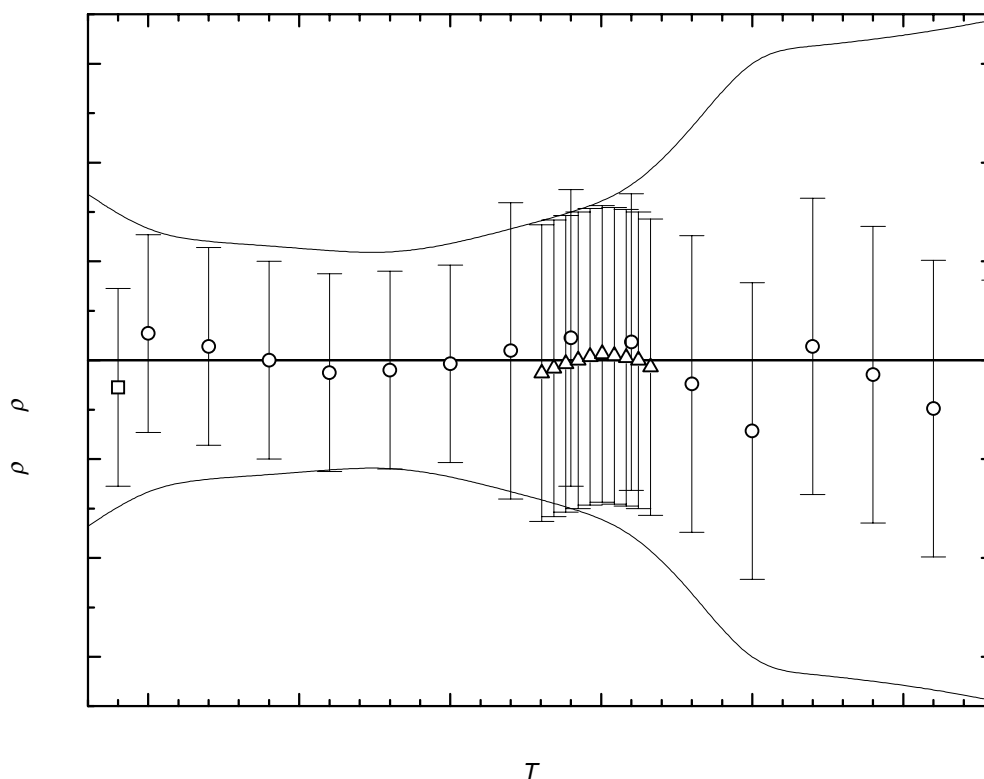


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

Difluoromethane

[75-10-5]

CH₂F₂**MW = 52.02****372** $T_c = 351.50 \text{ K}$ [1994-hig] $\rho_c = 428.00 \text{ kg}\cdot\text{m}^{-3}$ [1994-hig]

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction):

$\sigma_t = 1.1798$ (low temperature range), $\sigma_{c,w} = 1.0384$ (combined temperature ranges, weighted),

$\sigma_{c,uw} = 8.0383 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 138.86 \text{ to } 280.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 280.00 \text{ to } 351.50 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$1.83356 \cdot 10^3$	2.52892
<i>B</i>	-3.85471	$-6.76064 \cdot 10^{-2}$
<i>C</i>	$9.37968 \cdot 10^{-3}$	$8.74122 \cdot 10^{-4}$
<i>D</i>	$-2.08838 \cdot 10^{-5}$	$-4.21203 \cdot 10^{-6}$

cont.

Difluoromethane (cont.)**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)
248.15	1133.00 ± 1.50	-2.48	1968-mal/meu(X)	273.13	1055.30 ± 1.50	0.38	1994-bou/ric(Δ)
263.15	1087.00 ± 1.50	-1.15	1968-mal/meu(X)	293.12	981.80 ± 1.50	0.68	1994-bou/ric(Δ)
273.15	1052.00 ± 1.50	-2.86	1968-mal/meu ¹⁾	313.17	892.10 ± 1.50	-1.12	1994-bou/ric(Δ)
283.15	1017.00 ± 1.50	-2.82	1968-mal/meu(X)	333.39	771.50 ± 2.00	0.32	1994-bou/ric(Δ)
285.30	1006.00 ± 1.50	-5.79	1968-mal/meu ¹⁾	242.59	1153.26 ± 1.00	0.97	1994-def/mor(□)
298.15	961.00 ± 1.50	0.59	1968-mal/meu(X)	246.06	1143.17 ± 1.00	1.33	1994-def/mor(□)
323.15	840.00 ± 2.00	-0.27	1968-mal/meu(X)	250.57	1129.23 ± 1.00	1.19	1994-def/mor(□)
334.54	764.00 ± 3.00	2.05	1968-mal/meu(X)	255.13	1115.02 ± 1.00	1.19	1994-def/mor(□)
335.55	756.00 ± 3.00	2.49	1968-mal/meu(X)	259.78	1100.20 ± 1.00	1.15	1994-def/mor(□)
338.25	731.00 ± 4.00	1.74	1968-mal/meu ¹⁾	264.51	1084.85 ± 1.00	1.14	1994-def/mor(□)
339.11	723.00 ± 4.00	2.07	1968-mal/meu ¹⁾	269.39	1068.51 ± 1.00	0.96	1994-def/mor(□)
343.15	683.00 ± 4.00	6.37	1968-mal/meu ¹⁾	274.01	1052.49 ± 1.00	0.57	1994-def/mor(□)
346.32	640.00 ± 4.00	7.21	1968-mal/meu ¹⁾	278.82	1035.69 ± 1.00	0.39	1994-def/mor(□)
347.02	631.00 ± 5.00	9.70	1968-mal/meu ¹⁾	283.65	1018.00 ± 1.00	0.03	1994-def/mor(□)
349.37	575.00 ± 5.00	1.77	1968-mal/meu(X)	288.53	999.69 ± 1.00	0.32	1994-def/mor(□)
351.55	430.00 ± 5.00	2.17	1968-mal/meu ¹⁾	293.46	980.39 ± 1.00	0.65	1994-def/mor(□)
295.28	972.66 ± 1.50	0.35	1993-hol/nie(◆)	298.42	960.20 ± 1.00	0.92	1994-def/mor(□)
300.89	949.35 ± 1.50	0.53	1993-hol/nie(◆)	303.41	938.72 ± 1.00	0.78	1994-def/mor(□)
306.13	926.50 ± 1.50	0.56	1993-hol/nie(◆)	308.27	916.66 ± 1.00	0.38	1994-def/mor(□)
310.52	905.94 ± 1.50	0.07	1993-hol/nie(◆)	313.14	893.66 ± 1.00	0.29	1994-def/mor(□)
315.62	881.18 ± 1.50	0.09	1993-hol/nie(◆)	318.25	867.23 ± 2.00	-0.28	1994-def/mor(□)
320.59	854.05 ± 2.00	-0.80	1993-hol/nie(◆)	323.11	840.03 ± 2.00	-0.48	1994-def/mor(□)
328.49	807.64 ± 3.00	0.86	1993-hol/nie(◆)	327.96	810.63 ± 3.00	0.31	1994-def/mor(□)
329.01	803.51 ± 3.00	0.26	1993-hol/nie(◆)	332.80	778.01 ± 4.00	2.24	1994-def/mor ¹⁾
332.81	776.75 ± 3.00	1.06	1993-hol/nie(◆)	337.79	737.44 ± 4.00	3.85	1994-def/mor ¹⁾
334.84	761.46 ± 3.00	1.99	1993-hol/nie(◆)	219.97	1219.20 ± 1.50	1.99	1994-wid/sat-1(∇)
335.47	756.45 ± 3.00	2.26	1993-hol/nie(◆)	229.97	1188.80 ± 1.50	-0.35	1994-wid/sat-1(∇)
336.36	749.07 ± 4.00	2.56	1993-hol/nie ¹⁾	240.00	1159.10 ± 1.50	-0.90	1994-wid/sat-1(∇)
337.38	740.38 ± 4.00	3.01	1993-hol/nie ¹⁾	244.98	1143.70 ± 1.50	-1.41	1994-wid/sat-1(∇)
338.26	732.96 ± 4.00	3.79	1993-hol/nie ¹⁾	249.99	1128.10 ± 1.50	-1.73	1994-wid/sat-1(∇)
339.96	717.70 ± 4.00	5.33	1993-hol/nie ¹⁾	254.99	1112.60 ± 1.50	-1.67	1994-wid/sat-1(∇)
340.10	715.70 ± 4.00	4.78	1993-hol/nie ¹⁾	260.00	1097.00 ± 1.50	-1.34	1994-wid/sat-1(∇)
341.08	706.02 ± 4.00	5.50	1993-hol/nie ¹⁾	264.99	1080.60 ± 1.50	-1.54	1994-wid/sat-1(∇)
342.04	695.90 ± 4.00	6.10	1993-hol/nie ¹⁾	269.99	1064.10 ± 1.50	-1.44	1994-wid/sat-1(∇)
342.84	687.25 ± 4.00	6.85	1993-hol/nie ¹⁾	275.00	1047.90 ± 1.50	-0.63	1994-wid/sat-1(∇)
343.99	673.44 ± 4.00	7.42	1993-hol/nie ¹⁾	280.00	1030.40 ± 1.50	-0.76	1994-wid/sat-1(∇)
344.63	665.84 ± 4.00	8.33	1993-hol/nie ¹⁾	285.00	1012.20 ± 1.50	-0.72	1994-wid/sat-1(∇)
345.19	658.36 ± 5.00	8.64	1993-hol/nie ¹⁾	290.00	992.70 ± 1.50	-0.90	1994-wid/sat-1(∇)
346.15	643.89 ± 5.00	8.44	1993-hol/nie ¹⁾	295.00	973.80 ± 1.50	0.34	1994-wid/sat-1(∇)
347.14	628.00 ± 5.00	8.76	1993-hol/nie ¹⁾	310.00	907.60 ± 1.50	-0.70	1994-wid/sat-1(∇)
348.63	600.12 ± 5.00	9.54	1993-hol/nie ¹⁾	310.01	906.50 ± 1.50	-1.75	1994-wid/sat-1(∇)
253.11	1121.10 ± 1.50	0.94	1994-bou/ric(Δ)	315.00	882.30 ± 1.50	-1.91	1994-wid/sat-1(∇)

¹⁾ Not included in Fig. 1.

cont.

Table 2. (cont.)

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)
320.00	856.00 ± 2.00	-2.10	1994-wid/sat-1(∇)	194.08	1286.10 ± 1.50	0.03	1996-mag-1(O)
325.00	826.30 ± 3.00	-2.89	1994-wid/sat-1(∇)	207.43	1251.00 ± 1.50	-0.16	1996-mag-1(O)
330.00	795.00 ± 3.00	-1.38	1994-wid/sat-1(∇)	221.17	1213.80 ± 1.50	-0.09	1996-mag-1(O)
138.86	1423.00 ± 1.50	-0.23	1996-mag-1(O)	234.18	1176.90 ± 1.50	-0.14	1996-mag-1(O)
150.51	1395.90 ± 1.50	1.24	1996-mag-1(O)	248.94	1133.20 ± 1.50	0.14	1996-mag-1(O)
158.20	1375.70 ± 1.50	-0.10	1996-mag-1(O)	266.68	1078.00 ± 1.50	1.43	1996-mag-1(O)
168.43	1351.40 ± 1.50	0.79	1996-mag-1(O)	282.46	1022.20 ± 1.50	-0.15	1996-mag-1(O)
179.80	1322.60 ± 1.50	0.28	1996-mag-1(O)	304.73	933.00 ± 1.50	0.84	1996-mag-1(O)

Further references: [1964-cro/sco, 1973-tre/rob, 1985-shi/gee, 1993-rip/mat, 1994-hig, 1994-sat/sat, 1995-kuw/aoy, 1997-bou/ric, 1997-hol/mag].

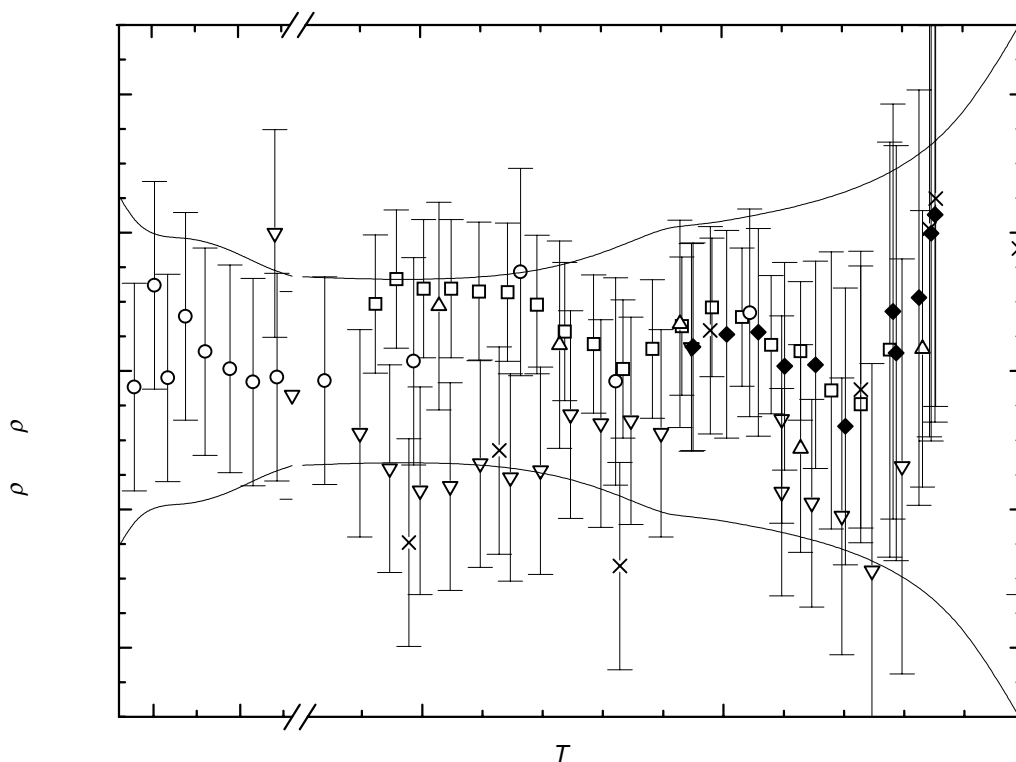


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

Difluoromethane (cont.)**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
130.00	1445.08 ± 2.53	220.00	1217.12 ± 1.45	298.15	960.41 ± 2.14
140.00	1420.43 ± 2.12	230.00	1189.06 ± 1.37	300.00	952.61 ± 2.16
150.00	1395.91 ± 1.97	240.00	1160.00 ± 1.33	310.00	908.30 ± 2.32
160.00	1371.38 ± 1.93	250.00	1129.80 ± 1.32	320.00	858.10 ± 2.55
170.00	1346.72 ± 1.92	260.00	1098.34 ± 1.35	330.00	796.38 ± 2.92
180.00	1321.81 ± 1.87	270.00	1065.51 ± 1.45	340.00	711.96 ± 3.61
190.00	1296.52 ± 1.79	280.00	1031.16 ± 1.68	350.00	555.55 ± 5.08
200.00	1270.73 ± 1.68	290.00	993.60 ± 2.06		
210.00	1244.30 ± 1.56	293.15	981.00 ± 2.09		

Fluoromethane**[593-53-3]****CH₃F****MW = 34.03****373** $T_c = 317.40 \text{ K}$ [1987-bom/bis] $\rho_c = 312.00 \text{ kg} \cdot \text{m}^{-3}$ [1989-bis/ten-1]**Table 1.** Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_t = 3.2452 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 9.5603 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.7571 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 130.79 \text{ to } 230.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 230.00 \text{ to } 317.40 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$1.20486 \cdot 10^{-3}$	1.72335
<i>B</i>	-1.19704	$-4.74960 \cdot 10^{-2}$
<i>C</i>	$-2.38620 \cdot 10^{-3}$	$5.93242 \cdot 10^{-4}$
<i>D</i>		$-2.62754 \cdot 10^{-6}$

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)
285.70	630.35 ± 2.00	-2.02	1989-bis/ten-1(○)	182.00	907.78 ± 1.00	-0.17	1997-hol/mag(□)
289.72	613.96 ± 2.00	-1.73	1989-bis/ten-1(○)	197.96	875.03 ± 1.00	0.65	1997-hol/mag(□)
294.93	590.39 ± 2.00	-1.01	1989-bis/ten-1(○)	217.54	831.22 ± 1.00	-0.31	1997-hol/mag(□)
300.80	559.59 ± 2.00	0.62	1989-bis/ten-1(○)	236.98	784.12 ± 1.50	-1.74	1997-hol/mag(□)
305.74	527.82 ± 2.00	2.34	1989-bis/ten-1(○)	256.96	730.02 ± 1.50	2.22	1997-hol/mag(□)
312.77	464.25 ± 3.00	5.33	1989-bis/ten-1 ¹⁾	275.80	669.32 ± 1.50	0.94	1997-hol/mag(□)
130.79	1007.75 ± 1.00	0.27	1997-hol/mag(□)	285.86	631.15 ± 1.50	-0.58	1997-hol/mag(□)
140.78	988.91 ± 1.00	-0.13	1997-hol/mag(□)	297.61	576.84 ± 1.50	-0.55	1997-hol/mag(□)
152.71	966.10 ± 1.00	-0.31	1997-hol/mag(□)	308.96	501.28 ± 2.00	2.34	1997-hol/mag(□)
166.52	939.36 ± 1.00	0.00	1997-hol/mag(□)				

¹⁾ Not included in Fig. 1.

cont.

Further references: [1932-caw/pat, 1940-gro/wac, 1985-shi/gee, 1989-fon/lob].

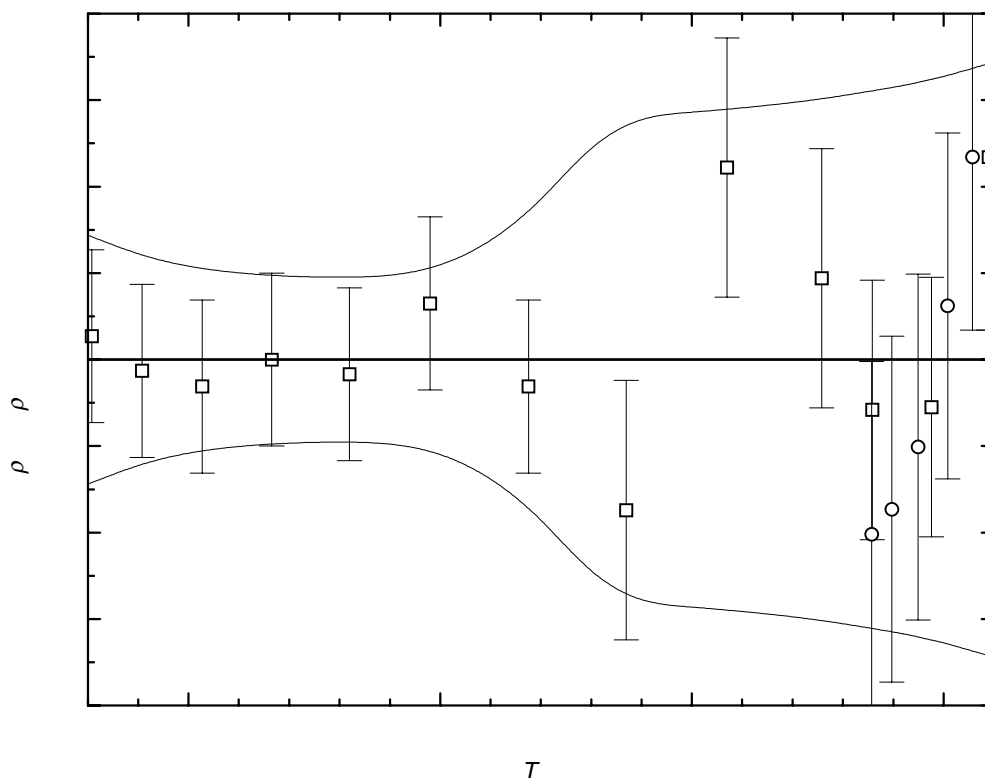


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
130.00	1008.91 ± 1.44	200.00	870.00 ± 1.07	270.00	687.41 ± 2.97
140.00	990.50 ± 1.21	210.00	848.25 ± 1.35	280.00	653.79 ± 3.05
150.00	971.61 ± 1.07	220.00	826.02 ± 1.82	290.00	614.47 ± 3.15
160.00	952.24 ± 1.00	230.00	803.31 ± 2.50	293.15	600.10 ± 3.18
170.00	932.40 ± 0.96	240.00	777.62 ± 2.82	298.15	574.41 ± 3.25
180.00	912.08 ± 0.95	250.00	748.70 ± 2.86	300.00	563.79 ± 3.27
190.00	891.28 ± 0.96	260.00	718.56 ± 2.91	310.00	489.19 ± 3.44

Hexafluoroethane**[76-16-4]****C₂F₆****MW = 138.01****374**

$$T_c = 293.05 \text{ K [1979-sai/kij]}$$

$$\rho_c = 622.00 \text{ kg}\cdot\text{m}^{-3} \text{ [1979-sai/kij]}$$

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction):
 $\sigma_i = 1.2957$ (low temperature range), $\sigma_{c,w} = 2.0558$ (combined temperature ranges, weighted),

 $\sigma_{c,uw} = 3.3472 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 175.00 \text{ to } 250.00 \text{ K}$	$T = 250.00 \text{ to } 293.05 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$	$\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$3.12456 \cdot 10^3$	3.31501
<i>B</i>	$-1.62046 \cdot 10^1$	$-1.73610 \cdot 10^{-1}$
<i>C</i>	$6.88393 \cdot 10^{-2}$	$3.93741 \cdot 10^{-3}$
<i>D</i>	$-1.31753 \cdot 10^{-4}$	$-3.18377 \cdot 10^{-5}$

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)
195.15	1589.50 ± 3.50	-15.19	1933-swa-1 ¹⁾	180.00	1669.70 ± 2.50	-0.05	1989-gun/zhe(∇)
225.15	1468.90 ± 3.50	6.91	1933-swa-1(Δ)	185.00	1648.70 ± 2.50	0.17	1989-gun/zhe(∇)
248.65	1344.00 ± 3.50	18.06	1933-swa-1 ¹⁾	190.00	1627.30 ± 2.50	0.20	1989-gun/zhe(∇)
273.15	1143.90 ± 4.00	5.10	1933-swa-1(Δ)	195.00	1605.40 ± 2.50	0.05	1989-gun/zhe(∇)
283.15	1012.90 ± 4.00	-7.47	1933-swa-1(Δ)	200.00	1583.00 ± 2.50	-0.20	1989-gun/zhe(∇)
288.15	929.70 ± 5.00	3.28	1933-swa-1(Δ)	205.00	1560.10 ± 2.50	-0.43	1989-gun/zhe(∇)
290.65	824.80 ± 6.00	-29.95	1933-swa-1 ¹⁾	210.00	1536.60 ± 2.50	-0.65	1989-gun/zhe(∇)
291.65	802.00 ± 6.00	-11.15	1933-swa-1 ¹⁾	215.00	1512.40 ± 2.50	-0.87	1989-gun/zhe(∇)
195.00	1604.80 ± 3.00	-0.55	1967-gil/zwi(□)	220.00	1487.50 ± 2.50	-0.97	1989-gun/zhe(∇)
291.20	835.20 ± 3.00	1.69	1979-sai/kij(○)	225.00	1461.80 ± 2.50	-0.98	1989-gun/zhe(∇)
291.75	811.30 ± 3.00	3.18	1979-sai/kij(○)	230.00	1435.30 ± 2.50	-0.77	1989-gun/zhe(∇)
292.16	785.30 ± 3.00	0.72	1979-sai/kij(○)	235.00	1407.60 ± 2.50	-0.67	1989-gun/zhe(∇)
292.45	760.70 ± 3.00	-2.83	1979-sai/kij(○)	240.00	1378.90 ± 2.50	-0.36	1989-gun/zhe(∇)
292.66	746.10 ± 3.50	2.24	1979-sai/kij(○)	245.00	1348.80 ± 2.50	-0.15	1989-gun/zhe(∇)
292.76	735.80 ± 3.50	3.75	1979-sai/kij(○)	250.00	1317.10 ± 2.50	-0.14	1989-gun/zhe(∇)
292.91	713.70 ± 3.50	5.86	1979-sai/kij(○)	255.00	1283.60 ± 2.50	0.34	1989-gun/zhe(∇)
292.98	691.20 ± 3.50	1.29	1979-sai/kij(○)	260.00	1247.60 ± 2.50	0.60	1989-gun/zhe(∇)
293.01	674.00 ± 4.00	-4.25	1979-sai/kij(○)	265.00	1208.90 ± 2.50	0.18	1989-gun/zhe(∇)
293.02	654.70 ± 5.00	-18.38	1979-sai/kij ¹⁾	270.00	1166.30 ± 2.50	-1.10	1989-gun/zhe(∇)
175.00	1690.30 ± 2.50	-0.55	1989-gun/zhe(∇)				

¹⁾ Not included in Fig. 1.**Further references:** [1956-tho/sco, 1970-gen/duv].

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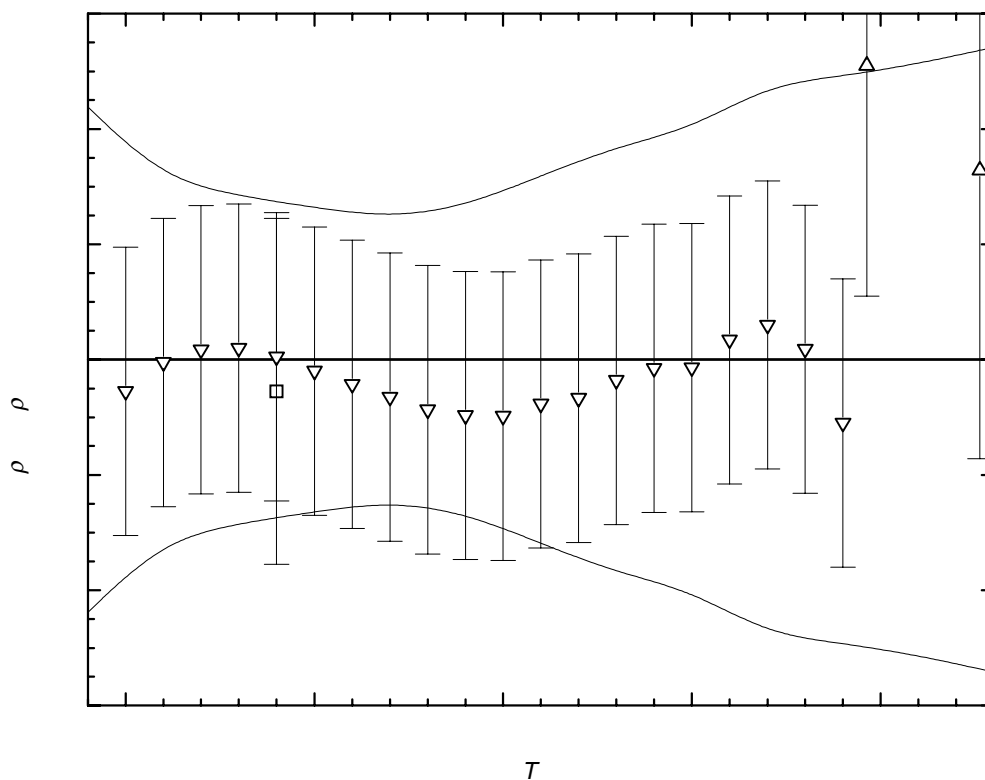


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
170.00	1711.94 ± 4.38	220.00	1488.47 ± 2.66	270.00	1167.40 ± 4.92
180.00	1669.75 ± 3.14	230.00	1436.07 ± 3.19	280.00	1064.18 ± 5.13
190.00	1627.10 ± 2.84	240.00	1379.26 ± 3.69	290.00	876.47 ± 5.42
200.00	1583.20 ± 2.64	250.00	1317.24 ± 4.01		
210.00	1537.25 ± 2.46	260.00	1247.00 ± 4.76		

Pentafluoroethane**[354-33-6]****MW = 120.02****375**

$T_c = 339.40 \text{ K [1992-wil/wil]}$

$\rho_c = 571.00 \text{ kg}\cdot\text{m}^{-3} \text{ [1992-wil/wil]}$

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_i = 1.4580$ (low temperature range), $\sigma_{c,w} = 1.4206$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.6292 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 173.48 \text{ to } 275.00 \text{ K}$	$T = 275.00 \text{ to } 339.40 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$	$\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$2.48155 \cdot 10^3$	2.83288
<i>B</i>	-7.05987	$-9.07161 \cdot 10^{-2}$
<i>C</i>	$2.14616 \cdot 10^{-2}$	$1.37570 \cdot 10^{-3}$
<i>D</i>	$-4.08551 \cdot 10^{-5}$	$-7.74036 \cdot 10^{-6}$

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)
250.05	1421.00 ± 2.00	1.63	1993-rip/mat(○)	264.98	1356.00 ± 1.50	-1.61	1994-wid/sat-1(□)
253.85	1406.00 ± 2.00	1.93	1993-rip/mat(○)	269.96	1334.00 ± 1.50	-1.96	1994-wid/sat-1(□)
260.25	1380.00 ± 2.00	2.33	1993-rip/mat(○)	274.98	1311.30 ± 1.50	-2.25	1994-wid/sat-1(□)
261.35	1376.00 ± 2.00	2.95	1993-rip/mat(○)	280.00	1286.40 ± 1.50	-3.23	1994-wid/sat-1(□)
270.15	1337.00 ± 2.00	1.88	1993-rip/mat(○)	286.02	1257.20 ± 1.50	-1.25	1994-wid/sat-1(□)
270.20	1337.00 ± 2.00	2.10	1993-rip/mat(○)	290.00	1235.60 ± 1.50	-1.13	1994-wid/sat-1(□)
270.35	1336.00 ± 2.00	1.76	1993-rip/mat(○)	295.00	1209.20 ± 1.50	0.86	1994-wid/sat-1(□)
279.15	1294.00 ± 2.00	0.17	1993-rip/mat(○)	300.00	1178.50 ± 2.00	-0.08	1994-wid/sat-1(□)
280.55	1287.00 ± 2.00	0.12	1993-rip/mat(○)	305.00	1147.60 ± 2.00	0.58	1994-wid/sat-1(□)
280.75	1286.00 ± 2.00	0.13	1993-rip/mat(○)	310.00	1111.70 ± 2.00	-1.16	1994-wid/sat-1(□)
290.35	1236.00 ± 2.00	1.22	1993-rip/mat(○)	310.00	1112.00 ± 2.00	-0.86	1994-wid/sat-1(□)
291.05	1232.00 ± 2.00	1.13	1993-rip/mat(○)	315.00	1074.30 ± 2.00	-0.63	1994-wid/sat-1(□)
292.15	1226.00 ± 2.00	1.33	1993-rip/mat(○)	320.00	1030.70 ± 2.00	-0.80	1994-wid/sat-1(□)
300.85	1173.00 ± 2.00	-0.36	1993-rip/mat(○)	325.00	980.70 ± 3.00	0.71	1994-wid/sat-1(□)
301.95	1166.00 ± 2.00	-0.52	1993-rip/mat(○)	330.00	918.80 ± 4.00	3.08	1994-wid/sat-1(□)
219.98	1530.40 ± 1.50	-1.76	1994-wid/sat-1(□)	335.00	831.40 ± 5.00	4.73	1994-wid/sat-1 ¹⁾
224.99	1513.00 ± 1.50	-1.24	1994-wid/sat-1(□)	173.48	1688.20 ± 1.50	-1.19	1996-mag-1(Δ)
229.98	1495.50 ± 1.50	-0.59	1994-wid/sat-1(□)	184.70	1653.10 ± 1.50	0.79	1996-mag-1(Δ)
234.98	1475.80 ± 1.50	-1.76	1994-wid/sat-1(□)	201.27	1597.80 ± 1.50	0.90	1996-mag-1(Δ)
239.99	1458.00 ± 1.50	-0.62	1994-wid/sat-1(□)	216.84	1544.10 ± 1.50	0.85	1996-mag-1(Δ)
244.98	1437.90 ± 1.50	-1.47	1994-wid/sat-1(□)	240.73	1457.10 ± 1.50	1.31	1996-mag-1(Δ)
249.97	1418.90 ± 1.50	-0.79	1994-wid/sat-1(□)	273.04	1321.50 ± 1.50	-0.78	1996-mag-1(Δ)
254.98	1398.00 ± 1.50	-1.47	1994-wid/sat-1(□)	308.46	1124.90 ± 1.50	1.18	1996-mag-1(Δ)
259.97	1377.90 ± 1.50	-0.94	1994-wid/sat-1(□)				

¹⁾ Not included in Fig. 1.**Further references:** [1994-hig, 1995-kuw/aoy, 1995-ogu/tak, 1997-def/mol, 1997-hol/mag].

cont.

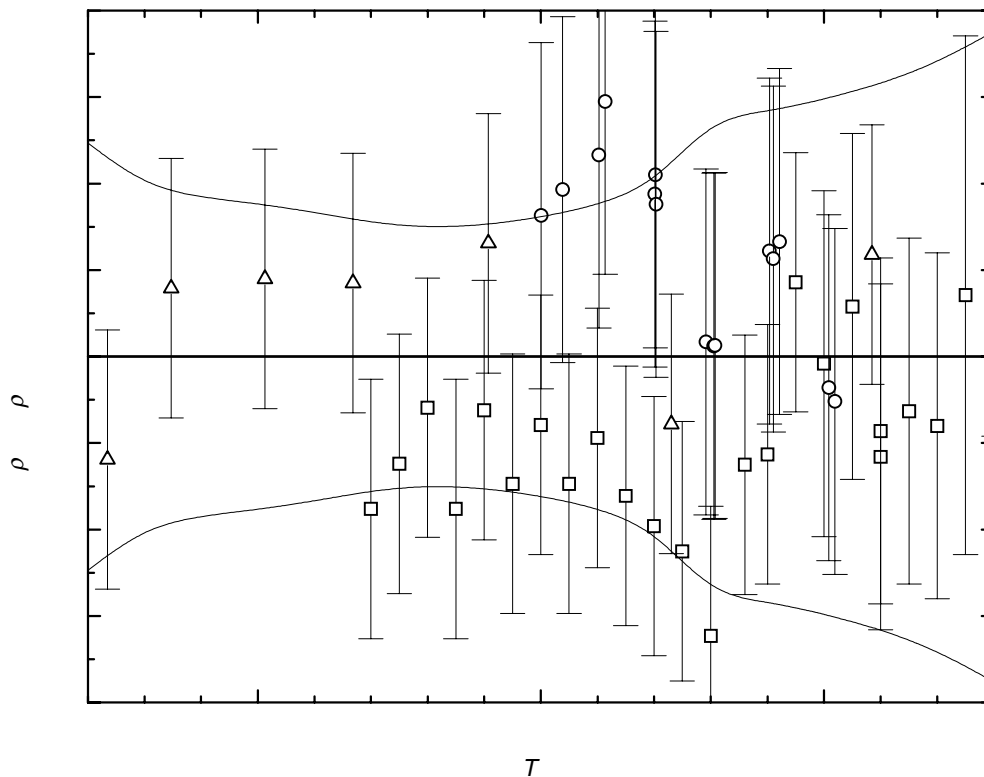


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the 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	1700.89 ± 2.47	240.00	1458.59 ± 1.52	298.15	1189.77 ± 2.95
180.00	1667.86 ± 1.98	250.00	1419.57 ± 1.61	300.00	1178.58 ± 2.98
190.00	1634.71 ± 1.84	260.00	1378.72 ± 1.75	310.00	1112.86 ± 3.15
200.00	1601.20 ± 1.77	270.00	1335.78 ± 2.00	320.00	1031.50 ± 3.40
210.00	1567.07 ± 1.67	280.00	1289.63 ± 2.74	330.00	915.72 ± 3.76
220.00	1532.09 ± 1.55	290.00	1236.73 ± 2.84		
230.00	1496.01 ± 1.49	293.15	1218.99 ± 2.88		

1,1,1,2-Tetrafluoroethane**[811-97-2]****MW = 102.03****376** $T_c = 374.25 \text{ K}$ [1991-mor/war] $\rho_c = 515.20 \text{ kg} \cdot \text{m}^{-3}$ [1991-mor/war]**Table 1.** Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_i = 5.2780 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 6.3868 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 4.0927 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 179.66 \text{ to } 300.00 \text{ K}$	$T = 300.00 \text{ to } 374.25 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$	$\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$2.22128 \cdot 10^3$	2.23710
<i>B</i>	-5.44427	$-6.06582 \cdot 10^{-2}$
<i>C</i>	$1.47389 \cdot 10^{-2}$	$7.78934 \cdot 10^{-4}$
<i>D</i>	$-2.64606 \cdot 10^{-5}$	$-3.70422 \cdot 10^{-6}$

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)
244.47	1386.00 ± 1.50	1.42	1991-fuk(◆)	361.49	854.80 ± 3.00	1.91	1991-yok/tak(×)
250.30	1364.00 ± 1.50	-3.03	1991-fuk ¹⁾	367.07	787.20 ± 4.00	3.63	1991-yok/tak(×)
255.06	1352.00 ± 1.50	-0.45	1991-fuk(◆)	250.05	1365.00 ± 1.50	-2.79	1993-rip/mat ¹⁾
261.82	1330.00 ± 1.50	-1.30	1991-fuk(◆)	255.05	1350.00 ± 1.50	-2.48	1993-rip/mat ¹⁾
266.89	1315.00 ± 1.50	-0.08	1991-fuk(◆)	260.15	1335.00 ± 1.50	-1.57	1993-rip/mat(×)
275.47	1287.00 ± 1.50	0.14	1991-fuk(◆)	265.15	1320.00 ± 1.50	-0.68	1993-rip/mat(×)
291.55	1232.00 ± 1.50	0.93	1991-fuk(◆)	270.45	1303.00 ± 1.50	-0.49	1993-rip/mat(×)
251.94	1361.10 ± 1.50	-0.93	1991-yok/tak(×)	275.55	1286.00 ± 1.50	-0.59	1993-rip/mat(×)
258.10	1342.30 ± 1.50	-0.70	1991-yok/tak(×)	280.45	1269.00 ± 1.50	-1.01	1993-rip/mat(×)
264.83	1321.30 ± 1.50	-0.41	1991-yok/tak(×)	280.45	1269.00 ± 1.50	-1.01	1993-rip/mat(×)
270.70	1302.40 ± 1.50	-0.27	1991-yok/tak(×)	285.75	1251.00 ± 1.50	-0.66	1993-rip/mat(×)
275.80	1285.60 ± 1.50	-0.15	1991-yok/tak(×)	291.05	1233.00 ± 1.50	0.13	1993-rip/mat(×)
279.23	1274.30 ± 1.50	0.13	1991-yok/tak(×)	295.95	1214.00 ± 1.50	-1.08	1993-rip/mat(×)
285.08	1254.40 ± 1.50	0.39	1991-yok/tak(×)	296.05	1214.00 ± 1.50	-0.71	1993-rip/mat(×)
291.19	1232.50 ± 1.50	0.13	1991-yok/tak(×)	300.75	1196.00 ± 2.00	-1.23	1993-rip/mat(×)
295.16	1218.20 ± 1.50	0.22	1991-yok/tak(×)	306.05	1175.00 ± 2.00	-1.36	1993-rip/mat(×)
299.98	1200.20 ± 1.50	0.07	1991-yok/tak(×)	243.27	1388.20 ± 0.80	0.05	1993-til/bae(○)
306.17	1176.10 ± 2.00	0.23	1991-yok/tak(×)	253.27	1358.20 ± 0.80	0.24	1993-til/bae(○)
313.42	1146.40 ± 2.00	1.09	1991-yok/tak(×)	263.26	1327.00 ± 0.80	0.28	1993-til/bae(○)
319.50	1120.20 ± 2.00	1.87	1991-yok/tak(×)	273.25	1294.60 ± 0.80	0.34	1993-til/bae(○)
325.20	1092.70 ± 2.00	0.78	1991-yok/tak(×)	283.16	1261.10 ± 0.80	0.42	1993-til/bae(○)
331.52	1061.60 ± 2.00	0.54	1991-yok/tak(×)	293.15	1225.50 ± 1.00	0.20	1993-til/bae(○)
337.16	1032.00 ± 2.00	0.48	1991-yok/tak(×)	293.16	1225.40 ± 1.00	0.14	1993-til/bae(○)
341.72	1005.20 ± 2.00	-0.48	1991-yok/tak(×)	303.15	1187.50 ± 1.50	-0.46	1993-til/bae(○)
345.60	982.10 ± 2.00	0.25	1991-yok/tak(×)	313.17	1146.70 ± 1.50	0.30	1993-til/bae(○)
355.86	907.50 ± 3.00	1.06	1991-yok/tak(×)	323.15	1102.30 ± 1.50	0.75	1993-til/bae(○)

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)
333.15	1052.80 ± 1.50	0.05	1993-til/bae(○)	343.11	996.85 ± 2.00	-0.51	1995-bla/kli(×)
343.15	996.20 ± 2.00	-0.92	1993-til/bae(○)	348.09	964.92 ± 2.00	-0.51	1995-bla/kli(×)
353.16	928.10 ± 3.00	-0.41	1993-til/bae(○)	353.08	929.16 ± 3.00	0.03	1995-bla/kli(×)
316.19	1133.15 ± 1.00	-0.01	1994-nie/van(▽)	353.09	929.36 ± 3.00	0.31	1995-bla/kli(×)
320.35	1114.68 ± 1.00	0.22	1994-nie/van(▽)	358.08	887.89 ± 3.00	1.17	1995-bla/kli(×)
325.18	1091.48 ± 1.00	-0.54	1994-nie/van(▽)	363.07	838.53 ± 3.00	3.14	1995-bla/kli(×)
329.94	1068.68 ± 1.00	-0.28	1994-nie/van(▽)	368.06	772.93 ± 4.00	4.56	1995-bla/kli ¹⁾
335.19	1041.61 ± 1.50	-0.49	1994-nie/van(▽)	372.55	675.24 ± 4.00	4.27	1995-bla/kli ¹⁾
338.79	1022.54 ± 1.50	0.03	1994-nie/van(▽)	373.56	632.18 ± 4.00	3.87	1995-bla/kli ¹⁾
344.86	985.41 ± 1.50	-1.14	1994-nie/van(▽)	258.32	1343.30 ± 1.00	0.99	1995-ogu/tak(Δ)
349.15	956.92 ± 2.00	-1.20	1994-nie/van(▽)	263.81	1325.30 ± 1.00	0.33	1995-ogu/tak(Δ)
351.58	939.90 ± 3.00	-0.68	1994-nie/van(▽)	268.17	1311.70 ± 1.00	0.77	1995-ogu/tak(Δ)
364.66	822.20 ± 3.00	5.91	1994-nie/van ¹⁾	283.48	1260.80 ± 1.00	1.23	1995-ogu/tak(Δ)
367.27	785.88 ± 4.00	5.28	1994-nie/van ¹⁾	286.73	1249.10 ± 1.50	0.88	1995-ogu/tak(Δ)
370.51	729.82 ± 4.00	6.09	1994-nie/van ¹⁾	306.68	1173.80 ± 2.00	0.01	1995-ogu/tak(Δ)
288.25	1243.45 ± 1.00	0.59	1995-bla/kli(×)	308.52	1167.70 ± 2.00	1.52	1995-ogu/tak(Δ)
288.26	1242.91 ± 1.00	0.09	1995-bla/kli(×)	179.66	1565.11 ± 0.80	-0.34	1996-bla/wei(□)
288.29	1242.78 ± 1.00	0.07	1995-bla/kli(×)	189.58	1538.54 ± 0.80	-0.04	1996-bla/wei(□)
293.23	1225.46 ± 1.50	0.45	1995-bla/kli(×)	199.59	1512.29 ± 0.80	0.88	1996-bla/wei(□)
298.18	1206.98 ± 1.50	0.13	1995-bla/kli(×)	199.59	1512.16 ± 0.80	0.75	1996-bla/wei(□)
303.19	1187.62 ± 2.00	-0.19	1995-bla/kli(×)	209.54	1483.84 ± 0.80	-0.34	1996-bla/wei(□)
308.18	1167.64 ± 2.00	0.04	1995-bla/kli(×)	219.47	1456.30 ± 0.80	-0.33	1996-bla/wei(□)
308.19	1167.30 ± 2.00	-0.26	1995-bla/kli(×)	229.33	1428.33 ± 0.80	-0.42	1996-bla/wei(□)
313.17	1146.91 ± 2.00	0.51	1995-bla/kli(×)	239.44	1398.96 ± 0.80	-0.51	1996-bla/wei(□)
318.15	1125.27 ± 2.00	0.85	1995-bla/kli(×)	248.13	1374.41 ± 0.80	0.81	1996-bla/wei(□)
318.18	1124.93 ± 2.00	0.64	1995-bla/kli(×)	249.25	1369.71 ± 0.80	-0.51	1996-bla/wei(□)
323.17	1102.44 ± 2.00	0.98	1995-bla/kli(×)	253.90	1356.82 ± 0.80	0.80	1996-bla/wei(□)
328.14	1078.61 ± 2.00	0.80	1995-bla/kli(×)	259.02	1339.97 ± 0.80	-0.15	1996-bla/wei(□)
333.14	1053.20 ± 2.00	0.40	1995-bla/kli(×)	259.03	1340.83 ± 0.80	0.74	1996-bla/wei(□)
338.13	1026.08 ± 2.00	-0.11	1995-bla/kli(×)				

¹⁾ Not included in Fig. 1.

Further references: [1988-wil/bas, 1989-bas/wil, 1989-kab/tan, 1990-fuk/wat, 1990-mae/sat, 1990-pia/sat, 1990-ruv/lav, 1991-mor/war, 1992-lav/ruv, 1994-hig, 1995-ogu/tak, 1996-aoy/kis, 1997-def/mol, 1997-hol/mag].

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
170.00	1591.70 ± 1.53	200.00	1510.29 ± 0.92	230.00	1426.84 ± 0.93
180.00	1564.53 ± 1.14	210.00	1482.91 ± 0.91	240.00	1397.82 ± 0.96
190.00	1537.45 ± 0.97	220.00	1455.15 ± 0.92	250.00	1367.94 ± 1.02

cont.

1,1,1,2-Tetrafluoroethane (cont.)**Table 3.** (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
260.00	1337.04 \pm 1.11	298.15	1206.96 \pm 1.66	340.00	1015.67 \pm 2.68
270.00	1304.96 \pm 1.21	300.00	1200.06 \pm 1.71	350.00	952.12 \pm 2.85
280.00	1271.55 \pm 1.34	310.00	1159.97 \pm 2.34	360.00	868.27 \pm 3.08
290.00	1236.63 \pm 1.49	320.00	1116.06 \pm 2.43	370.00	734.12 \pm 3.37
293.15	1225.30 \pm 1.55	330.00	1068.66 \pm 2.54		

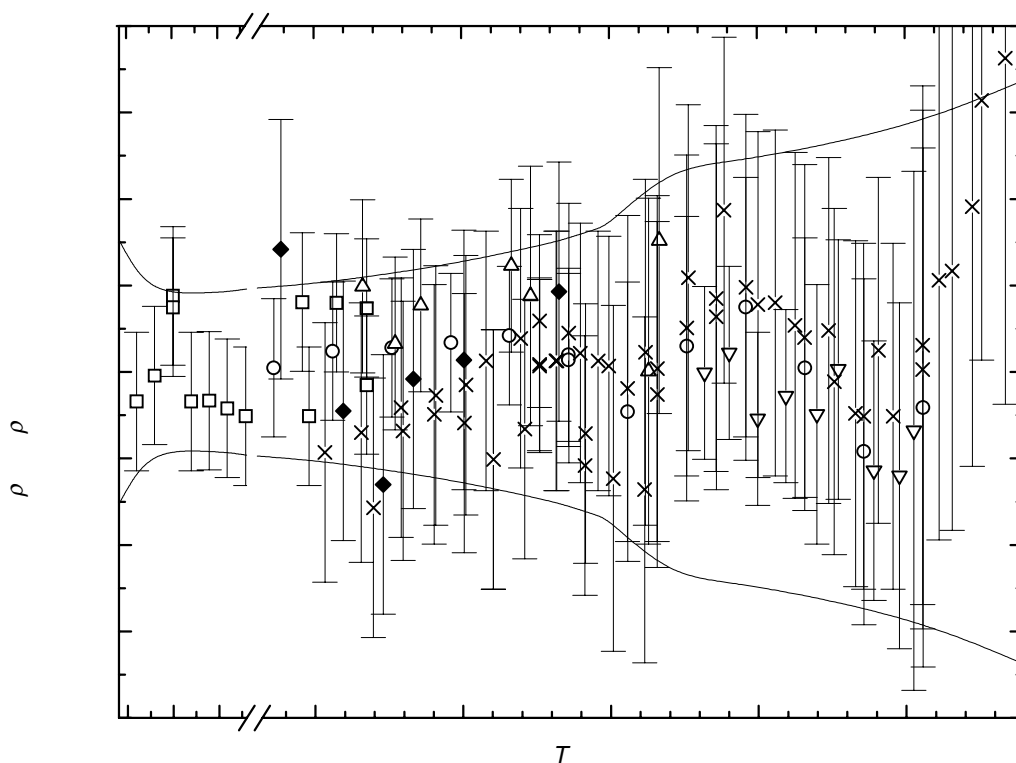


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

1,1,2,2-Tetrafluoroethane**[359-35-3]****MW = 102.03****377**

$T_c = 391.74 \text{ K [1993-tat/kuw]}$

$\rho_c = 536.00 \text{ kg}\cdot\text{m}^{-3} \text{ [1993-tat/kuw]}$

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_i = 4.8252 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 1.4061$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.6148 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 200.00 \text{ to } 300.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 300.00 \text{ to } 391.74 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$1.92129 \cdot 10^3$	2.29009
<i>B</i>	$-9.74599 \cdot 10^{-1}$	$-6.36002 \cdot 10^{-2}$
<i>C</i>	$-3.81818 \cdot 10^{-3}$	$7.50275 \cdot 10^{-4}$
<i>D</i>		$-3.10549 \cdot 10^{-6}$

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)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg}\cdot\text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{cal}}}{\text{kg}\cdot\text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
200.00	1573.40 ± 1.60	-0.24	1991-mae/sat-1(□)	279.98	1349.40 ± 1.70	0.28	1991-mae/sat-1(□)
200.00	1574.30 ± 1.60	0.66	1991-mae/sat-1(□)	279.99	1347.90 ± 1.70	-1.19	1991-mae/sat-1(□)
210.00	1550.60 ± 1.60	2.36	1991-mae/sat-1 ¹⁾	300.00	1285.40 ± 1.80	0.13	1991-mae/sat-1(□)
210.01	1547.80 ± 1.60	-0.42	1991-mae/sat-1(□)	319.99	1211.70 ± 1.80	1.77	1991-mae/sat-1(□)
220.00	1521.90 ± 1.60	-0.18	1991-mae/sat-1(□)	320.00	1212.50 ± 1.80	2.61	1991-mae/sat-1(□)
230.00	1495.10 ± 1.60	-0.05	1991-mae/sat-1(□)	359.93	1024.20 ± 1.90	-4.21	1991-mae/sat-1(□)
240.01	1467.10 ± 1.60	-0.33	1991-mae/sat-1(□)	360.00	1029.20 ± 1.90	1.19	1991-mae/sat-1(□)
250.00	1439.30 ± 1.70	0.30	1991-mae/sat-1(□)	379.98	872.40 ± 2.00	2.58	1991-mae/sat-1(□)
260.00	1410.30 ± 1.70	0.52	1991-mae/sat-1(□)	390.02	704.00 ± 3.00	7.80	1991-mae/sat-1 ¹⁾
270.01	1380.30 ± 1.70	0.53	1991-mae/sat-1(□)	390.66	673.50 ± 2.00	1.87	1993-tat/kuw(○)

¹⁾ Not included in Fig. 1.**Further references:** [1959-eis, 1997-def/mol].**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	1573.64 ± 2.06	280.00	1349.06 ± 1.87	340.00	1126.28 ± 3.49
210.00	1548.24 ± 1.86	290.00	1317.55 ± 2.30	350.00	1080.65 ± 3.57
220.00	1522.08 ± 1.73	293.15	1307.46 ± 2.47	360.00	1028.01 ± 3.65
230.00	1495.15 ± 1.65	298.15	1291.30 ± 2.80	370.00	961.80 ± 3.76
240.00	1467.46 ± 1.59	300.00	1285.27 ± 2.94	380.00	869.59 ± 3.89
250.00	1439.00 ± 1.55	310.00	1249.47 ± 3.34	390.00	696.88 ± 4.05
260.00	1409.78 ± 1.56	320.00	1209.89 ± 3.38		
270.00	1379.80 ± 1.64	330.00	1168.77 ± 3.43		

cont.

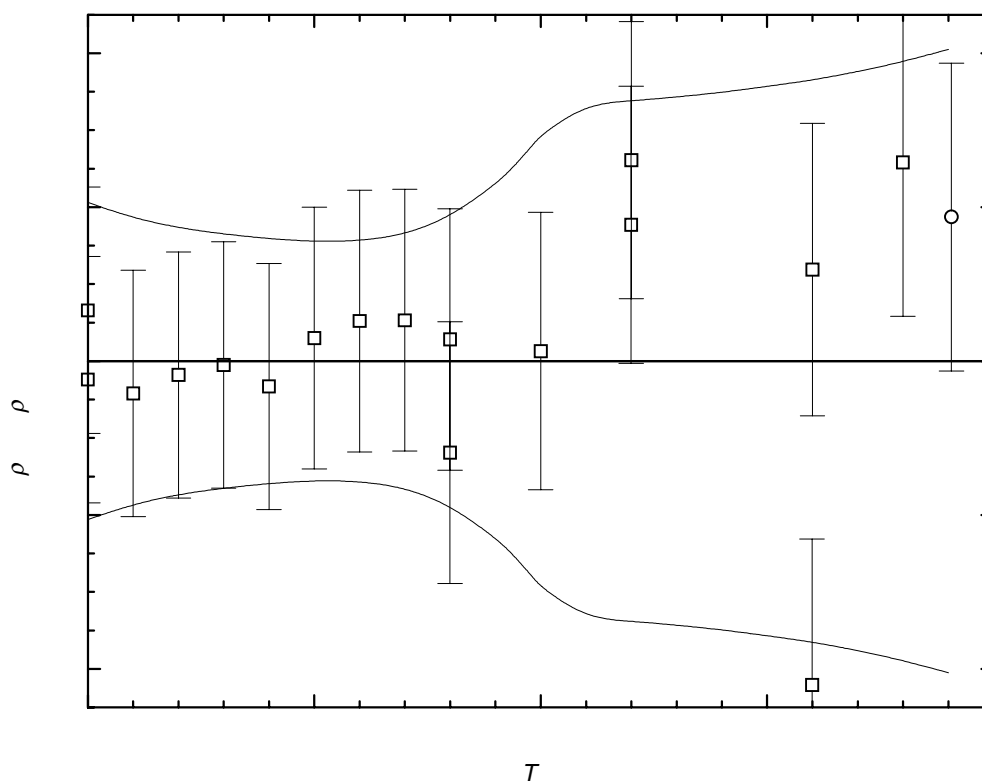
1,1,2,2-Tetrafluoroethane (cont.)

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-Trifluoroethane

[420-46-2]



MW = 84.04

378

 $T_c = 345.86 \text{ K}$ [1996-aoy/kis] $\rho_c = 434.00 \text{ kg}\cdot\text{m}^{-3}$ [1996-aoy/kis]

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction):

$\sigma_t = 1.0141$ (low temperature range), $\sigma_{c,w} = 2.2884$ (combined temperature ranges, weighted),

$\sigma_{c,uw} = 2.1566 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 164.12 \text{ to } 265.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 265.00 \text{ to } 345.86 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$1.59489 \cdot 10^3$	1.91355
<i>B</i>	-1.02181	$-5.37577 \cdot 10^{-2}$
<i>C</i>	$-3.85913 \cdot 10^{-3}$	$7.05428 \cdot 10^{-4}$
<i>D</i>		$-3.34181 \cdot 10^{-6}$

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)
248.05	1103.90 ± 1.50	-0.08	1991-yok/tak(○)	343.44	587.90 ± 3.00	0.56	1993-fuk(▽)
253.81	1086.20 ± 1.50	-0.74	1991-yok/tak(○)	344.12	571.40 ± 4.00	1.49	1993-fuk(▽)
261.13	1062.90 ± 1.50	-2.01	1991-yok/tak(○)	344.48	560.30 ± 4.00	1.29	1993-fuk(▽)
268.46	1038.60 ± 1.50	-3.45	1991-yok/tak(○)	344.82	550.50 ± 4.00	3.47	1993-fuk(▽)
272.20	1025.80 ± 1.50	-3.47	1991-yok/tak(○)	345.38	522.80 ± 4.00	2.55	1993-fuk(▽)
278.54	1003.30 ± 1.50	-2.86	1991-yok/tak(○)	345.60	508.10 ± 4.00	4.22	1993-fuk(▽)
282.87	986.50 ± 1.50	-3.14	1991-yok/tak(○)	332.69	729.60 ± 2.00	-0.44	1996-aoy/kis(Δ)
292.36	949.10 ± 1.50	-2.87	1991-yok/tak(○)	335.93	702.50 ± 2.00	4.23	1996-aoy/kis(Δ)
297.34	929.30 ± 1.50	-2.11	1991-yok/tak(○)	338.04	681.30 ± 3.00	7.03	1996-aoy/kis ¹⁾
305.06	895.60 ± 2.00	-2.31	1991-yok/tak(○)	342.38	611.80 ± 4.00	2.19	1996-aoy/kis(Δ)
310.71	868.50 ± 2.00	-2.94	1991-yok/tak(○)	345.85	458.50 ± 4.00	1.16	1996-aoy/kis(Δ)
315.76	842.20 ± 2.00	-3.44	1991-yok/tak(○)	345.86	434.40 ± 4.00	0.40	1996-aoy/kis(Δ)
321.06	812.30 ± 2.00	-3.11	1991-yok/tak(○)	164.12	1324.00 ± 1.50	0.76	1998-mag(□)
327.94	767.00 ± 2.00	-2.09	1991-yok/tak(○)	179.96	1285.80 ± 1.50	-0.22	1998-mag(□)
336.86	690.70 ± 3.00	2.62	1991-yok/tak(○)	200.15	1235.40 ± 1.50	-0.38	1998-mag(□)
340.95	640.40 ± 4.00	6.14	1991-yok/tak(○)	218.63	1187.60 ± 1.50	0.57	1998-mag(□)
339.00	661.10 ± 3.00	-1.05	1993-fuk(▽)	239.00	1131.40 ± 1.50	1.16	1998-mag(□)
339.73	651.30 ± 3.00	-0.99	1993-fuk(▽)	258.14	1074.90 ± 1.00	0.94	1998-mag(□)
341.25	630.10 ± 3.00	0.64	1993-fuk(▽)	277.98	1009.20 ± 1.00	0.95	1998-mag(□)
341.96	619.00 ± 3.00	1.65	1993-fuk(▽)	298.00	932.36 ± 1.00	3.73	1998-mag(□)
342.74	604.10 ± 3.00	1.56	1993-fuk(▽)				

¹⁾ Not included in Fig. 1.**Further references:** [1955-mea/sta, 1994-wid/sat-1, 1996-hig/ike, 1997-dem/fo1, 1997-hol/mag, 1997-wan/qu].**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
160.00	1332.61 ± 2.38	230.00	1155.72 ± 1.37	293.15	948.75 ± 2.44
170.00	1309.65 ± 2.01	240.00	1127.37 ± 1.36	298.15	928.00 ± 2.49
180.00	1285.93 ± 1.77	250.00	1098.24 ± 1.46	300.00	920.13 ± 2.51
190.00	1261.43 ± 1.62	260.00	1068.34 ± 1.75	310.00	874.89 ± 2.65
200.00	1236.16 ± 1.54	270.00	1036.88 ± 2.27	320.00	821.77 ± 2.86
210.00	1210.12 ± 1.48	280.00	1000.64 ± 2.33	330.00	753.04 ± 3.17
220.00	1183.31 ± 1.42	290.00	961.52 ± 2.41	340.00	648.49 ± 3.68

cont.

1,1,1-Trifluoroethane (cont.)

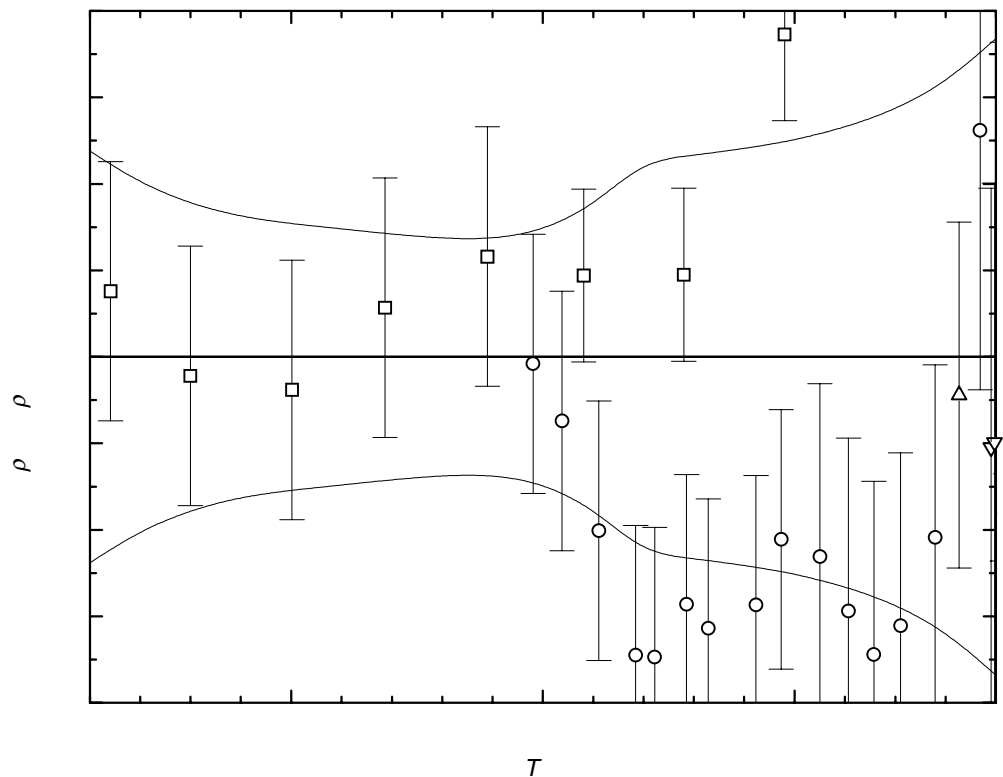


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

1,1,2-Trifluoroethane [430-66-0] C₂H₃F₃ MW = 84.04 379

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

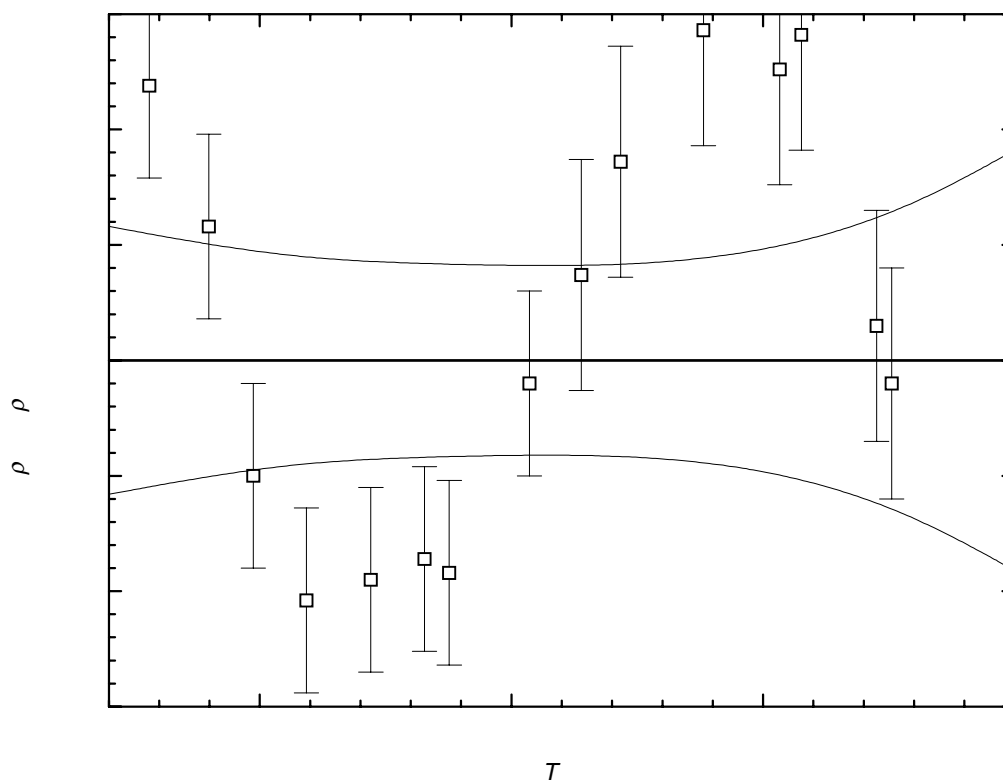
$\sigma_{c,w} = 1.0107$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.9765 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 314.02 \text{ to } 393.66 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$7.95814 \cdot 10^2$
B	4.79137
C	$-1.14198 \cdot 10^{-2}$

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)
314.02	1175.50 ± 0.40	1.19	1994-hol/van(□)	360.86	1038.60 ± 0.50	0.86	1994-hol/van(□)
319.94	1160.40 ± 0.40	0.58	1994-hol/van(□)	369.09	1010.00 ± 0.50	1.43	1994-hol/van(□)
324.35	1148.00 ± 0.40	-0.50	1994-hol/van(□)	376.67	981.60 ± 0.50	1.26	1994-hol/van(□)
329.64	1133.30 ± 0.40	-1.04	1994-hol/van(□)	378.82	973.50 ± 0.50	1.41	1994-hol/van(□)
336.04	1115.40 ± 0.40	-0.95	1994-hol/van(□)	386.28	942.80 ± 0.50	0.15	1994-hol/van(□)
341.37	1099.80 ± 0.40	-0.86	1994-hol/van(□)	387.80	936.40 ± 0.50	-0.10	1994-hol/van(□)
343.82	1092.30 ± 0.40	-0.92	1994-hol/van(□)	393.66	909.50 ± 0.50	-2.78	1994-hol/van(□)
351.79	1068.00 ± 0.40	-0.10	1994-hol/van(□)	400.96	872.70 ± 0.50	-8.31	1994-hol/van ¹⁾
356.96	1051.40 ± 0.50	0.37	1994-hol/van(□)				

¹⁾ Not included in Fig. 1.**Further references:** [1997-def/mol].**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.

1,1,2-Trifluoroethane (cont.)**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
310.00	1183.70 ± 0.58	350.00	1073.87 ± 0.41	390.00	927.50 ± 0.67
320.00	1159.67 ± 0.50	360.00	1040.70 ± 0.41	400.00	885.20 ± 0.91
330.00	1133.35 ± 0.44	370.00	1005.25 ± 0.44		
340.00	1104.75 ± 0.42	380.00	967.52 ± 0.52		

1,1-Difluoroethane

[75-37-6]



MW = 66.05

380

 $T_c = 386.41 \text{ K}$ [1992-tam/sat-2] $\rho_c = 368.00 \text{ kg} \cdot \text{m}^{-3}$ [1992-tam/sat-2]**Table 1.** Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_t = 8.5337 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 1.0145$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.0409 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 157.02 \text{ to } 310.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 310.00 \text{ to } 386.41 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$1.57877 \cdot 10^3$	2.14191
<i>B</i>	-3.48991	$-6.35066 \cdot 10^{-2}$
<i>C</i>	$8.98665 \cdot 10^{-3}$	$8.44199 \cdot 10^{-4}$
<i>D</i>	$-1.65191 \cdot 10^{-5}$	$-4.01648 \cdot 10^{-6}$

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)
231.74	1043.00 ± 2.00	-4.05	1955-mea/sta ¹⁾	210.00	1090.30 ± 1.00	1.08	1980-gel/por(Δ)
249.66	1009.00 ± 2.00	-1.56	1955-mea/sta ¹⁾	220.00	1070.80 ± 1.00	0.75	1980-gel/por(Δ)
271.40	962.00 ± 2.00	-1.32	1955-mea/sta ¹⁾	230.00	1050.90 ± 1.00	0.40	1980-gel/por(Δ)
287.08	929.00 ± 2.00	2.31	1955-mea/sta ¹⁾	240.00	1030.80 ± 1.00	0.33	1980-gel/por(Δ)
298.01	901.00 ± 2.00	1.35	1955-mea/sta ¹⁾	250.00	1010.00 ± 1.00	0.15	1980-gel/por(Δ)
312.71	858.00 ± 2.00	-2.92	1955-mea/sta(X)	260.00	988.50 ± 1.00	-0.05	1980-gel/por(Δ)
333.15	799.00 ± 2.00	1.77	1955-mea/sta(X)	270.00	966.40 ± 1.00	-0.08	1980-gel/por(Δ)
353.06	721.00 ± 3.00	-5.31	1955-mea/sta(X)	280.00	943.38 ± 1.00	-0.14	1980-gel/por(Δ)
160.00	1184.20 ± 1.00	1.42	1980-gel/por(Δ)	290.00	919.36 ± 1.00	-0.23	1980-gel/por(Δ)
170.00	1165.60 ± 1.00	1.56	1980-gel/por(Δ)	300.00	894.13 ± 1.00	-0.45	1980-gel/por(Δ)
180.00	1147.00 ± 1.00	1.58	1980-gel/por(Δ)	310.00	867.49 ± 1.50	-0.91	1980-gel/por ¹⁾
190.00	1128.60 ± 1.00	1.80	1980-gel/por(Δ)	320.00	839.08 ± 1.50	-0.18	1980-gel/por(Δ)
200.00	1109.40 ± 1.00	1.30	1980-gel/por(Δ)	330.00	808.42 ± 1.50	0.90	1980-gel/por(Δ)

¹⁾ Not included in Fig. 1.

cont.

Table 2. (cont.)

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)
340.00	774.89 ± 1.50	0.57	1980-gel/por(Δ)	159.55	1181.71 ± 0.80	-1.92	1992-bla/wei(O)
222.92	1064.00 ± 0.80	-0.39	1987-sat/uem(◆)	171.73	1159.18 ± 0.80	-1.64	1992-bla/wei(O)
232.90	1044.00 ± 0.80	-0.74	1987-sat/uem(◆)	183.56	1137.94 ± 0.80	-0.85	1992-bla/wei(O)
253.01	1003.00 ± 0.80	-0.52	1987-sat/uem(◆)	195.52	1115.79 ± 0.80	-0.71	1992-bla/wei(O)
261.91	982.00 ± 0.80	-2.40	1987-sat/uem ¹⁾	219.40	1070.41 ± 0.80	-0.80	1992-bla/wei(O)
273.47	959.00 ± 0.80	0.38	1987-sat/uem(◆)	231.42	1046.54 ± 0.80	-1.15	1992-bla/wei(O)
278.18	949.00 ± 0.80	1.23	1987-sat/uem(◆)	243.45	1022.90 ± 0.80	-0.52	1992-bla/wei(O)
283.16	938.00 ± 0.80	1.93	1987-sat/uem(◆)	252.47	1004.43 ± 0.80	-0.23	1992-bla/wei(O)
288.16	928.00 ± 0.80	3.93	1987-sat/uem ¹⁾	257.33	993.95 ± 0.80	-0.36	1992-bla/wei(O)
293.15	914.00 ± 0.80	2.17	1987-sat/uem(◆)	263.14	981.41 ± 0.80	-0.30	1992-bla/wei(O)
293.15	914.00 ± 0.80	2.17	1987-sat/uem(◆)	268.44	969.67 ± 0.80	-0.31	1992-bla/wei(O)
298.15	898.00 ± 0.80	-1.29	1987-sat/uem(◆)	273.27	958.77 ± 0.80	-0.30	1992-bla/wei(O)
303.15	886.00 ± 0.80	-0.47	1987-sat/uem(◆)	278.28	947.25 ± 0.80	-0.29	1992-bla/wei(O)
308.15	872.00 ± 0.80	-1.33	1987-sat/uem(◆)	283.12	935.91 ± 0.80	-0.26	1992-bla/wei(O)
313.15	858.00 ± 1.00	-1.67	1987-sat/uem(◆)	288.10	924.02 ± 0.80	-0.20	1992-bla/wei(O)
313.15	859.00 ± 1.00	-0.67	1987-sat/uem(◆)	293.52	910.76 ± 0.80	-0.16	1992-bla/wei(O)
318.15	844.00 ± 1.00	-0.92	1987-sat/uem(◆)	298.46	898.28 ± 0.80	-0.23	1992-bla/wei(O)
323.15	829.00 ± 1.50	-0.44	1987-sat/uem(◆)	303.37	885.63 ± 0.80	-0.26	1992-bla/wei(O)
323.15	830.00 ± 1.50	0.56	1987-sat/uem(◆)	308.31	872.53 ± 0.80	-0.38	1992-bla/wei(O)
323.16	831.00 ± 1.50	1.59	1987-sat/uem(◆)	243.27	1023.00 ± 0.80	-0.79	1993-til/bae(V)
328.16	815.00 ± 1.50	1.53	1987-sat/uem(◆)	253.27	1002.30 ± 0.80	-0.67	1993-til/bae(V)
333.15	797.00 ± 1.50	-0.23	1987-sat/uem(◆)	263.26	980.80 ± 0.80	-0.65	1993-til/bae(V)
338.15	781.00 ± 2.00	0.40	1987-sat/uem(◆)	273.25	958.70 ± 0.80	-0.42	1993-til/bae(V)
343.16	764.00 ± 2.00	0.61	1987-sat/uem(◆)	283.16	935.80 ± 0.80	-0.27	1993-til/bae(V)
348.16	744.00 ± 2.00	-1.33	1987-sat/uem(◆)	293.15	911.70 ± 0.80	-0.13	1993-til/bae(V)
353.16	724.00 ± 2.00	-1.91	1987-sat/uem(◆)	293.16	911.70 ± 0.80	-0.11	1993-til/bae(V)
358.16	700.00 ± 3.00	-4.45	1987-sat/uem(◆)	303.15	886.30 ± 0.80	-0.17	1993-til/bae(V)
363.17	675.00 ± 3.00	-5.02	1987-sat/uem(◆)	313.17	859.50 ± 1.00	-0.12	1993-til/bae(V)
298.10	897.43 ± 1.50	-1.99	1987-val/lau ¹⁾	323.15	830.60 ± 1.50	1.16	1993-til/bae(V)
323.00	828.74 ± 1.50	-1.17	1987-val/lau(X)	333.15	799.20 ± 1.50	1.97	1993-til/bae(V)
348.10	745.49 ± 2.00	-0.06	1987-val/lau(X)	343.15	764.70 ± 2.00	1.28	1993-til/bae(V)
372.30	624.30 ± 2.00	0.74	1987-val/lau(X)	353.16	725.40 ± 2.00	-0.51	1993-til/bae(V)
375.56	600.50 ± 3.00	2.94	1988-kab/hig(X)	157.02	1188.20 ± 0.80	-0.20	1998-mag(□)
379.40	565.60 ± 3.00	5.44	1988-kab/hig(X)	169.86	1164.70 ± 0.80	0.39	1998-mag(□)
382.11	533.70 ± 3.00	7.52	1988-kab/hig(X)	184.60	1137.20 ± 0.80	0.34	1998-mag(□)
384.44	498.50 ± 4.00	13.06	1988-kab/hig ¹⁾	200.30	1107.90 ± 0.80	0.36	1998-mag(□)
385.99	444.00 ± 4.00	8.44	1988-kab/hig ¹⁾	216.21	1077.50 ± 0.80	0.14	1998-mag(□)
386.42	406.20 ± 4.00	38.23	1988-kab/hig ¹⁾	235.87	1038.60 ± 0.80	-0.20	1998-mag(□)
386.44	368.60 ± 4.00	0.69	1988-kab/hig ¹⁾	260.82	986.86 ± 0.80	0.09	1998-mag(□)
386.44	373.90 ± 4.00	5.99	1988-kab/hig ¹⁾	286.34	928.87 ± 0.80	0.40	1998-mag(□)
386.44	391.40 ± 4.00	23.49	1988-kab/hig ¹⁾	318.46	845.08 ± 0.80	1.07	1998-mag(□)

¹⁾ Not included in Fig. 1.

cont.

1,1-Difluoroethane (cont.)

Further references: [1937-ano-1, 1987-hig/ash, 1989-iso/uem, 1992-tam/sat-2, 1992-wan/liu, 1993-hol/nie, 1997-def/mol].

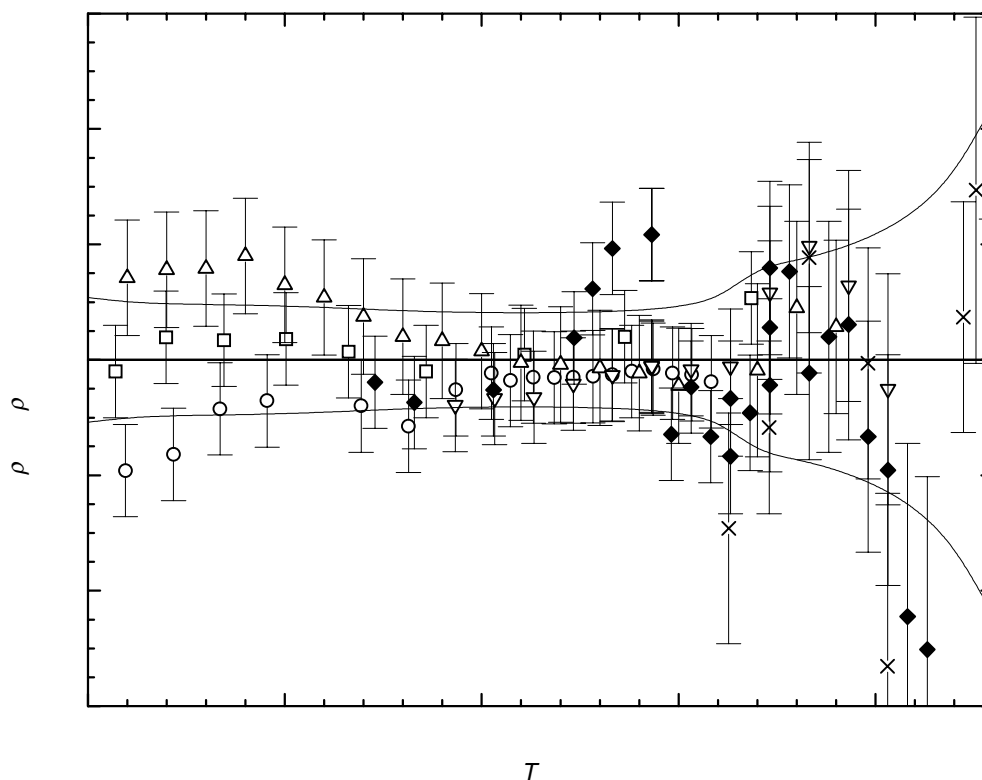


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
150.00	1201.73 ± 1.08	240.00	1030.47 ± 0.83	310.00	868.40 ± 1.04
160.00	1182.78 ± 1.00	250.00	1009.85 ± 0.82	320.00	839.26 ± 1.60
170.00	1164.04 ± 0.97	260.00	988.55 ± 0.81	330.00	807.52 ± 1.72
180.00	1145.42 ± 0.96	270.00	966.48 ± 0.82	340.00	774.32 ± 1.90
190.00	1126.80 ± 0.95	280.00	943.52 ± 0.83	350.00	738.37 ± 2.16
200.00	1108.10 ± 0.93	290.00	919.59 ± 0.86	360.00	695.87 ± 2.55
210.00	1089.22 ± 0.91	293.15	911.83 ± 0.88	370.00	639.69 ± 3.20
220.00	1070.05 ± 0.88	298.15	899.29 ± 0.91	380.00	553.36 ± 4.45
230.00	1050.50 ± 0.85	300.00	894.58 ± 0.93		

1,2-Difluoroethane

[624-72-6]

**MW = 66.05****381****Table 1.** Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
283.15	1024.00 ± 2.00	1957-tit/ver

Fluoroethane

[353-36-6]

**MW = 48.06****382****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction):

$\sigma_{\text{c,w}} = 2.4375 \cdot 10^{-2}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.2188 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 173.15 \text{ to } 236.05 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.13095 \cdot 10^3$
B	-1.32738

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)
173.15	901.10 ± 0.40	-0.02	1940-gro/wac(□)	233.15	821.50 ± 0.40	0.03	1940-gro/wac(□)
193.15	874.60 ± 0.40	0.03	1940-gro/wac(□)	236.05	817.60 ± 0.40	-0.02	1940-gro/wac(□)
213.15	848.00 ± 0.40	-0.02	1940-gro/wac(□)				

Further references: [1998-bey/des].**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
170.00	905.30 ± 0.61	200.00	865.48 ± 0.34	230.00	825.65 ± 0.43
180.00	892.02 ± 0.53	210.00	852.20 ± 0.29	240.00	812.38 ± 0.65
190.00	878.75 ± 0.43	220.00	838.93 ± 0.31	250.00	799.11 ± 1.00

cont.

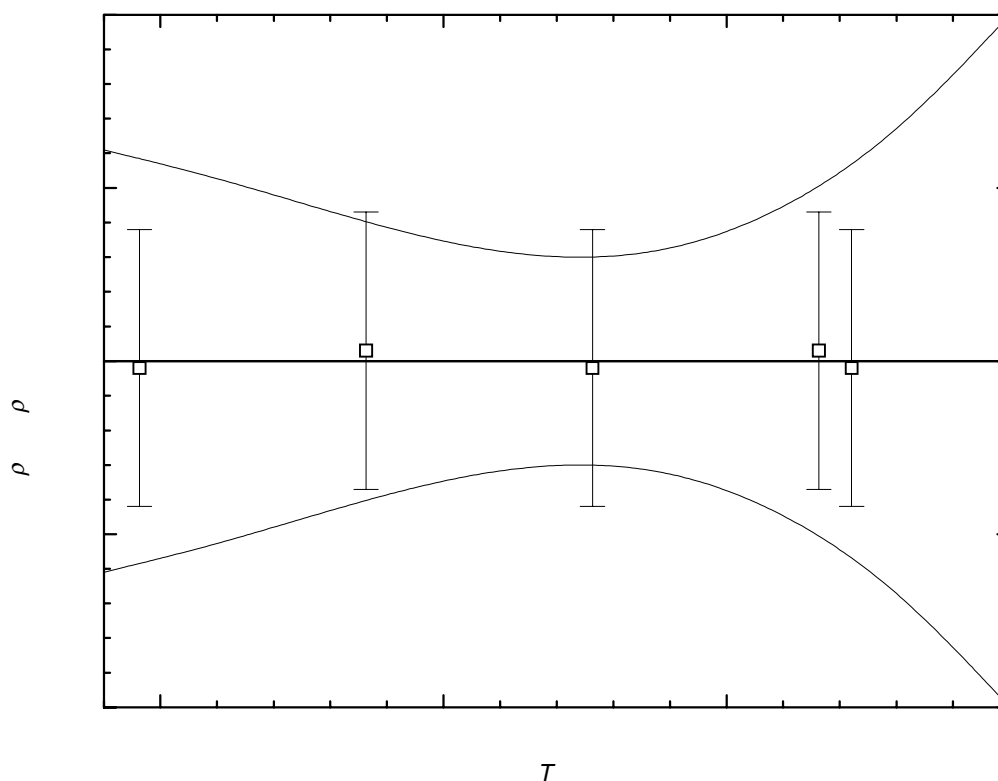
Fluoroethane (cont)

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.)