

2.1.2 Bromoalkanes, C₄ - C₅

1,2,2,3-Tetrabromobutane [116779-78-3] C₄H₆Br₄ MW = 373.71 25

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
293.15	2510.00 ± 2.00	1931-hur/mei

1,2,2-Tribromobutane [3675-69-2] C₄H₇Br₃ MW = 294.81 26

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.675$.

Coefficient	$\rho = A + BT$
A	2652.22
B	-1.650

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.
290.15	2136.00 ± 10.00	-37.47	1891-reb ¹⁾
293.15	2169.20 ± 2.00	0.67	1926-lep
288.15	2176.10 ± 2.00	-0.68	1926-lep

¹⁾ Not included in calculation of linear coefficients.

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
280.00	2190.2 ± 1.7
290.00	2173.7 ± 1.4
293.15	2168.5 ± 1.4
298.15	2160.3 ± 1.6

1,2,3-Tribromobutane [632-05-3] C₄H₇Br₃ MW = 294.81 27

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.707$.

Coefficient	$\rho = A + BT$
A	2696.51
B	-1.750

cont.

1,2,3-Tribromobutane (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.
273.15	2219.50 ± 2.00	1.00	1899-cha
273.15	2218.00 ± 2.00	-0.50	1923-del-1
289.15	2190.00 ± 2.00	-0.50	1923-del-1
293.15	2150.40 ± 20.00	-33.10	1935-slo ¹⁾
273.15	2185.20 ± 20.00	-33.30	1935-slo ¹⁾

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	2224.0 ± 1.5
280.00	2206.5 ± 1.3
290.00	2189.0 ± 1.7

1,2,4-Tribromobutane

[38300-67-3]

C₄H₇Br₃

MW = 294.81

28

Table 1. Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	2276.00 ± 10.00	1911-par
298.15	2210.00 ± 15.00	1953-buc/con

2,2,3-Tribromobutane

[62127-47-3]

C₄H₇Br₃

MW = 294.81

29

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.775$

Coefficient	$\rho = A + BT$
A	2743.27
B	-1.950

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.
293.15	2172.40 ± 2.00	0.78	1926-lep
288.15	2180.60 ± 2.00	-0.78	1926-lep

cont.

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	2197.3 ± 2.5
290.00	2177.8 ± 2.0
293.15	2171.6 ± 2.0
298.15	2161.9 ± 2.2

1,1,2-Tribromo-2-methylpropane

[15331-16-5]



MW = 294.81

30

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 1.650$.

Coefficient	$\rho = A + BT$
A	2585.46
B	-1.400

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.
293.15	2016.90 ± 30.00	-158.15	1893-ari ¹⁾
289.15	2188.00 ± 3.00	7.35	1899-mou-1 ¹⁾
273.15	2201.40 ± 2.00	-1.65	1905-pog-1
294.15	2175.30 ± 2.00	1.65	1905-pog-1

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	2207.5 ± 2.3
280.00	2193.5 ± 1.9
290.00	2179.5 ± 2.0
293.15	2175.1 ± 2.1
298.15	2168.1 ± 2.4

1,2,3-Tribromo-2-methylpropane

[631-28-7]



MW = 294.81

31

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.047$.

Coefficient	$\rho = A + BT$
A	2681.23
B	-1.680

cont.

1,2,3-Tribromo-2-methylpropane (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.	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	2232.60 ± 4.00	10.27	1905-pog-1 ¹⁾	298.15	2180.30 ± 1.00	-0.03	1929-hur/spe
294.15	2197.10 ± 4.00	10.05	1905-pog-1 ¹⁾	293.15	2188.80 ± 1.00	0.07	1941-sut/mal
273.15	2234.40 ± 2.00	12.07	1914-mer ¹⁾	295.15	2193.50 ± 3.00	8.13	1949-fre/nog ¹⁾
287.15	2210.60 ± 2.00	11.79	1914-mer ¹⁾	293.15	2185.60 ± 2.00	-3.13	1950-wal/pet ¹⁾
293.15	2188.70 ± 1.00	-0.03	1929-hur/spe				

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	2194.0 ± 0.5
293.15	2188.7 ± 0.3
298.15	2180.3 ± 0.4

1,1-Dibromobutane

[62168-25-6]

C₄H₈Br₂

MW = 215.92

32

Table 1. Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
294.15	1722.00 ± 10.00	1927-kir
298.15	1800.00 ± 5.00	1953-con

1,2-Dibromobutane

[533-98-2]

C₄H₈Br₂

MW = 215.92

33

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 1.674$.

Coefficient	$\rho = A + BT$
A	2174.63
B	-1.300

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.
288.15	1802.10 ± 1.00	2.07	1926-lep
293.15	1791.50 ± 1.00	-2.03	1930-dil/you
298.15	1787.00 ± 1.00	-0.03	1930-dil/you
293.15	1789.20 ± 2.00	-4.33	1949-fre/nog ¹⁾

¹⁾ Not included in calculation of linear coefficients.

cont.

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	1810.6 \pm 2.0
290.00	1797.6 \pm 1.8
293.15	1793.5 \pm 1.8
298.15	1787.0 \pm 1.8

1,3-Dibromobutane

[107-80-2]

**MW = 215.92****34****Table 1.** Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$		$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.00	1829.00 \pm 5.00	1892-dem	293.15	1790.40 \pm 2.00	1952-kaz/luk-1
291.65	1807.00 \pm 5.00	1892-dem	293.15	1796.00 \pm 3.00	1953-zei
273.15	1831.90 \pm 4.00	1907-fav/sok-2	293.15	1761.10 \pm 6.00	1955-han-1

1,4-Dibromobutane

[110-52-1]

**MW = 215.92****35****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction):

$\sigma_{\text{c,w}} = 2.8115$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.0961$ (combined temperature ranges, unweighted).

Coefficient	$T = 293.15 \text{ to } 358.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$2.25929 \cdot 10^3$
<i>B</i>	-1.47724

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)
298.15	1817.70 \pm 0.60	-1.15	1932-smy/wal(□)	293.15	1826.60 \pm 1.00	0.36	1960-grz/jef-1(Δ)
323.15	1778.60 \pm 0.60	-3.32	1932-smy/wal(□)	333.15	1771.80 \pm 1.00	4.65	1960-grz/jef-1(Δ)
293.15	1826.90 \pm 1.00	0.66	1951-whi/dea(○)	358.15	1729.00 \pm 1.00	-1.22	1960-grz/jef-1(Δ)

Further references: [1905-ham, 1936-tzy/rot, 1941-lut/sch, 1948-kat, 1951-oka].

cont.

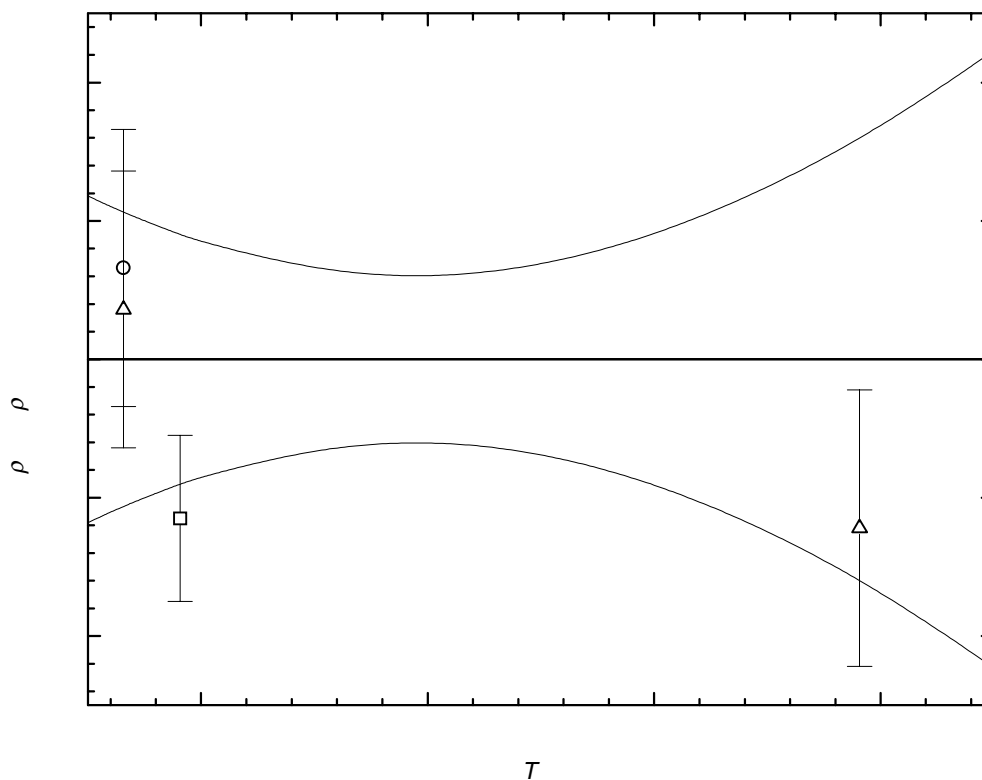
1,4-Dibromobutane (cont.)

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1830.89 ± 1.18	310.00	1801.34 ± 0.64	350.00	1742.25 ± 1.23
293.15	1826.24 ± 1.06	320.00	1786.57 ± 0.58	360.00	1727.48 ± 1.67
298.15	1818.85 ± 0.90	330.00	1771.80 ± 0.67	370.00	1712.71 ± 2.23
300.00	1816.12 ± 0.85	340.00	1757.03 ± 0.89		

dl*-2,3-Dibromobutane*[598-71-0]****MW = 215.92****36****Table 1.** Fit with estimated B coefficient for 8 accepted points. Deviation $\sigma_w = 0.625$.

Coefficient	$\rho = A + BT$
A	2260.61
B	-1.600

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.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
288.15	1798.10 \pm 1.00	-1.47	1926-lep	295.15	1789.20 \pm 1.00	0.88	1936-tri
293.15	1791.60 \pm 1.00	0.03	1929-you/dil	293.15	1778.30 \pm 2.00	-13.27	1936-wil/luc ¹⁾
298.15	1783.60 \pm 1.00	0.03	1929-you/dil	293.15	1791.60 \pm 1.00	0.03	1945-kha/lam
293.15	1791.60 \pm 1.00	0.03	1930-dil/you	293.15	1792.00 \pm 1.00	0.43	1950-wal/pet
298.15	1783.60 \pm 1.00	0.03	1930-dil/you	298.15	1786.40 \pm 2.00	2.83	1959-goe/lar ¹⁾

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	1812.6 \pm 1.2
290.00	1796.6 \pm 1.0
293.15	1791.6 \pm 1.0
298.15	1783.6 \pm 1.0

Meso*-2,3-Dibromobutane*[5780-13-2]****MW = 215.92****37****Table 1.** Fit with estimated B coefficient for 7 accepted points. Deviation $\sigma_w = 0.538$.

Coefficient	$\rho = A + BT$
A	2263.84
B	-1.640

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.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
288.15	1791.30 \pm 1.00	0.02	1926-lep	295.15	1781.00 \pm 1.00	1.25	1936-tri
293.15	1782.90 \pm 1.00	-0.18	1929-you/dil	293.15	1792.20 \pm 2.00	9.12	1936-wil/luc ¹⁾
298.15	1774.70 \pm 1.00	-0.18	1929-you/dil	293.15	1782.50 \pm 1.00	-0.58	1945-kha/lam
293.15	1782.90 \pm 1.00	-0.18	1930-dil/you	298.15	1766.50 \pm 2.00	-8.38	1959-goe/lar ¹⁾
298.15	1774.70 \pm 1.00	-0.18	1930-dil/you				

¹⁾ Not included in calculation of linear coefficients.

cont.

Meso-2,3-dibromobutane (cont.)**Table 3.** Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	1804.6 \pm 1.1
290.00	1788.2 \pm 0.9
293.15	1783.1 \pm 0.9
298.15	1774.9 \pm 0.9

1,2-Dibromo-2-methylpropane

[594-34-3]

**MW = 215.92****38****Table 1.** Experimental and recommended values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	1782.70 \pm 10.00	1922-kre ¹⁾
293.15	1762.80 \pm 2.00	1949-fre/nog
293.15	1759.80 \pm 1.00	1950-wal/pet
293.15	1760.40 \pm 1.10	Recommended

¹⁾ Not included in calculation of recommended value.**1,3-Dibromo-2-methylpropane**

[28148-04-1]

**MW = 215.92****39****Table 1.** Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	1820.40 \pm 4.00	1907-fav/sok-3
273.15	1851.20 \pm 4.00	1907-fav/sok-3
298.15	1799.50 \pm 1.00	1951-bre

1-Bromobutane

[109-65-9]

**MW = 137.02****40****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 9.9054 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.7814 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 183.15 \text{ to } 368.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.66298 \cdot 10^3$
<i>B</i>	-1.18165
<i>C</i>	$-4.82777 \cdot 10^{-4}$

cont.

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{ca}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
273.15	1303.30 ± 1.00	-0.89	1912-kar(×)	273.15	1304.60 ± 0.60	0.41	1931-dee(∇)
288.15	1281.60 ± 1.00	-0.80	1912-kar(×)	298.15	1268.90 ± 0.60	1.15	1931-dee(∇)
293.15	1274.60 ± 1.00	-0.49	1912-kar ¹⁾	298.15	1268.90 ± 0.60	1.15	1939-cup/rog(Δ)
273.15	1304.35 ± 1.00	0.16	1926-tim/mar(◆)	288.95	1275.20 ± 2.00	-6.03	1943-fri/har ¹⁾
288.15	1282.92 ± 1.00	0.52	1926-tim/mar(◆)	322.75	1230.40 ± 2.00	-0.91	1943-fri/har ¹⁾
303.15	1261.20 ± 1.00	0.81	1926-tim/mar(◆)	342.65	1202.70 ± 2.00	1.30	1943-fri/har(×)
288.15	1282.84 ± 1.00	0.44	1927-bog(×)	355.55	1182.30 ± 2.00	0.49	1943-fri/har(×)
183.15	1431.00 ± 1.00	0.64	1930-smy/rog-1(×)	362.25	1172.40 ± 2.00	0.83	1943-fri/har(×)
203.15	1404.00 ± 1.00	1.00	1930-smy/rog-1(×)	368.15	1163.10 ± 2.00	0.58	1943-fri/har(×)
223.15	1373.50 ± 1.00	-1.75	1930-smy/rog-1(×)	293.15	1274.10 ± 0.50	-0.99	1949-lag/mcm(□)
263.15	1317.00 ± 1.00	-1.59	1930-smy/rog-1(×)	303.15	1259.90 ± 0.50	-0.49	1949-lag/mcm(□)
283.15	1288.00 ± 1.00	-1.69	1930-smy/rog-1(×)	313.15	1245.40 ± 0.50	-0.20	1949-lag/mcm(□)
303.15	1259.20 ± 1.00	-1.19	1930-smy/rog-1(×)	323.15	1230.80 ± 0.50	0.09	1949-lag/mcm(□)
323.15	1230.00 ± 1.00	-0.71	1930-smy/rog-1(×)	293.15	1275.80 ± 0.50	0.71	1961-bje(○)
343.15	1200.50 ± 1.00	-0.14	1930-smy/rog-1(×)	298.15	1268.60 ± 0.50	0.85	1961-bje(○)
363.15	1169.50 ± 1.00	-0.69	1930-smy/rog-1(×)				

¹⁾ Not included in Fig. 1.

Further references: [1871-lie/ros, 1872-lin, 1929-smy/eng-1, 1930-van/del, 1933-bri, 1935-ska/mcc, 1938-cow/par, 1942-aud/gos-1, 1943-vog, 1948-lag/eva, 1999-cab/mar].

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
180.00	1434.64 ± 1.41	260.00	1323.11 ± 0.92	320.00	1235.41 ± 0.87
190.00	1421.03 ± 1.40	270.00	1308.74 ± 0.84	330.00	1220.46 ± 1.02
200.00	1407.33 ± 1.37	280.00	1294.26 ± 0.78	340.00	1205.41 ± 1.24
210.00	1393.54 ± 1.33	290.00	1279.70 ± 0.74	350.00	1190.26 ± 1.53
220.00	1379.65 ± 1.26	293.15	1275.09 ± 0.74	360.00	1175.01 ± 1.90
230.00	1365.66 ± 1.18	298.15	1267.75 ± 0.74	370.00	1159.67 ± 2.35
240.00	1351.57 ± 1.10	300.00	1265.03 ± 0.74	380.00	1144.24 ± 2.90
250.00	1337.39 ± 1.01	310.00	1250.27 ± 0.78		

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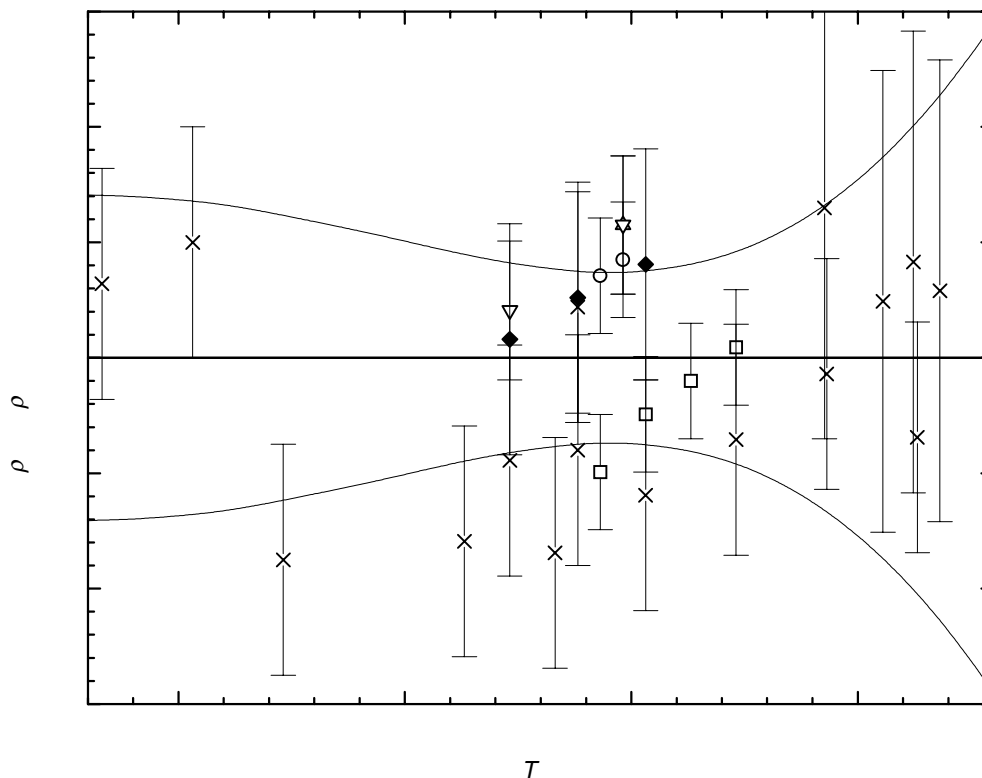
1-Bromobutane (cont.)

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.)

2-Bromobutane

[78-76-2]

C₄H₉Br**MW = 137.02****41**

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

$\sigma_{c,w} = 1.0196$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 4.1442 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 335.65 \text{ K}$
	$\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.39349 \cdot 10^3$
<i>B</i>	$5.82752 \cdot 10^{-1}$
<i>C</i>	$-3.53385 \cdot 10^{-3}$

cont.

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{ca}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
298.15	1250.70 ± 2.00	-2.41	1901-nor/gre(X)	298.15	1253.60 ± 1.00	0.49	1936-lev/rot-2(V)
298.15	1251.00 ± 2.00	-2.11	1931-lev/mar-2(X)	293.15	1259.70 ± 2.00	-0.94	1943-vog(◆)
273.15	1289.68 ± 1.00	0.67	1934-tim/del(O)	314.65	1226.40 ± 2.00	-0.59	1943-vog(◆)
288.15	1268.08 ± 1.00	0.08	1934-tim/del(O)	335.65	1193.50 ± 2.00	2.53	1943-vog(◆)
303.15	1246.43 ± 1.00	1.04	1934-tim/del(O)	298.15	1255.00 ± 2.00	1.89	1948-let(X)
298.15	1251.00 ± 2.00	-2.11	1935-ken/phi(X)	298.15	1253.87 ± 0.50	0.76	1967-her/bre(□)
298.15	1253.00 ± 1.00	-0.11	1935-ska/mcc(Δ)	298.15	1253.88 ± 0.50	0.77	1971-her/bre(X)

Further references: [1933-chi/kat].

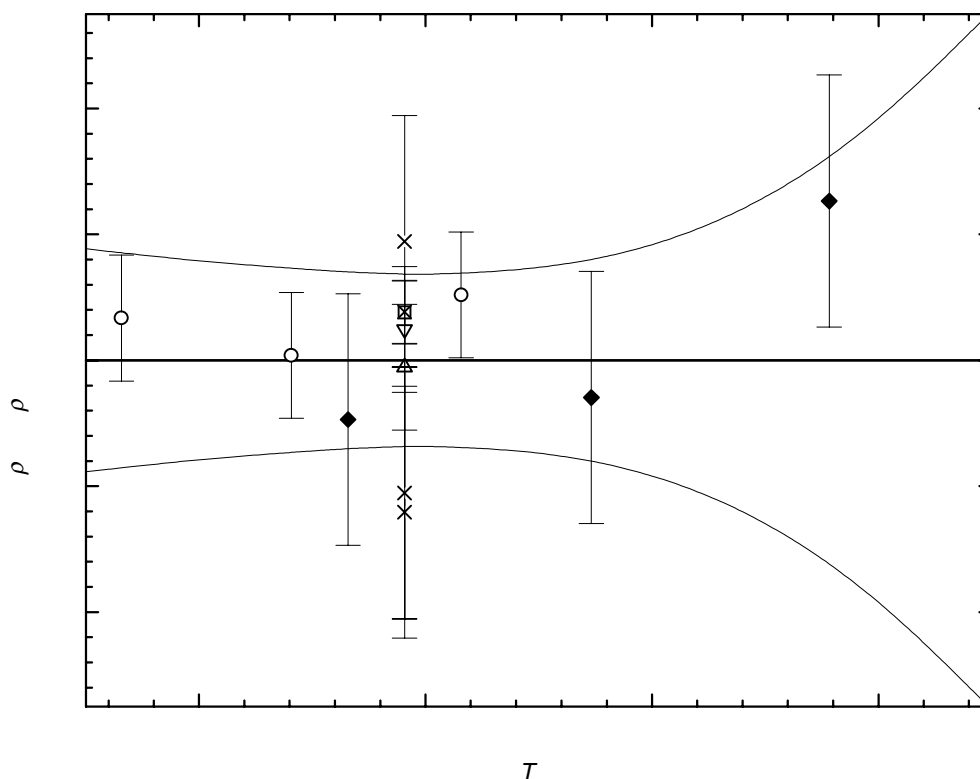


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1293.22 ± 1.77	298.15	1253.11 ± 1.37	330.00	1200.97 ± 2.51
280.00	1279.61 ± 1.57	300.00	1250.27 ± 1.36	340.00	1183.12 ± 3.75
290.00	1265.30 ± 1.44	310.00	1234.54 ± 1.43	350.00	1164.56 ± 5.55
293.15	1260.64 ± 1.40	320.00	1218.11 ± 1.77		

1-Bromo-2-methylpropane

[78-77-3]

C₄H₉Br

MW = 137.02

42

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

$\sigma_{c,w} = 2.2165 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.7303 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 303.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.69756 \cdot 10^3$
B	-1.47733

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)
288.15	1271.07 ± 2.00	-0.80	1885-per-1(Δ)	273.15	1294.07 ± 0.40	0.04	1928-tim/mar(□)
298.15	1256.12 ± 2.00	-0.98	1885-per-1(Δ)	288.15	1271.94 ± 0.40	0.07	1928-tim/mar(□)
298.15	1258.70 ± 2.00	1.60	1911-bru(O)	303.15	1249.77 ± 0.40	0.06	1928-tim/mar(□)

Further references: [1872-lin-4, 1886-sch, 1935-ska/mcc, 1943-vog].**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	1298.68 ± 1.51	293.15	1264.48 ± 1.29	310.00	1239.59 ± 2.14
280.00	1283.91 ± 1.13	298.15	1257.10 ± 1.51		
290.00	1269.14 ± 1.17	300.00	1254.36 ± 1.60		

cont.

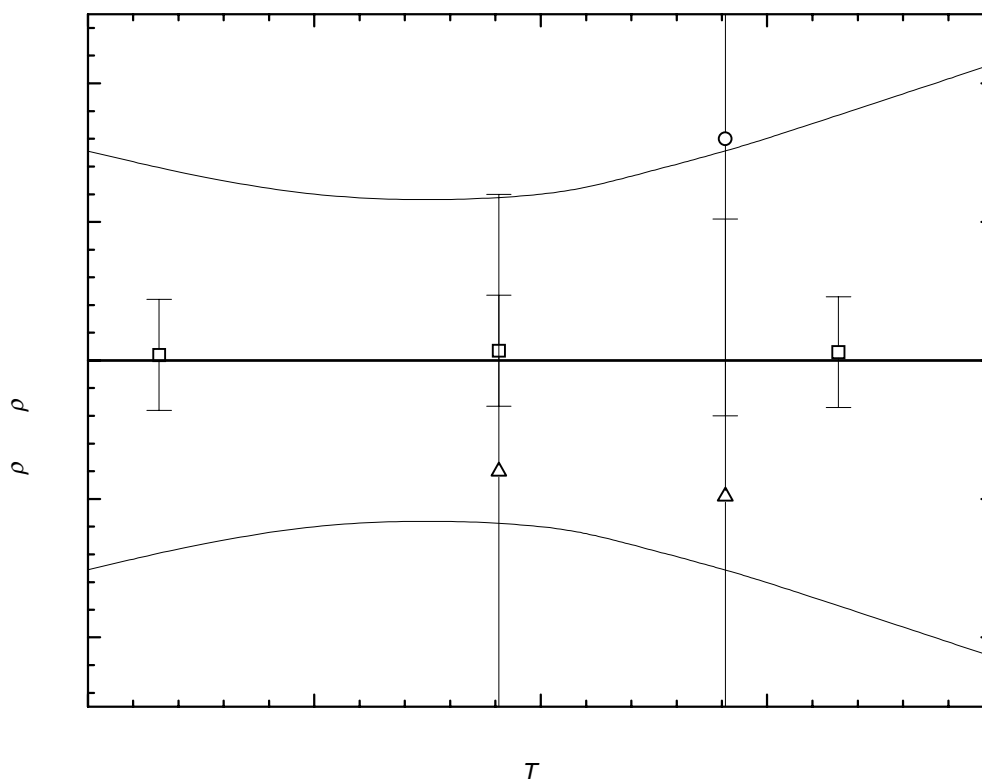


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

2-Bromo-2-methylpropane

[507-19-7]

C₄H₉Br

MW = 137.02

43

Table 1. Fit with estimated B coefficient for 4 accepted points. Deviation $\sigma_w = 0.602$.

Coefficient	$\rho = A + BT$
A	1660.53
B	-1.500

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.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
288.15	1200.90 ± 20.00	-27.39	1885-per-1 ¹⁾	288.15	1228.60 ± 1.00	0.30	1934-tim/del
298.15	1185.70 ± 20.00	-27.60	1885-per-1 ¹⁾	303.15	1205.50 ± 1.00	-0.28	1934-tim/del
273.15	1251.60 ± 1.00	0.79	1934-tim/del	298.15	1212.50 ± 1.00	-0.81	1951-bry/how

¹⁾ Not included in calculation of linear coefficients.

cont.

2-Bromo-2-methylpropane (cont.)**Table 3.** Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1255.5 \pm 1.5
280.00	1240.5 \pm 1.1
290.00	1225.5 \pm 0.8
293.15	1220.8 \pm 0.9
298.15	1213.3 \pm 1.0
310.00	1195.5 \pm 1.4

1,2,2,3-Tetrabromopentane [500030-36-4] C₅H₈Br₄ MW = 387.73 44

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.
295.15	2283.90 \pm 3.00	1927-bou-1

1,1,2-Tribromo-3-methylbutane [500047-65-4] C₅H₉Br₃ MW = 308.84 45

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.
294.15	2032.00 \pm 2.00	1929-kir

1,2,2-Tribromo-3-methylbutane [500047-64-3] C₅H₉Br₃ MW = 308.84 46

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.
293.15	2071.10 \pm 2.00	1913-kuc

1,2,3-Tribromo-2-methylbutane [57513-16-3] C₅H₉Br₃ MW = 308.84 47

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.025$.

Coefficient	$\rho = A + BT$
A	2530.61
B	-1.530

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.
293.15	2082.10 \pm 2.00	0.03	1925-mer
273.15	2112.70 \pm 2.00	-0.02	1925-mer

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	2117.5 \pm 2.2
280.00	2102.2 \pm 1.8
290.00	2086.9 \pm 1.9
293.15	2082.1 \pm 2.0
298.15	2074.4 \pm 2.3

1,1,1-Tribromopentane [16644-66-9] C₅H₉Br₃ MW = 308.84 48

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.
293.15	1988.20 \pm 2.00	1956-nes/fre-1

1,2,2-Tribromopentane [500047-66-5] C₅H₉Br₃ MW = 308.84 49

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.
273.15	2030.00 \pm 5.00	1921-les

1,2,3-Tribromopentane [130156-60-4] C₅H₉Br₃ MW = 308.84 50

Table 1. Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	2116.60 \pm 10.00	1923-del-1	292.15	2071.40 \pm 3.00	1928-bou
287.15	2095.20 \pm 10.00	1923-del-1	294.15	2068.20 \pm 3.00	1929-les/wie
292.15	2071.40 \pm 3.00	1927-bou-1	293.15	2021.00 \pm 20.00	1950-cha/kam

1,2,5-Tribromopentane [28885-22-5] C₅H₉Br₃ MW = 308.84 51

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
295.15	2073.00 ± 3.00	1932-pau

1,3,5-Tribromopentane [128813-74-1] C₅H₉Br₃ MW = 308.84 52

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
292.15	2065.00 ± 2.00	1951-pau/tch-1

1,1,1-Tris(Bromomethyl)ethane [60111-68-4] C₅H₉Br₃ MW = 308.84 53

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
293.15	2091.70 ± 2.00	1949-der/gre

1,1-Dibromo-2,2-dimethylpropane [2443-91-6] C₅H₁₀Br₂ MW = 229.94 54

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.000$.

Coefficient	$\rho = A + BT$
A	2097.50
B	-1.460

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.
293.15	1669.50 ± 2.00	0.00	1913-kuc
273.15	1698.70 ± 2.00	0.00	1913-kuc

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
270.00	1703.3 ± 2.2
280.00	1688.7 ± 1.8
290.00	1674.1 ± 1.9
293.15	1669.5 ± 2.0
298.15	1662.2 ± 2.3

1,3-Dibromo-2,2-dimethylpropane [5434-27-5] C₅H₁₀Br₂ MW = 229.94 55

Table 1. Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	1693.40 ± 1.00	1948-sho/cra
293.15	1677.50 ± 3.00	1953-slo/gri

1,2-Dibromo-2-methylbutane [10428-64-5] C₅H₁₀Br₂ MW = 229.94 56

Table 1. Experimental values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	1692.10 ± 2.00	1899-vas
294.15	1663.80 ± 2.00	1899-vas
293.15	1671.10 ± 0.60	1936-she/wal
293.15	1644.00 ± 10.00	1953-slo/gri

1,2-Dibromo-3-methylbutane [10288-13-8] C₅H₁₀Br₂ MW = 229.94 57

Table 1. Experimental and recommended values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	1677.00 ± 1.00	1913-kuc
293.15	1677.00 ± 1.00	1935-gre-3
293.15	1677.60 ± 1.00	Recommended

1,3-Dibromo-3-methylbutane [24443-15-0] C₅H₁₀Br₂ MW = 229.94 58

Table 1. Experimental and recommended values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	1700.00 ± 2.00	1897-ipa
273.15	1696.00 ± 2.00	1897-ipa-1
273.15	1698.60 ± 2.40	Recommended

2-Methyl-1,4-dibromobutane

[54462-66-7]



MW = 229.94

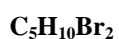
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Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
273.15	1748.80 ± 6.00	1907-fav/kut
293.15	1722.20 ± 6.00	1907-fav/kut
290.15	1697.40 ± 6.00	1911-har
293.15	1711.50 ± 1.00	1951-whi/dea

2,3-Dibromo-2-methylbutane

[594-51-4]



MW = 229.94

60

Table 1. Fit with estimated B coefficient for 4 accepted points. Deviation $\sigma_w = 0.821$.

Coefficient	$\rho = A + BT$
A	2093.40
B	-1.440

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.
273.15	1699.60 ± 1.00	-0.46	1907-fav/kut
294.15	1670.90 ± 1.00	1.08	1907-fav/kut
298.15	1572.90 ± 30.00	-91.16	1935-gre-3 ¹⁾
298.15	1663.00 ± 1.00	-1.06	1944-sut/zoo
293.15	1671.70 ± 1.00	0.44	1951-pan/pri

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$
270.00	1704.6 ± 1.6
280.00	1690.2 ± 1.2
290.00	1675.8 ± 1.1
293.15	1671.3 ± 1.1
298.15	1664.1 ± 1.2

1,2-Dibromopentane [3234-49-9] C₅H₁₀Br₂ MW = 229.94 61
Table 1. Experimental and recommended values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
286.35	1670.70 ± 1.50	1894-jah/mol ¹⁾	293.15	1674.00 ± 2.00	1931-wil ¹⁾
288.55	1666.60 ± 1.50	1894-jah/mol ¹⁾	293.15	1672.20 ± 1.00	1934-she/smi
288.15	1670.00 ± 1.50	1894-jah/mol ¹⁾	293.15	1670.80 ± 1.00	1950-lev/vik
293.15	1649.50 ± 10.00	1930-dyk/lew ¹⁾	293.15	1671.50 ± 1.10	Recommended

¹⁾ Not included in calculation of recommended value.
1,3-Dibromopentane [42474-20-4] C₅H₁₀Br₂ MW = 229.94 62
Table 1. Experimental values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
298.15	1681.00 ± 4.00	1929-les/wie
293.15	1613.00 ± 30.00	1955-han
293.15	1665.30 ± 2.00	1953-zei

1,4-Dibromopentane [626-87-9] C₅H₁₀Br₂ MW = 229.94 63
Table 1. Experimental and recommended values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	1683.00 ± 2.00	1929-ros ¹⁾	293.15	1686.80 ± 1.00	1956-shu/bel-1
288.15	1685.00 ± 3.00	1932-pau ¹⁾	293.15	1687.10 ± 1.00	1956-shu/bel-3
293.15	1686.10 ± 1.00	1951-whi/dea	293.15	1686.70 ± 1.0	Recommended
293.15	1682.10 ± 2.00	1955-han ¹⁾			

¹⁾ Not included in calculation of recommended value.
1,5-Dibromopentane [111-24-0] C₅H₁₀Br₂ MW = 229.94 64

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 7.7635 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 2.5878 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 358.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$2.09279 \cdot 10^3$
B	-1.33201

cont.

1,5-Dibromopentane (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)
291.15	1706.00 ± 1.00	1.03	1905-ham(∇)	293.15	1703.00 ± 1.00	0.69	1951-whi/dea(\circ)
298.15	1694.00 ± 1.00	-1.65	1913-dun/hil(\blacklozenge)	293.15	1702.40 ± 1.00	0.09	1960-grz/jef-1(Δ)
273.15	1729.52 ± 1.00	0.57	1933-ser(\square)	313.15	1675.70 ± 1.00	0.03	1960-grz/jef-1(Δ)
288.15	1708.76 ± 1.00	-0.21	1933-ser(\square)	333.15	1649.20 ± 1.00	0.17	1960-grz/jef-1(Δ)
303.15	1687.88 ± 1.00	-1.11	1933-ser(\square)	358.15	1616.10 ± 1.00	0.37	1960-grz/jef-1(Δ)

Further references: [1925-les, 1932-smv/wal, 1933-joh, 1933-pau, 1950-har/for, 1955-sav/sya].

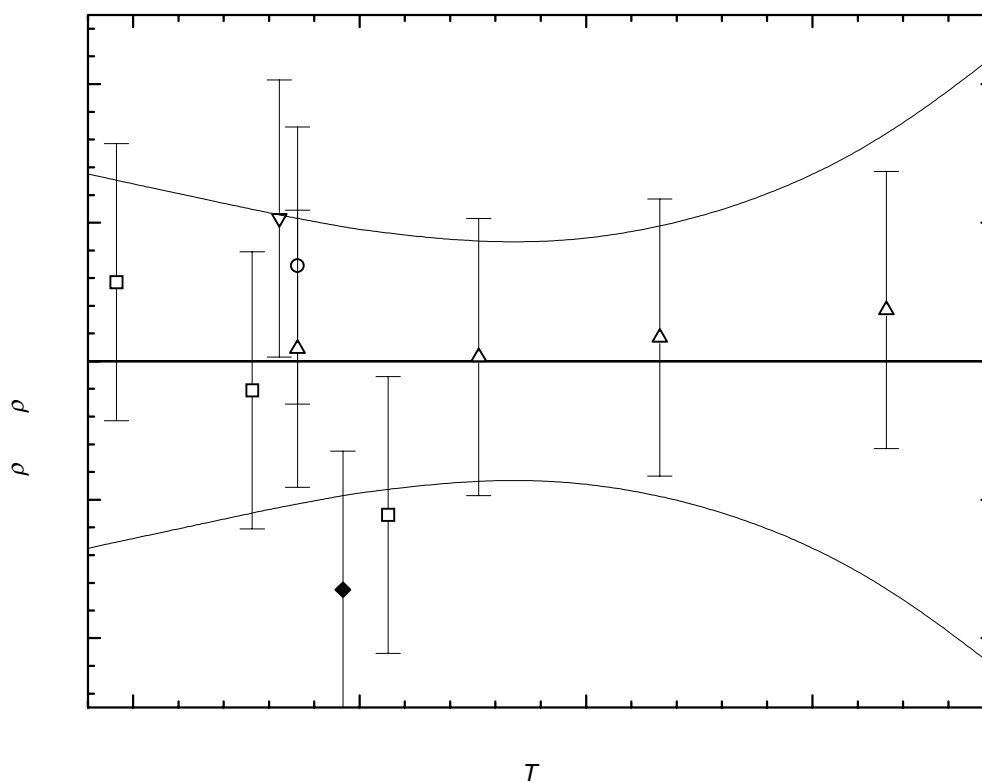


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

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

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1733.14 ± 1.35	300.00	1693.18 ± 0.95	350.00	1626.58 ± 1.33
280.00	1719.82 ± 1.21	310.00	1679.86 ± 0.87	360.00	1613.26 ± 1.70
290.00	1706.50 ± 1.07	320.00	1666.54 ± 0.85	370.00	1599.94 ± 2.20
293.15	1702.31 ± 1.03	330.00	1653.22 ± 0.92		
298.15	1695.65 ± 0.97	340.00	1639.90 ± 1.08		

2,2-Dibromopentane

[54653-26-8]

C₅H₁₀Br₂

MW = 229.94

65

Table 1. Experimental values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
289.15	1645.20 ± 2.00	1927-bou-2
289.15	1645.20 ± 2.00	1928-bou

2,3-Dibromopentane

[5398-25-4]

C₅H₁₀Br₂

MW = 229.94

66

Table 1. Experimental values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
287.15	1686.60 ± 2.00	1875-wag/say-1	290.35	1676.40 ± 3.00	1914-van-1
284.15	1685.70 ± 3.00	1913-van	293.15	1673.00 ± 3.00	1930-les-1
290.35	1676.60 ± 3.00	1913-van	293.15	1678.90 ± 1.50	1934-she/smi
284.15	1685.50 ± 3.00	1914-van-1			

Threo-2,3-dibromopentane

[22415-73-2]

C₅H₁₀Br₂

MW = 229.94

67

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.050$.

Coefficient	$\rho = A + BT$
A	2062.05
B	-1.300

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.
293.15	1680.90 ± 2.00	-0.05	1937-luc/pra
298.15	1674.50 ± 2.00	0.05	1941-luc/sch

cont.

Threo-2,3-dibromopentane (cont.)**Table 3.** Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
290.00	1685.0 ± 1.8
293.15	1681.0 ± 1.8
298.15	1674.5 ± 1.8

Erythro-2,3-dibromopentane

[22415-74-3]

C₅H₁₀Br₂

MW = 229.94

68

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.650$.

Coefficient	$\rho = A + BT$
A	2150.09
B	-1.600

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.
293.15	1681.70 ± 2.00	0.65	1937-luc/pra
298.15	1672.40 ± 2.00	-0.65	1941-luc/sch

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
290.00	1686.1 ± 2.0
293.15	1681.1 ± 1.9
298.15	1673.1 ± 1.9

2,4-Dibromopentane

[19398-53-9]

C₅H₁₀Br₂

MW = 229.94

69

Table 1. Experimental values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
293.15	1665.90 ± 5.00	1911-zel/uje
293.15	1630.20 ± 1.00	1955-kel/gre

1-Bromo-2,2-dimethylpropane**[630-17-1]****C₅H₁₁Br****MW = 151.05****70****Table 1.** Experimental and recommended values with uncertainties.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	1225.30 ± 1.50	1893-tis-1 ¹⁾	295.85	1196.00 ± 1.50	1942-bar/ros ¹⁾
273.15	1294.00 ± 20.00	1905-pon ¹⁾	293.15	1200.00 ± 1.00	1951-som/bla
293.55	1260.40 ± 20.00	1905-pon ¹⁾	293.15	1199.00 ± 1.00	1954-som/bla
293.15	1199.00 ± 1.00	1939-whi/wit	293.15	1199.30 ± 1.00	Recommended

¹⁾ Not included in calculation of recommended value.**1-Bromo-2-methylbutane****[10422-35-2]****C₅H₁₁Br****MW = 151.05****71****Table 1.** Fit with estimated B coefficient for 5 accepted points. Deviation $\sigma_w = 1.368$.

Coefficient	$\rho = A + BT$
A	1662.28
B	-1.500

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{cal}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
288.85	1221.00 ± 3.00	-8.00	1886-lie/zei ¹⁾
293.15	1221.00 ± 2.00	-1.55	1904-mar-1
304.65	1207.20 ± 2.00	1.90	1908-har/sik
298.15	1214.40 ± 2.00	-0.65	1935-lev/mar
293.15	1223.90 ± 2.00	1.35	1938-whi/ole-1
298.15	1214.00 ± 2.00	-1.05	1948-let

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	1227.3 ± 2.2
293.15	1222.6 ± 2.1
298.15	1215.1 ± 2.0
310.00	1197.3 ± 2.4

d-1-Bromo-2-methylbutane**[500047-69-8]****C₅H₁₁Br****MW = 151.05****72****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.
293.15	1223.40 ± 2.00	1937-bra

(S)-(+)-1-Bromo-2-methylbutane**[534-00-9]****C₅H₁₁Br****MW = 151.05****73****Table 1.** Experimental and recommended values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg·m ⁻³	Ref.
293.15	1223.90 ± 1.00	1938-whi/ole-1
293.15	1225.00 ± 1.00	1948-bro/bro
296.15	1220.00 ± 2.00	1952-hel ¹⁾
293.15	1224.50 ± 1.10	Recommended

¹⁾ Not included in calculation of recommended value.**1-Bromo-3-methylbutane****[107-82-4]****C₅H₁₁Br****MW = 151.05****74****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction):

$\sigma_{\text{c,w}} = 1.4480$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 3.9034 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T 273.15 to 384.35 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.43293 \cdot 10^3$
B	$-3.32501 \cdot 10^{-1}$
C	$-1.49724 \cdot 10^{-3}$

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)
295.15	1205.80 ± 1.00	1.44	1883-lac(□)	357.85	1122.10 ± 1.00	-0.11	1943-fri/har(O)
273.15	1229.12 ± 2.00	-1.28	1929-tim/hen(∇)	369.35	1105.40 ± 1.00	-0.47	1943-fri/har(O)
288.15	1209.54 ± 2.00	-3.26	1929-tim/hen(∇)	384.35	1084.50 ± 1.00	0.55	1943-fri/har(O)
303.15	1189.89 ± 2.00	-4.65	1929-tim/hen ¹⁾	293.15	1206.90 ± 1.00	0.11	1943-vog(Δ)
285.65	1217.20 ± 1.00	1.42	1943-fri/har(O)	314.95	1179.10 ± 1.00	-0.59	1943-vog(Δ)
323.15	1170.20 ± 1.00	1.07	1943-fri/har(O)	335.75	1152.90 ± 1.00	0.39	1943-vog(Δ)
344.75	1139.50 ± 1.00	-0.85	1943-fri/har(O)	360.55	1120.00 ± 1.00	1.59	1943-vog(Δ)

¹⁾ Not included in Fig. 1.**Further references:** [1876-bal, 1886-sch, 1898-kah].

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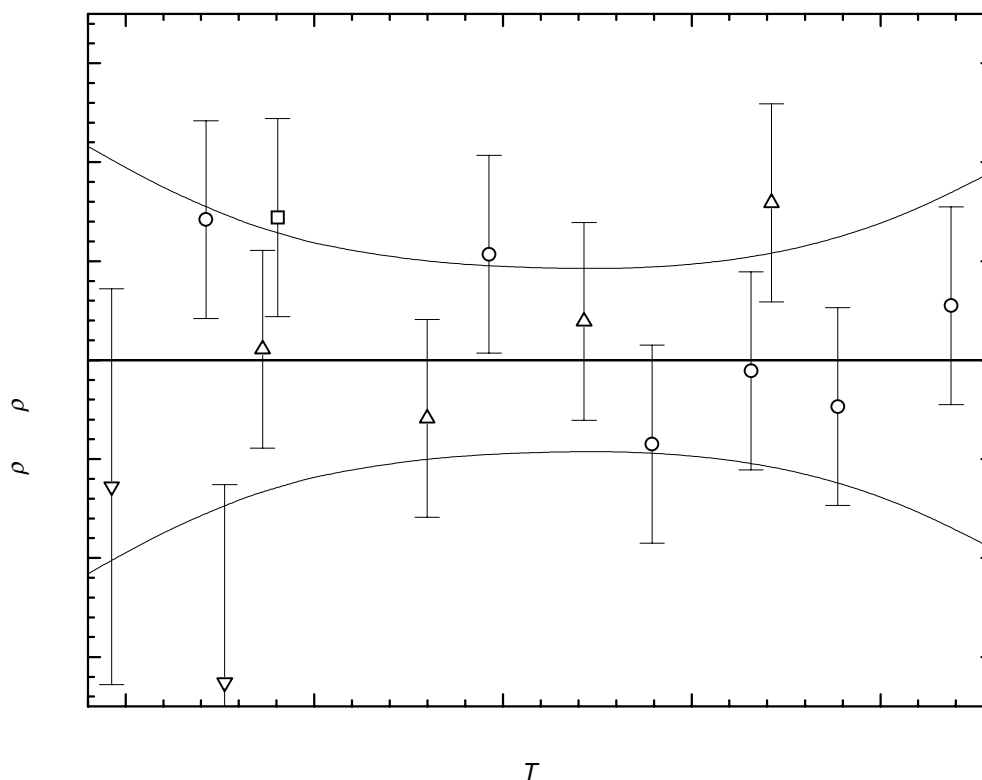


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1234.01 \pm 2.16	300.00	1198.43 \pm 1.18	350.00	1133.14 \pm 0.96
280.00	1222.45 \pm 1.73	310.00	1185.97 \pm 1.04	360.00	1119.19 \pm 1.06
290.00	1210.59 \pm 1.41	320.00	1173.21 \pm 0.96	370.00	1104.93 \pm 1.24
293.15	1206.79 \pm 1.33	330.00	1160.15 \pm 0.93	380.00	1090.38 \pm 1.52
298.15	1200.70 \pm 1.22	340.00	1146.80 \pm 0.92	390.00	1075.52 \pm 1.91

2-Bromo-2-methylbutane

[507-36-8]

C₅H₁₁Br

MW = 151.05

75

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 1.065$.

Coefficient	$\rho = A + BT$
A	1597.73
B	-1.300

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.
273.15	1243.70 \pm 2.00	1.06	1905-pon
293.05	1215.70 \pm 2.00	-1.06	1905-pon

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1246.7 \pm 2.3
280.00	1233.7 \pm 2.1
290.00	1220.7 \pm 2.1
293.15	1216.6 \pm 2.2
298.15	1210.1 \pm 2.3

2-Bromo-3-methylbutane

[18295-25-5]

C₅H₁₁Br

MW = 151.05

76

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	1221.00 \pm 2.00	1904-mar-1

1-Bromopentane

[110-53-2]

C₅H₁₁Br

MW = 151.05

77

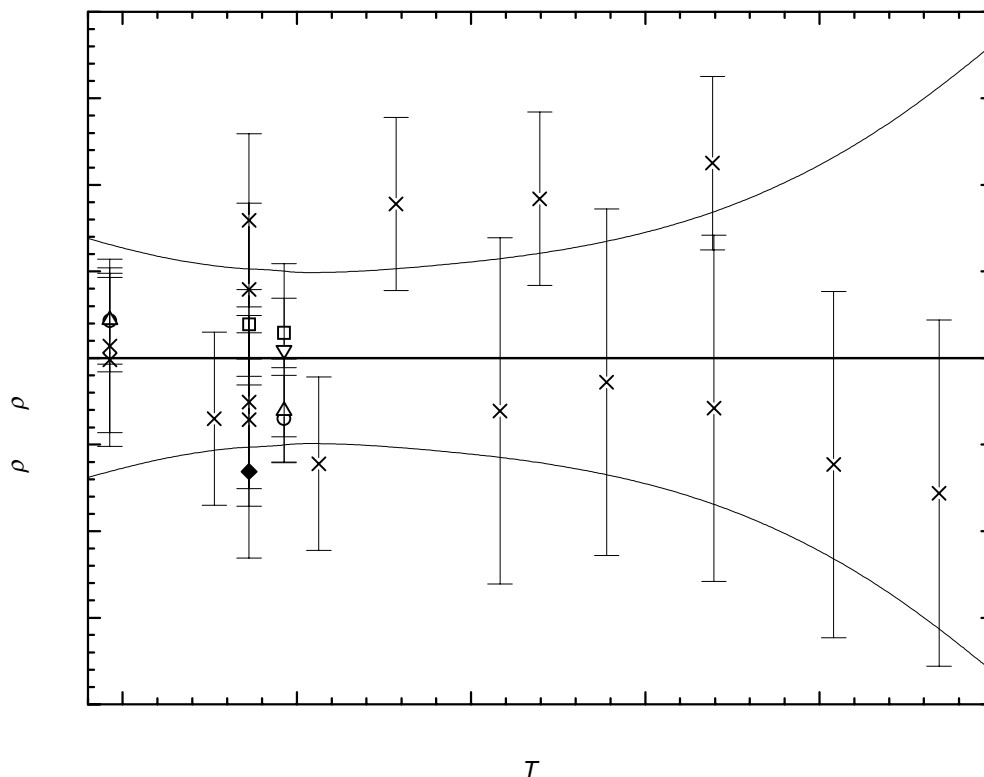
Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 6.8640 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.1976 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 273.15 \text{ to } 392.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.52128 \cdot 10^3$
B	$-8.31479 \cdot 10^{-1}$
C	$-6.90276 \cdot 10^{-4}$

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)
273.15	1242.80 \pm 1.00	0.14	1912-kar(×)	329.15	1172.20 \pm 2.00	-0.61	1943-fri/har(×)
293.15	1217.50 \pm 1.00	-0.71	1912-kar(×)	344.45	1152.70 \pm 2.00	-0.28	1943-fri/har(×)
273.15	1242.64 \pm 1.00	-0.02	1929-sim(×)	359.85	1132.10 \pm 2.00	-0.58	1943-fri/har(×)
288.15	1223.67 \pm 1.00	-0.70	1929-sim(×)	377.05	1108.40 \pm 2.00	-1.23	1943-fri/har(×)
303.15	1204.56 \pm 1.00	-1.22	1929-sim(×)	392.15	1087.50 \pm 2.00	-1.56	1943-fri/har(×)
273.15	1243.10 \pm 0.60	0.44	1931-dee(Δ)	293.15	1219.00 \pm 1.00	0.79	1943-vog(×)
298.15	1211.40 \pm 0.60	-0.61	1931-dee(Δ)	314.25	1193.60 \pm 1.00	1.78	1943-vog(×)
273.15	1243.09 \pm 0.50	0.43	1932-ell/rei(○)	334.85	1167.30 \pm 1.00	1.84	1943-vog(×)
298.15	1211.31 \pm 0.50	-0.70	1932-ell/rei(○)	359.65	1135.20 \pm 1.00	2.25	1943-vog(×)
298.15	1212.10 \pm 1.00	0.09	1935-ska/mcc(∇)	293.15	1219.80 \pm 1.00	1.59	1946-boo/gre(×)
293.15	1216.90 \pm 1.00	-1.31	1936-oli(◆)	293.15	1218.60 \pm 0.40	0.39	1961-bje(□)
293.15	1217.70 \pm 1.00	-0.51	1938-cow/par(×)	298.15	1212.30 \pm 0.40	0.29	1961-bje(□)
287.55	1224.70 \pm 2.00	-0.41	1943-fri/har ¹⁾				

¹⁾ Not included in Fig. 1.**Further references:** [1871-lie/ros-3, 1894-jah/mol, 1933-bri, 1943-hal, 1950-hes/hen, 1953-kar/mcl].**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-Bromopentane (cont.)**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1246.46 ± 1.38	310.00	1197.18 ± 1.00	370.00	1119.13 ± 2.01
280.00	1234.35 ± 1.16	320.00	1184.52 ± 1.07	380.00	1105.64 ± 2.44
290.00	1222.10 ± 1.04	330.00	1171.72 ± 1.15	390.00	1092.01 ± 2.98
293.15	1218.21 ± 1.03	340.00	1158.78 ± 1.27	400.00	1078.24 ± 3.63
298.15	1212.01 ± 1.01	350.00	1145.70 ± 1.44		
300.00	1209.71 ± 0.98	360.00	1132.49 ± 1.68		

2-Bromopentane

[107-81-3]

C₅H₁₁Br

MW = 151.05

78

Table 1. Fit with estimated B coefficient for 6 accepted points. Deviation $\sigma_w = 1.482$.

Coefficient	$\rho = A + BT$
A	1559.37
B	-1.200

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.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	1232.50 ± 0.60	0.94	1932-ell/rei	314.65	1182.80 ± 2.00	1.01	1943-vog
298.15	1200.50 ± 0.60	-1.07	1932-ell/rei	334.25	1157.70 ± 2.00	-0.57	1943-vog
293.15	1212.20 ± 2.00	4.61	1943-vog	357.95	1126.30 ± 2.00	-3.53	1943-vog

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1235.4 ± 2.3	298.15	1201.6 ± 2.0	340.00	1151.4 ± 3.1
280.00	1223.4 ± 2.1	310.00	1187.4 ± 2.2	350.00	1139.4 ± 3.5
290.00	1211.4 ± 2.0	320.00	1175.4 ± 2.5	360.00	1127.4 ± 4.0
293.15	1207.6 ± 2.0	330.00	1163.4 ± 2.8		

(S)-(+)-2-Bromopentane**[29882-58-4]****C₅H₁₁Br****MW = 151.05****79****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.
293.15	1204.60 ± 0.50	1943-bra

3-Bromopentane**[1809-10-5]****C₅H₁₁Br****MW = 151.05****80**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 6.0302 \cdot 10^{-2}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 4.2640 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 298.15 \text{ to } 357.65 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.43785 \cdot 10^3$
<i>B</i>	$-3.70427 \cdot 10^{-1}$
<i>C</i>	$-1.37628 \cdot 10^{-3}$

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)
298.15	1205.10 ± 1.00	0.03	1943-vog(□)	337.15	1156.60 ± 1.00	0.08	1943-vog(□)
316.15	1183.10 ± 1.00	-0.08	1943-vog(□)	357.65	1129.30 ± 1.00	-0.03	1943-vog(□)

Further references: [1916-ros-1, 1926-gri/ono].**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	1214.68 ± 2.00	310.00	1190.76 ± 1.14	350.00	1139.61 ± 1.14
293.15	1210.99 ± 1.78	320.00	1178.39 ± 1.06	360.00	1126.13 ± 1.78
298.15	1205.07 ± 1.50	330.00	1165.74 ± 1.01	370.00	1112.38 ± 2.93
300.00	1202.86 ± 1.41	340.00	1152.81 ± 0.97		

cont.

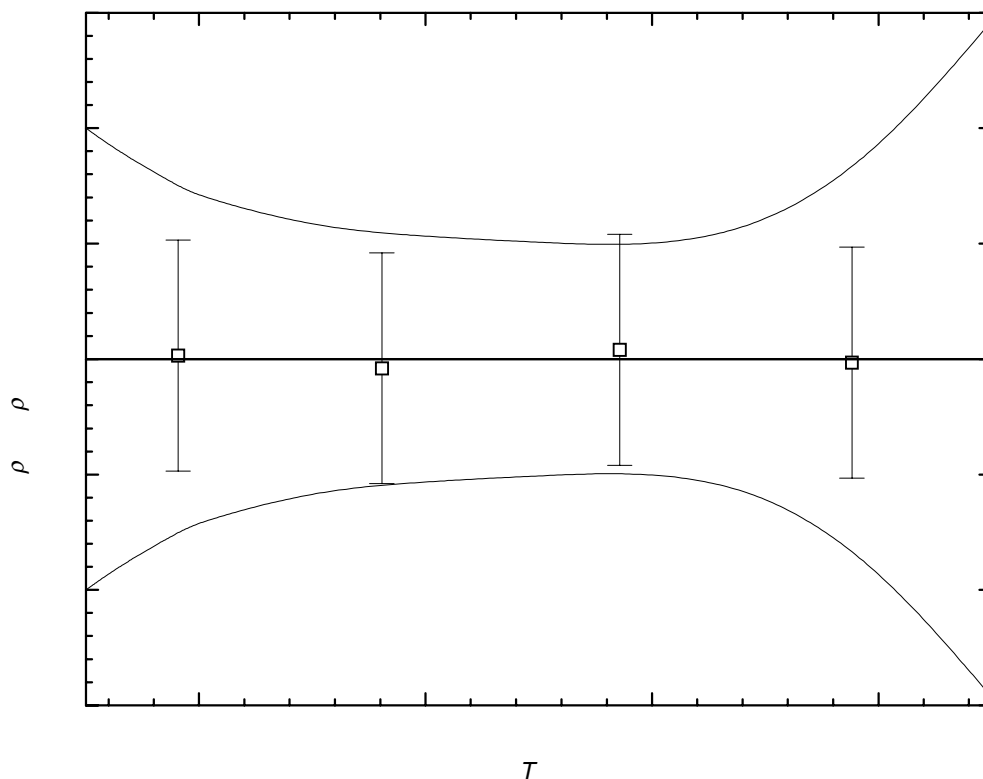
3-Bromopentane (cont.)

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.)