

5.3 Fluoroalkylbenzenes and Iodoalkylbenzenes

Hexafluorobenzene

[392-56-3]

 C_6F_6

MW = 186.06

913

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 8.0526 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.2139 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 293.15 \text{ to } 423.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$2.01912 \cdot 10^3$
B	$-5.44420 \cdot 10^{-1}$
C	$-2.81671 \cdot 10^{-3}$

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	1618.74 ± 2.00	1.27	1970-hal ¹⁾	298.15	1606.85 ± 0.00	0.43	1972-mar/mur ¹⁾
333.15	1526.03 ± 2.00	0.90	1970-hal(×)	293.15	1618.16 ± 0.50	0.69	1972-nis/kuv(∇)
398.15	1359.38 ± 2.00	3.53	1970-hal ¹⁾	303.15	1593.39 ± 0.50	-1.84	1972-nis/kuv(∇)
423.15	1284.53 ± 2.00	0.13	1970-hal(×)	313.15	1572.50 ± 0.50	0.08	1972-nis/kuv(∇)
293.15	1617.68 ± 0.40	0.21	1971-mey/bar(○)	323.15	1549.43 ± 0.50	0.37	1972-nis/kuv(∇)
298.15	1606.34 ± 0.40	-0.08	1971-mey/bar(○)	293.15	1615.50 ± 0.60	-1.97	1973-chi/hou(◆)
308.15	1583.78 ± 0.40	-0.11	1971-mey/bar(○)	298.15	1606.94 ± 0.50	0.52	1975-che/zwo(Δ)
318.15	1560.90 ± 0.40	0.09	1971-mey/bar(○)	298.15	1606.40 ± 0.60	-0.02	1981-dym/rob-1(×)
298.15	1606.88 ± 0.30	0.46	1972-mar/mur(□)	293.15	1618.01 ± 0.60	0.54	1996-auc/mon(×)

¹⁾ Not included in Fig. 1.

Further references: [1955-des-2, 1964-cox/gun, 1965-cou/gre, 1971-bar/mey, 1974-hal/tow, 1986-ara/rub, 1987-ara/rub-1].

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1624.36 ± 0.75	330.00	1532.72 ± 0.78	390.00	1378.38 ± 1.36
293.15	1617.47 ± 0.61	340.00	1508.41 ± 0.79	400.00	1350.68 ± 1.73
298.15	1606.42 ± 0.59	350.00	1483.53 ± 0.81	410.00	1322.42 ± 2.24
300.00	1602.29 ± 0.61	360.00	1458.09 ± 0.85	420.00	1293.60 ± 2.90
310.00	1579.67 ± 0.70	370.00	1432.08 ± 0.94	430.00	1264.21 ± 3.74
320.00	1556.48 ± 0.76	380.00	1405.51 ± 1.10		

cont.

Hexafluorobenzene (cont.)

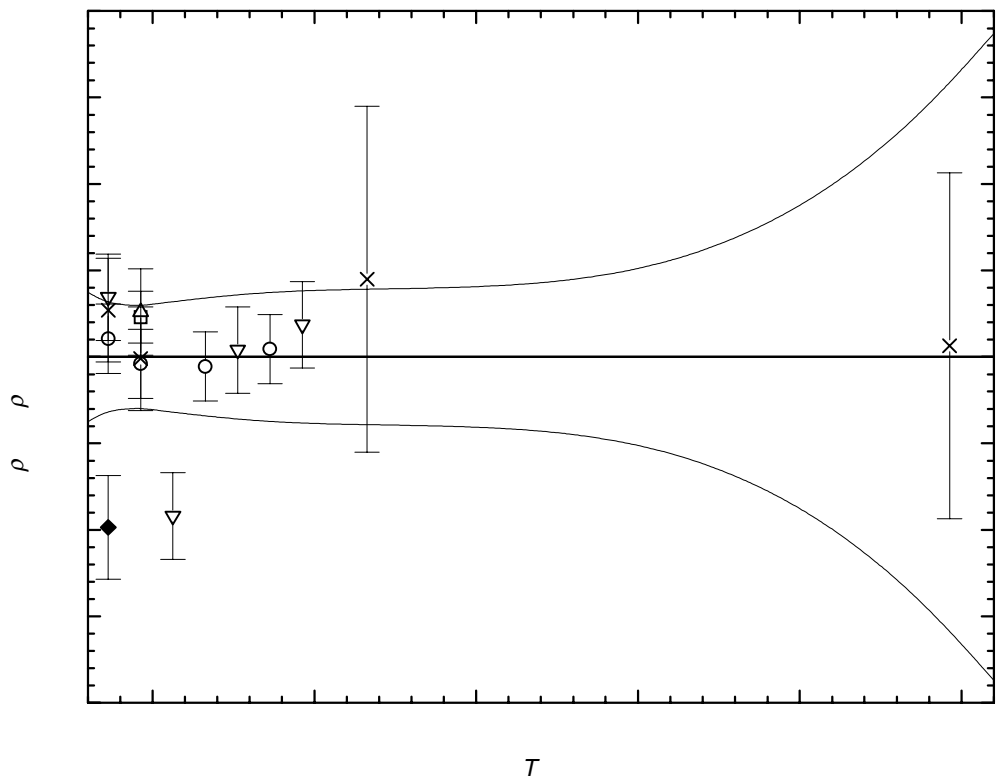


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

Pentafluorobenzene [363-72-4] C₆HF₅ MW = 168.07 914

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

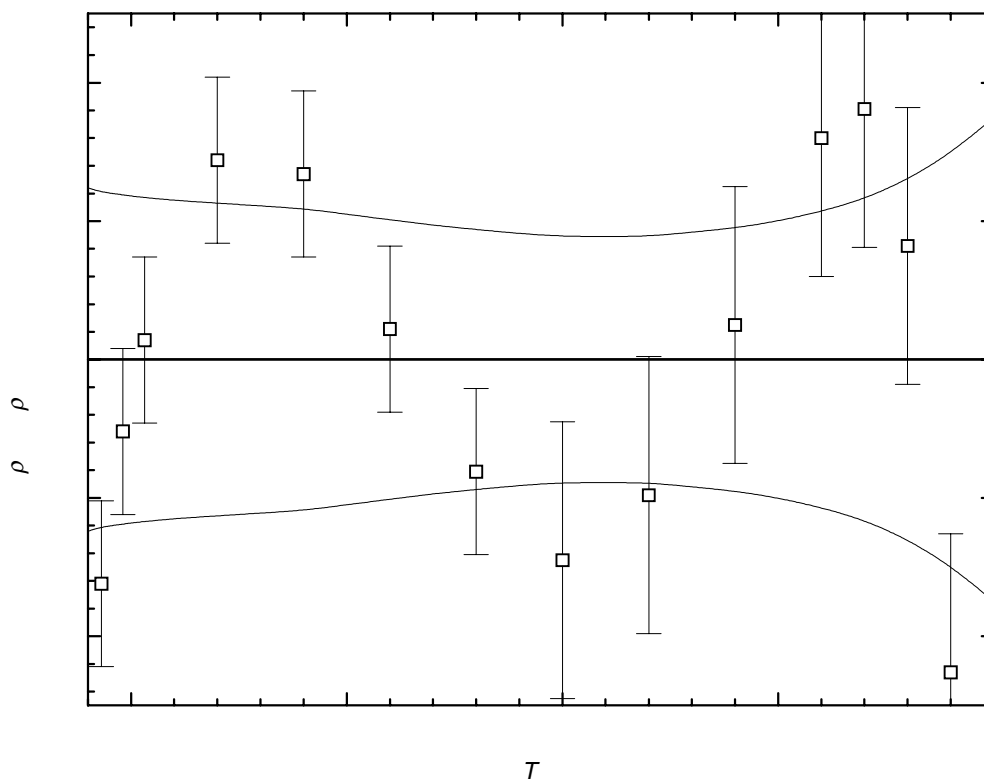
$\sigma_{c,w} = 1.5859$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.7966 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 293.15 \text{ to } 490.00 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$
A	$3.06836 \cdot 10^3$
B	$-1.06059 \cdot 10^1$
C	$2.59598 \cdot 10^{-2}$
D	$-2.62992 \cdot 10^{-5}$

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)
293.15	1525.98 ± 0.60	-1.62	1974-hal/tow(□)	400.00	1294.96 ± 1.00	-1.45	1974-hal/tow(□)
298.15	1516.32 ± 0.60	-0.52	1974-hal/tow(□)	420.00	1243.74 ± 1.00	-0.98	1974-hal/tow(□)
303.15	1506.34 ± 0.60	0.14	1974-hal/tow(□)	440.00	1187.55 ± 1.00	0.25	1974-hal/tow(□)
320.00	1472.41 ± 0.60	1.44	1974-hal/tow(□)	460.00	1124.47 ± 1.00	1.60	1974-hal/tow(□)
340.00	1430.97 ± 0.60	1.34	1974-hal/tow(□)	470.00	1089.44 ± 1.00	1.81	1974-hal/tow(□)
360.00	1387.82 ± 0.60	0.22	1974-hal/tow(□)	480.00	1050.99 ± 1.00	0.82	1974-hal/tow(□)
380.00	1342.80 ± 0.60	-0.81	1974-hal/tow(□)	490.00	1008.07 ± 1.00	-2.26	1974-hal/tow(□)

**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.

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1534.45 ± 1.24	350.00	1408.78 ± 1.05	430.00	1216.81 ± 0.92
293.15	1527.60 ± 1.21	360.00	1387.60 ± 1.01	440.00	1187.30 ± 0.95
298.15	1516.84 ± 1.19	370.00	1365.93 ± 0.97	450.00	1156.04 ± 1.00
300.00	1512.89 ± 1.18	380.00	1343.61 ± 0.94	460.00	1122.87 ± 1.07
310.00	1491.78 ± 1.15	390.00	1320.49 ± 0.91	470.00	1087.63 ± 1.16
320.00	1470.97 ± 1.13	400.00	1296.41 ± 0.89	480.00	1050.17 ± 1.30
330.00	1450.31 ± 1.11	410.00	1271.20 ± 0.89	490.00	1010.33 ± 1.49
340.00	1429.63 ± 1.09	420.00	1244.72 ± 0.89	500.00	967.94 ± 1.75

1,2,3,4-Tetrafluorobenzene

[551-62-2]



MW = 150.08

915

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

$\sigma_{c,w} = 4.7825 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.8459 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 293.15 \text{ to } 490.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$2.37272 \cdot 10^3$
B	-5.85767
C	$1.30376 \cdot 10^{-2}$
D	$-1.39197 \cdot 10^{-5}$

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)
293.15	1424.84 ± 0.60	-0.44	1974-hal/tow(□)	400.00	1224.15 ± 1.00	-0.65	1974-hal/tow(□)
298.15	1416.14 ± 0.60	-0.15	1974-hal/tow(□)	420.00	1180.75 ± 1.00	-0.29	1974-hal/tow(□)
303.15	1407.56 ± 0.60	0.23	1974-hal/tow(□)	440.00	1134.11 ± 1.00	0.43	1974-hal/tow(□)
320.00	1377.75 ± 0.60	0.56	1974-hal/tow(□)	460.00	1083.05 ± 1.00	1.00	1974-hal/tow(□)
340.00	1341.52 ± 0.60	0.36	1974-hal/tow(□)	470.00	1055.26 ± 1.00	0.83	1974-hal/tow(□)
360.00	1304.01 ± 0.60	-0.18	1974-hal/tow(□)	480.00	1025.69 ± 1.00	0.20	1974-hal/tow(□)
380.00	1265.08 ± 0.60	-0.55	1974-hal/tow(□)	490.00	993.81 ± 1.00	-1.33	1974-hal/tow(□)

cont.

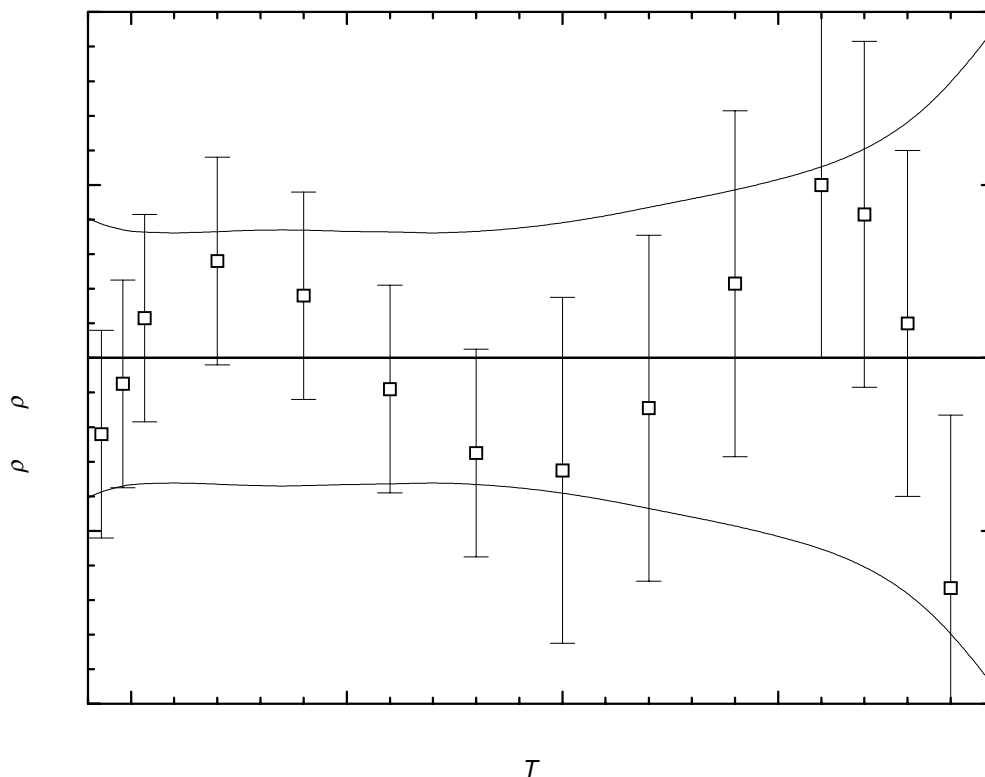


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1430.97 ± 0.81	350.00	1322.83 ± 0.73	430.00	1157.86 ± 0.92
293.15	1425.28 ± 0.77	360.00	1304.19 ± 0.73	440.00	1133.68 ± 0.97
298.15	1416.29 ± 0.74	370.00	1285.15 ± 0.72	450.00	1108.44 ± 1.03
300.00	1412.97 ± 0.73	380.00	1265.63 ± 0.73	460.00	1082.05 ± 1.10
310.00	1395.07 ± 0.72	390.00	1245.54 ± 0.75	470.00	1054.43 ± 1.20
320.00	1377.19 ± 0.73	400.00	1224.80 ± 0.78	480.00	1025.49 ± 1.35
330.00	1359.25 ± 0.74	410.00	1203.33 ± 0.82	490.00	995.14 ± 1.58
340.00	1341.16 ± 0.74	420.00	1181.04 ± 0.87	500.00	963.32 ± 1.90

1,2,4,5-Tetrafluorobenzene [327-54-8] $\text{C}_6\text{H}_2\text{F}_4$ MW = 150.08 916

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	1420.00 ± 2.00	1978-har/hea

1,2-Difluorobenzene [367-11-3] $\text{C}_6\text{H}_4\text{F}_2$ MW = 114.09 917

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	1150.00 ± 0.60	1962-goo/lac

1,3-Difluorobenzene [372-18-9] $\text{C}_6\text{H}_4\text{F}_2$ MW = 114.09 918

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	1147.00 ± 0.00	1962-goo/lac

1,4-Difluorobenzene [540-36-3] $\text{C}_6\text{H}_4\text{F}_2$ MW = 114.09 919

Table 1. Experimental values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1168.80 ± 1.50	1956-ber/ber
298.15	1163.01 ± 0.60	1962-goo/lac

Fluorobenzene [462-06-6] $\text{C}_6\text{H}_5\text{F}$ MW = 96.10 920

$$T_c = 559.70 \text{ K [1889-you-1]}$$

$$\rho_c = 405.00 \text{ kg} \cdot \text{m}^{-3} \text{ [1889-you-1]}$$

Table 1. Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_t = 8.6393 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = 1.0897$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.8585 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 470.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 470.00 \text{ to } 559.70 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
A	$1.38718 \cdot 10^3$	-2.48996
B	-1.57913	$6.11982 \cdot 10^{-2}$
C	$2.10807 \cdot 10^{-3}$	$-6.03329 \cdot 10^{-4}$
D	$-3.23859 \cdot 10^{-6}$	$2.09096 \cdot 10^{-6}$

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)
<i>crystal</i>				493.15	726.48 ± 1.00	-1.78	1889-you-1(◆)
231.90	1236.0 ± 5.0		1961-sch/sau	503.15	703.58 ± 1.00	-0.15	1889-you-1(◆)
<i>liquid</i>				513.15	678.93 ± 1.00	2.00	1889-you-1(◆)
273.15	1046.53 ± 0.60	-0.60	1889-you-1(◆)	523.15	650.41 ± 2.00	1.51	1889-you-1(◆)
283.15	1034.66 ± 0.60	-0.89	1889-you-1(◆)	533.15	616.33 ± 2.00	-4.19	1889-you-1(◆)
286.01	1031.46 ± 0.60	-0.75	1889-you-1(◆)	543.15	573.92 ± 3.00	-16.98	1889-you-1 ¹⁾
303.15	1010.41 ± 0.60	-1.57	1889-you-1(◆)	548.15	546.18 ± 3.00	-27.36	1889-you-1 ¹⁾
313.15	998.60 ± 0.60	-1.35	1889-you-1(◆)	553.15	513.29 ± 3.00	-36.70	1889-you-1 ¹⁾
323.15	984.64 ± 0.60	-3.10	1889-you-1 ¹⁾	553.75	505.94 ± 3.00	-40.34	1889-you-1 ¹⁾
333.15	974.37 ± 0.60	-0.95	1889-you-1(◆)	277.15	1041.80 ± 0.60	-0.71	1896-per(∇)
343.15	962.19 ± 0.60	-0.48	1889-you-1(◆)	278.15	1040.37 ± 0.60	-0.98	1896-per(∇)
353.15	949.58 ± 0.60	-0.20	1889-you-1(◆)	283.15	1033.94 ± 0.60	-1.61	1896-per(∇)
363.15	936.68 ± 0.60	0.05	1889-you-1(◆)	288.15	1028.02 ± 0.60	-1.69	1896-per(∇)
373.15	923.28 ± 0.60	0.09	1889-you-1(◆)	293.15	1022.54 ± 0.60	-1.29	1896-per(∇)
383.15	909.67 ± 0.60	0.22	1889-you-1(◆)	298.15	1017.00 ± 0.60	-0.93	1896-per(∇)
393.15	895.58 ± 0.60	0.20	1889-you-1(◆)	273.15	1048.61 ± 0.40	1.48	1935-tim/hen(◆)
403.15	881.13 ± 1.00	0.15	1889-you-1(◆)	288.15	1030.89 ± 0.40	1.18	1935-tim/hen(◆)
413.15	866.55 ± 1.00	0.34	1889-you-1(◆)	303.15	1013.12 ± 0.40	1.14	1935-tim/hen(◆)
423.15	852.30 ± 1.00	1.24	1889-you-1(◆)	293.15	1024.90 ± 0.50	1.07	1948-lag/eva(○)
433.15	836.33 ± 1.00	0.82	1889-you-1(◆)	293.15	1024.90 ± 0.50	1.07	1949-lag/mcm(□)
443.15	820.34 ± 1.00	0.80	1889-you-1(◆)	303.15	1013.00 ± 0.50	1.02	1949-lag/mcm(□)
453.15	803.73 ± 1.00	0.60	1889-you-1(◆)	313.15	1000.80 ± 0.50	0.85	1949-lag/mcm(□)
463.15	785.73 ± 1.00	-0.53	1889-you-1(◆)	323.15	988.80 ± 0.50	1.06	1949-lag/mcm(□)
473.15	767.17 ± 1.00	-1.70	1889-you-1(◆)	298.15	1019.05 ± 0.60	1.12	1984-rou/gro(Δ)
483.15	748.00 ± 1.00	-1.92	1889-you-1(◆)				

¹⁾ Not included in Fig. 1.**Further references:** [1980-dia/cre, 1981-kor/kov].**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	1050.75 ± 0.63	310.00	1003.76 ± 0.57	370.00	927.46 ± 0.63
280.00	1039.21 ± 0.59	320.00	991.61 ± 0.57	380.00	913.81 ± 0.66
290.00	1027.54 ± 0.57	330.00	979.25 ± 0.57	390.00	899.85 ± 0.71
293.15	1023.83 ± 0.57	340.00	966.68 ± 0.57	400.00	885.55 ± 0.77
298.15	1017.93 ± 0.57	350.00	953.87 ± 0.58	410.00	870.90 ± 0.83
300.00	1015.73 ± 0.57	360.00	940.80 ± 0.60	420.00	855.87 ± 0.91

cont.

Fluorobenzene (cont.)**Table 3.** (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
430.00	840.45 ± 1.01	480.00	756.15 ± 1.99	530.00	629.49 ± 2.58
440.00	824.61 ± 1.14	490.00	735.40 ± 2.04	540.00	600.61 ± 2.97
450.00	808.34 ± 1.30	500.00	711.74 ± 2.10	550.00	565.93 ± 3.73
460.00	791.62 ± 1.51	510.00	685.55 ± 2.20		
470.00	774.43 ± 1.77	520.00	657.80 ± 2.35		

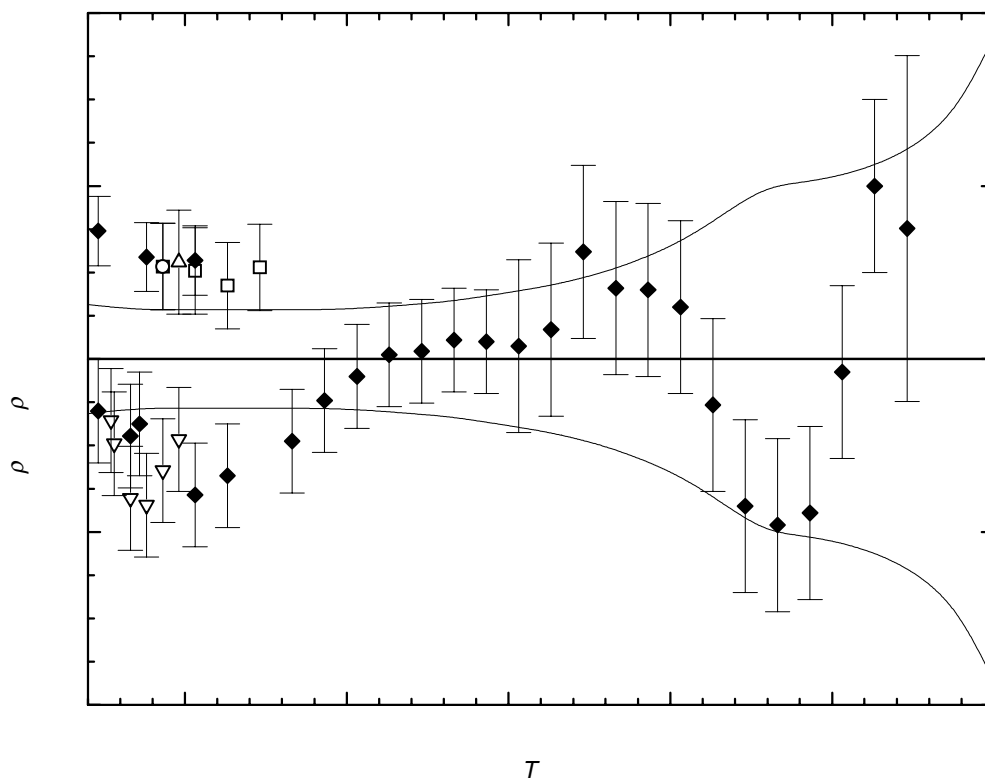


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

Pentafluoro(trifluoromethyl)benzene [434-64-0] C_7F_8 MW = 236.06 921

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 6.1234 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.5008 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 293.15 \text{ to } 480.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$2.97714 \cdot 10^3$
<i>B</i>	-8.51375
<i>C</i>	$2.01504 \cdot 10^{-2}$
<i>D</i>	$-2.13961 \cdot 10^{-5}$

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)
293.15	1673.45 ± 0.60	-0.53	1974-hal/tow(□)	400.00	1425.68 ± 1.00	-0.68	1974-hal/tow(□)
298.15	1662.80 ± 0.60	-0.13	1974-hal/tow(□)	420.00	1370.68 ± 1.00	-0.02	1974-hal/tow(□)
303.15	1652.13 ± 0.60	0.20	1974-hal/tow(□)	440.00	1310.66 ± 1.00	1.05	1974-hal/tow(□)
320.00	1615.71 ± 0.60	0.68	1974-hal/tow(□)	460.00	1243.35 ± 1.00	1.32	1974-hal/tow(□)
340.00	1571.31 ± 0.60	0.41	1974-hal/tow(□)	470.00	1205.98 ± 1.00	0.48	1974-hal/tow(□)
360.00	1525.13 ± 0.60	-0.30	1974-hal/tow(□)	480.00	1165.24 ± 1.00	-1.72	1974-hal/tow(□)
380.00	1476.82 ± 0.60	-0.77	1974-hal/tow(□)	490.00	1120.04 ± 1.00	-6.25	1974-hal/tow ¹⁾

¹⁾ Not included in Fig. 1.

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1680.97 ± 0.82	350.00	1548.39 ± 0.72	430.00	1340.90 ± 0.96
293.15	1673.98 ± 0.78	360.00	1525.43 ± 0.71	440.00	1309.61 ± 1.02
298.15	1662.93 ± 0.74	370.00	1501.87 ± 0.70	450.00	1276.69 ± 1.09
300.00	1658.86 ± 0.73	380.00	1477.59 ± 0.72	460.00	1242.03 ± 1.20
310.00	1636.92 ± 0.71	390.00	1452.46 ± 0.75	470.00	1205.50 ± 1.36
320.00	1615.03 ± 0.72	400.00	1426.36 ± 0.79	480.00	1166.96 ± 1.60
330.00	1593.07 ± 0.73	410.00	1399.15 ± 0.84	490.00	1126.29 ± 1.94
340.00	1570.90 ± 0.73	420.00	1370.70 ± 0.90		

cont.

Pentafluoro(trifluoromethyl)benzene (cont.)

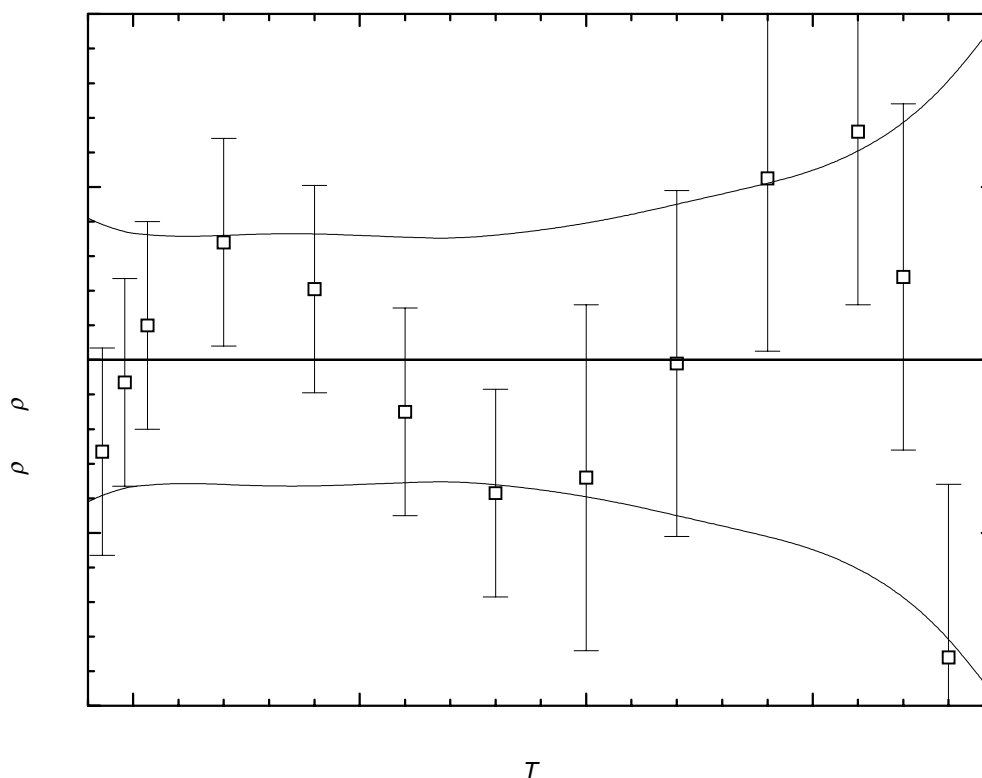


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

Methylpentafluorobenzene

[771-56-2]

 $\text{C}_7\text{H}_3\text{F}_5$

MW = 182.09

922

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

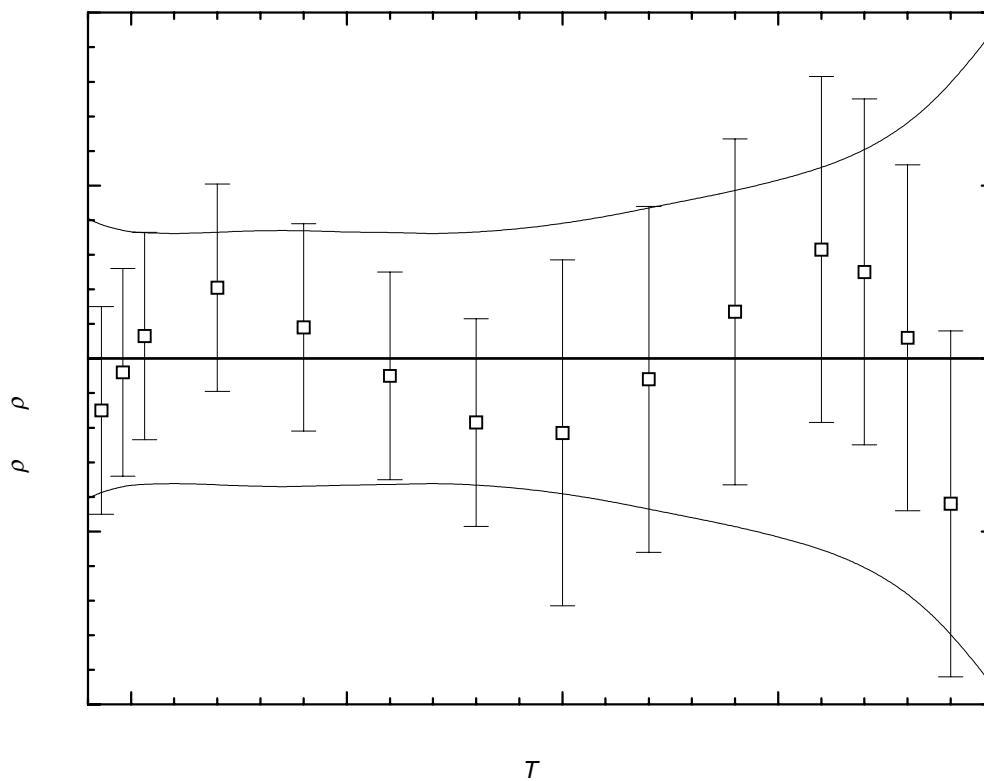
$\sigma_{c,w} = 3.0621 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.1672 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 293.15 \text{ to } 490.00 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$2.25270 \cdot 10^3$
<i>B</i>	-4.76362
<i>C</i>	$1.00035 \cdot 10^{-2}$
<i>D</i>	$-1.08411 \cdot 10^{-5}$

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)
293.15	1442.50 ± 0.60	-0.30	1974-hal/tow(□)	400.00	1253.55 ± 1.00	-0.43	1974-hal/tow(□)
298.15	1434.27 ± 0.60	-0.08	1974-hal/tow(□)	420.00	1213.28 ± 1.00	-0.12	1974-hal/tow(□)
303.15	1426.03 ± 0.60	0.13	1974-hal/tow(□)	440.00	1170.17 ± 1.00	0.27	1974-hal/tow(□)
320.00	1397.87 ± 0.60	0.41	1974-hal/tow(□)	460.00	1123.58 ± 1.00	0.63	1974-hal/tow(□)
340.00	1363.56 ± 0.60	0.18	1974-hal/tow(□)	470.00	1098.52 ± 1.00	0.50	1974-hal/tow(□)
360.00	1328.35 ± 0.60	-0.10	1974-hal/tow(□)	480.00	1072.15 ± 1.00	0.12	1974-hal/tow(□)
380.00	1291.79 ± 0.60	-0.37	1974-hal/tow(□)	490.00	1044.09 ± 1.00	-0.84	1974-hal/tow(□)

**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.

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1448.14 \pm 0.81	350.00	1346.05 \pm 0.73	430.00	1192.05 \pm 0.92
293.15	1442.80 \pm 0.77	360.00	1328.45 \pm 0.73	440.00	1169.90 \pm 0.97
298.15	1434.35 \pm 0.74	370.00	1310.51 \pm 0.72	450.00	1146.89 \pm 1.03
300.00	1431.22 \pm 0.73	380.00	1292.16 \pm 0.73	460.00	1122.95 \pm 1.10
310.00	1414.35 \pm 0.72	390.00	1273.34 \pm 0.75	470.00	1098.02 \pm 1.20
320.00	1397.46 \pm 0.73	400.00	1253.98 \pm 0.78	480.00	1072.03 \pm 1.35
330.00	1380.49 \pm 0.74	410.00	1234.03 \pm 0.82	490.00	1044.93 \pm 1.58
340.00	1363.38 \pm 0.74	420.00	1213.40 \pm 0.87	500.00	1016.63 \pm 1.90

(Trifluoromethyl)benzene**[98-08-8]****C₇H₅F₃****MW = 146.11****923****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.
298.15	1181.40 \pm 0.50	1991-aiz/kat

1-Fluoro-2-methylbenzene**[95-52-3]****C₇H₇F****MW = 110.13****924****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.
298.15	998.10 \pm 0.50	1960-ter/kep

1-Fluoro-4-methylbenzene**[352-32-9]****C₇H₇F****MW = 110.13****925****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.
298.15	990.00 \pm 1.00	1962-goo/lac

Iodobenzene**[591-50-4]****C₆H₅I****MW = 204.01****926****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction):
 $\sigma_{c,w} = 1.4698$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.3651 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 523.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$2.21220 \cdot 10^3$
<i>B</i>	-1.14643
<i>C</i>	$-5.49018 \cdot 10^{-4}$

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>				463.15	1562.74 ± 1.00	-0.73	1889-you-1(∇)
241.80	2060.71 ± 8.33		1961-sch/sau	473.15	1547.03 ± 1.00	0.17	1889-you-1(∇)
<i>liquid</i>				483.15	1531.63 ± 1.00	1.48	1889-you-1(∇)
273.15	1860.55 ± 1.00	2.46	1889-you-1(∇)	493.15	1511.49 ± 1.00	-1.83	1889-you-1(∇)
283.15	1846.72 ± 1.00	3.15	1889-you-1(∇)	503.15	1494.10 ± 1.00	-2.29	1889-you-1(∇)
284.15	1844.34 ± 1.00	2.22	1889-you-1(∇)	513.15	1476.45 ± 2.00	-2.89	1889-you-1(∇)
288.36	1837.94 ± 1.00	1.97	1889-you-1(∇)	523.15	1458.15 ± 2.00	-4.04	1889-you-1(∇)
288.85	1836.21 ± 1.00	0.96	1889-you-1(∇)	533.15	1438.43 ± 3.00	-6.50	1889-you-1 ¹⁾
303.15	1814.88 ± 1.00	0.67	1889-you-1(∇)	543.15	1417.23 ± 3.00	-10.32	1889-you-1 ¹⁾
313.15	1798.88 ± 1.00	-0.48	1889-you-1(∇)	281.15	1848.20 ± 1.00	1.71	1892-per-1(Δ)
323.15	1784.76 ± 1.00	0.36	1889-you-1(∇)	361.15	1727.19 ± 1.00	0.63	1892-per-1(Δ)
333.15	1770.22 ± 1.00	0.89	1889-you-1(∇)	293.15	1828.70 ± 0.60	-0.25	1933-azi/bha(□)
343.15	1753.46 ± 1.00	-0.70	1889-you-1(∇)	303.15	1813.80 ± 0.60	-0.41	1933-azi/bha(□)
353.15	1739.13 ± 1.00	0.26	1889-you-1(∇)	313.15	1798.90 ± 0.60	-0.46	1933-azi/bha(□)
363.15	1724.73 ± 1.00	1.26	1889-you-1(∇)	323.15	1784.10 ± 0.60	-0.30	1933-azi/bha(□)
373.15	1707.94 ± 1.00	-0.03	1889-you-1(∇)	333.15	1769.20 ± 0.60	-0.13	1933-azi/bha(□)
383.15	1693.19 ± 1.00	0.84	1889-you-1(∇)	348.15	1744.50 ± 0.60	-2.03	1933-azi/bha(□)
393.15	1676.73 ± 1.00	0.11	1889-you-1(∇)	293.15	1828.00 ± 1.00	-0.95	1948-lag/eva(○)
403.15	1663.06 ± 1.00	2.27	1889-you-1(∇)	283.15	1843.10 ± 0.60	-0.47	1949-lag/mcm(◆)
413.15	1645.28 ± 1.00	0.44	1889-you-1(∇)	293.15	1828.00 ± 0.60	-0.95	1949-lag/mcm(◆)
423.15	1629.46 ± 1.00	0.67	1889-you-1(∇)	303.15	1812.50 ± 0.60	-1.71	1949-lag/mcm(◆)
433.15	1613.42 ± 1.00	0.80	1889-you-1(∇)	313.15	1797.70 ± 0.60	-1.66	1949-lag/mcm(◆)
443.15	1597.19 ± 1.00	0.84	1889-you-1(∇)	323.15	1782.20 ± 0.60	-2.20	1949-lag/mcm(◆)
453.15	1580.28 ± 1.00	0.32	1889-you-1(∇)				

¹⁾ Not included in Fig. 1.**Further references:** [1932-tim/hen, 1961-sch/sau, 1965-mal/hil, 1981-kor/kov].

cont.

Iodobenzene (cont.)

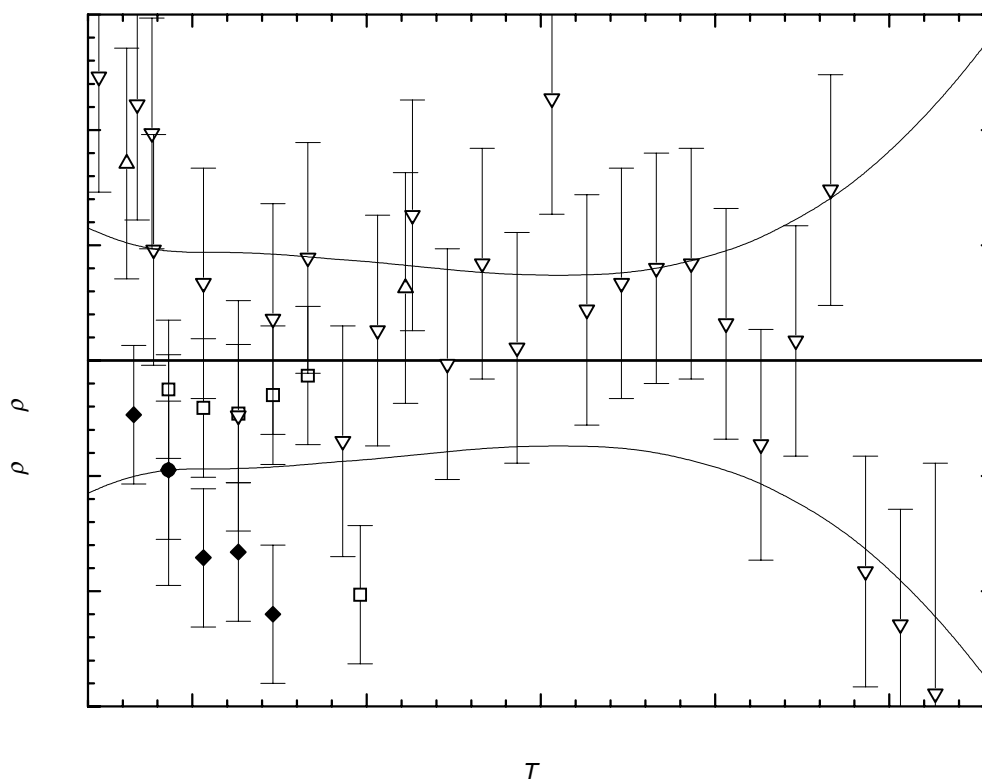


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1862.64 ± 1.15	350.00	1743.70 ± 0.86	450.00	1585.13 ± 0.92
280.00	1848.16 ± 1.02	360.00	1728.33 ± 0.83	460.00	1568.67 ± 1.02
290.00	1833.57 ± 0.96	370.00	1712.86 ± 0.80	470.00	1552.10 ± 1.17
293.15	1828.95 ± 0.95	380.00	1697.28 ± 0.77	480.00	1535.42 ± 1.34
298.15	1821.59 ± 0.94	390.00	1681.59 ± 0.75	490.00	1518.63 ± 1.55
300.00	1818.86 ± 0.94	400.00	1665.79 ± 0.74	500.00	1501.73 ± 1.81
310.00	1804.05 ± 0.94	410.00	1649.88 ± 0.74	510.00	1484.72 ± 2.11
320.00	1789.13 ± 0.93	420.00	1633.86 ± 0.75	520.00	1467.60 ± 2.45
330.00	1774.09 ± 0.91	430.00	1617.72 ± 0.78	530.00	1450.38 ± 2.84
340.00	1758.95 ± 0.88	440.00	1601.48 ± 0.84		

1-Iodo-4-methylbenzene**[624-31-7]****C₇H₇I****MW = 218.04****927****Table 1.** Fit with estimated B coefficient for 5 accepted points. Deviation $\sigma_w = 1.338$.

Coefficient	$\rho = A + BT$
A	2116.40
B	-1.400

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.
313.15	1678.00 \pm 1.50	0.01	1924-sug-2
344.15	1635.00 \pm 1.50	0.41	1924-sug-2
375.15	1591.00 \pm 1.50	-0.19	1924-sug-2
405.15	1547.00 \pm 1.70	-2.19	1924-sug-2
437.15	1507.00 \pm 2.00	2.61	1924-sug-2

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
310.00	1682.4 \pm 2.6	360.00	1612.4 \pm 2.0	410.00	1542.4 \pm 2.4
320.00	1668.4 \pm 2.4	370.00	1598.4 \pm 2.0	420.00	1528.4 \pm 2.5
330.00	1654.4 \pm 2.3	380.00	1584.4 \pm 2.0	430.00	1514.4 \pm 2.7
340.00	1640.4 \pm 2.1	390.00	1570.4 \pm 2.1	440.00	1500.4 \pm 3.0
350.00	1626.4 \pm 2.1	400.00	1556.4 \pm 2.2		

1-Iodo-2,6-dimethylbenzene**[608-28-6]****C₈H₉I****MW = 232.06****928****Table 1.** Experimental value with uncertainty.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	1549.00 \pm 0.80	1954-sch/cor